Appendix ES-A

Summary of Sections that Meet GSP Regulations §356.4

Table 1. Summary of Sections that Meet GSP Regulations §356.4

GSP Regulations §356.4	GSP Amendment 1	GSP 2025 Evaluation
(a) A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives, interim milestones and minimum thresholds.	2020 groundwater conditions are compared to SMC in Chapter 8 (8.6.2, 8.6.3.2, 8.7.2, 8.7.3.2, 8.8.2, 8.9.2, 8.10.2, 8.11.2, 8.11.3.2). In GSP Amendment 1, the Depletion of ISW included in Chapter 5 was completed using the SVIHM. Additionally, the SMC approach is changed for Reduction in Groundwater Storage and Depletion of ISW, but the intent of the SMC is not changed. Therefore, since the 2020 GSP established minimum thresholds for these indicators based on 2017 conditions, the updated minimum thresholds also are based on 2017 conditions.	Section 2 of the GSP 2025 Evaluation includes current conditions through WY 2023 (last available year of data prior to drafting). Groundwater conditions are compared to the measurable objectives, 2025 interim milestones, and minimum thresholds for each sustainability indicator. Section 2 also describes the revisions to SMC included in GSP Amendment 1.
(b) A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.	A description of the actions taken toward implementing projects and management actions are described in Chapter 10 (Section 10.1.3), as of 2022 when GSP Amendment 1 was drafted. MCWRA's well destruction program has prevented further vertical migration of seawater intrusion through well destruction. Other activities contribute significant steps that advance the planning, modeling, and funding of projects and management but have yet to result in changes to groundwater conditions. GSP Amendment 1 notes that SVBGSA's receipt of a $7.6 million SGM Implementation Grant will fund implementation of projects and further feasibility studies.	Section 3 of the GSP 2025 Evaluation updates the GSP Amendment 1's description of implementation of projects and management actions with progress through the end of 2024.
(c) Elements of the Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, shall be reconsidered and revisions proposed, if necessary.	The basin setting description generally consists of the same information as the 2020 GSP. Revisions include clarifications and additions based on new information and analyses, as noted in section (d) below. No management areas have been added. Chapter 2 Communications and Public Engagement developed based on previous Chapter 11 and additional information to address DWR Recommended Corrective Action 1 on how SVBGSA will provide additional information on the required, ongoing communications elements. Chapter 4 Hydrogeologic Conceptual Model includes greater description on ISW and GDEs in discharge areas. Greater detail added to address DWR Recommended Corrective Action 2 on the hydraulic connectivity between the Salinas River, the non-principal shallow sediments, and principal aquifers. Greater detail added to address DWR Recommended Corrective Action 3 on how SVBGSA plans to conduct field reconnaissance for GDE identification. Regarding the SMC, the minimum thresholds, measurable objectives, and interim milestones for the expanded groundwater level monitoring network are added to GSP Amendment 1 (Sections 8.6.2 and 8.6.3.2). The approach and measurement method are updated for Reduction in Groundwater Storage SMC (Sections 8.7) and for ISW SMC (Sections 8.11)	The GSP 2025 Evaluation summarizes revisions to the elements of the GSP included in GSP Amendment 1. New data collected and analyses conducted since then are described and recommended for inclusion in a future amendment, such as the revisions to the Hydrogeologic Conceptual Model.

	in GSP Amendment 1 (for example, shifting the Storage SMC from extraction to calculated storage change). The intent of the minimum thresholds, measurable objectives, and undesirable results is not changed (for example, basin the Storage SMC on 2017 conditions). In Chapter 5 Groundwater Conditions, the change in storage calculation was revised to include aquifer specific storage change calculations for the 180-Foot and 400-Foot Aquifers. Chapter 5 also includes another calculation for the whole Subbasin to adequately compare current conditions to the SMC presented in Chapter 8. In addition, the storage change calculated for the Subbasin is used for the water budget, as explained in (d). The undesirable results statement for Degraded Groundwater Quality has been updated based on DWR's review of the 2020 GSP. The analysis of groundwater quality is updated to include review of all Title 22 constituents, not just those identified as present within the Subbasin. Chapter 5 Groundwater Conditions is updated to include data up to 2020, which was the most recent at the time GSP Amendment 1 development began. The water quality analysis included in Chapter 5 was updated to include all the wells that have been historically monitored in the Subbasin and those that continue to be monitored today under the DDW and ILRP monitoring programs. This analysis of all constituents is used to update the Water Quality SMC. The intent of the SMC is still the same as in the 2020 GSP, but the analysis is updated to include all Title 22/Basin Plan constituents and all wells that have been sampled in the Subbasin, thus providing a better representation of historical and current conditions. 10.1.1 explains how the monitoring networks were expanded.	
(d) An evaluation of the basin setting in light of significant new information or changes in water use, and an explanation of any significant changes. If the Agency's evaluation shows that the basin is experiencing overdraft conditions, the Agency shall include an assessment of measures to mitigate that overdraft	Chapter 3 Basin Setting includes an additional section on the County Public Policy of Safe and Clean Water (3.8) and updates on County ordinances (Section 3.6.5). Chapter 4 Hydrogeologic Conceptual Model includes a new analysis and greater description of the shallow sediments and their connection to underlying aquifers (Section 4.4.1.1), which addresses Corrective Action #2 of DWR's review of the 2020 GSP. In addition, new data on the Deep Aquifers, new analyses on the locations of interconnected surface water (Section 4.4.5.1), and a new section on groundwater dependent ecosystems (Section 4.4.5.2) are added to the Hydrogeologic Conceptual Model. Chapter 5 Groundwater Conditions now includes a new water use section (Section 5.7) that discusses the different types and quantities of water used in the Subbasin. The data included in this section ranges from 2017 (current conditions in the 2020 GSP) to 2020 (current conditions in GSP Amendment 1) to show how water use has changed since GSP submittal.	The GSP 2025 Evaluation summarizes new information collected in Section 1 and describes changes to the understanding of the basin setting based on this new information in Section 4. Updated water use is included in Section 2. Section 3 provides an update on projects and management actions that would be needed to mitigate overdraft conditions.

	Chapter 5 also includes an updated calculation for historical change in groundwater storage based on observed groundwater elevations. Chapter 6 Water Budgets use the annual average calculated change in storage based on observed conditions due to model uncertainties. The calculated change in storge is also used for the projected water budget because the simulated projected change in storage is anticipated to be similar to simulated historical change in storage change due to assumptions of static land use and similar urban pumping. The long-term sustainable yield and overdraft are based on anticipated extraction, change in storage based on observed groundwater elevation declines that occurred for similar levels of extraction, and change in storage based on observed seawater intrusion that occurred with similar levels of extraction. Chapter 9 Projects and Management Actions includes a section (Section 9.9) that addresses mitigation of overdraft. Chapter 10 GSP Implementation includes progress on projects and management actions, including to mitigate overdraft. As the GSP Amendment 1 was only undertaken 2 years after submittal of the 2020 GSP, most actions are planning, modeling, and funding of projects and management actions; however, SVBGSA recently secured funding to begin implementation of certain projects.	
(e) A description of the monitoring network within the basin, including whether data gaps exist, or any areas within the basin are represented by data that does not satisfy the requirements of Sections 352.4 and 354.34(c). The description shall include the following: (1) An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of Section 354.38. (2) If the Agency identifies data gaps, the Plan shall describe a program for the acquisition of additional data sources, including an estimate of the timing of that acquisition, and for incorporation of newly obtained information into the Plan. (3) The Plan shall prioritize the installation of new data collection facilities and analysis of new data based on the needs of the basin.	Chapter 7 Monitoring Networks includes the groundwater level monitoring network that is expanded in GSP Amendment 1. GSP Amendment 1 notes that as of 2022, data gaps still existed, particularly in the Deep Aquifers, as is noted in the Chapter (Section 7.2.2). The groundwater storage monitoring network is the same as the groundwater level monitoring network. Monitoring of the Deep Aquifers was also a data gap for seawater intrusion monitoring network (Section 7.4.2). For ISW, 2 existing monitoring wells will be used to monitor shallow groundwater elevations as proxies for stream depletion due to pumping and 2 new wells will be identified or drilled to fill the remaining data gaps (Section 7.7.2). There are no data gaps in the water quality or subsidence monitoring networks. Although not used to measure sustainability indicators, the surface water use from the SWRCB's eWRIMS and groundwater pumping from MCWRA's GEMS are also included under Other Monitoring Networks (Section 7.8) in GSP Amendment 1. The eWRIMS network does not have data gaps, but GEMS has some potential data gaps regarding its accuracy and reliability (Section 7.8.1.2). The steps needed to improve the monitoring networks that have data gaps are included in Chapter 10 (10.2.3). SVBGSA received $7.6 million under the SGM Implementation Grant, which includes funds for filling data gaps.	Section 5 of the GSP 2025 Evaluation includes an assessment of the GSP monitoring networks. It describes the wells added to the monitoring network within GSP Amendment 1, which filled most monitoring network data gaps. The GSP 2025 Evaluation includes further revisions to the monitoring networks completed since 2022, including newly installed wells; these are recommended for inclusion in a future amendment. The Deep Aquifers Study identified additional groundwater level monitoring network data gaps, which SVBGSA and partner agencies plan to fill.

(f) A description of significant new information that has been made available since Plan adoption or amendment, or the last five-year assessment. The description shall also include whether new information warrants changes to any aspect of the Plan, including the evaluation of the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results	Additional existing Deep Aquifer wells have been added to the groundwater level and seawater intrusion monitoring networks (Sections 7.2, 7.4). The Groundwater Level SMC for the Deep Aquifers are now included in Chapter 8 (Section 8.6). Groundwater conditions data up to 2020 has been added to GSP Amendment 1. No new information warrants significant changes to the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results.	Section 1 of the GSP 2025 Evaluation summarizes significant new information collected. Section 2 includes groundwater conditions data up to 2023 with respect to the SMC. No new information warrants significant changes to the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results at this time.
(g) A description of relevant actions taken by the Agency, including a summary of regulations or ordinances related to the Plan	Chapter 10 (Section 10.1) includes a new section on progress towards implementation of the GSP. Chapter 3 Description of Plan Area (Section 3.7) now includes a section on new regulations, ordinances, enforcement, and legal action.	Sections 6 and 7 of the GSP 2025 Evaluation summarize relevant actions taken by the Agency included in GSP Amendment 1 and since then with respect to GSA administration, legal action, funding, authorities, coordination, and outreach.
(h) Information describing any enforcement or legal actions taken by the Agency in furtherance of the sustainability goal for the basin	No enforcement or legal actions have been taken by SVBGSA, as noted in a new section in Chapter 3 (Section 3.7).	No enforcement or legal actions have been taken by SVBGSA, as noted in Section 6.7 of the GSP 2025 Evaluation.
(i) A description of completed or proposed Plan amendments	SVBGSA is submitting GSP Amendment 1 to DWR as an amendment to the GSP submitted in 2020. This will enable SVBGSA to complete 5-year assessments for all 6 of its subbasins simultaneously, beginning in 2027.	The GSP 2025 Evaluation describes GSP Amendment 1.
(j) Where appropriate, a summary of coordination that occurred between multiple Agencies in a single basin, Agencies in hydrologically connected basins, and land use agencies	Chapter 1 Introduction includes new sections to summarize coordination between GSAs (Section 1.3.1) and SVBGSA coordination with land use agencies (Section 1.3.2). Chapter 9 Projects and Management Actions includes a new implementation action titled Water Quality Coordination Group, which outlines how SVBGSA will address Recommended Corrective Action 4 and coordinate with water quality regulatory agencies and programs.	Section 7 of the GSP 2025 Evaluation describes GSA coordination.
(k) Other information the Agency deems appropriate, along with any information required by the Department to conduct a periodic review as required by Water Code Section 10733	GSP Amendment 1 includes an updated water budget based on provisional versions of the SVIHM and SVOM released in 2021.	Section 4.4 of the GSP 2025 Evaluation includes an updated water budget based on provisional versions of the SVIHM and SVOM released in 2024.

Appendix ES-B

Resolution No. 2022-16

Before the Board of Directors of the
Salinas Valley Basin Sustainable Groundwater Management Agency

Resolution No 2022-16.

Approving an update to the Groundwater	)
Sustainability Plan for the 180/400-foot	)
aquifer subbasin of the Salinas Valley	)
Groundwater Basin, and authorizing and	)
directing its filing with the California	)
Department of Water Resources.	)

WHEREAS, in the fall of 2014 the California legislature adopted, and the Governor signed into law, three bills (SB 1168, AB 1739, and SB 1319) collectively referred to as the "Sustainable Groundwater Management Act" ("SGMA"), that initially became effective on January 1, 2015, and that has been amended from time-to-time thereafter; and,

WHEREAS, the stated purpose of SGMA, as set forth in California Water Code section 10720.1, is to provide for the sustainable management of groundwater basins at a local level by providing local groundwater agencies with the authority, and technical and financial assistance necessary, to sustainably manage groundwater; and,

WHEREAS, SGMA requires the designation of Groundwater Sustainability Agencies ("GSAs") for the purpose of achieving groundwater sustainability through the adoption and implementation of regulatory programs known as Groundwater Sustainability Plans ("GSPs") or an alternative plan for all medium and high priority basins as designated by the California Department of Water Resources ("DWR"); and,

WHEREAS, in December of 2016 a joint powers authority, known as the Salinas Valley Basin Groundwater Sustainability Agency ("SVBGSA") was formed for the purpose of being a GSA for the Salinas Valley Groundwater Basin ("Basin"), and the subbasins therein (with limited exceptions), within Monterey County; and,

WHEREAS, SGMA requires GSAs to adopt GSPs for each basin/subbasin within the GSA's jurisdiction; and,

WHEREAS, GSPs for basins designated high priority in DWR's Bulletin 118, and for those basins designated a in a critical condition of overdraft, are due to be filed with DWR no later than January 31, 2020; and,

WHEREAS, the 180/400-foot aquifer subbasin of the Salinas Valley Groundwater Basin ("Subbasin") is designated high priority and in a critical condition of overdraft; and,

WHEREAS, the SVBGSA undertook the process to prepare a GSP for the Subbasin as required by SGMA and timely filed it with DWR; and, WHEREAS, DWR approved the GSP for the Subbasin; and,

WHEREAS, pursuant to SGMA and its implementing regulations, the SVBGSA is required to evaluate GSPs and report to DWR on the evaluation at least every 5 years, and update or amend GSPs as necessary or appropriate; and,

WHEREAS, the initial evaluation of and report to DWR on the GSP for the Subbasin is due no later than January of 2025; and,

WHEREAS, the SVBGSA has approved and timely filed with DWR GSPs for the other subbasins in the Basin, which were due to be filed no later than January 31 of 2022; and,

WHEREAS, the initial evaluation of and report to DWR on the other GSPS are due no later than January of 2027; and,

WHEREAS, it is more efficient and appropriate to align the evaluation of the GSP for the Subbasin with the evaluations of the other GSPs within the Basin; and,

WHEREAS, pursuant to SGMA and its implementing regulations, a GSP may be updated at any time after a noticed public hearing; and,

WHEREAS, the SVBGSA Board of Directors and the Advisory Committee held numerous public meetings where elements of the GSP update for the Subbasin have been presented and discussed, and where the general public has been provided the opportunity to comment on the various elements of the GSP update; and,

WHEREAS, the SVBGSA formed a Subbasin Committee for the Subbasin, which also held numerous public meetings to discuss the elements of the GSP update , and where the general public was provided the opportunity to comment on the various elements of the GSP update; and,

WHEREAS, the SVBGSA has received a significant amount of written public comments on the various elements of the GSP update, which have been reviewed and commented on as part of the GSP update; and

WHEREAS, a public hearing was timely noticed for the Board of Directors meeting on September 8, 2020, to consider an update to the GSP for the Subbasin; and,

WHEREAS, updating the GSP for the Subbasin at this time will align its next required evaluation and report to DWR with the evaluations and reports to DWR for the other GSPs in the Basin; NOW, THEREFORE,

BE IT RESOLVED, by the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, as follows:

1. The above Recitals are true and correct.

2. The update to the Groundwater Sustainability Plan for the 180/400-foot aquifer subbasin of the Salinas Valley Groundwater Basin is approved.

3. The General Manager is hereby authorized and directed to cause the update, and any associated report, to be filed with the California Department of Water Resources.

4. The General Manager and Agency Counsel are hereby authorized and directed to take such other and further actions as may be necessary or appropriate to implement the intent and purposes of this resolution.

PASSED AND ADOPTED on this 8th day of September, 2022, by the following vote, to-wit:

AYES ADAMS, ALEJO, BRENNAN, CHAPIN, CREMERS, GRANILLO, MCINTYRE, PEREIRA, AND CHAIR BRAMERS:

NOES:NONE

ABSENT: ROCHA, STEFANI
ABSTAIN: NONE

I, Debra McNay, Clerk of the Board of Directors of the Salinas Valley Basin Groundwater Sustainability Agency, State of California, hereby certify that the foregoing is a true copy of an original order of said Board of Directors duly made and entered in the minutes thereof for the meeting on September 8, 2022.

Dated: Debra McNay, Clerk of the Board of Directors of the Salinas Valley Groundwater Sustainability Agency, County of Monterey, State of California

DocuSigned by:
Debra McNay
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Appendix 3A

Groundwater Elevation 5-Year and 20-Year Linear Regressions for RMS Wells

This GSP 2025 Evaluation includes data from WY 2019 to 2023. However, WY 2023 was a very wet year that may not be reflective of average groundwater conditions in the 180/400 Subbasin during the evaluation period. To assess groundwater elevation trends in the Subbasin, 5-year and 20-year linear regressions of groundwater elevations in RMS were prepared. Table 1 includes a summary of the 5-year and 20-year rate of groundwater elevations change at RMS wells. The 5-year and 20-year hydrographs that correspond with Table 1 showing the minimum threshold, 2025 interim milestone, measurable objective, and linear regression trendline are included in Sections 3A-1 and 3A-2, respectively. The groundwater elevation scale on the Y-axis differs by well to be able to clearly see all the relevant information for that respective well. Three wells that did not have at least 3 years of data were excluded from the table and hydrographs of 5-year trendlines, and 16 wells that did not have at least 15 years of data were excluded from the 20-year trendlines.

The rates of change in the 180-Foot and 400-Foot Aquifer wells were very similar during both the 5-year and 20-year periods. In both the 180-Foot and 400-Foot Aquifers the average 5-year trends are slightly increasing at 0.1 feet/year, while the average 20-year trends are decreasing at -0.4 and -0.3 feet/year in the aquifers, respectively. The increasing 5-year trends in these aquifers are primarily due to high groundwater elevations in WY 2023, compared to the 4 prior years. The wet water year was not enough to result in an increasing 5-year trend in the Deep Aquifers, which show a general decrease of approximately -0.1 feet/year. The average 20-year trend in the Deep Aquifers is decreasing at a greater rate than the 5-year trend at -1.2 feet/year. During both periods, the Deep Aquifers had the greatest decline in groundwater elevations compared to the other principal aquifers.

Table 3-5 of the main text of the GSP 2025 Evaluation compares the SMC to the observed fall 2023 groundwater elevations and the 5-year trendline at fall 2023.

Table 1. Summary of 5-Year and 20-Year Linear Regression of Groundwater Elevations

Well Name	5-Year Trend		20-Year Trend	
	Rate of Change (feet/year)	Number of Data Points Used	Rate of Change (feet/year)	Number of Data Points Used
180-Foot Aquifer				
13S/02E-21Q01	-2.309	5	-0.094	20
13S/02E-26L01	3.067	3	0.391	18
13S/02E-33R01	1.616	5	0.148	20
14S/02E-03F04	0.733	4	-0.007	19
14S/02E-10P01	2.098	5	-0.169	20
14S/02E-11A02	0.031	5	0.041	20
14S/02E-12B02	-0.657	5	0.127	20
14S/02E-13F03	0.672	5	-0.020	20
14S/02E-17C02	-1.847	5	--	9
14S/02E-21L01	-0.493	5	0.000	19
14S/02E-26H01	0.139	4	-0.060	18
14S/02E-27A01	-1.143	4	-0.067	19
14S/02E-34B03	0.544	5	-0.297	20
14S/02E-36E01	-0.339	5	-0.199	20
14S/03E-18C01	0.596	4	0.327	18
14S/03E-19G01	-0.241	5	-0.220	20
14S/03E-30G08	-0.435	3	-0.175	18
14S/03E-31F01	0.416	5	-0.087	20
15S/02E-12C01	1.690	5	--	7
15S/03E-09E03	-0.860	5	-0.503	20
15S/03E-13N01	0.302	5	-0.762	18
15S/03E-16M01	-0.907	5	-0.608	20
15S/03E-17M01	-0.612	5	-0.539	20
15S/03E-25L01	-0.155	5	-0.752	20
15S/03E-26F01	1.362	5	-0.535	20
15S/04E-31A02	-1.528	5	-1.020	19
16S/04E-05M02	-1.005	5	-0.910	20
16S/04E-13R02	-4.547	5	-1.087	20
16S/04E-15D01	0.249	4	-0.739	19
16S/04E-15R02	2.549	5	-0.453	19
16S/04E-25C01	-0.362	5	-0.526	20
16S/05E-30E01	0.267	5	-0.559	20
16S/05E-31M01	-1.380	5	-0.717	20
17S/04E-01D01	2.175	5	-1.601	20
17S/05E-06C02	2.157	4	-0.648	18
400-Foot Aquifer				
12S/02E-33H02	0.094	4	--	8

Well Name	5-Year Trend		20-Year Trend	
	Rate of Change (feet/year)	Number of Data Points Used	Rate of Change (feet/year)	Number of Data Points Used
13S/02E-10K01	4.558	4	0.630	15
13S/02E-21N01	0.281	5	0.154	20
13S/02E-24N01	0.050	4	0.272	15
13S/02E-27P01	2.046	5	-0.001	20
13S/02E-31N02	0.370	5	0.087	20
13S/02E-32J03	1.615	5	0.136	19
14S/02E-02C03	0.686	5	-0.158	17
14S/02E-03F03	-1.439	4	0.091	18
14S/02E-05K01	-1.034	5	0.132	20
14S/02E-08M02	-0.643	5	0.070	20
14S/02E-11A04	-0.840	5	-0.038	20
14S/02E-11M03	2.025	5	0.241	17
14S/02E-12B03	-1.897	5	-0.243	20
14S/02E-12Q01	1.580	5	0.092	20
14S/02E-15K01	-1.205	5	-0.110	19
14S/02E-16A02	0.836	5	0.096	20
14S/02E-27G03	1.023	4	-0.105	19
14S/02E-34A03	0.499	5	0.063	20
14S/02E-36G01	-1.036	5	-0.207	20
14S/03E-18C02	2.526	4	-0.098	19
14S/03E-20C01	1.099	4	0.074	16
14S/03E-29F03	2.098	5	-1.813	16
14S/03E-31L01	0.399	5	-0.423	16
15S/02E-01A03	-1.411	5	-0.276	20
15S/02E-02G01	-0.333	5	-0.257	19
15S/02E-12A01	0.617	5	-0.384	19
15S/03E-03R02	-0.201	5	-0.649	17
15S/03E-04Q01	0.199	5	-0.515	17
15S/03E-05C02	-0.999	3	--	14
15S/03E-08F01	-0.793	4	-0.505	19
15S/03E-14P02	0.979	5	-0.709	20
15S/03E-15B01	0.864	5	-0.502	19
15S/03E-16F02	-1.081	5	-0.731	20
15S/03E-17P02	-2.499	5	-0.477	16
15S/03E-26A01	-0.393	5	-0.599	19
15S/03E-28B02	-1.700	5	0.097	16
15S/04E-29Q02	1.119	5	-0.847	20
16S/04E-04C01	3.667	5	-0.969	18
16S/04E-08H03	-1.220	4	-0.844	19
16S/04E-10R02	-2.518	5	-1.064	20

Well Name	5-Year Trend		20-Year Trend	
	Rate of Change (feet/year)	Number of Data Points Used	Rate of Change (feet/year)	Number of Data Points Used
16S/04E-25G01	-0.166	5	-0.670	20
16S/05E-30J02	-3.878	4	-0.718	19
Deep Aquifers				
13S/01E-36J02	-0.767	5	-0.949	16
13S/02E-19Q03	-0.803	5	-0.949	20
13S/02E-28L03	-0.730	5	--	8
13S/02E-32E05	-0.540	4	-1.052	20
14S/02E-06L01	0.000	5	-1.106	19
14S/02E-07J03	0.757	5	--	5
14S/02E-14R02	--	2	--	2
14S/02E-20E01	-0.562	4	--	5
14S/02E-21K04	5.990	4	--	4
14S/02E-22A03	-2.827	5	--	7
14S/02E-23J02	-4.161	3	--	3
14S/02E-25A03	5.122	3	--	2
14S/02E-26G01	--	2	--	2
14S/02E-27K02	-3.804	4	--	4
14S/02E-28H04	1.789	5	-2.190	16
14S/02E-35B01	--	2	--	2
14S/03E-19C01	-0.696	4	--	4

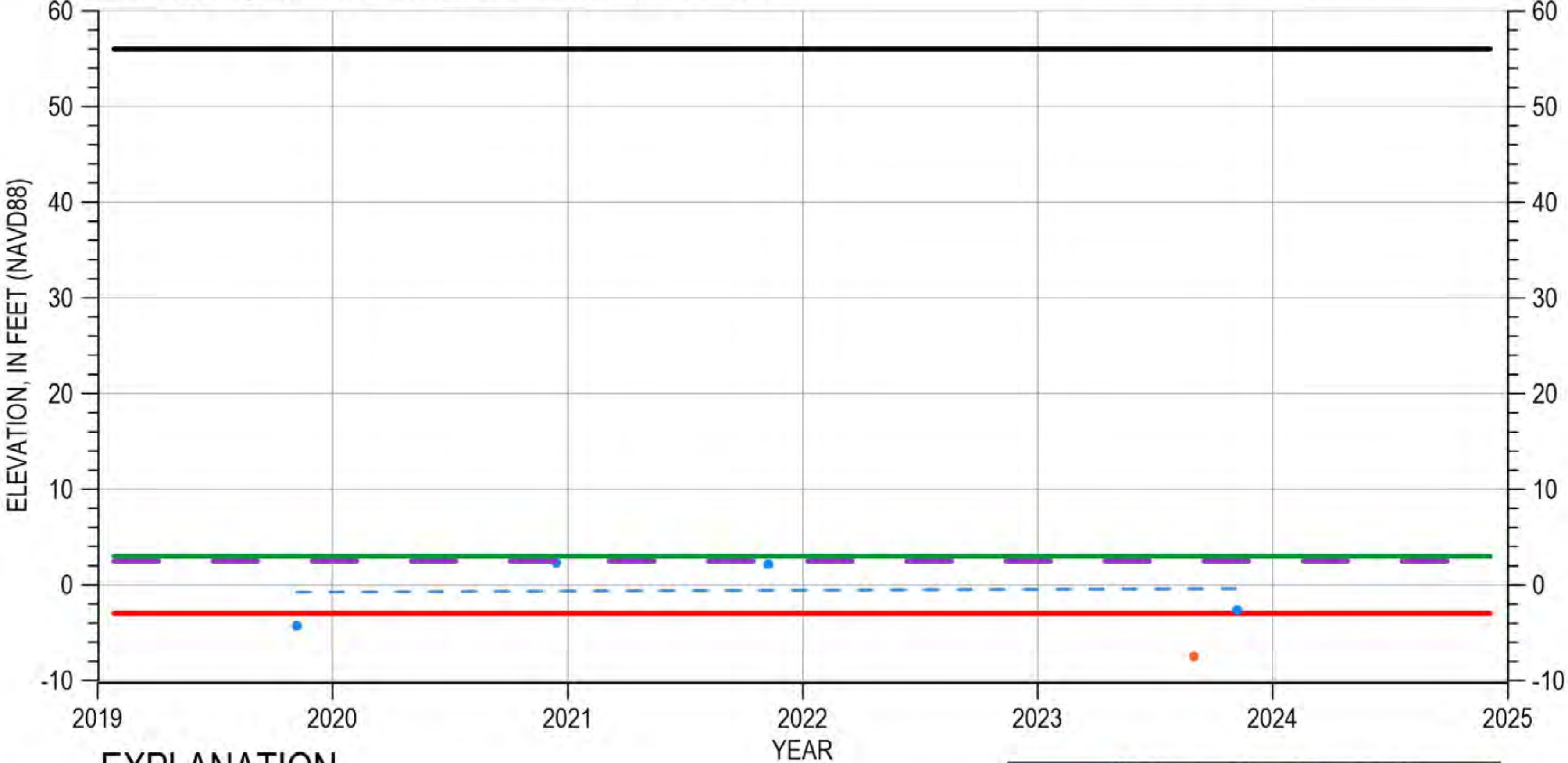
Note: Wells not included in the trend analyses are denoted by dashes.

3A-1 Hydrographs with 5-Year Linear Regressions

12S/02E-33H02

400-Foot Aquifer Perforated from -234 to -514 feel msl

5 YEAR TREND HYDROGRAPH



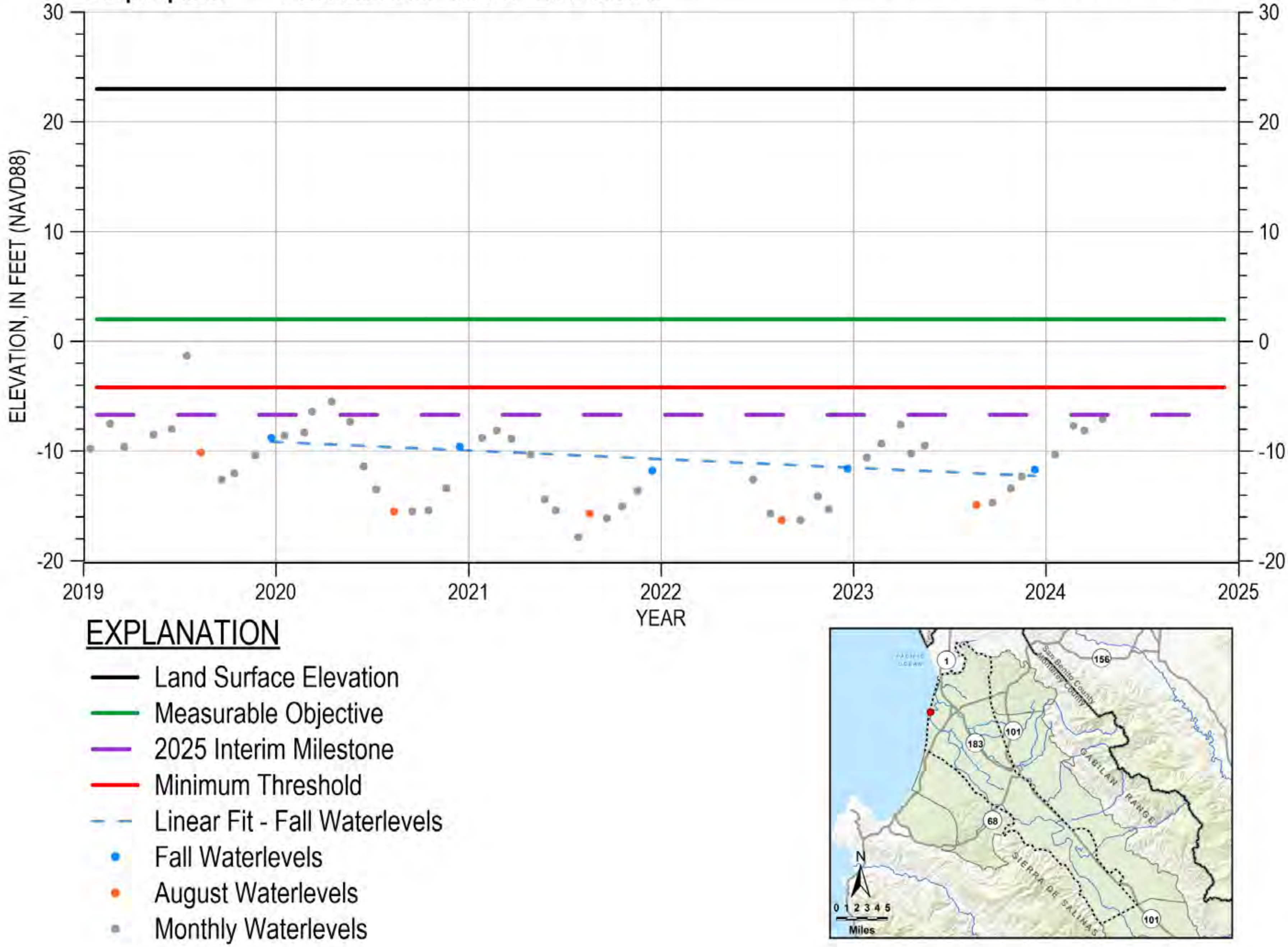
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/01E-36J02

Deep Aquifers Perforated from -1278 to -1338 feet msl

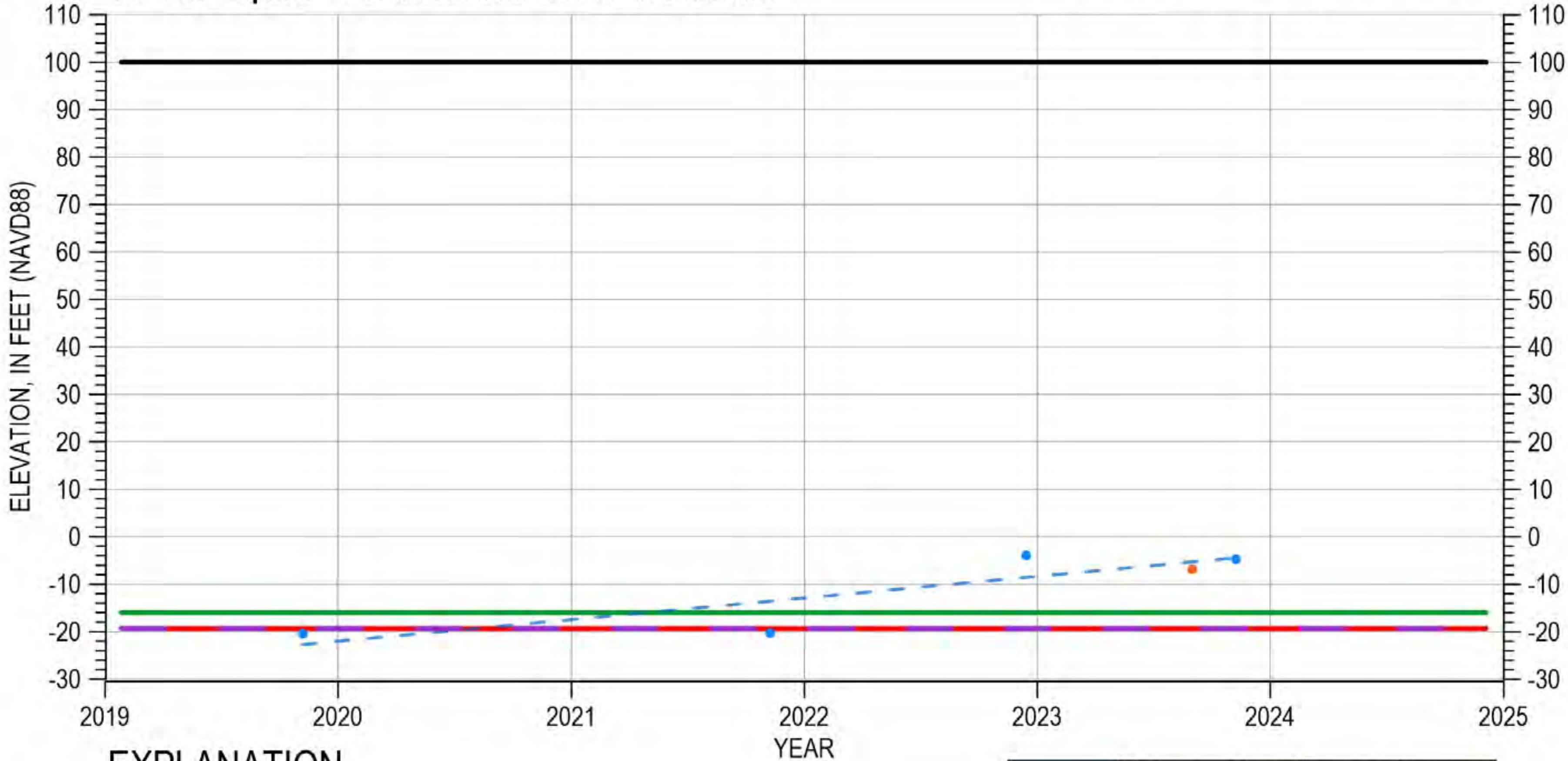
5 YEAR TREND HYDROGRAPH



13S/02E-10K01

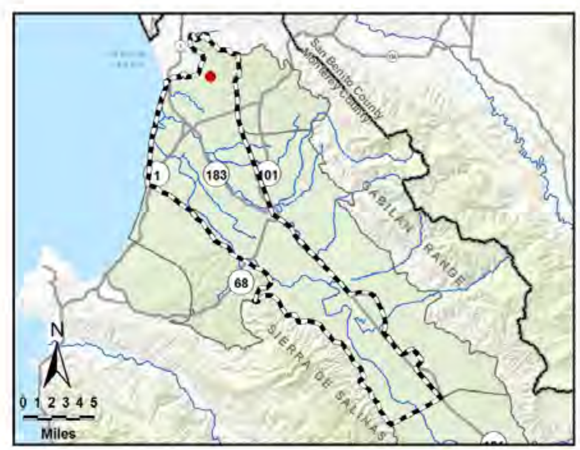
400-Foot Aquifer Perforated from -280 to -560 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

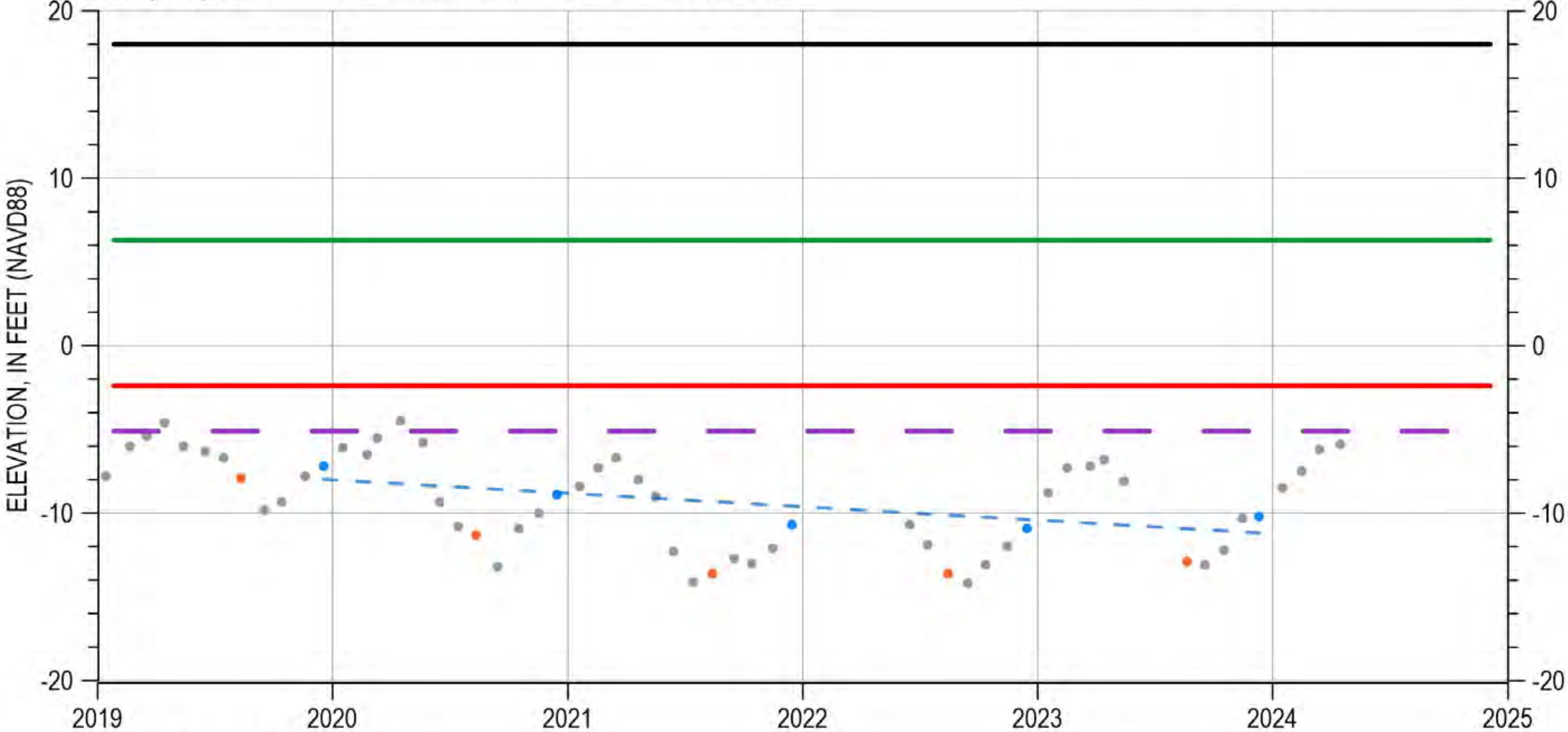
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-19Q03

Deep Aquifers Perforated from -1202 to -1532 feet msl

5 YEAR TREND HYDROGRAPH



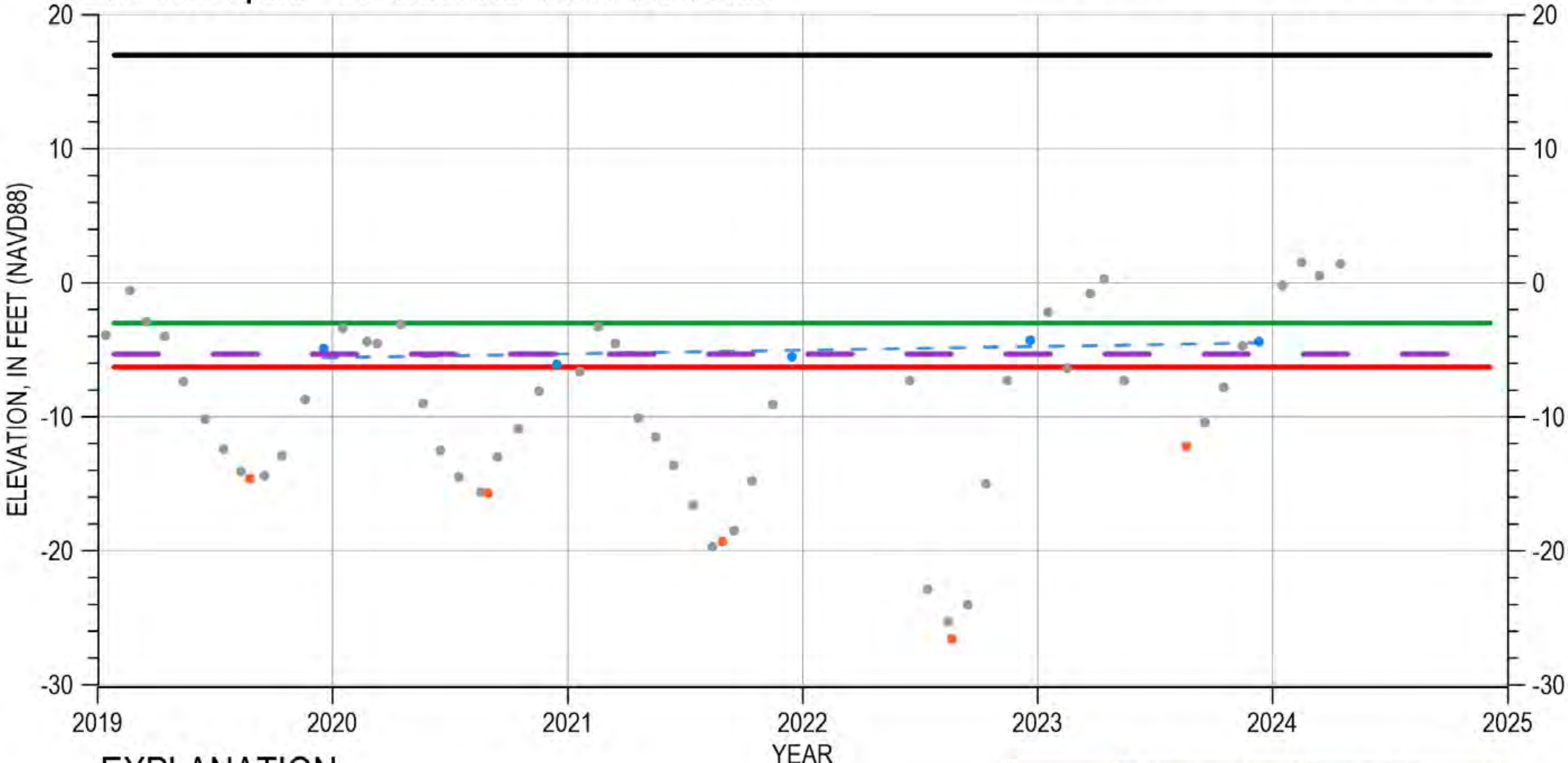
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-21N01

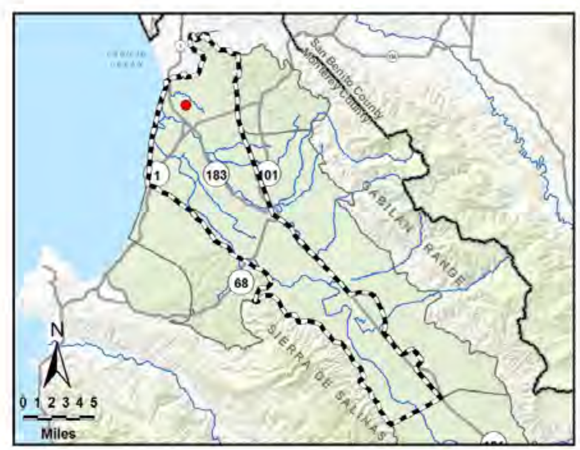
400-Foot Aquifer Perforated from -352 to -533 feet msl

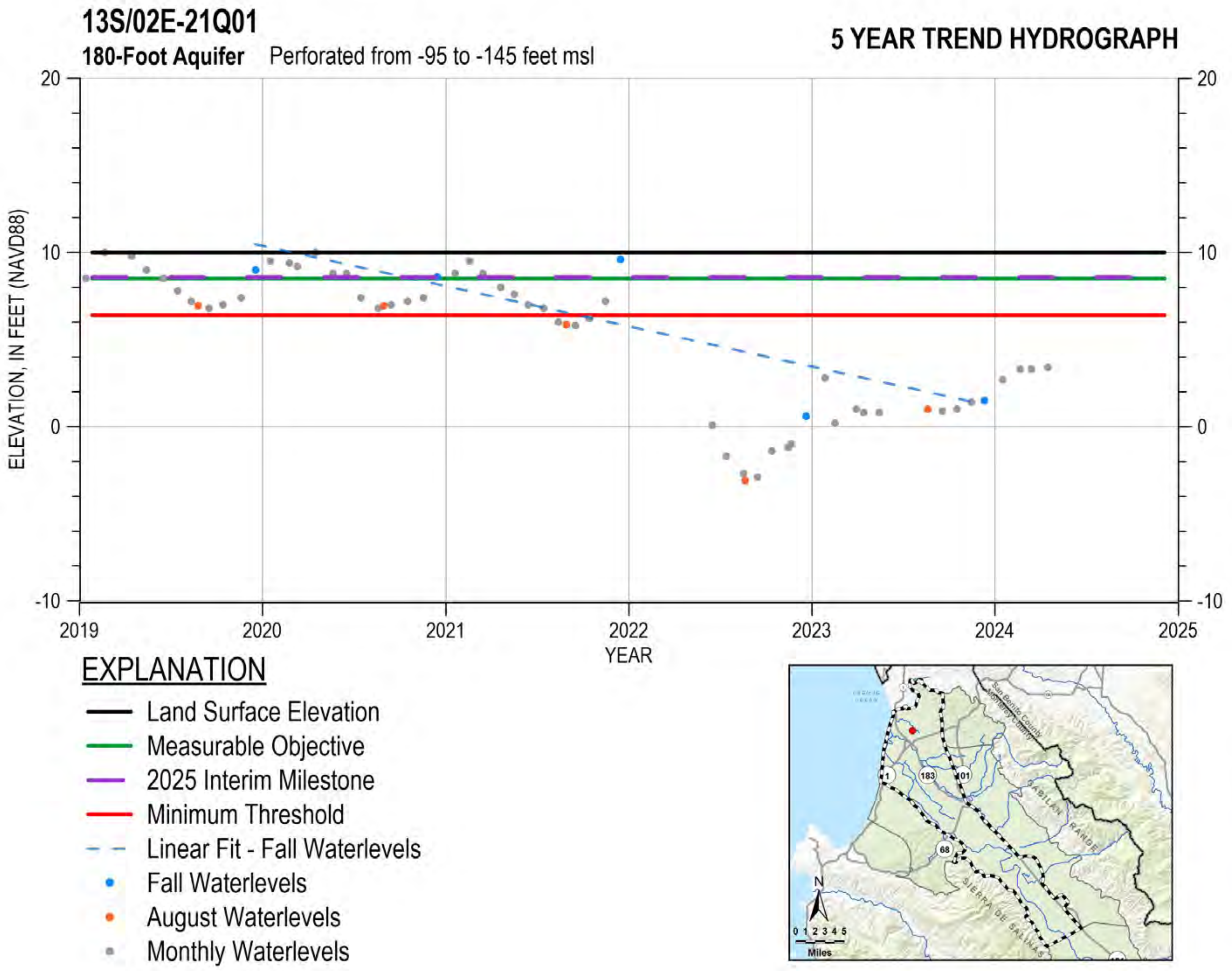
5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



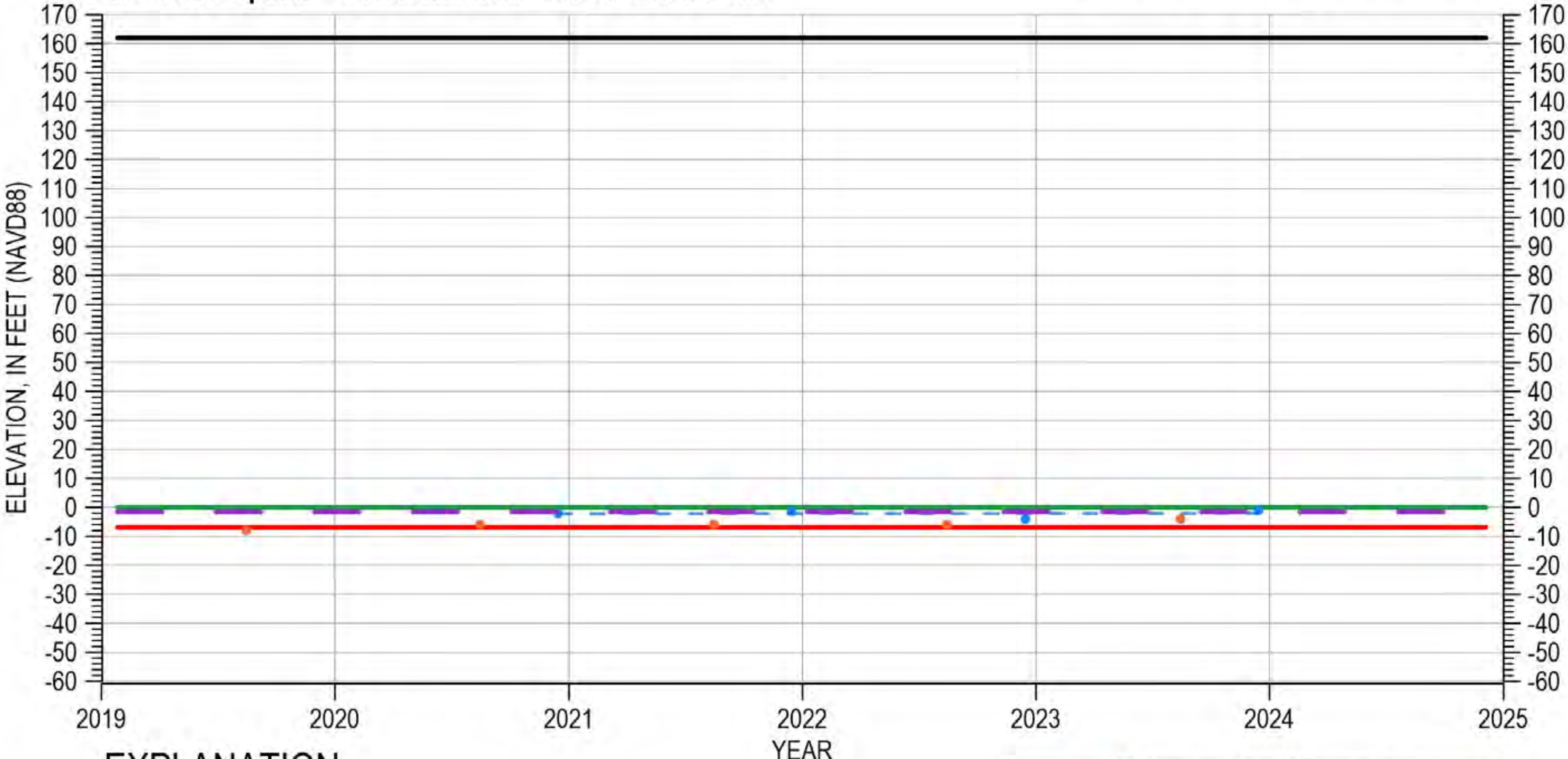


13S/02E-21Q01
180-Foot Aquifer Perforated from -95 to -145 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
20
10
0
-10
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
183
101
1
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

13S/02E-24N01

400-Foot Aquifer Perforated from -138 to -438 feet msl

5 YEAR TREND HYDROGRAPH



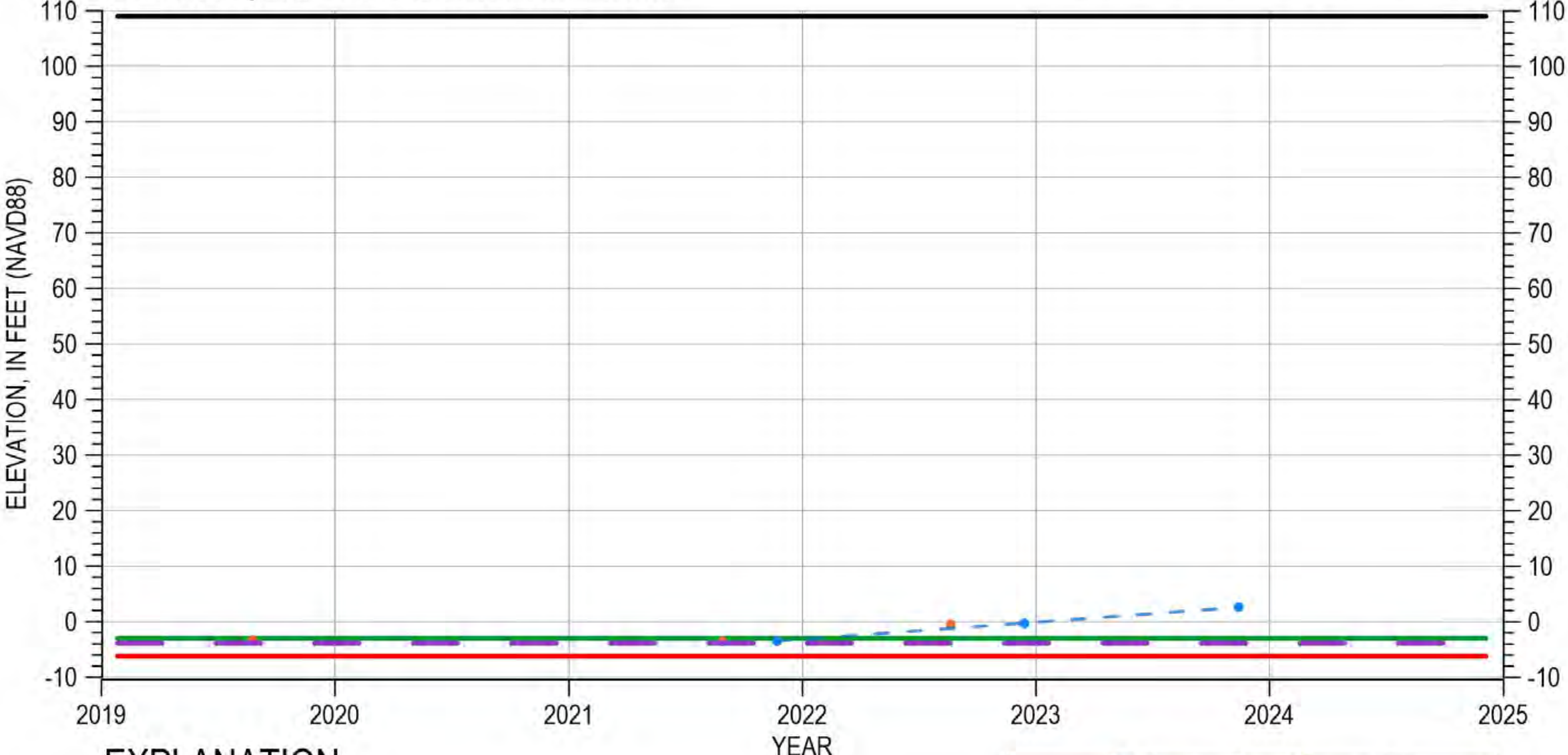
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-26L01

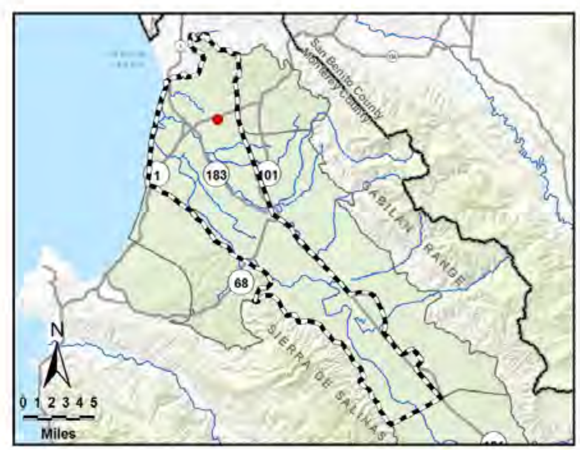
180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



EXPLANATION

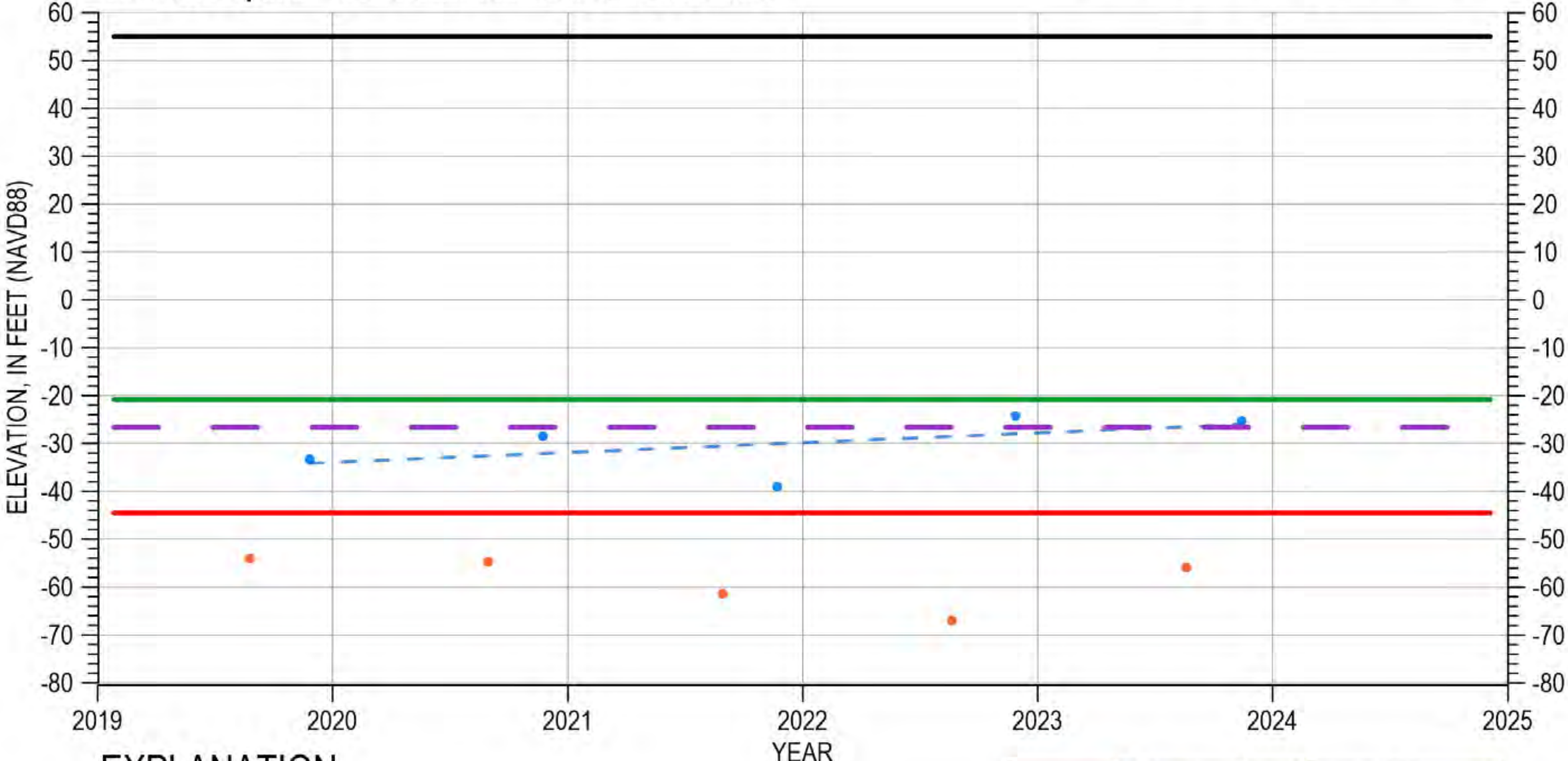
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-27P01

400-Foot Aquifer Perforated from -361 to -521 feet msl

5 YEAR TREND HYDROGRAPH



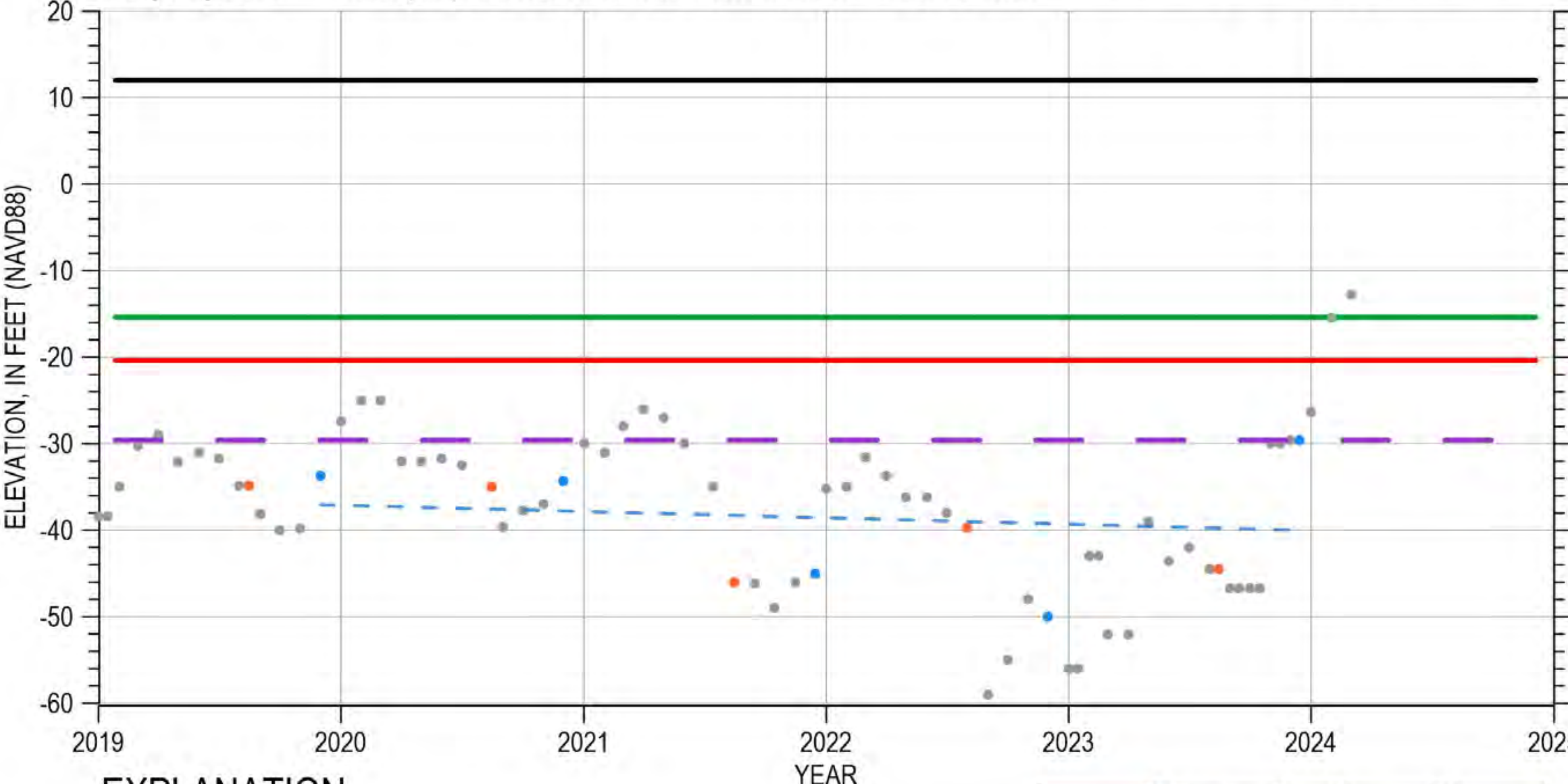
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-28L03

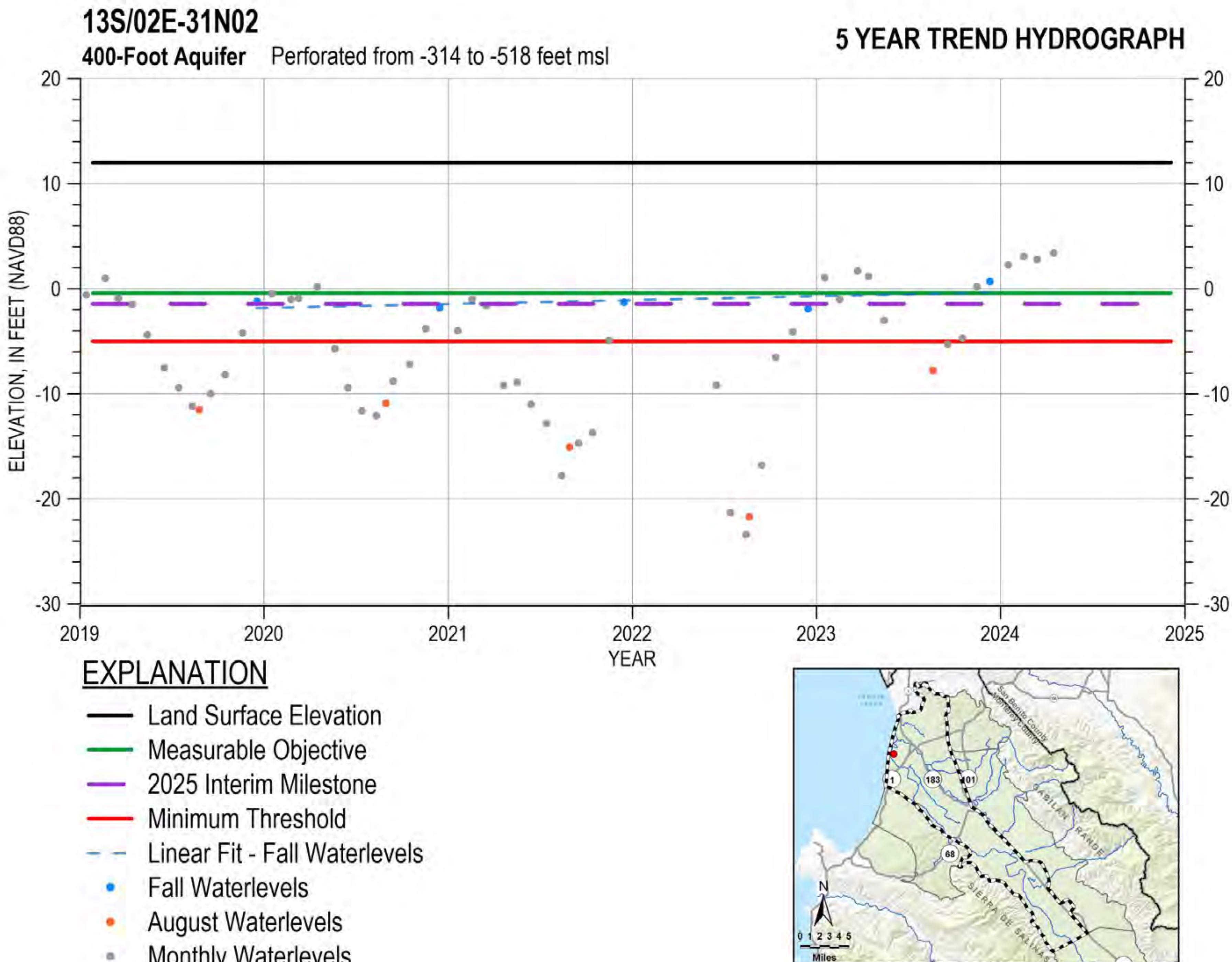
Deep Aquifers Multiple perforated intervals from -1068 to -1438 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

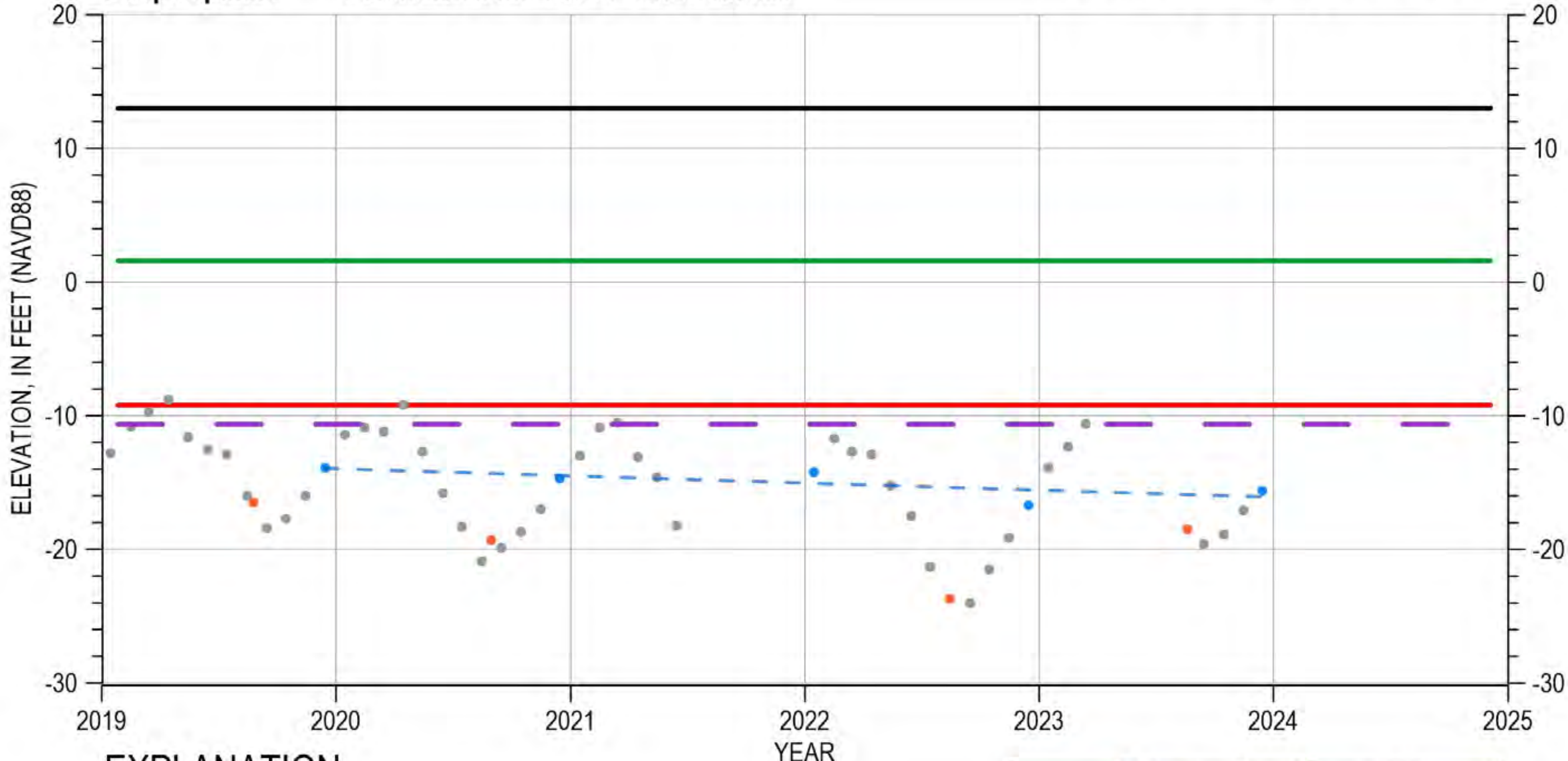
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


13S/02E-31N02
400-Foot Aquifer Perforated from -314 to -518 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
20
10
0
-10
-20
-30
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
San Benito County
Monterey County
GABILAN RANGE
SIERRA DE SALINAS
1
183
101
68
N
0 1 2 3 4 5
Miles

13S/02E-32E05

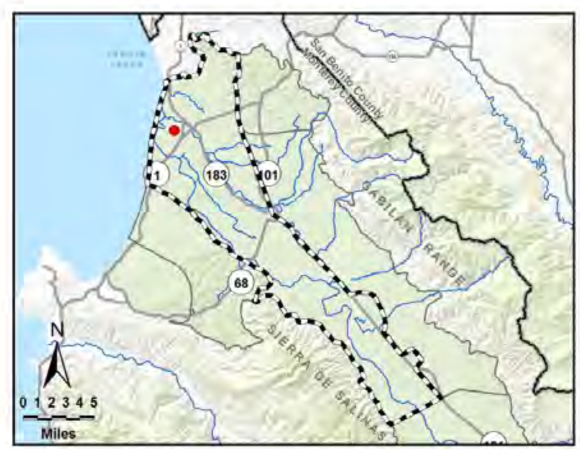
Deep Aquifers Perforated from -756 to -1566 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

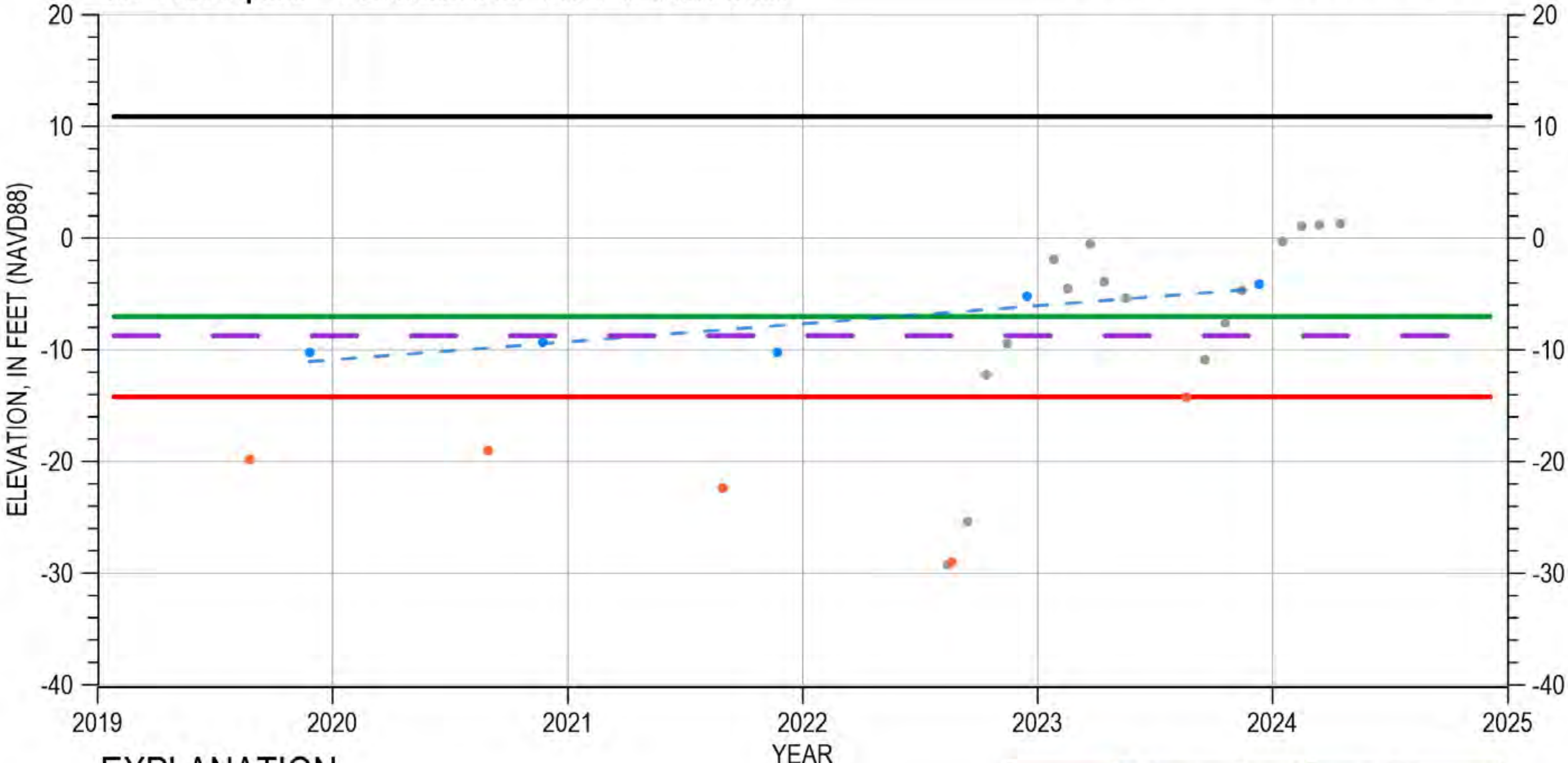
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-32J03

400-Foot Aquifer Perforated from -313.1 to -565.1 ft msl

5 YEAR TREND HYDROGRAPH



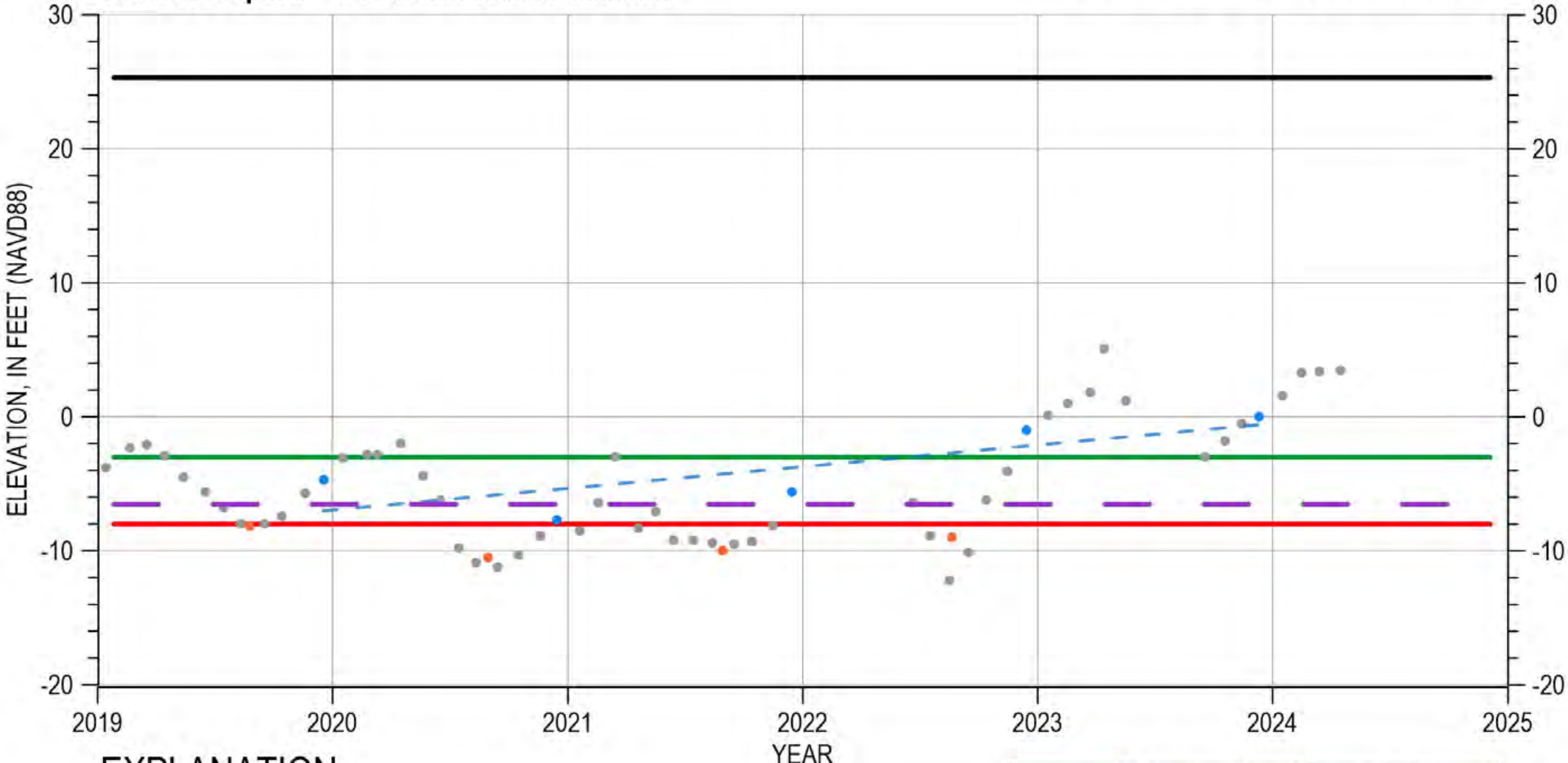
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-33R01

180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



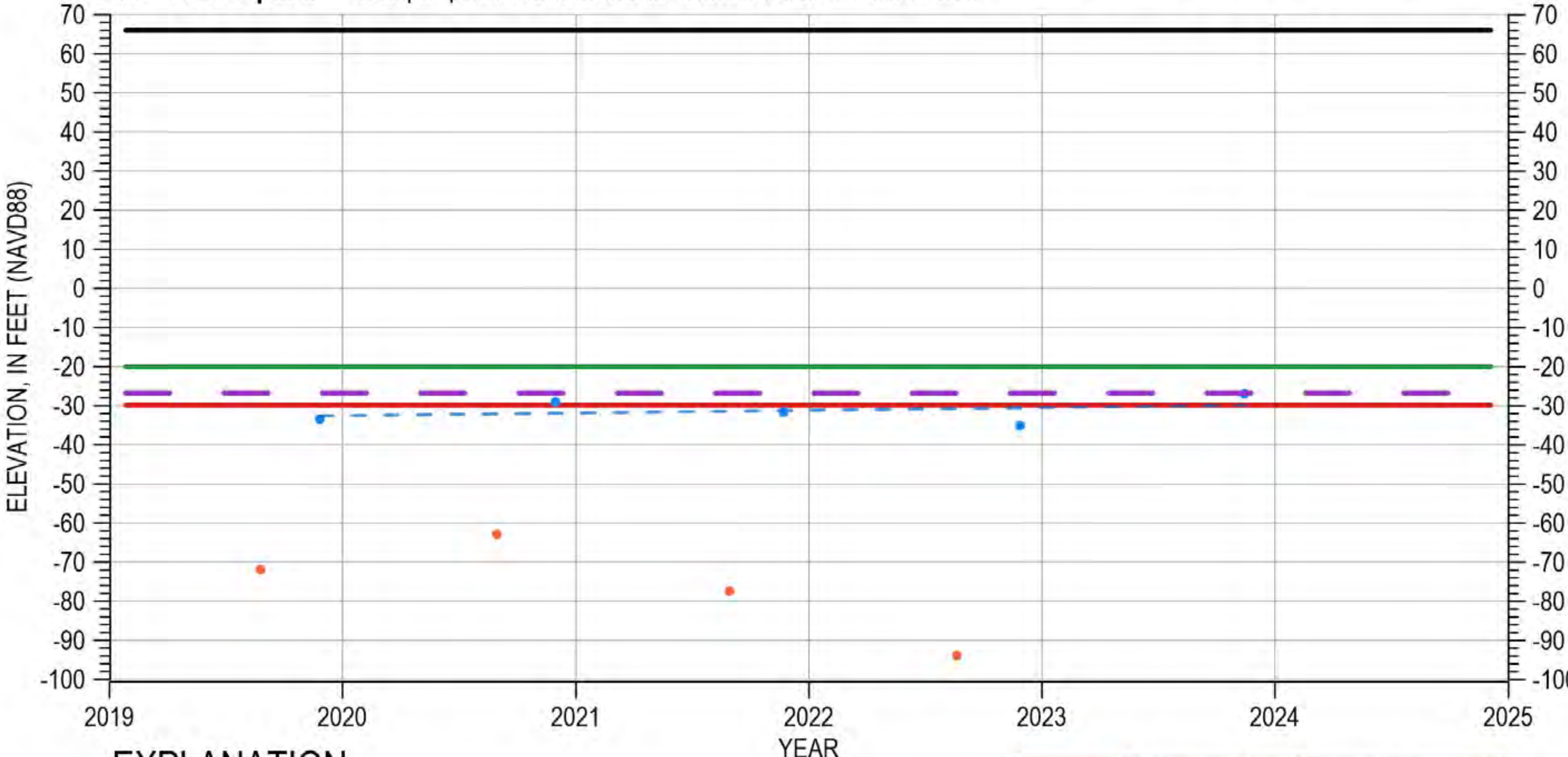
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-02C03

400-Foot Aquifer Multiple perforated intervals from -335 to -775 feet msl

5 YEAR TREND HYDROGRAPH



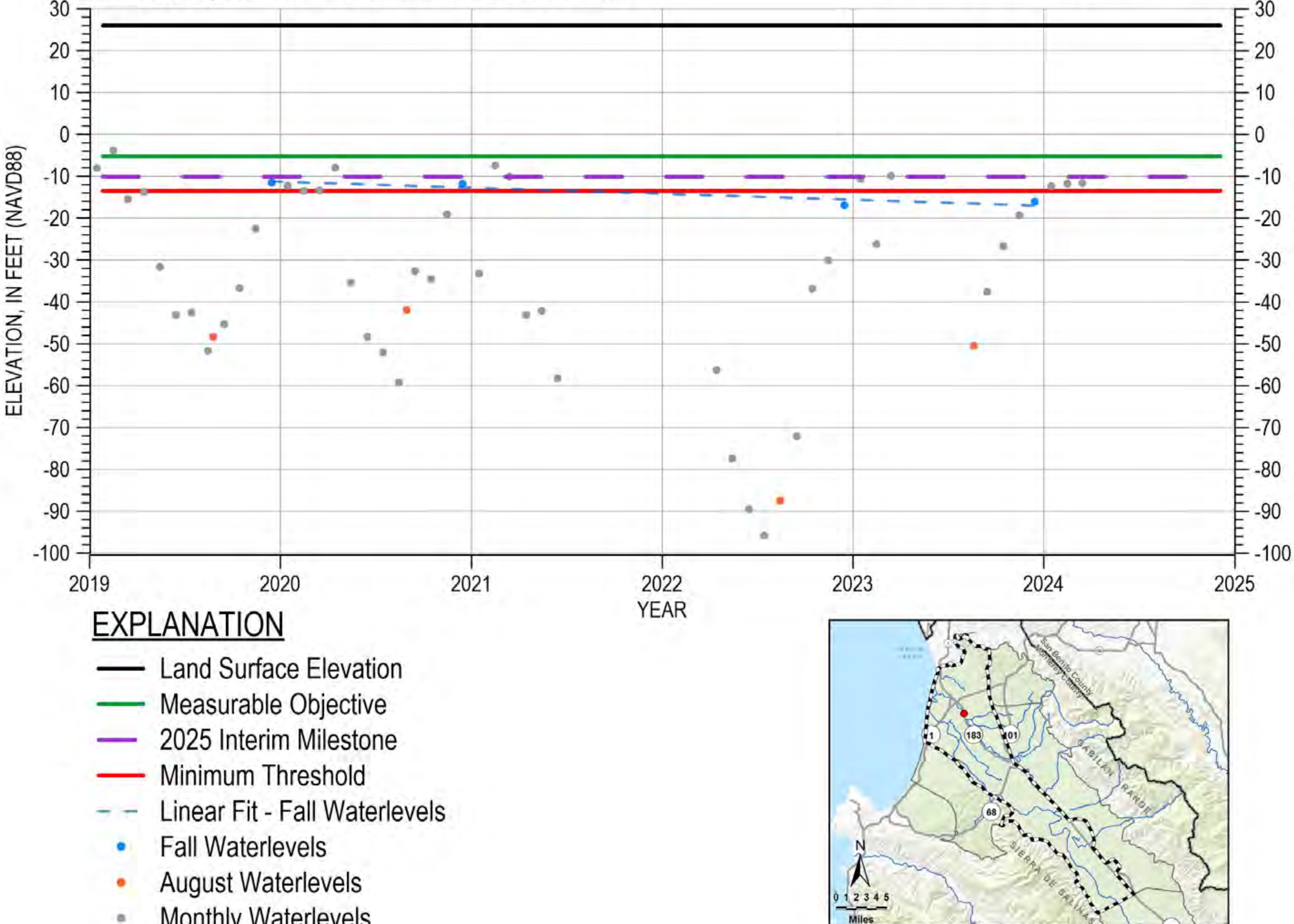
EXPLANATION

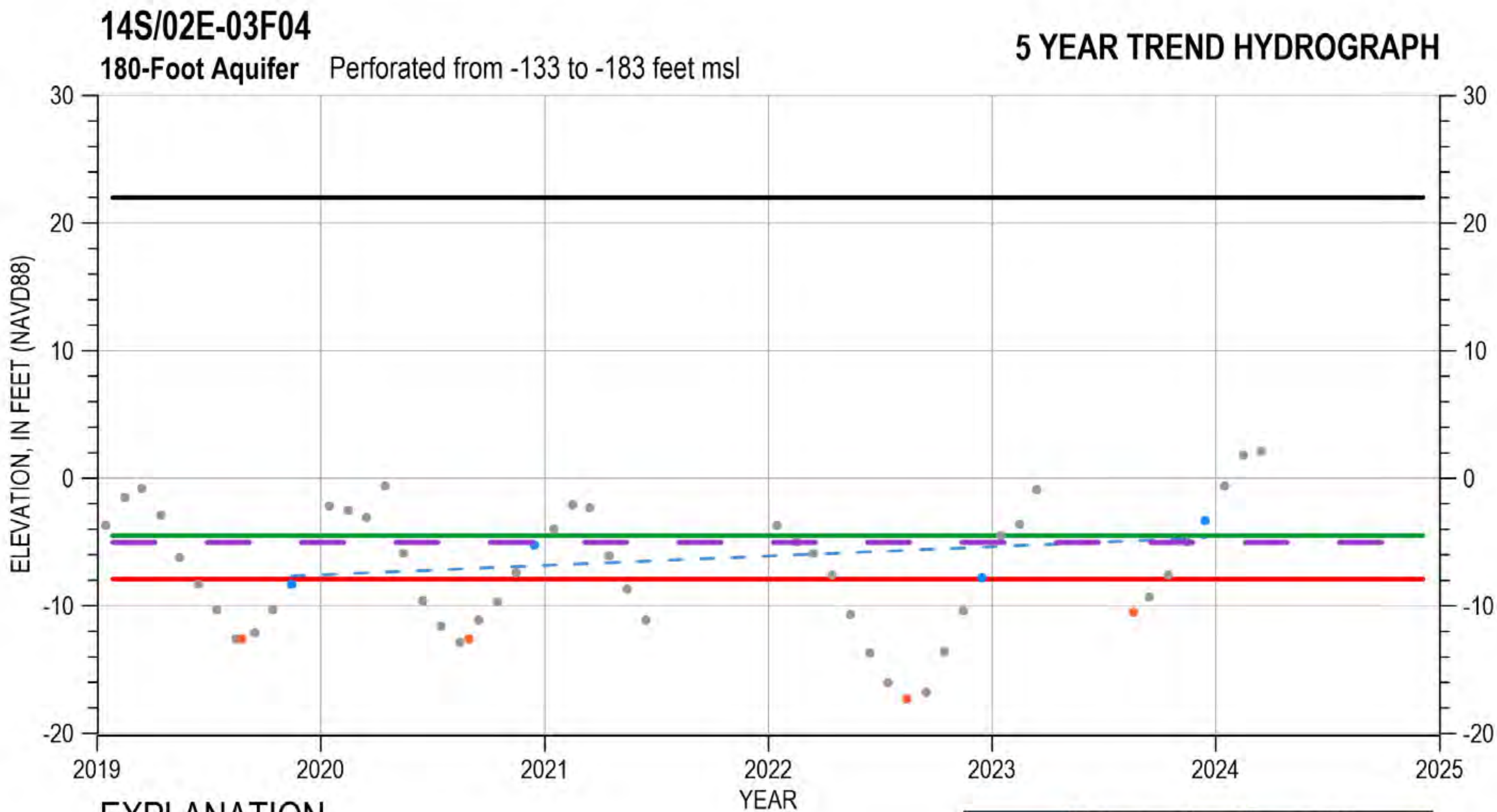
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-03F03

400-Foot Aquifer Perforated from -395 to -425 feet msl

5 YEAR TREND HYDROGRAPH





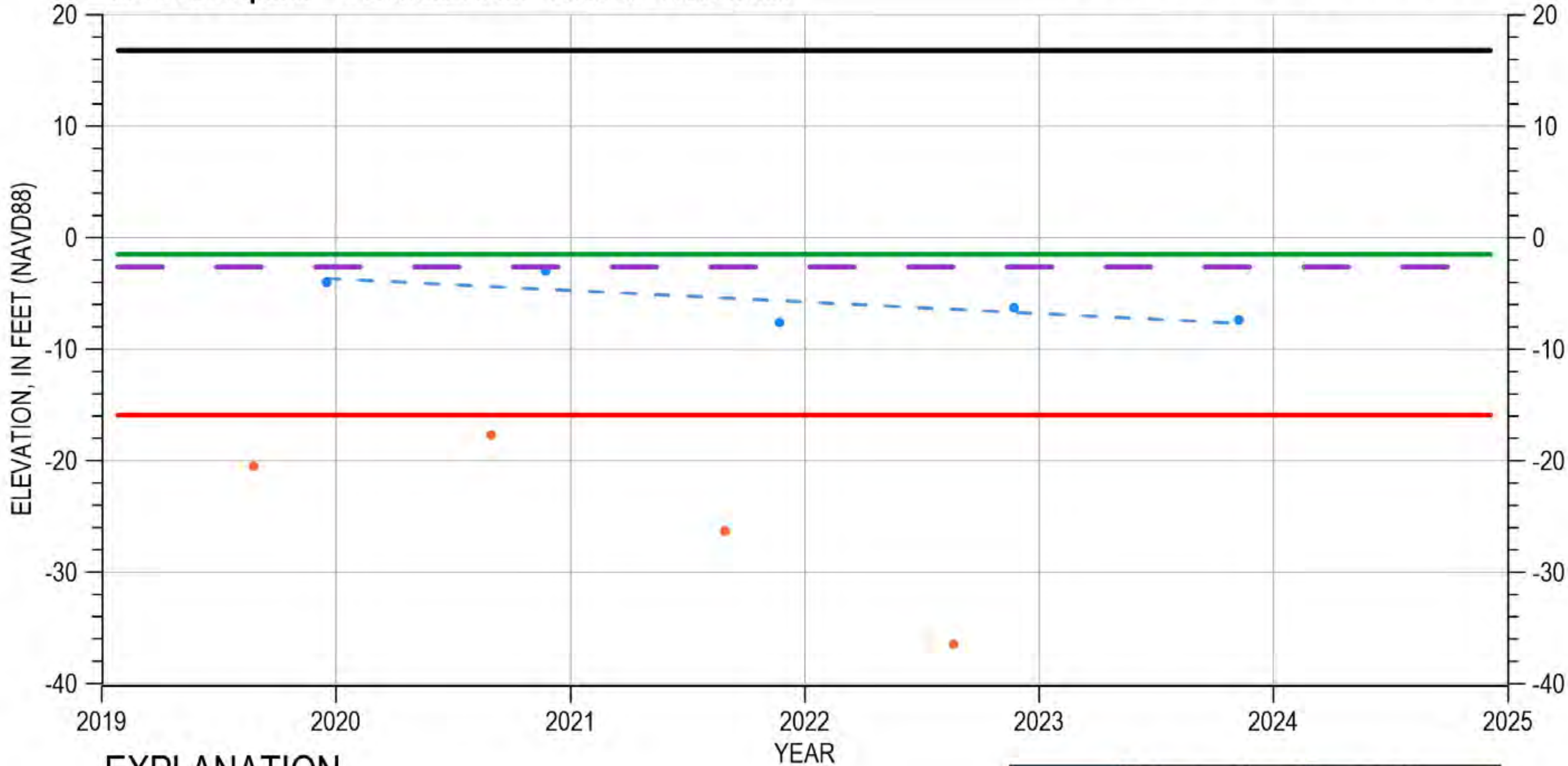
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-05K01

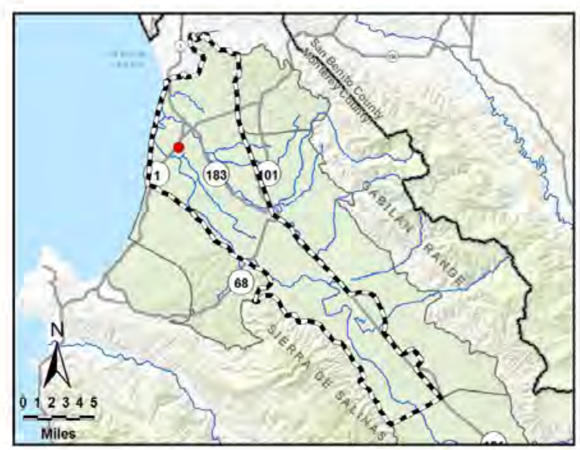
400-Foot Aquifer Perforated from -425.2 to -456.2 ft msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

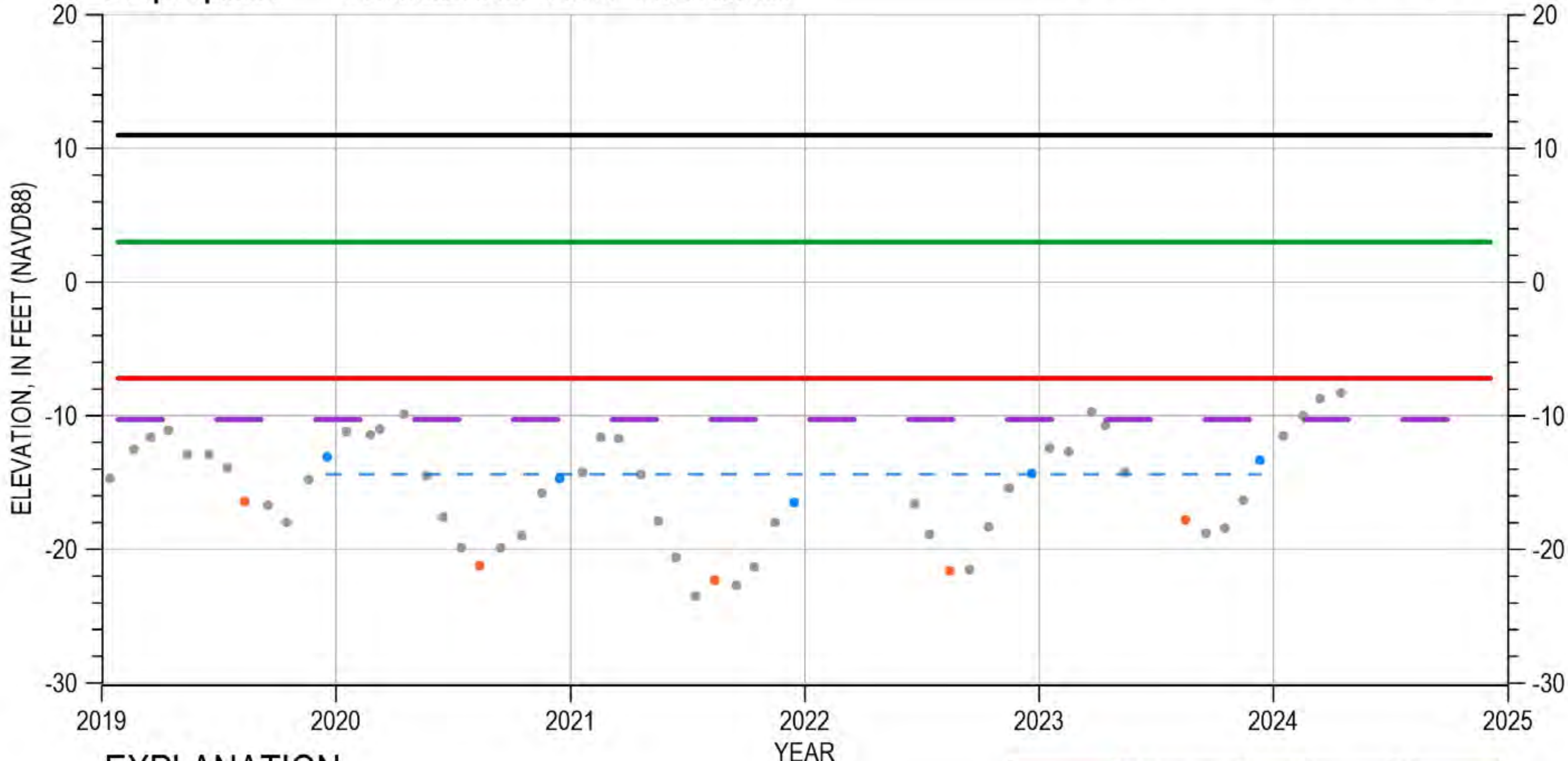
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-06L01

5 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -852 to -1532 feet msl



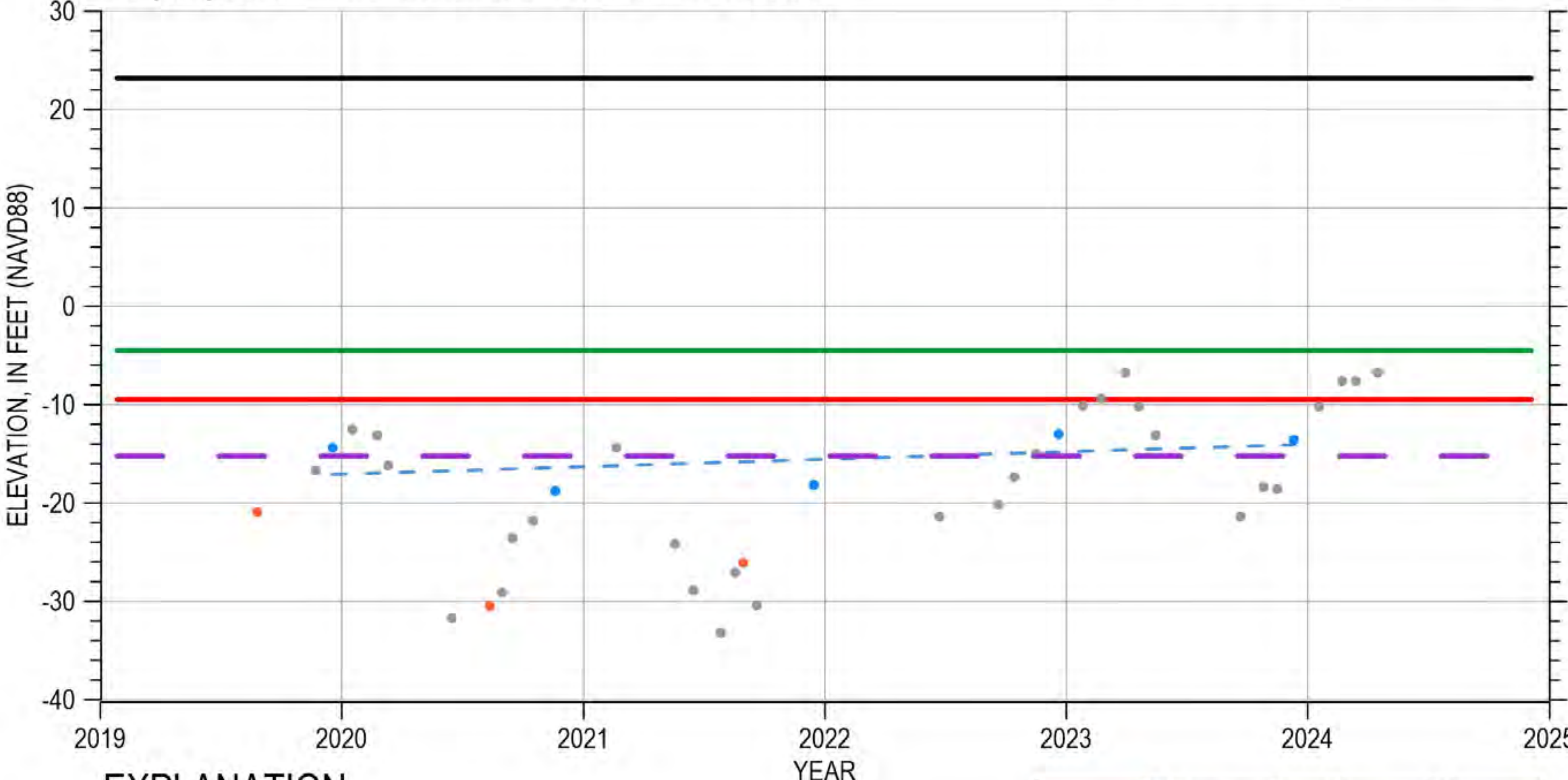
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-07J03

5 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -1427 to -1547 feet msl



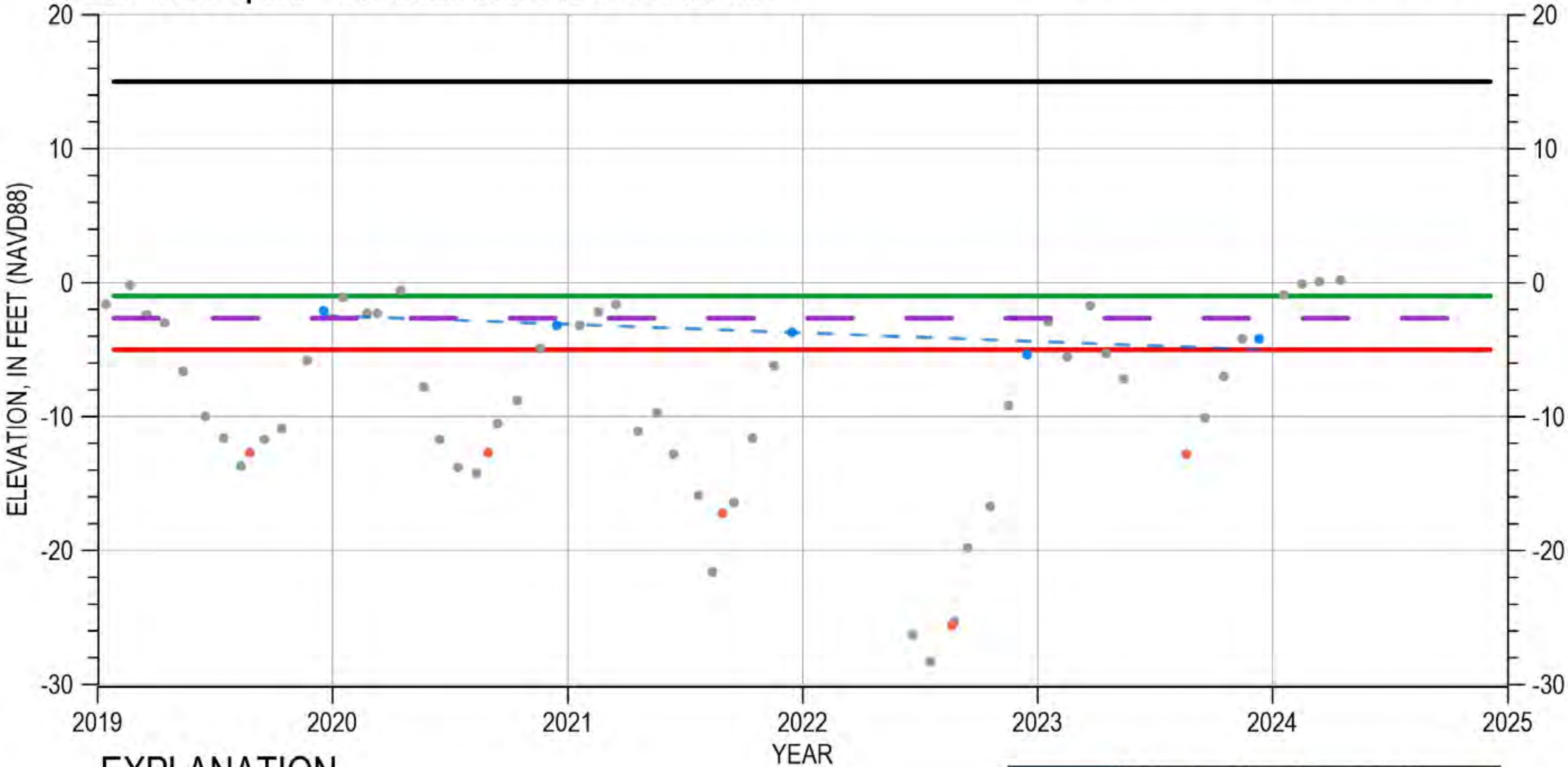
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-08M02

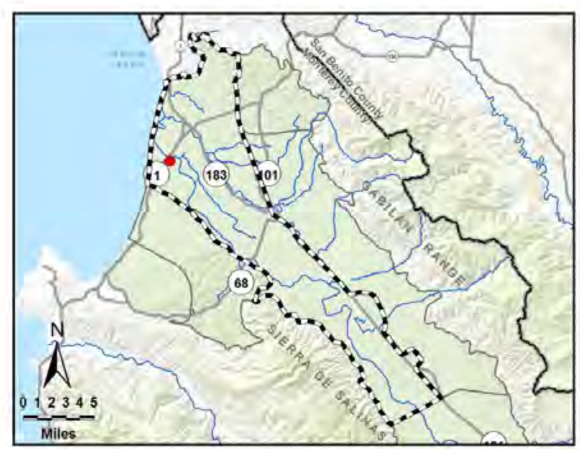
400-Foot Aquifer Perforated from -299 to -441 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

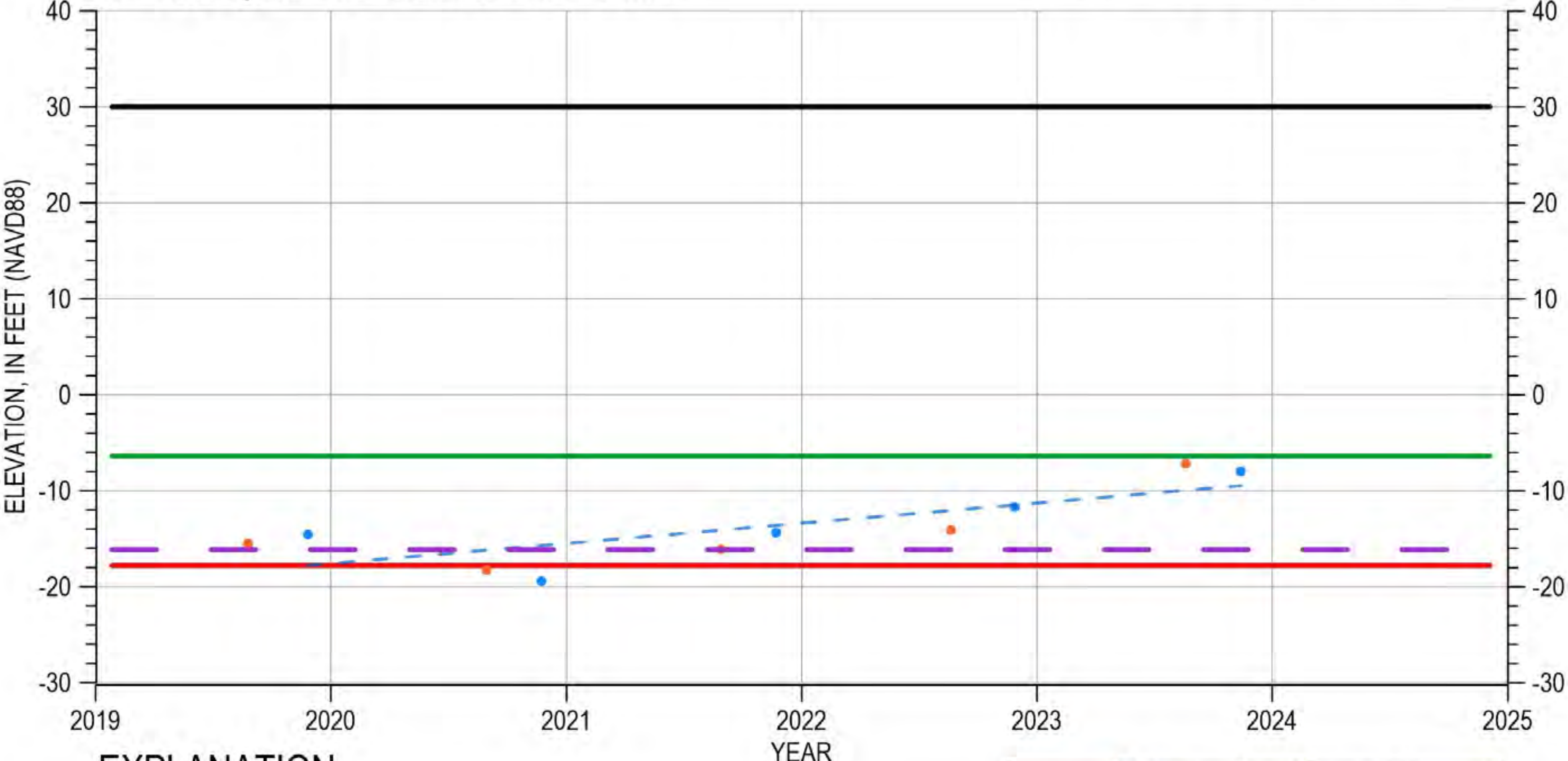
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-10P01

180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



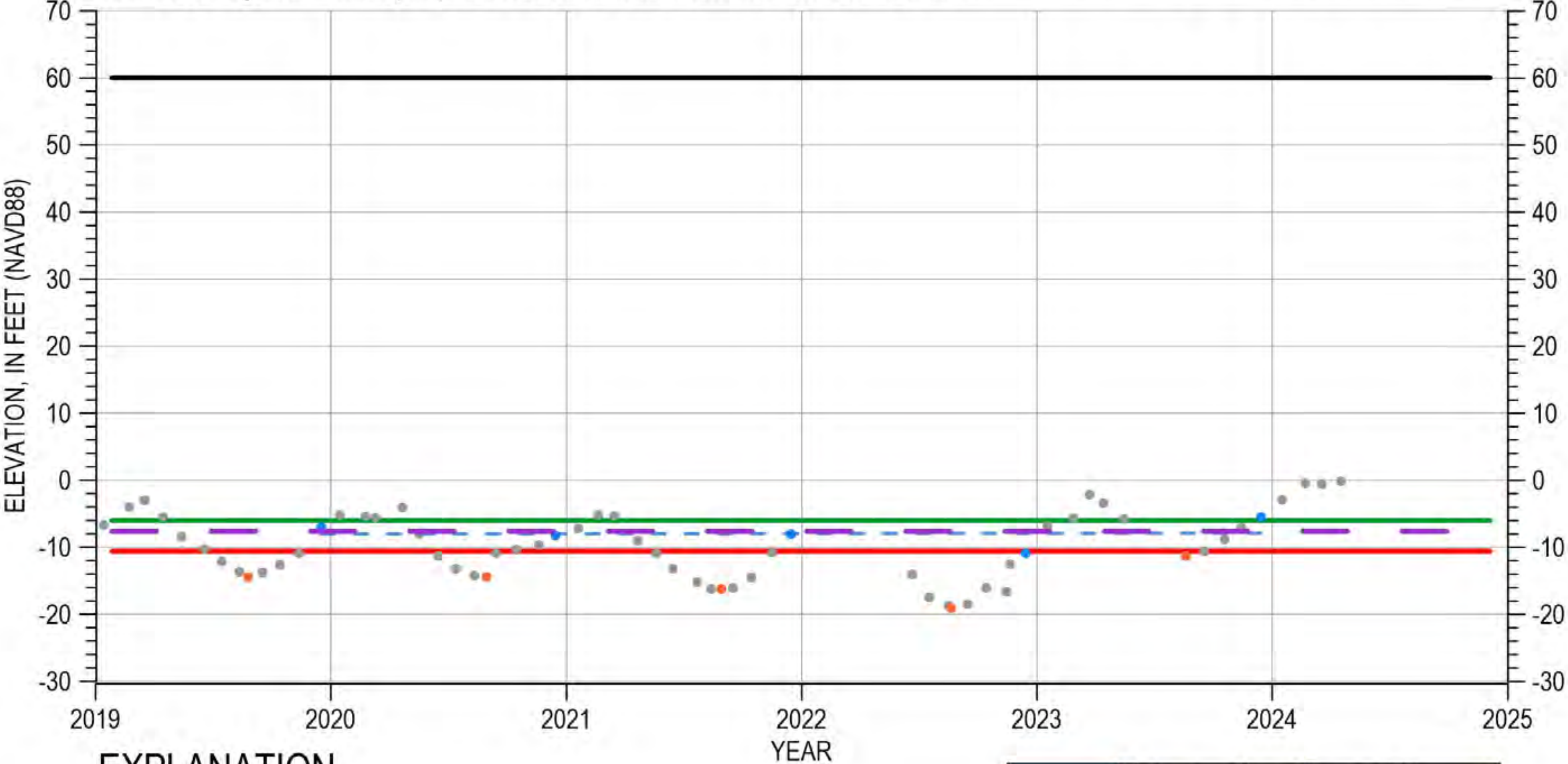
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-11A02

180-Foot Aquifer Multiple perforated intervals from -131 to -181 feet msl

5 YEAR TREND HYDROGRAPH



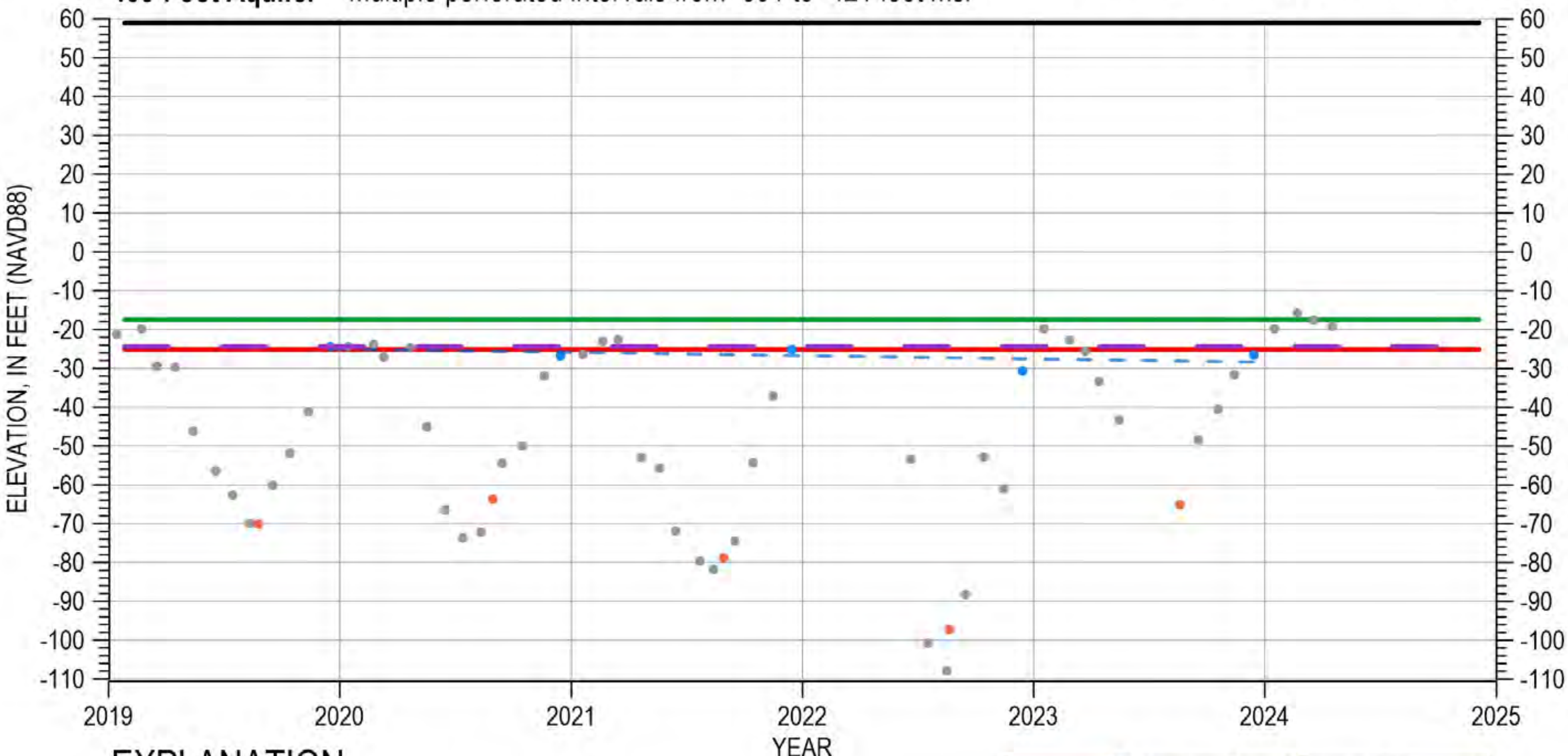
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-11A04

400-Foot Aquifer Multiple perforated intervals from -391 to -421 feet msl

5 YEAR TREND HYDROGRAPH



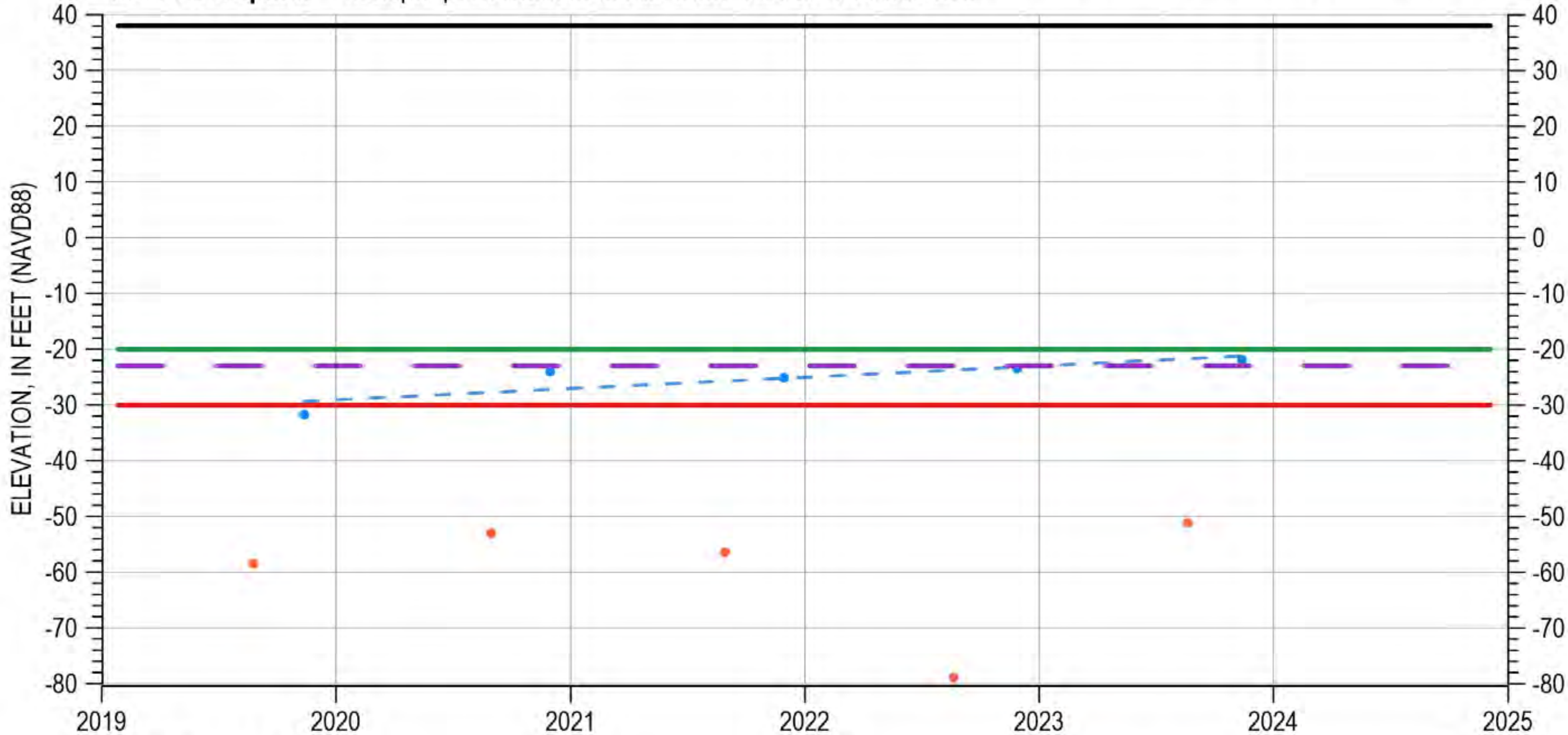
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-11M03

400-Foot Aquifer Multiple perforated intervals from -358 to -618 feet msl

5 YEAR TREND HYDROGRAPH



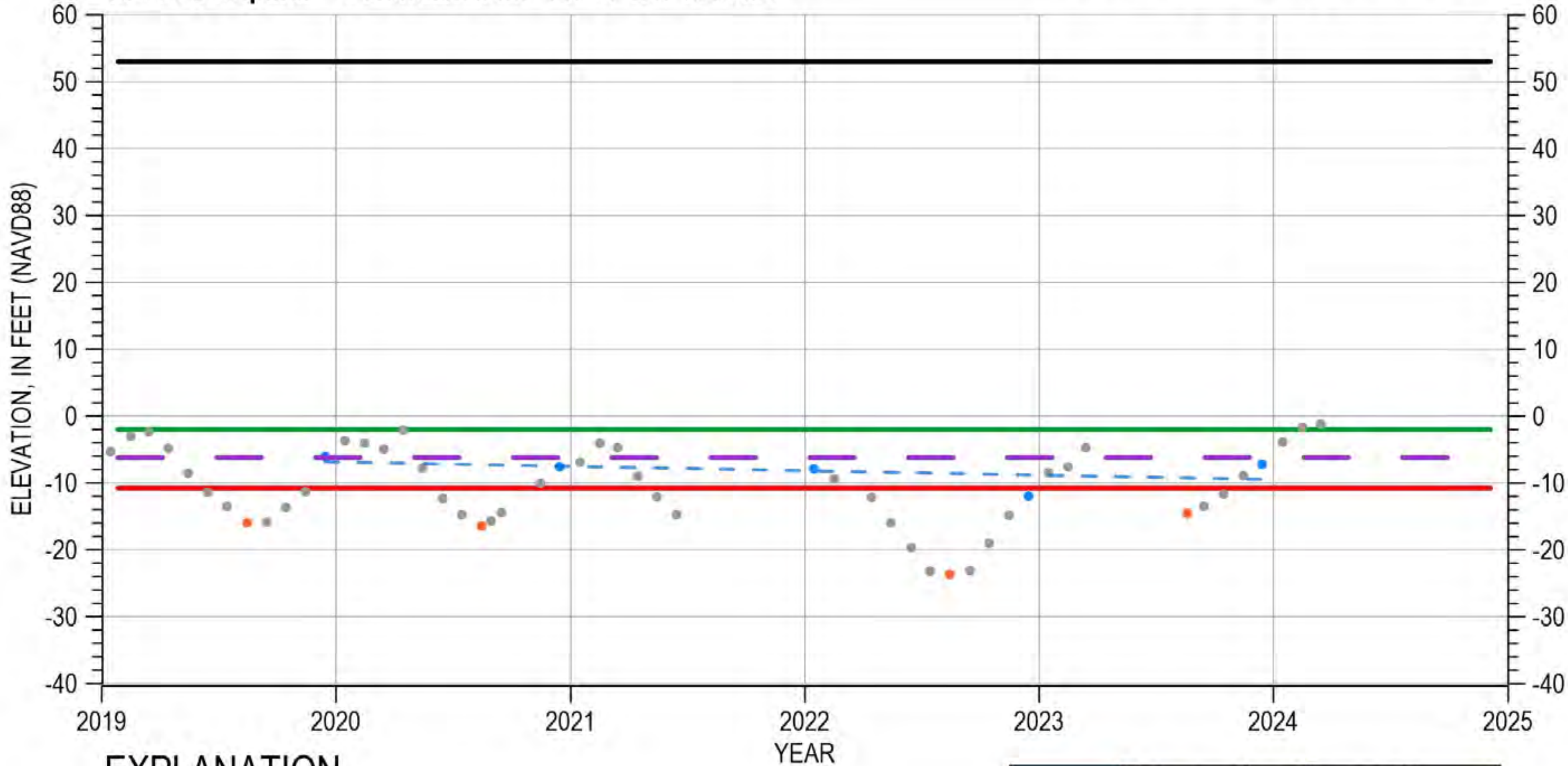
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-12B02

180-Foot Aquifer Perforated from -157 to -207 feet msl

5 YEAR TREND HYDROGRAPH



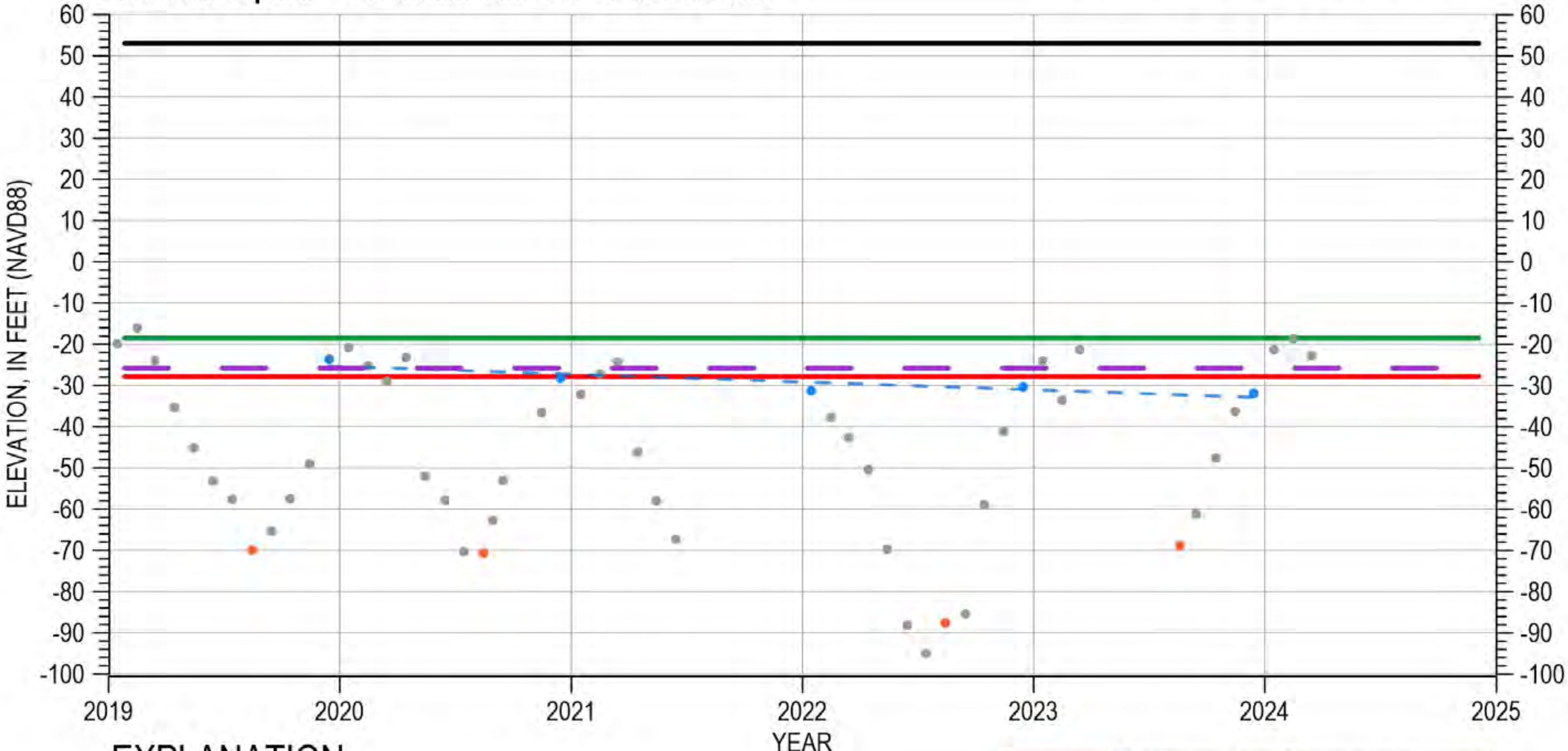
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-12B03

400-Foot Aquifer Perforated from -297 to -327 feet msl

5 YEAR TREND HYDROGRAPH



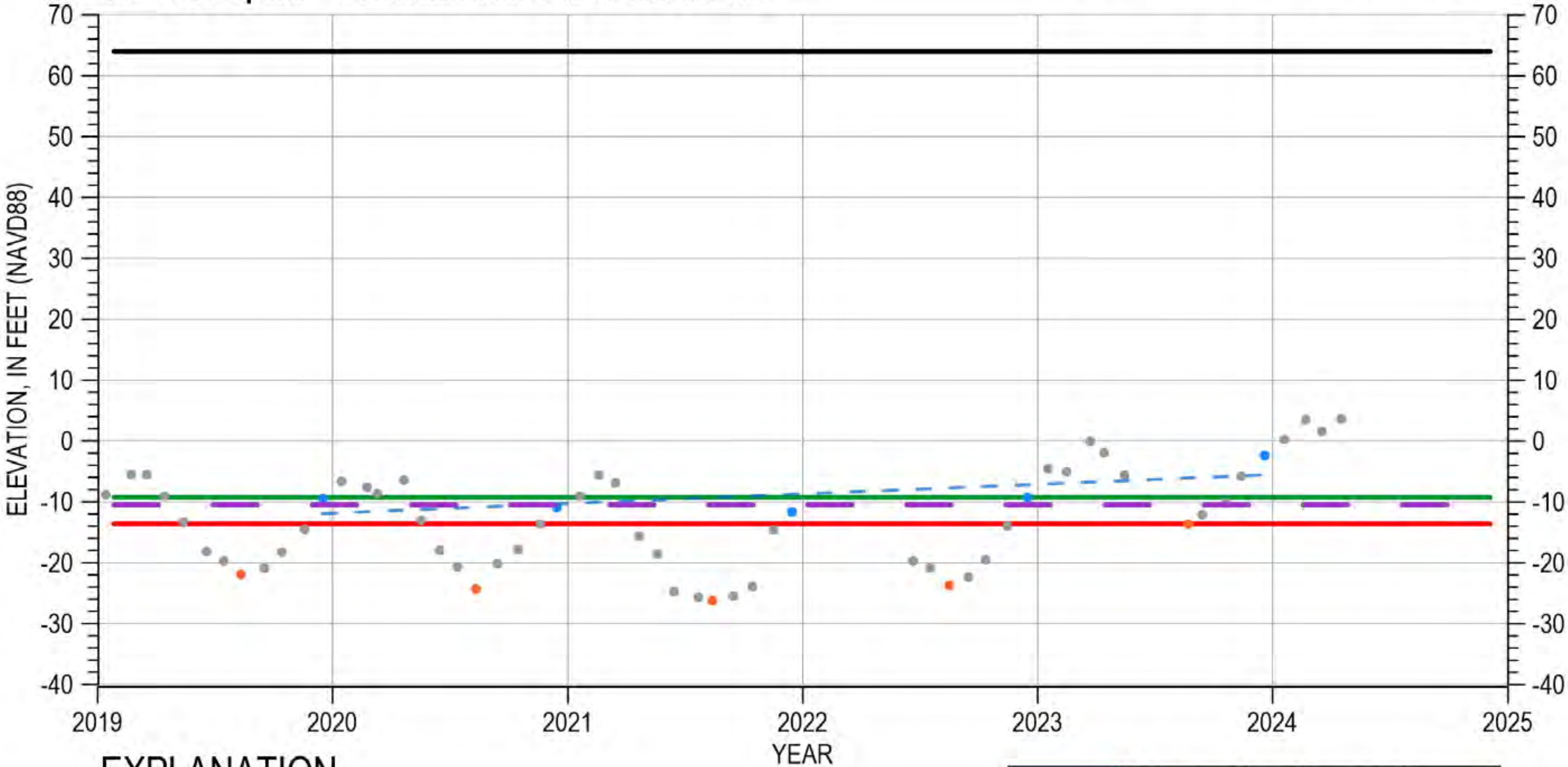
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-12Q01

400-Foot Aquifer Perforated from -209 to -228 feet msl

5 YEAR TREND HYDROGRAPH



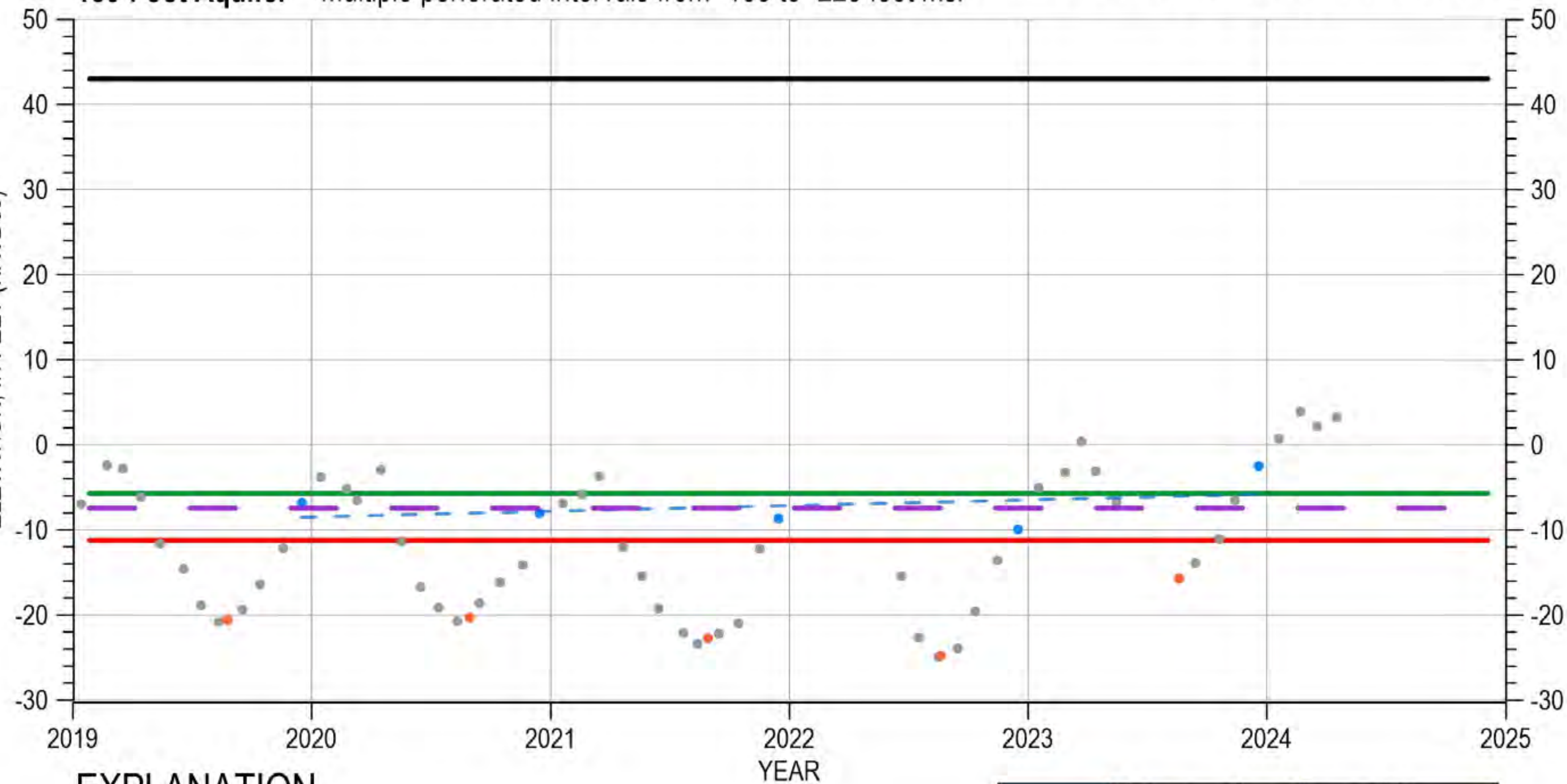
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-13F03

180-Foot Aquifer Multiple perforated intervals from -185 to -225 feet msl

5 YEAR TREND HYDROGRAPH



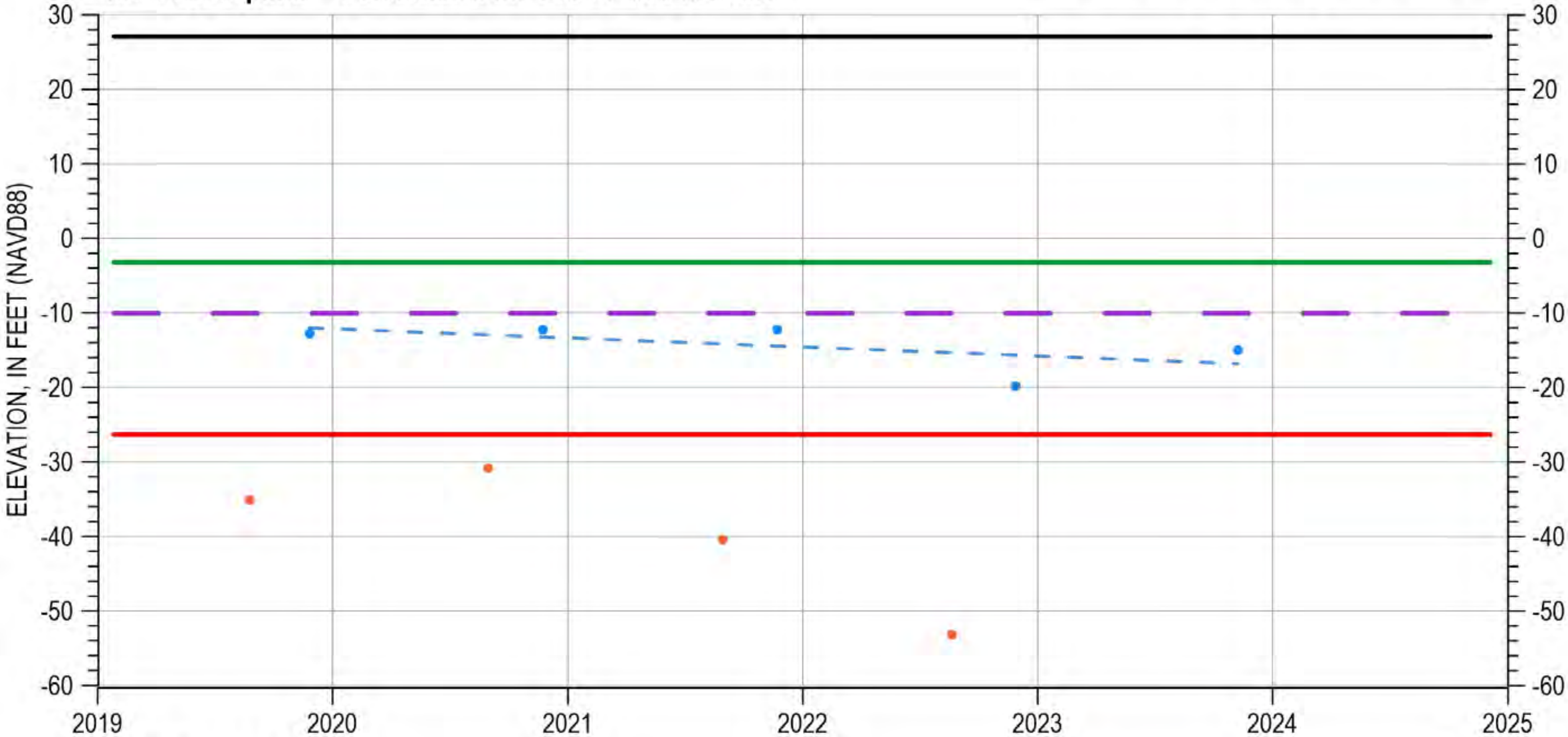
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-15K01

400-Foot Aquifer Perforated from -273 to -573 feet msl

5 YEAR TREND HYDROGRAPH



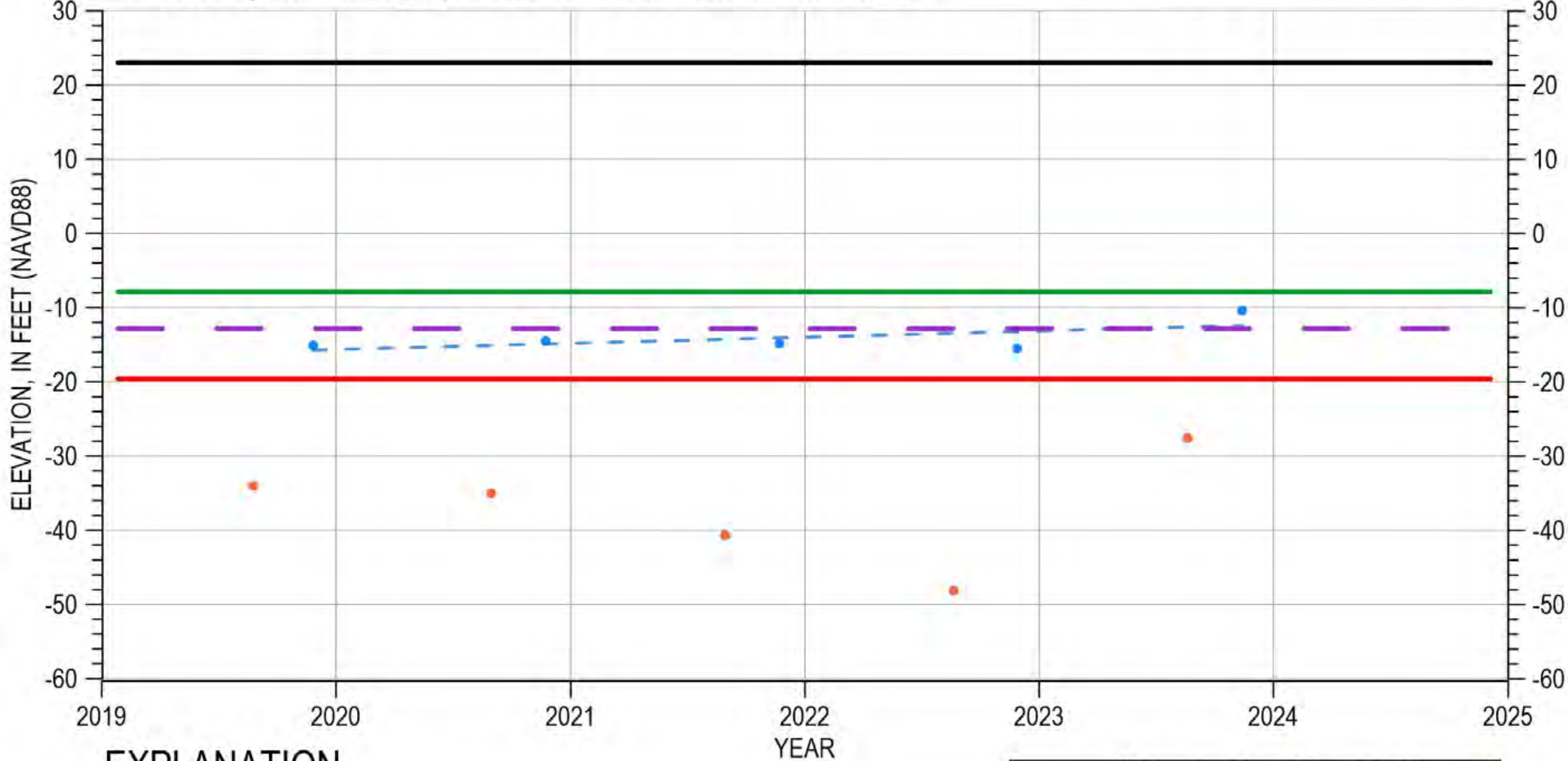
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

14S/02E-16A02

400-Foot Aquifer Multiple perforated intervals from -409 to -597 feet msl

5 YEAR TREND HYDROGRAPH



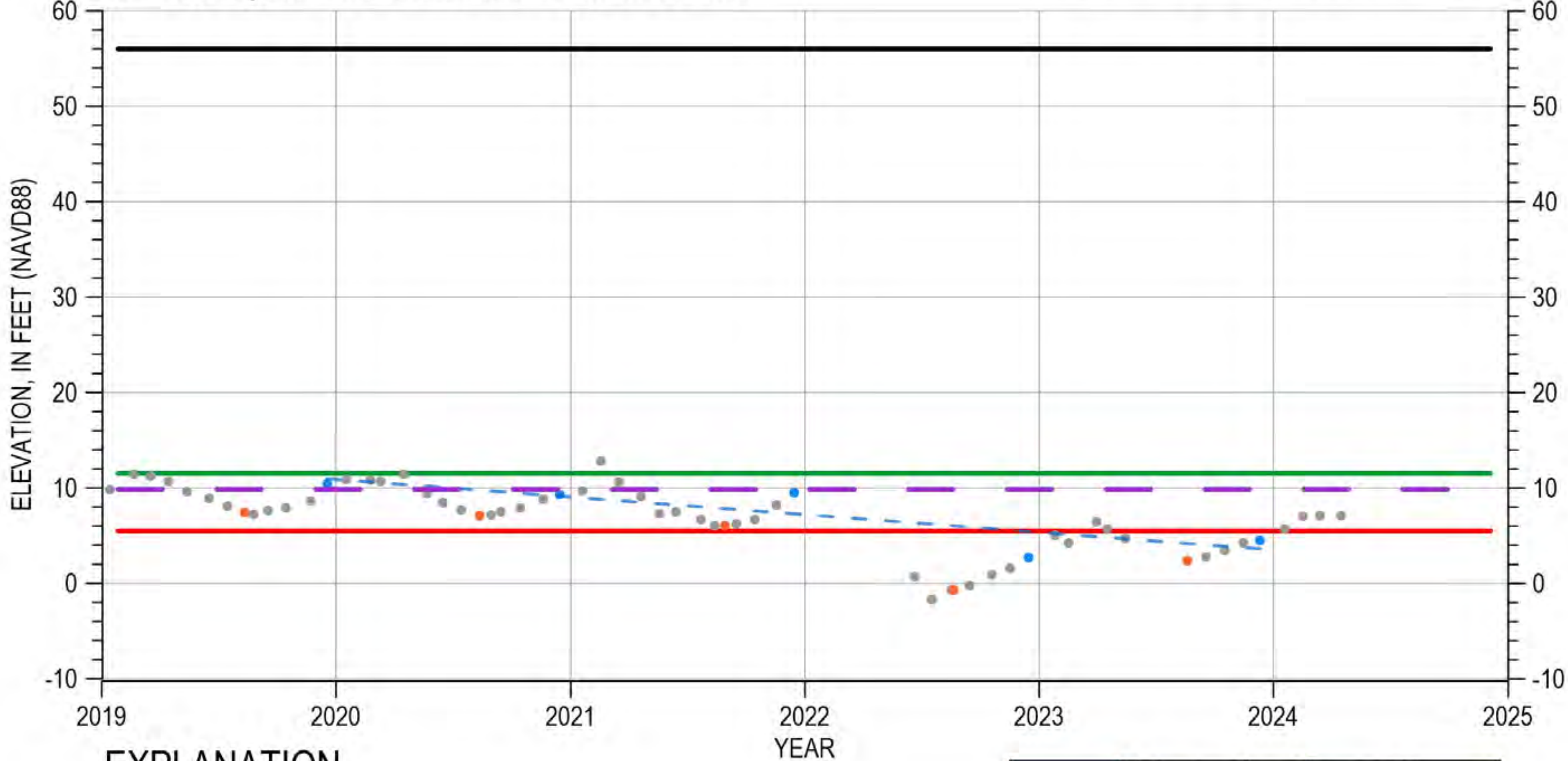
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-17C02

180-Foot Aquifer Perforated from -24 to -84 feet msl

5 YEAR TREND HYDROGRAPH



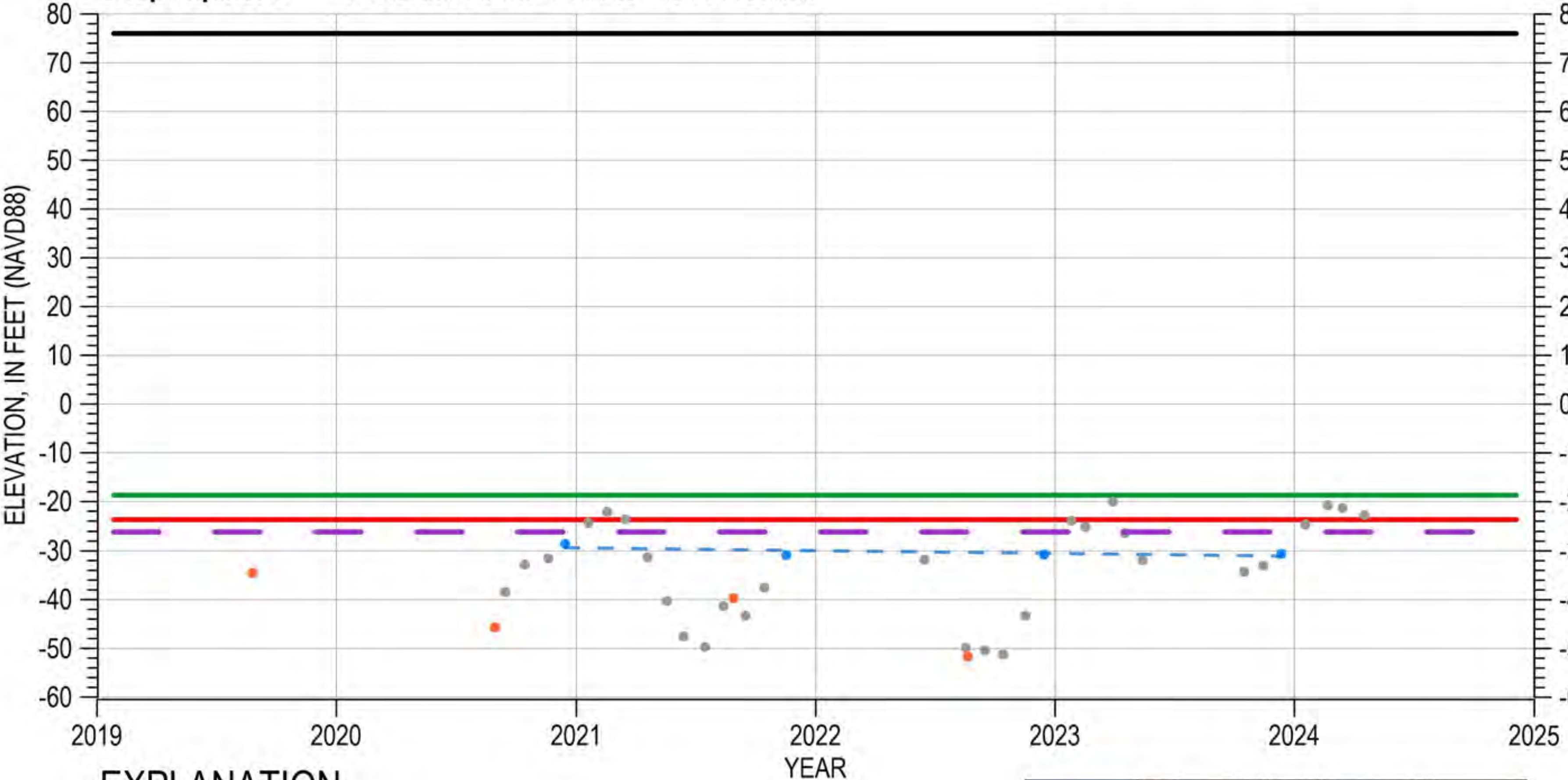
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-20E01

Deep Aquifers Perforated from -1044 to -1944 feet msl

5 YEAR TREND HYDROGRAPH



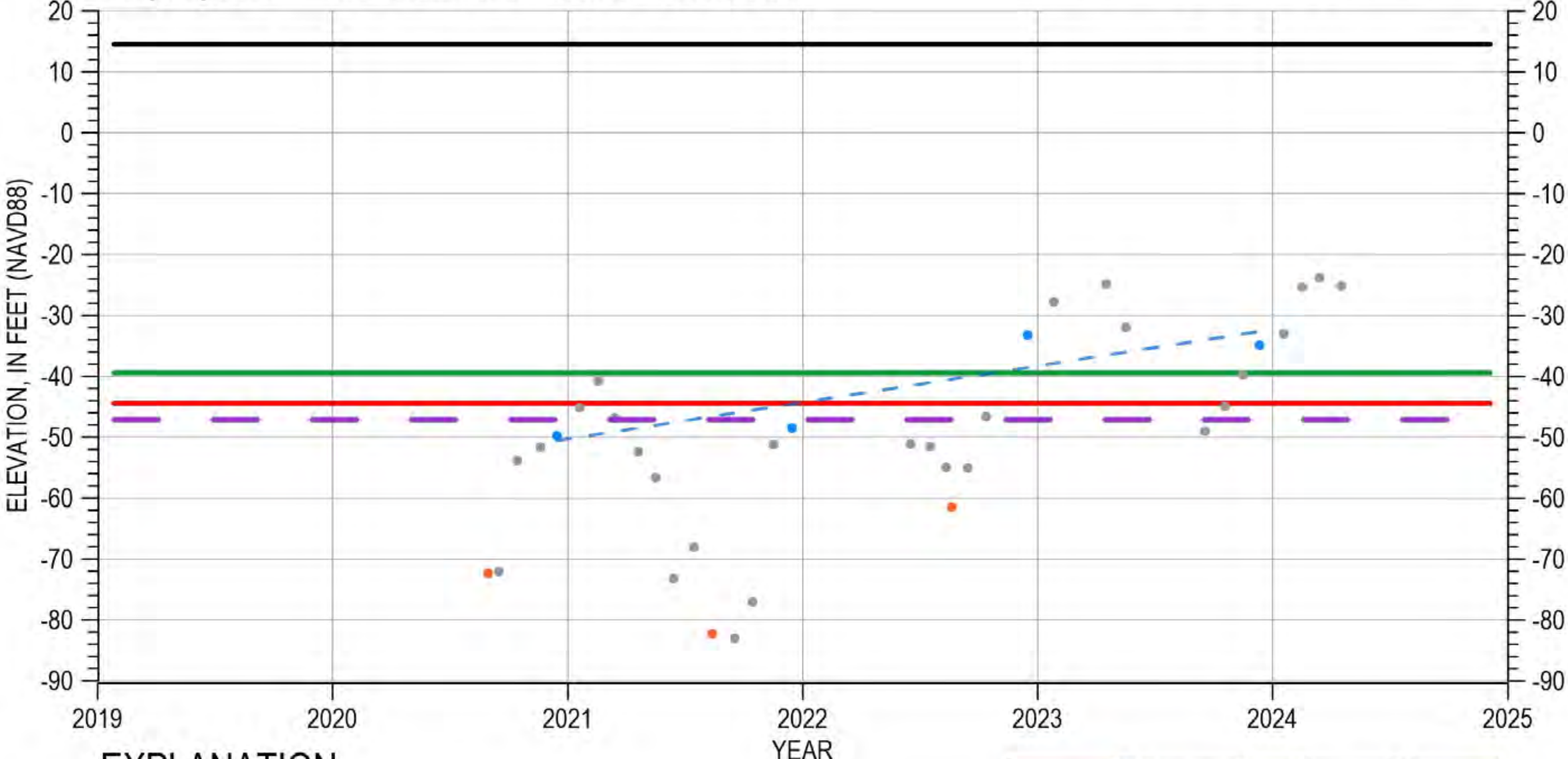
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-21K04

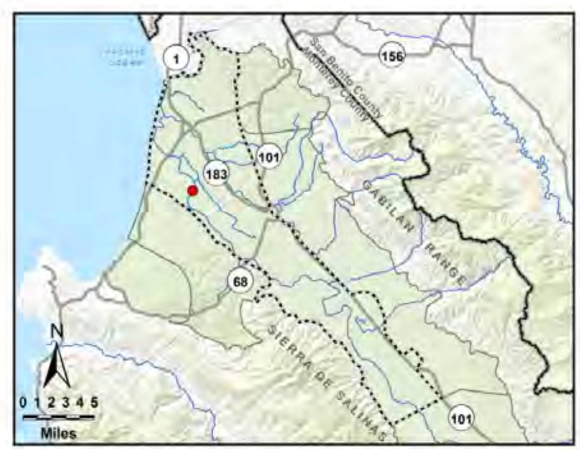
5 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -1226 to -1786 feet msl



EXPLANATION

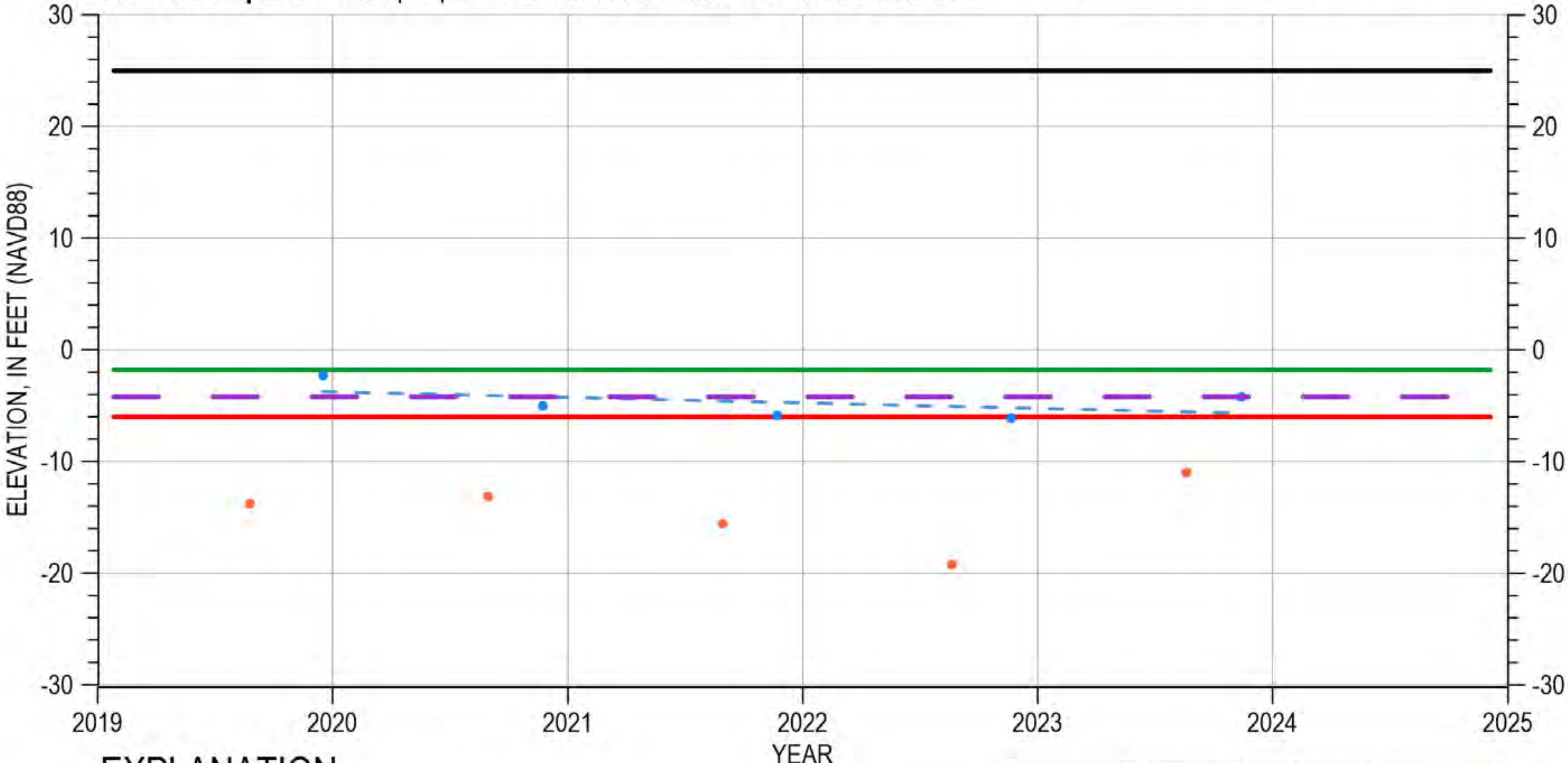
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-21L01

180-Foot Aquifer Multiple perforated intervals from -147 to -242 feet msl

5 YEAR TREND HYDROGRAPH



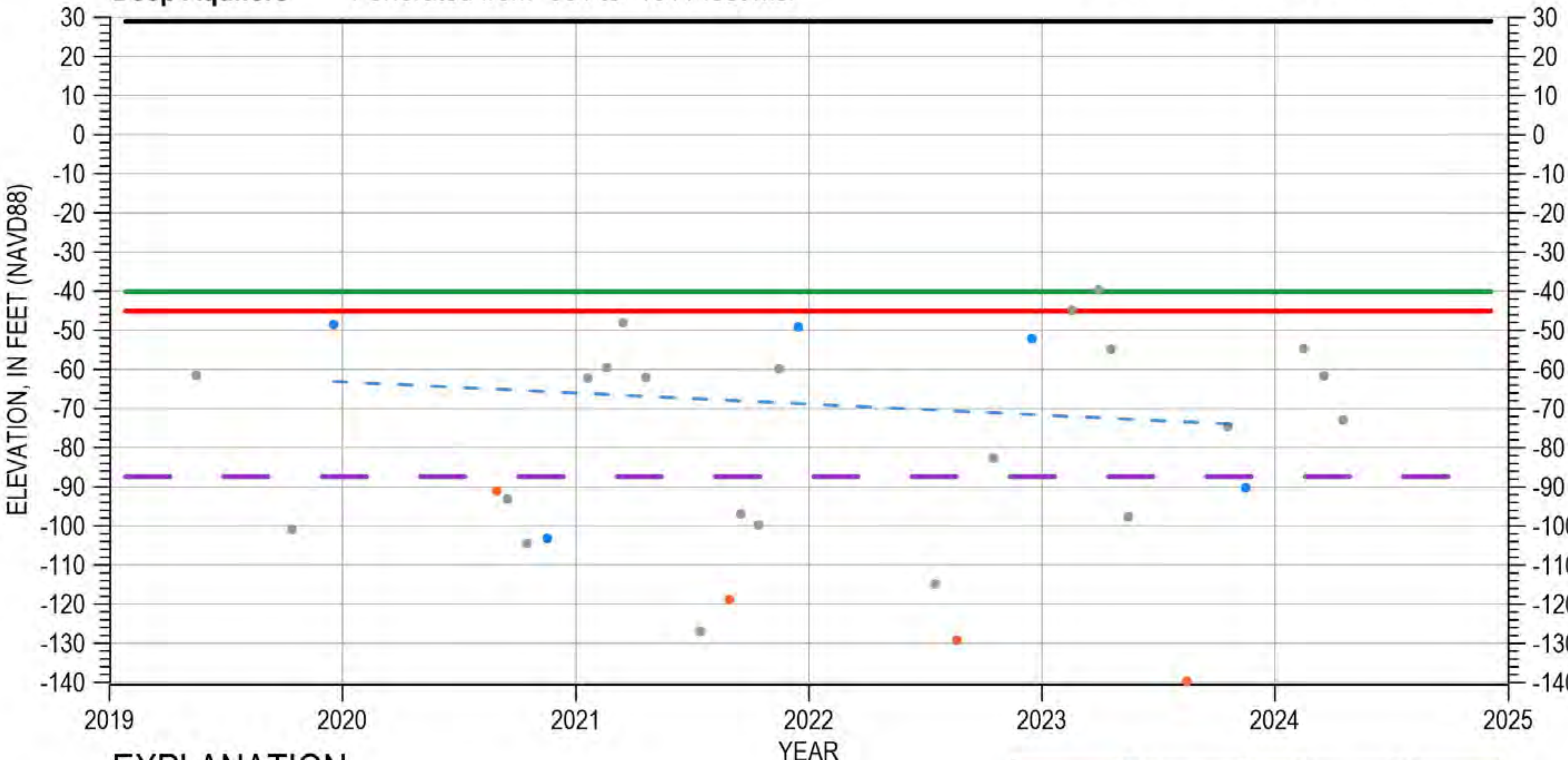
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-22A03

Deep Aquifers Perforated from -951 to -1611 feet msl

5 YEAR TREND HYDROGRAPH



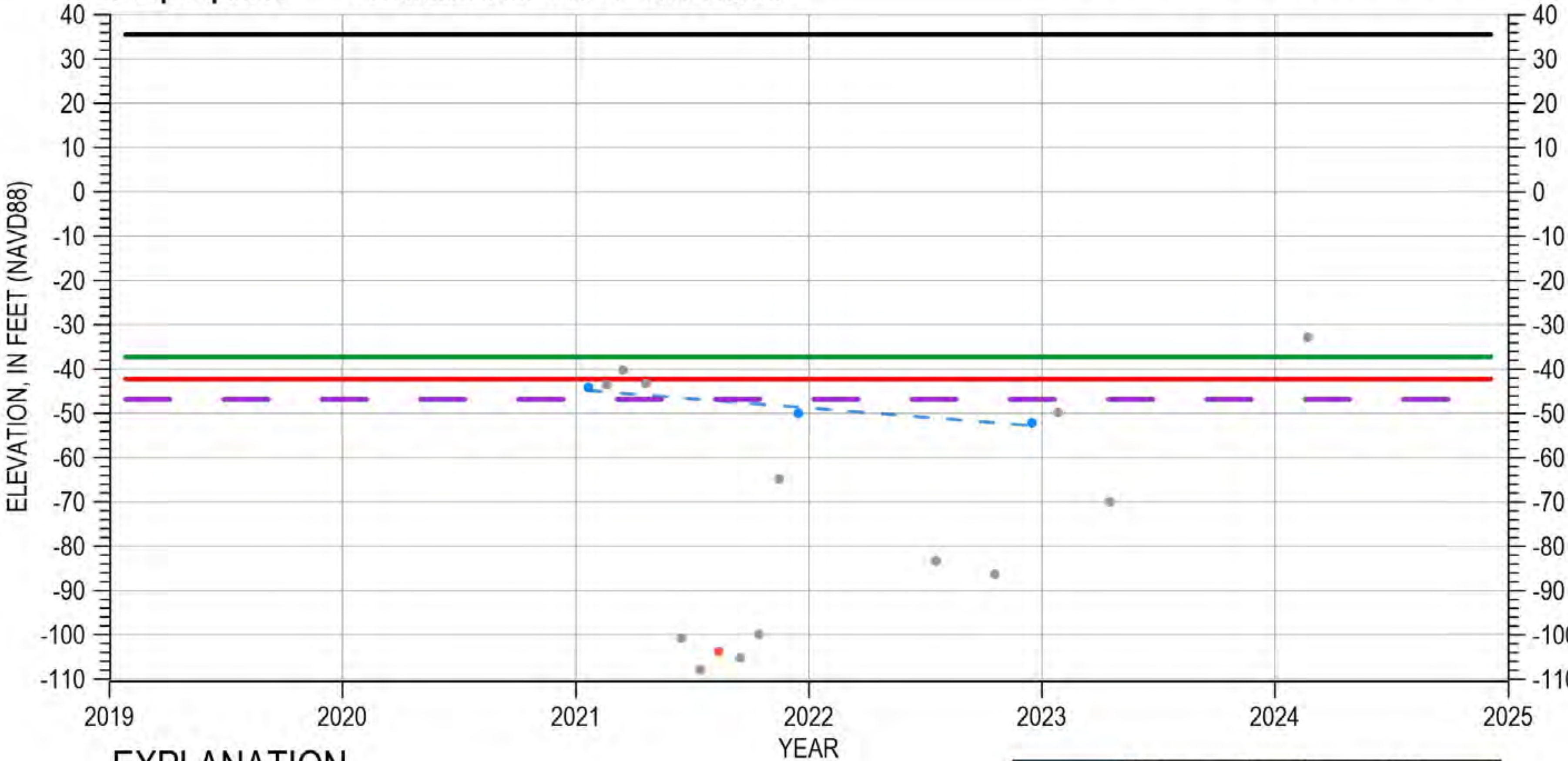
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-23J02

Deep Aquifers Perforated from -815 to -1645 feel msl

5 YEAR TREND HYDROGRAPH



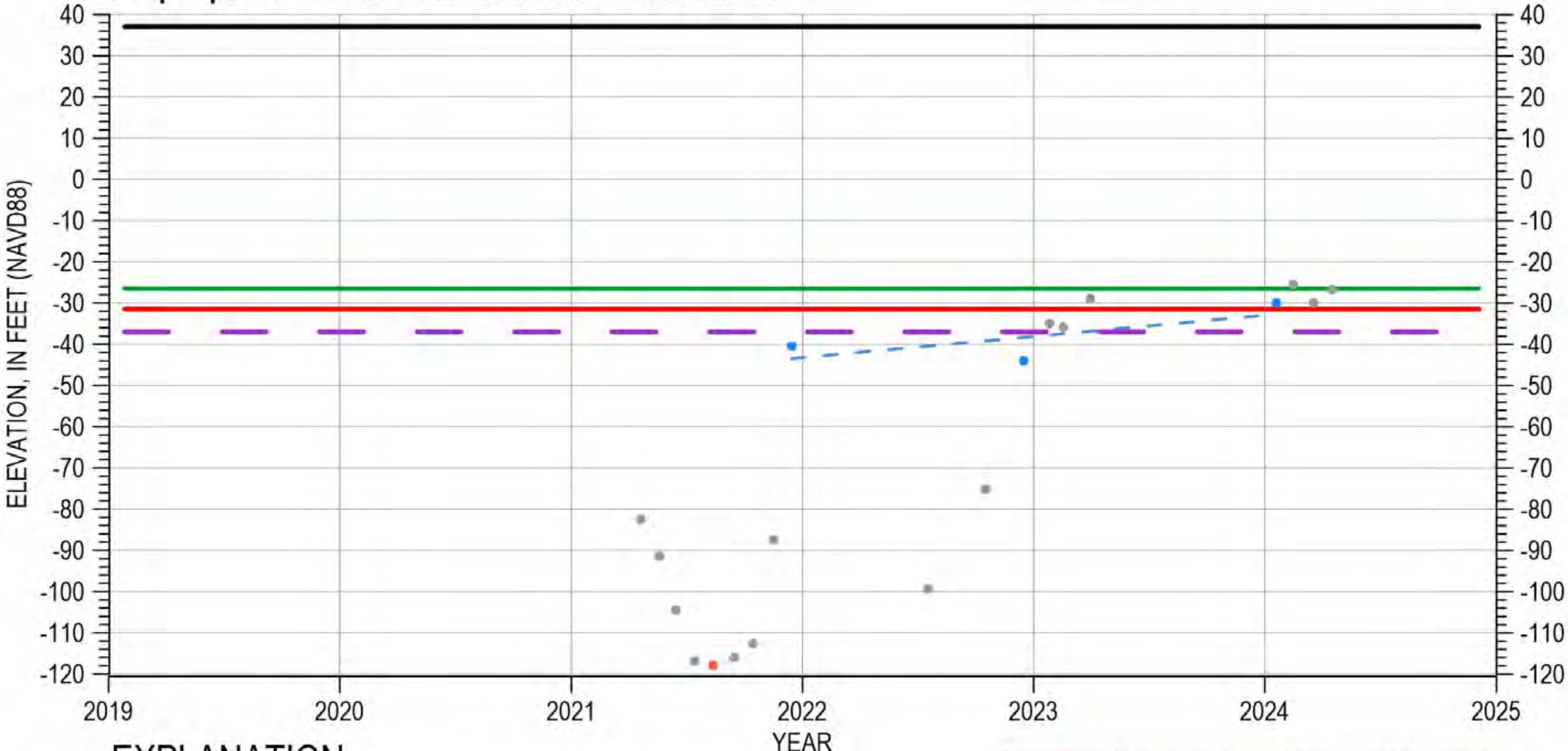
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-25A03

Deep Aquifers Perforated from -773 to -1663 feel msl

5 YEAR TREND HYDROGRAPH



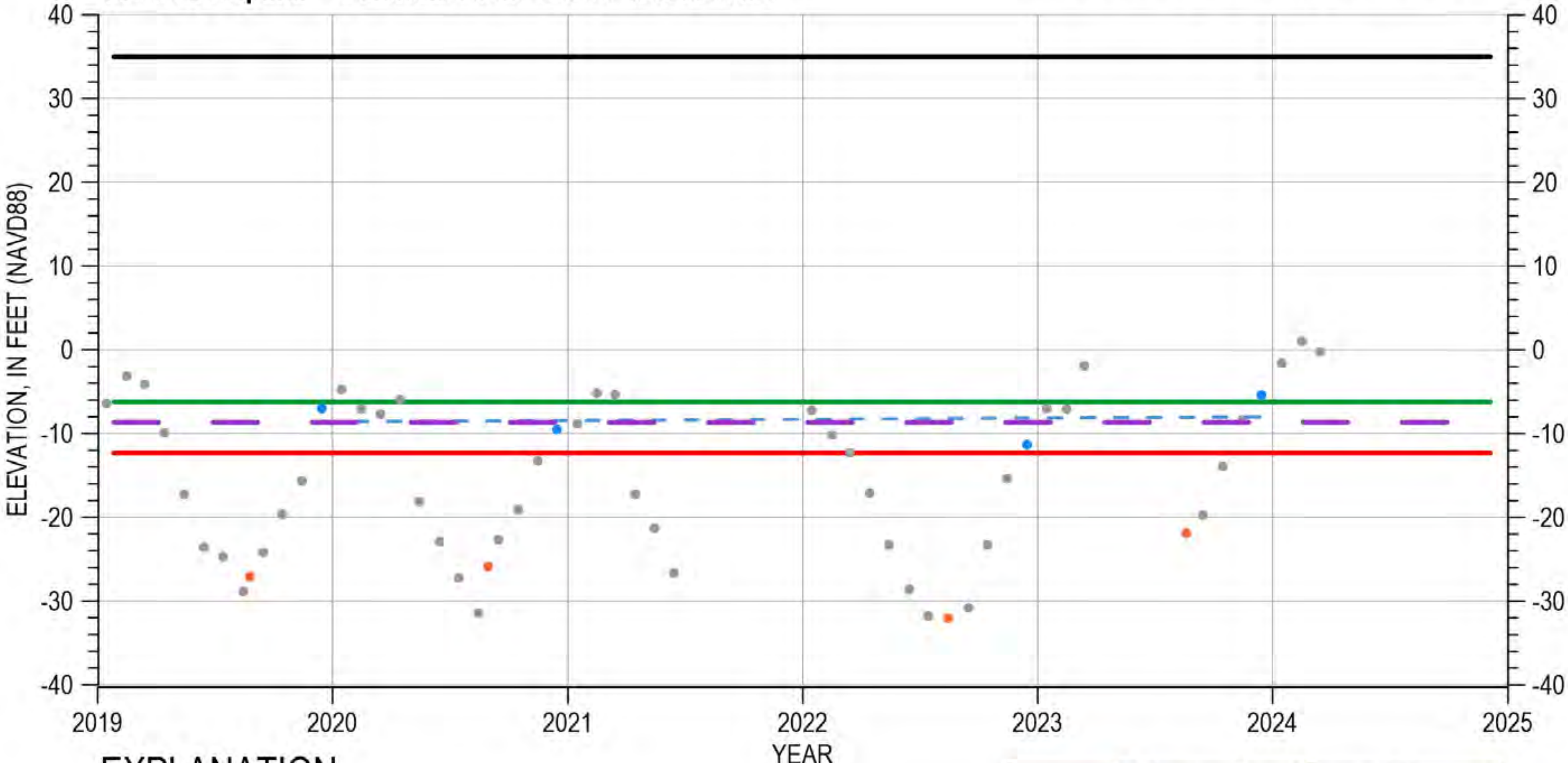
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-26H01

180-Foot Aquifer Perforated from -252 to -302 feet msl

5 YEAR TREND HYDROGRAPH



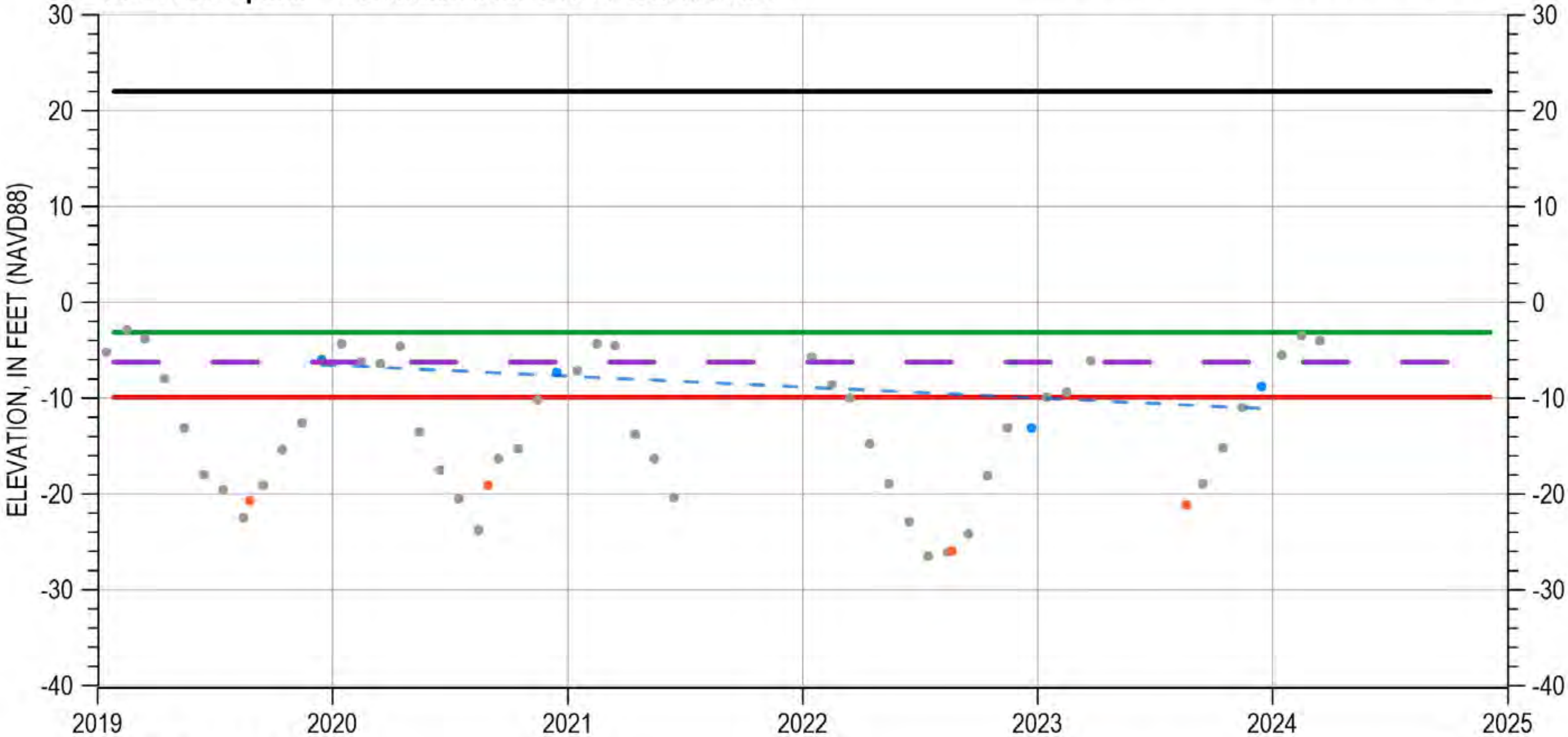
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-27A01

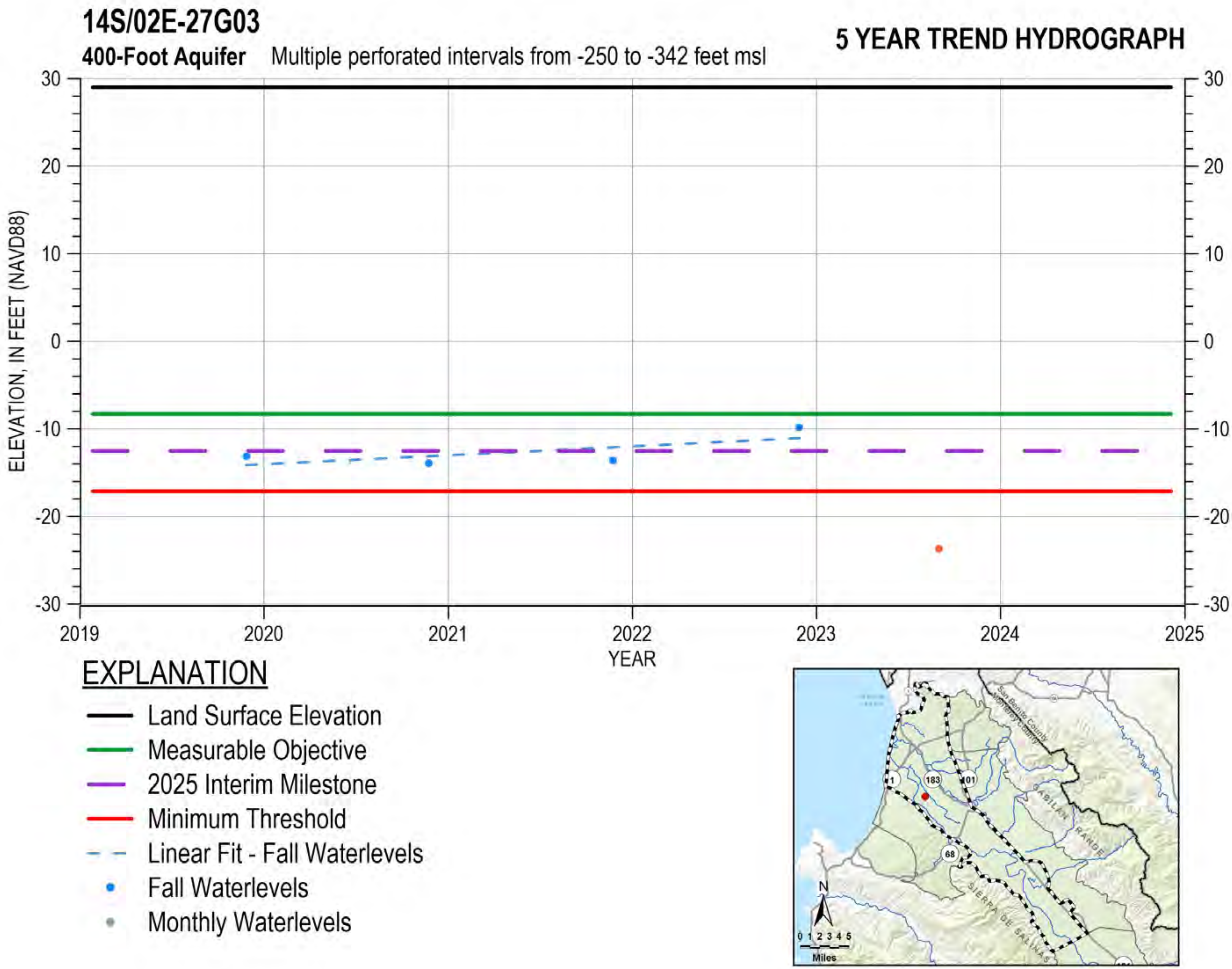
180-Foot Aquifer Perforated from -218 to -268 feet msl

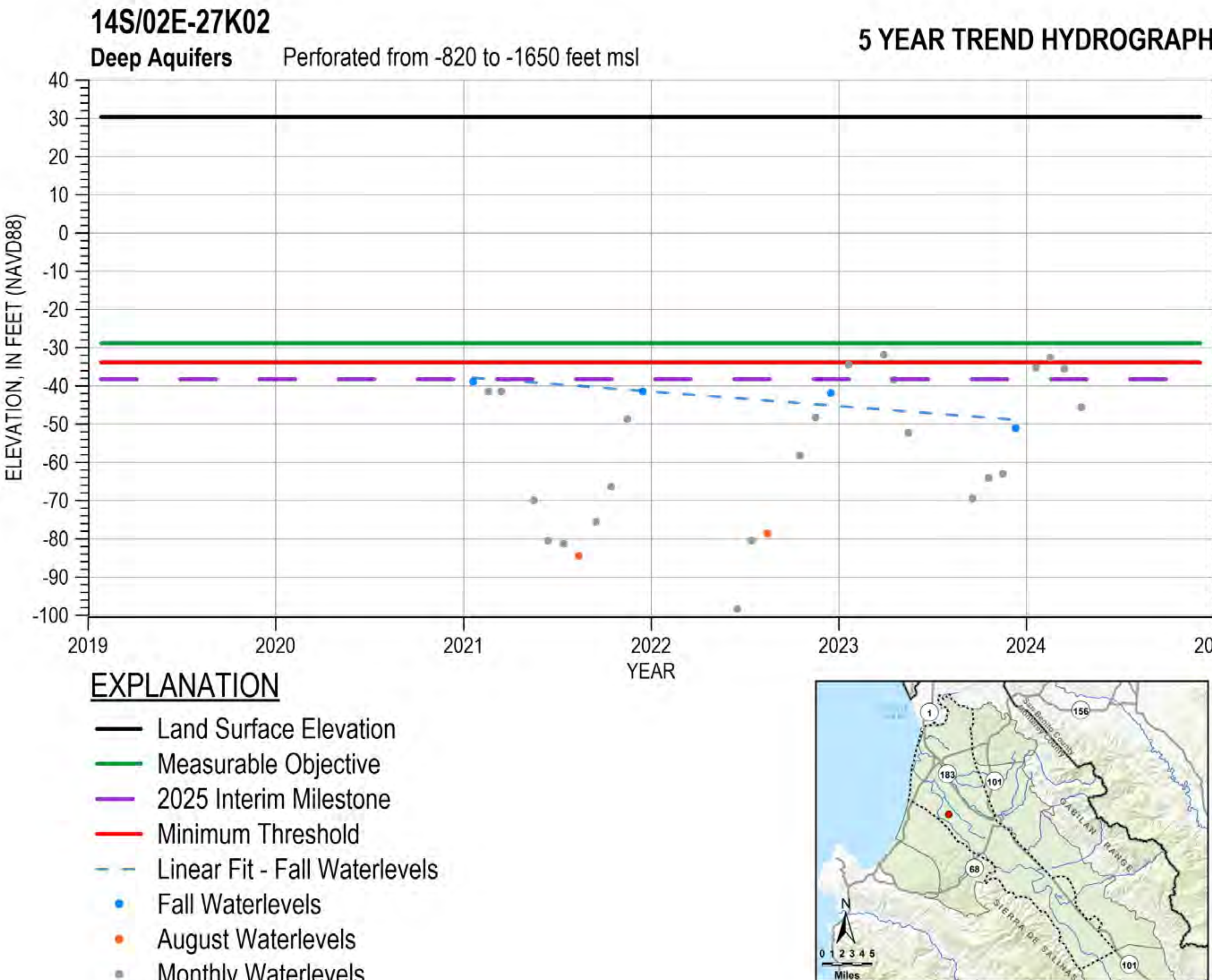
5 YEAR TREND HYDROGRAPH

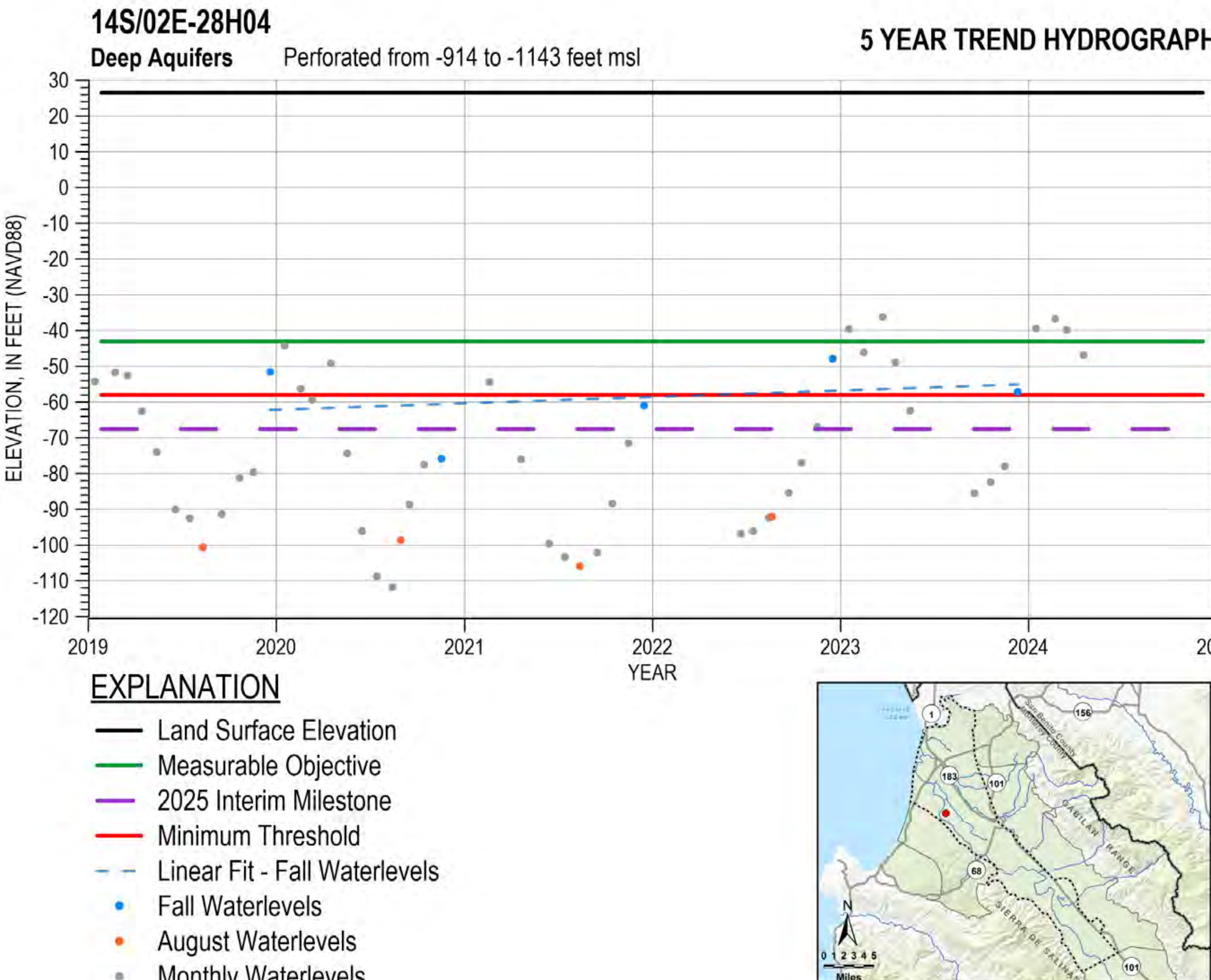


EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


14S/02E-27G03
400-Foot Aquifer
Multiple perforated intervals from -250 to -342 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
30
20
10
0
-10
-20
-30
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
Monthly Waterlevels
San Benito County
Monterey County
1
183
101
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles


14S/02E-27K02
Deep Aquifers
Perforated from -820 to -1650 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
1
156
183
101
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

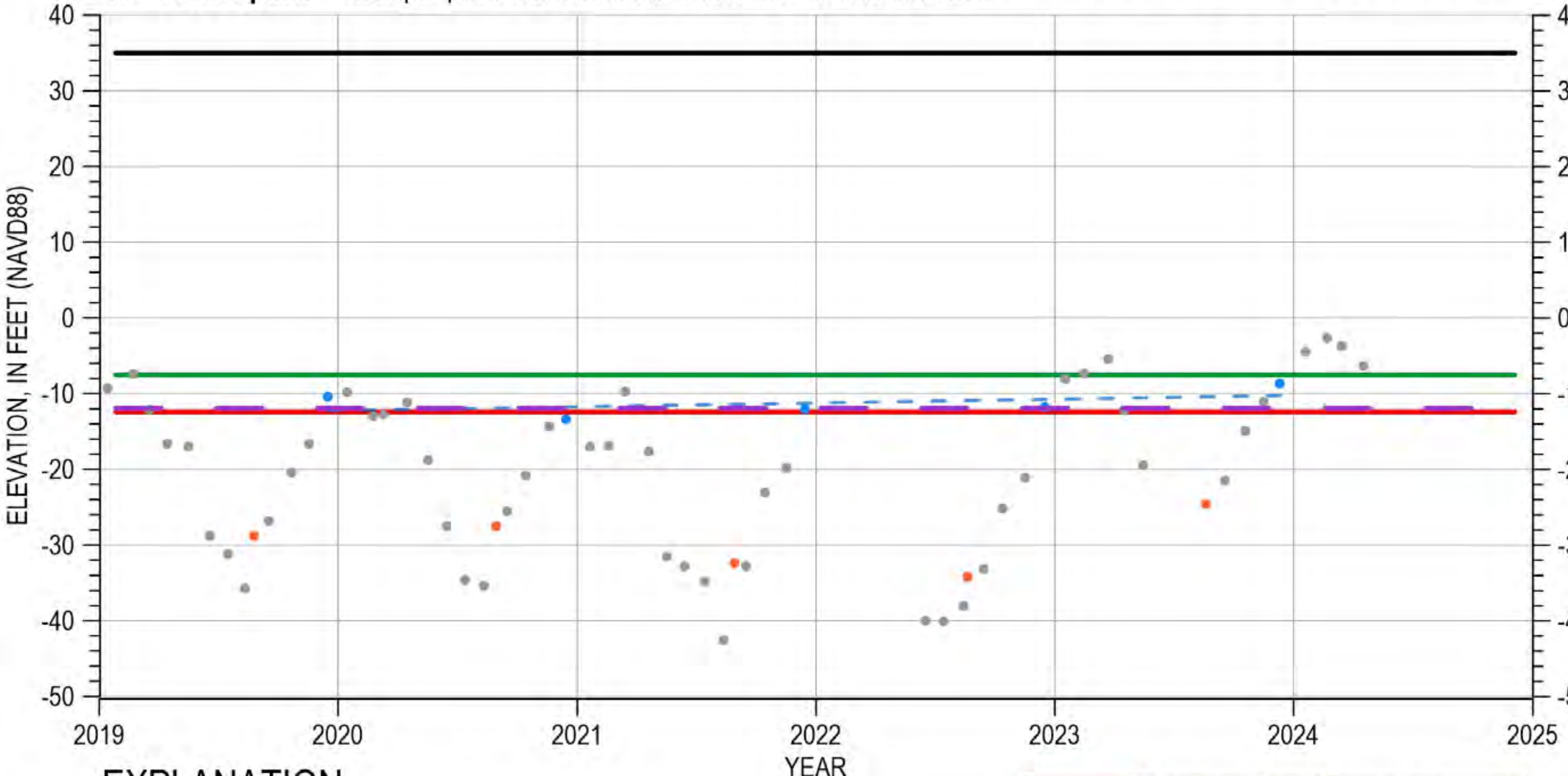


14S/02E-28H04
Deep Aquifers
Perforated from -914 to -1143 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
1
156
183
101
68
GABILAN RANGE
SIERRA DE SALINAS
San Benito County
Monterey County
N
0 1 2 3 4 5
Miles

14S/02E-34A03

400-Foot Aquifer Multiple perforated intervals from -457 to -587 feet msl

5 YEAR TREND HYDROGRAPH



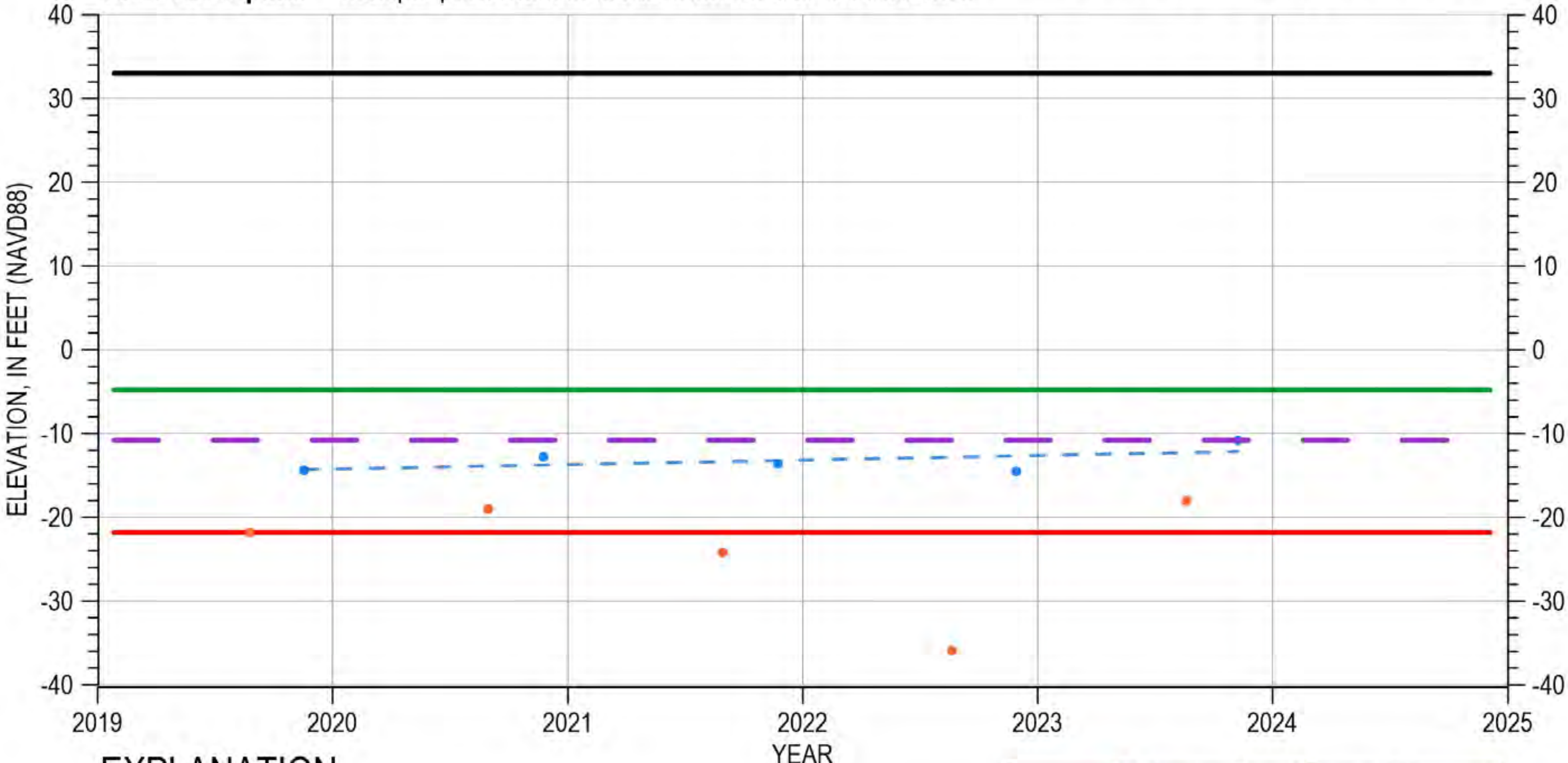
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-34B03

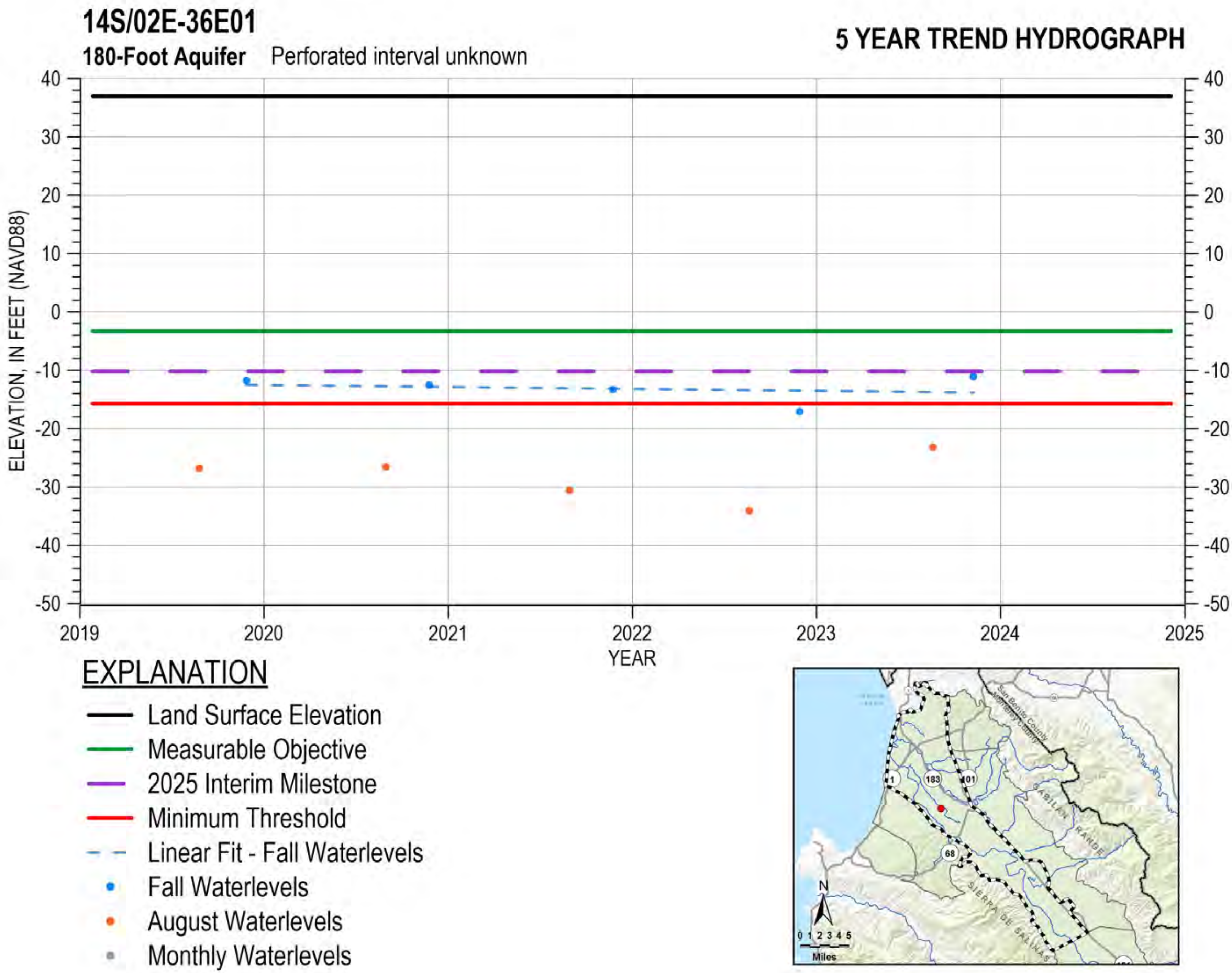
180-Foot Aquifer Multiple perforated intervals from -275 to -313 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

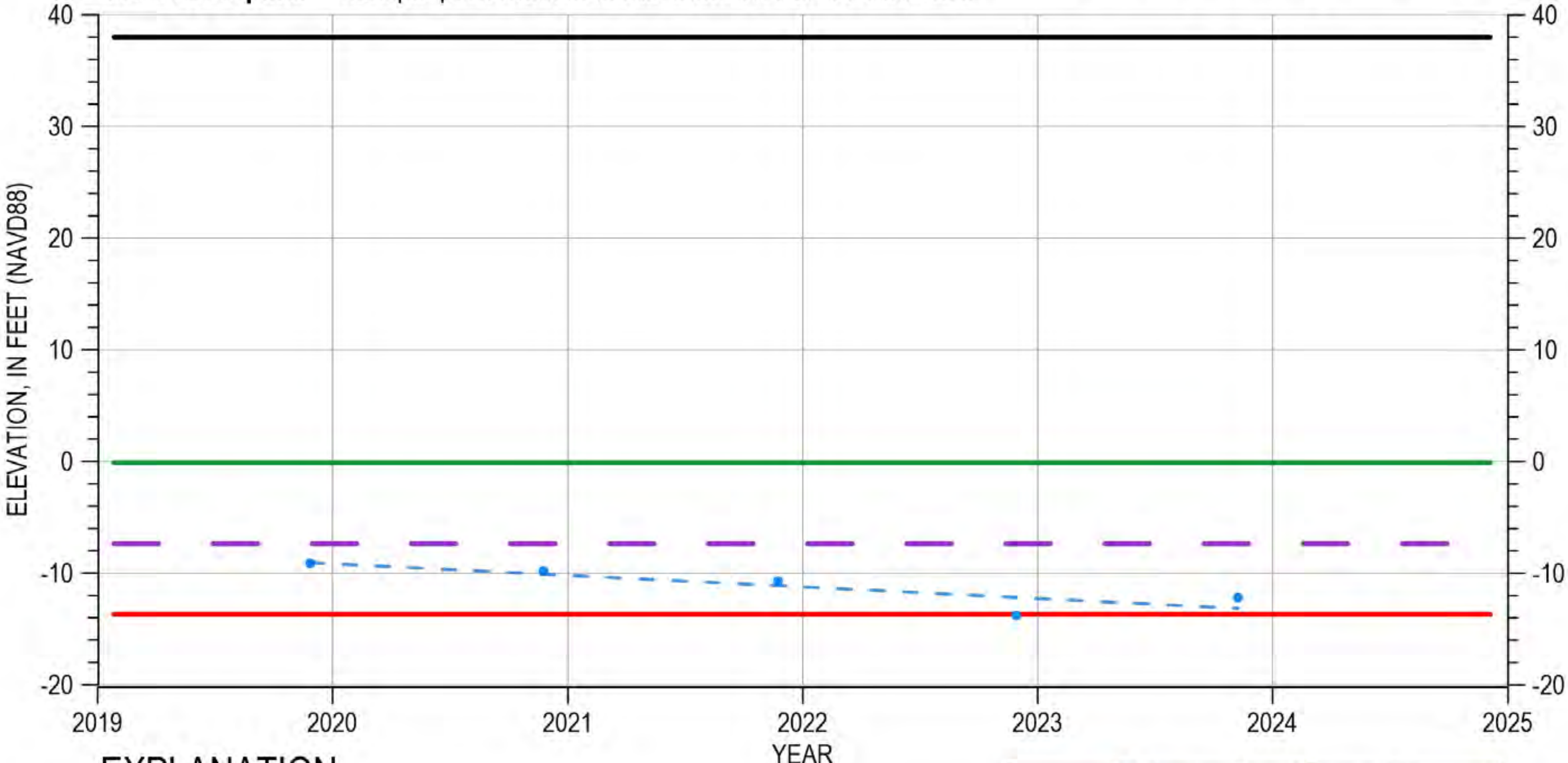
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


14S/02E-36E01
180-Foot Aquifer
Perforated interval unknown
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
40
30
20
10
0
-10
-20
-30
-40
-50
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
183
101
1
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

14S/02E-36G01

400-Foot Aquifer Multiple perforated intervals from -301 to -375 feet msl

5 YEAR TREND HYDROGRAPH



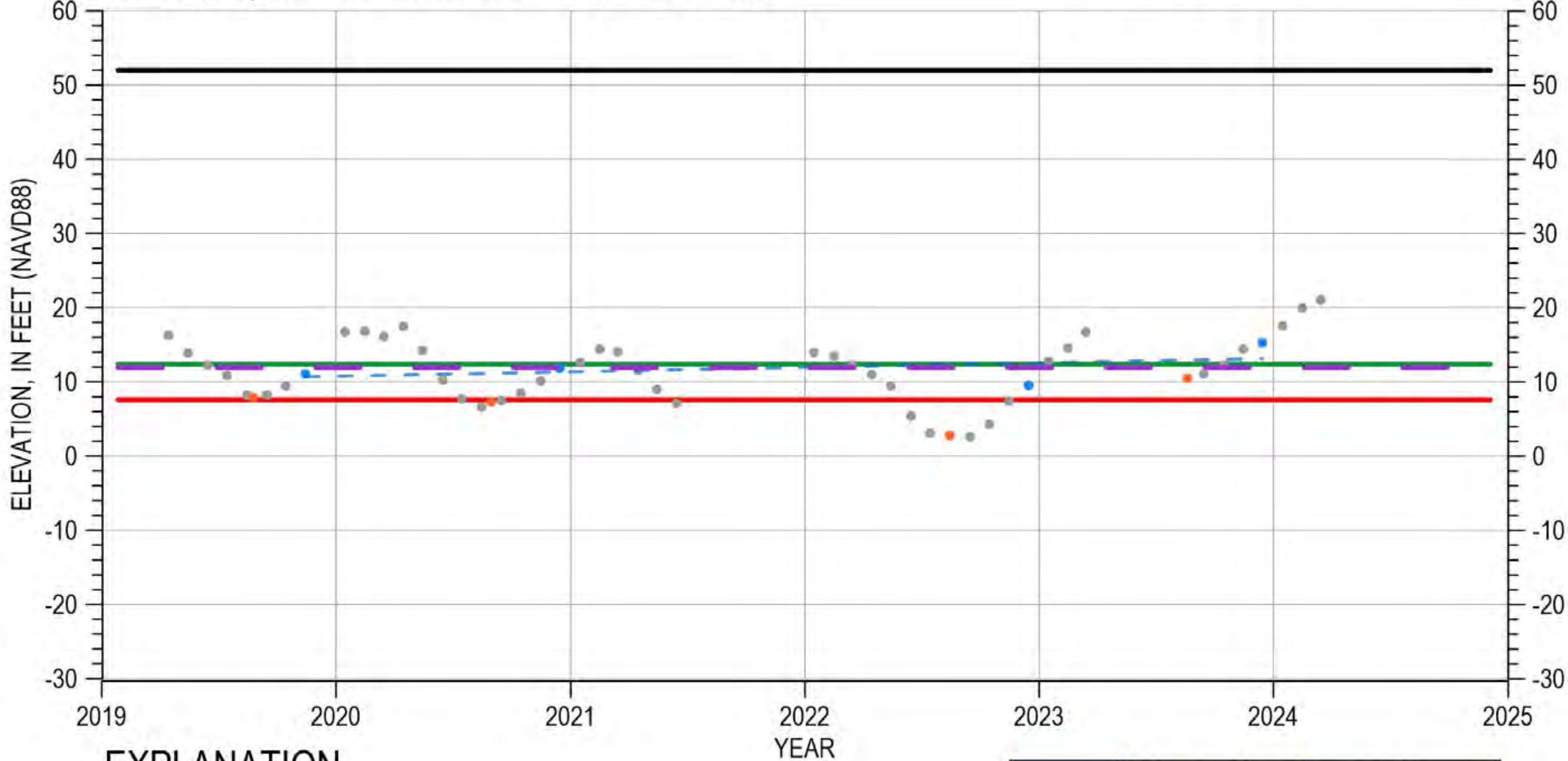
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

14S/03E-18C01

180-Foot Aquifer Perforated from -113 to -163 feet msl

5 YEAR TREND HYDROGRAPH



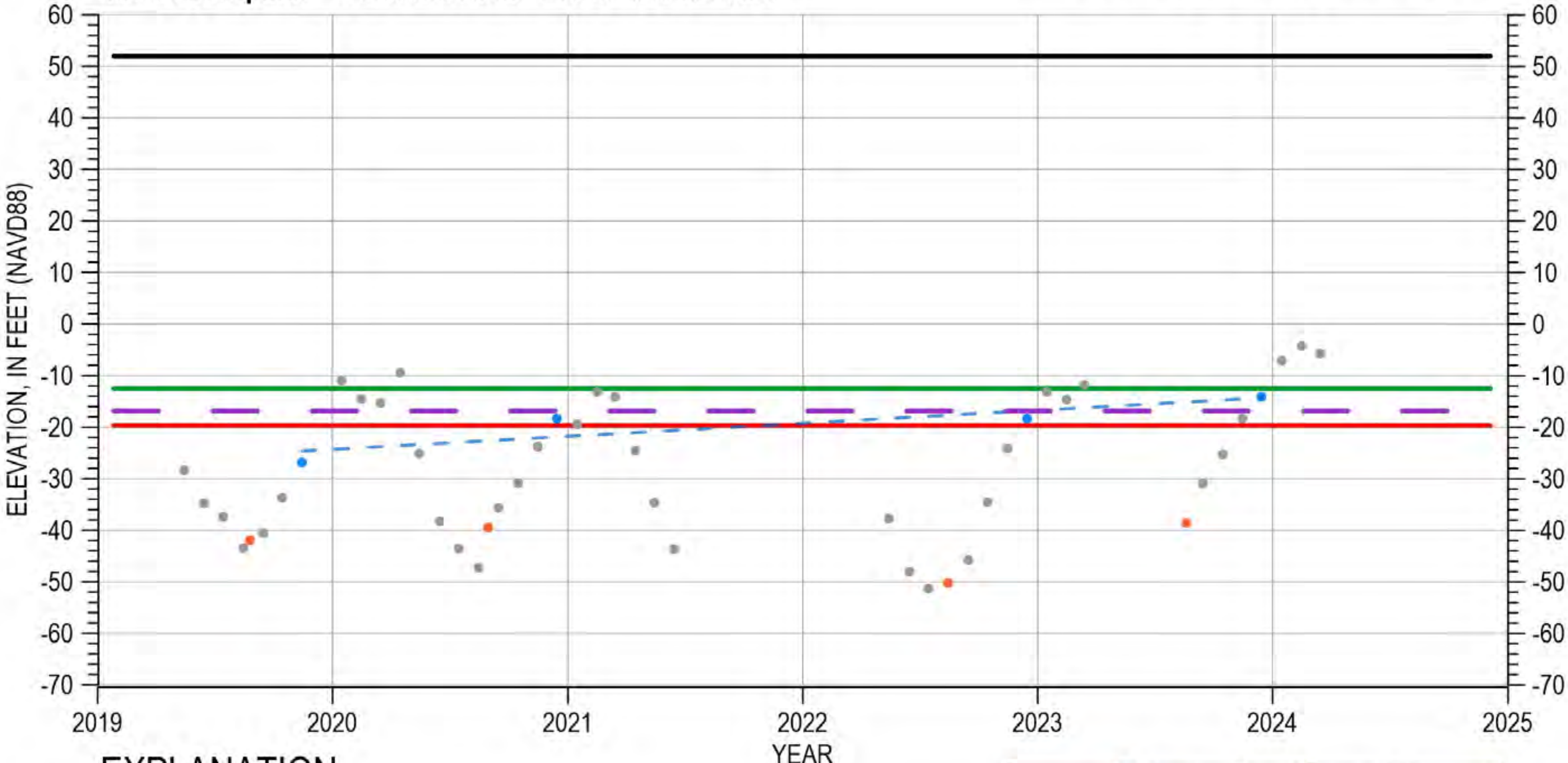
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-18C02

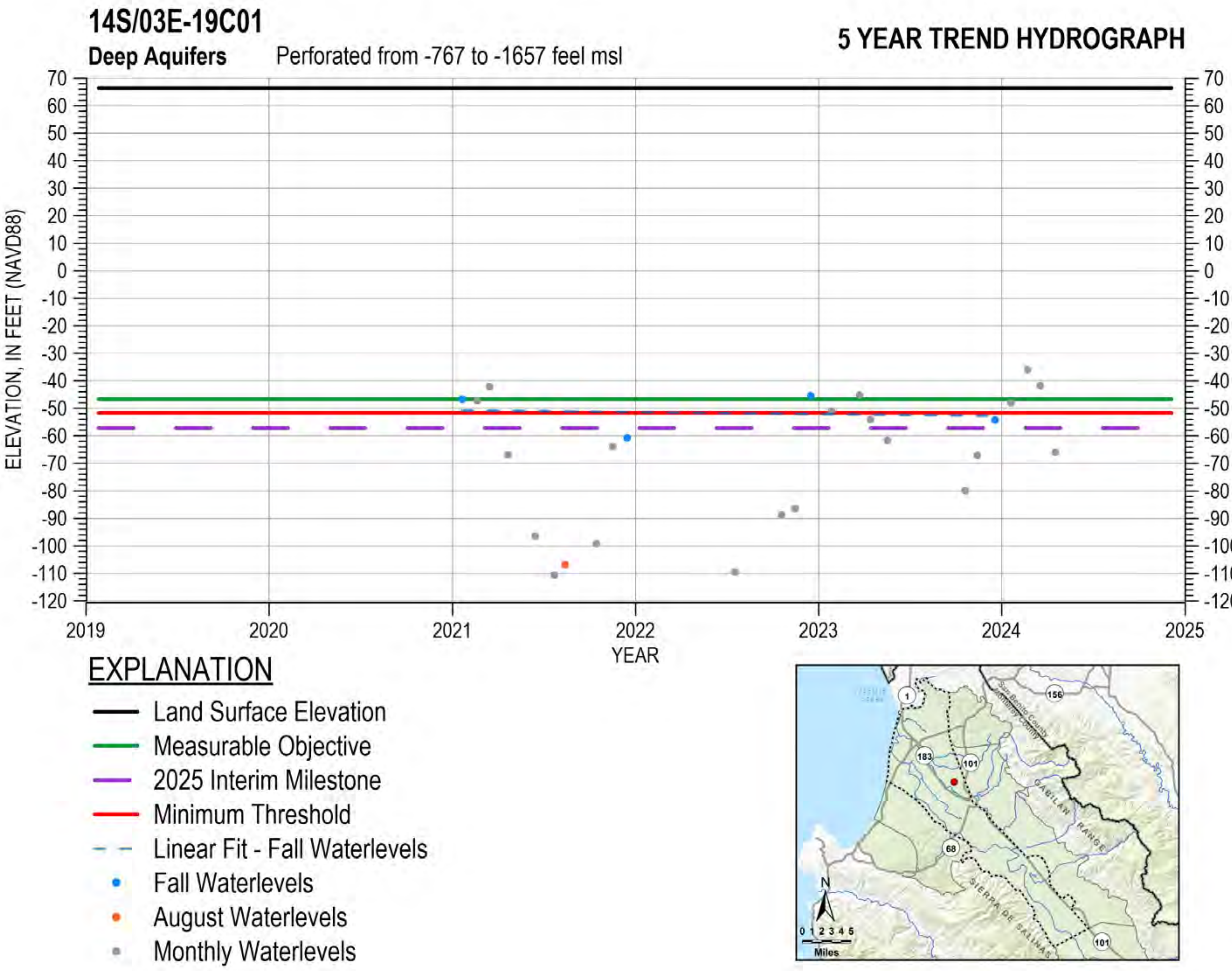
400-Foot Aquifer Perforated from -218 to -333 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

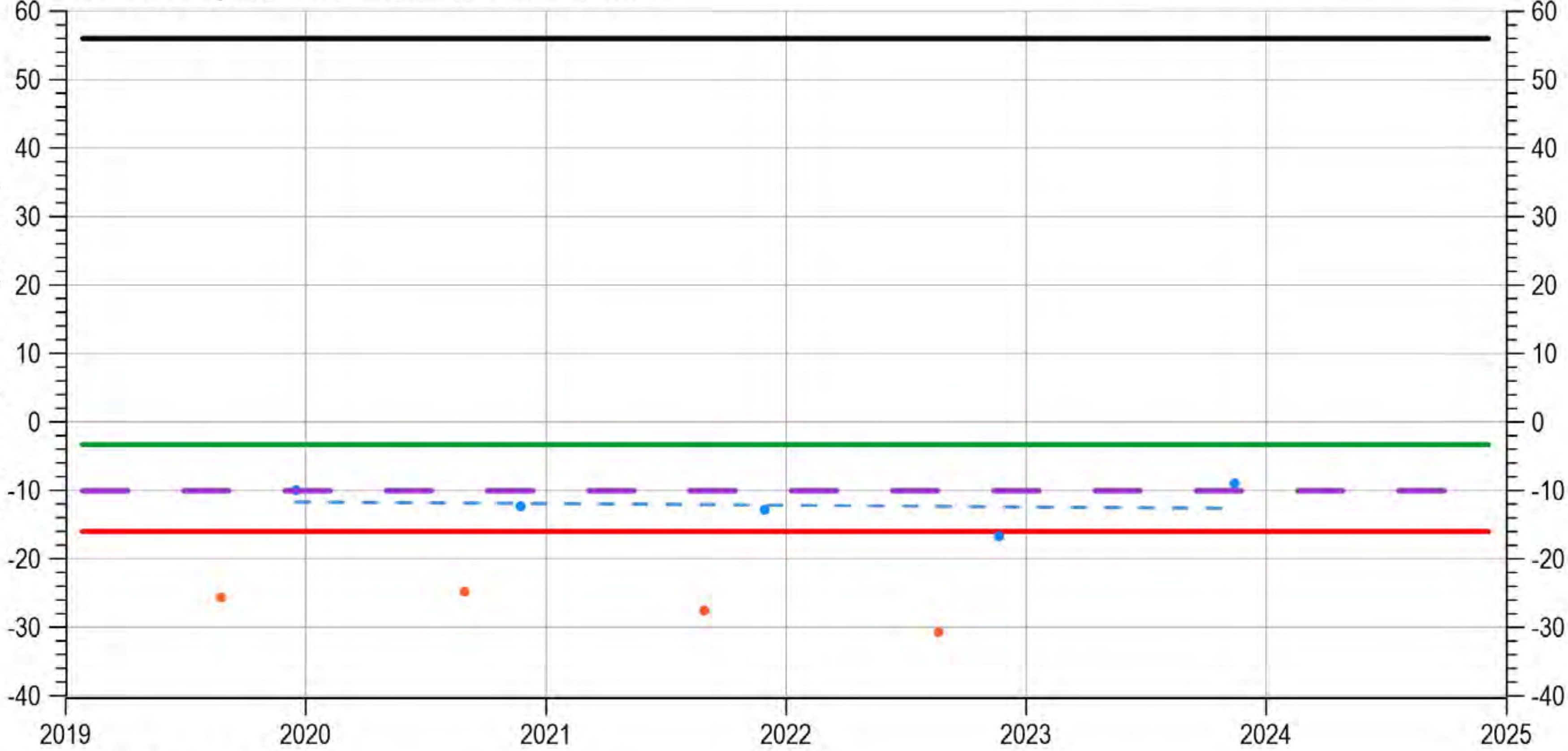


14S/03E-19C01
Deep Aquifers
Perforated from -767 to -1657 feel msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
1
156
183
101
68
101
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

14S/03E-19G01

180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



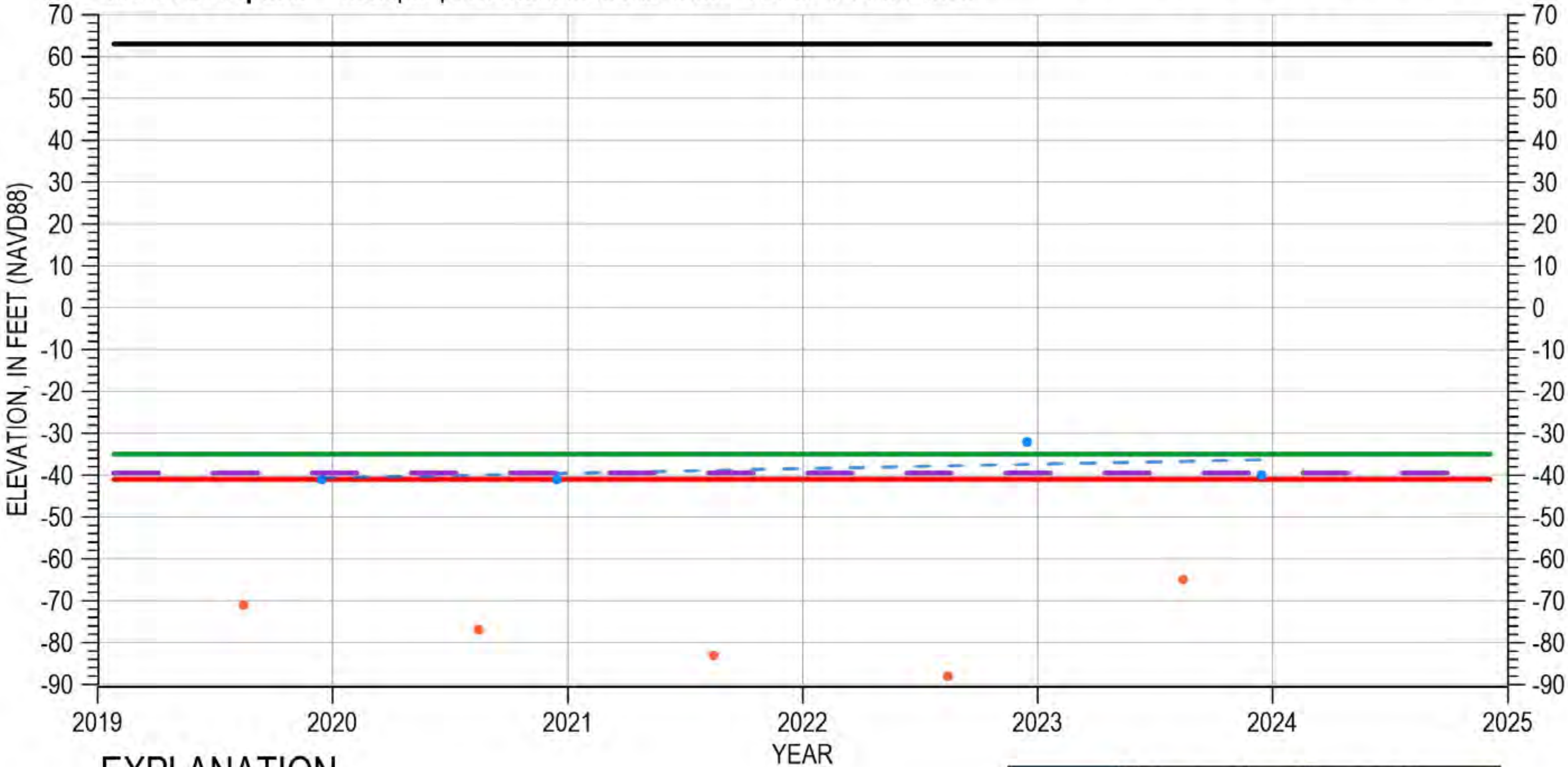
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-20C01

400-Foot Aquifer Multiple perforated intervals from -400 to -548 feet msl

5 YEAR TREND HYDROGRAPH



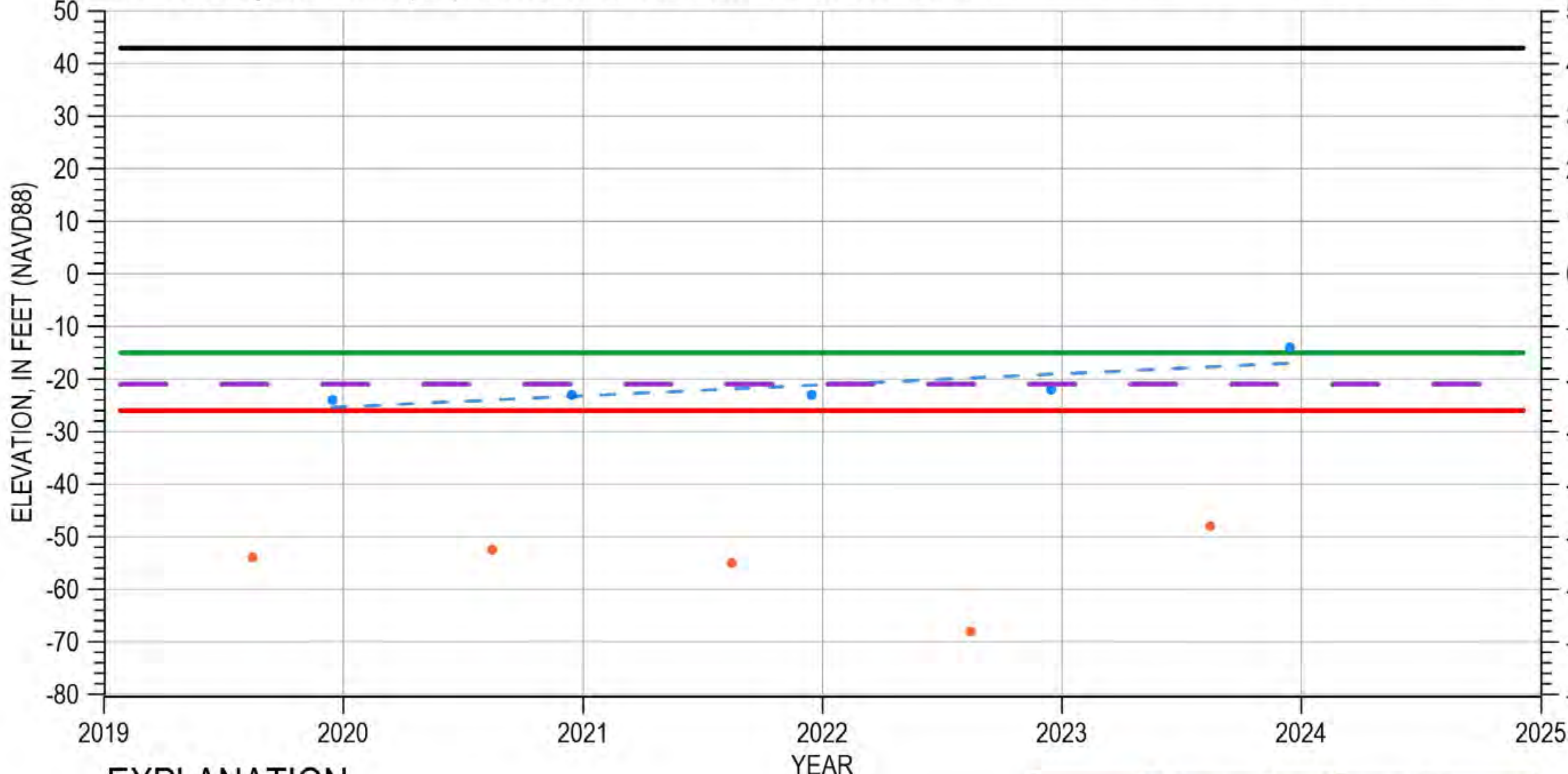
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-29F03

400-Foot Aquifer Multiple perforated intervals from -438 to -588 feet msl

5 YEAR TREND HYDROGRAPH



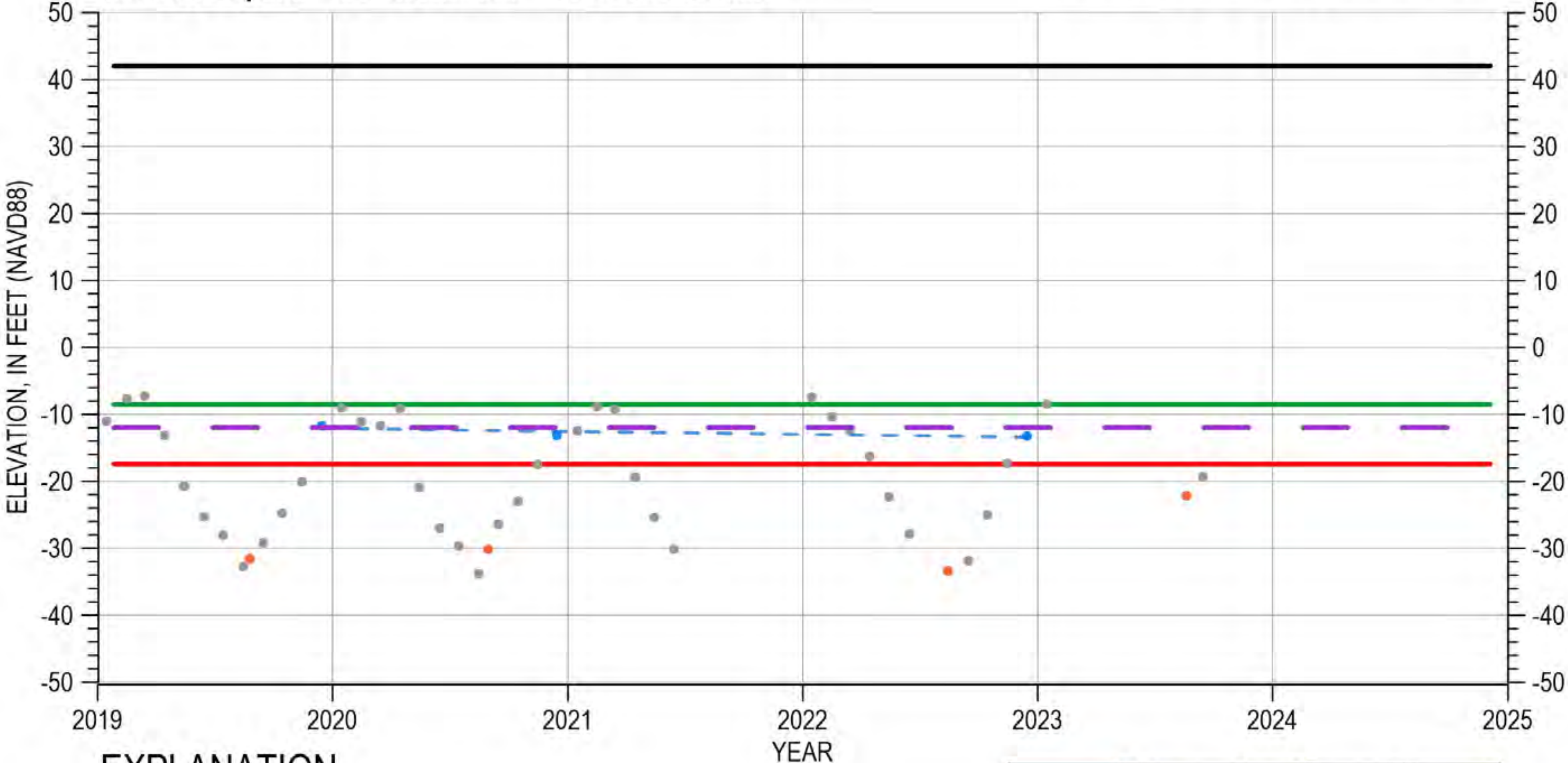
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-30G08

180-Foot Aquifer Perforated from -198 to -248 feet msl

5 YEAR TREND HYDROGRAPH



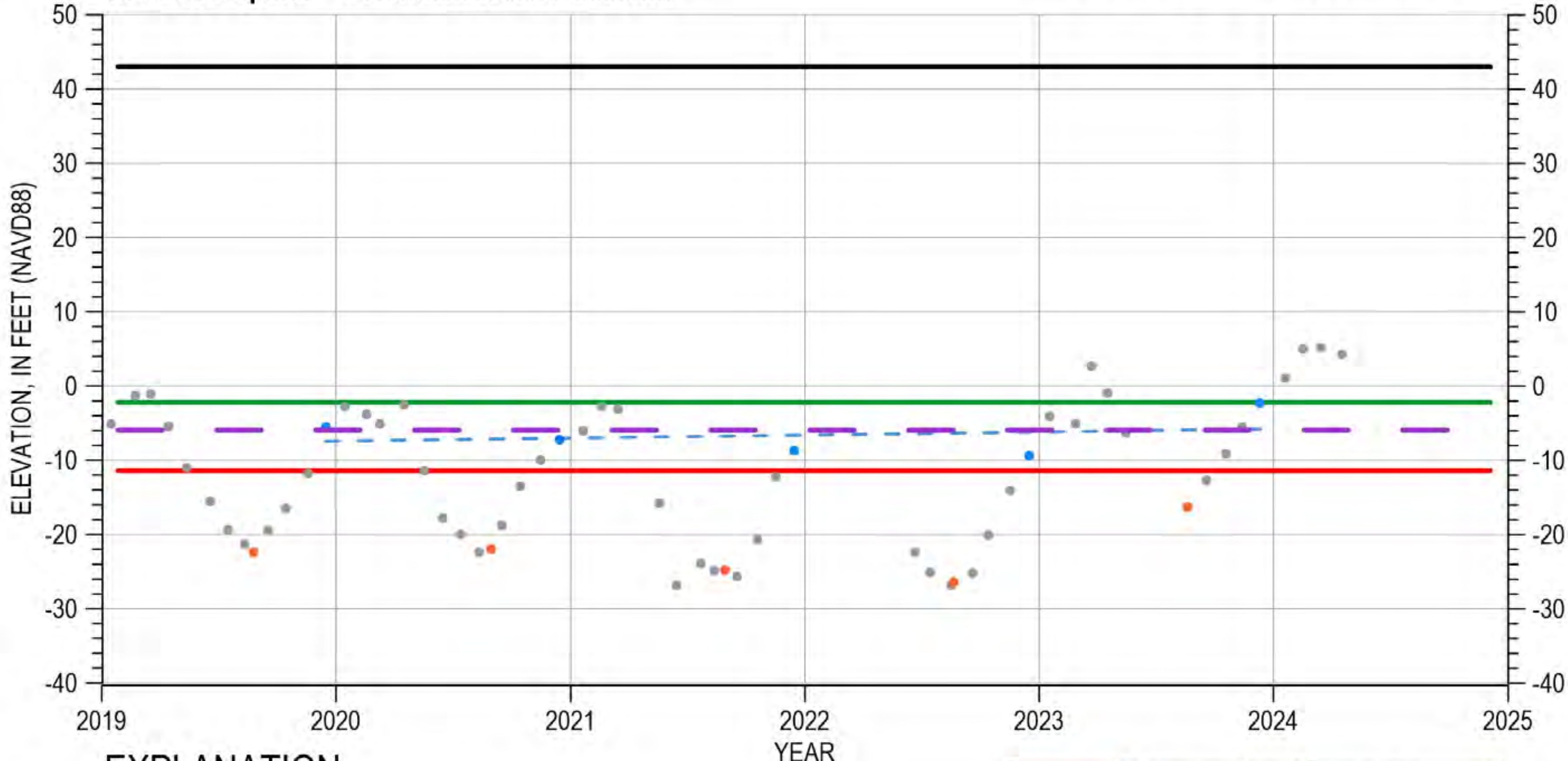
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-31F01

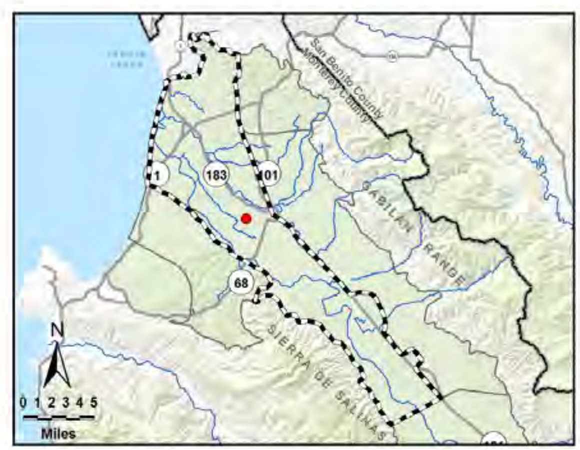
180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



EXPLANATION

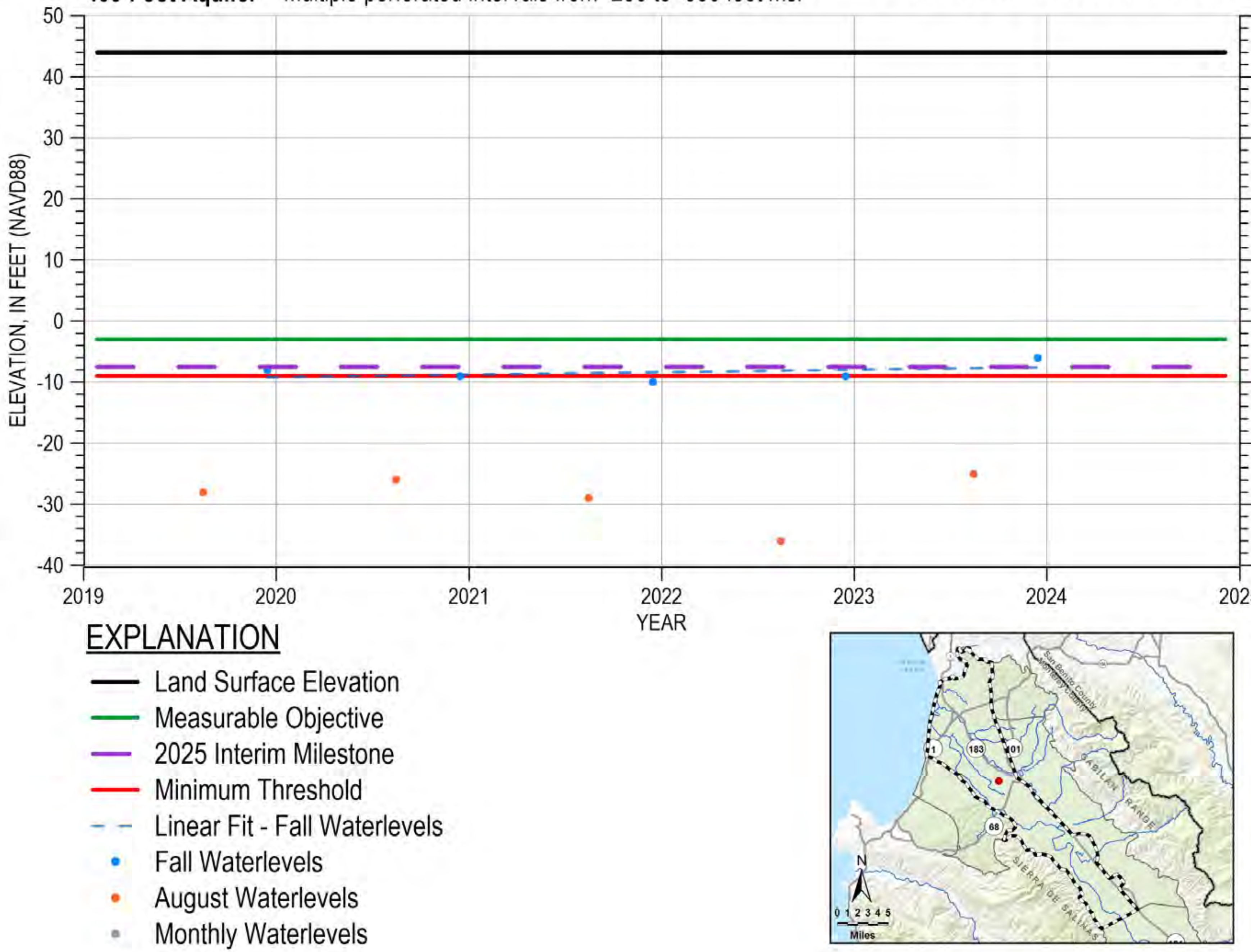
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/03E-31L01

400-Foot Aquifer Multiple perforated intervals from -286 to -586 feet msl

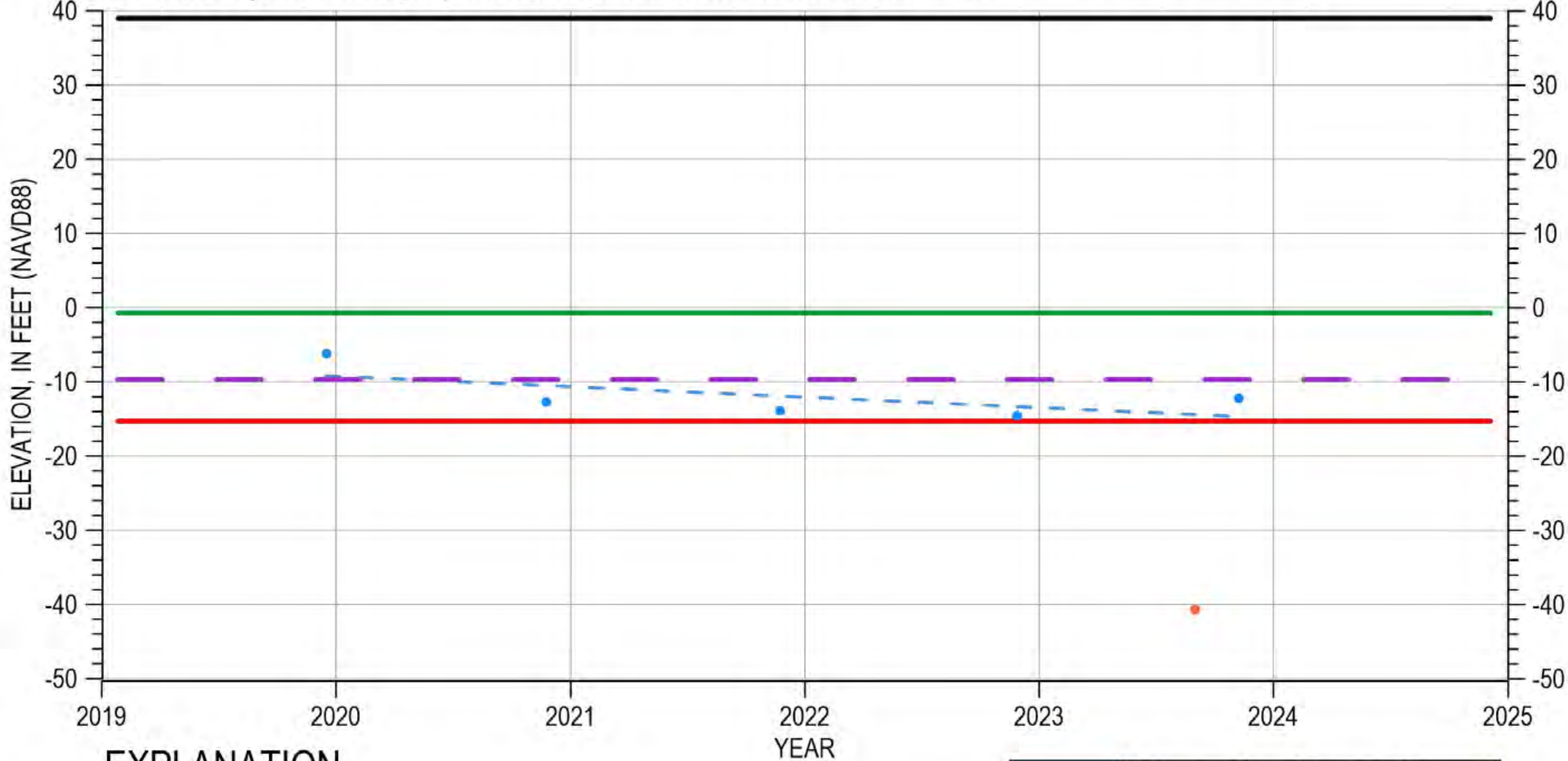
5 YEAR TREND HYDROGRAPH



15S/02E-01A03

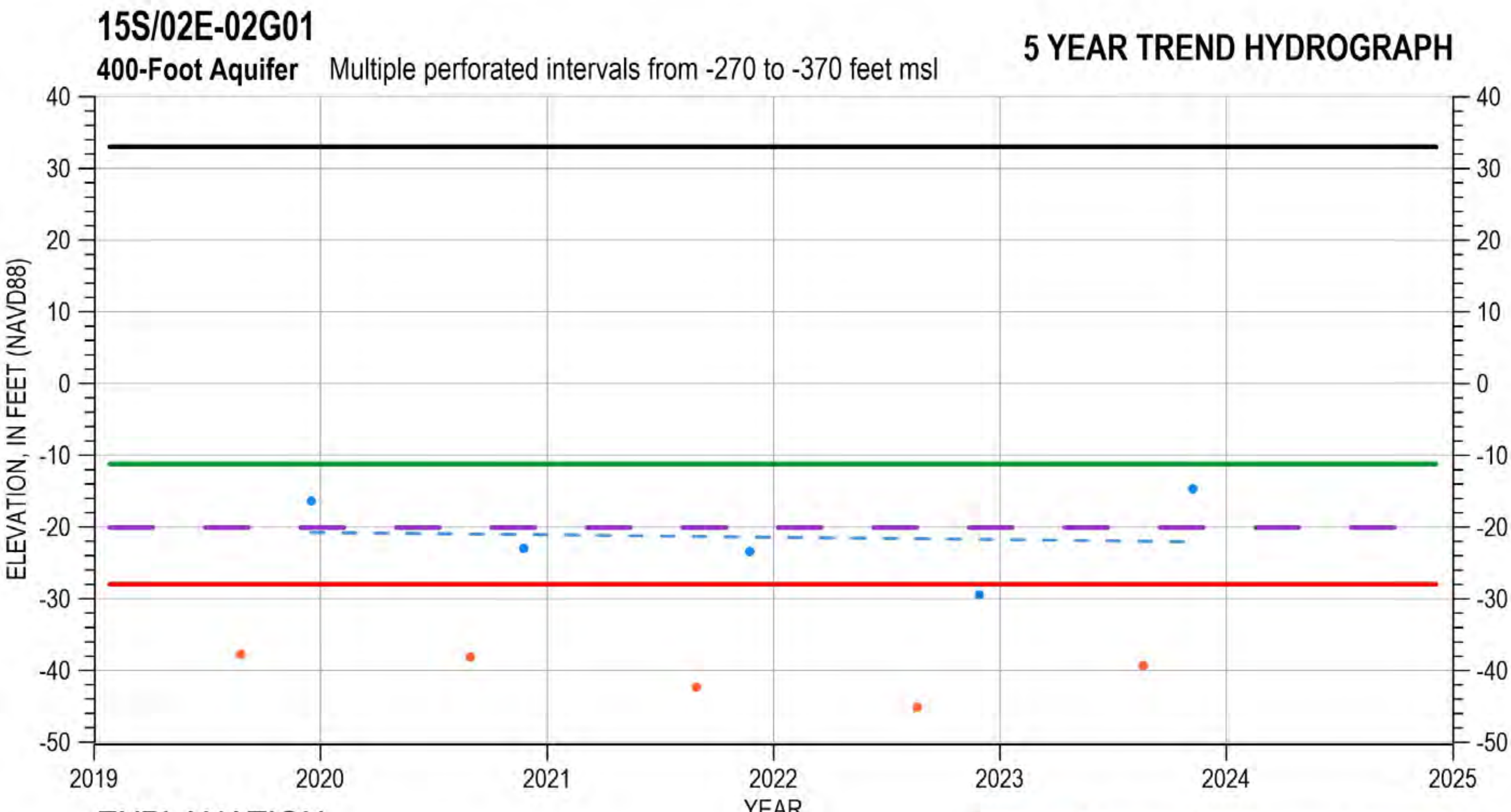
400-Foot Aquifer Multiple perforated intervals from -300 to -439 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



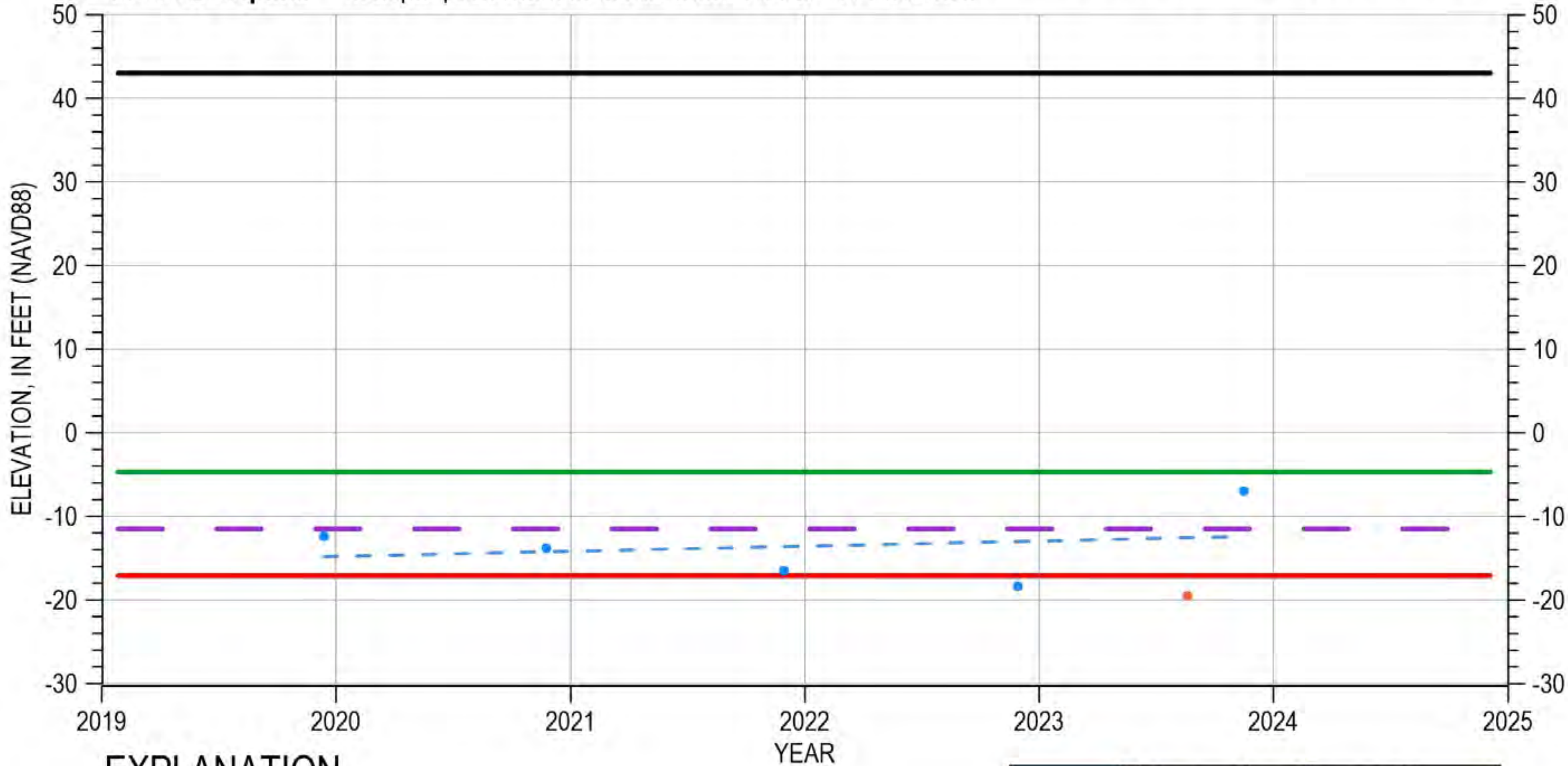
15S/02E-02G01
400-Foot Aquifer
Multiple perforated intervals from -270 to -370 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
40
30
20
10
0
-10
-20
-30
-40
-50
2019
2020
2021
2022
2023
2024
2025
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels

183
101
1
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

15S/02E-12A01

400-Foot Aquifer Multiple perforated intervals from -383 to -464 feet msl

5 YEAR TREND HYDROGRAPH



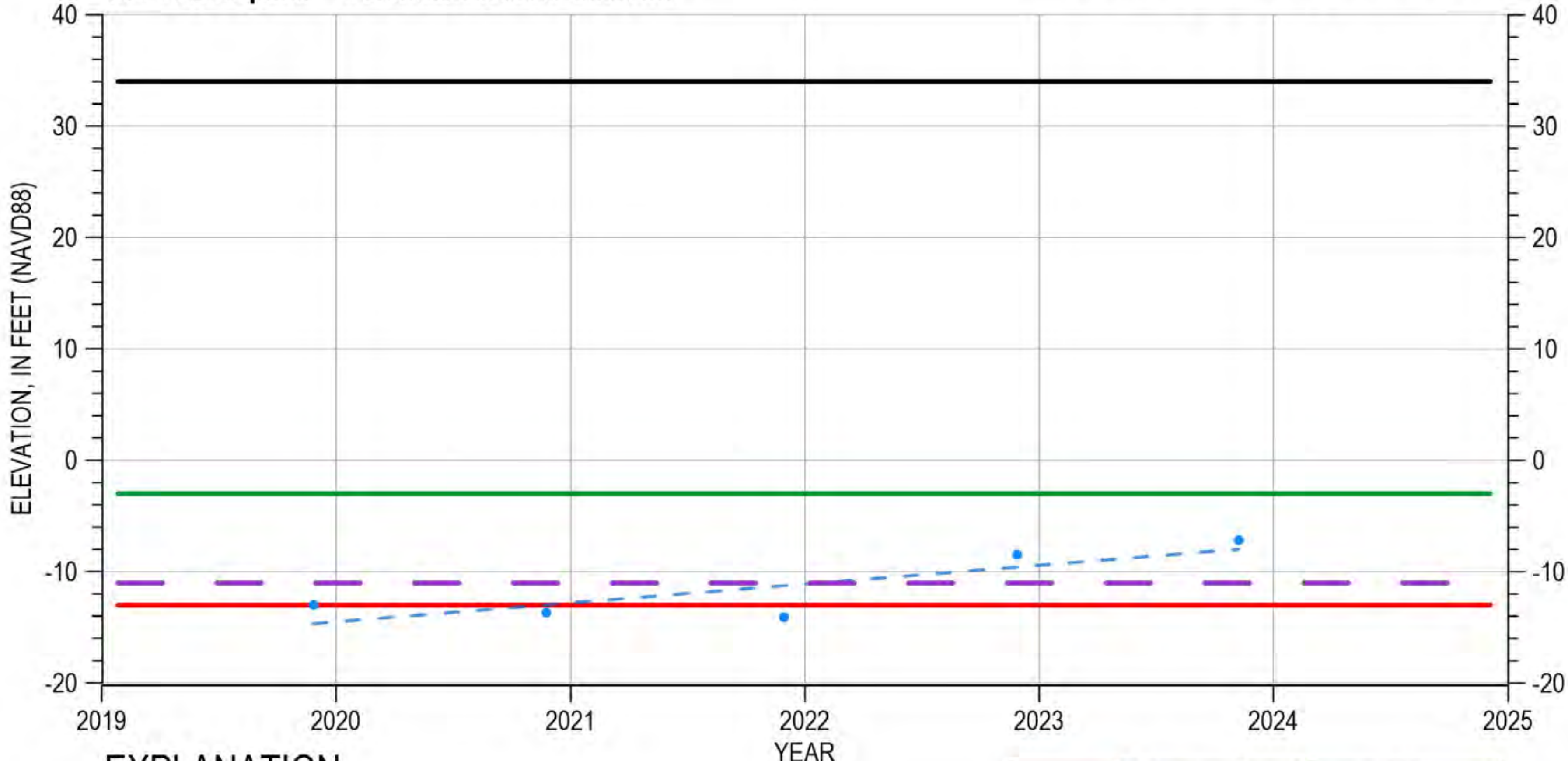
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

15S/02E-12C01

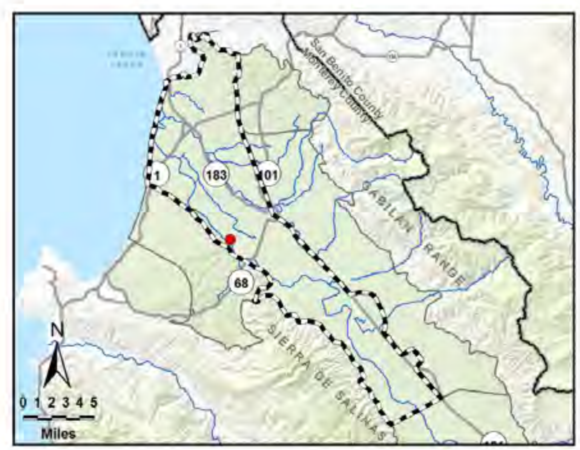
180-Foot Aquifer Perforated interval unknown

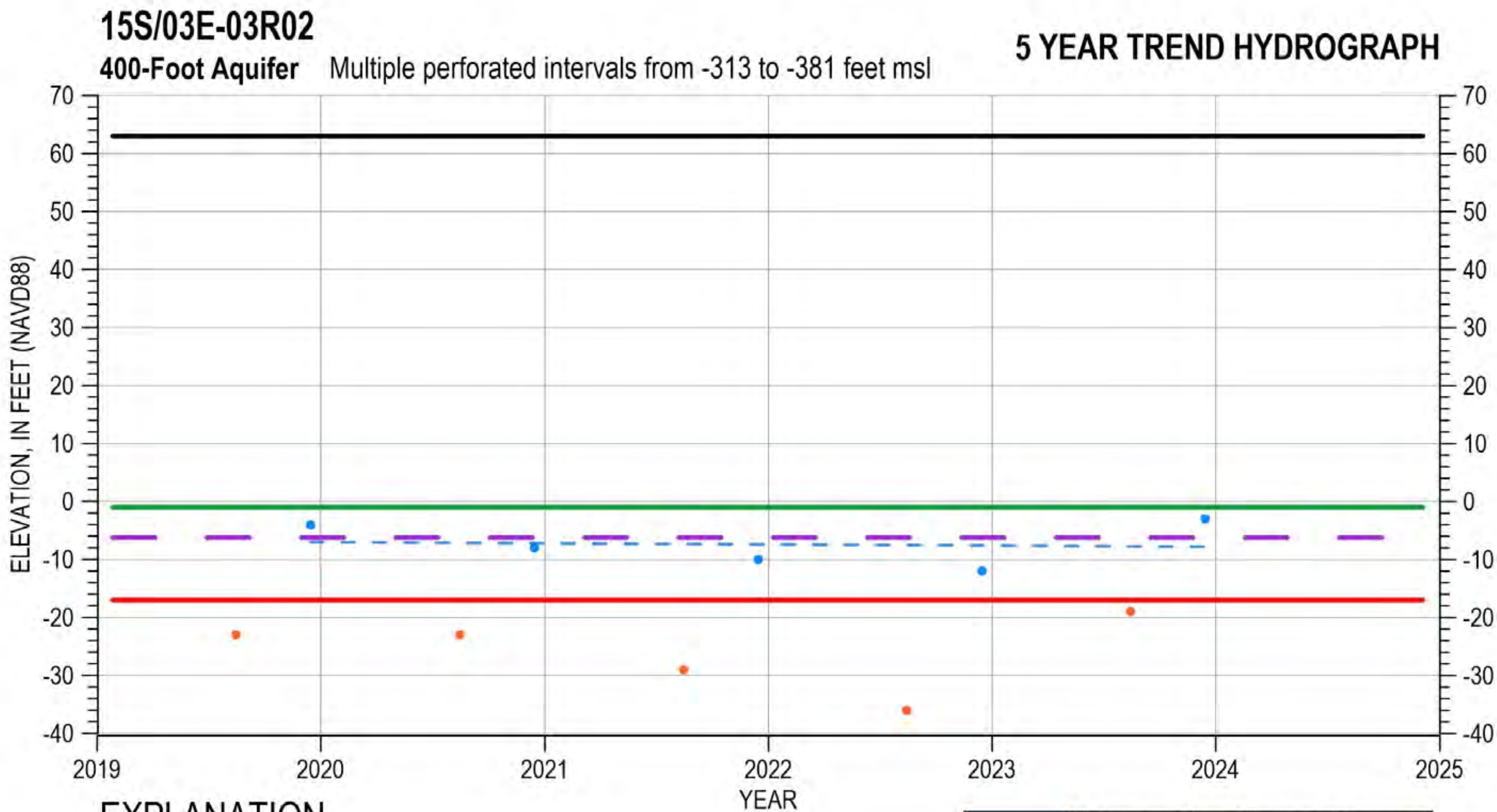
5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels



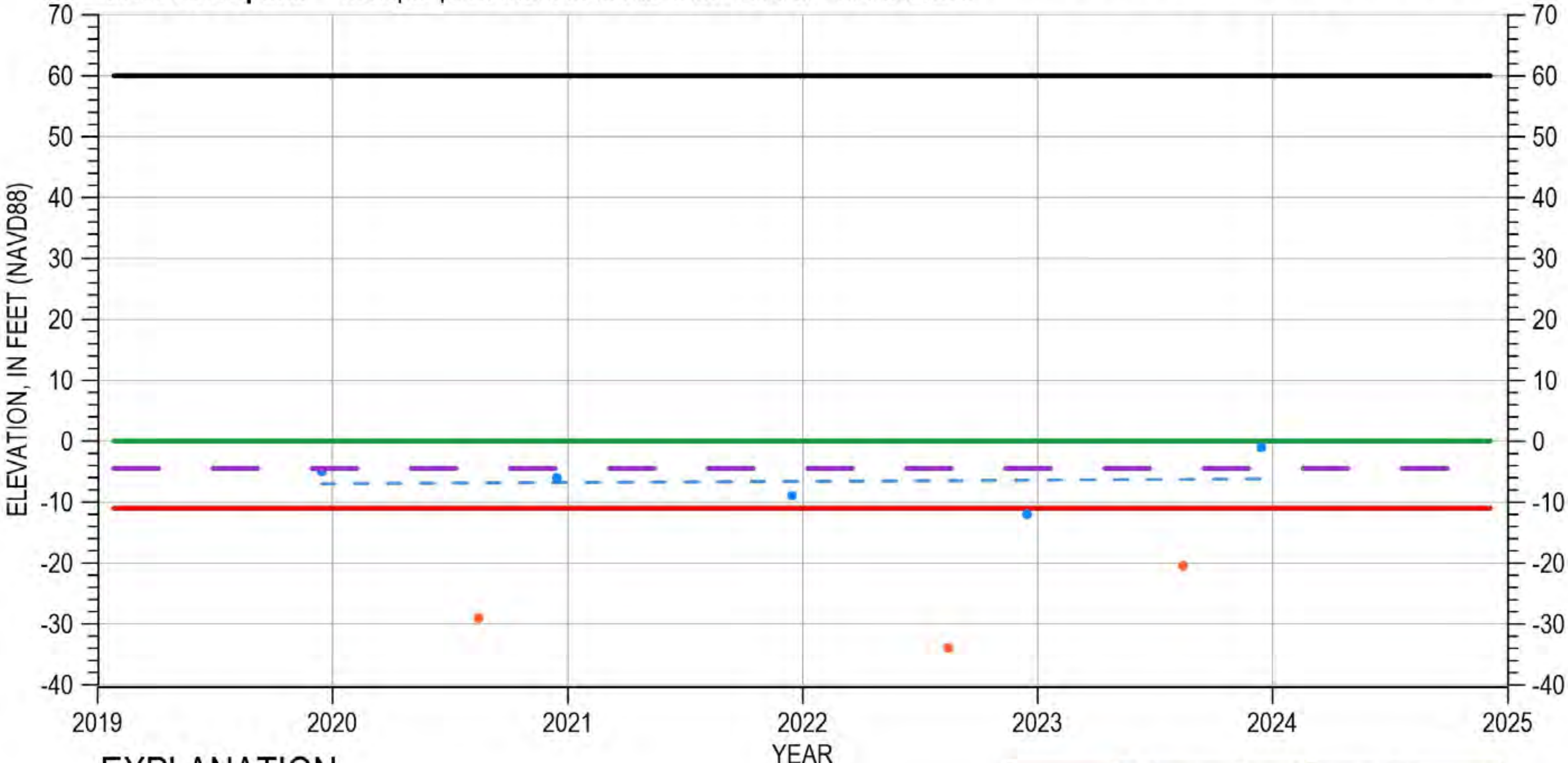

15S/03E-03R02
400-Foot Aquifer
Multiple perforated intervals from -313 to -381 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
70
60
50
40
30
20
10
0
-10
-20
-30
-40
2019
2020
2021
2022
2023
2024
2025
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels


San Benito County
Monterey County
1
183
101
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

15S/03E-04Q01

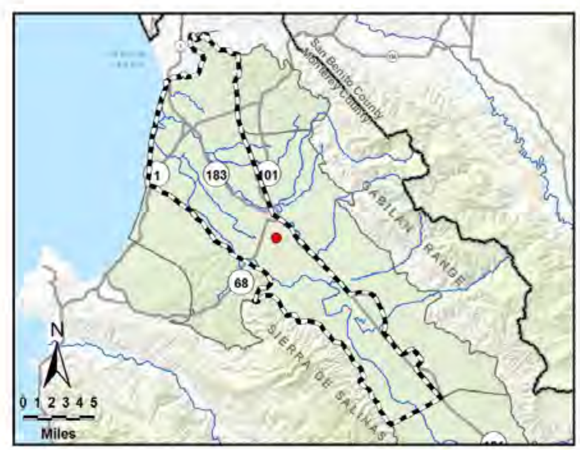
400-Foot Aquifer Multiple perforated intervals from -248 to -458 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

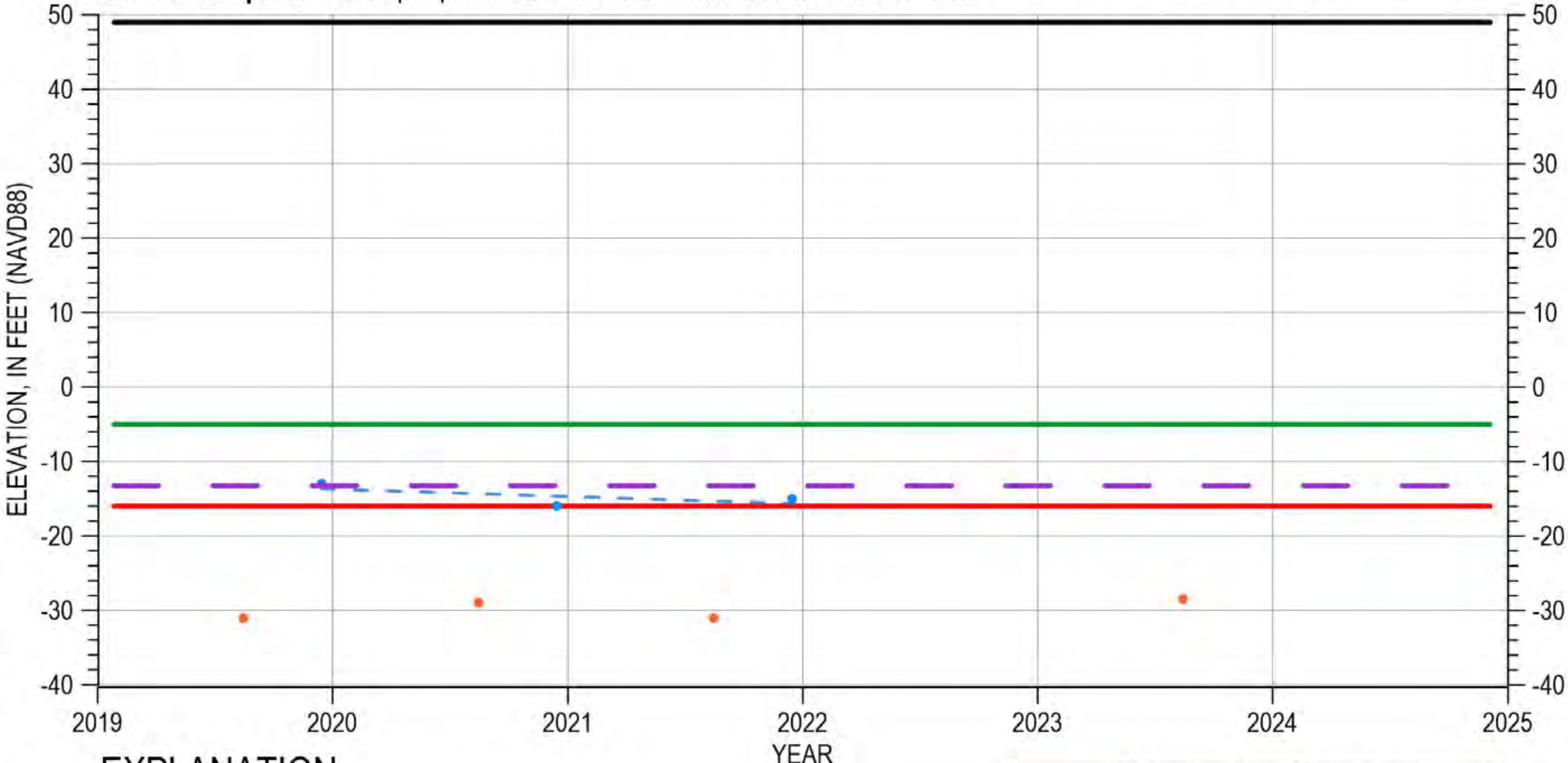
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



15S/03E-05C02

400-Foot Aquifer Multiple perforated intervals from -312 to -392 feet msl

5 YEAR TREND HYDROGRAPH



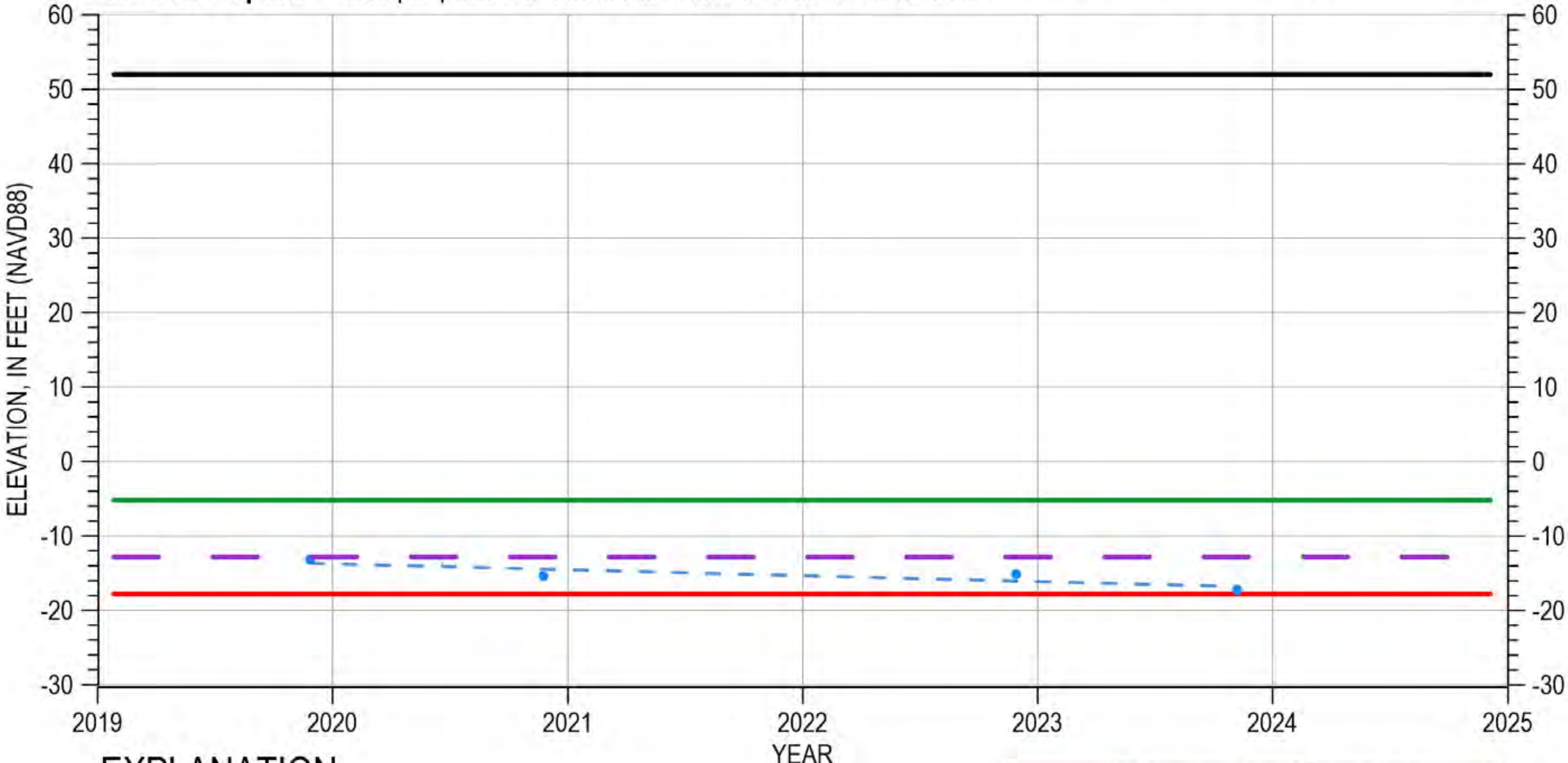
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-08F01

400-Foot Aquifer Multiple perforated intervals from -348 to -398 feet msl

5 YEAR TREND HYDROGRAPH



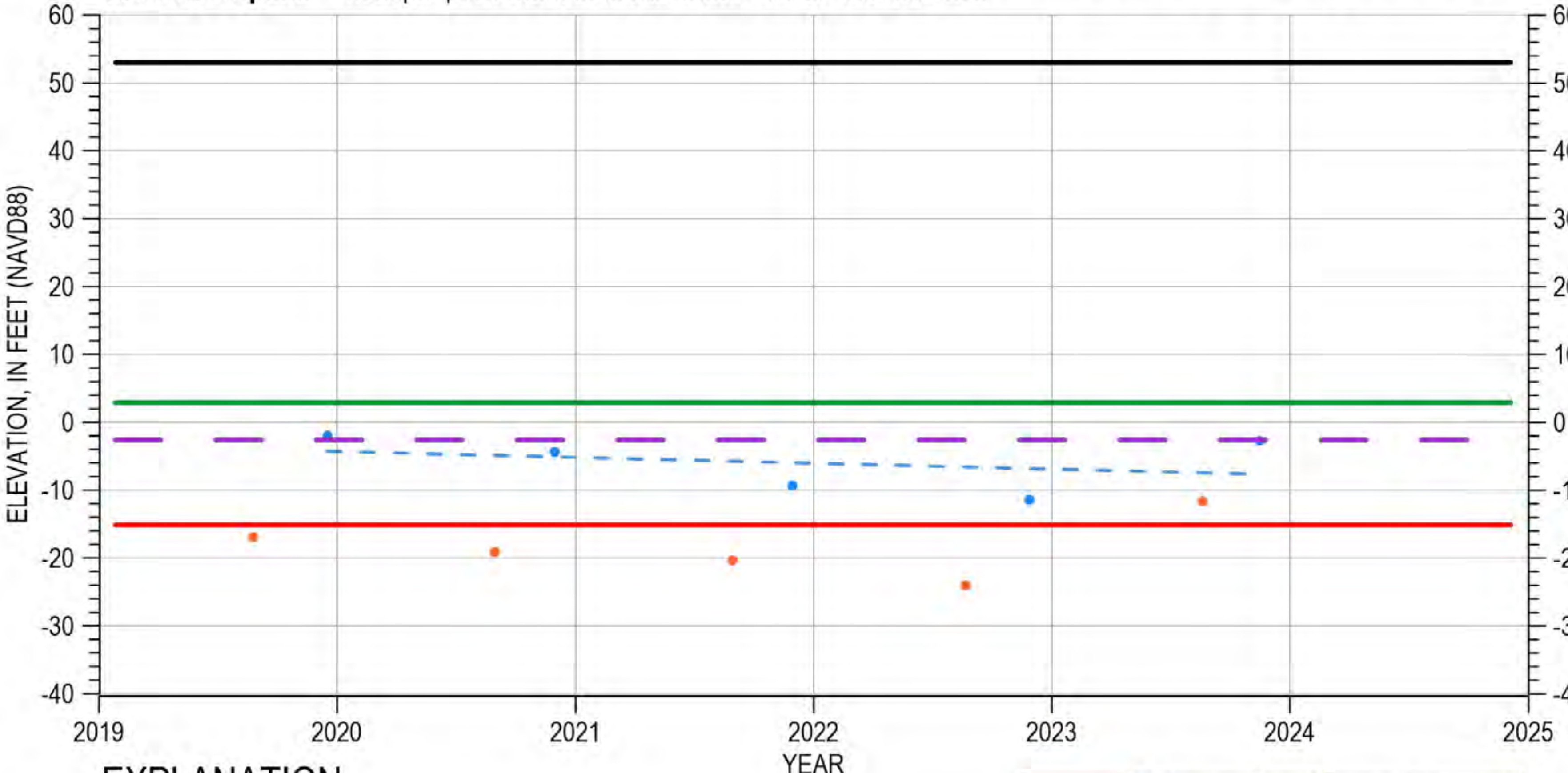
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

15S/03E-09E03

180-Foot Aquifer Multiple perforated intervals from -131 to -192 feet msl

5 YEAR TREND HYDROGRAPH



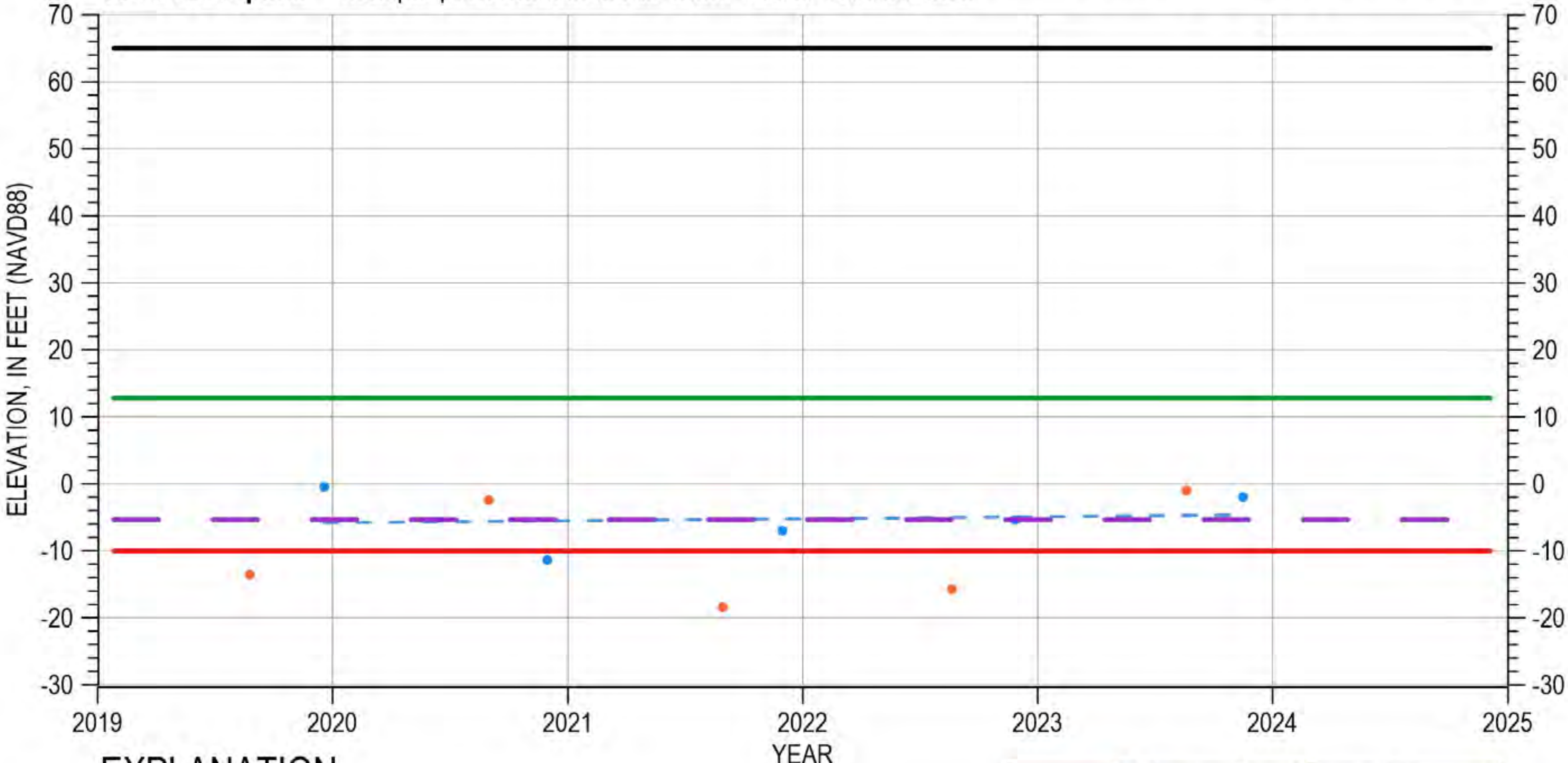
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-13N01

180-Foot Aquifer Multiple perforated intervals from -149 to -205 feet msl

5 YEAR TREND HYDROGRAPH



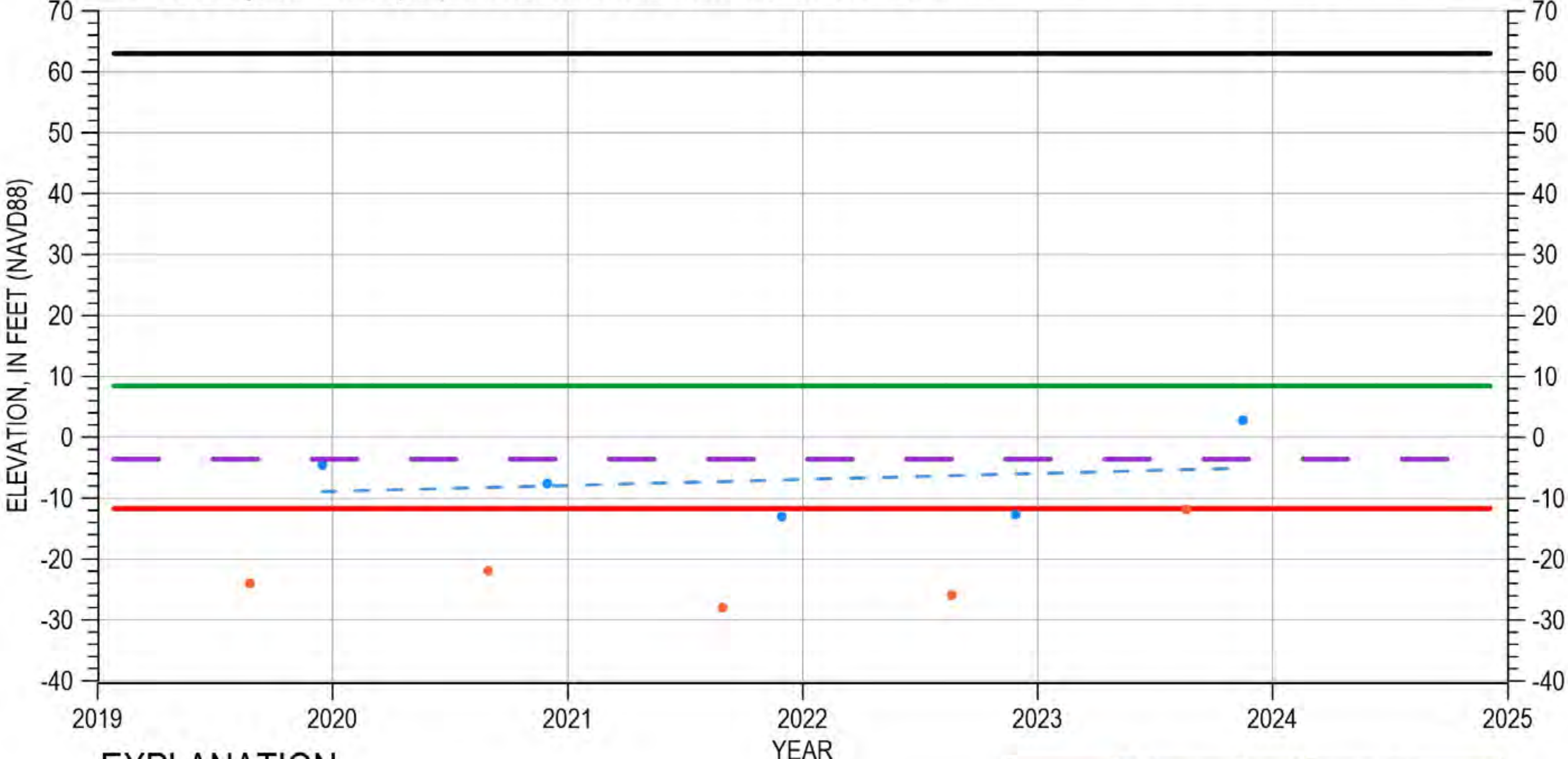
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-14P02

400-Foot Aquifer Multiple perforated intervals from -352 to -500 feet msl

5 YEAR TREND HYDROGRAPH



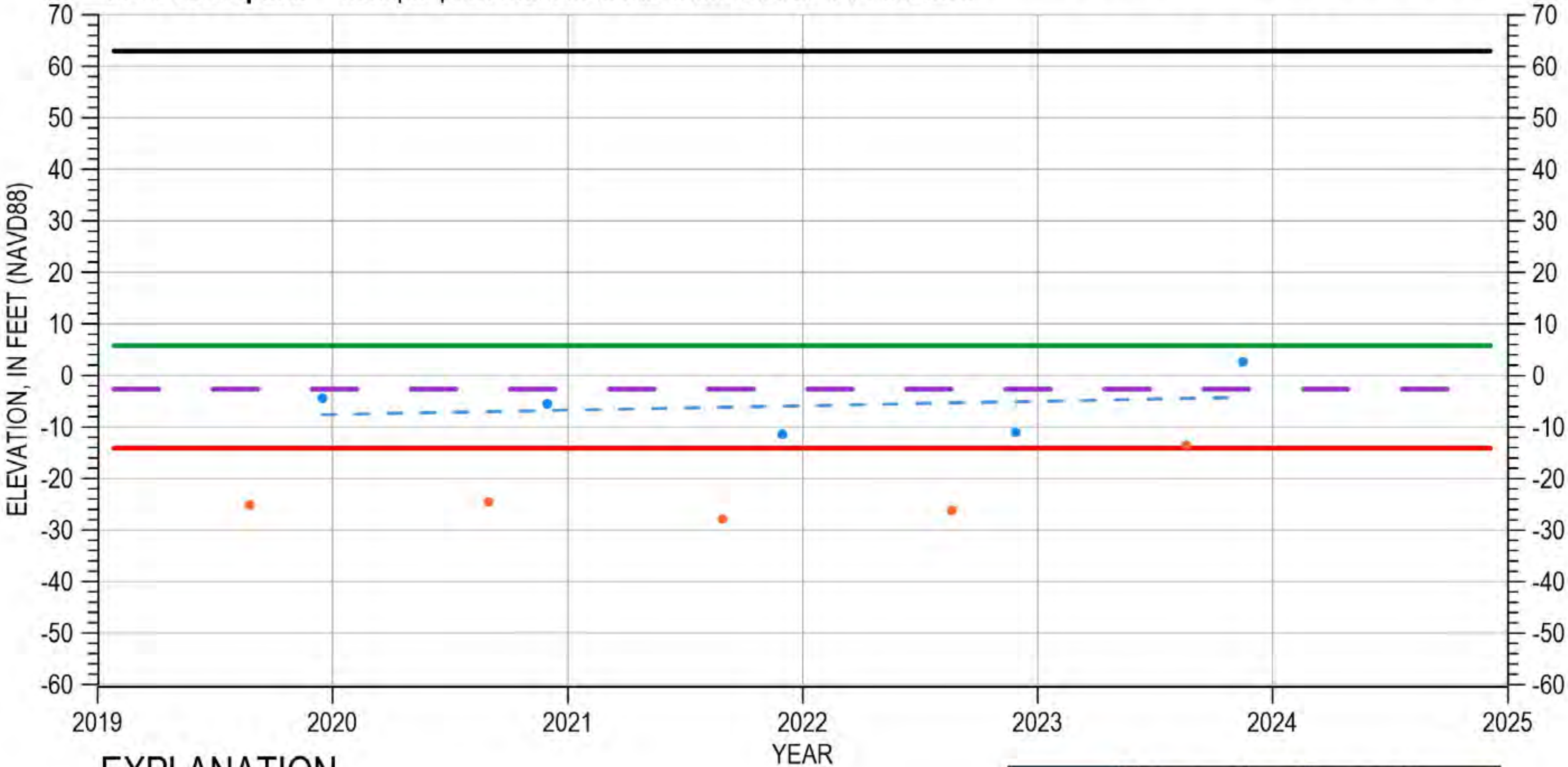
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-15B01

400-Foot Aquifer Multiple perforated intervals from -255 to -384 feet msl

5 YEAR TREND HYDROGRAPH



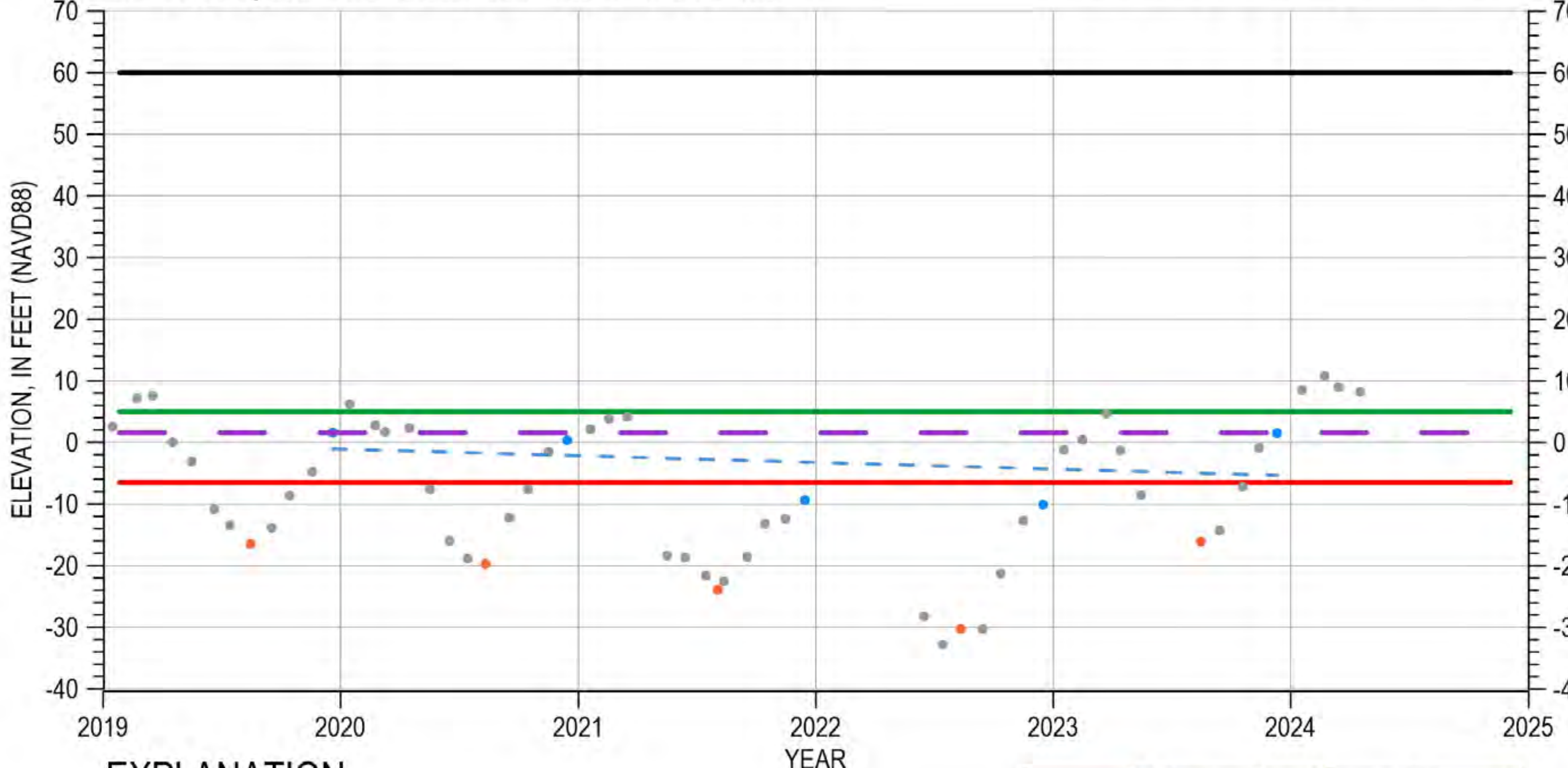
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-16F02

400-Foot Aquifer Perforated from -368 to -511 feet msl

5 YEAR TREND HYDROGRAPH



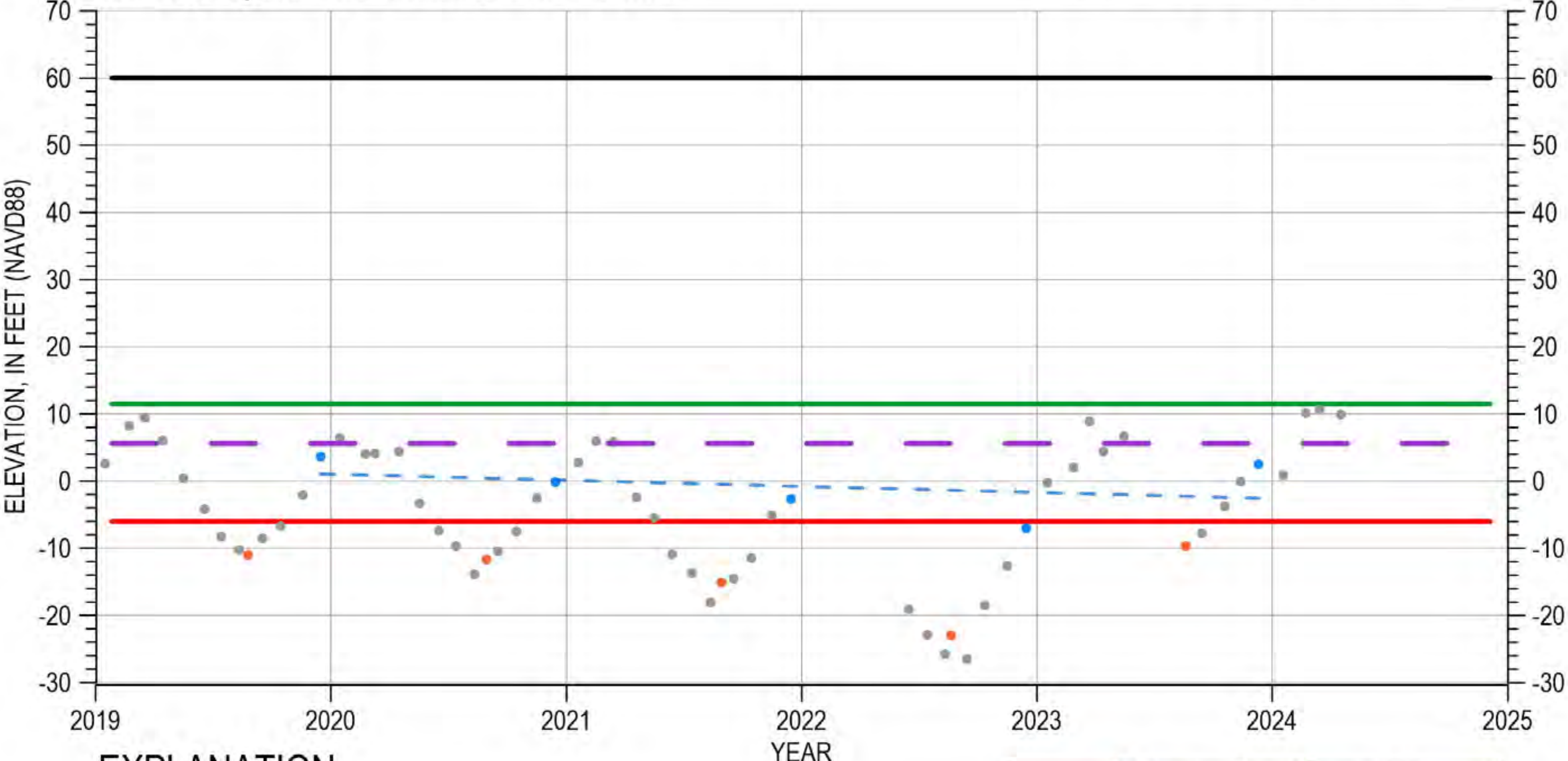
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-16M01

180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



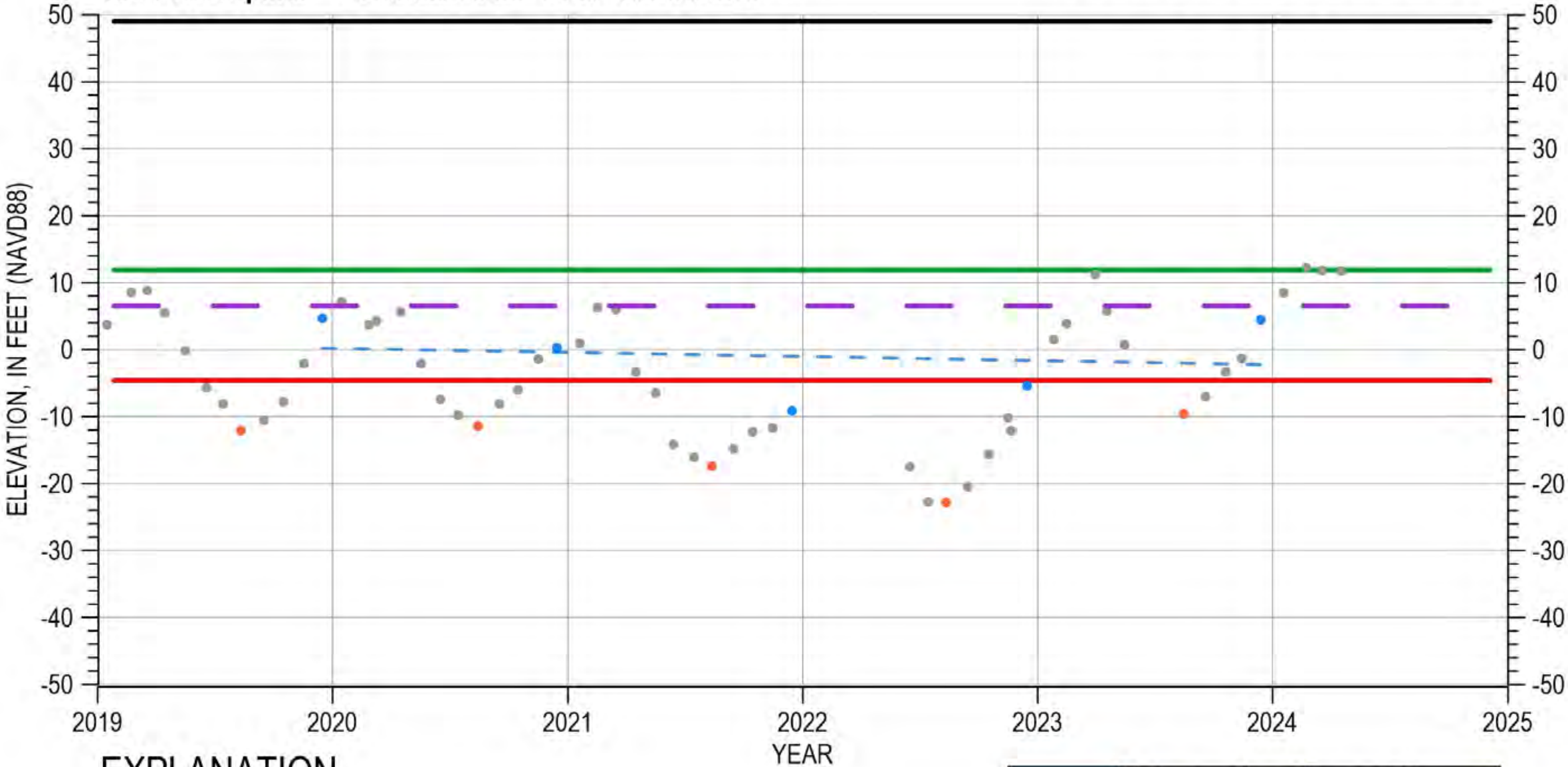
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-17M01

180-Foot Aquifer Perforated from -79 to -131 feet msl

5 YEAR TREND HYDROGRAPH



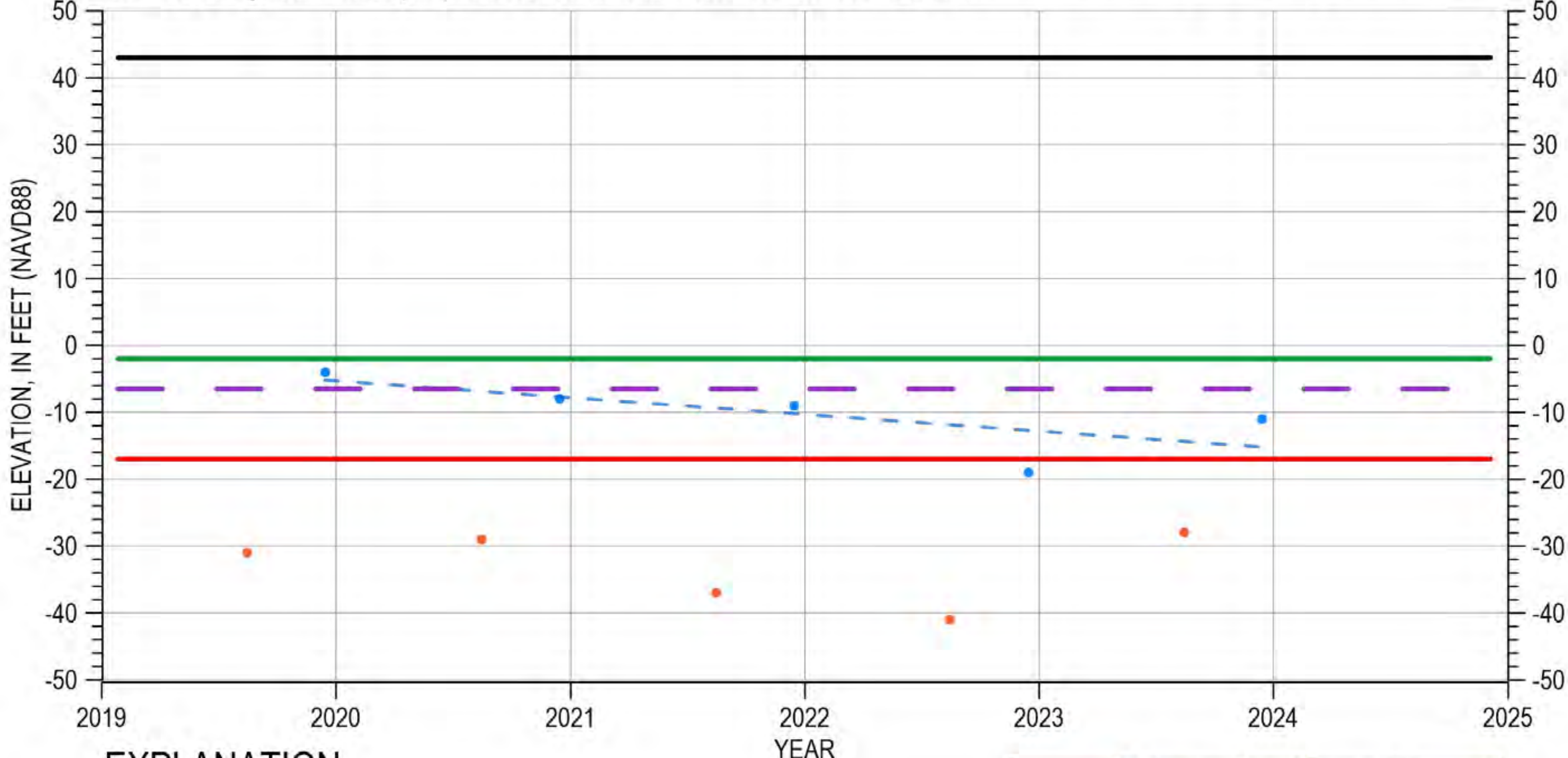
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-17P02

5 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -308 to -688 feet msl



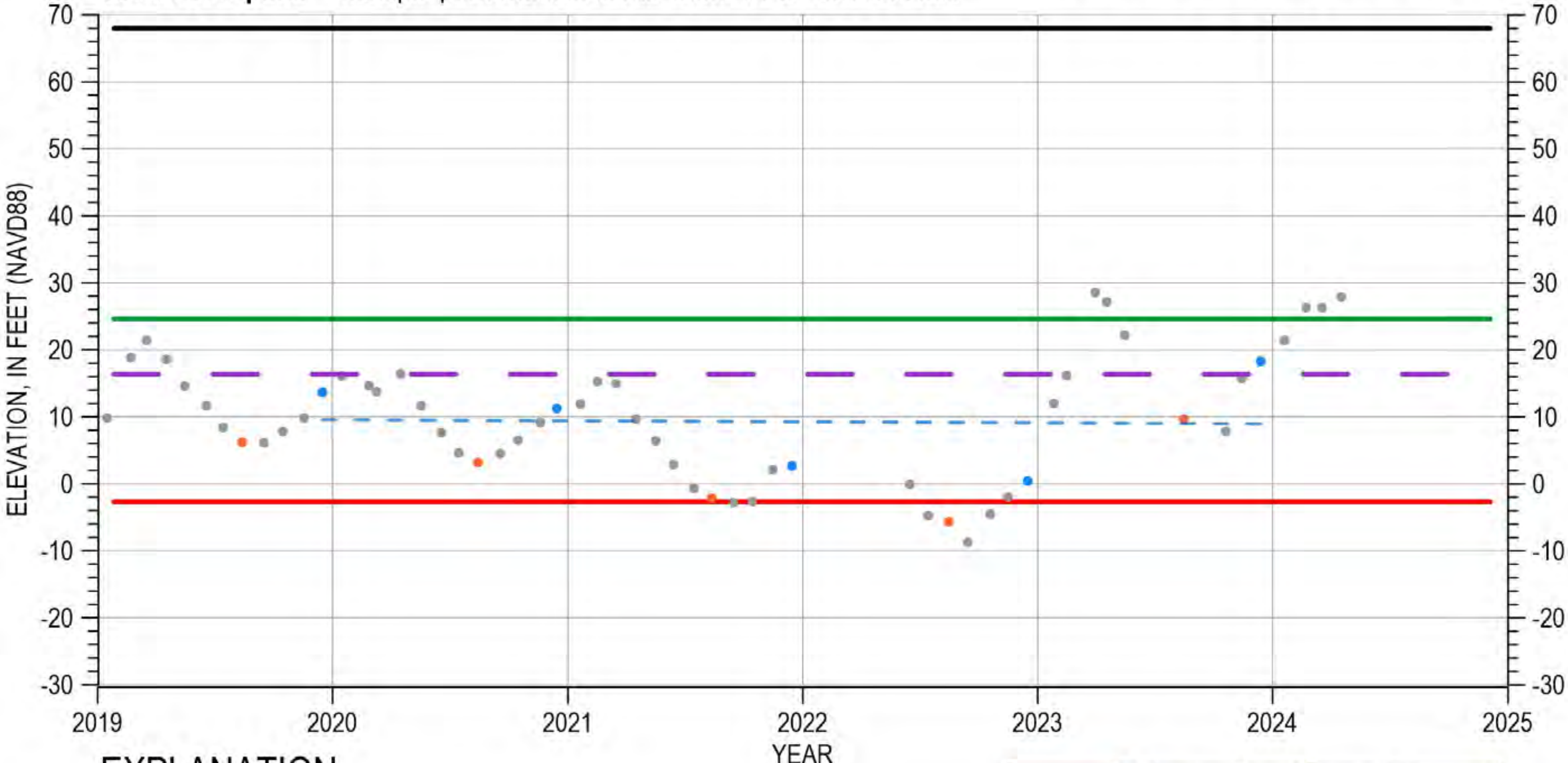
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-25L01

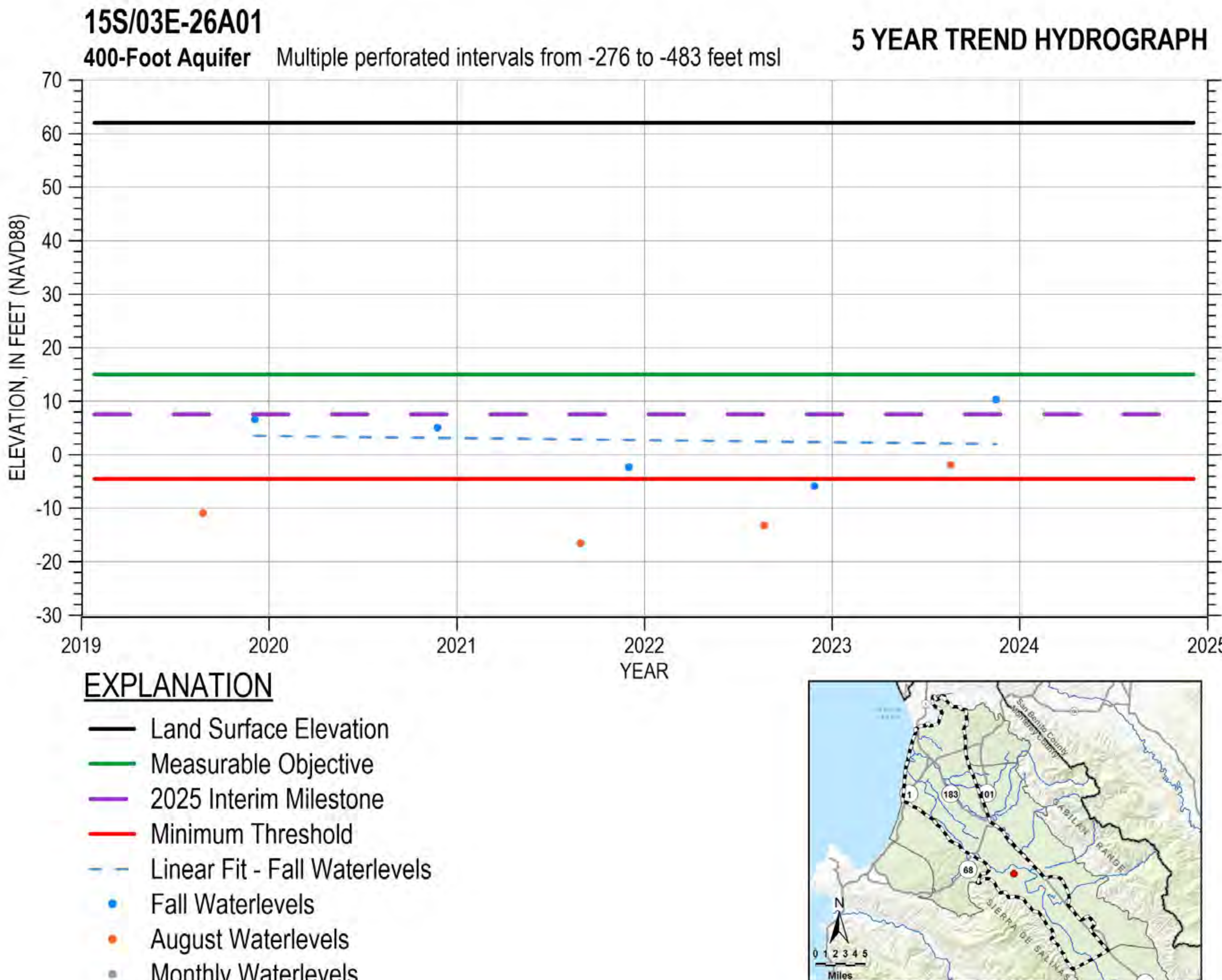
5 YEAR TREND HYDROGRAPH

180-Foot Aquifer Multiple perforated intervals from -61 to -291 feet msl



EXPLANATION

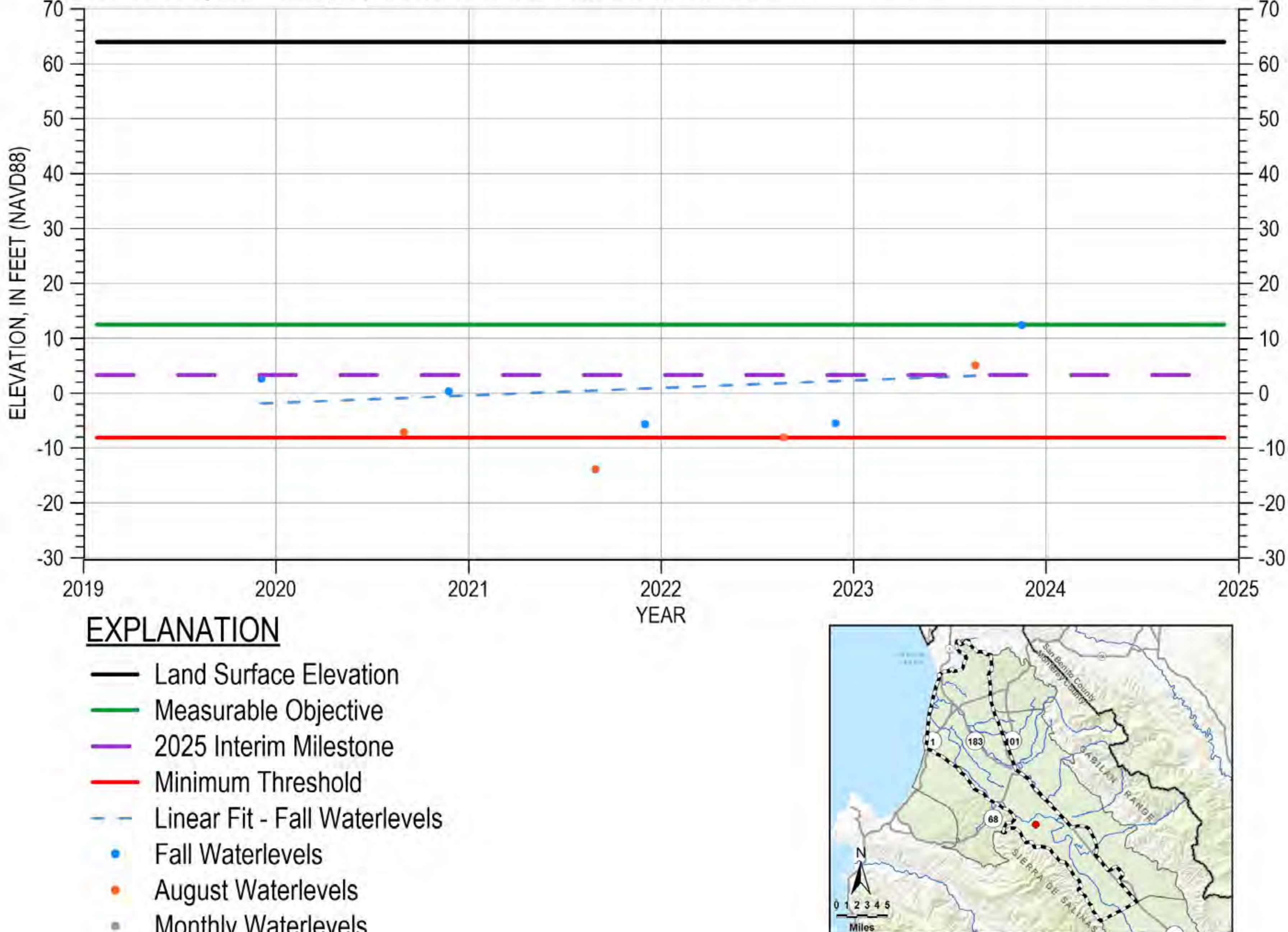
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


15S/03E-26A01
400-Foot Aquifer
Multiple perforated intervals from -276 to -483 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
70
60
50
40
30
20
10
0
-10
-20
-30
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
San Benito County
Monterey County
1
183
101
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

15S/03E-26F01

180-Foot Aquifer Multiple perforated intervals from -178 to -232 feet msl

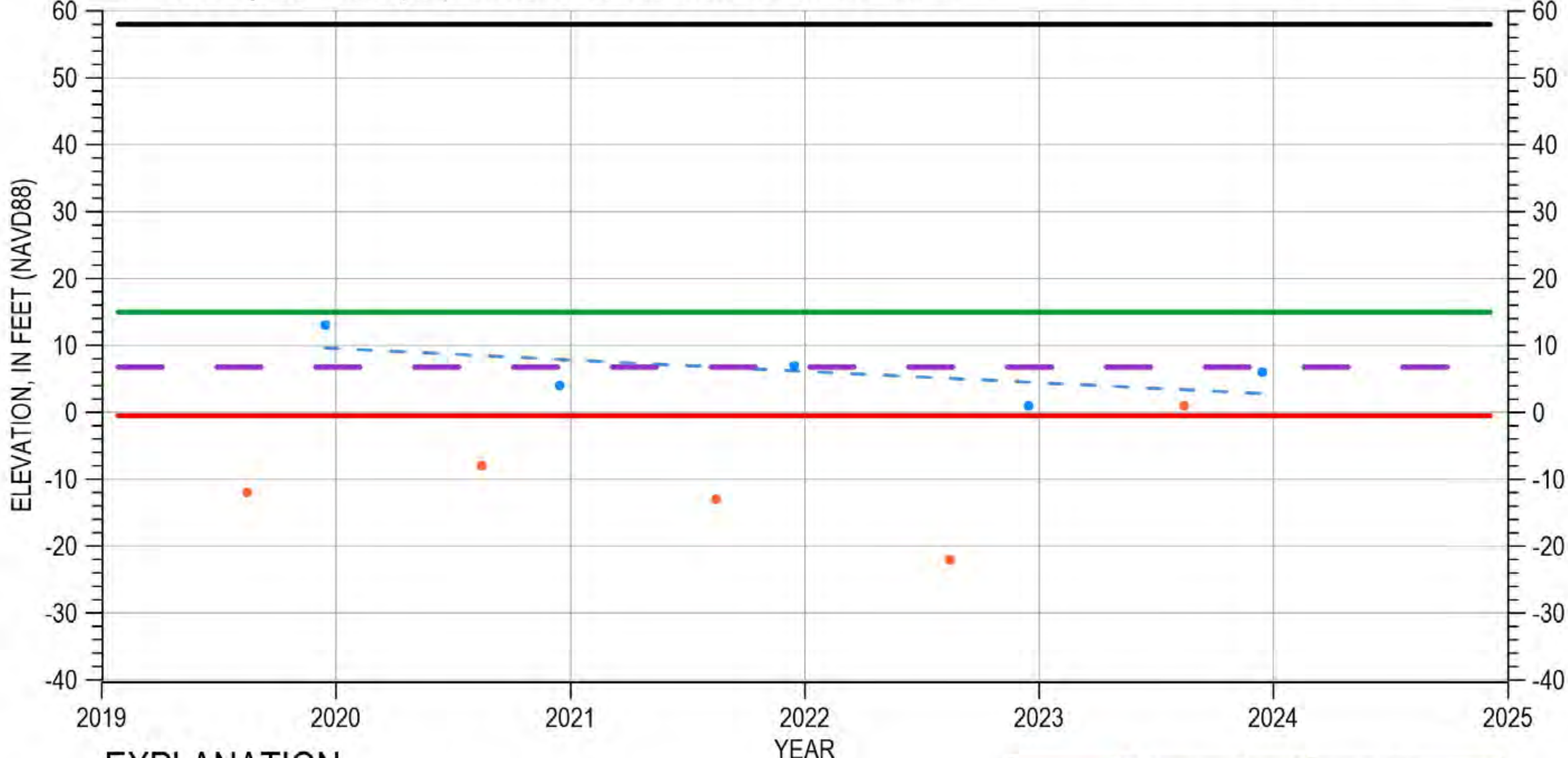
5 YEAR TREND HYDROGRAPH



15S/03E-28B02

400-Foot Aquifer Multiple perforated intervals from -343 to -395 feet msl

5 YEAR TREND HYDROGRAPH



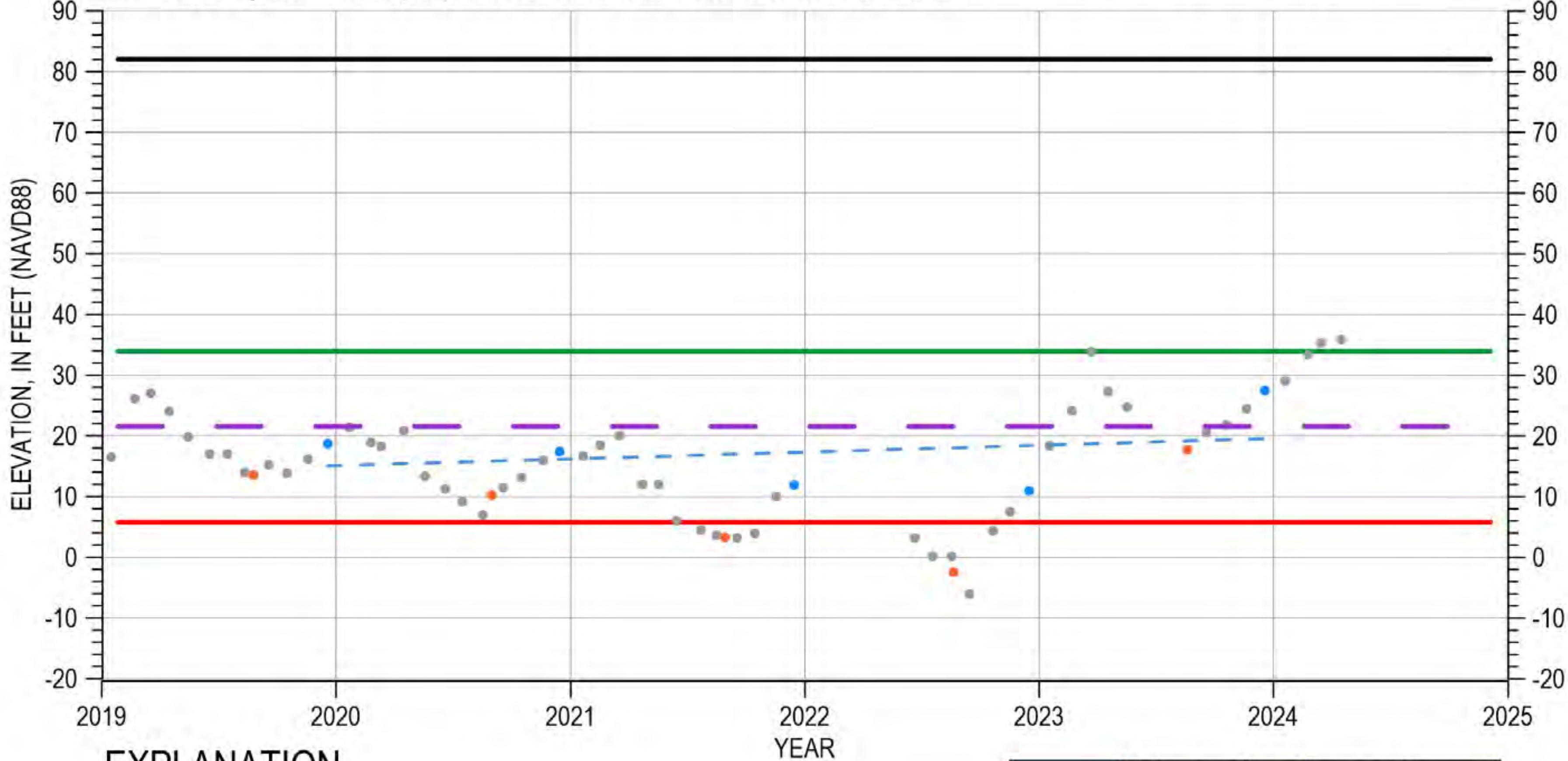
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/04E-29Q02

5 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -147 to -257 feet msl



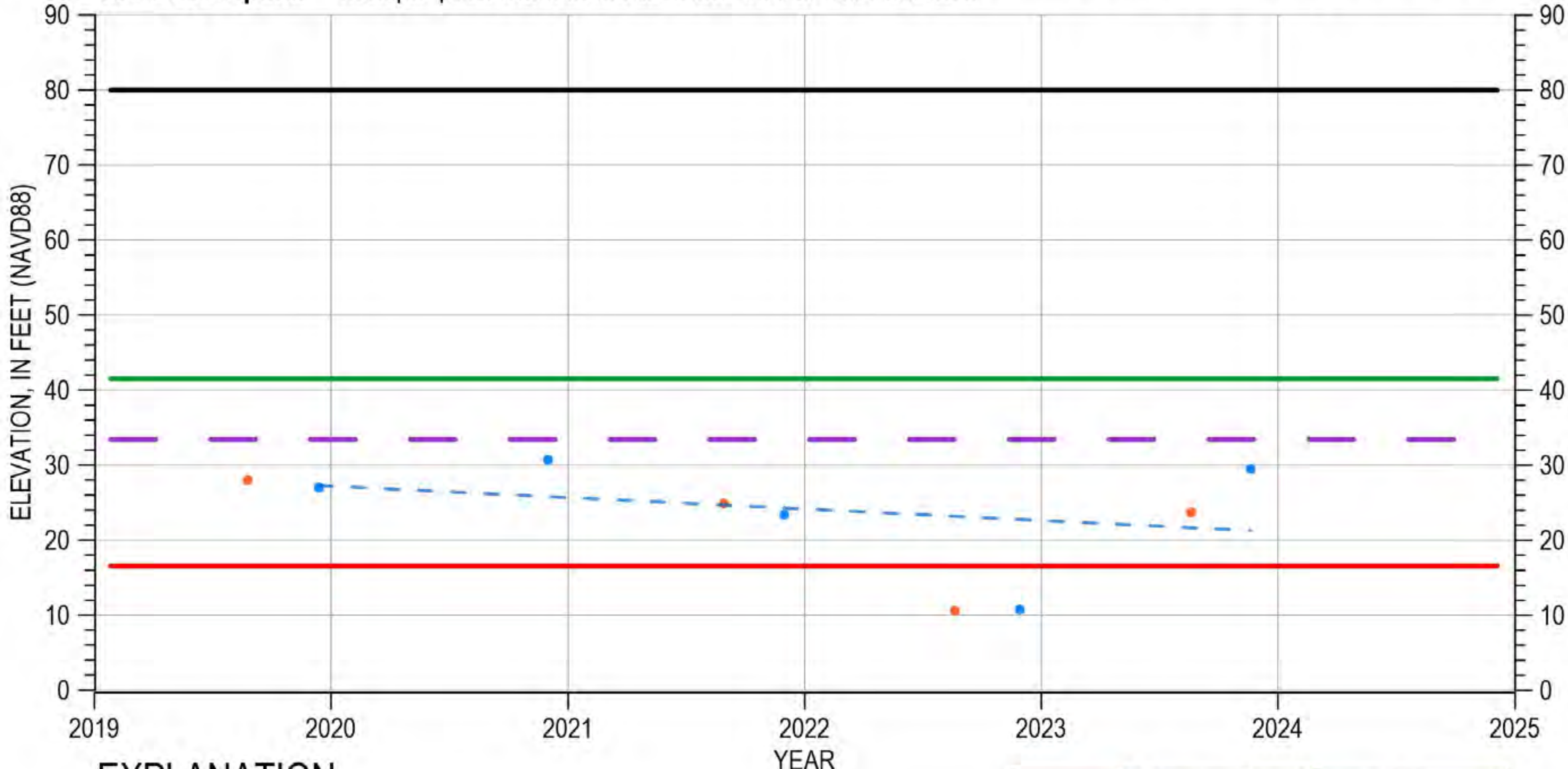
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/04E-31A02

180-Foot Aquifer Multiple perforated intervals from -141 to -250 feet msl

5 YEAR TREND HYDROGRAPH



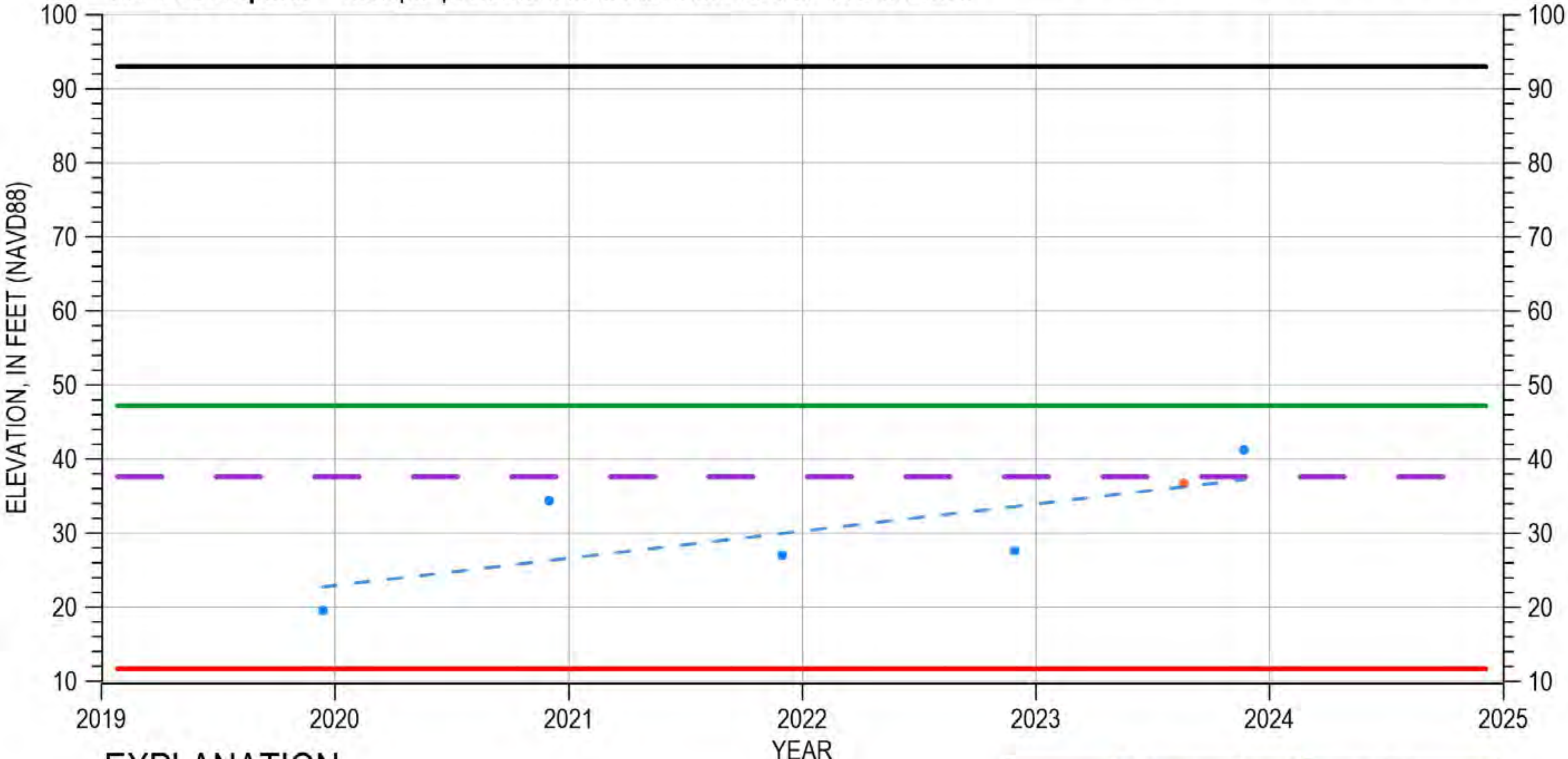
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/04E-04C01

400-Foot Aquifer Multiple perforated intervals from -228 to -372 feet msl

5 YEAR TREND HYDROGRAPH



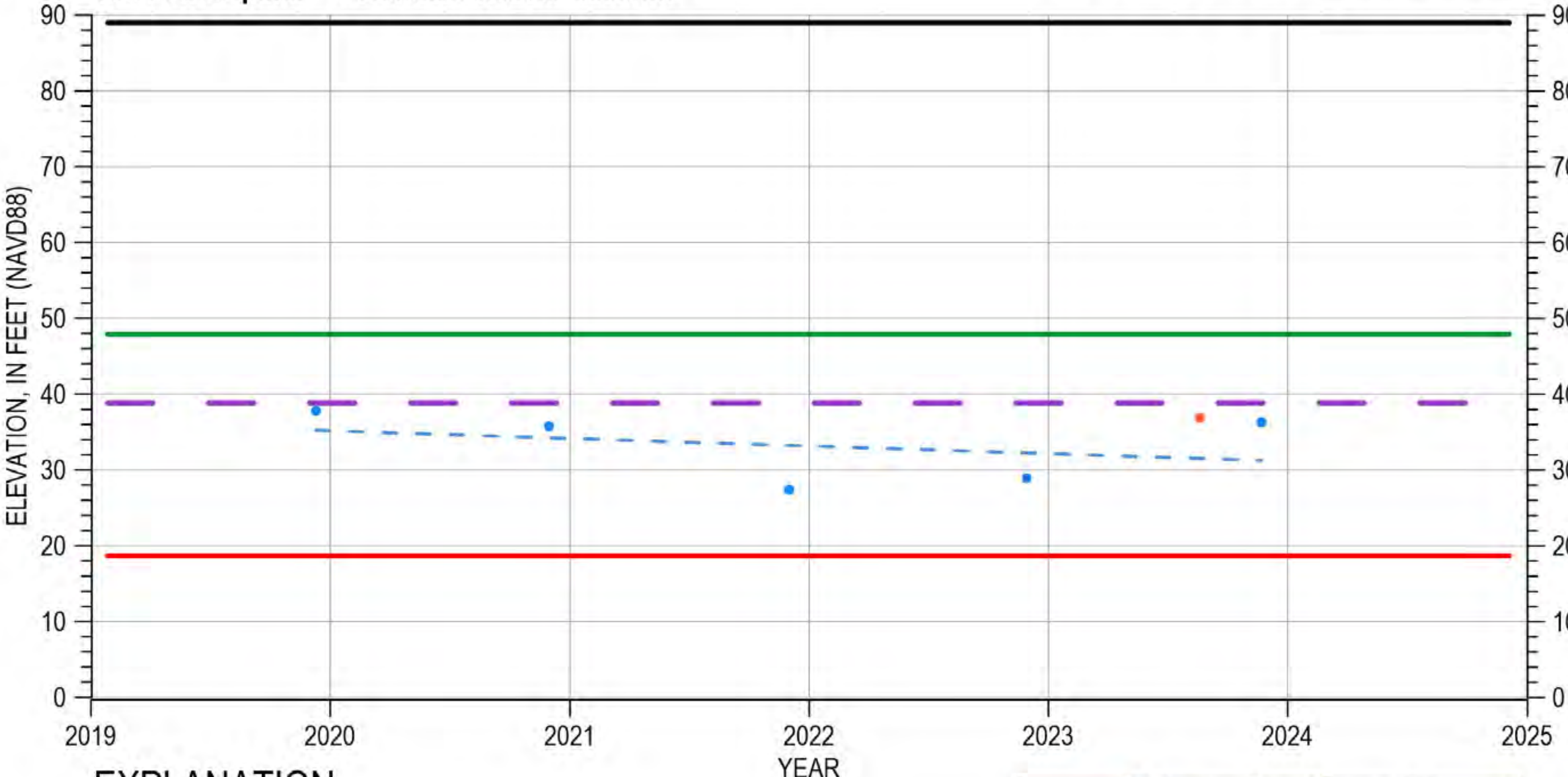
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/04E-05M02

180-Foot Aquifer Perforated interval unknown

5 YEAR TREND HYDROGRAPH



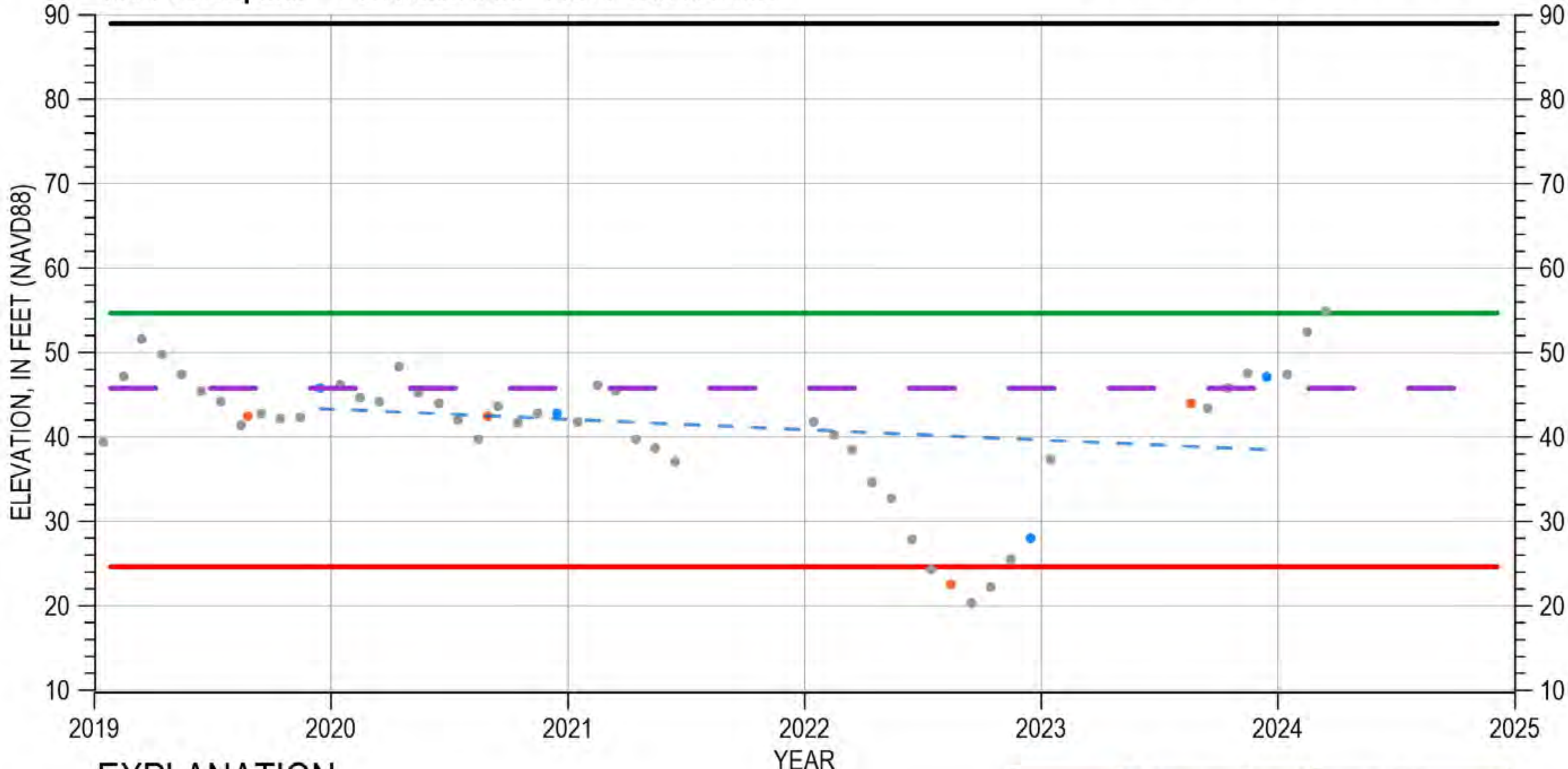
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/04E-08H03

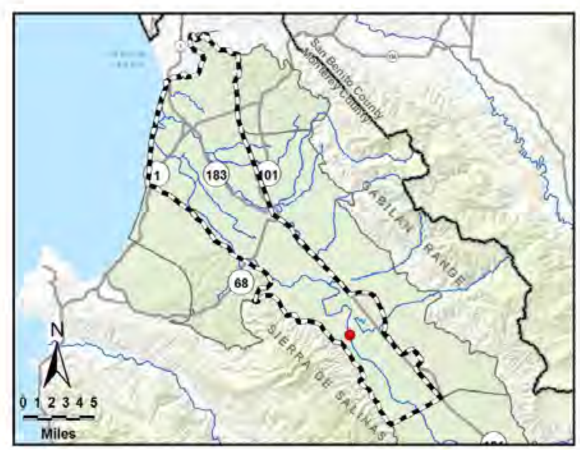
400-Foot Aquifer Perforated from -152 to -202 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

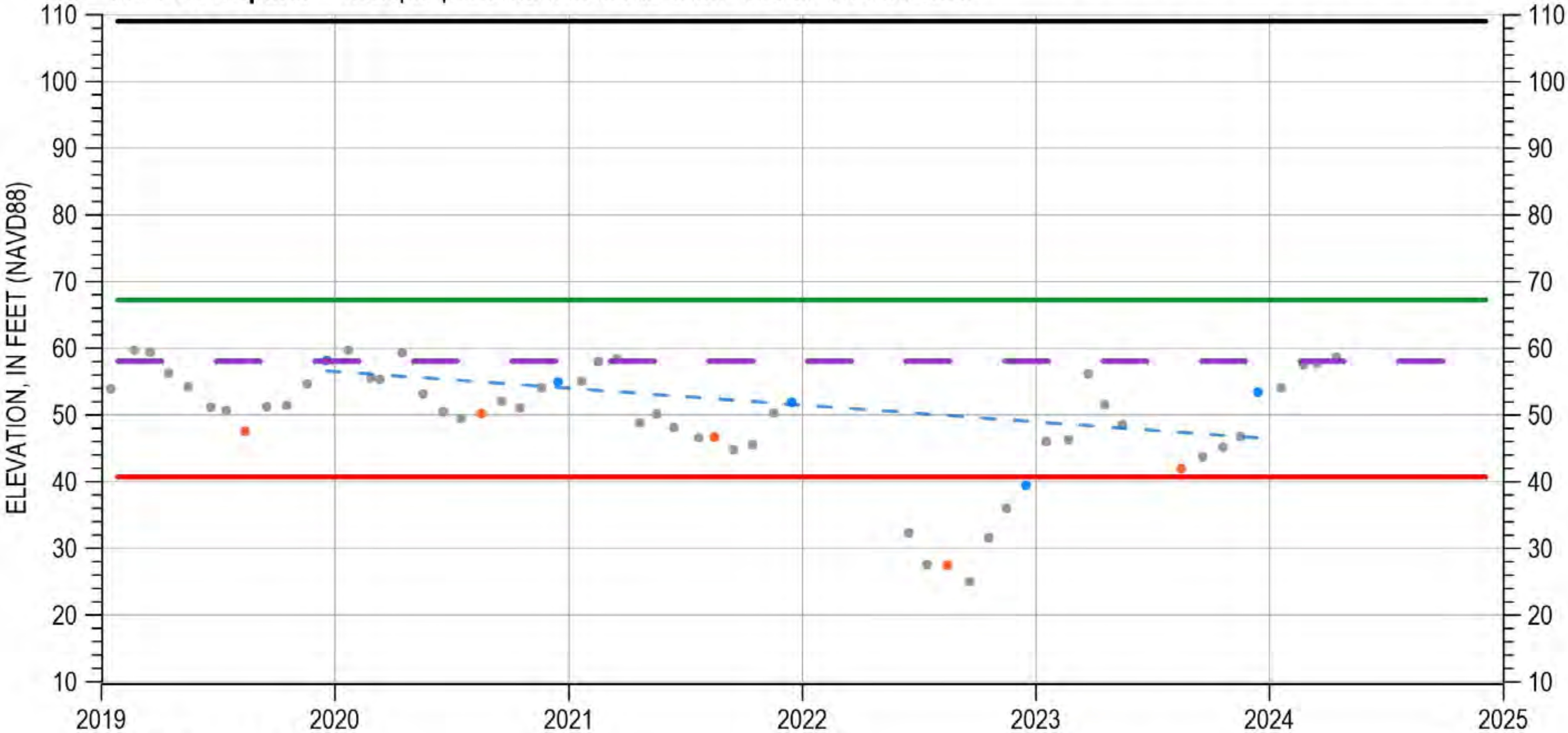
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/04E-10R02

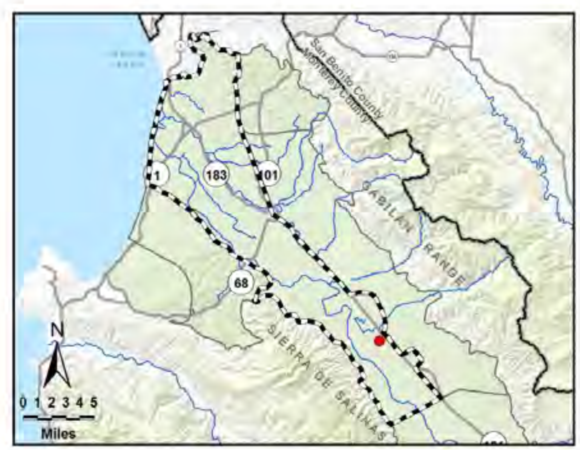
400-Foot Aquifer Multiple perforated intervals from -103 to -368 feet msl

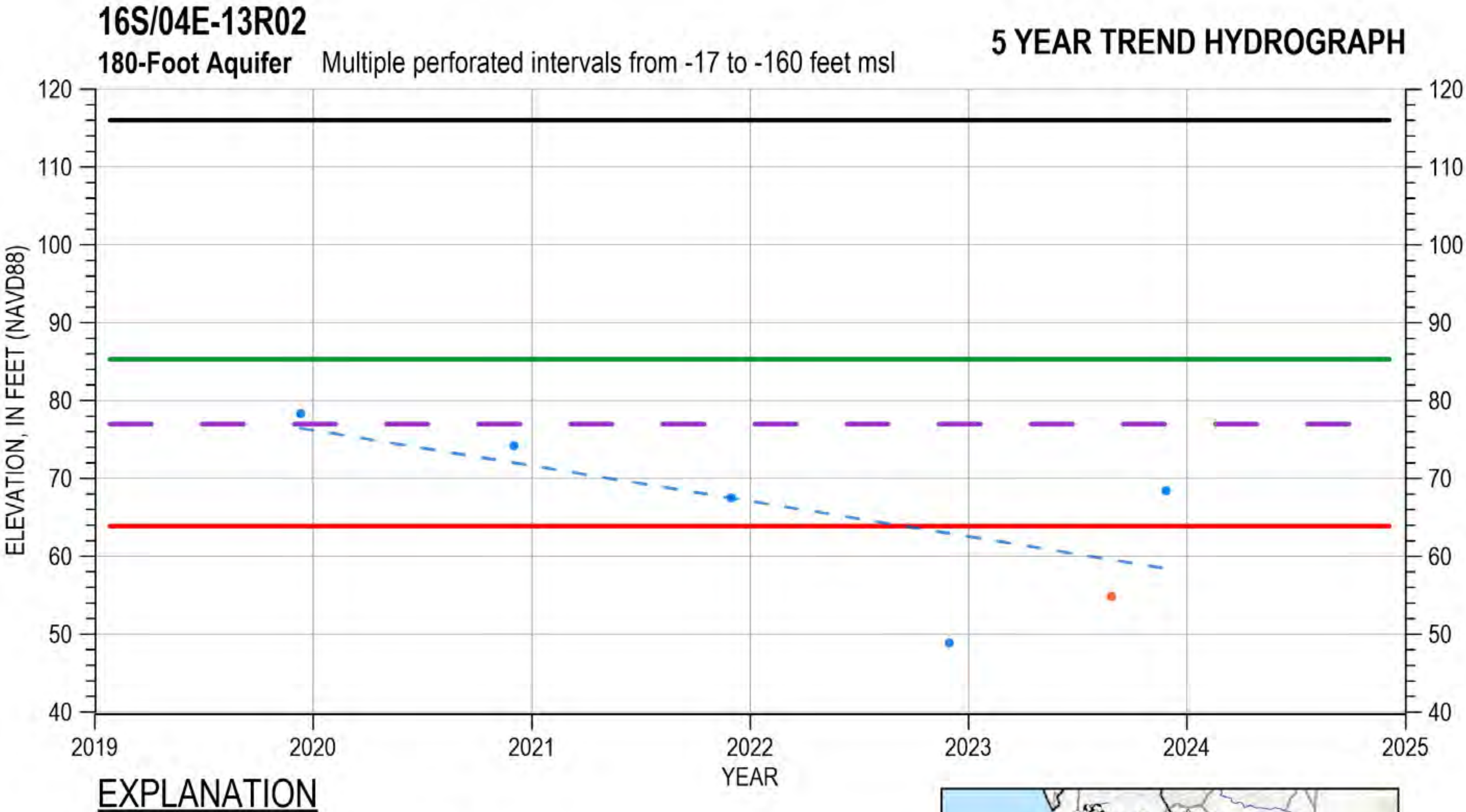
5 YEAR TREND HYDROGRAPH

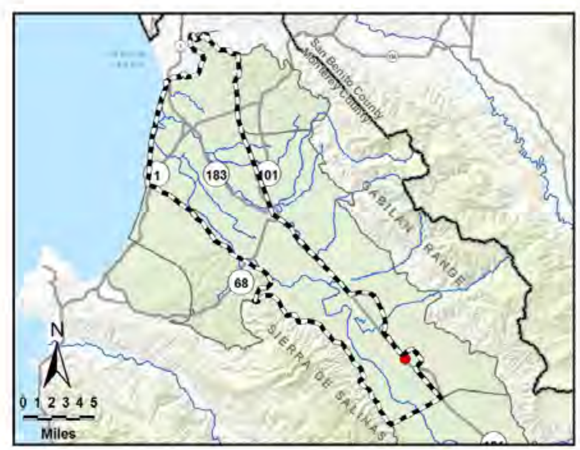


EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



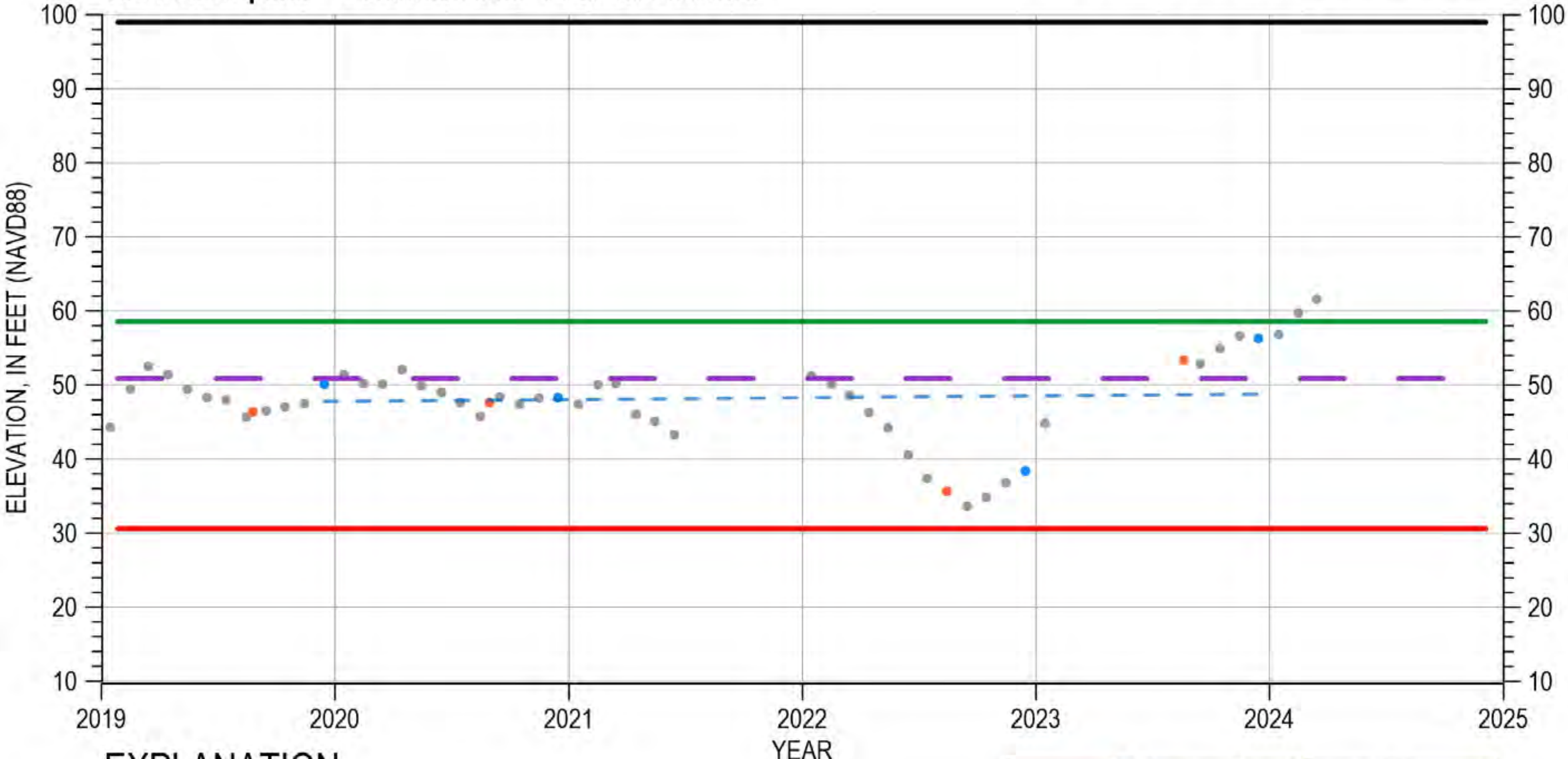

16S/04E-13R02
180-Foot Aquifer Multiple perforated intervals from -17 to -160 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
120
110
100
90
80
70
60
50
40
2019
2020
2021
2022
2023
2024
2025
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
Monthly Waterlevels


San Benito County
Monterey County
183
101
1
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

16S/04E-15D01

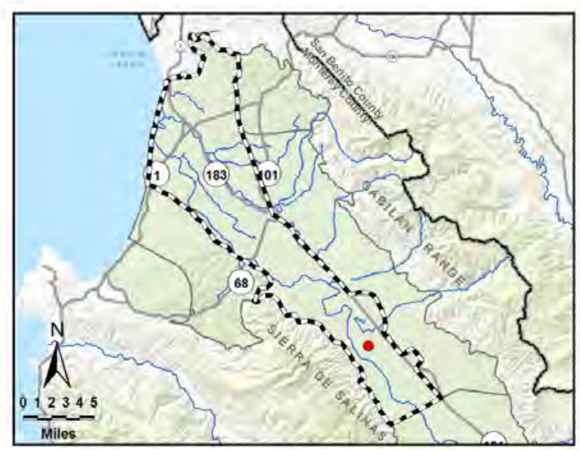
180-Foot Aquifer Perforated from -71 to -259 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

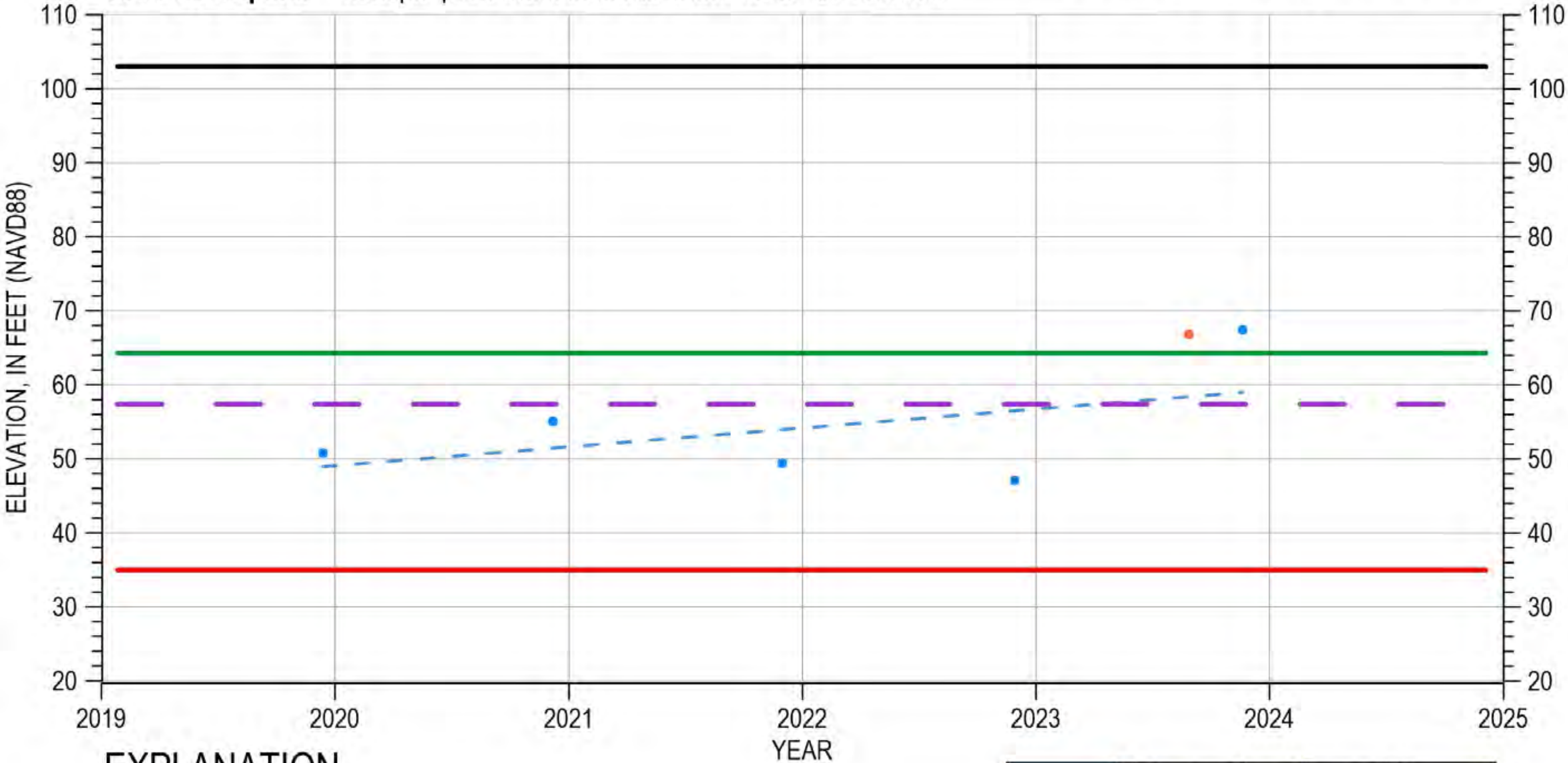
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/04E-15R02

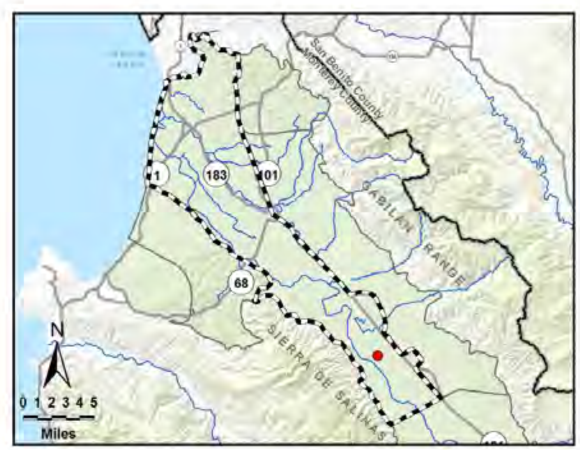
180-Foot Aquifer Multiple perforated intervals from -12 to -80 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

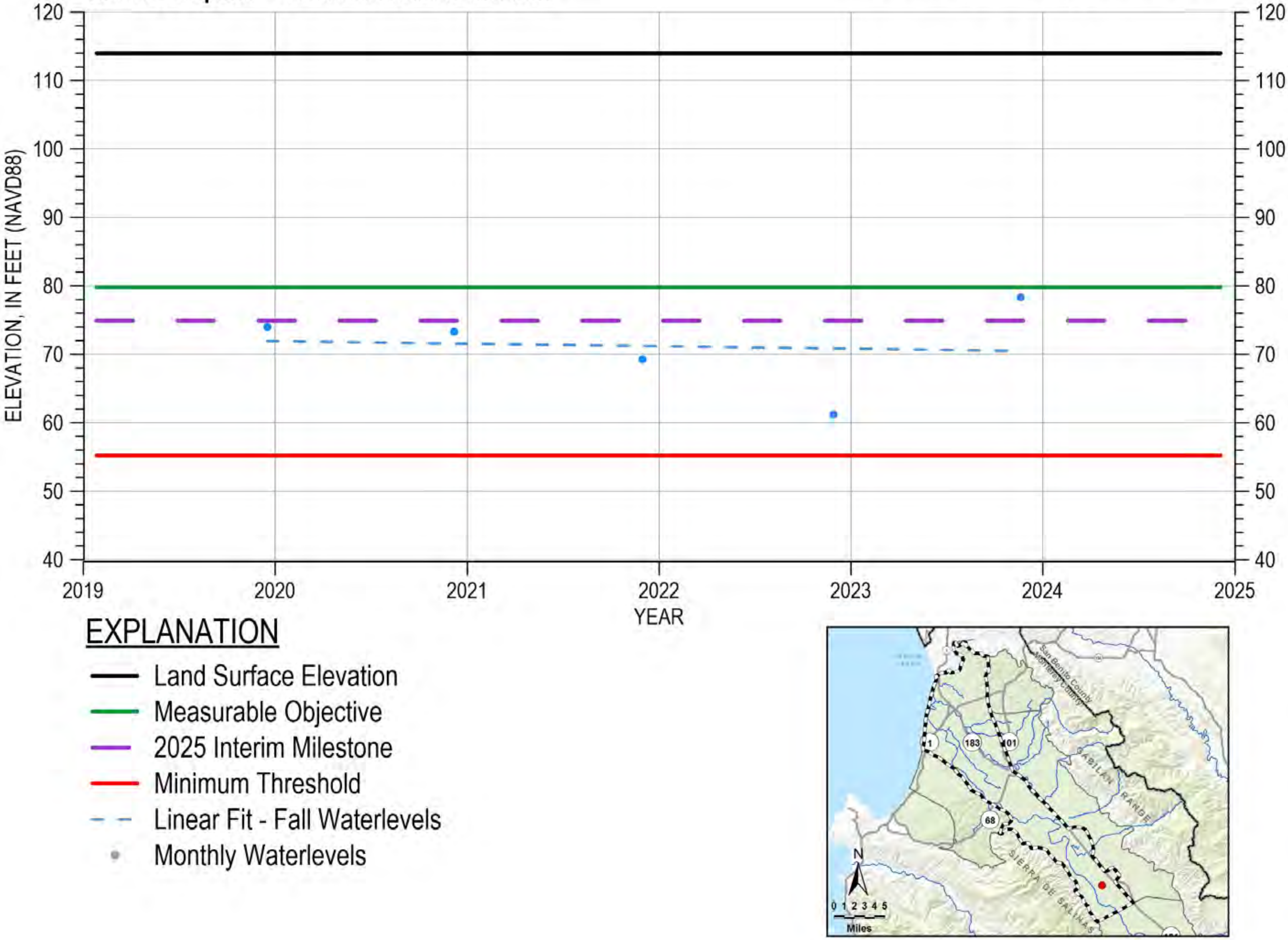
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



16S/04E-25C01

180-Foot Aquifer Perforated interval unknown

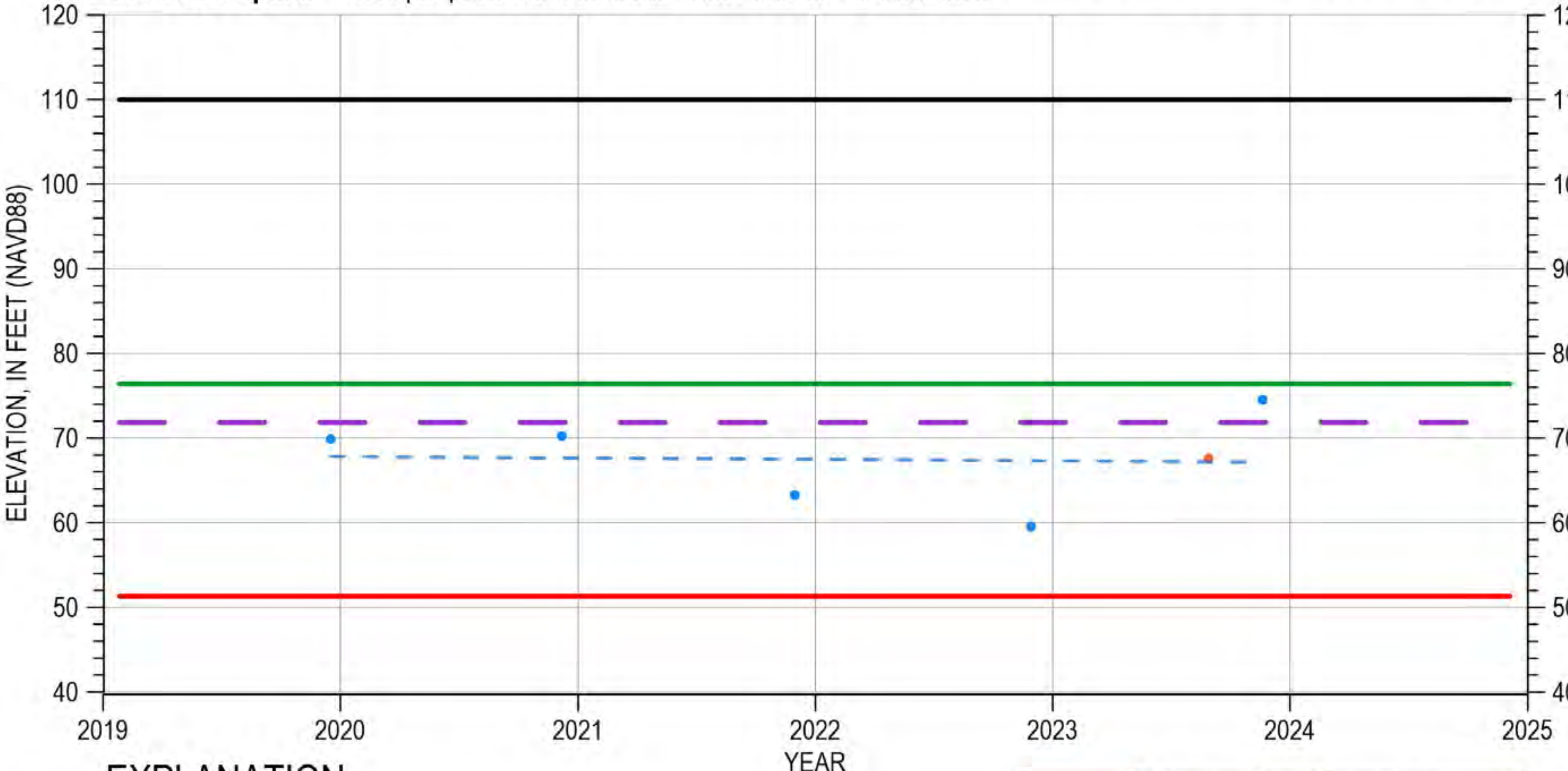
5 YEAR TREND HYDROGRAPH



16S/04E-25G01

400-Foot Aquifer Multiple perforated intervals from -322 to -438 feet msl

5 YEAR TREND HYDROGRAPH



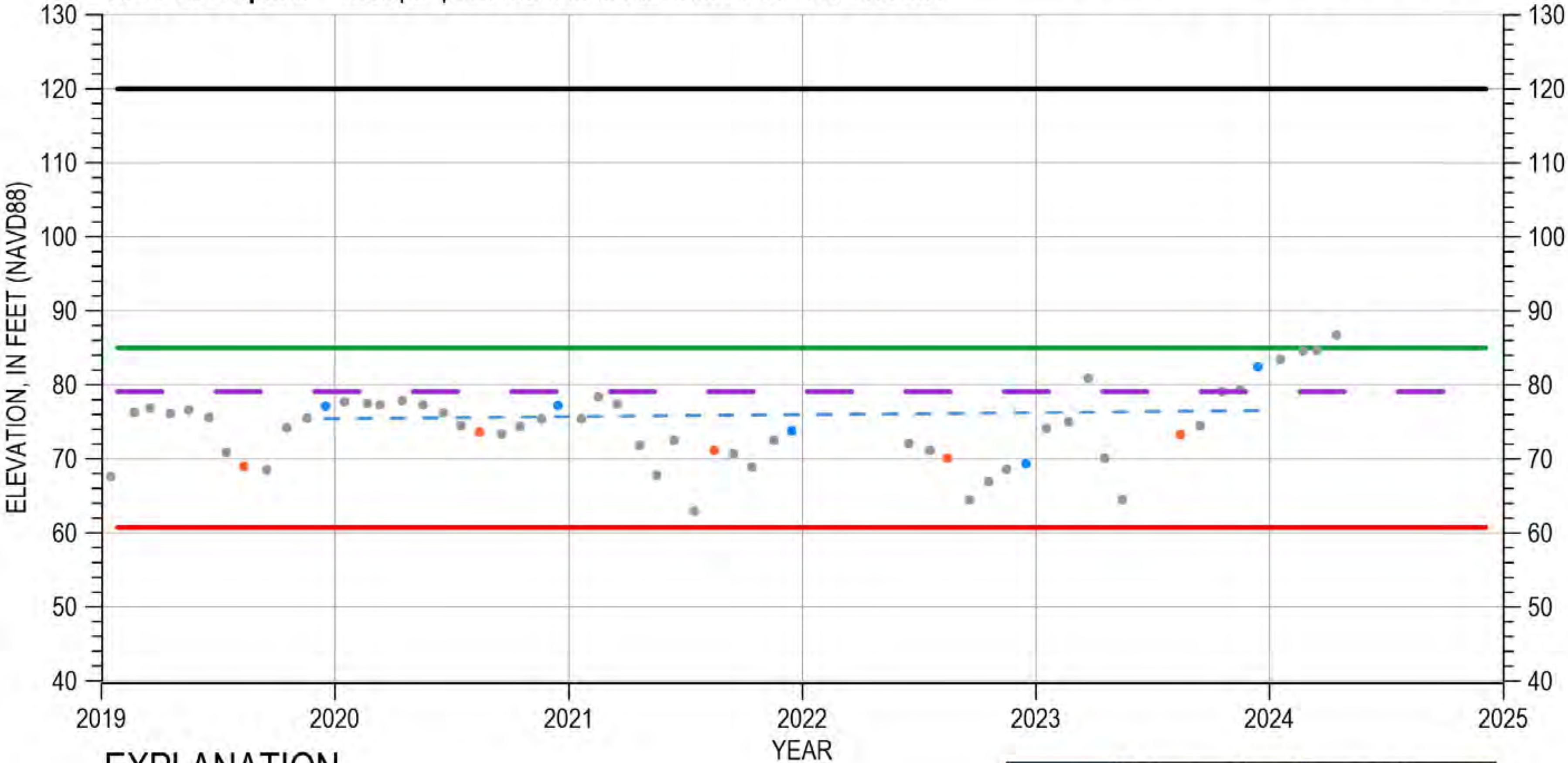
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/05E-30E01

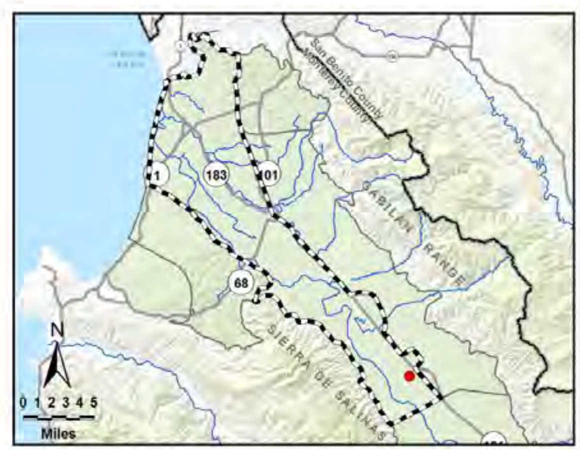
180-Foot Aquifer Multiple perforated intervals from -5 to -145 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

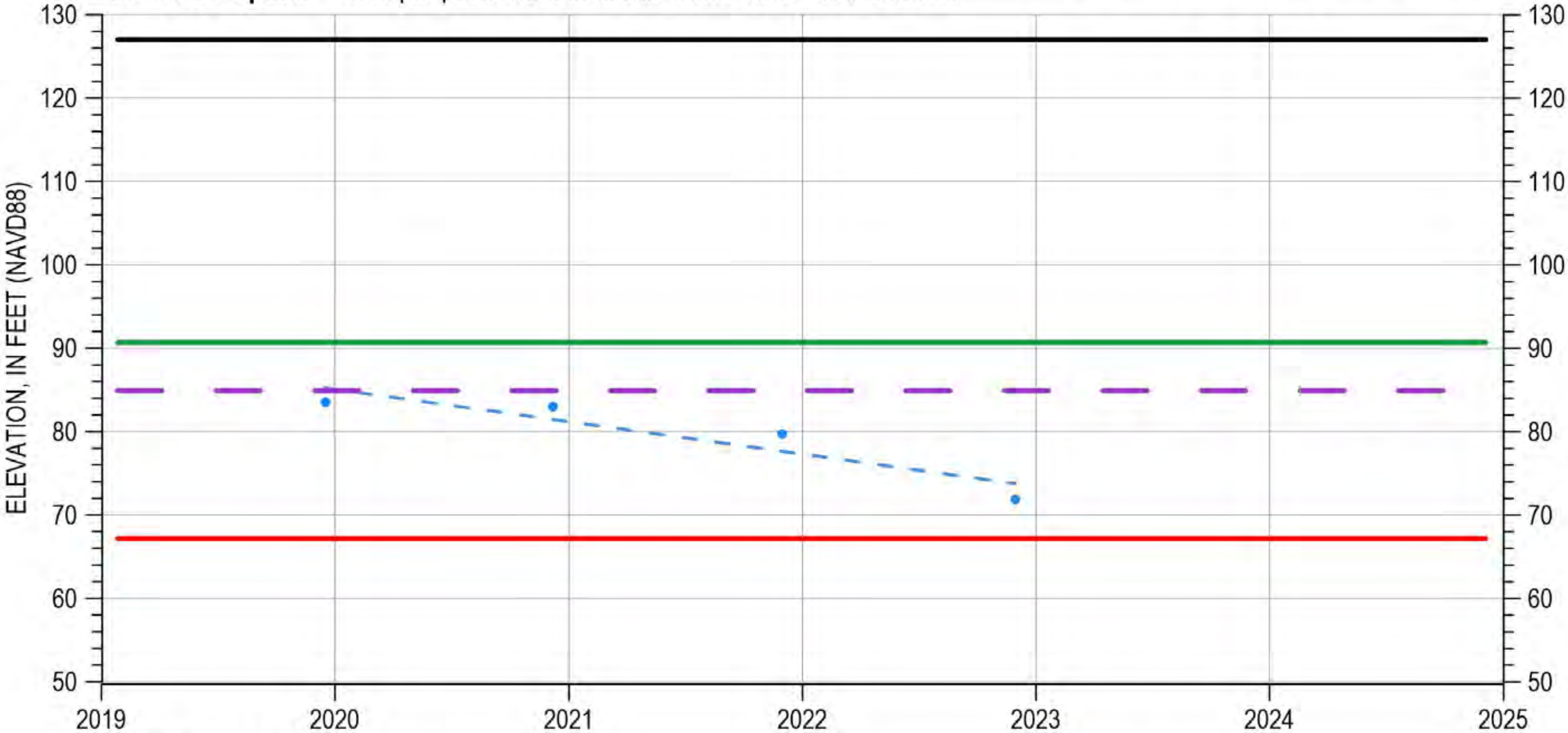
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/05E-30J02

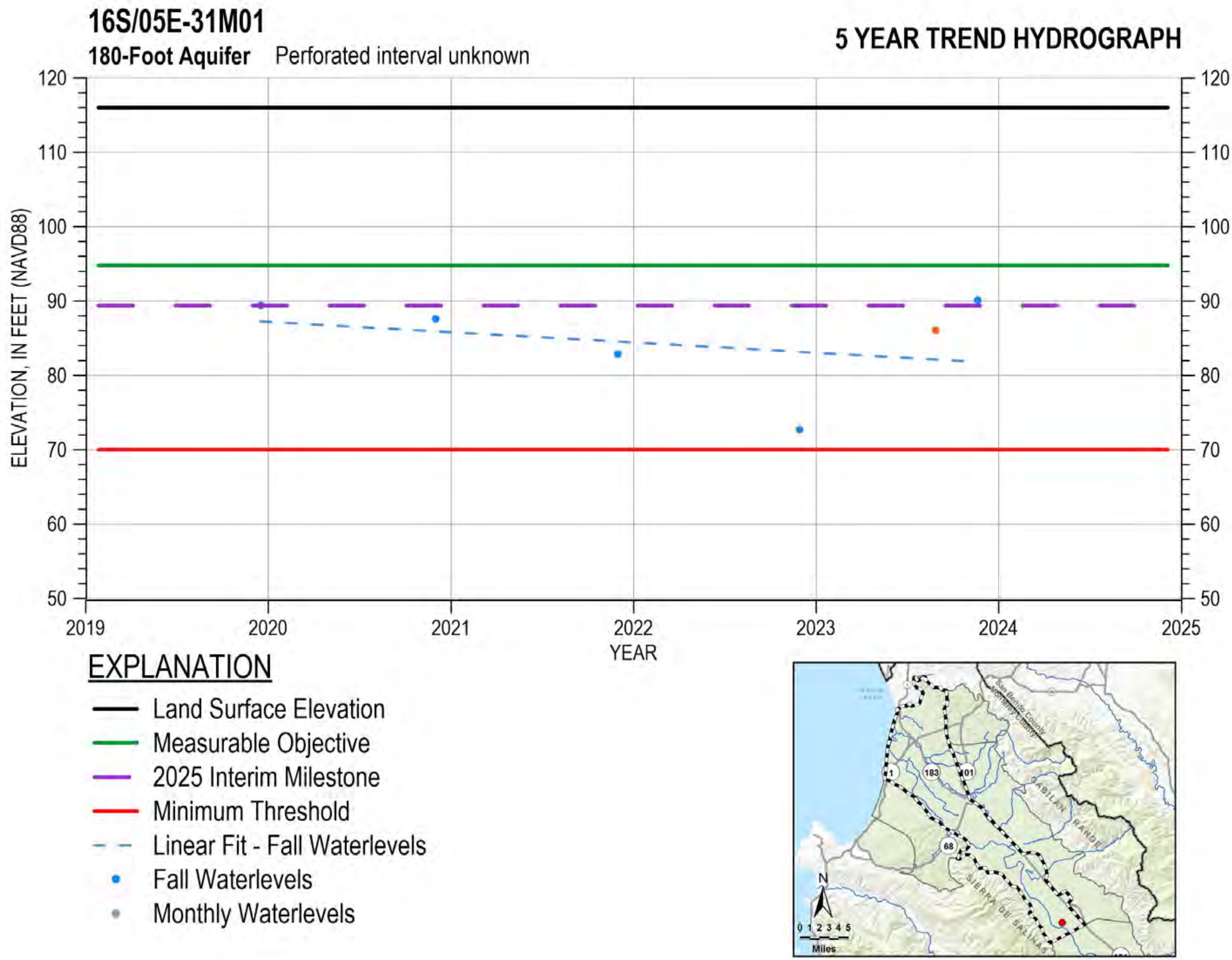
400-Foot Aquifer Multiple perforated intervals from -63 to -308 feet msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

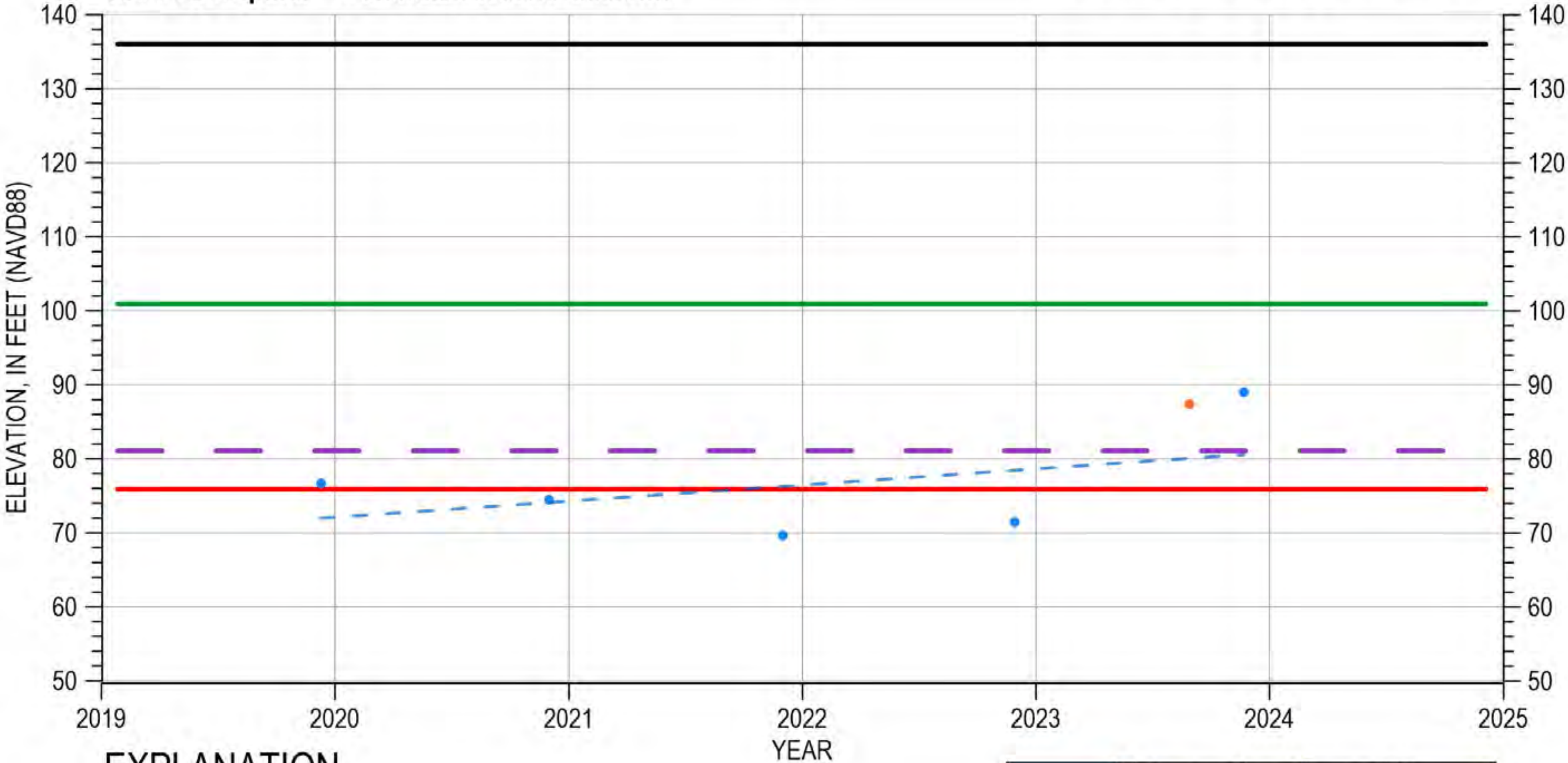


16S/05E-31M01
180-Foot Aquifer
Perforated interval unknown
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
120
110
100
90
80
70
60
50
2019
2020
2021
2022
2023
2024
2025
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
Monthly Waterlevels
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

17S/04E-01D01

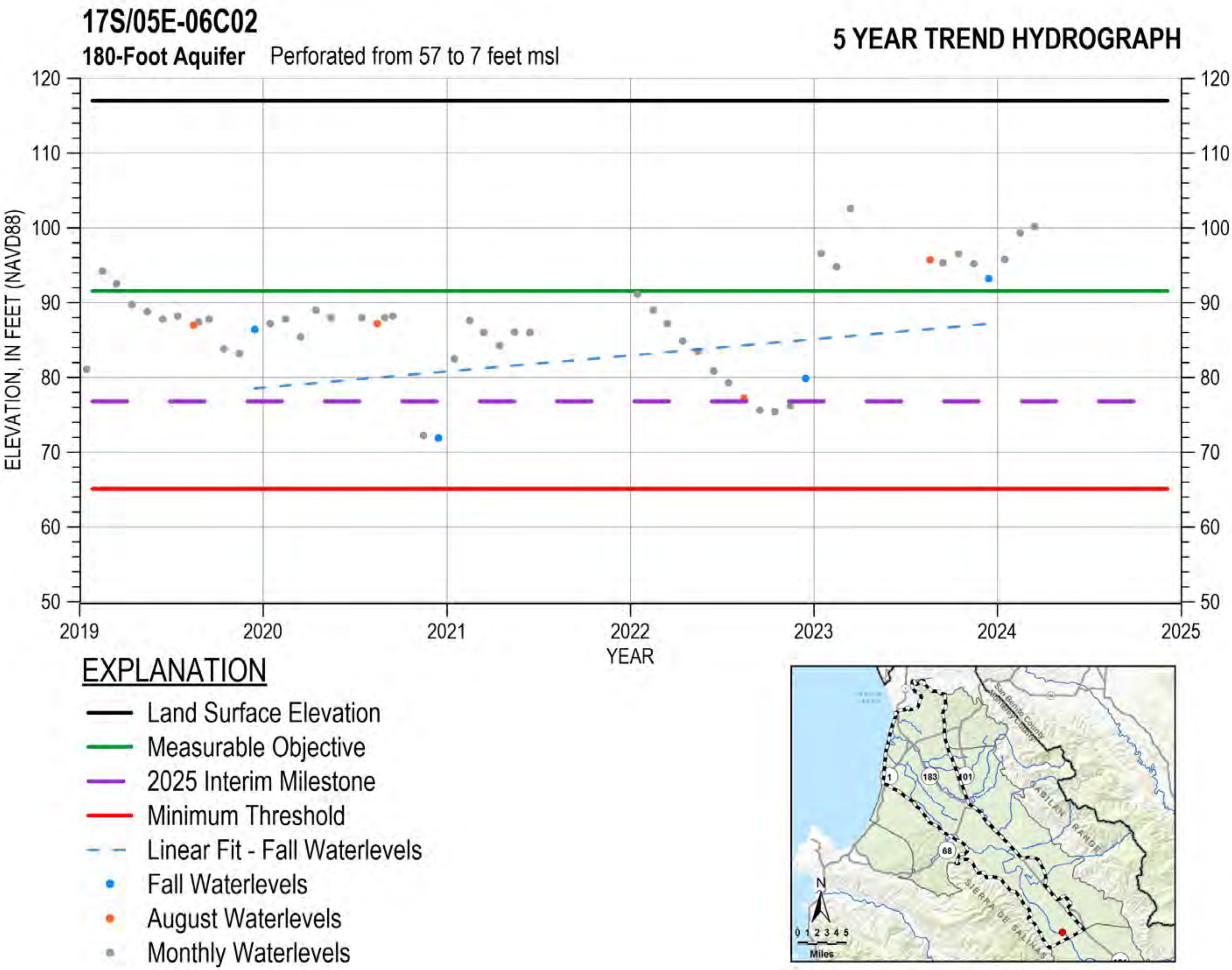
180-Foot Aquifer Perforated interval unknown

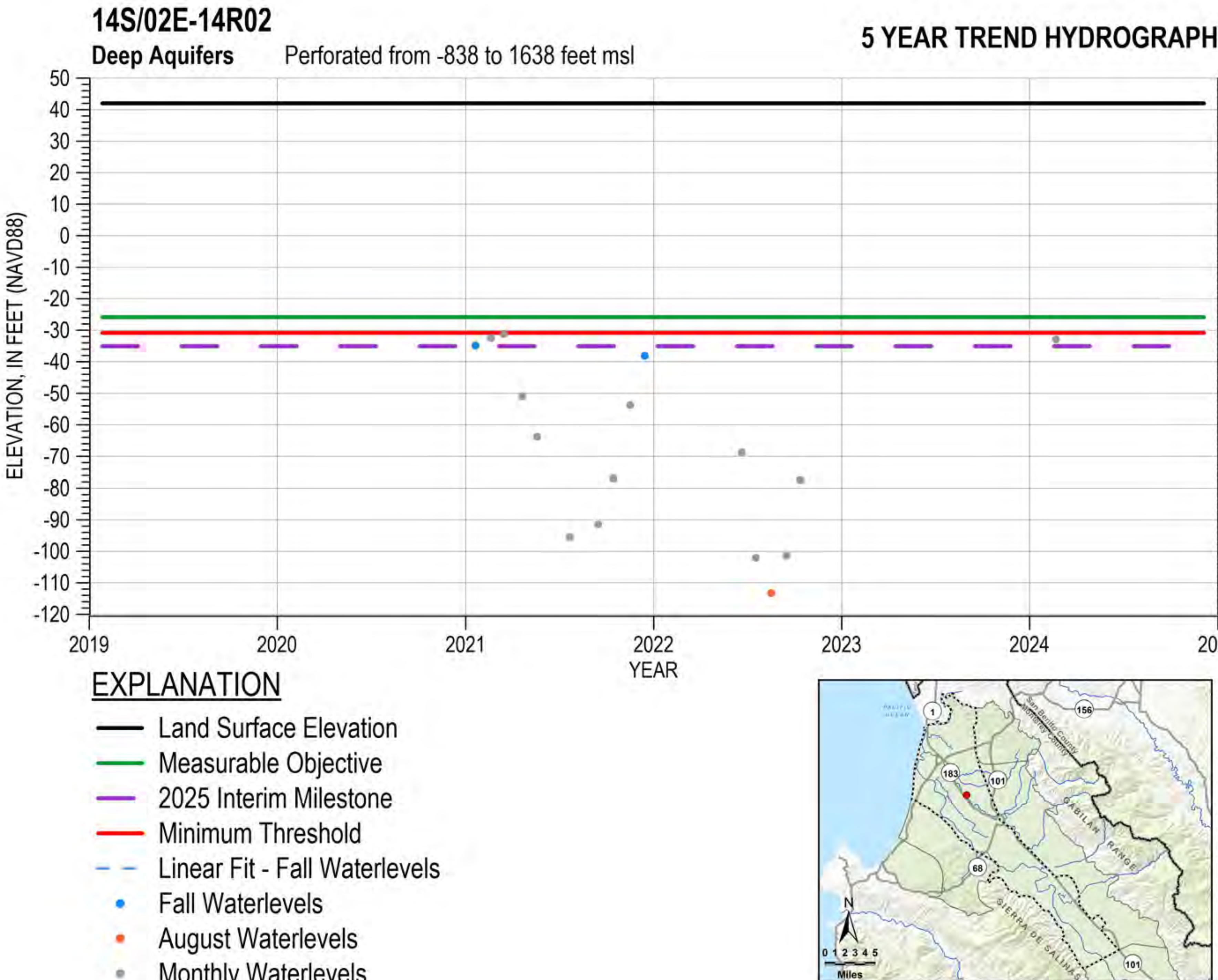
5 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

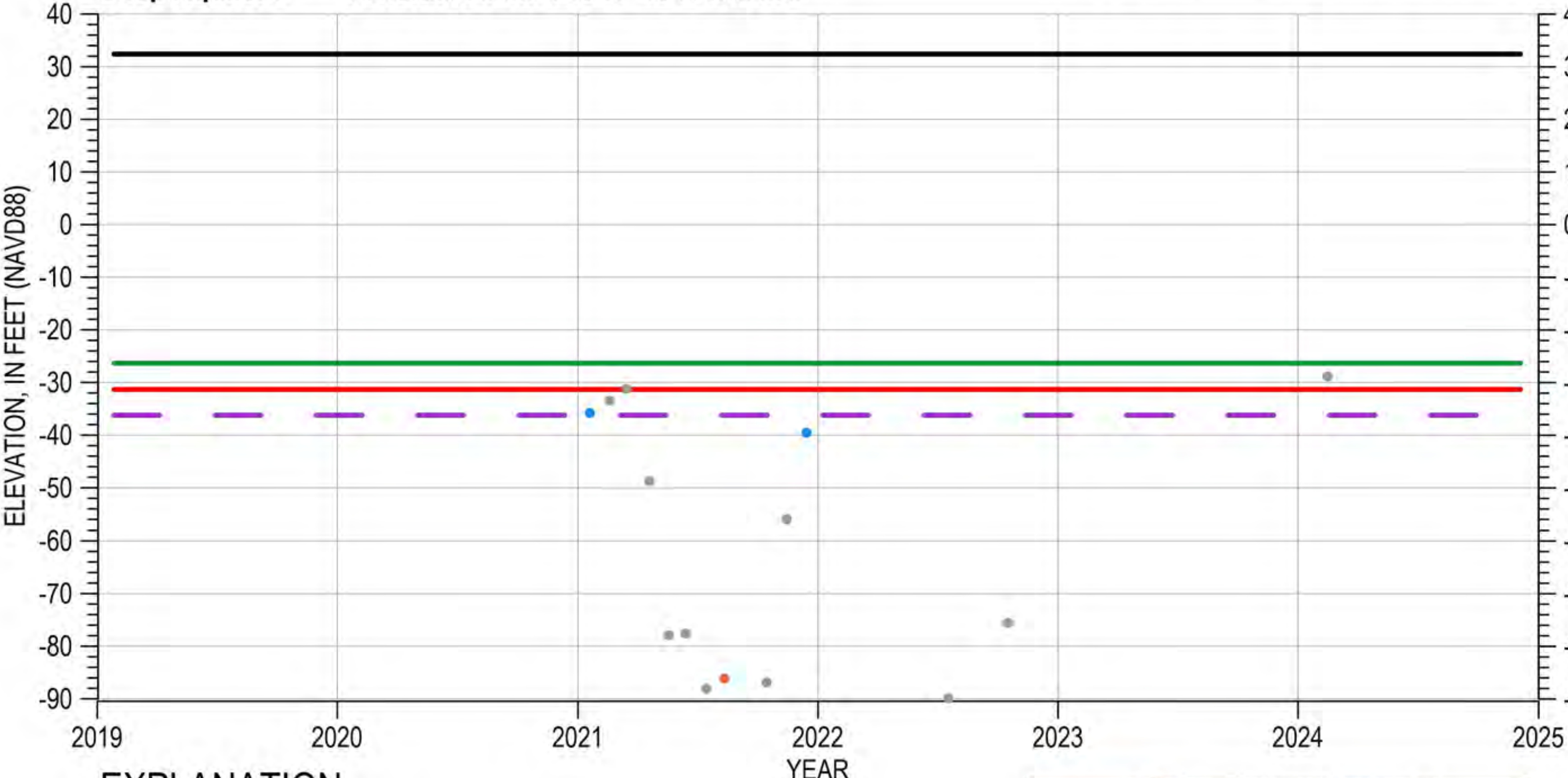

17S/05E-06C02
180-Foot Aquifer Perforated from 57 to 7 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
2019
2020
2021
2022
2023
2024
2025
50
60
70
80
90
100
110
120
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles


14S/02E-14R02
Deep Aquifers
Perforated from -838 to 1638 feet msl
5 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
GABILAN RANGE
SIERRA DE SALINAS
Miles

14S/02E-26G01

Deep Aquifers Perforated from -788 to -1648 feel msl

5 YEAR TREND HYDROGRAPH



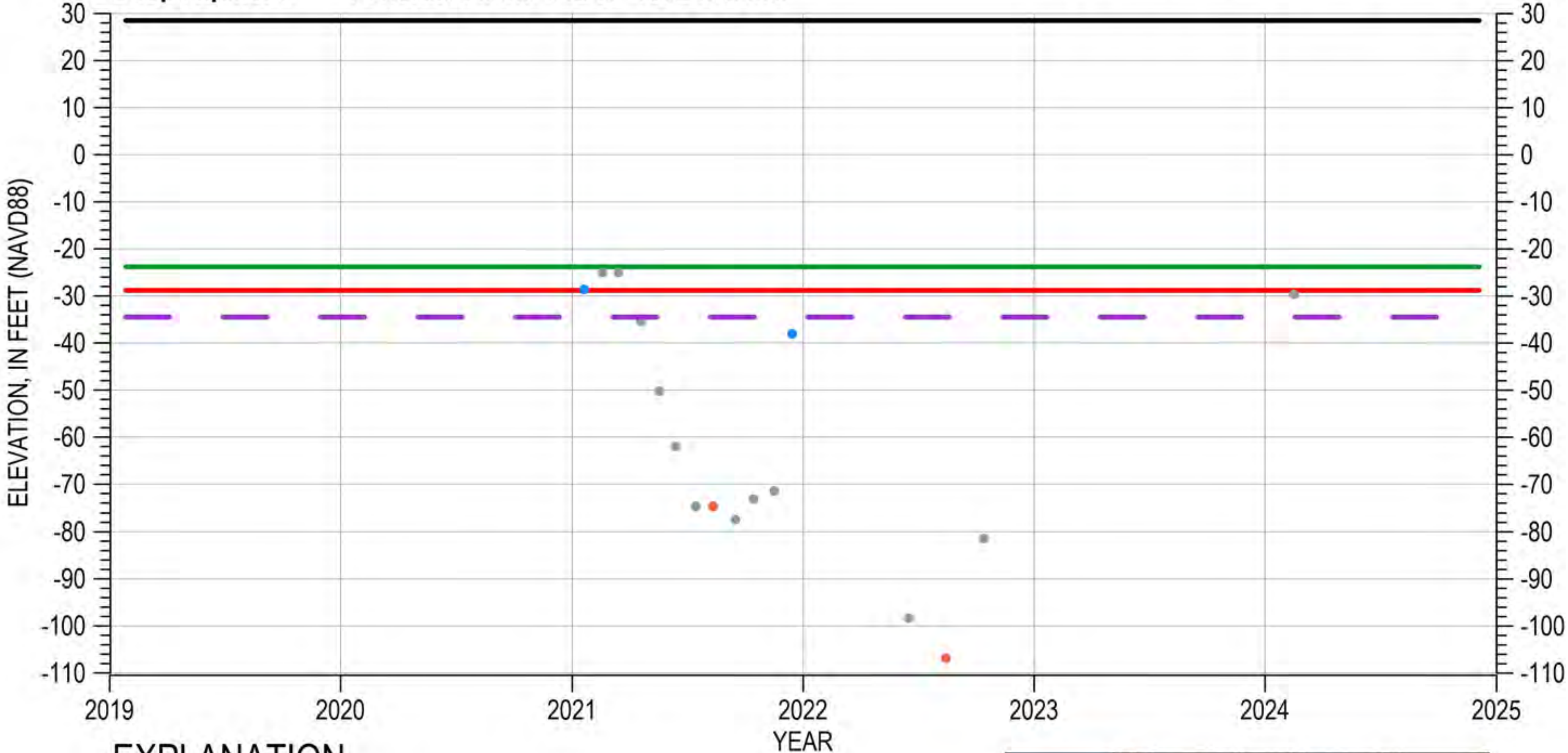
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-35B01

Deep Aquifers Perforated from -842 to -1652 feel msl

5 YEAR TREND HYDROGRAPH



EXPLANATION

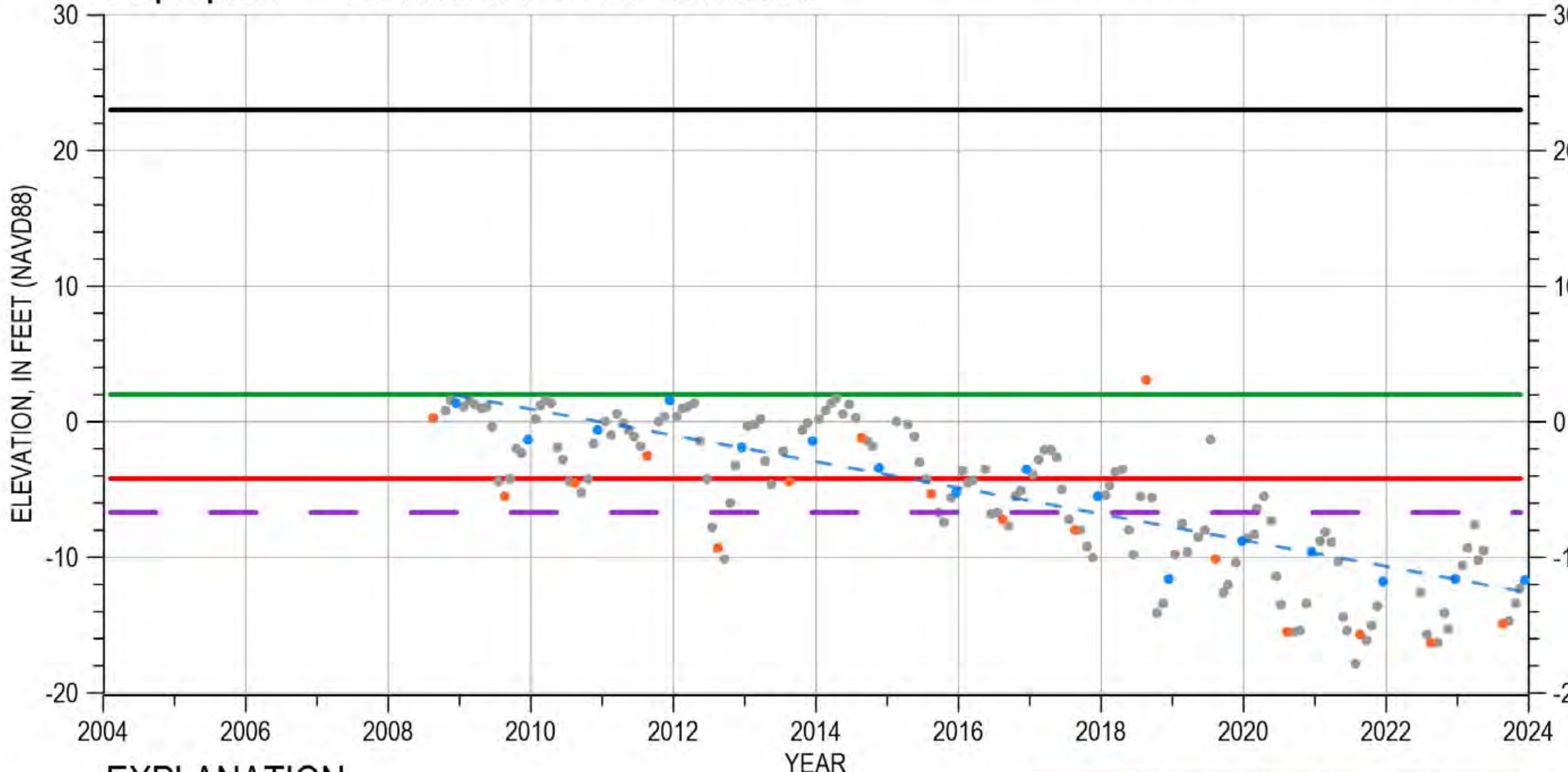
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

3A-2 Hydrographs with 20-Year Linear Regressions

13S/01E-36J02

Deep Aquifers Perforated from -1278 to -1338 feet msl

20 YEAR TREND HYDROGRAPH



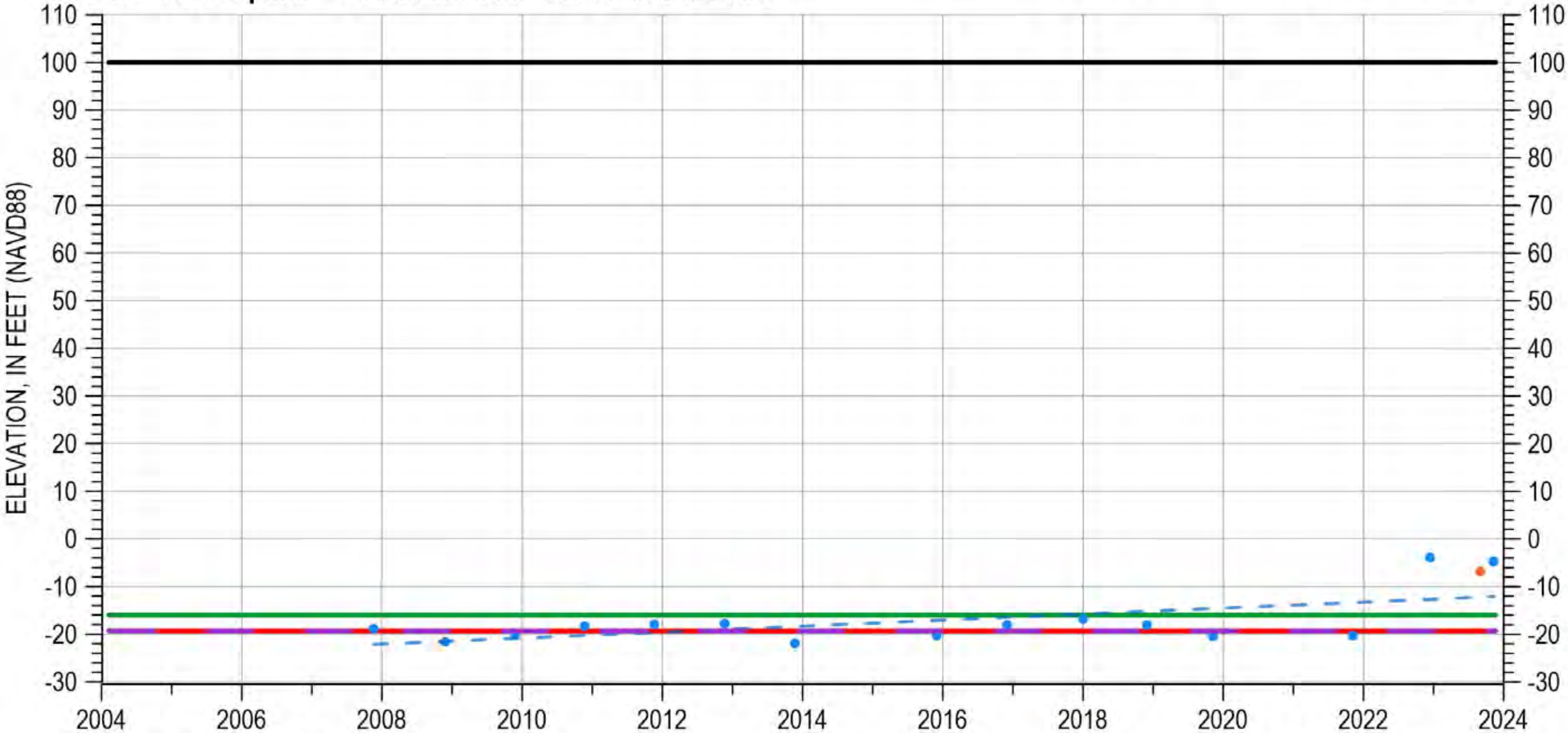
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-10K01

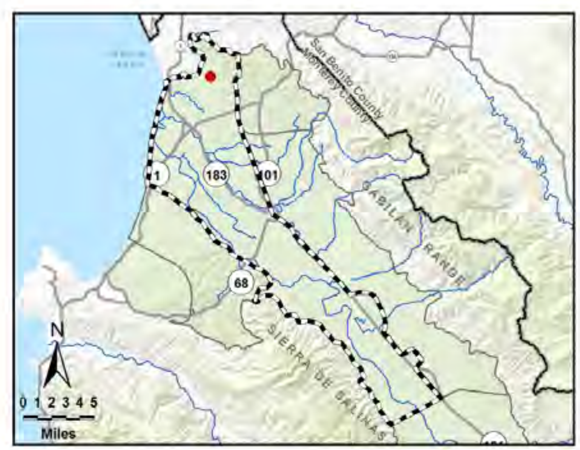
400-Foot Aquifer Perforated from -280 to -560 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

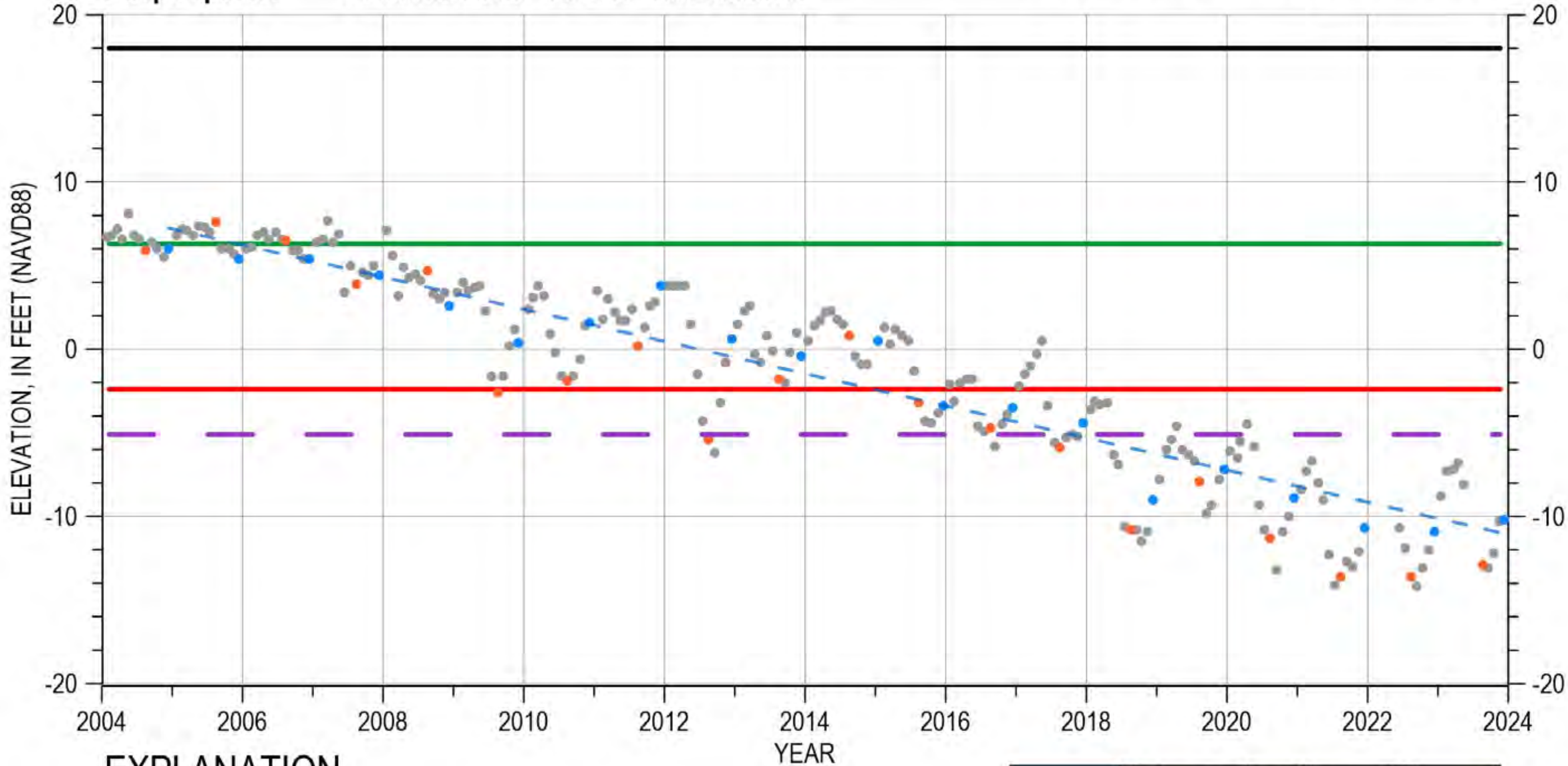
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-19Q03

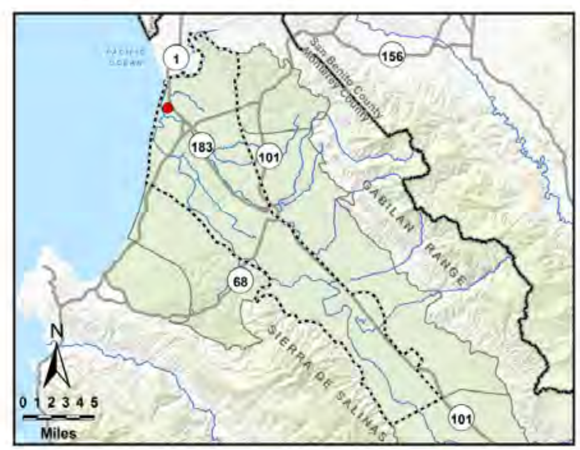
20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -1202 to -1532 feet msl



EXPLANATION

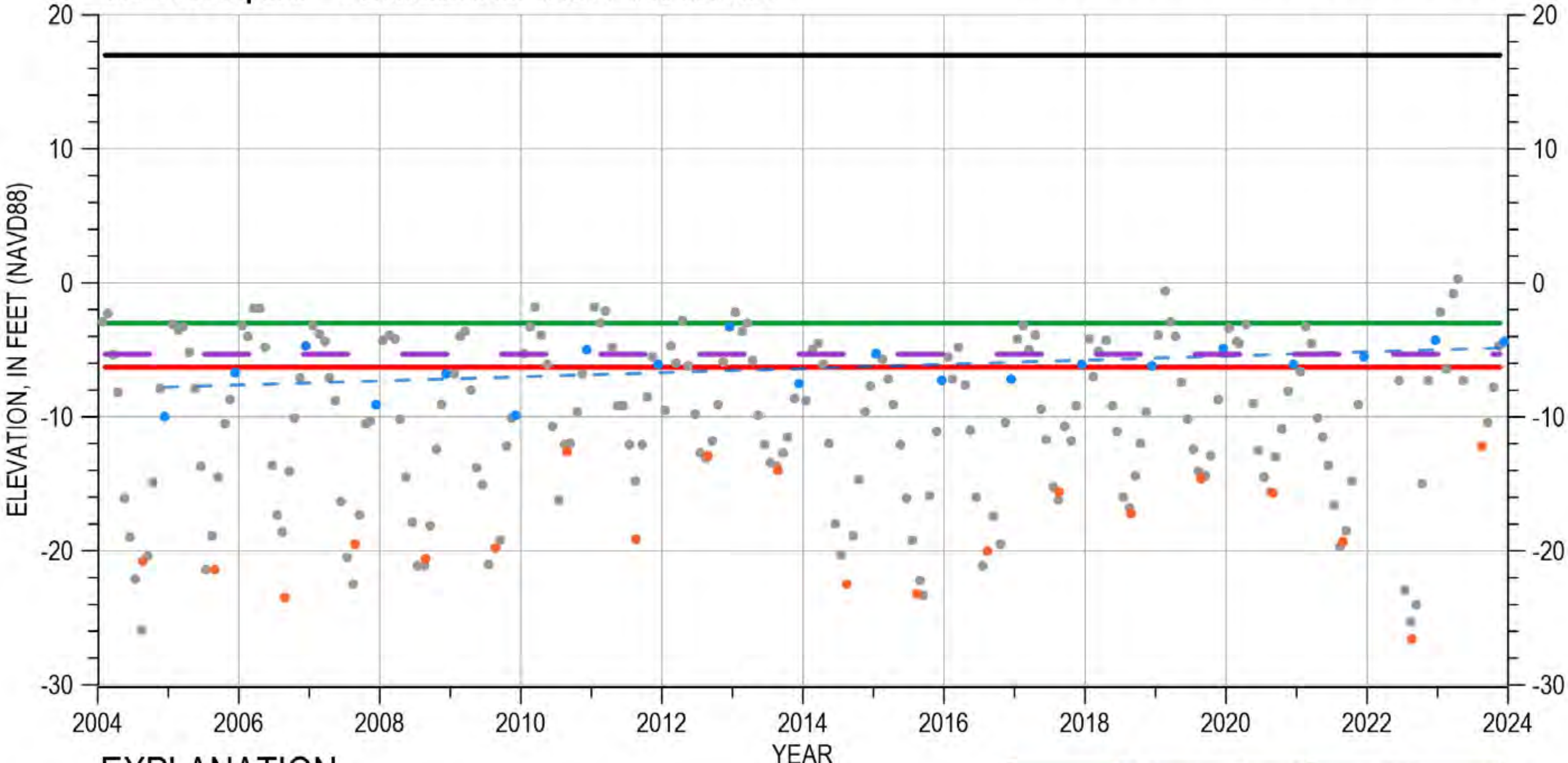
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-21N01

400-Foot Aquifer Perforated from -352 to -533 feet msl

20 YEAR TREND HYDROGRAPH



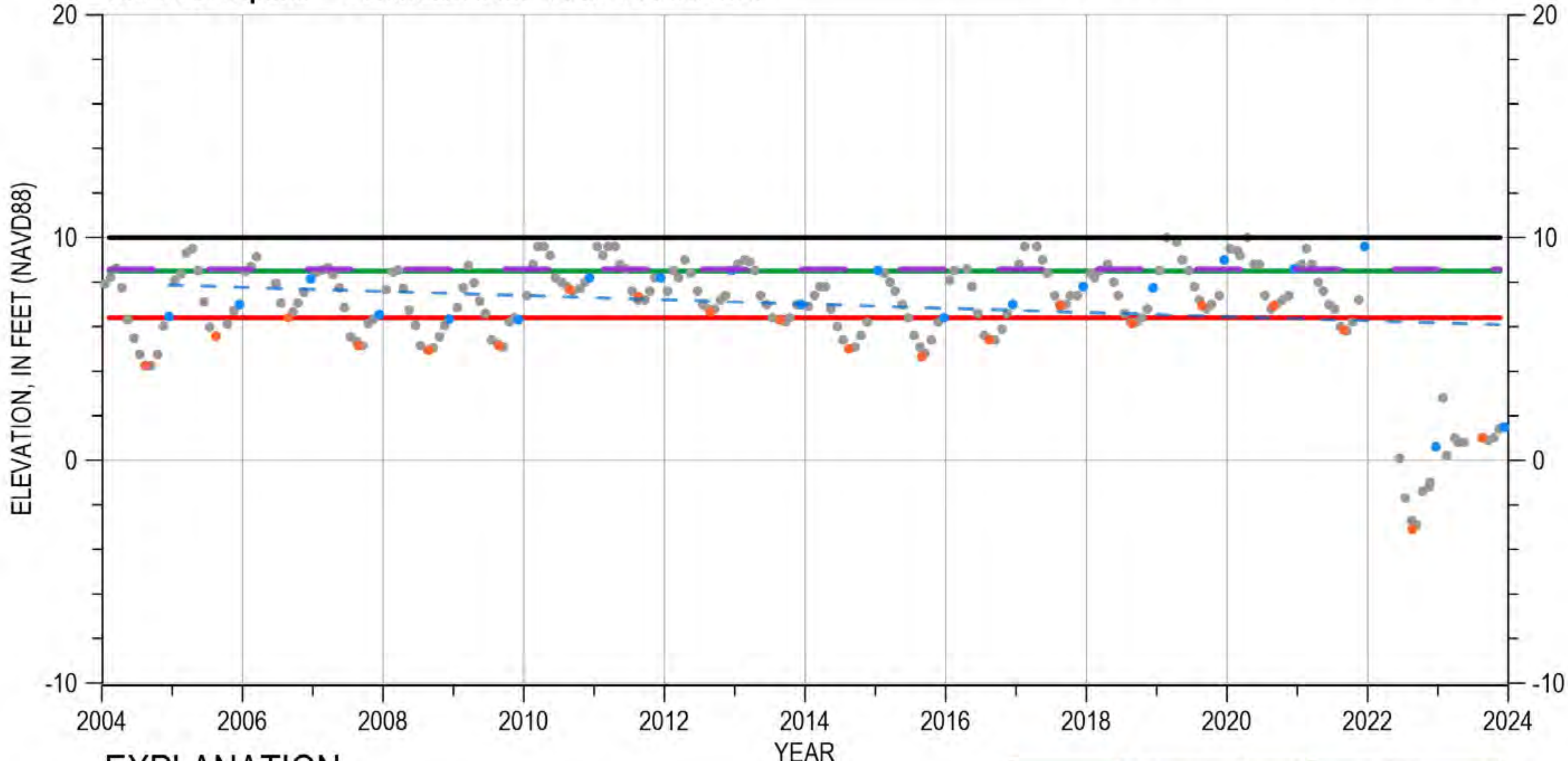
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-21Q01

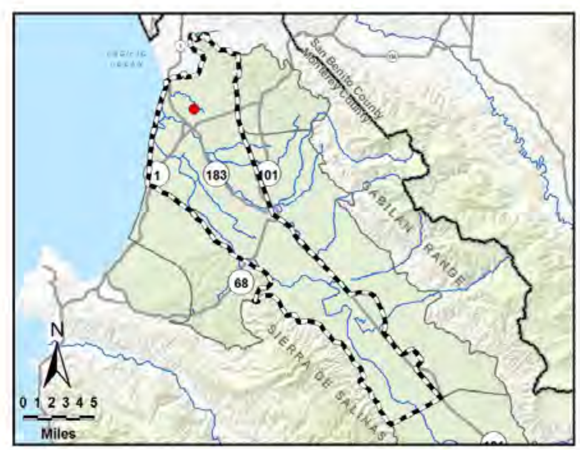
180-Foot Aquifer Perforated from -95 to -145 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

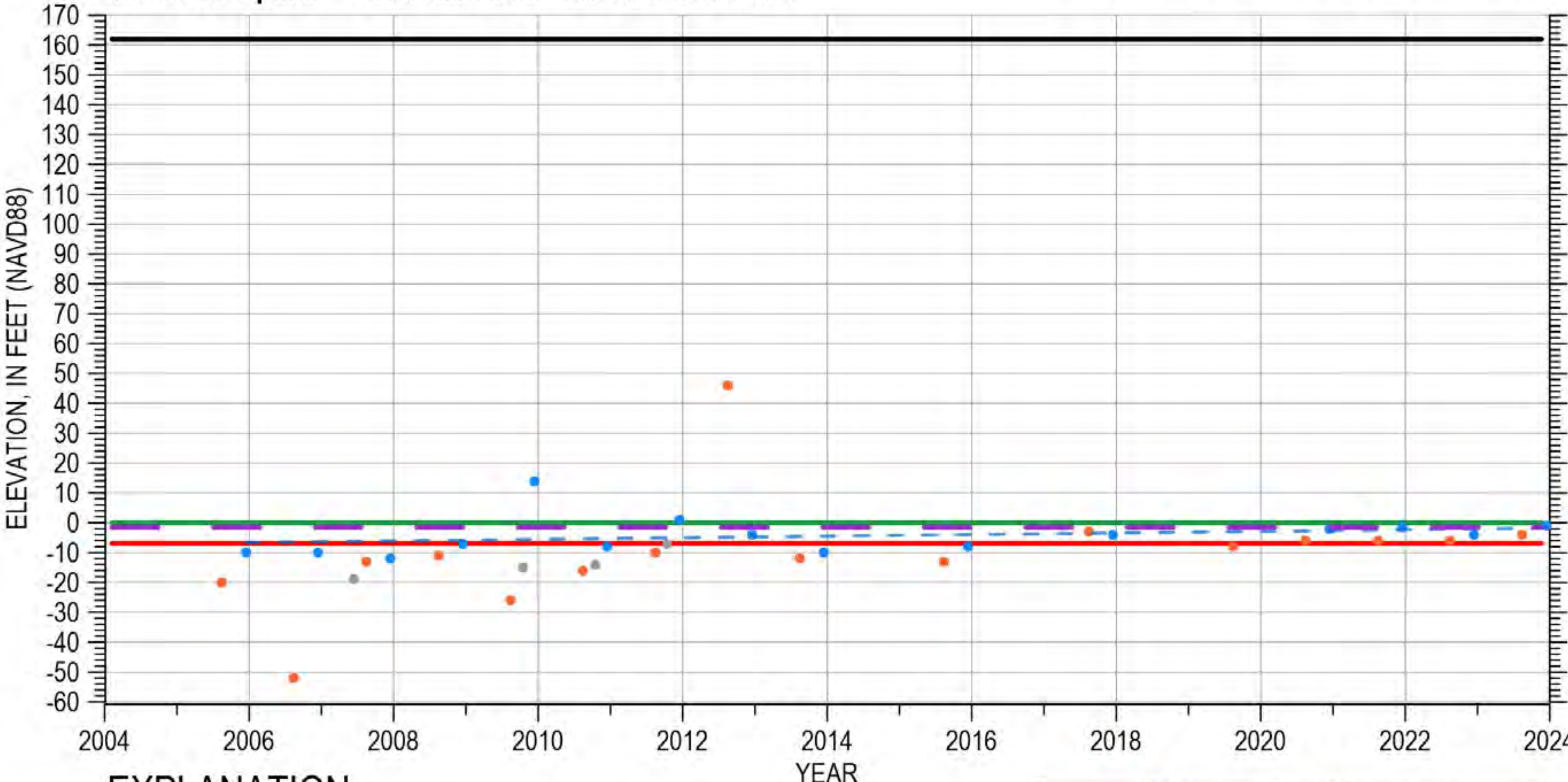
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-24N01

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Perforated from -138 to -438 feet msl



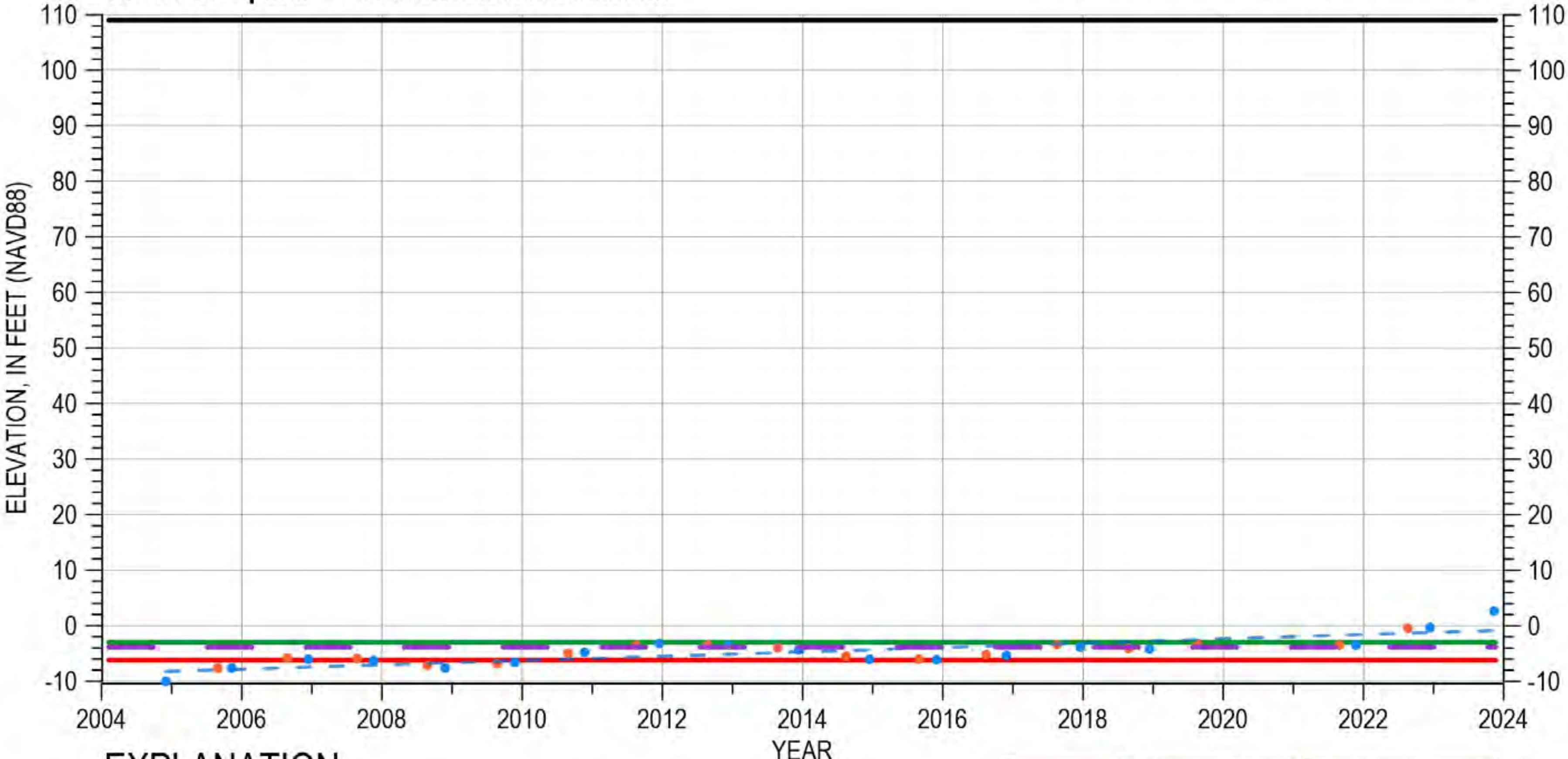
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-26L01

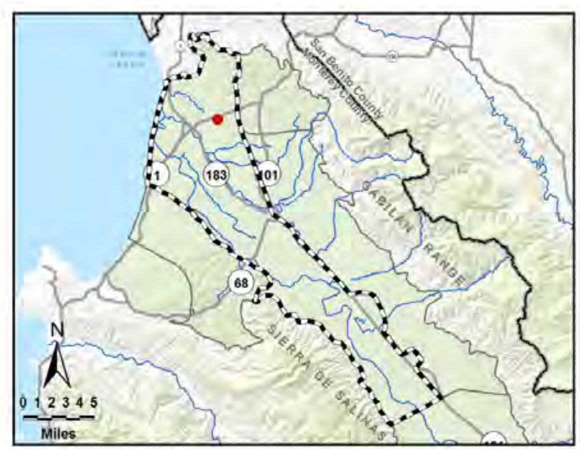
180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



EXPLANATION

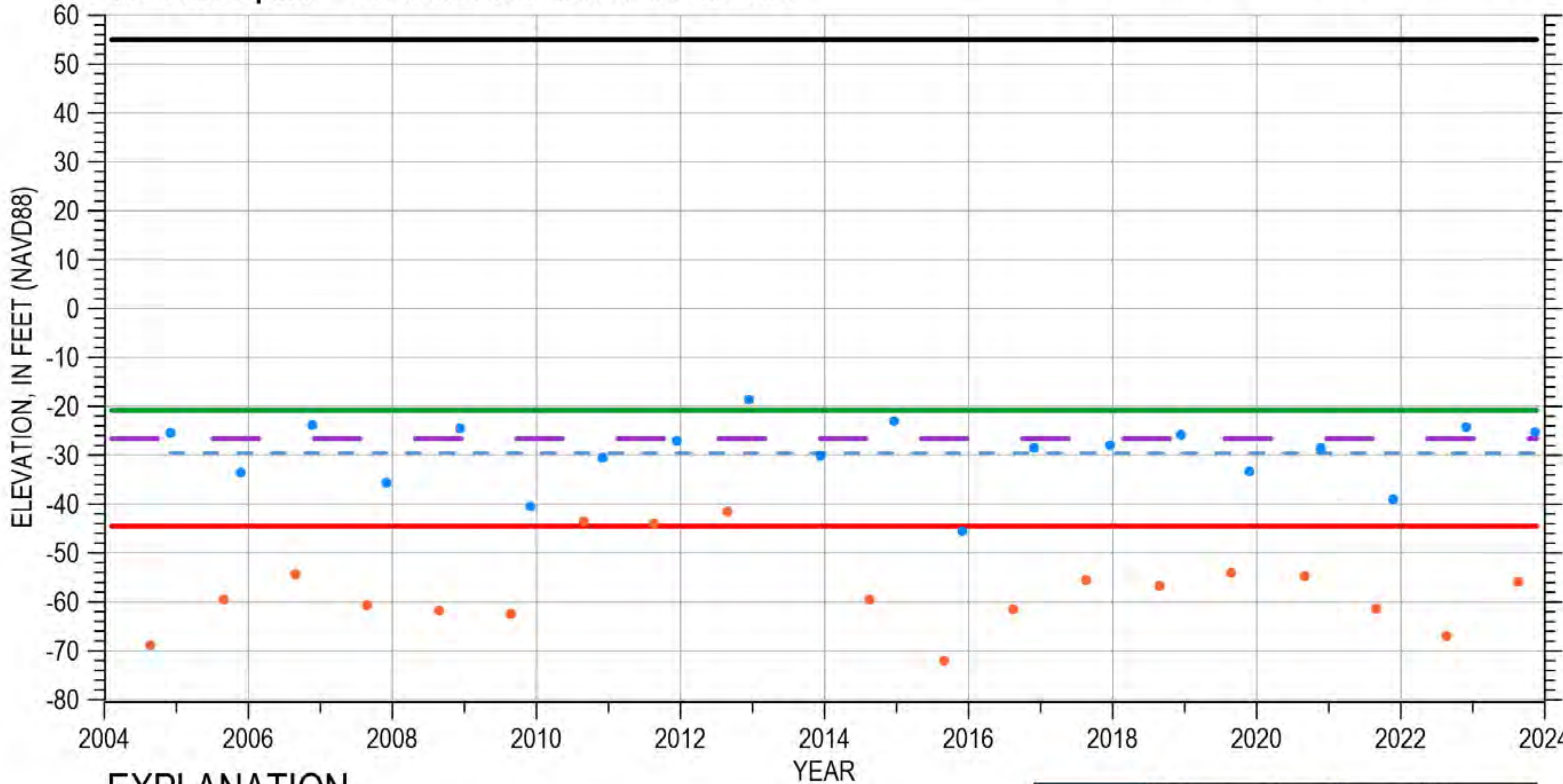
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



13S/02E-27P01

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Perforated from -361 to -521 feet msl



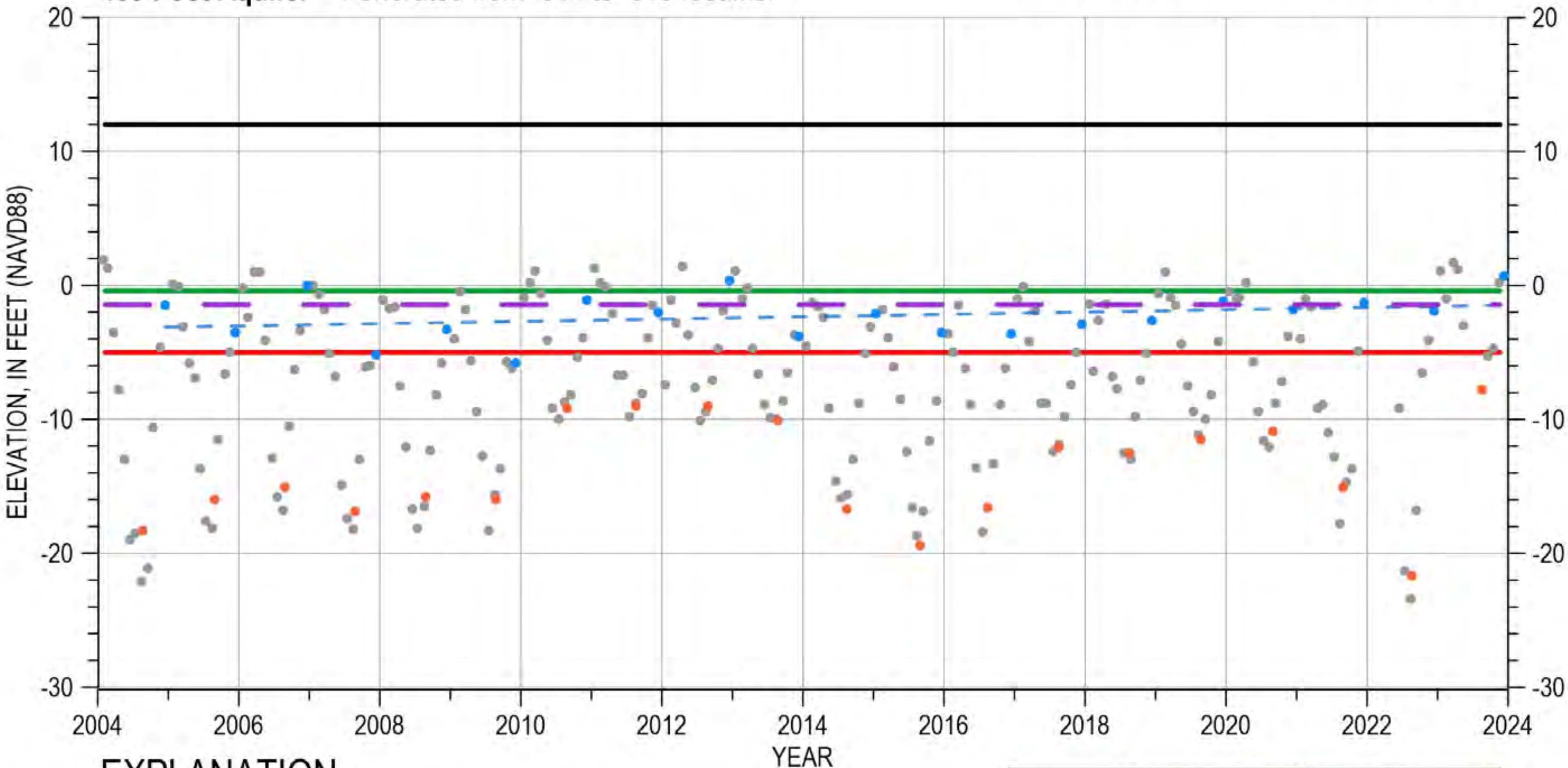
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-31N02

400-Foot Aquifer Perforated from -314 to -518 feet msl

20 YEAR TREND HYDROGRAPH



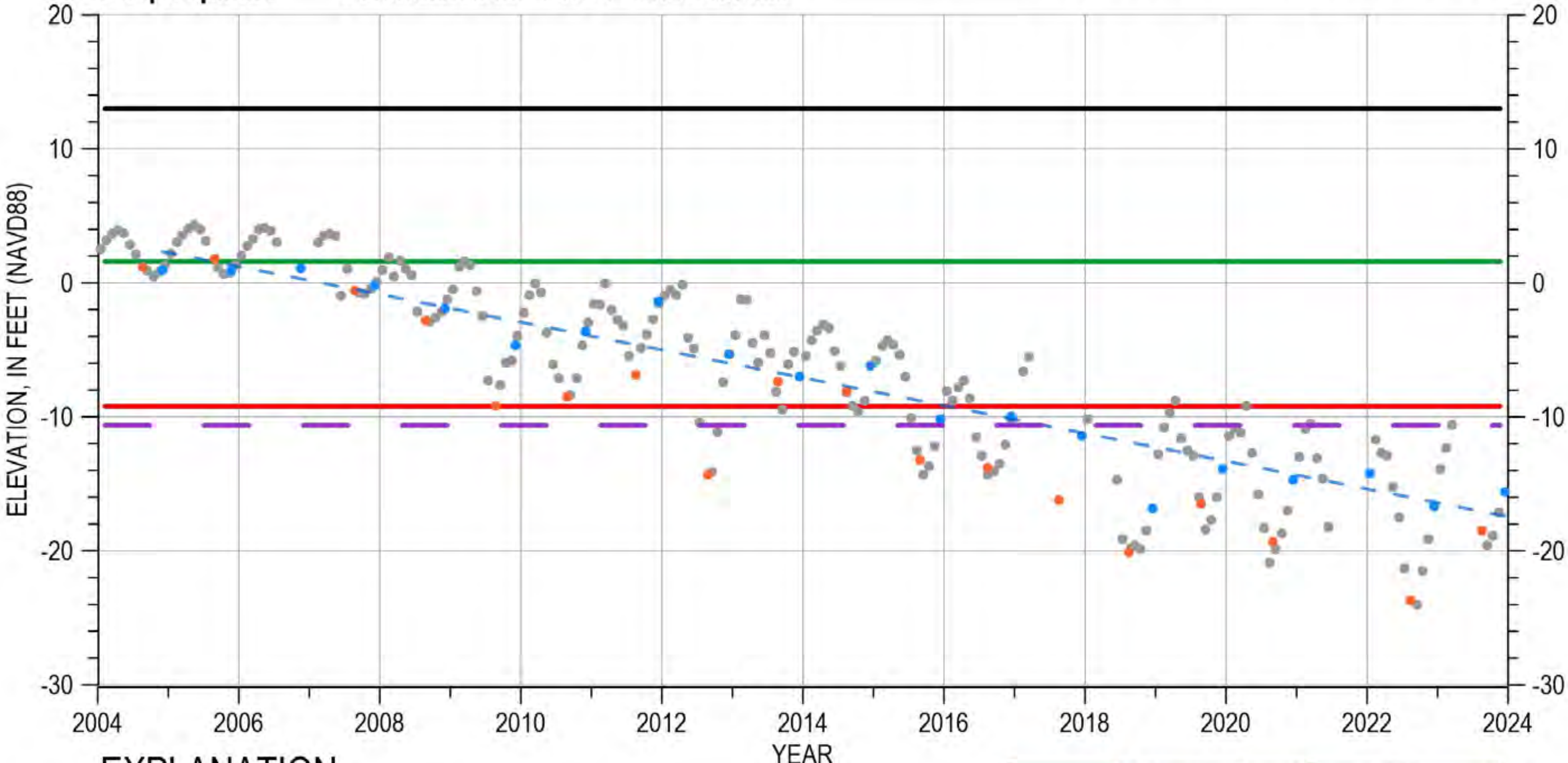
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-32E05

Deep Aquifers Perforated from -756 to -1566 feet msl

20 YEAR TREND HYDROGRAPH



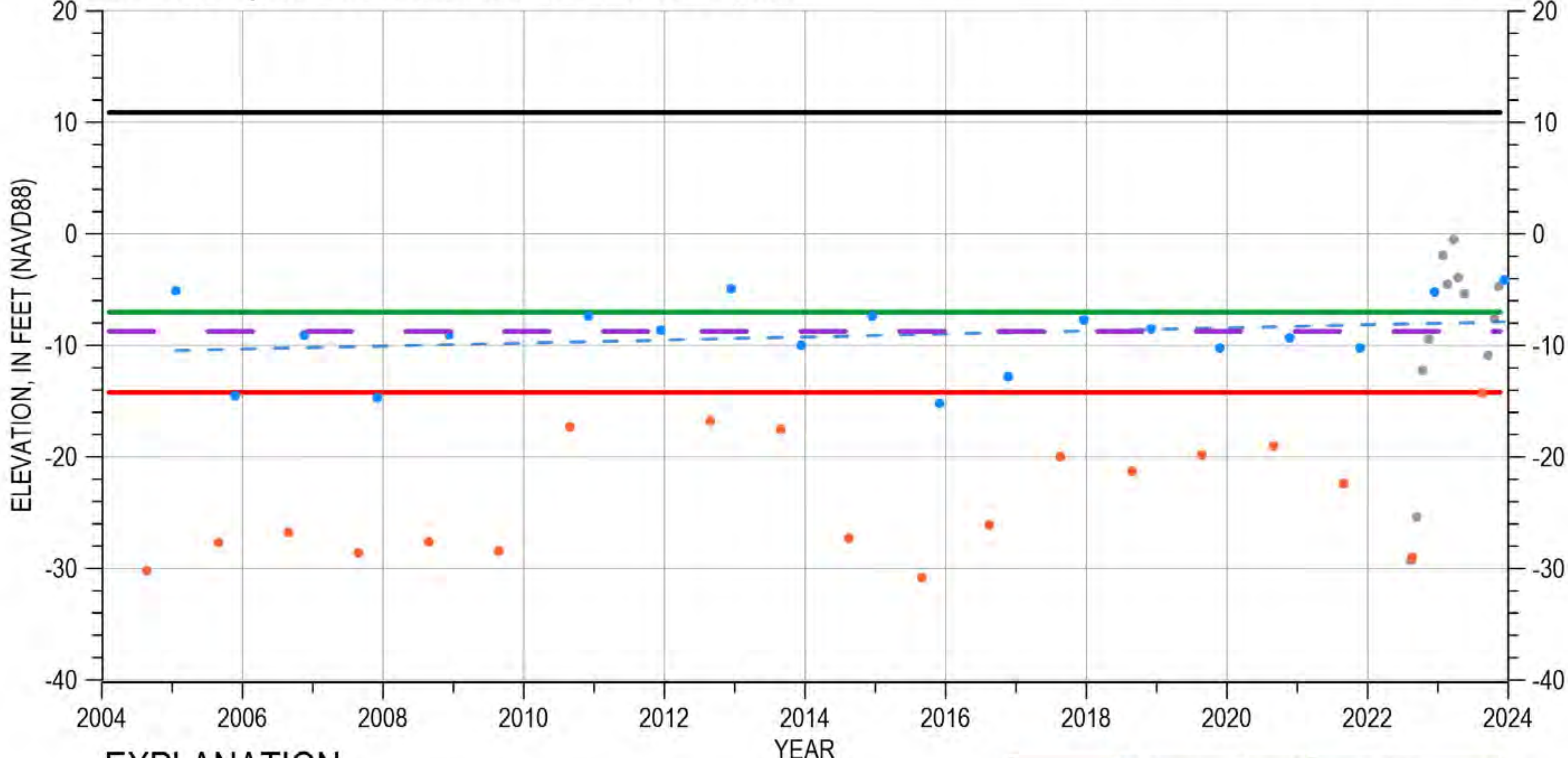
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-32J03

400-Foot Aquifer Perforated from -313.1 to -565.1 ft msl

20 YEAR TREND HYDROGRAPH



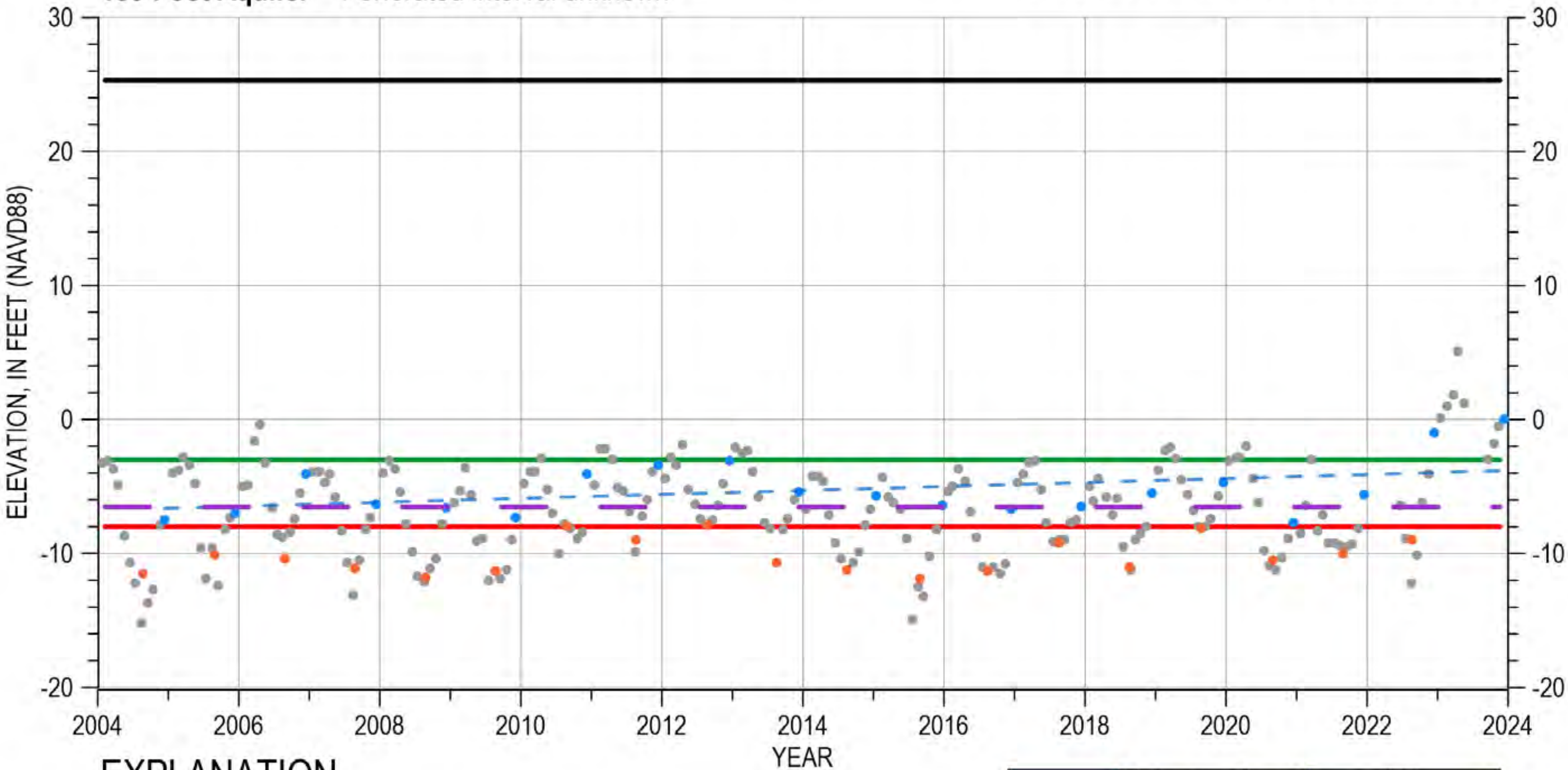
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-33R01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



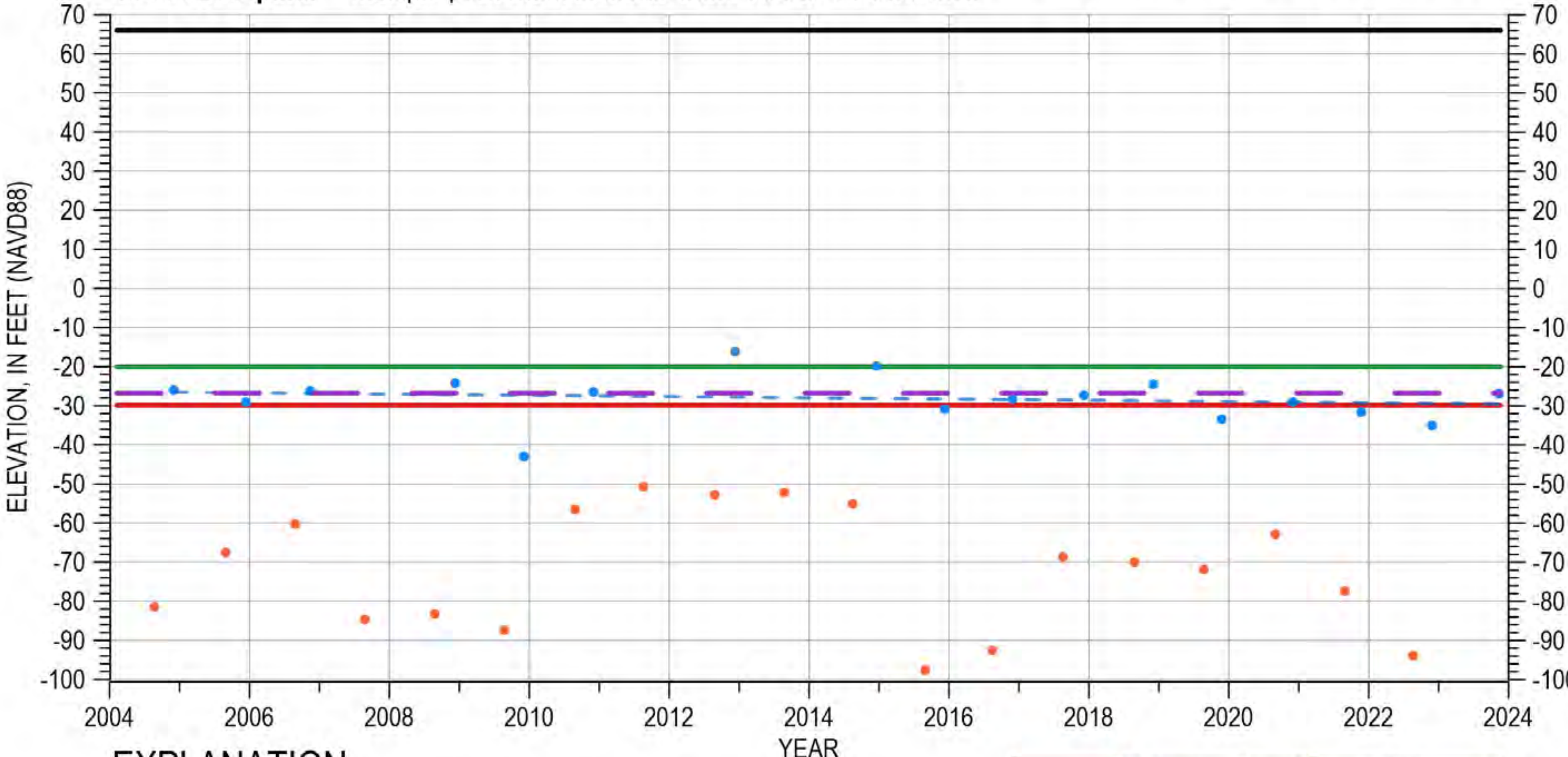
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-02C03

400-Foot Aquifer Multiple perforated intervals from -335 to -775 feet msl

20 YEAR TREND HYDROGRAPH



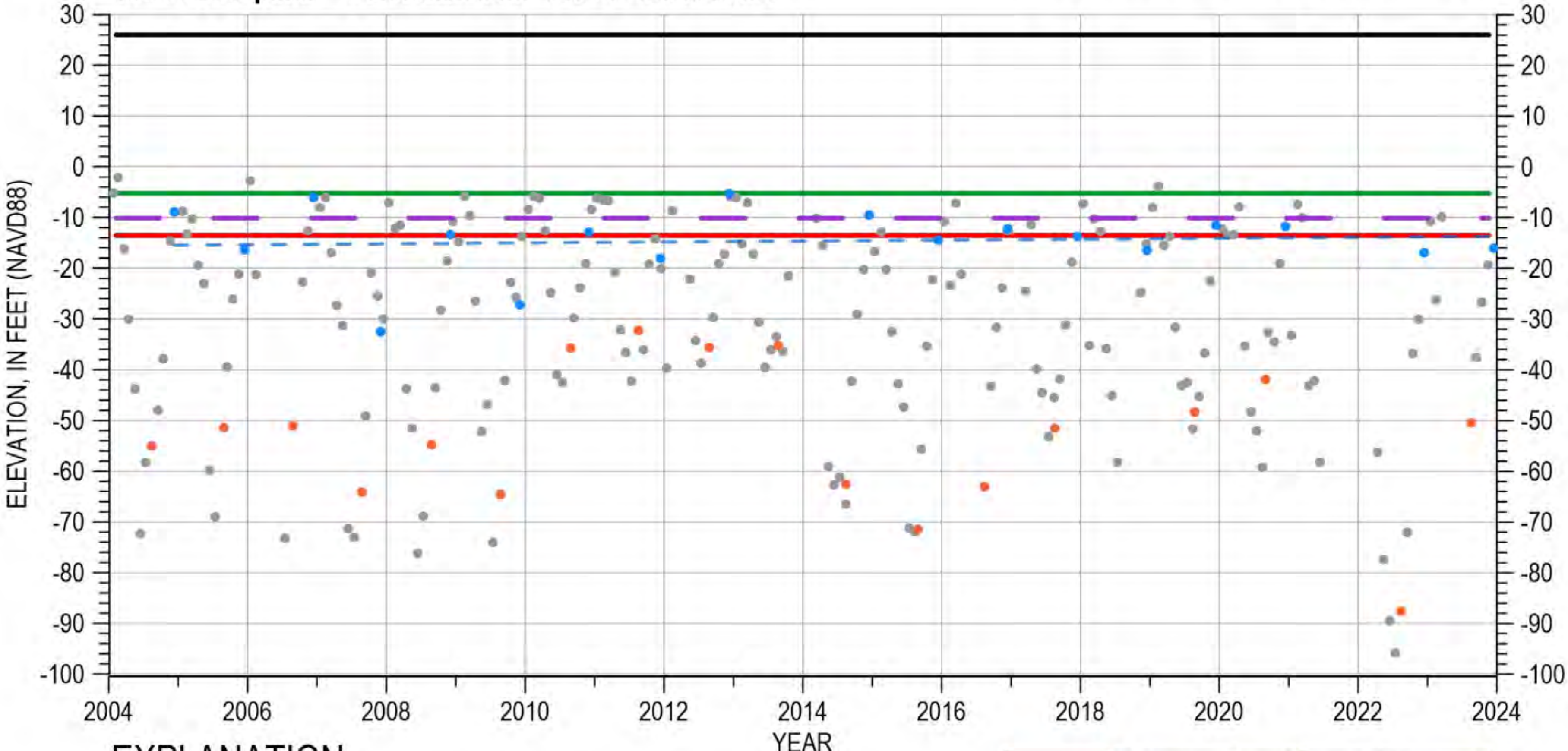
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-03F03

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Perforated from -395 to -425 feet msl



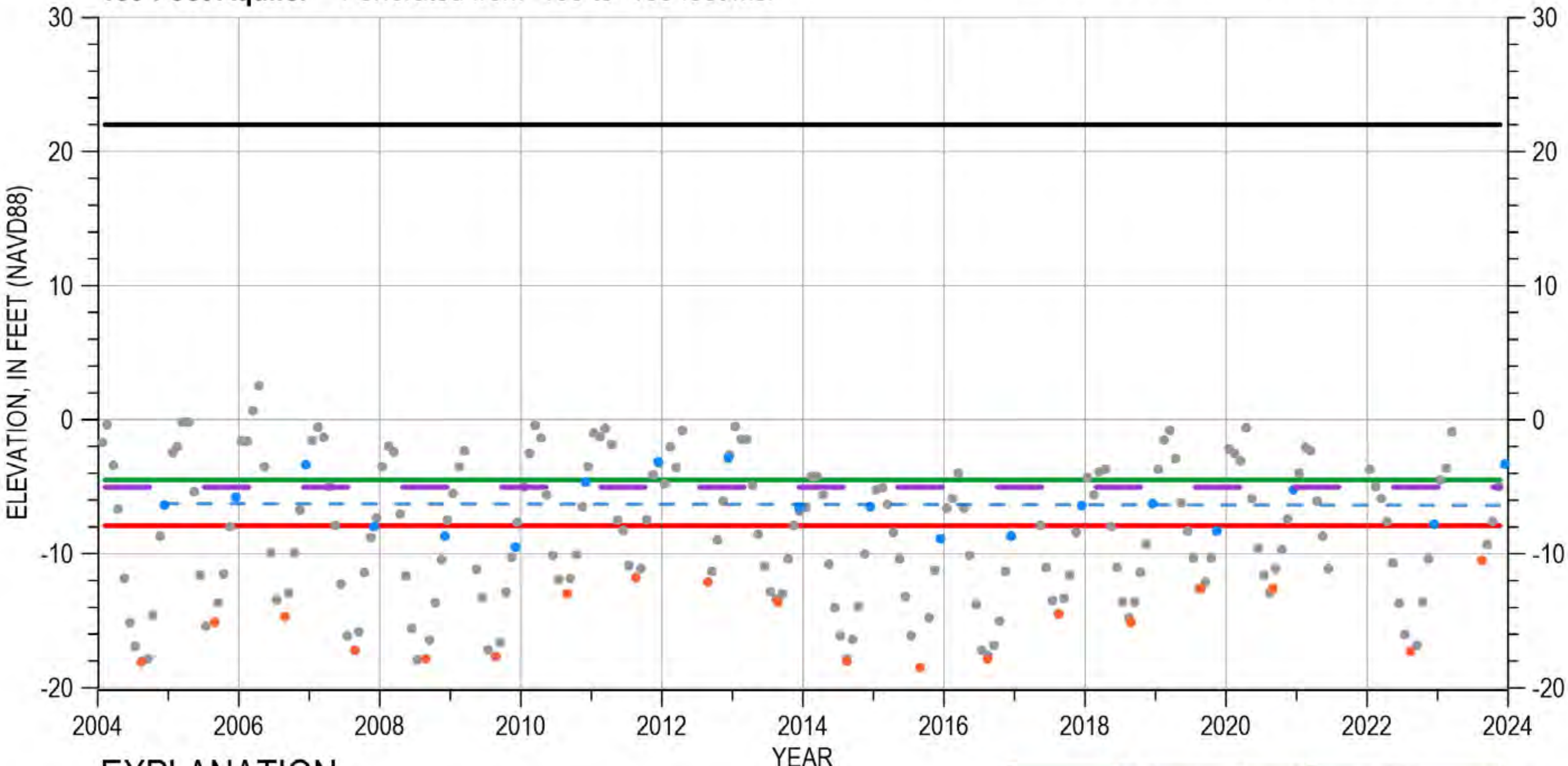
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-03F04

180-Foot Aquifer Perforated from -133 to -183 feet msl

20 YEAR TREND HYDROGRAPH



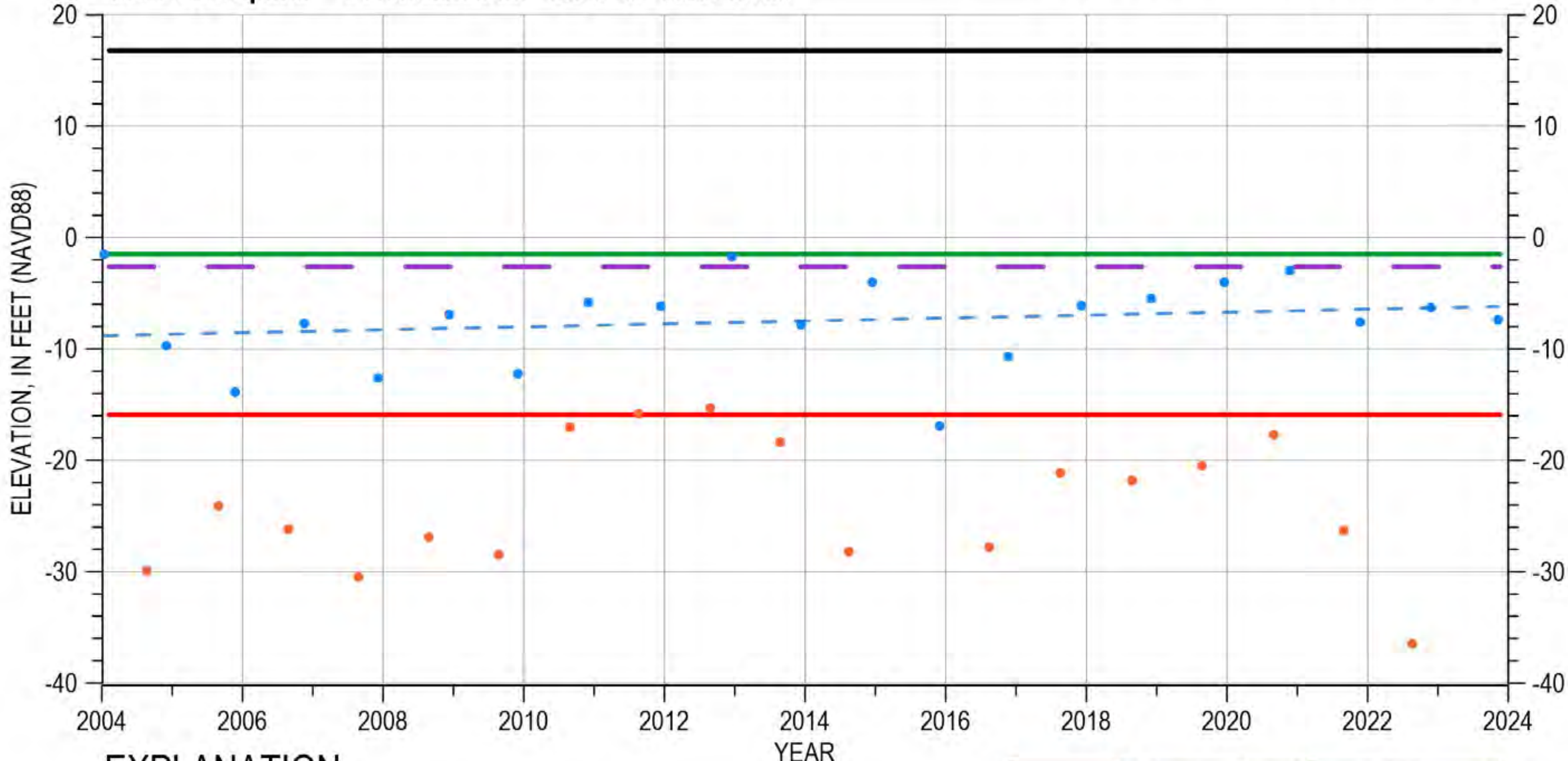
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-05K01

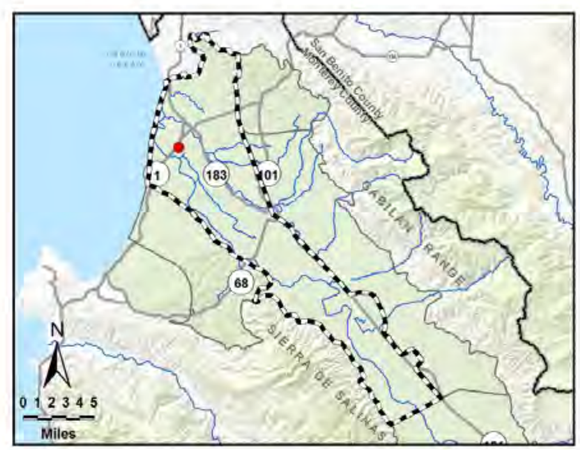
400-Foot Aquifer Perforated from -425.2 to -456.2 ft msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

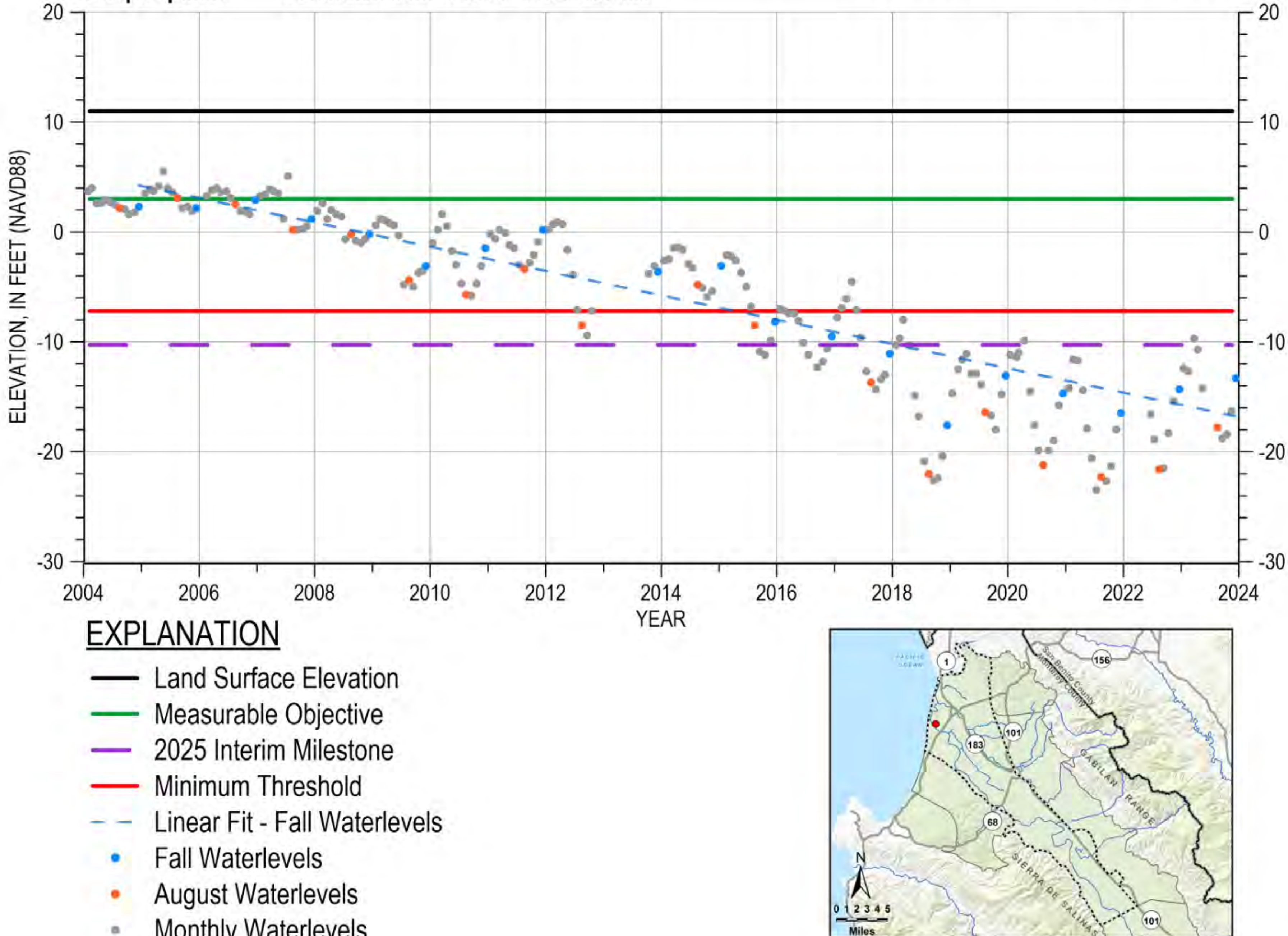
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-06L01

20 YEAR TREND HYDROGRAPH

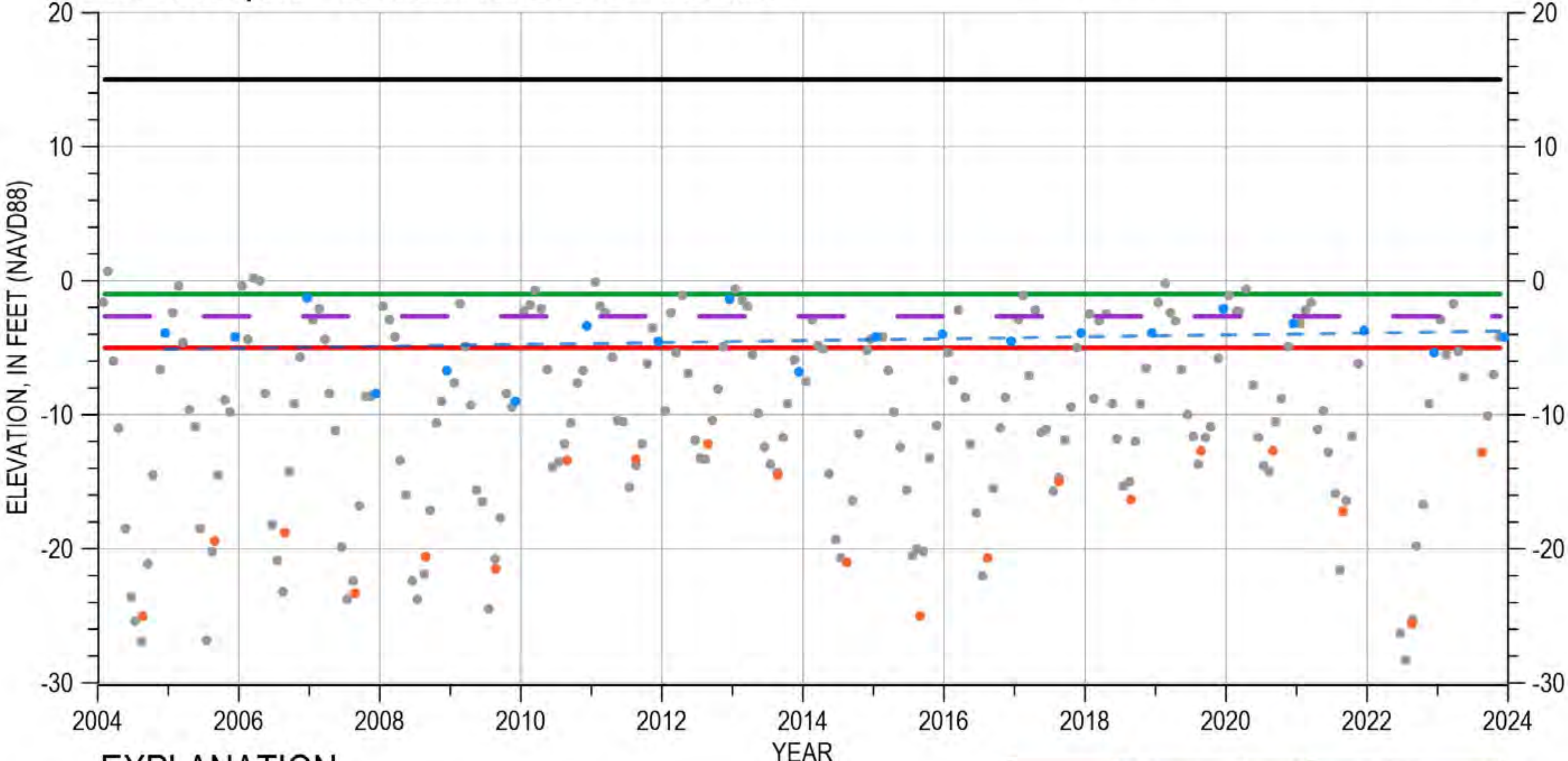
Deep Aquifers Perforated from -852 to -1532 feet msl



14S/02E-08M02

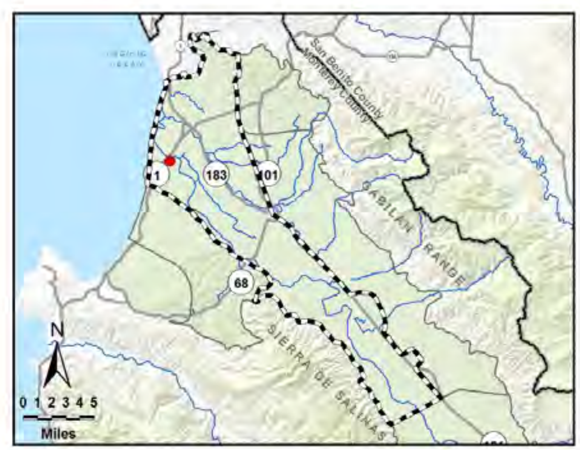
400-Foot Aquifer Perforated from -299 to -441 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

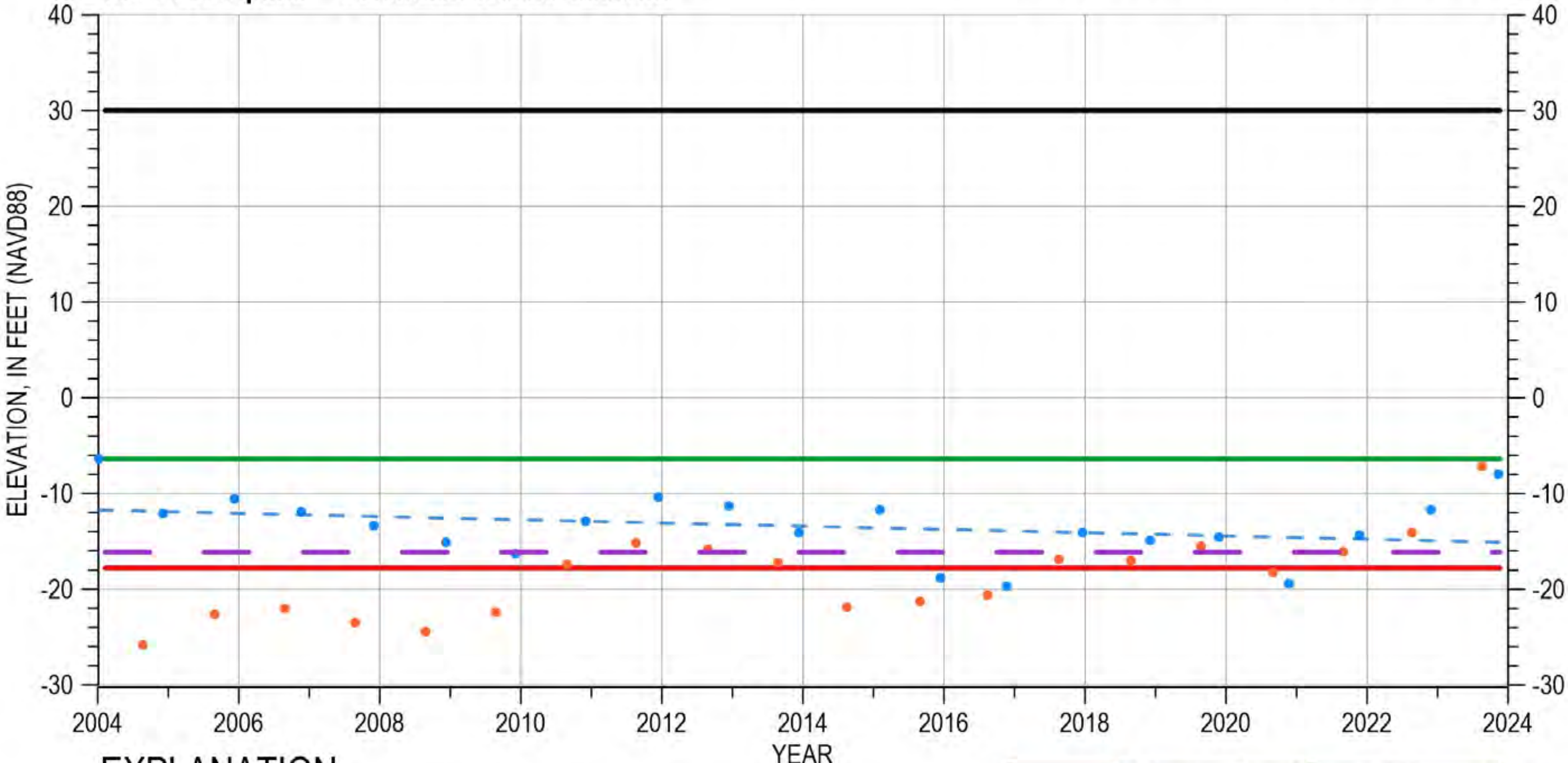
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-10P01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



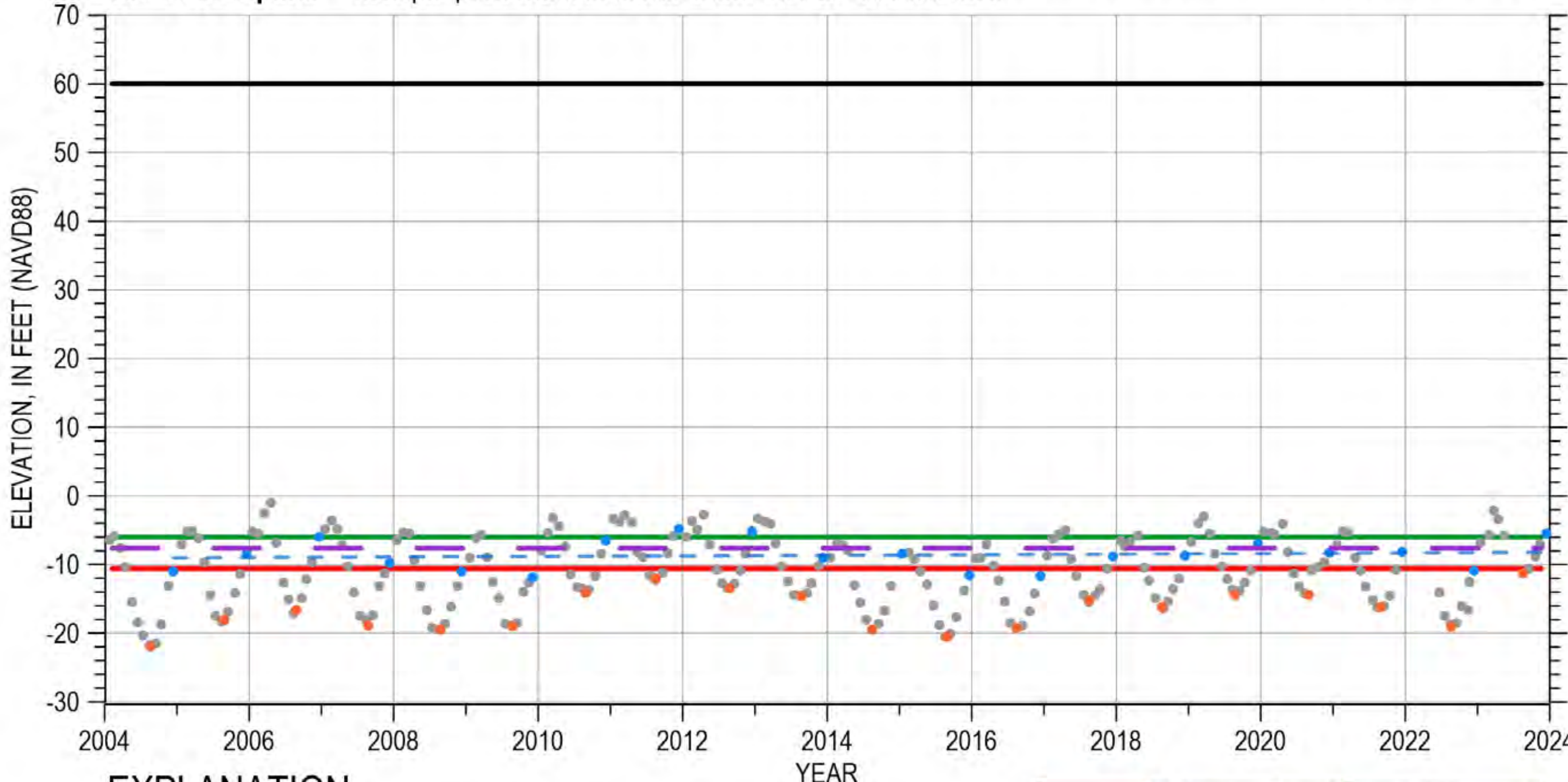
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-11A02

20 YEAR TREND HYDROGRAPH

180-Foot Aquifer Multiple perforated intervals from -131 to -181 feet msl



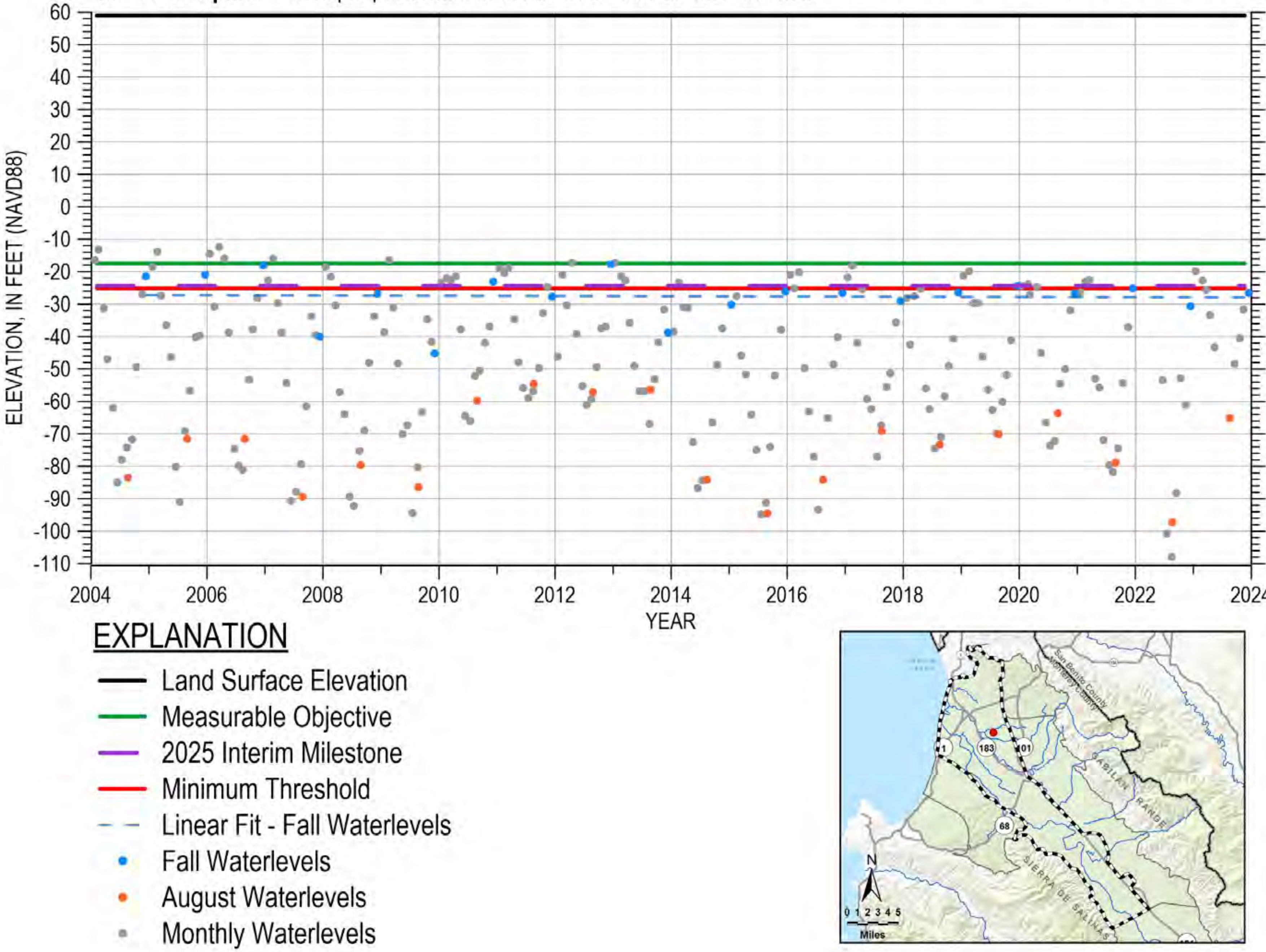
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-11A04

20 YEAR TREND HYDROGRAPH

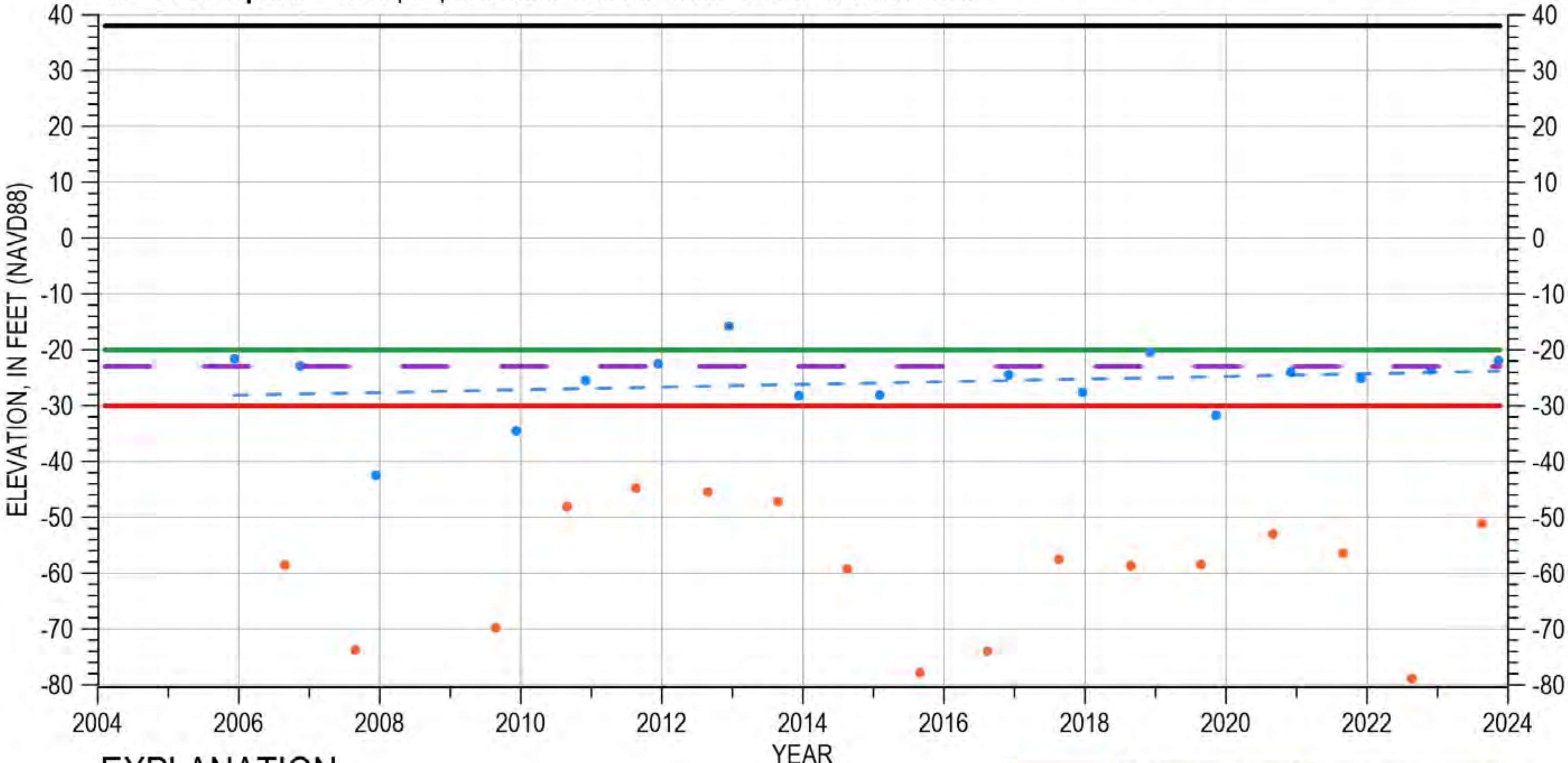
400-Foot Aquifer Multiple perforated intervals from -391 to -421 feet msl



14S/02E-11M03

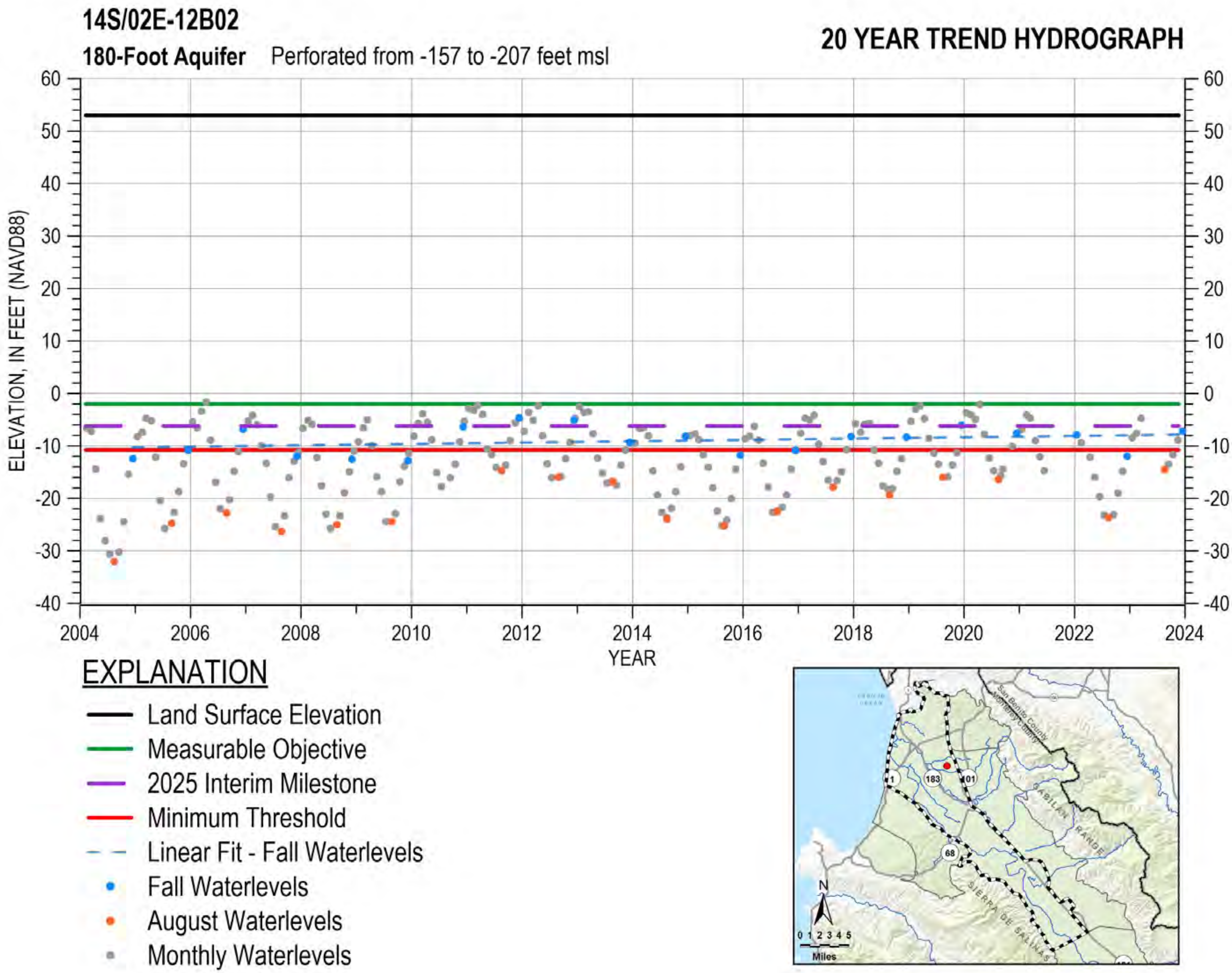
20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -358 to -618 feet msl



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

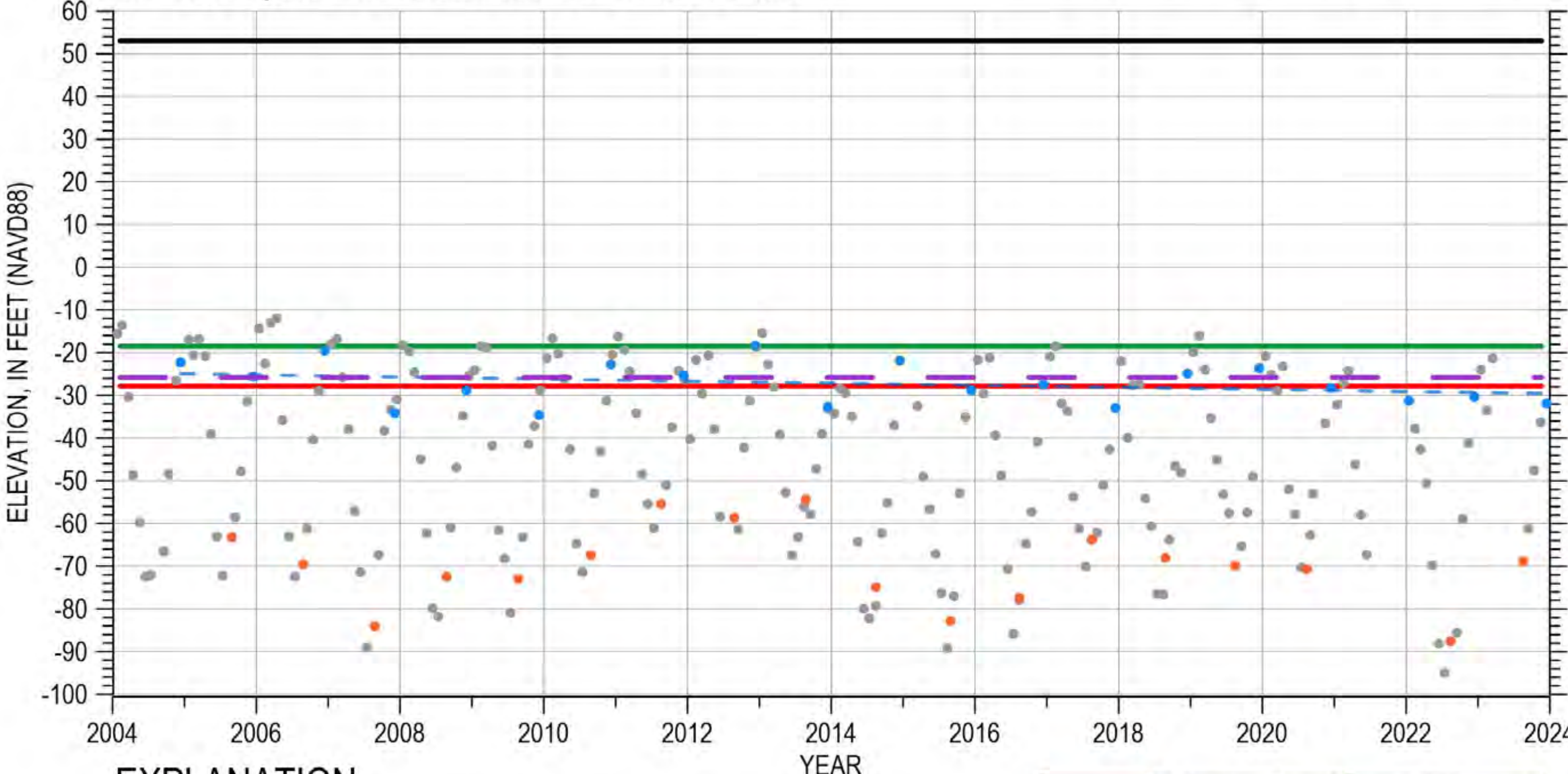


14S/02E-12B02
180-Foot Aquifer Perforated from -157 to -207 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
60
50
40
30
20
10
0
-10
-20
-30
-40
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
183
101
1
68
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

14S/02E-12B03

400-Foot Aquifer Perforated from -297 to -327 feet msl

20 YEAR TREND HYDROGRAPH



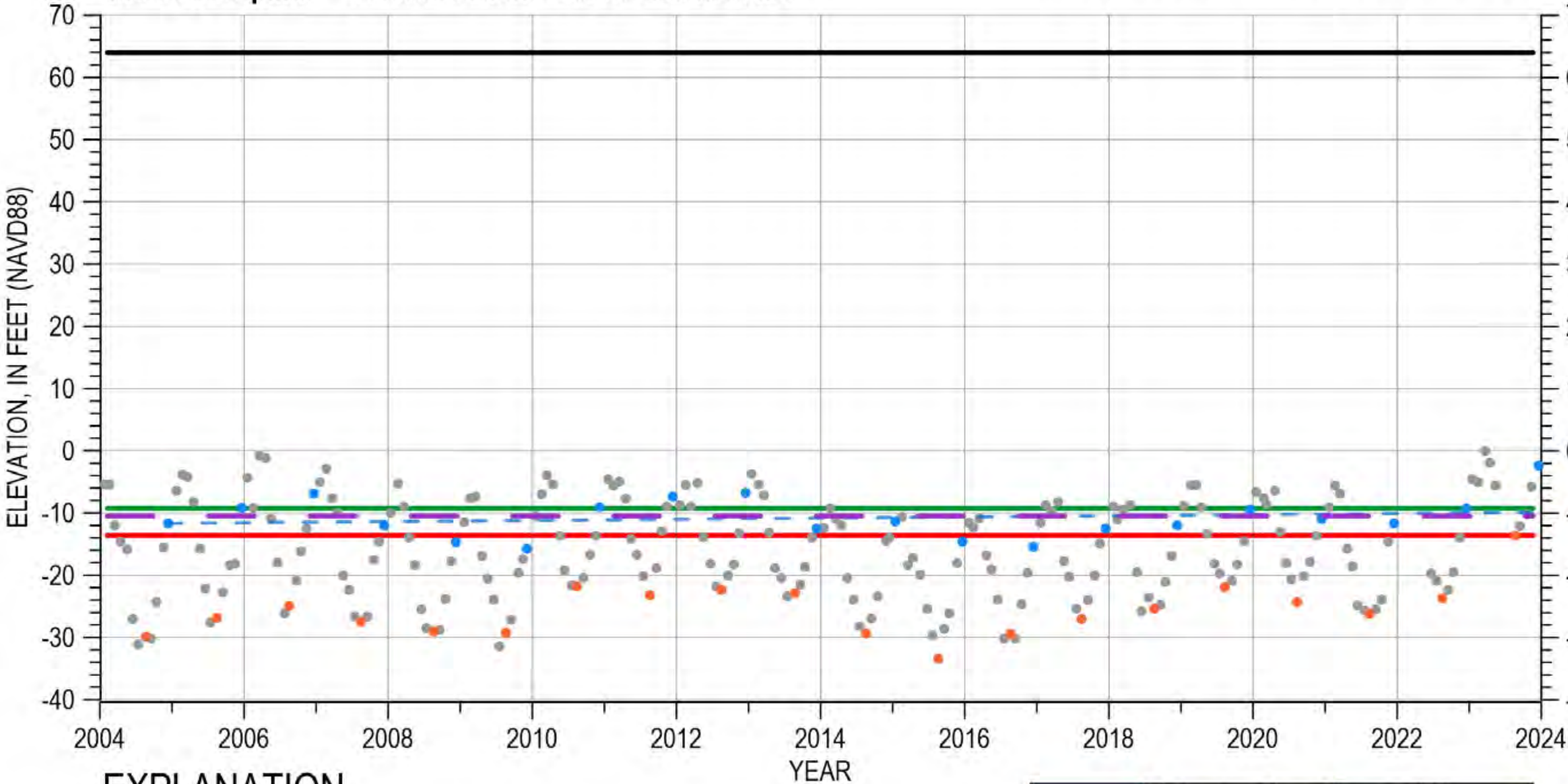
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-12Q01

400-Foot Aquifer Perforated from -209 to -228 feet msl

20 YEAR TREND HYDROGRAPH



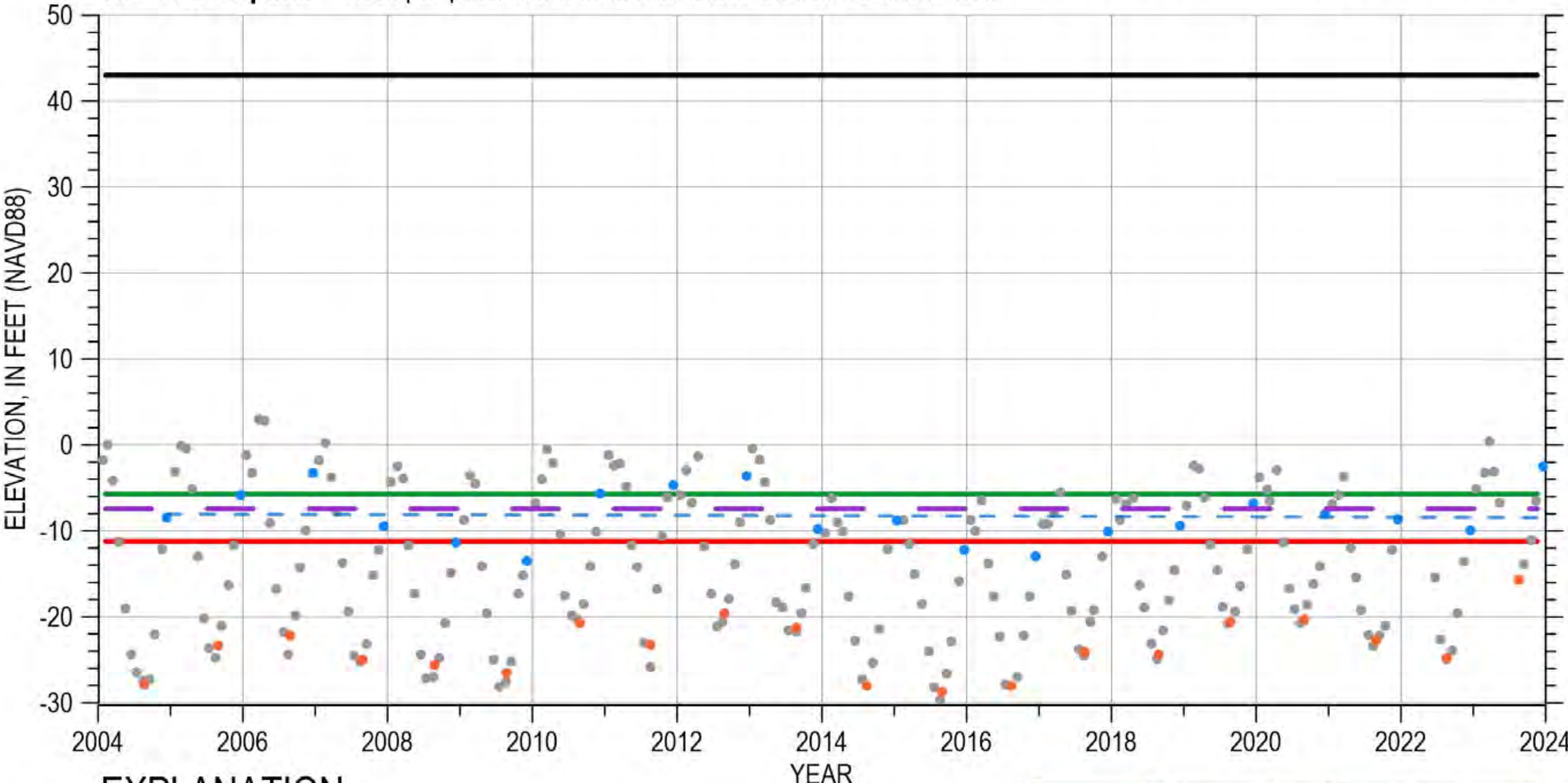
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-13F03

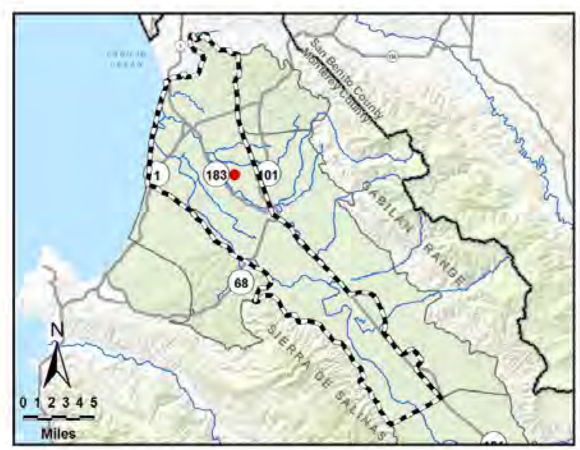
180-Foot Aquifer Multiple perforated intervals from -185 to -225 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

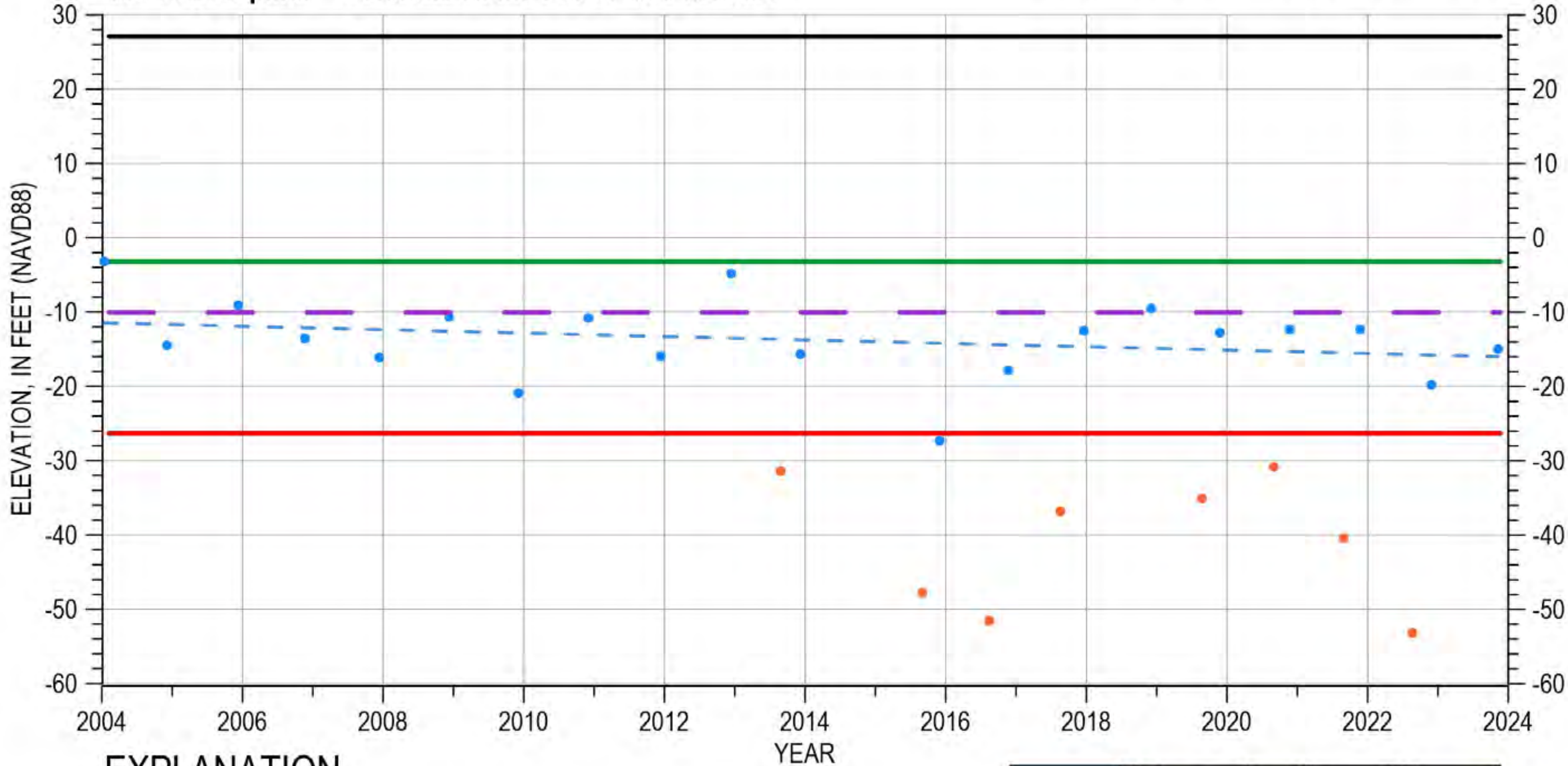
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-15K01

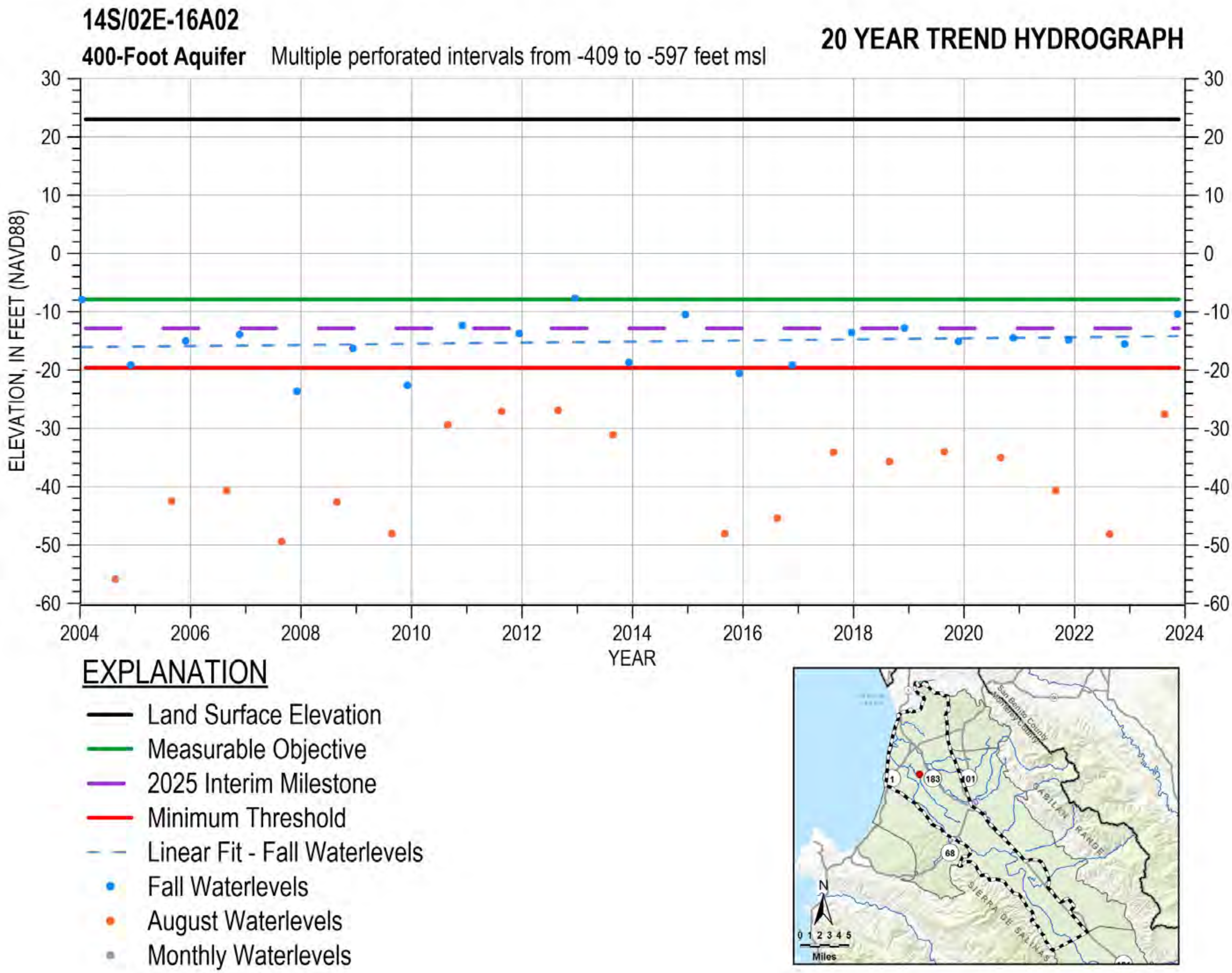
400-Foot Aquifer Perforated from -273 to -573 feet msl

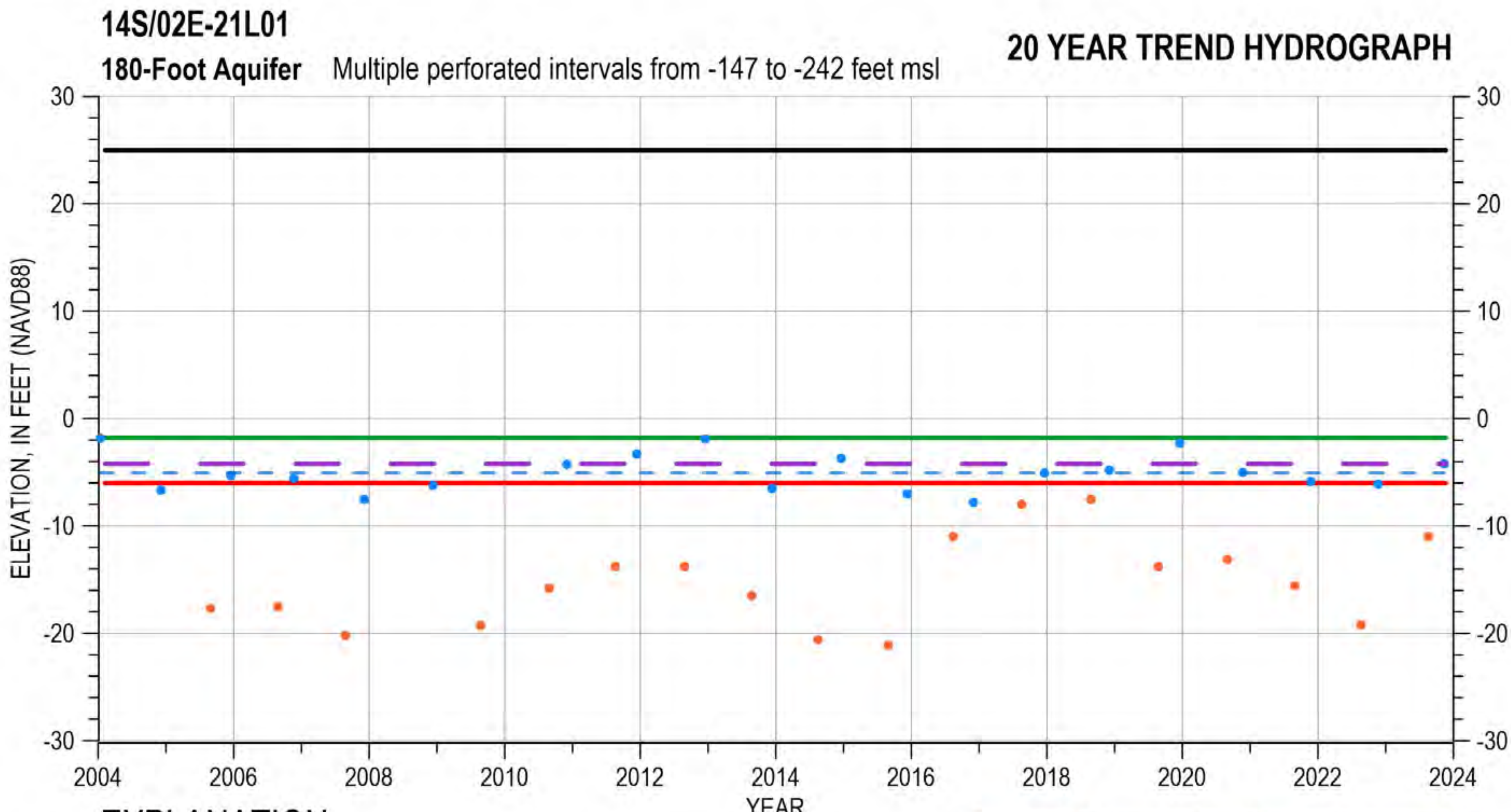
20 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels


14S/02E-16A02
400-Foot Aquifer Multiple perforated intervals from -409 to -597 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
GABILAN RANGE
SIERRA DE SALINAS
Miles

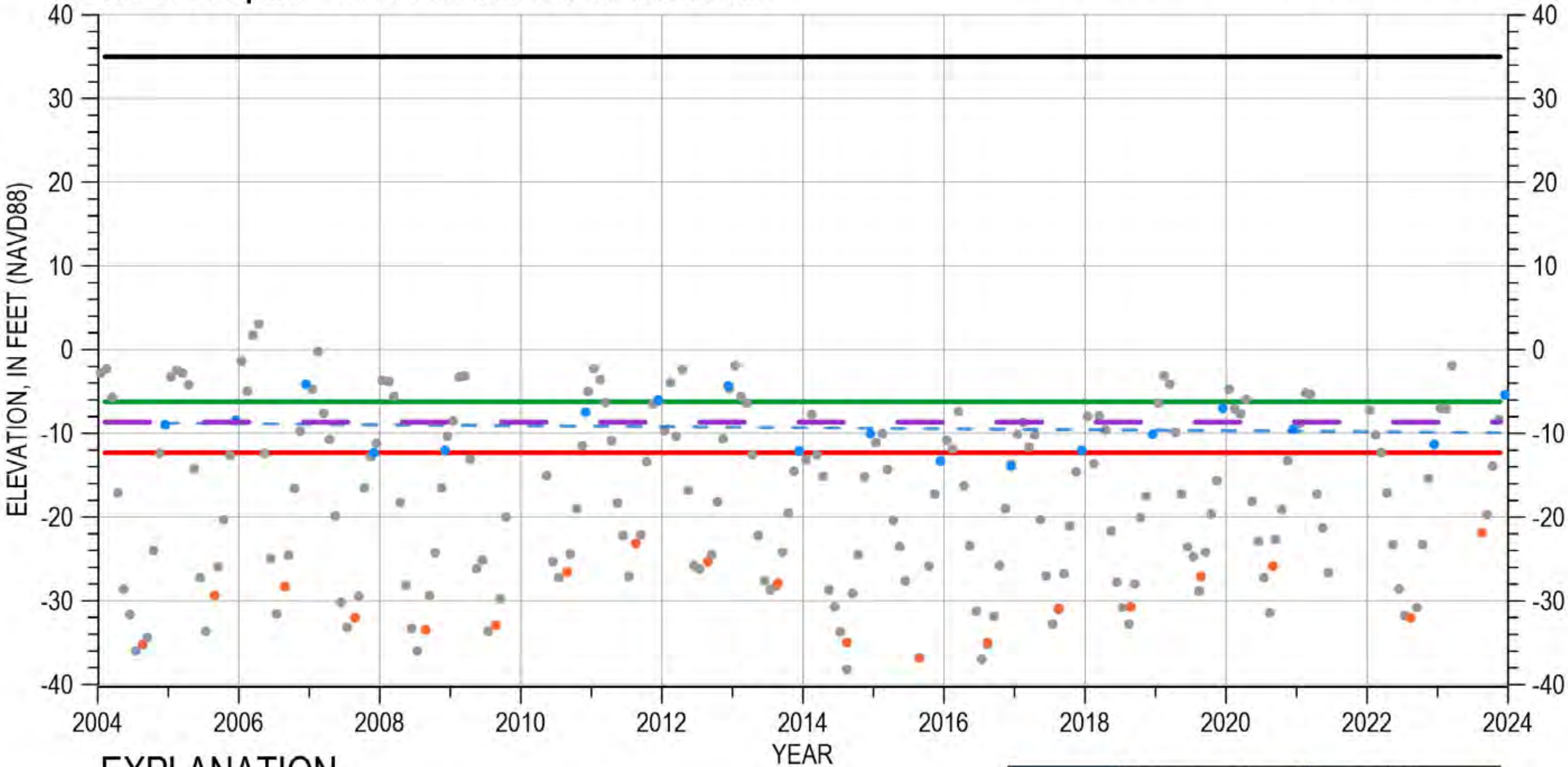

14S/02E-21L01
180-Foot Aquifer Multiple perforated intervals from -147 to -242 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
30
20
10
0
-10
-20
-30
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels


San Benito County
Monterey County
GABILAN RANGE
SIERRA DE SALINAS
1
183
101
68
N
0 1 2 3 4 5
Miles

14S/02E-26H01

180-Foot Aquifer Perforated from -252 to -302 feet msl

20 YEAR TREND HYDROGRAPH



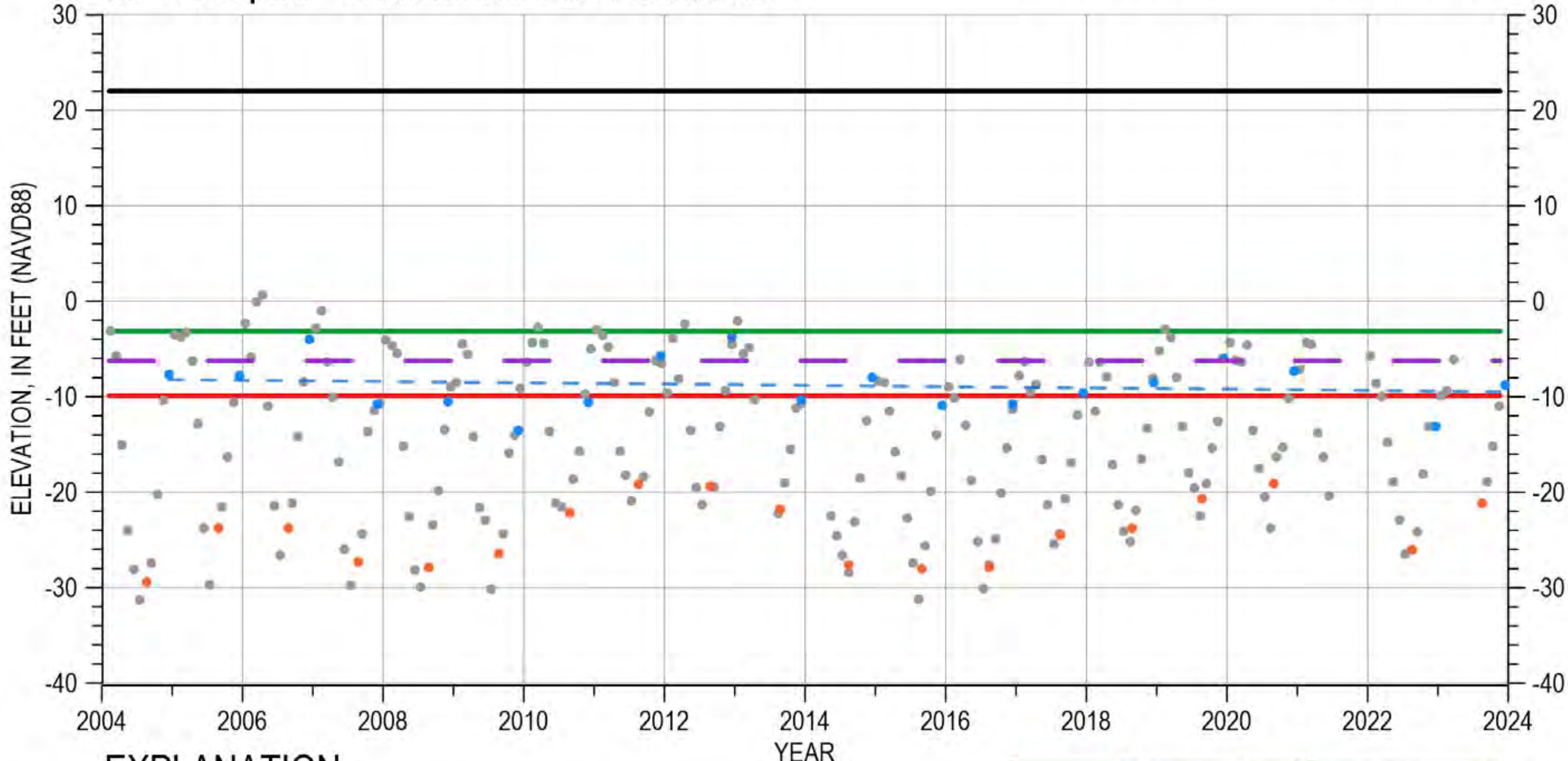
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-27A01

180-Foot Aquifer Perforated from -218 to -268 feet msl

20 YEAR TREND HYDROGRAPH



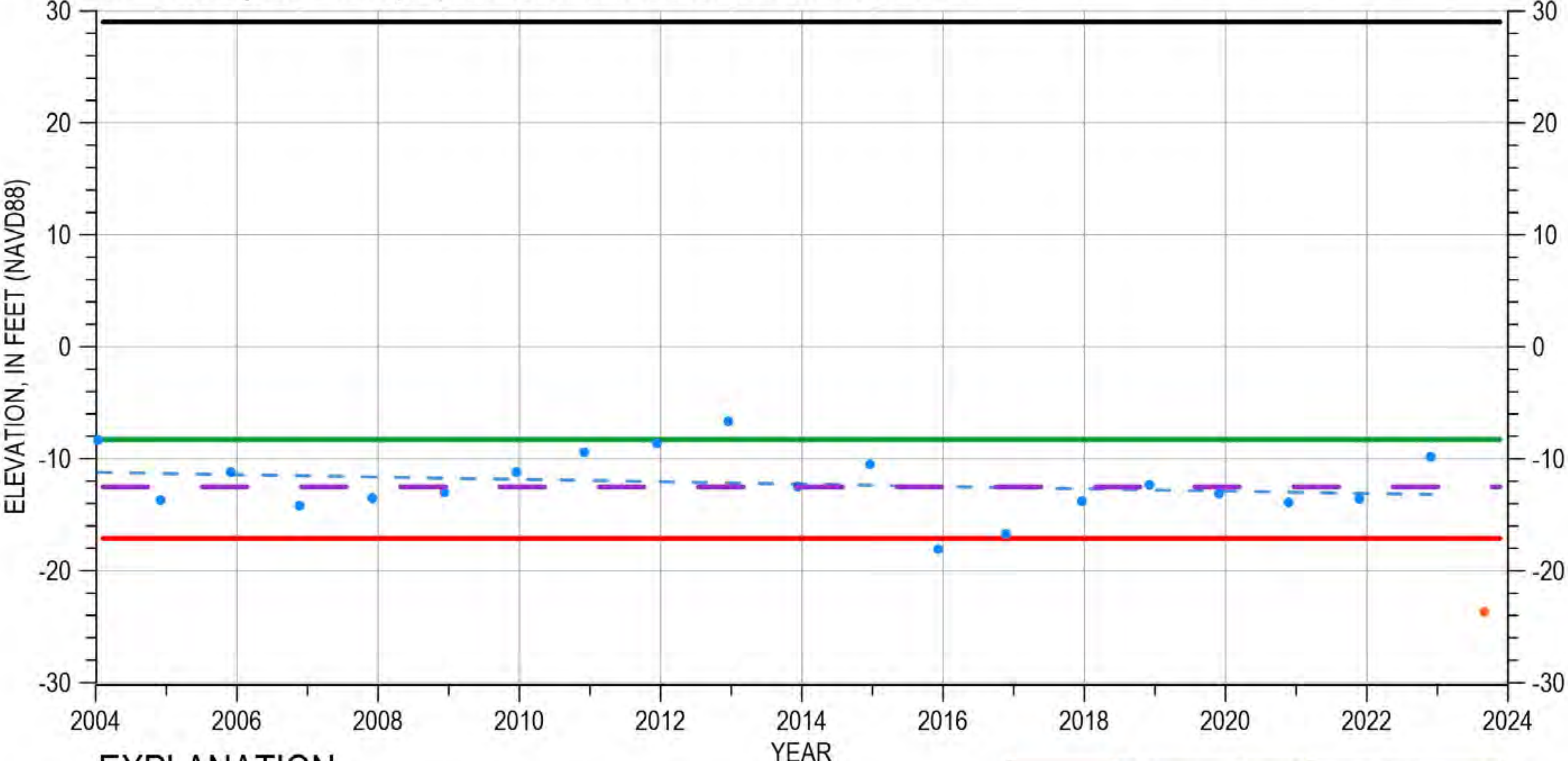
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-27G03

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -250 to -342 feet msl



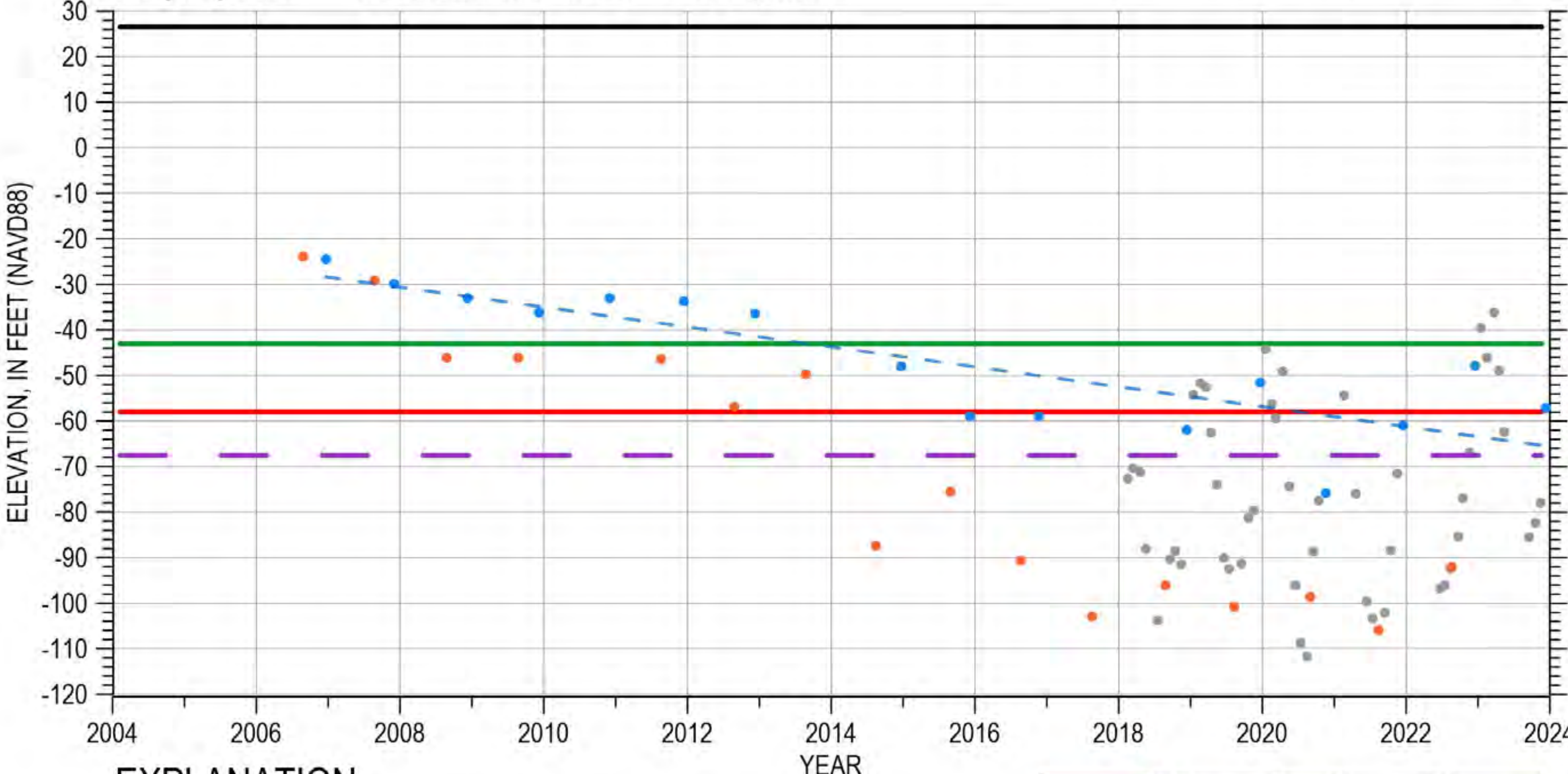
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

14S/02E-28H04

20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -914 to -1143 feet msl



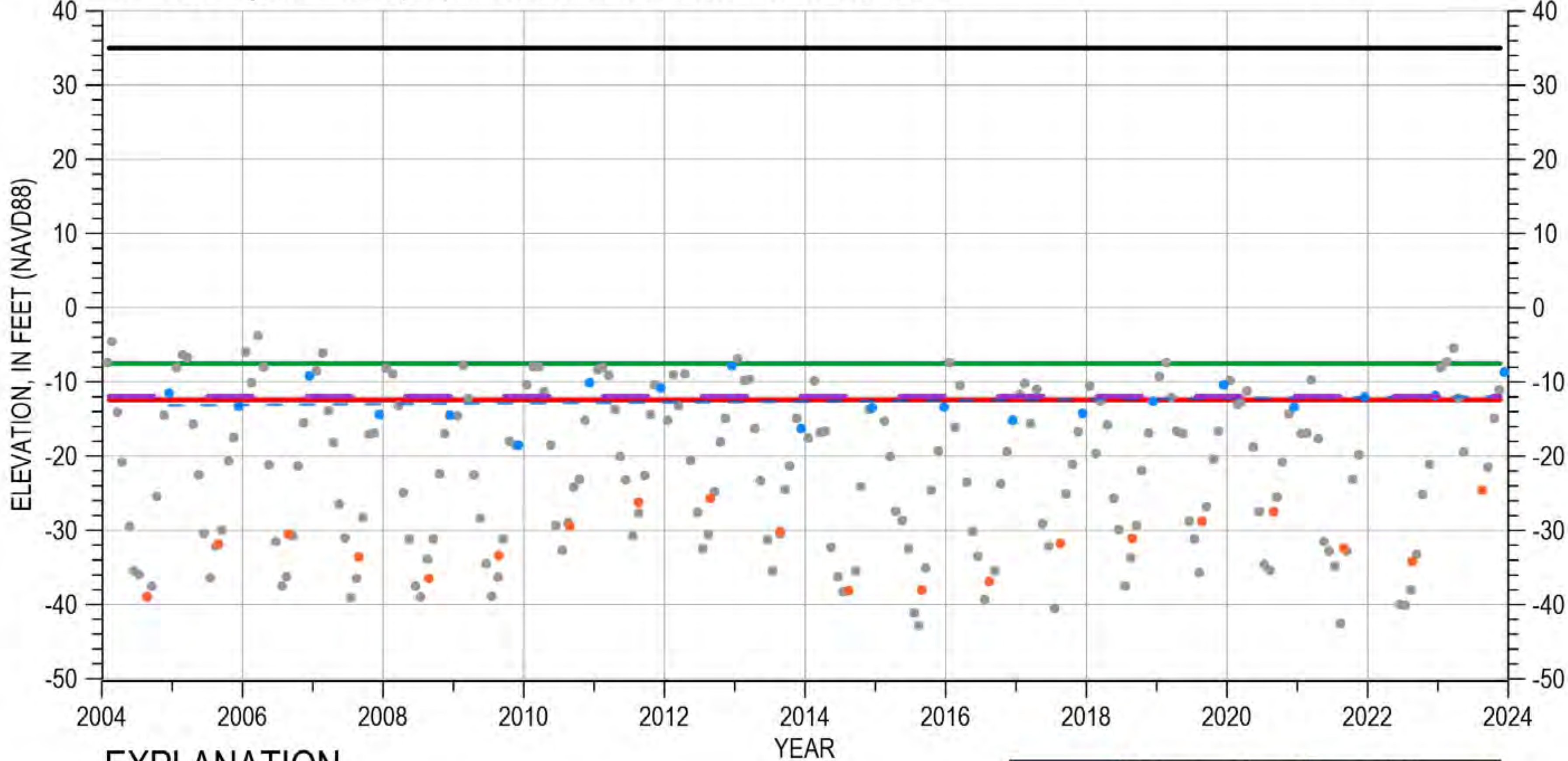
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-34A03

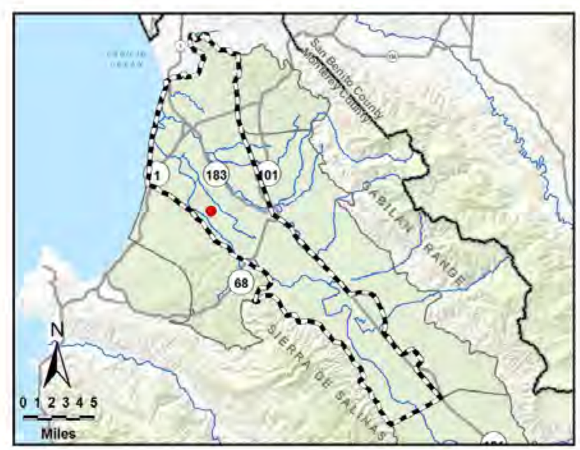
400-Foot Aquifer Multiple perforated intervals from -457 to -587 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

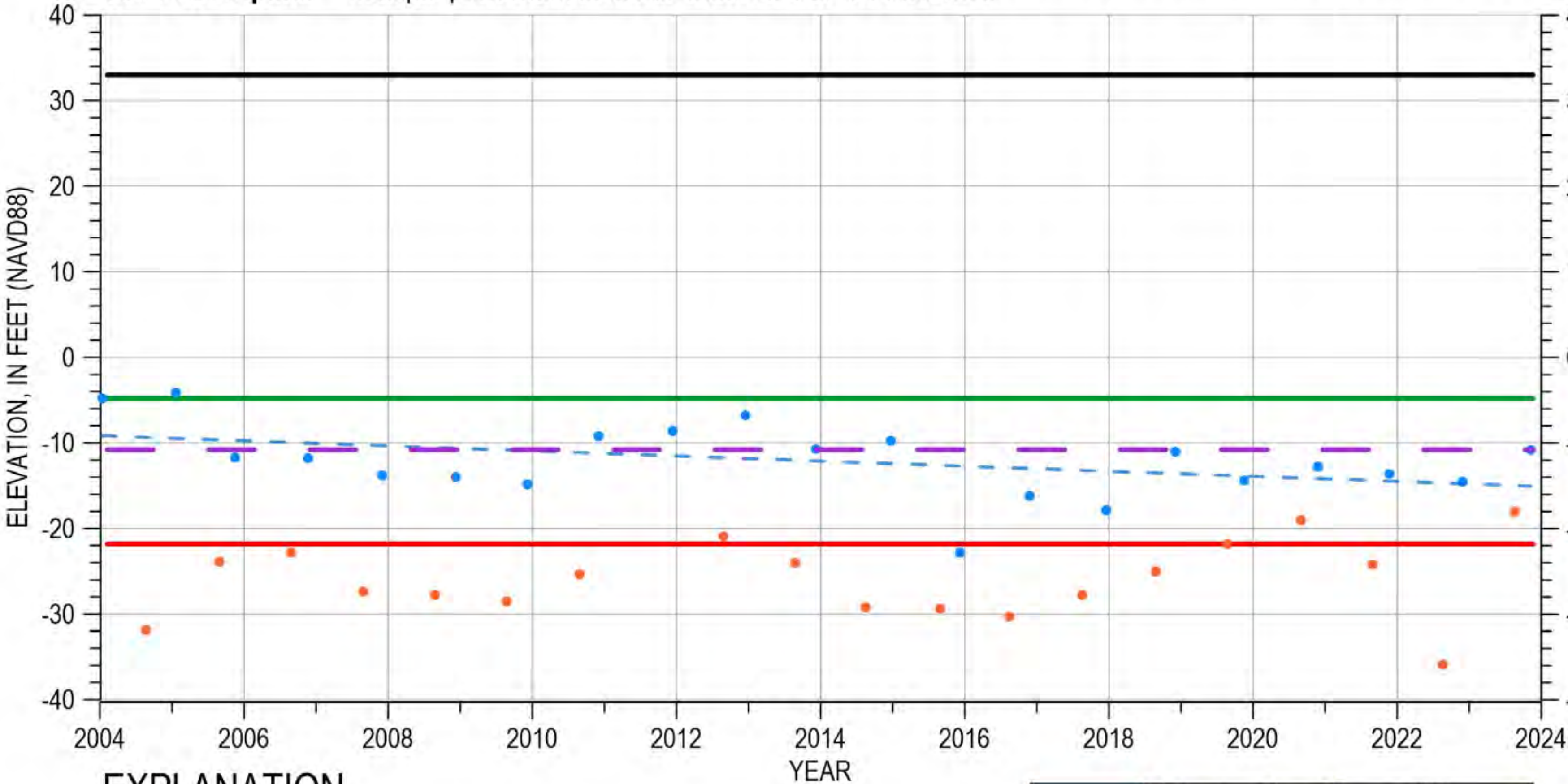
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-34B03

180-Foot Aquifer Multiple perforated intervals from -275 to -313 feet msl

20 YEAR TREND HYDROGRAPH



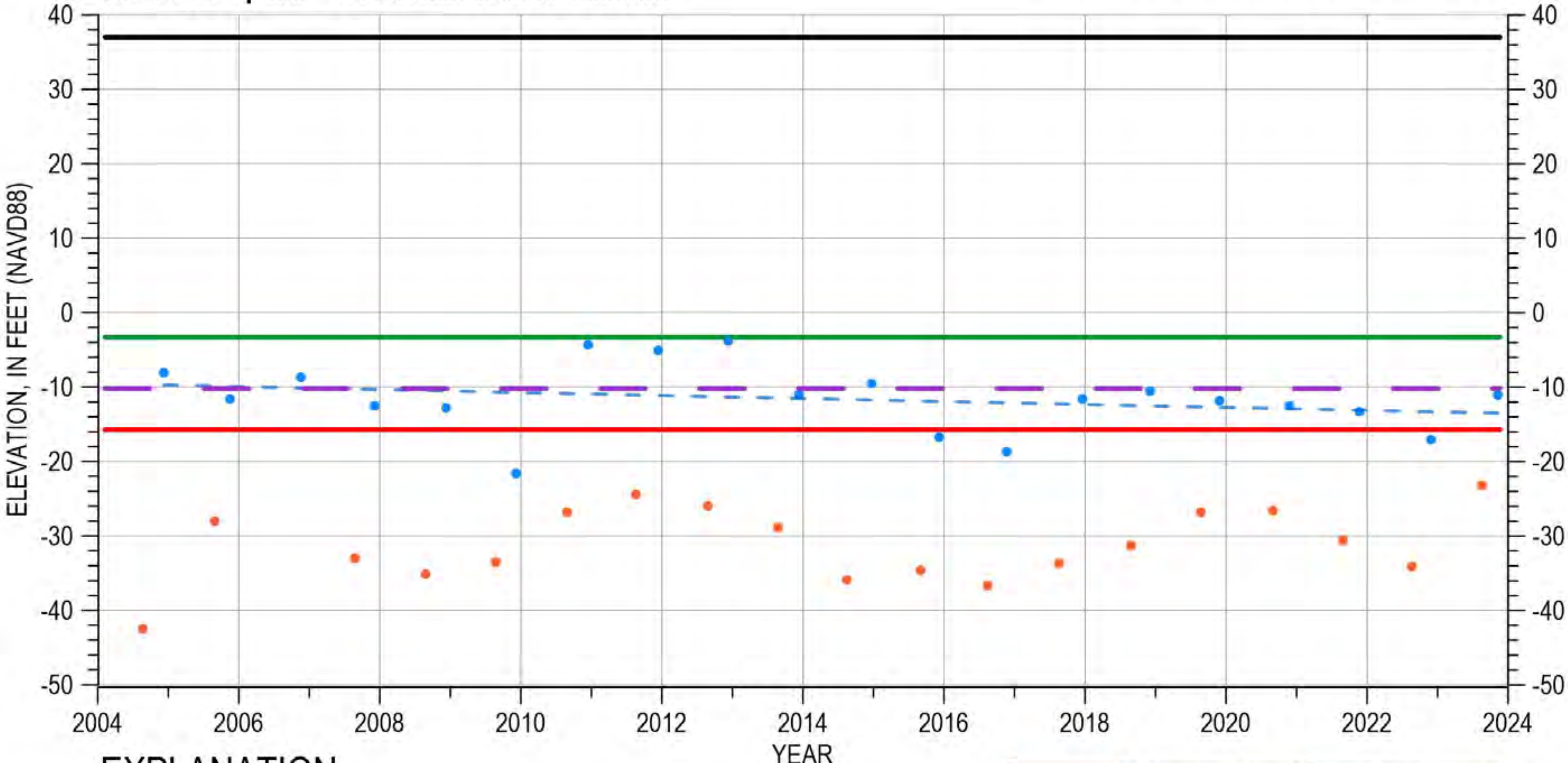
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-36E01

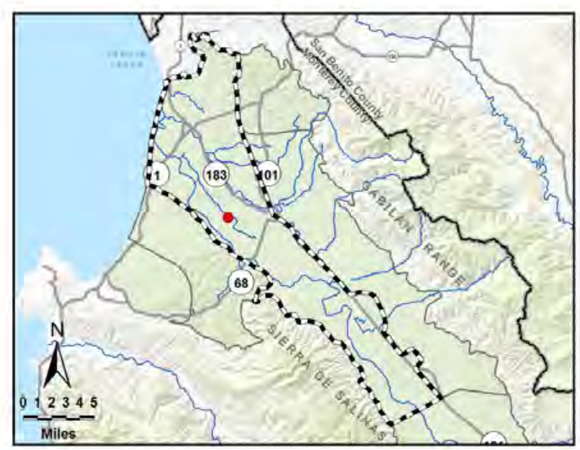
180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



EXPLANATION

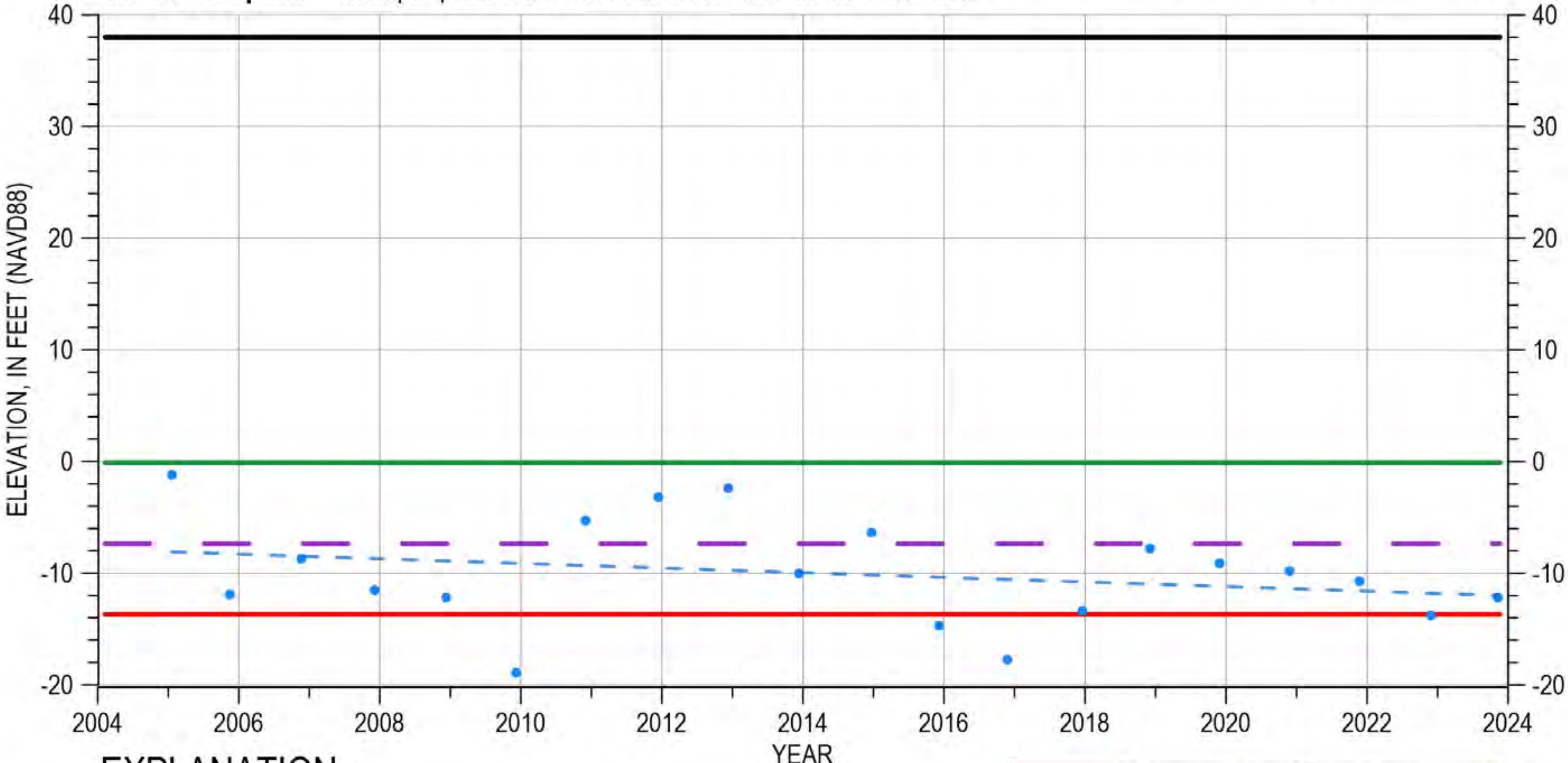
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-36G01

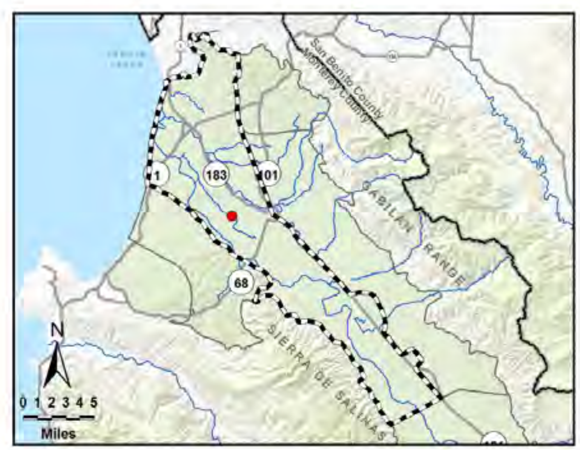
400-Foot Aquifer Multiple perforated intervals from -301 to -375 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

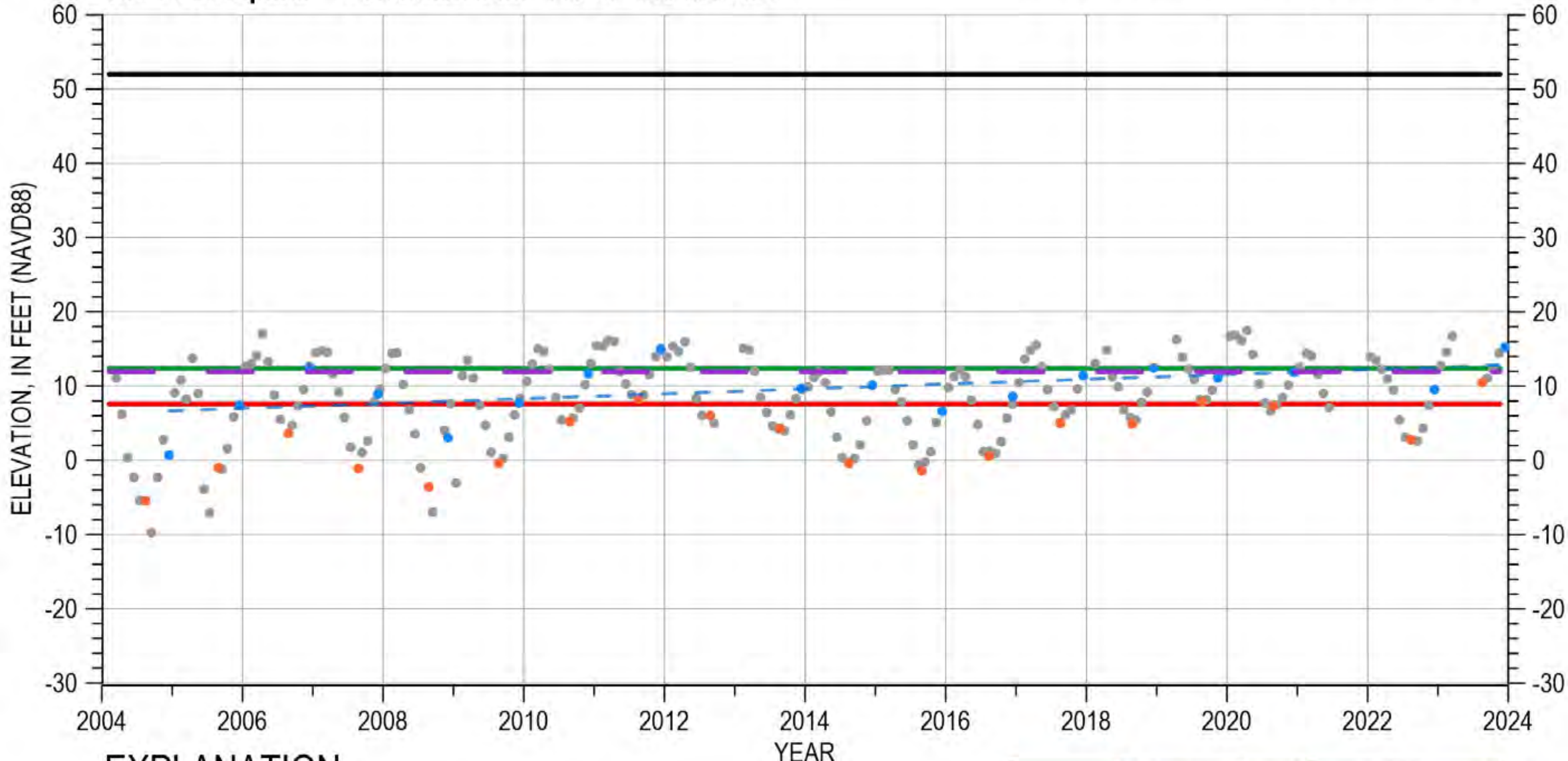
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels



14S/03E-18C01

180-Foot Aquifer Perforated from -113 to -163 feet msl

20 YEAR TREND HYDROGRAPH



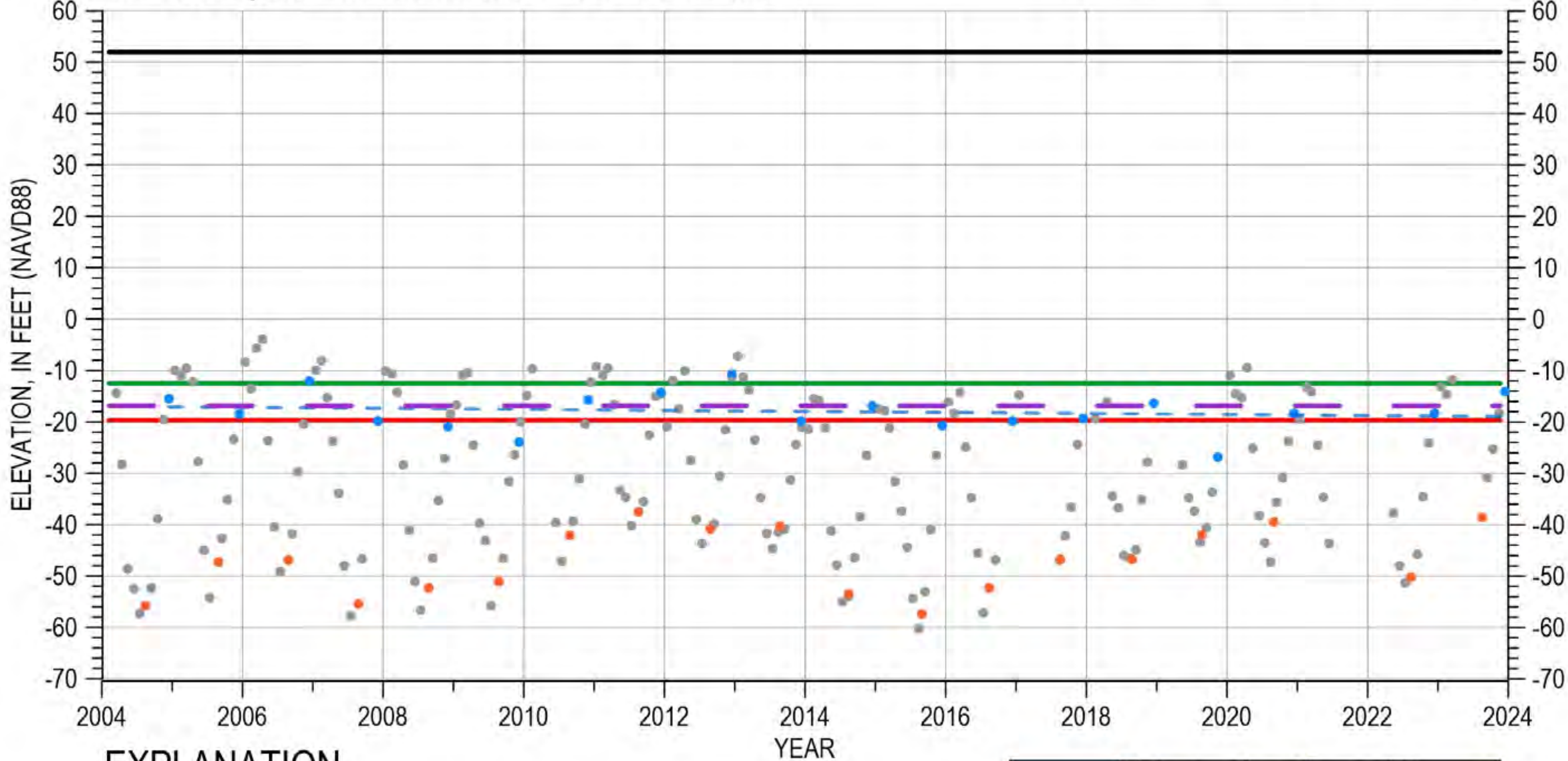
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-18C02

400-Foot Aquifer Perforated from -218 to -333 feet msl

20 YEAR TREND HYDROGRAPH



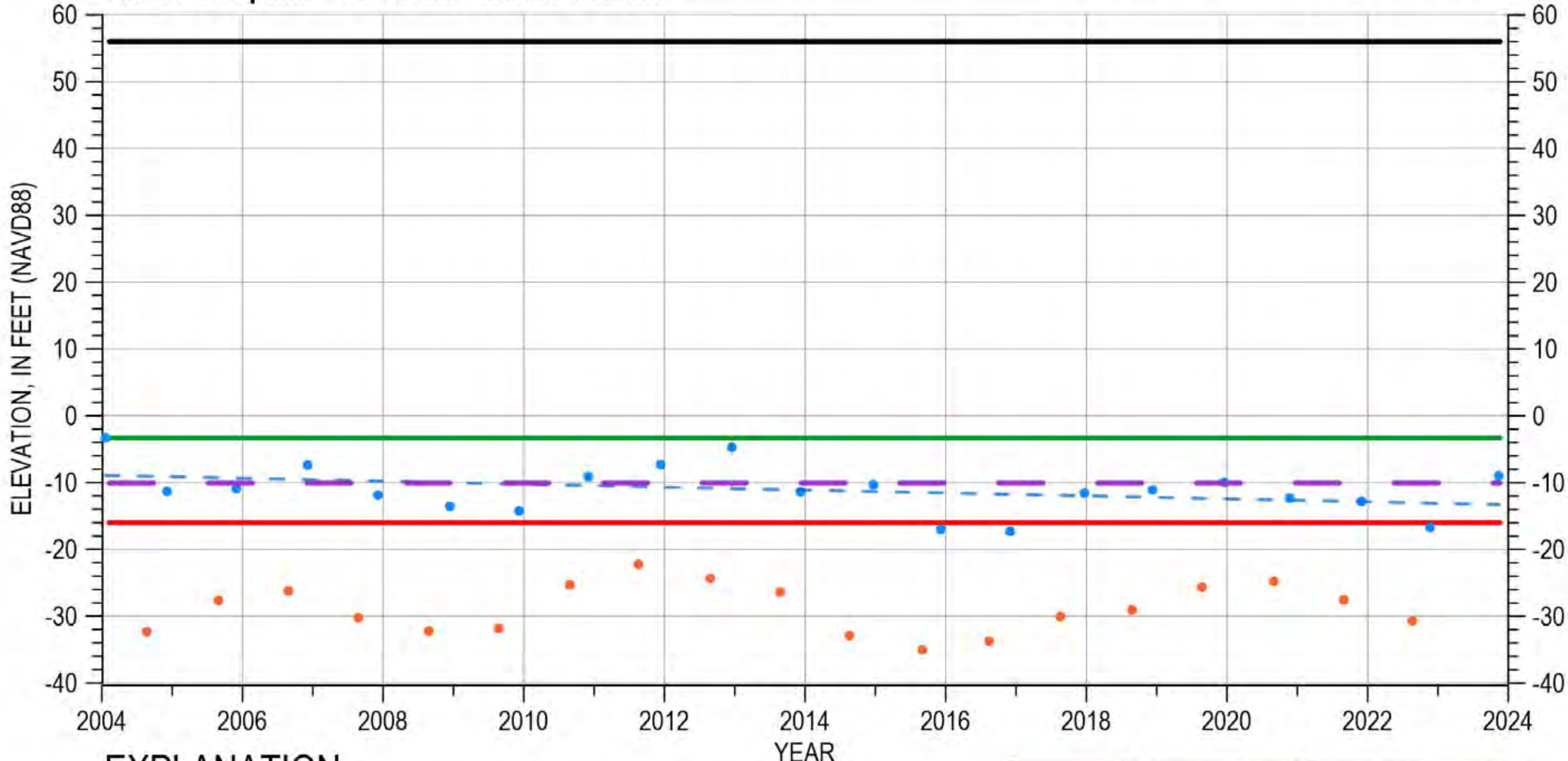
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-19G01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



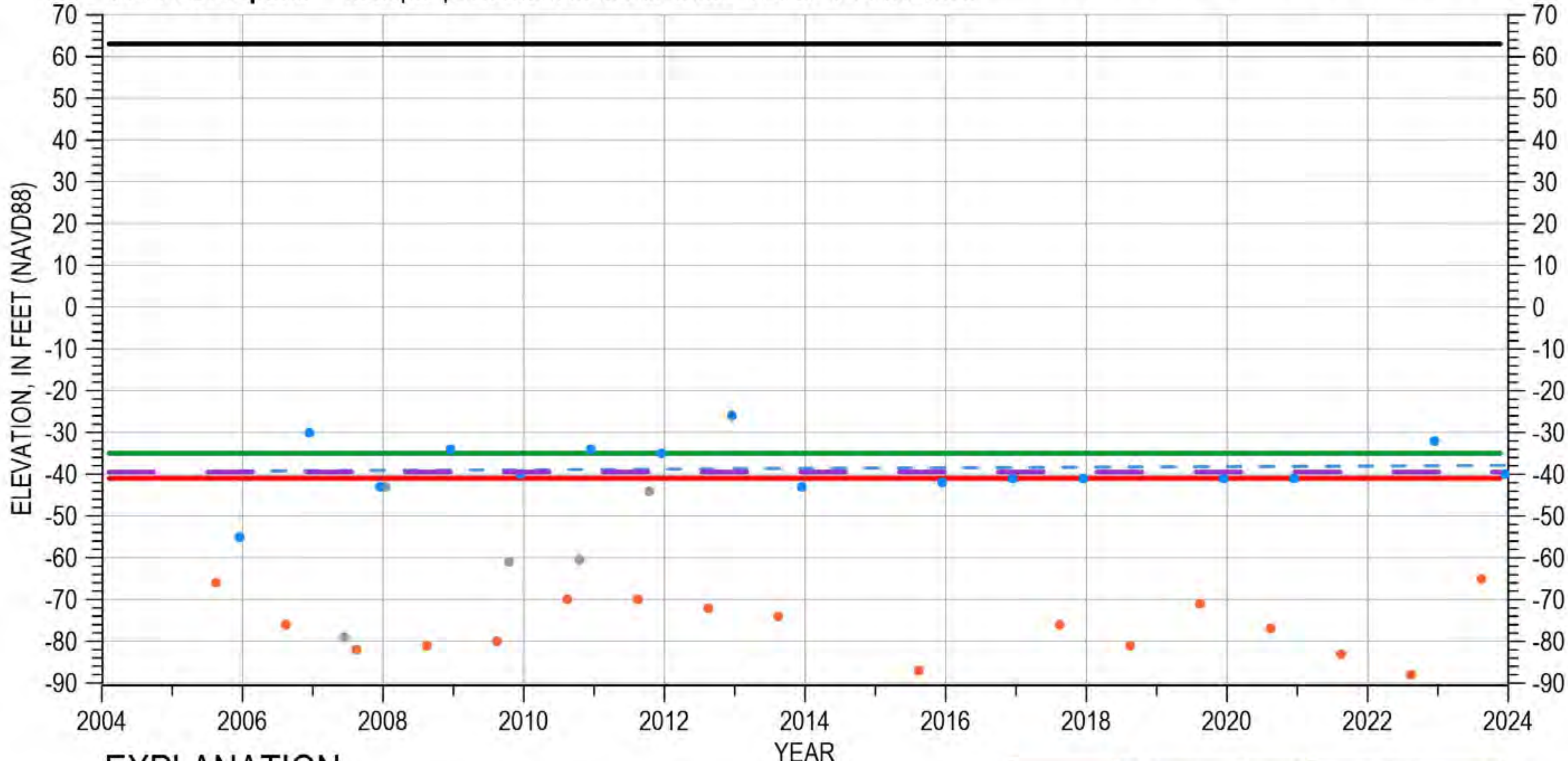
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-20C01

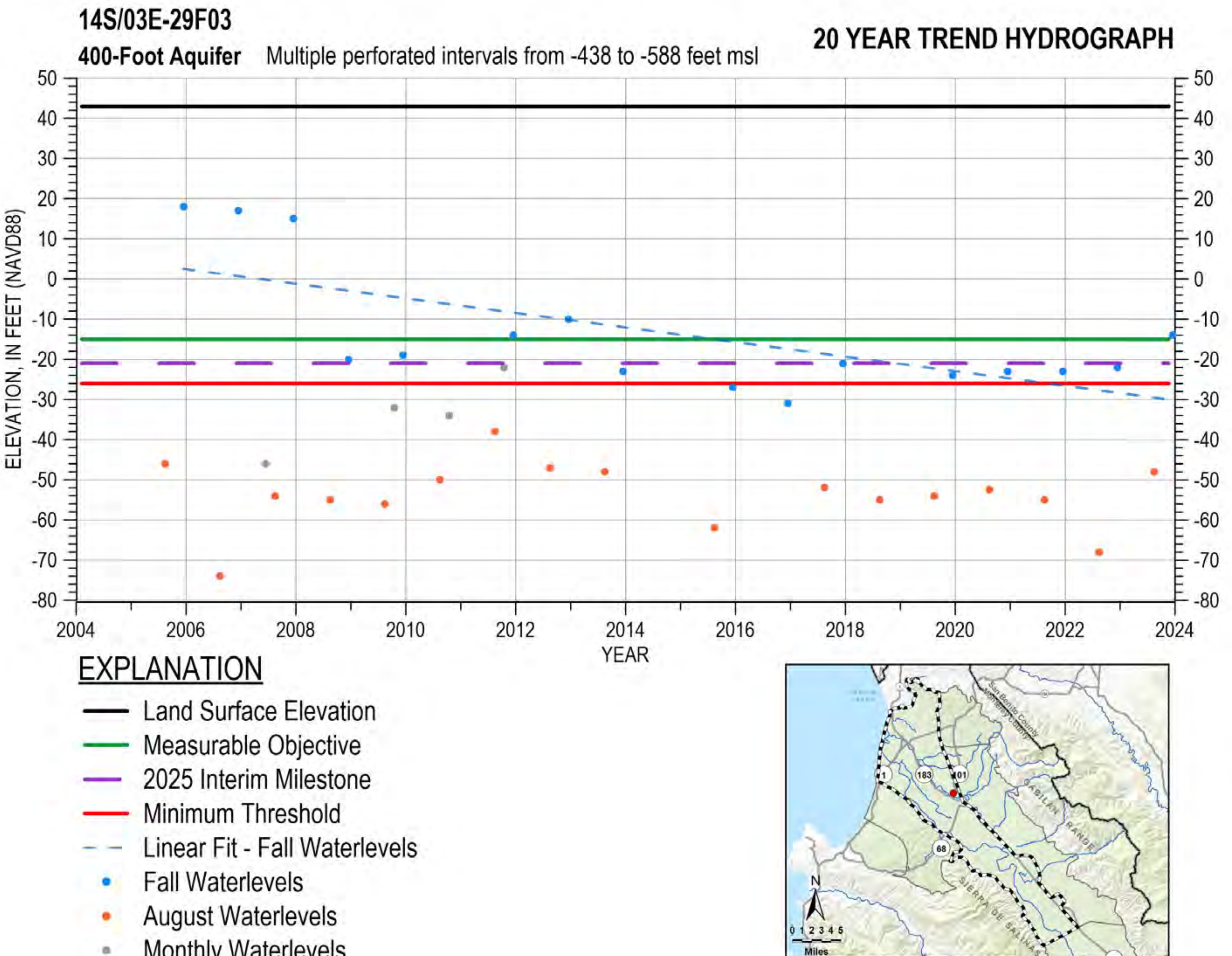
400-Foot Aquifer Multiple perforated intervals from -400 to -548 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

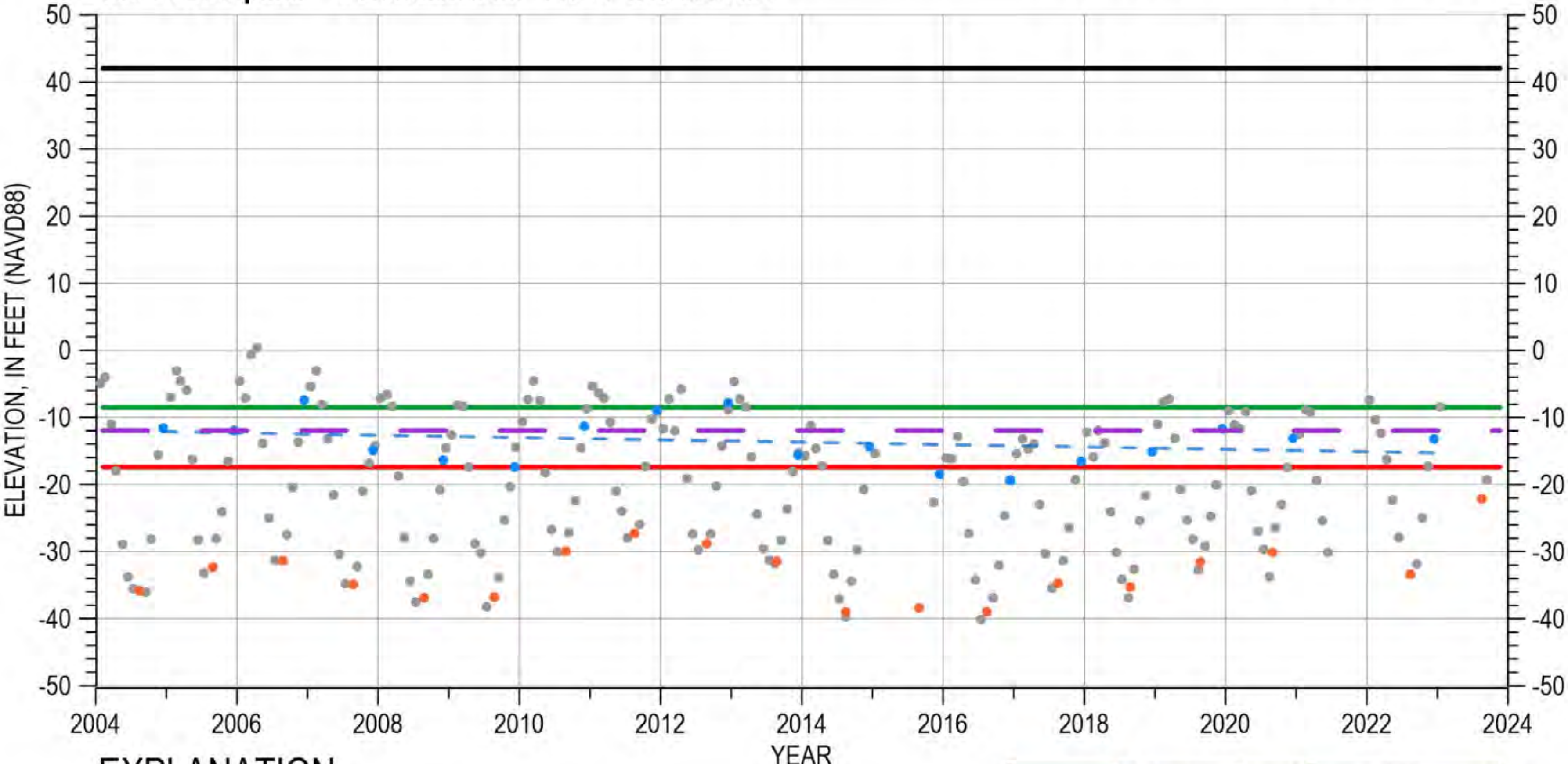
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


14S/03E-29F03
400-Foot Aquifer Multiple perforated intervals from -438 to -588 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
SABILAN RANGE
SIERRA DE SALINAS
Miles

14S/03E-30G08

180-Foot Aquifer Perforated from -198 to -248 feet msl

20 YEAR TREND HYDROGRAPH



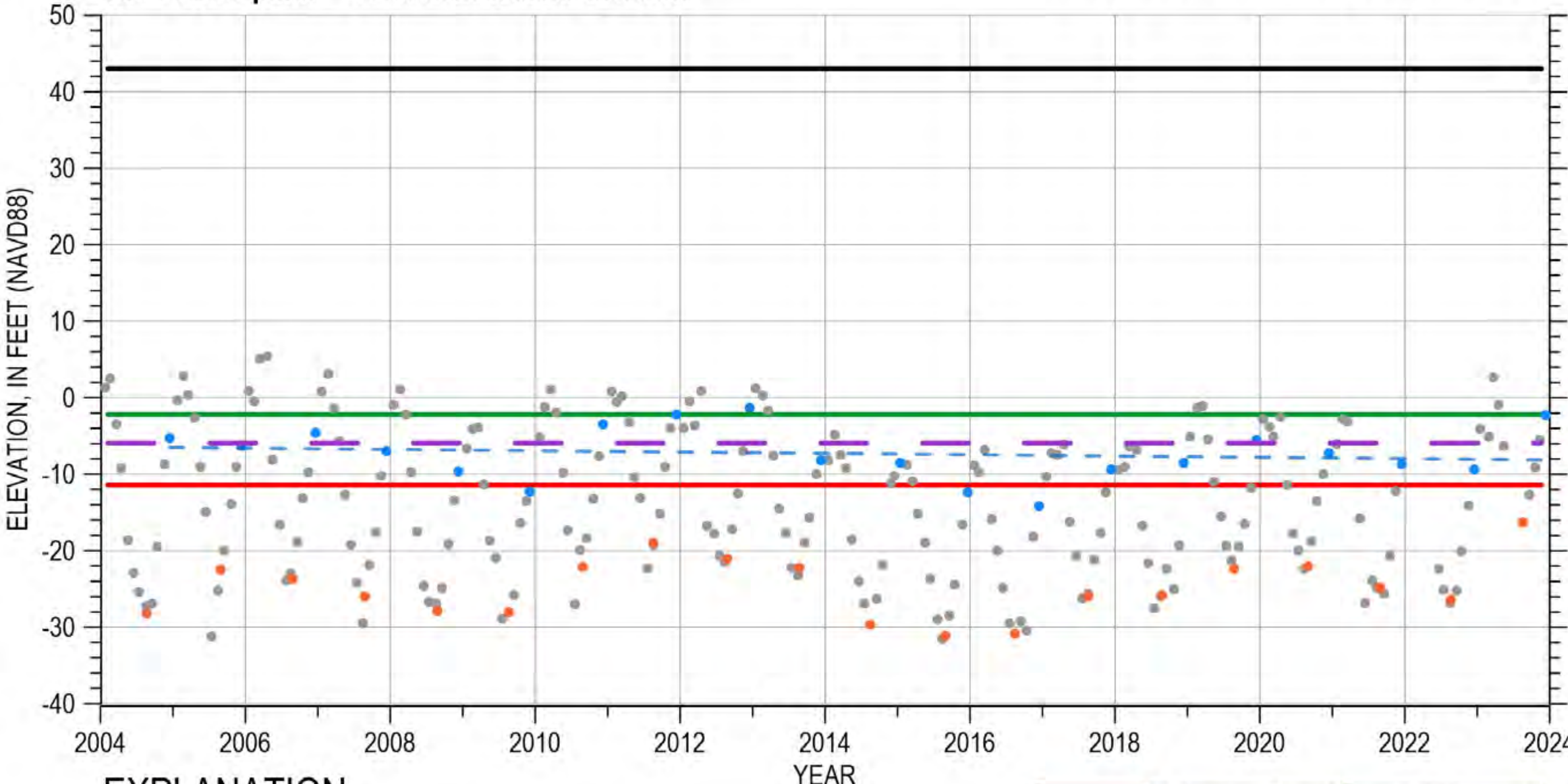
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-31F01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



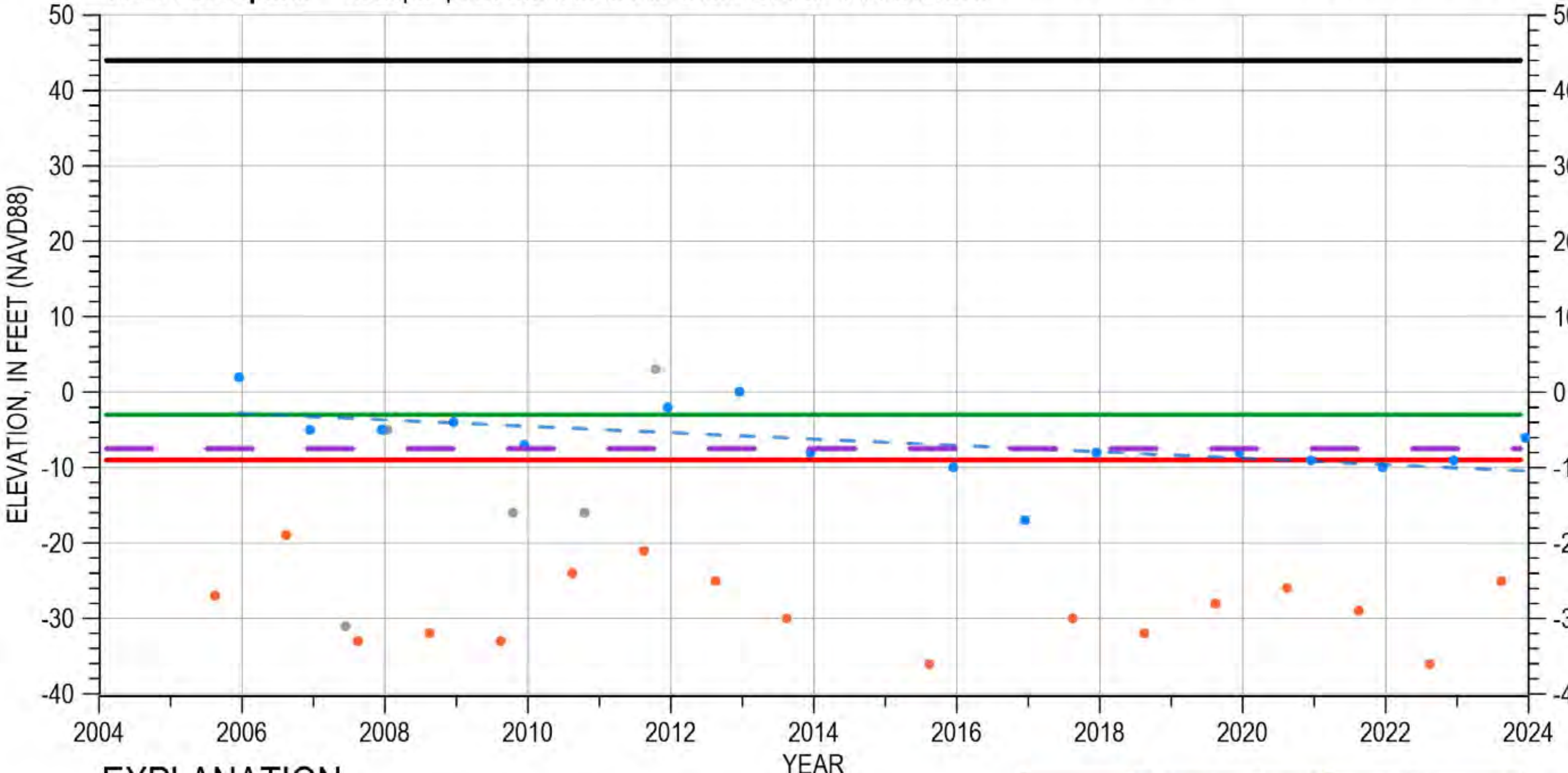
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-31L01

400-Foot Aquifer Multiple perforated intervals from -286 to -586 feet msl

20 YEAR TREND HYDROGRAPH



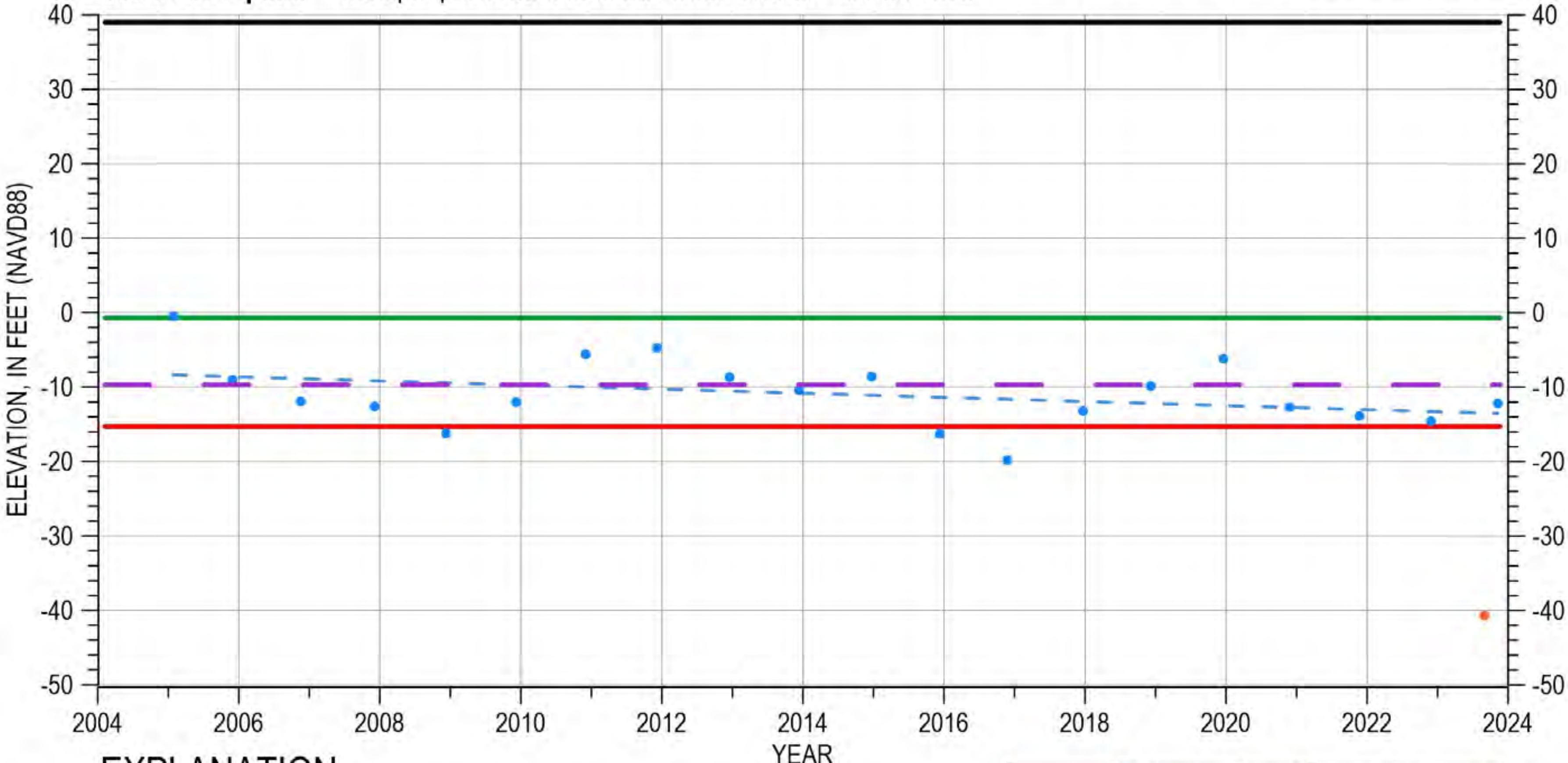
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/02E-01A03

400-Foot Aquifer Multiple perforated intervals from -300 to -439 feet msl

20 YEAR TREND HYDROGRAPH



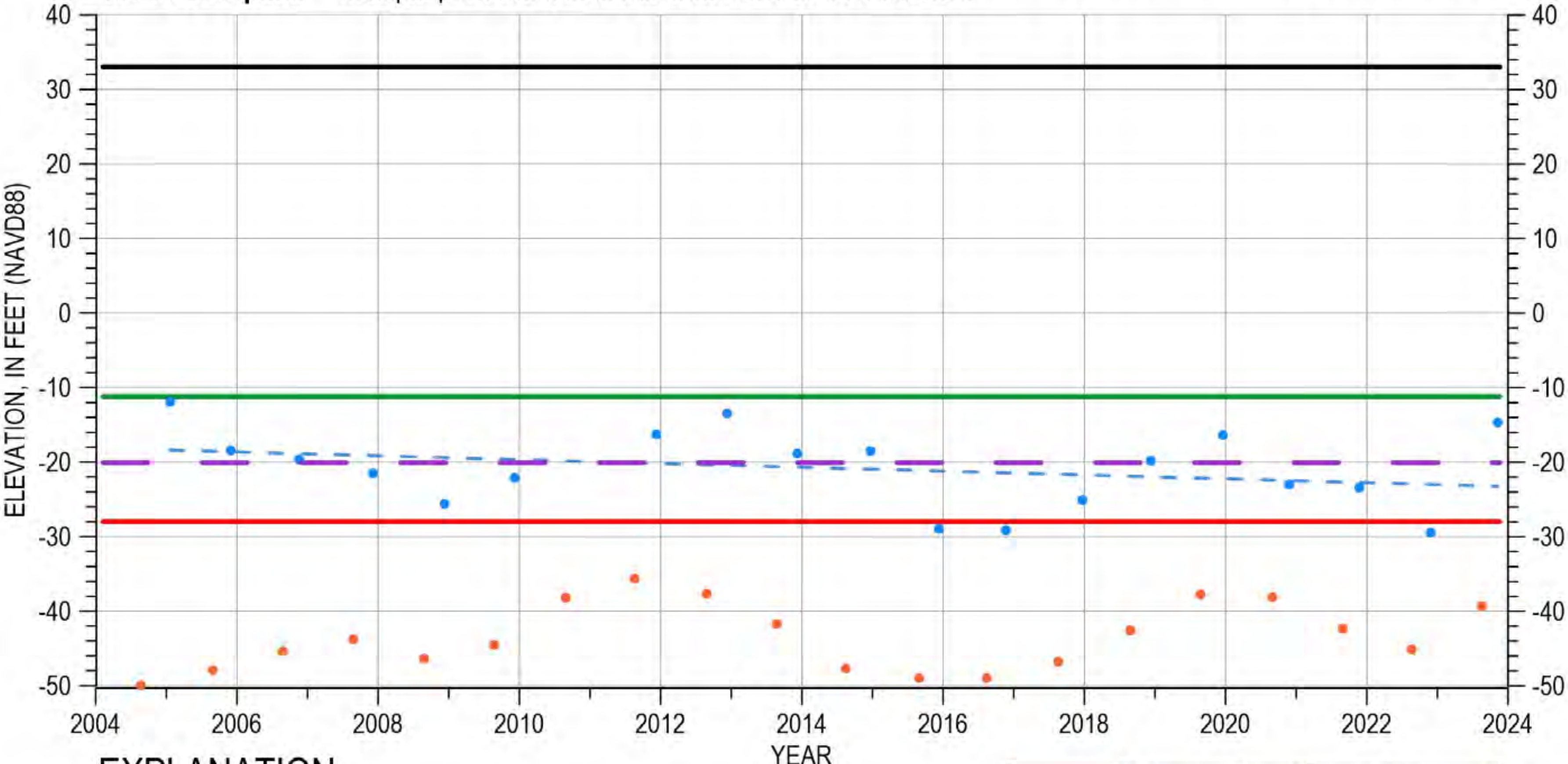
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

15S/02E-02G01

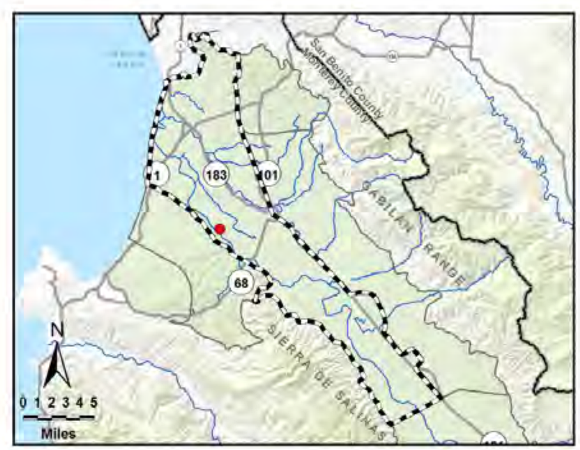
400-Foot Aquifer Multiple perforated intervals from -270 to -370 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

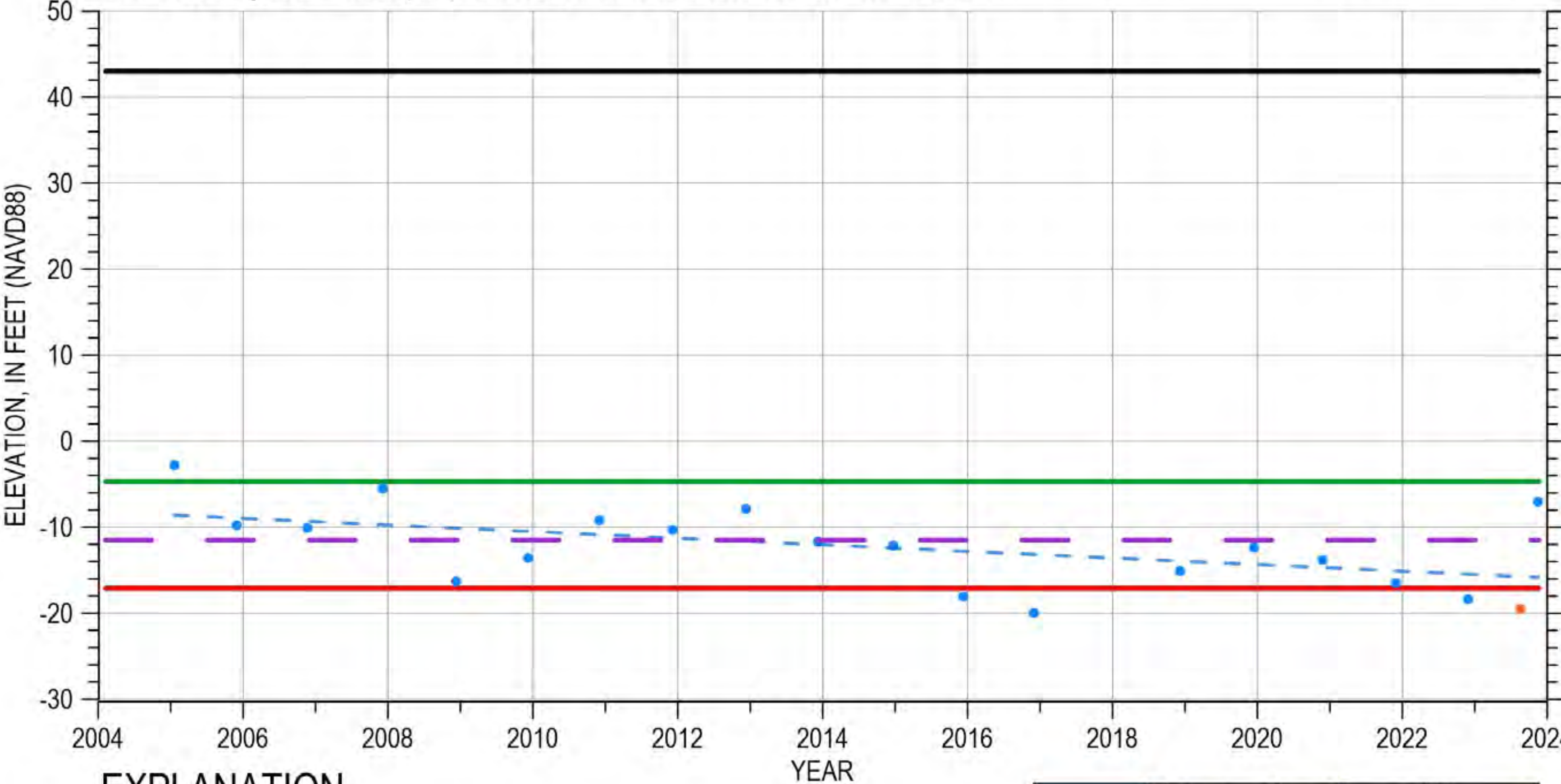
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



15S/02E-12A01

400-Foot Aquifer Multiple perforated intervals from -383 to -464 feet msl

20 YEAR TREND HYDROGRAPH



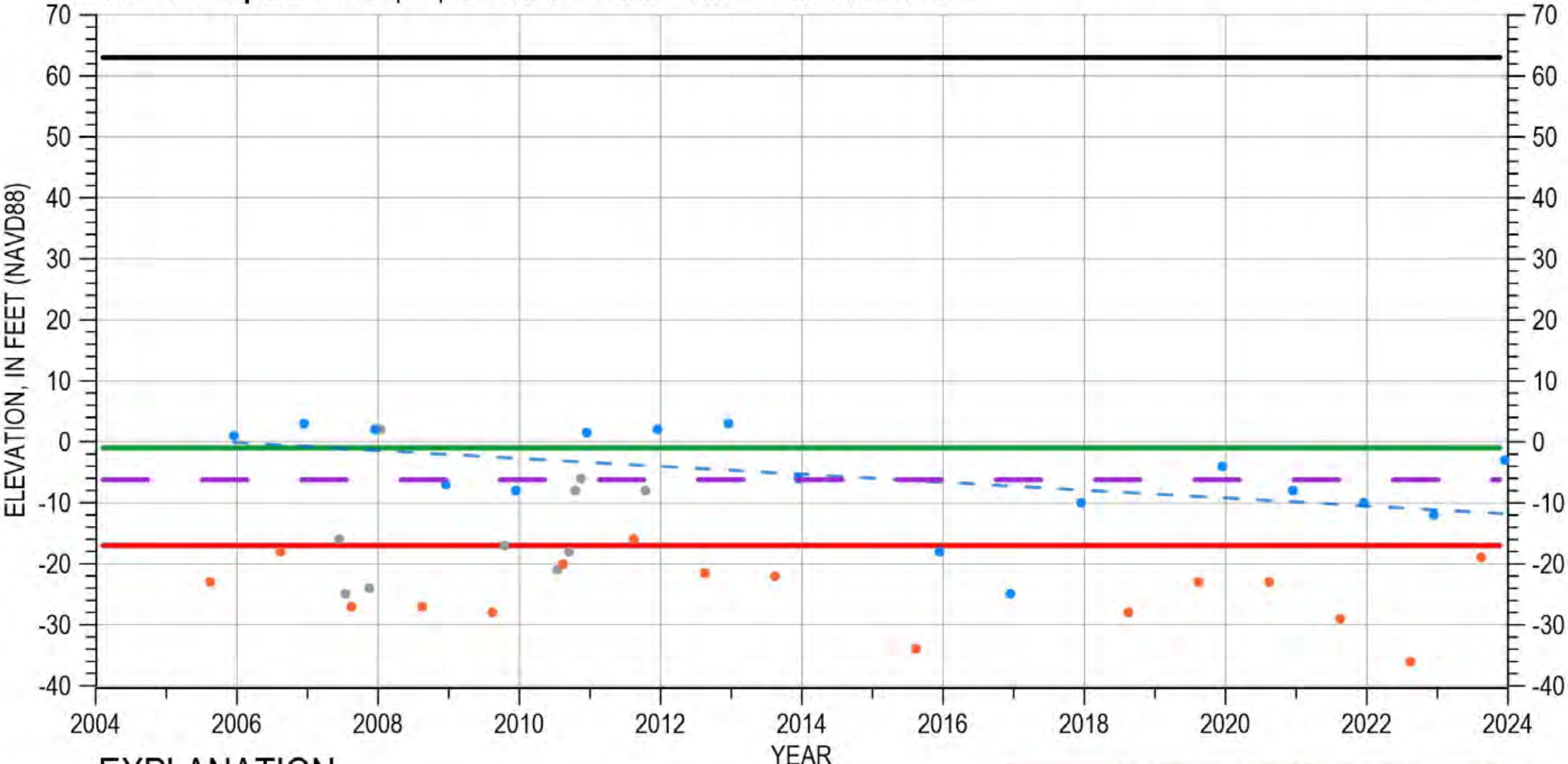
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

15S/03E-03R02

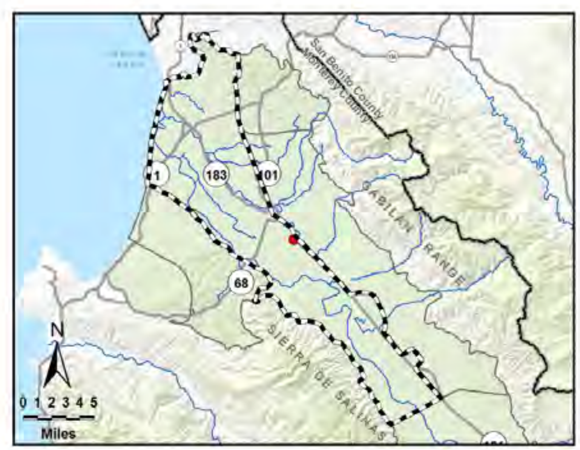
400-Foot Aquifer Multiple perforated intervals from -313 to -381 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

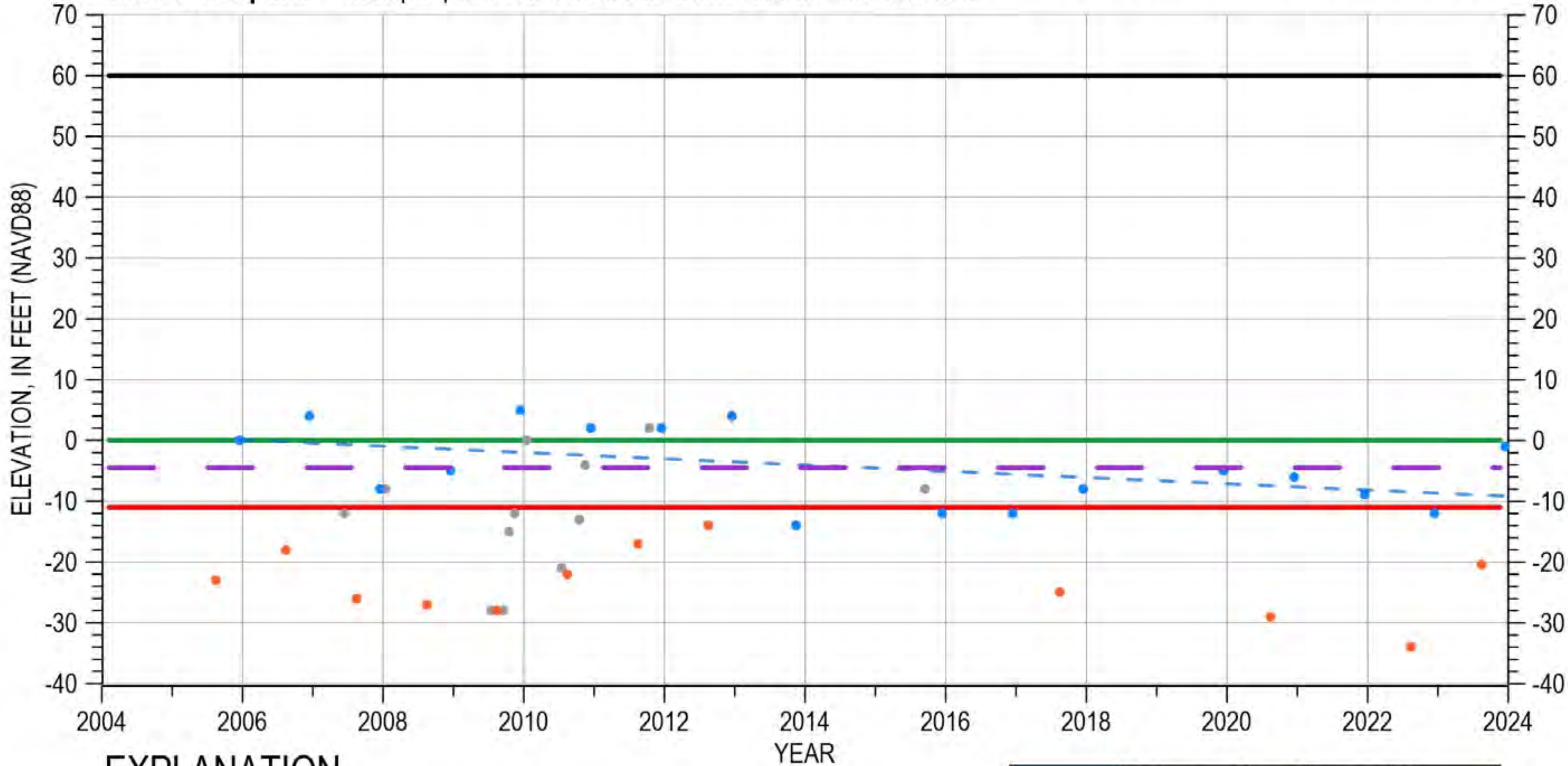
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



15S/03E-04Q01

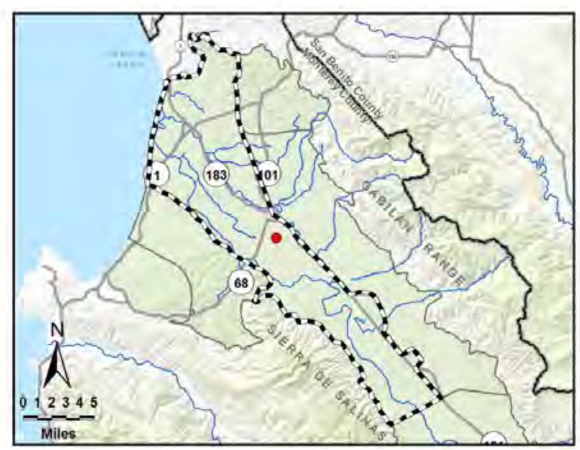
20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -248 to -458 feet msl



EXPLANATION

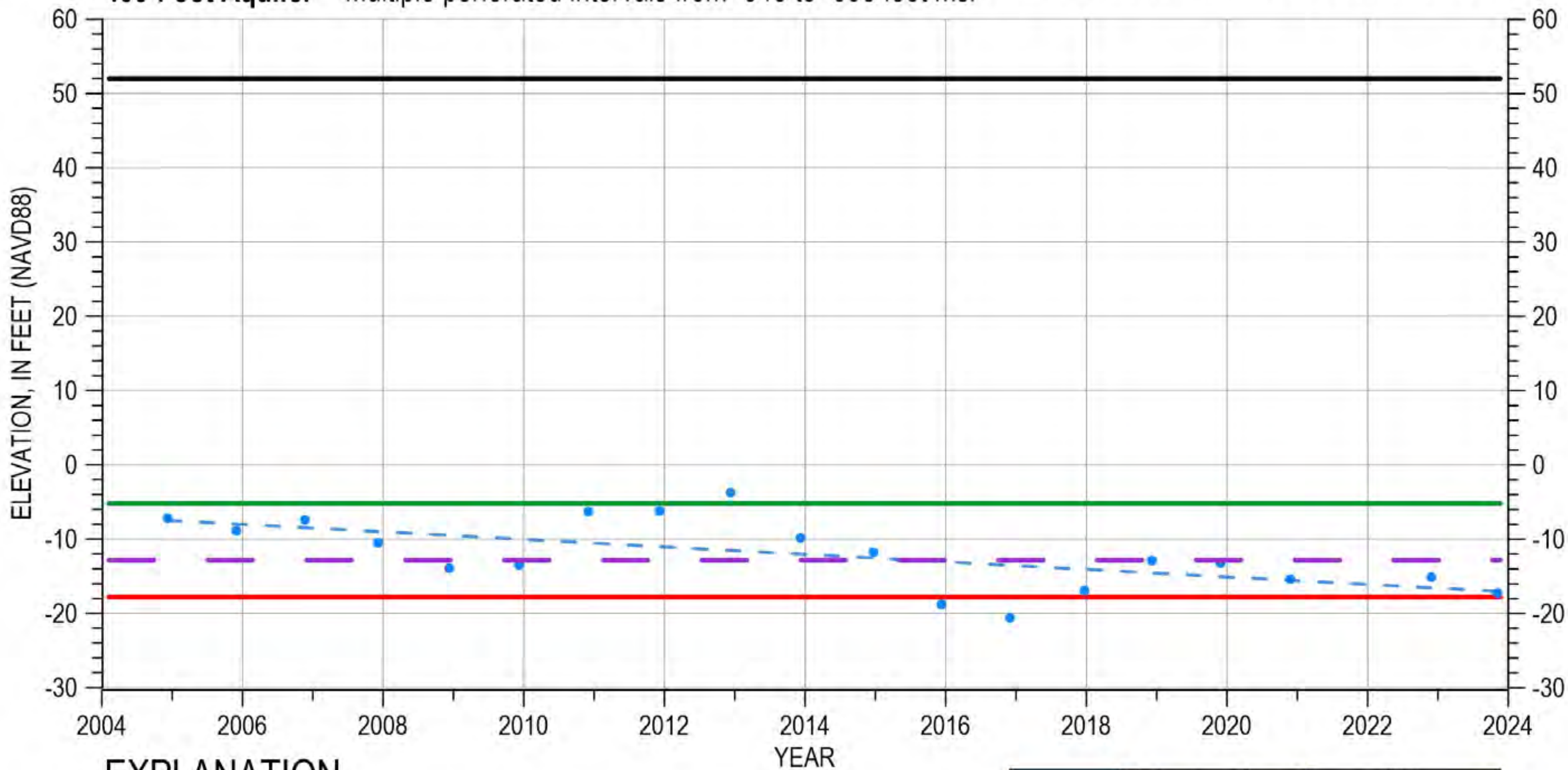
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



15S/03E-08F01

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -348 to -398 feet msl



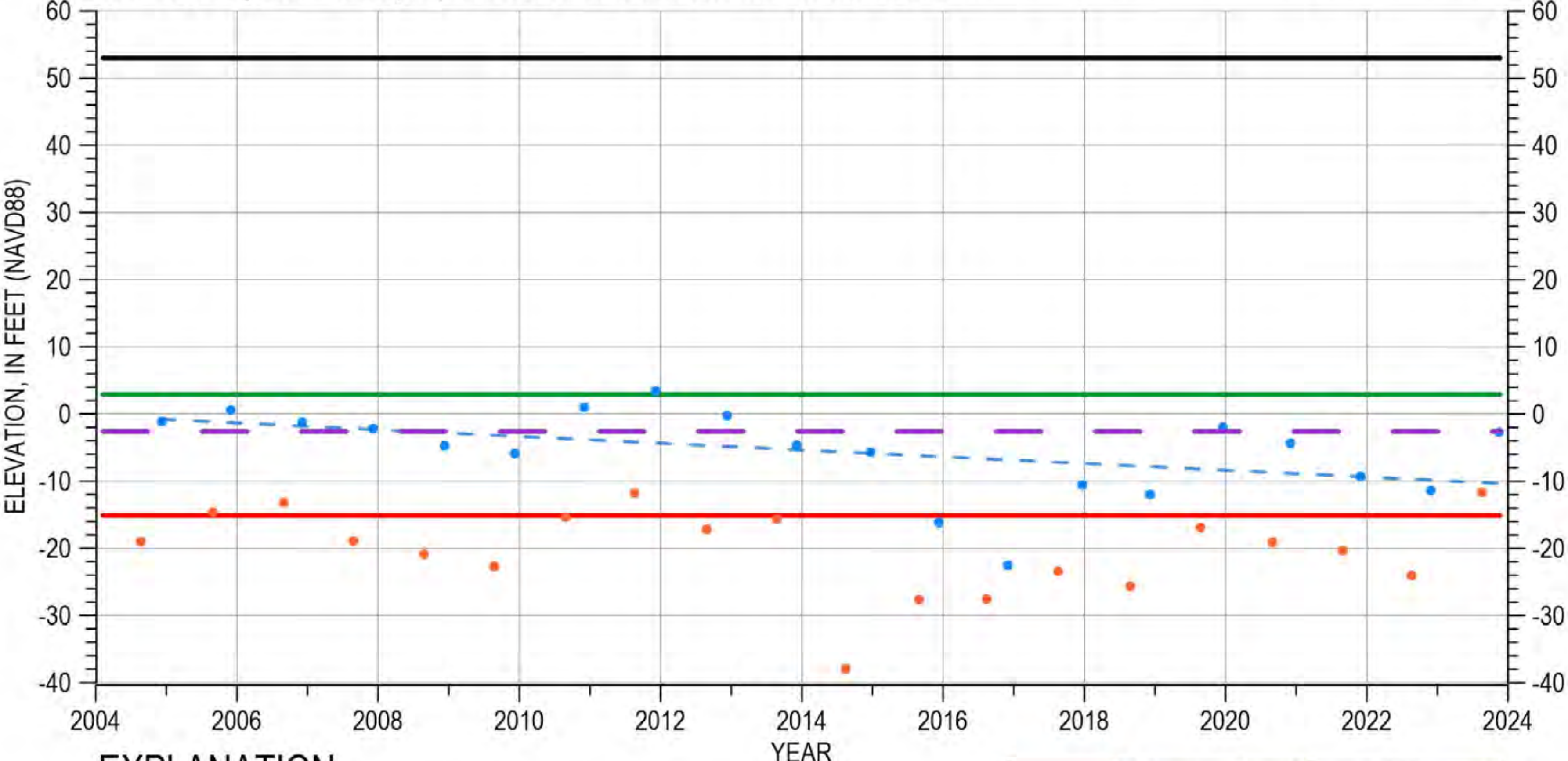
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

15S/03E-09E03

180-Foot Aquifer   Multiple perforated intervals from -131 to -192 feet msl

20 YEAR TREND HYDROGRAPH



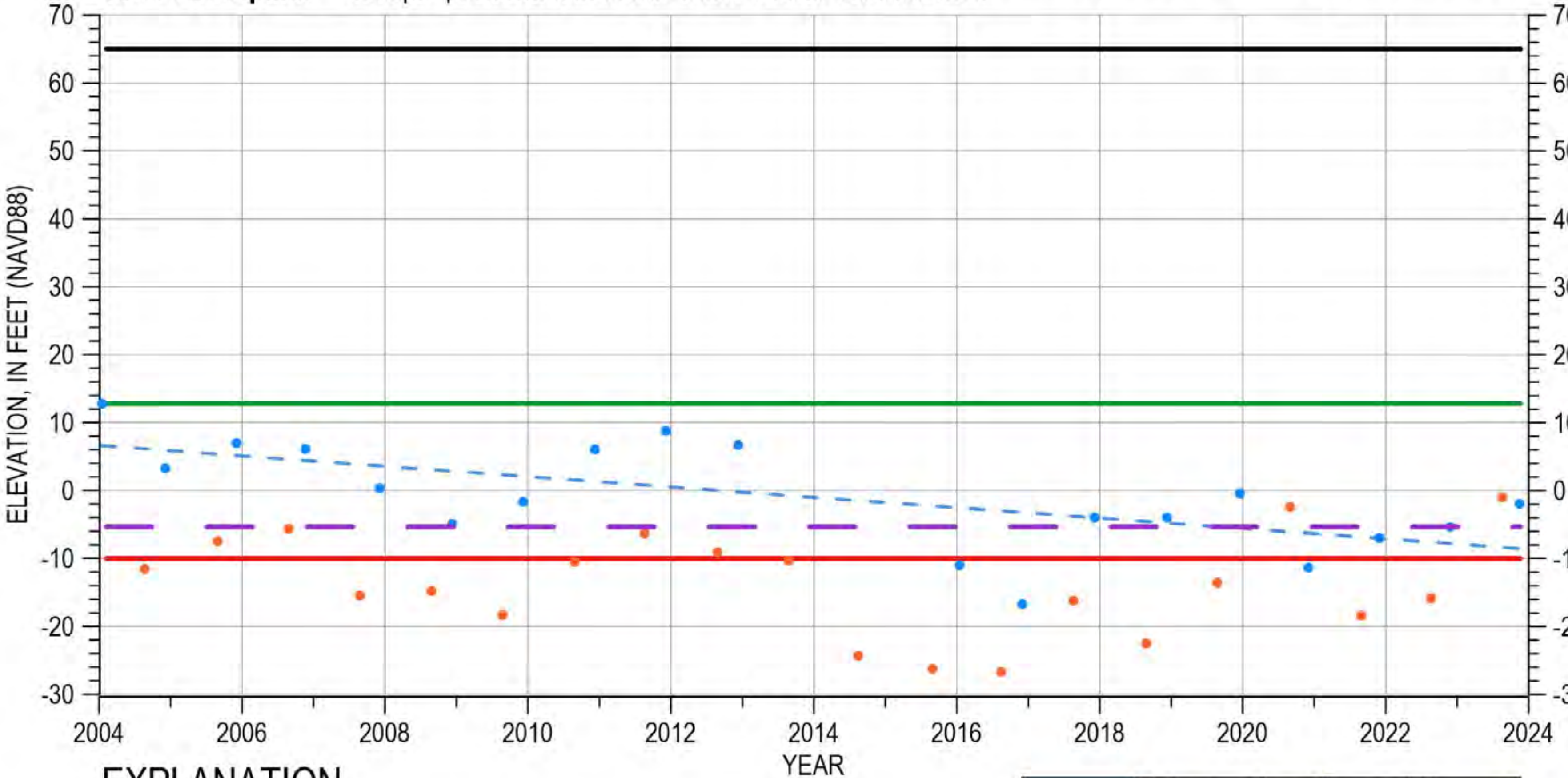
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-13N01

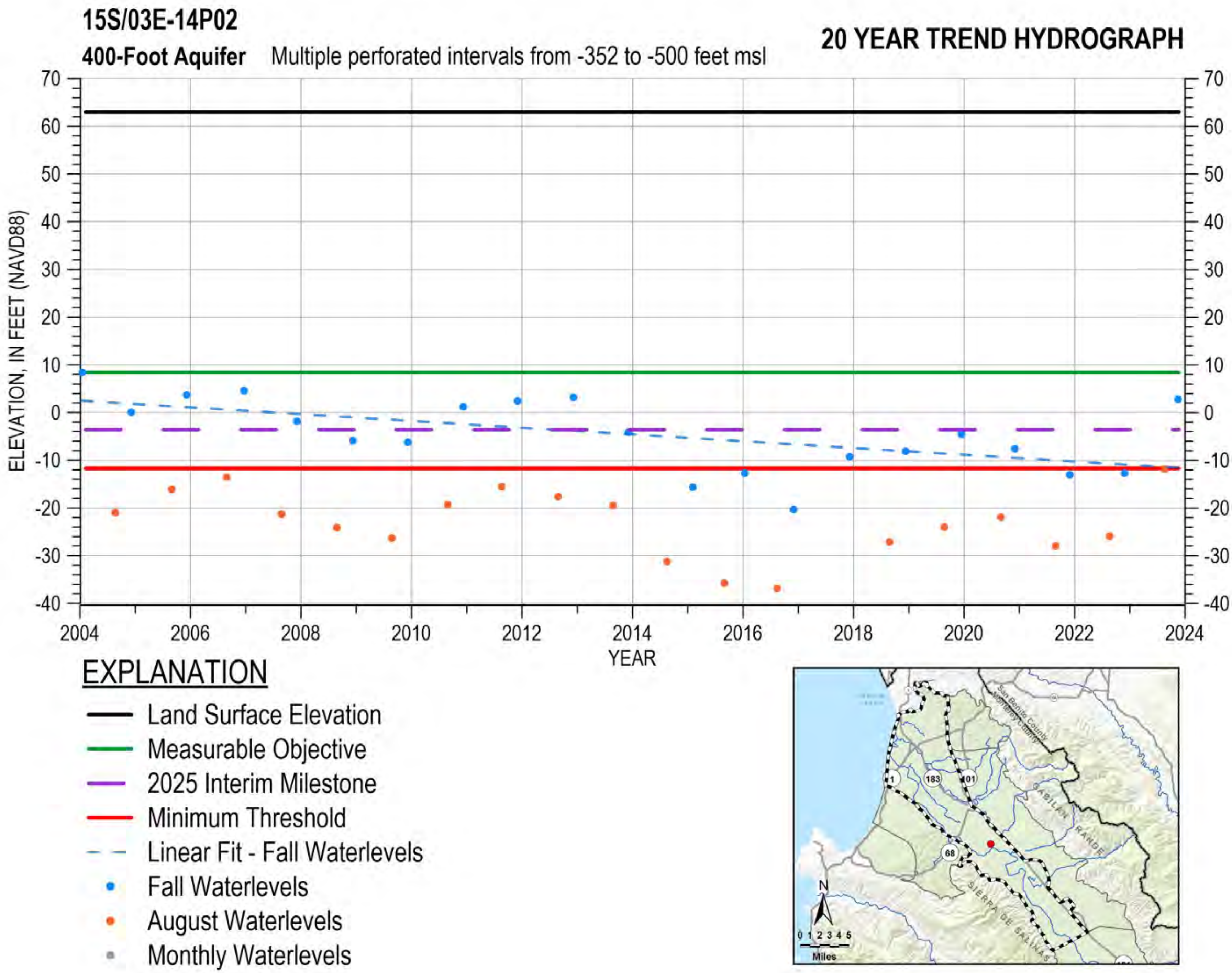
180-Foot Aquifer Multiple perforated intervals from -149 to -205 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

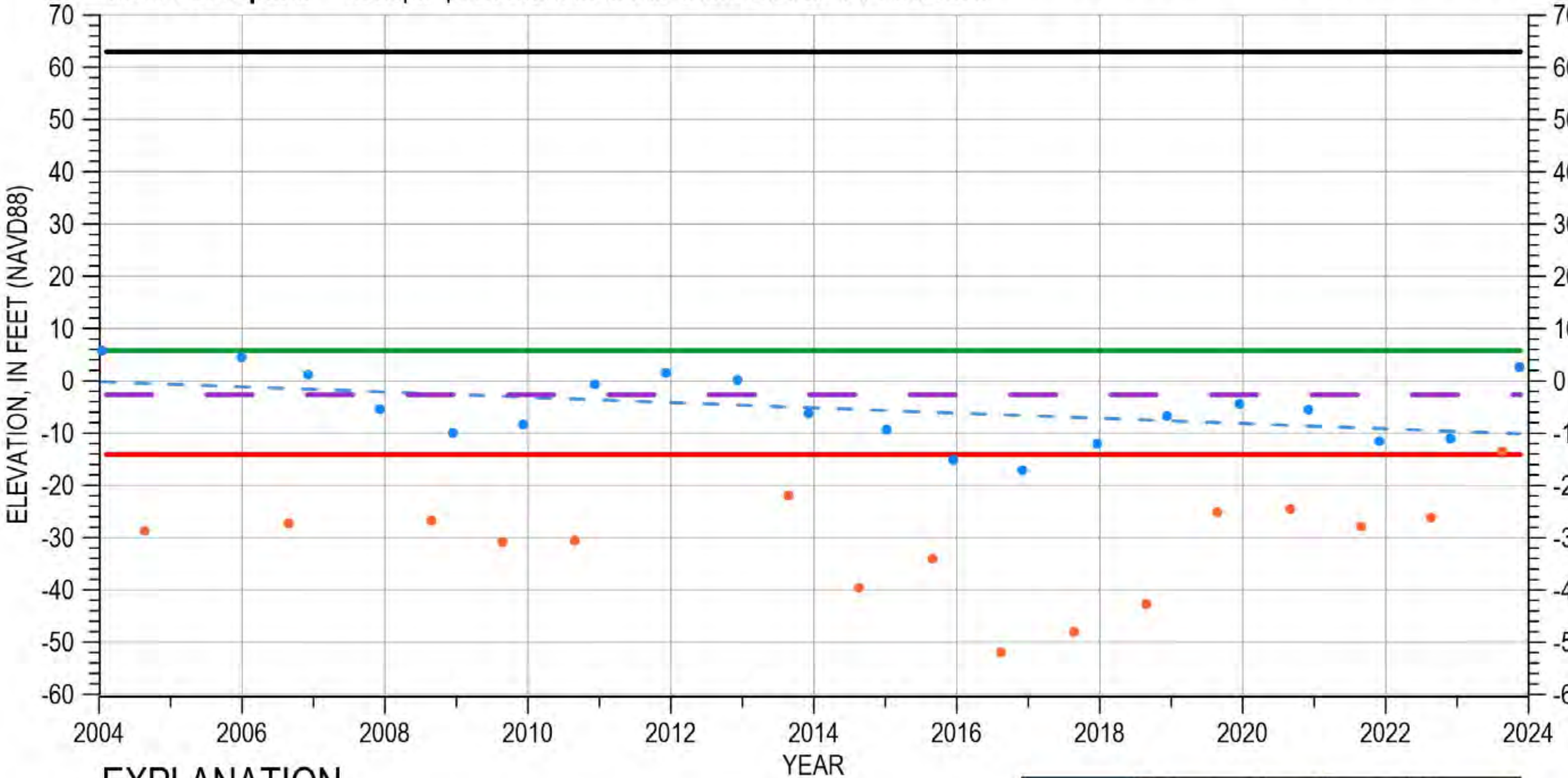
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels


15S/03E-14P02
400-Foot Aquifer
Multiple perforated intervals from -352 to -500 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
70
60
50
40
30
20
10
0
-10
-20
-30
-40
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
SIERRA DE SALINAS
GABILAN RANGE
N
Miles

15S/03E-15B01

400-Foot Aquifer Multiple perforated intervals from -255 to -384 feet msl

20 YEAR TREND HYDROGRAPH



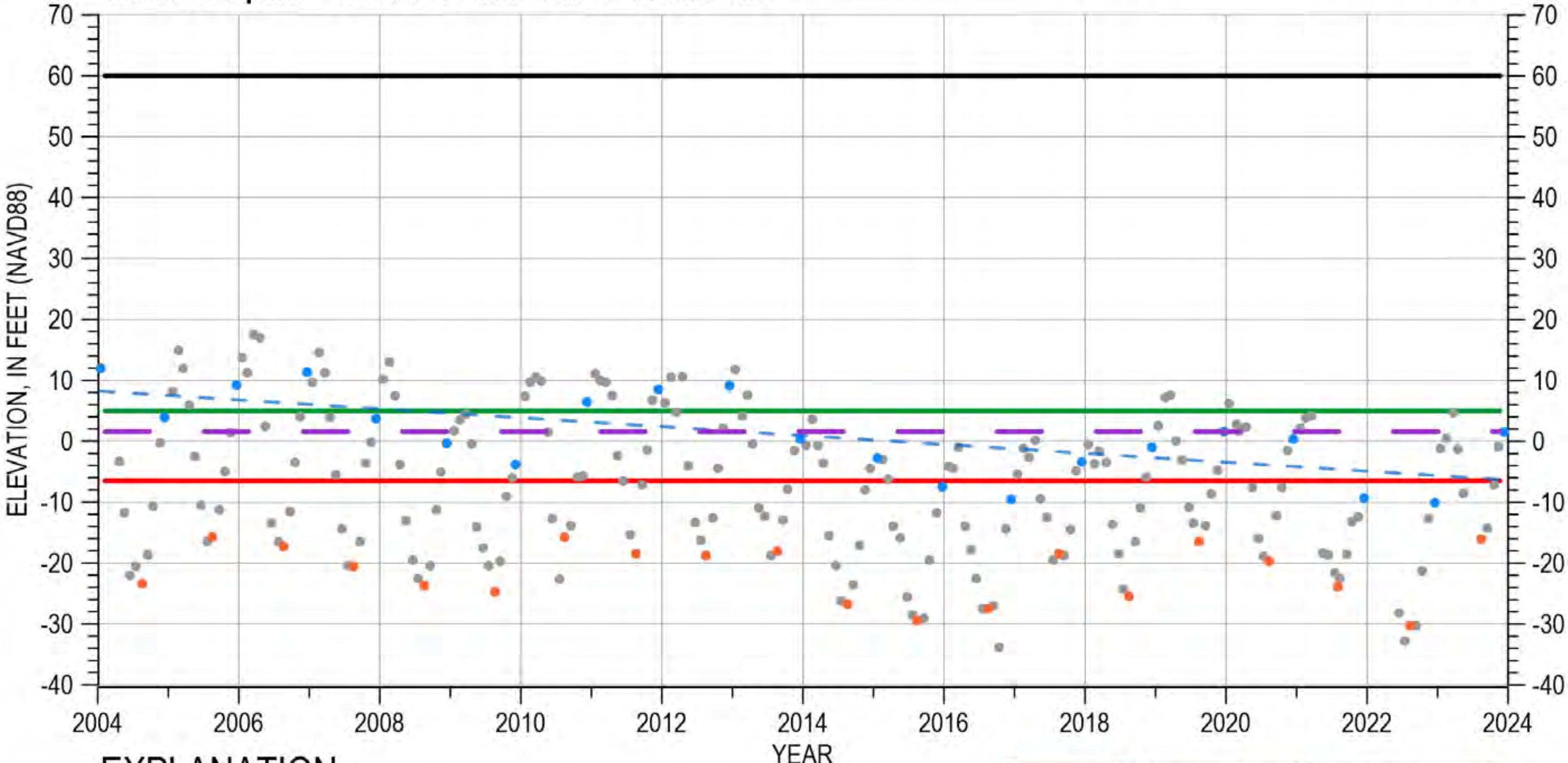
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-16F02

400-Foot Aquifer Perforated from -368 to -511 feet msl

20 YEAR TREND HYDROGRAPH



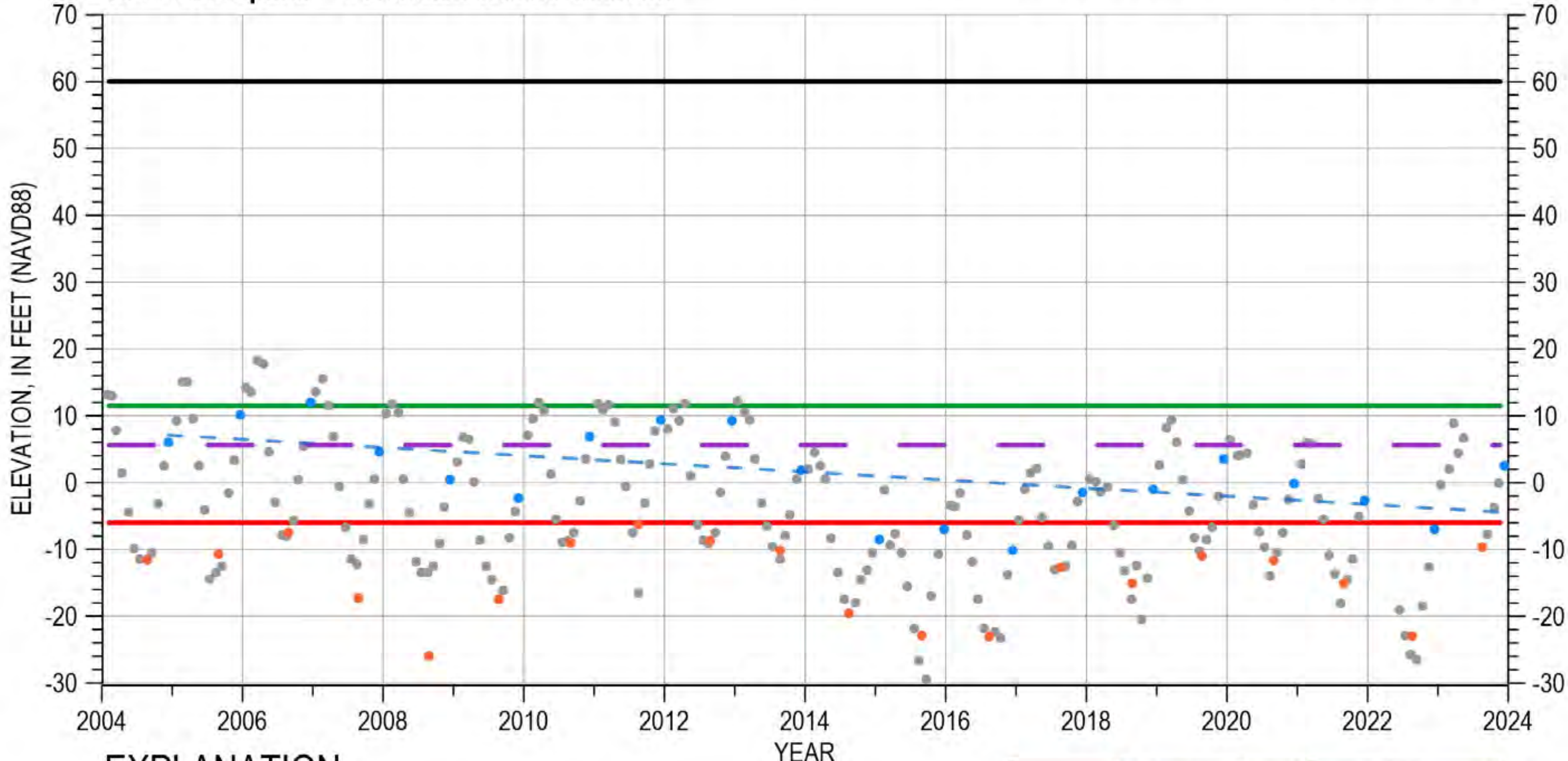
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-16M01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



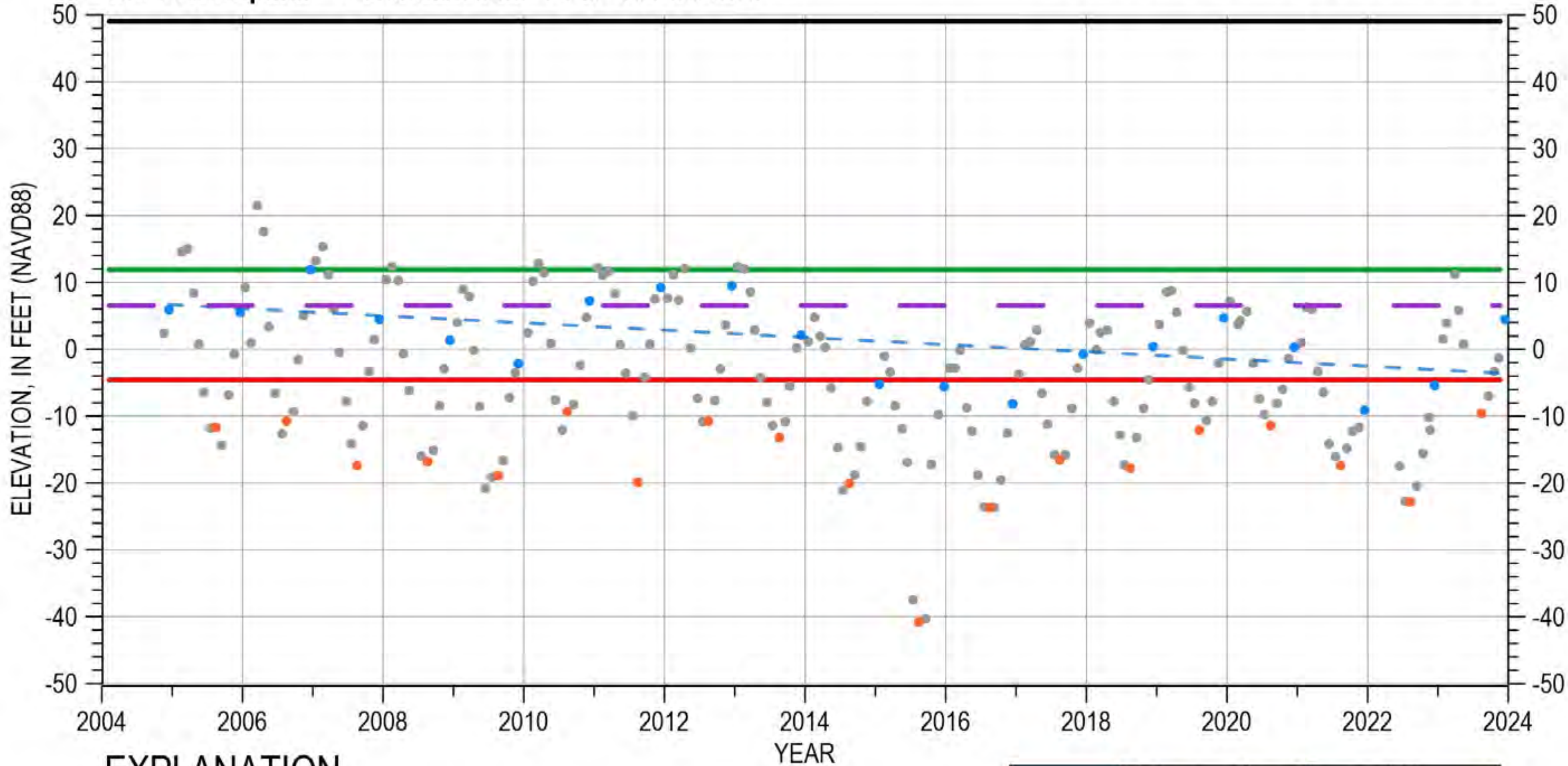
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-17M01

180-Foot Aquifer Perforated from -79 to -131 feet msl

20 YEAR TREND HYDROGRAPH



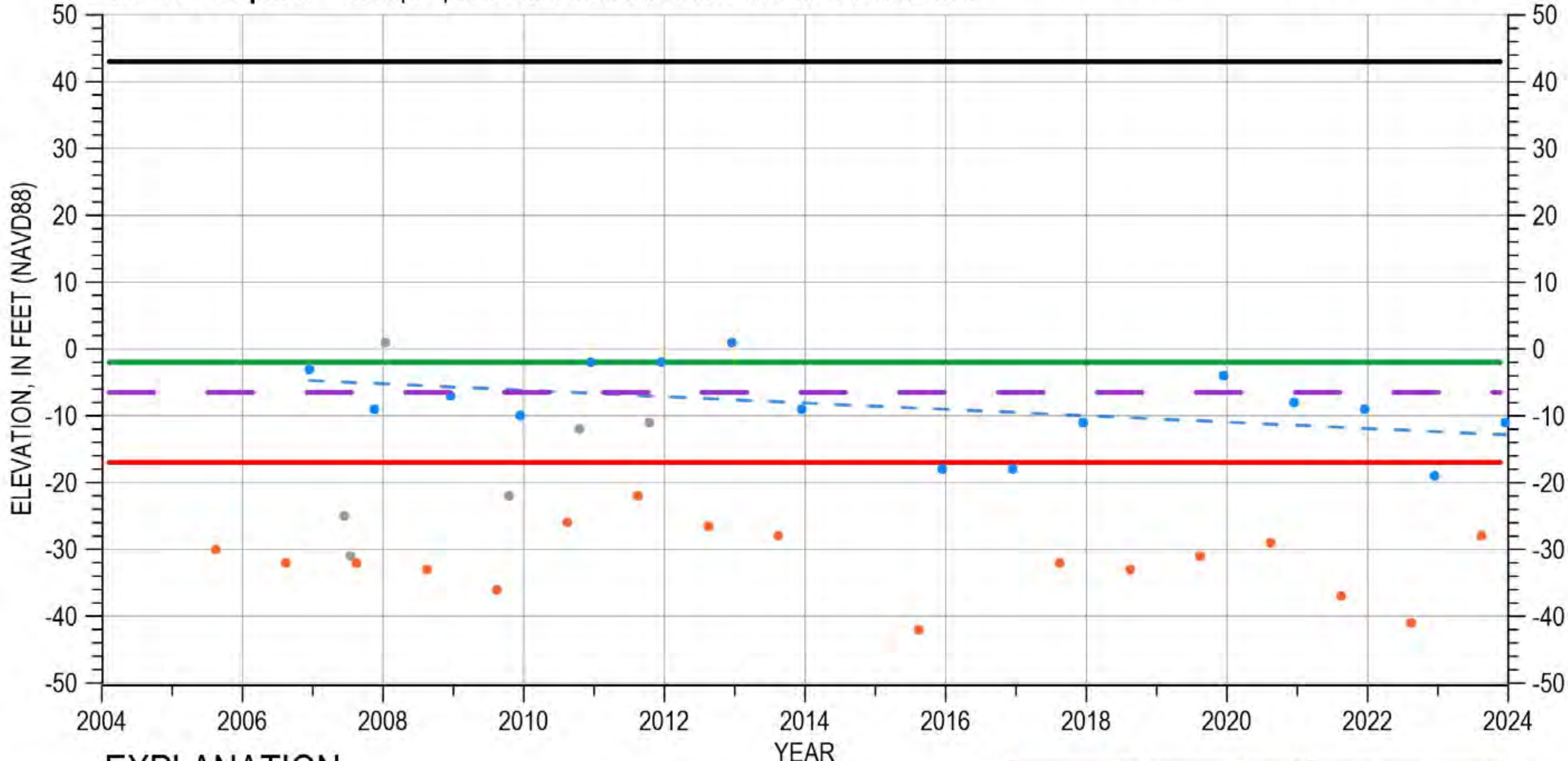
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-17P02

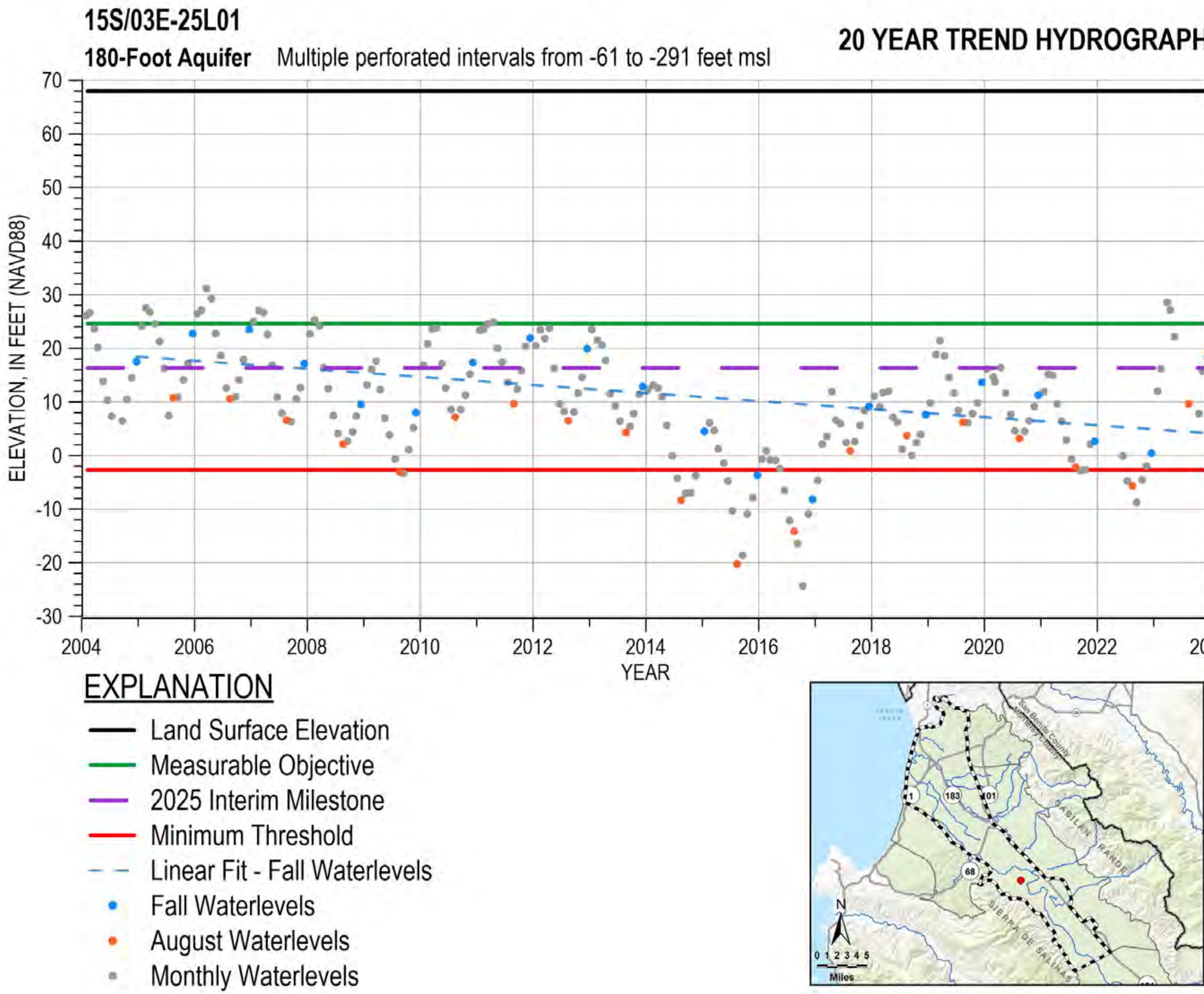
400-Foot Aquifer Multiple perforated intervals from -308 to -688 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

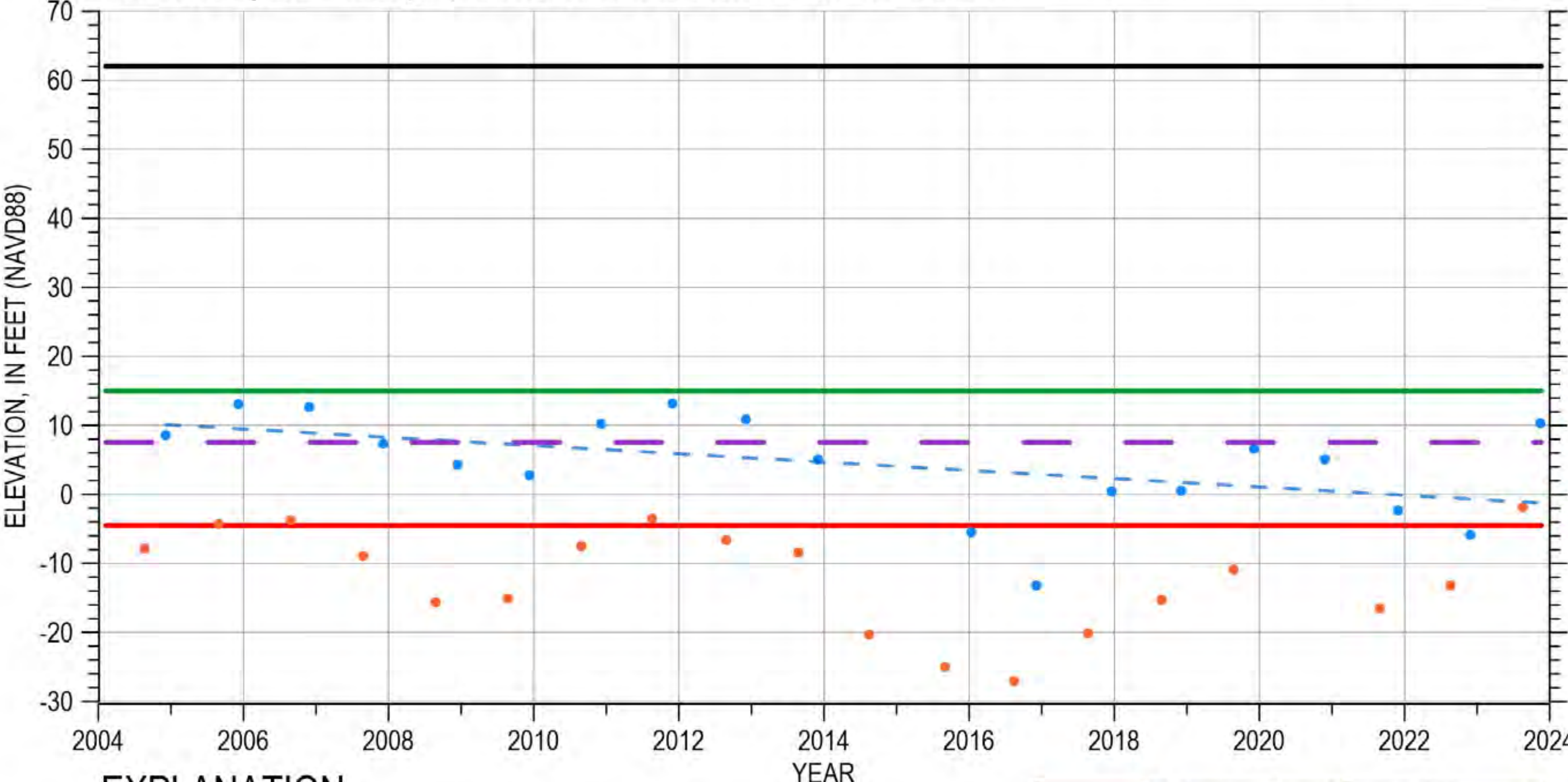


15S/03E-25L01
180-Foot Aquifer
Multiple perforated intervals from -61 to -291 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
YEAR
70
60
50
40
30
20
10
0
-10
-20
-30
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
San Benito County
Monterey County
GABILAN RANGE
SIERRA DE SALINAS
1
183
101
68
N
0 1 2 3 4 5
Miles

15S/03E-26A01

20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Multiple perforated intervals from -276 to -483 feet msl



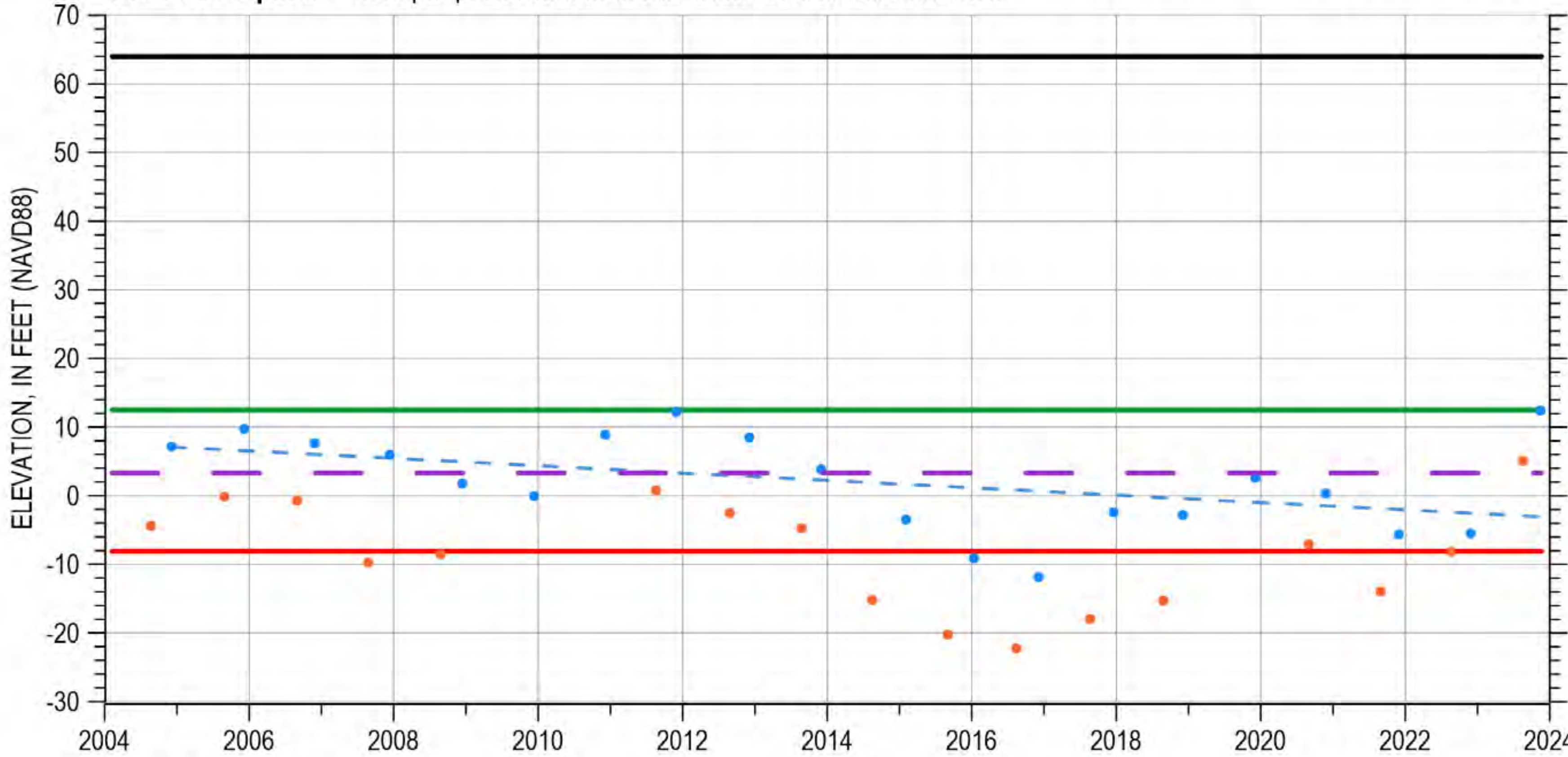
EXPLANATION

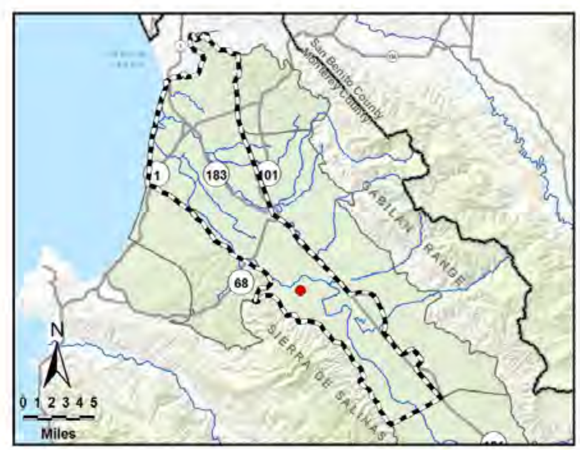
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

15S/03E-26F01

180-Foot Aquifer Multiple perforated intervals from -178 to -232 feet msl

20 YEAR TREND HYDROGRAPH

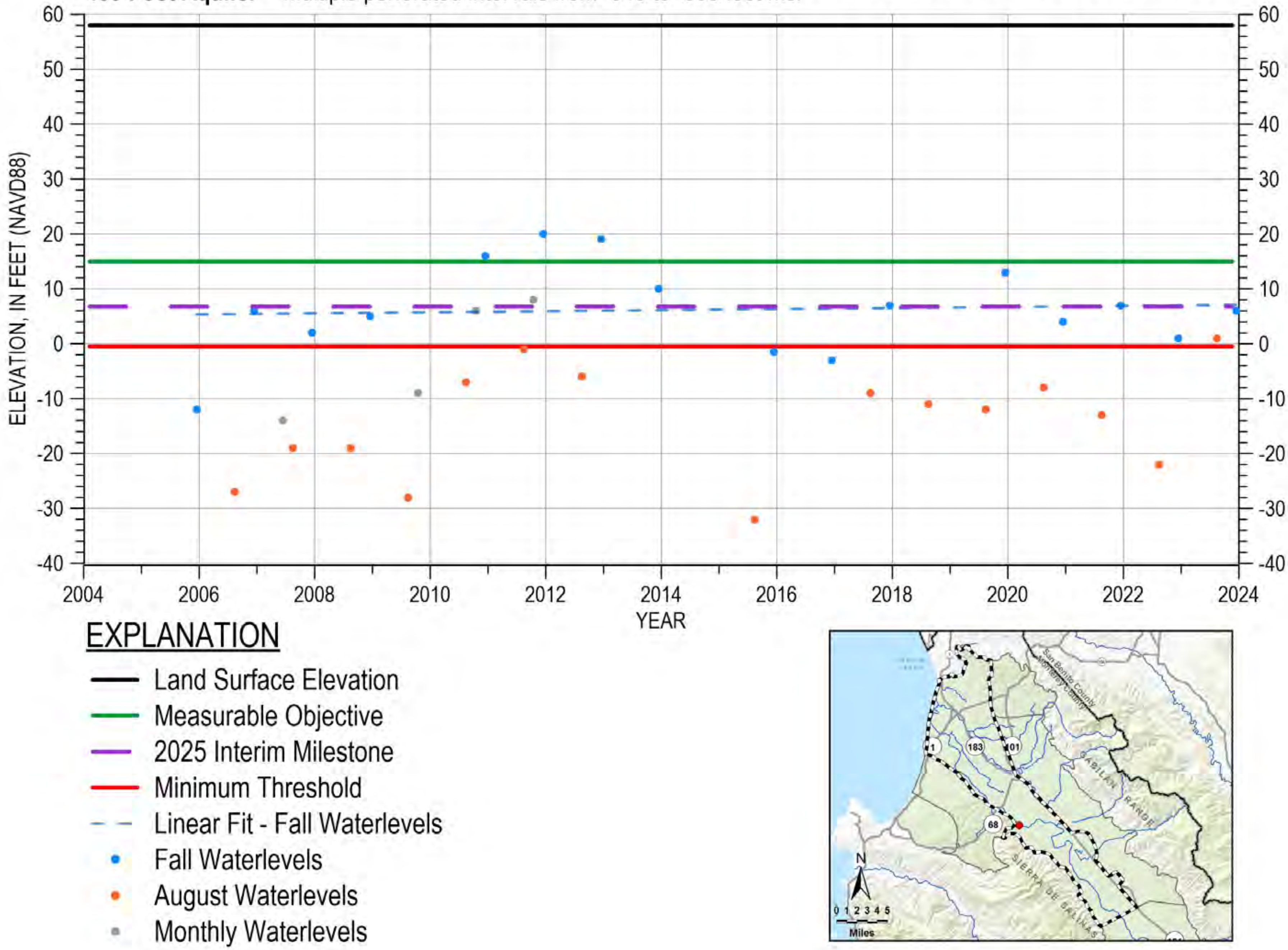




15S/03E-28B02

400-Foot Aquifer Multiple perforated intervals from -343 to -395 feet msl

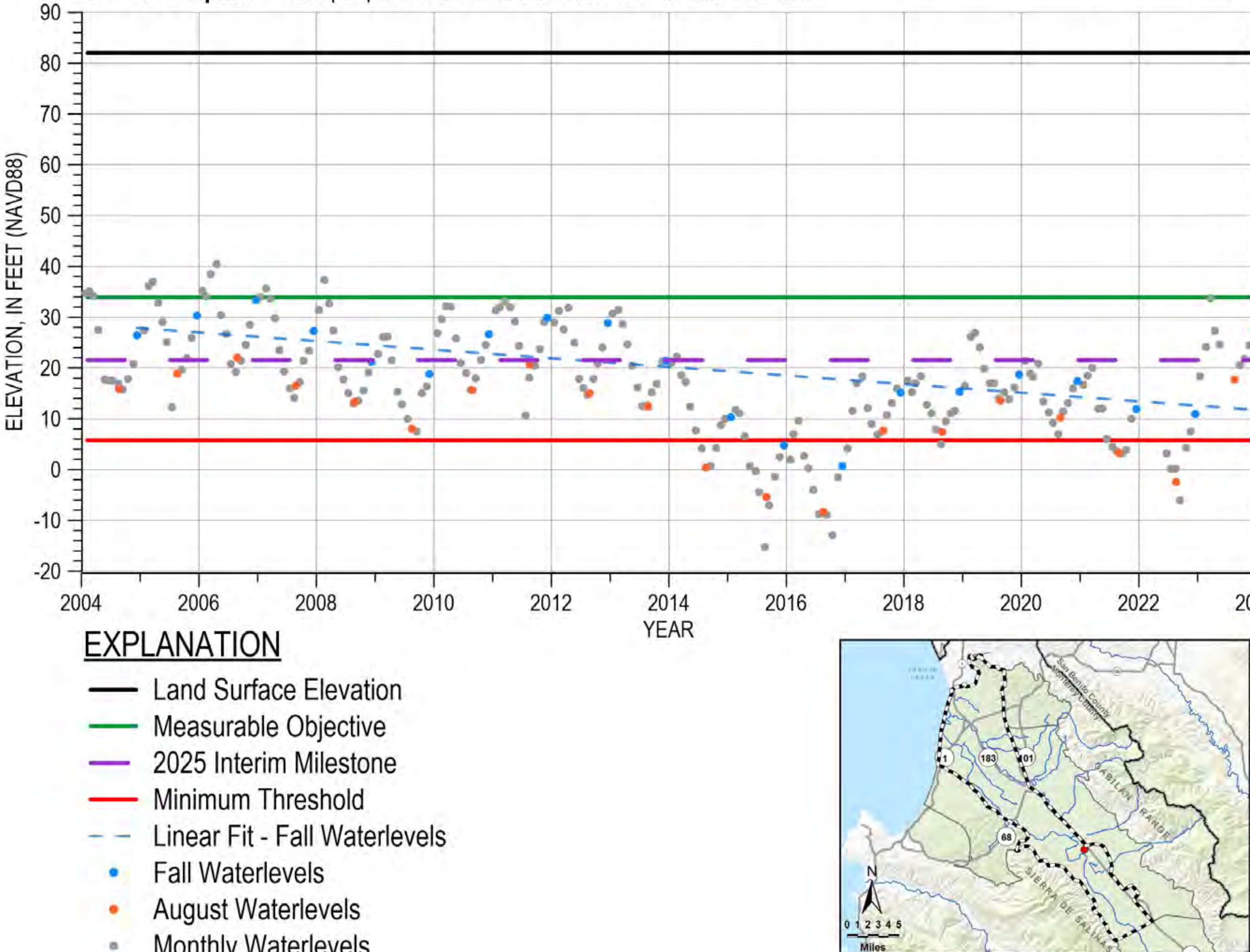
20 YEAR TREND HYDROGRAPH



15S/04E-29Q02

400-Foot Aquifer Multiple perforated intervals from -147 to -257 feet msl

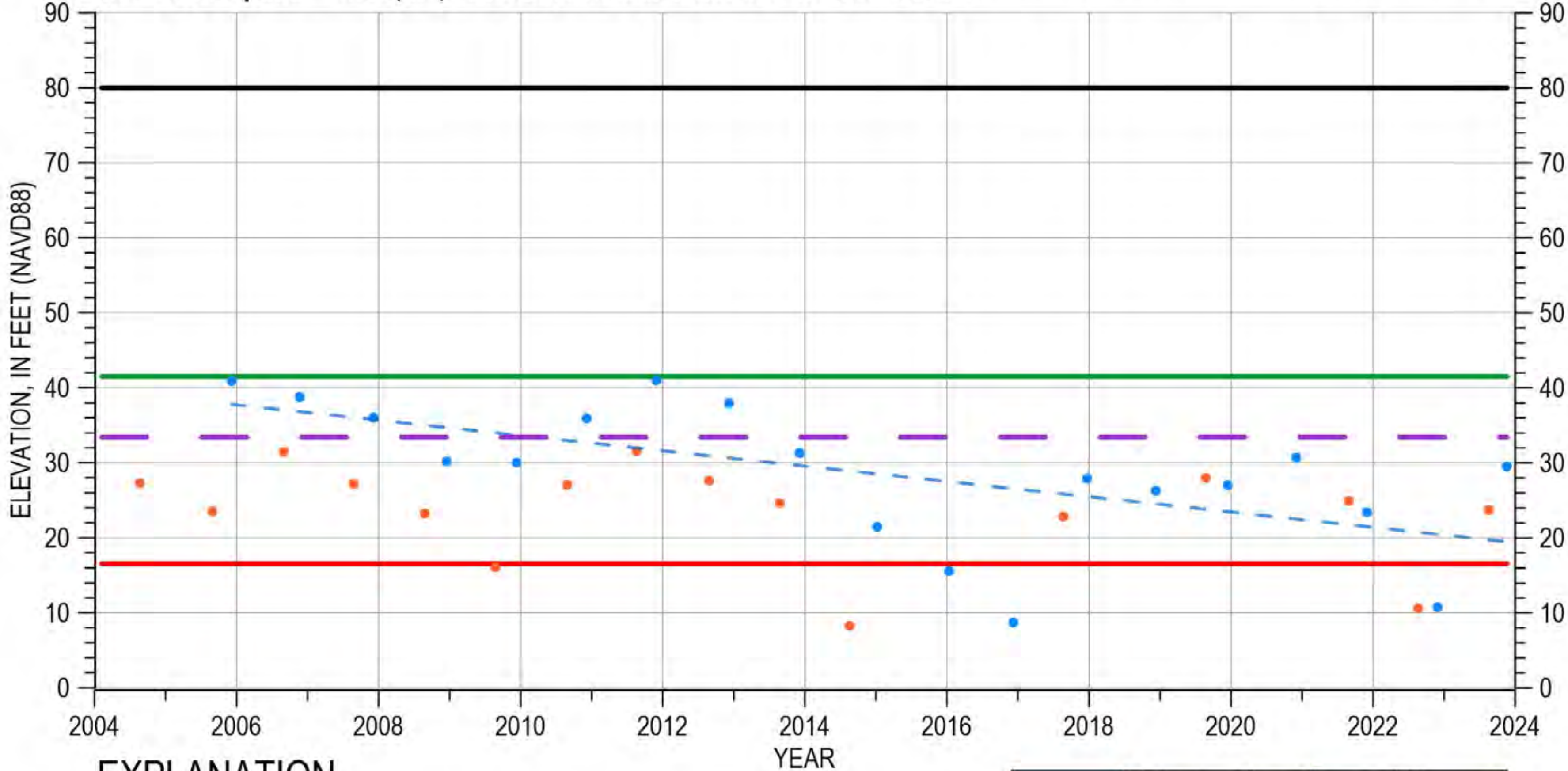
20 YEAR TREND HYDROGRAPH



15S/04E-31A02

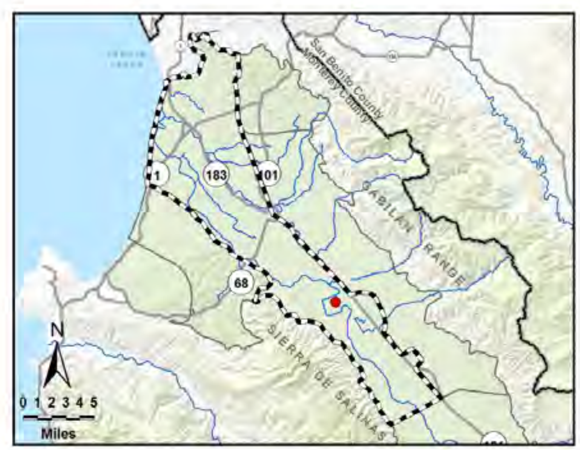
180-Foot Aquifer Multiple perforated intervals from -141 to -250 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

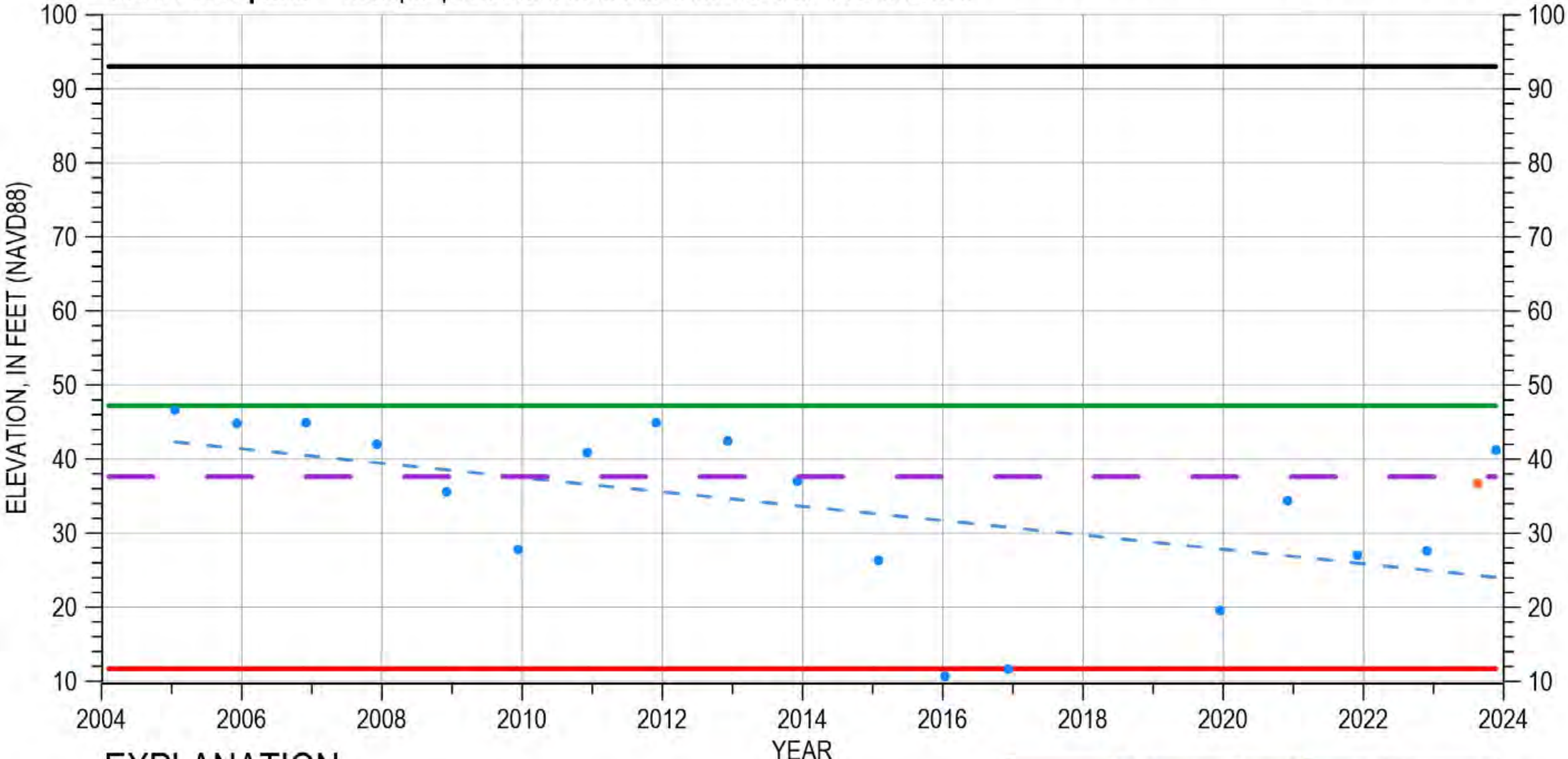
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



16S/04E-04C01

400-Foot Aquifer Multiple perforated intervals from -228 to -372 feet msl

20 YEAR TREND HYDROGRAPH



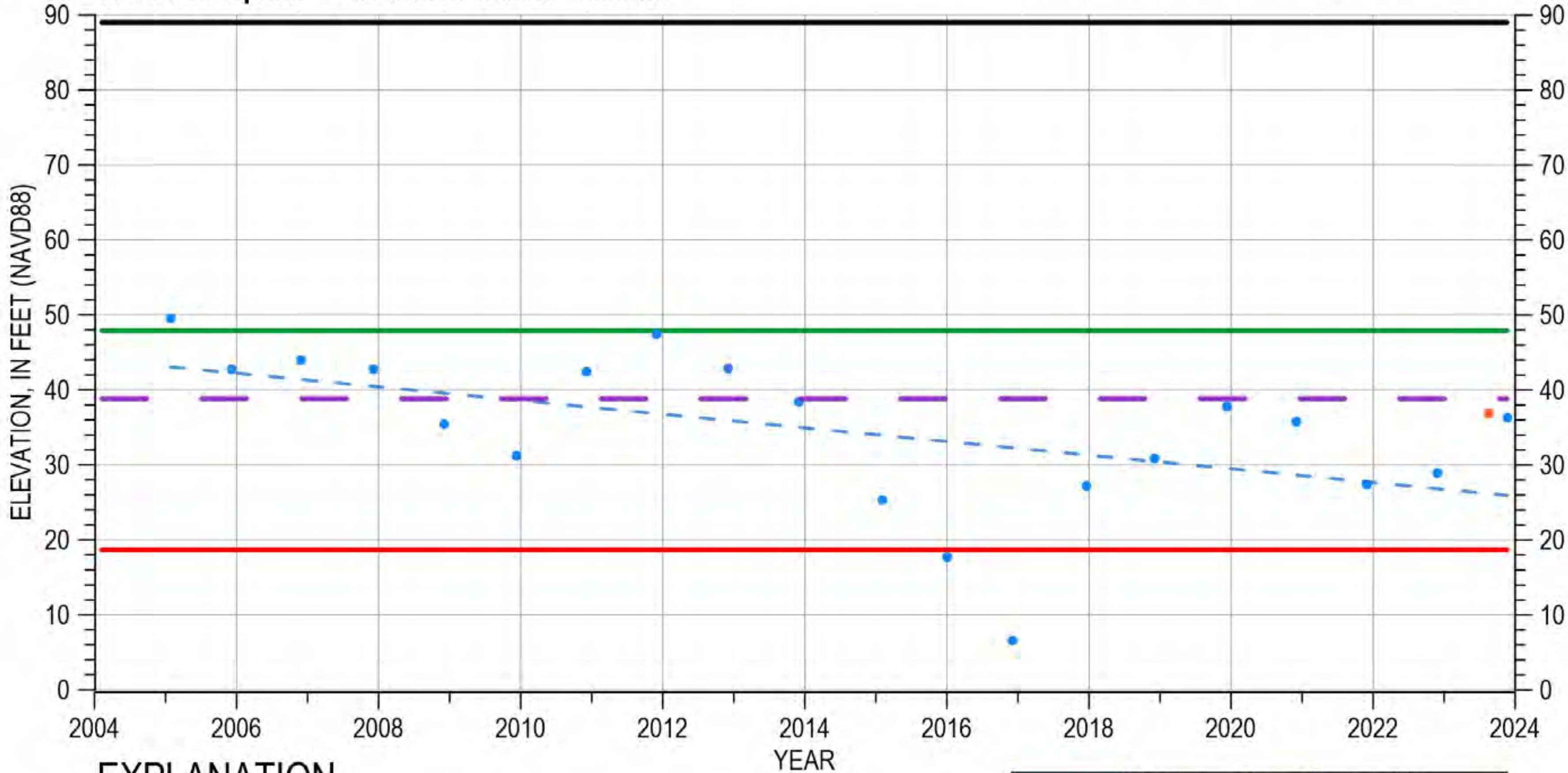
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/04E-05M02

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



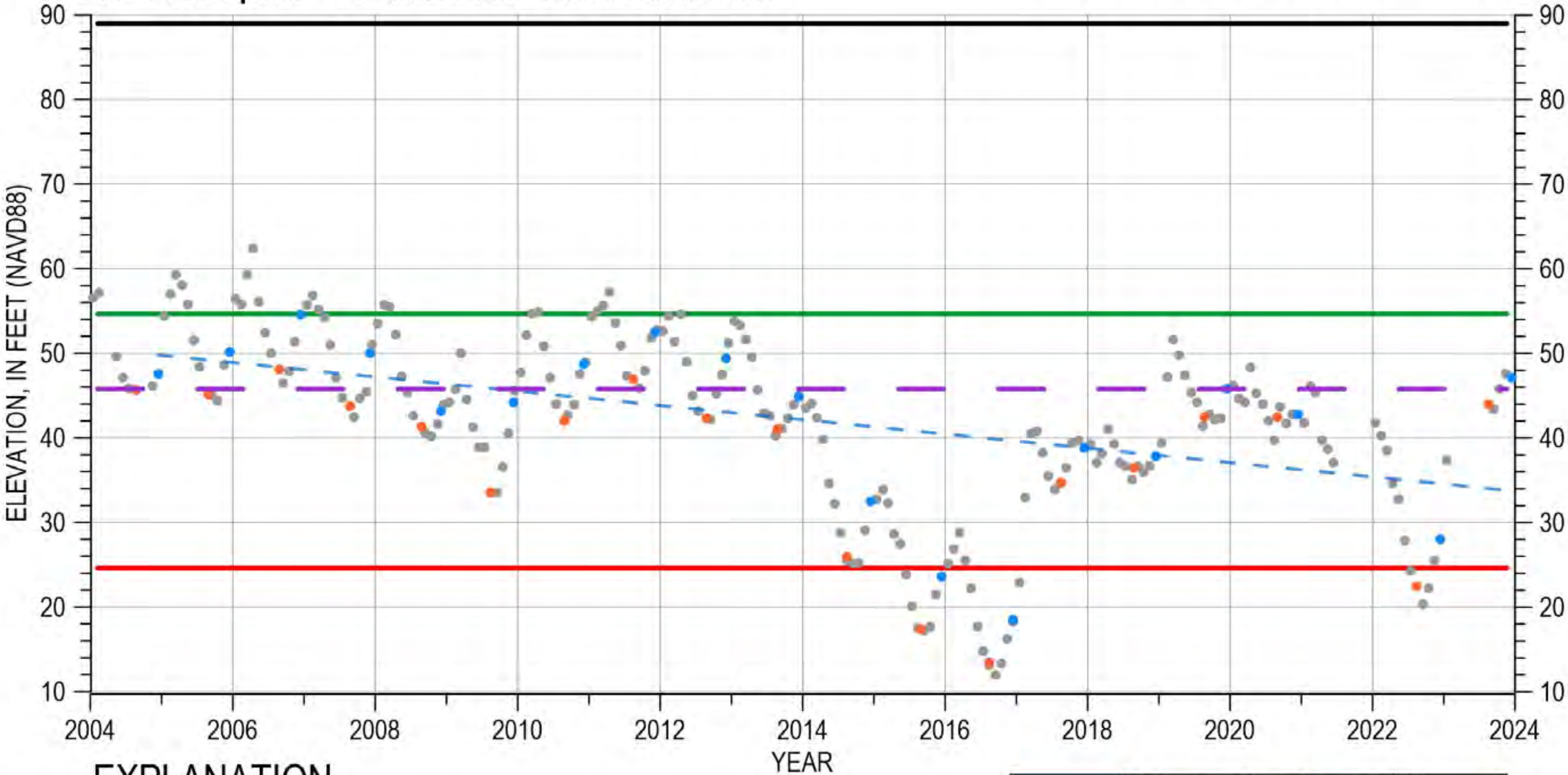
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels

16S/04E-08H03

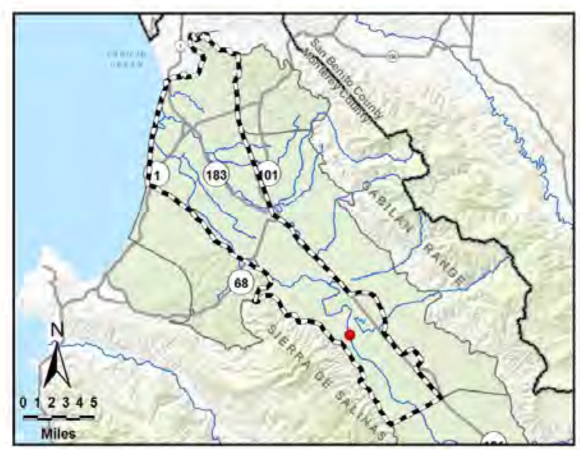
20 YEAR TREND HYDROGRAPH

400-Foot Aquifer Perforated from -152 to -202 feet msl



EXPLANATION

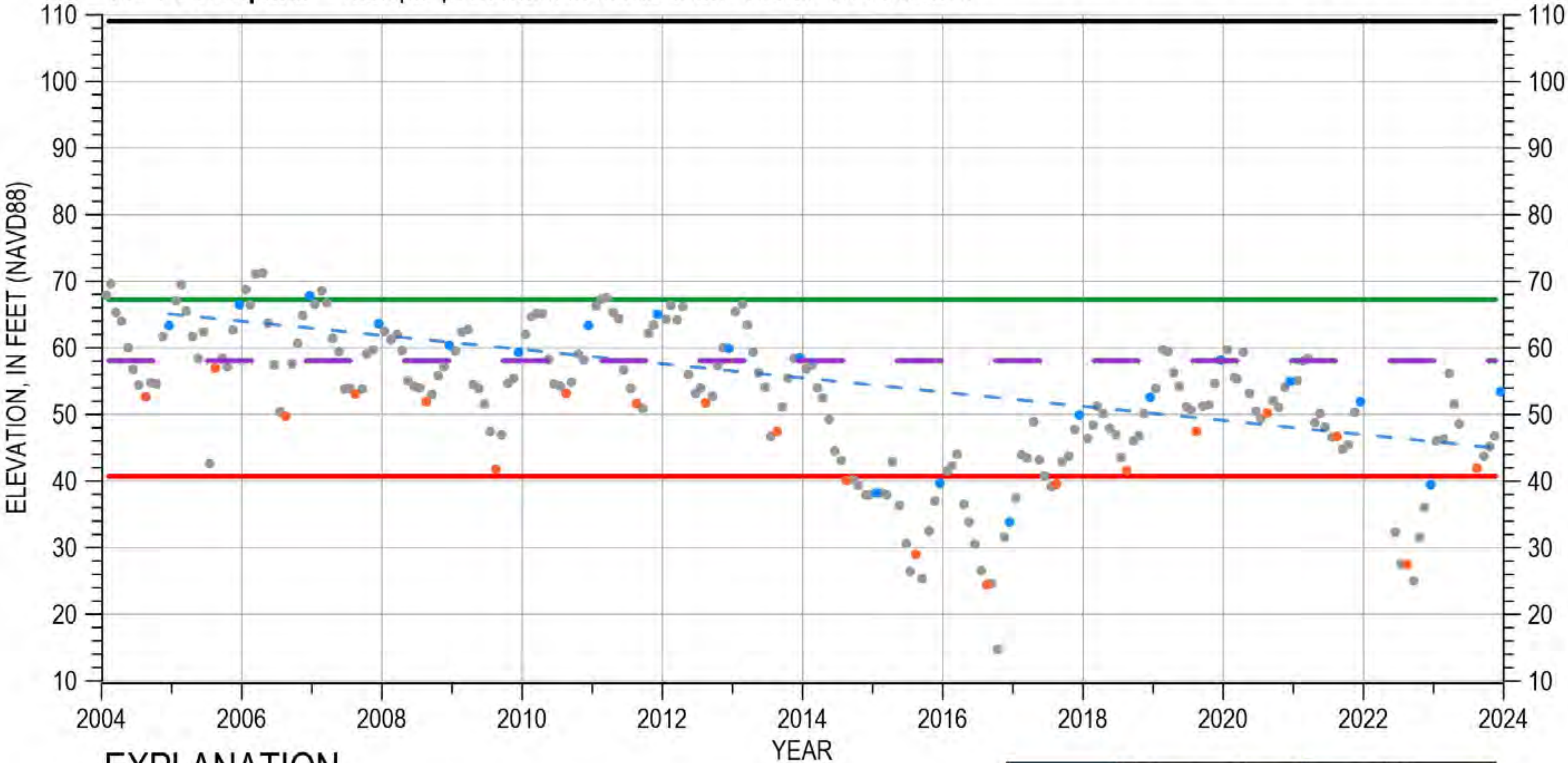
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/04E-10R02

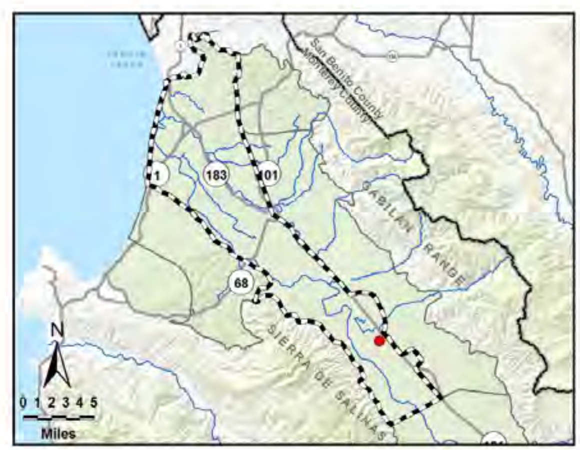
400-Foot Aquifer Multiple perforated intervals from -103 to -368 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

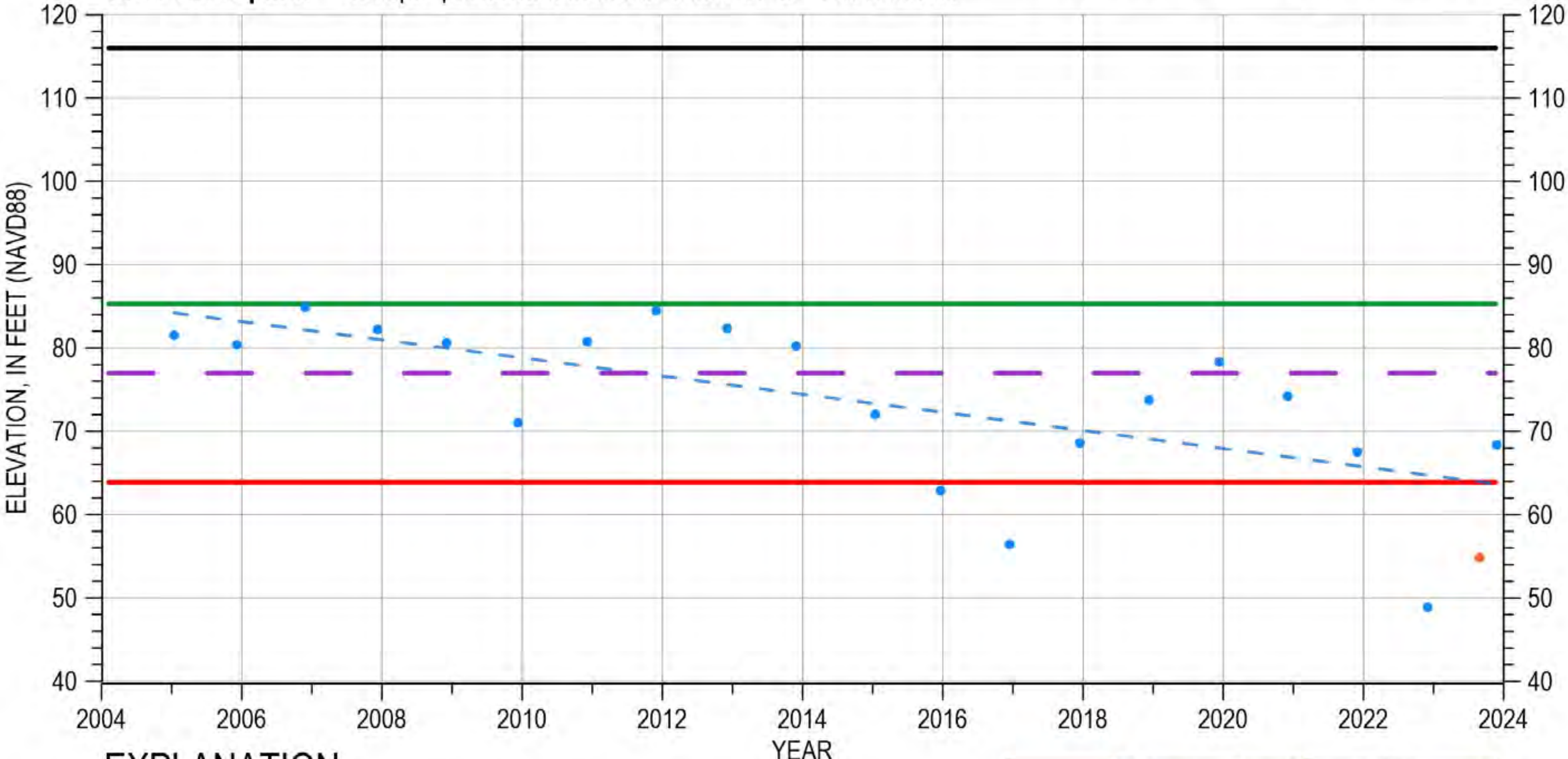
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/04E-13R02

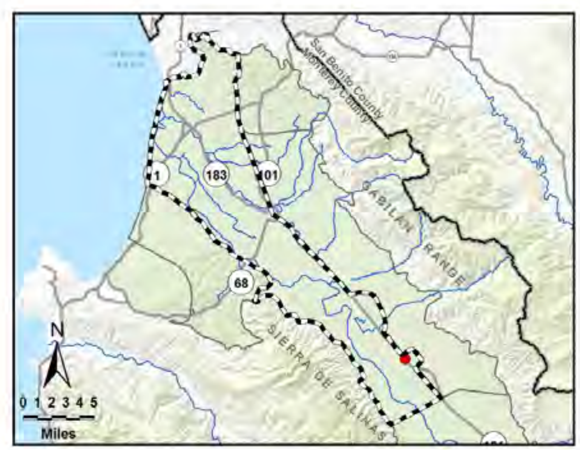
180-Foot Aquifer Multiple perforated intervals from -17 to -160 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

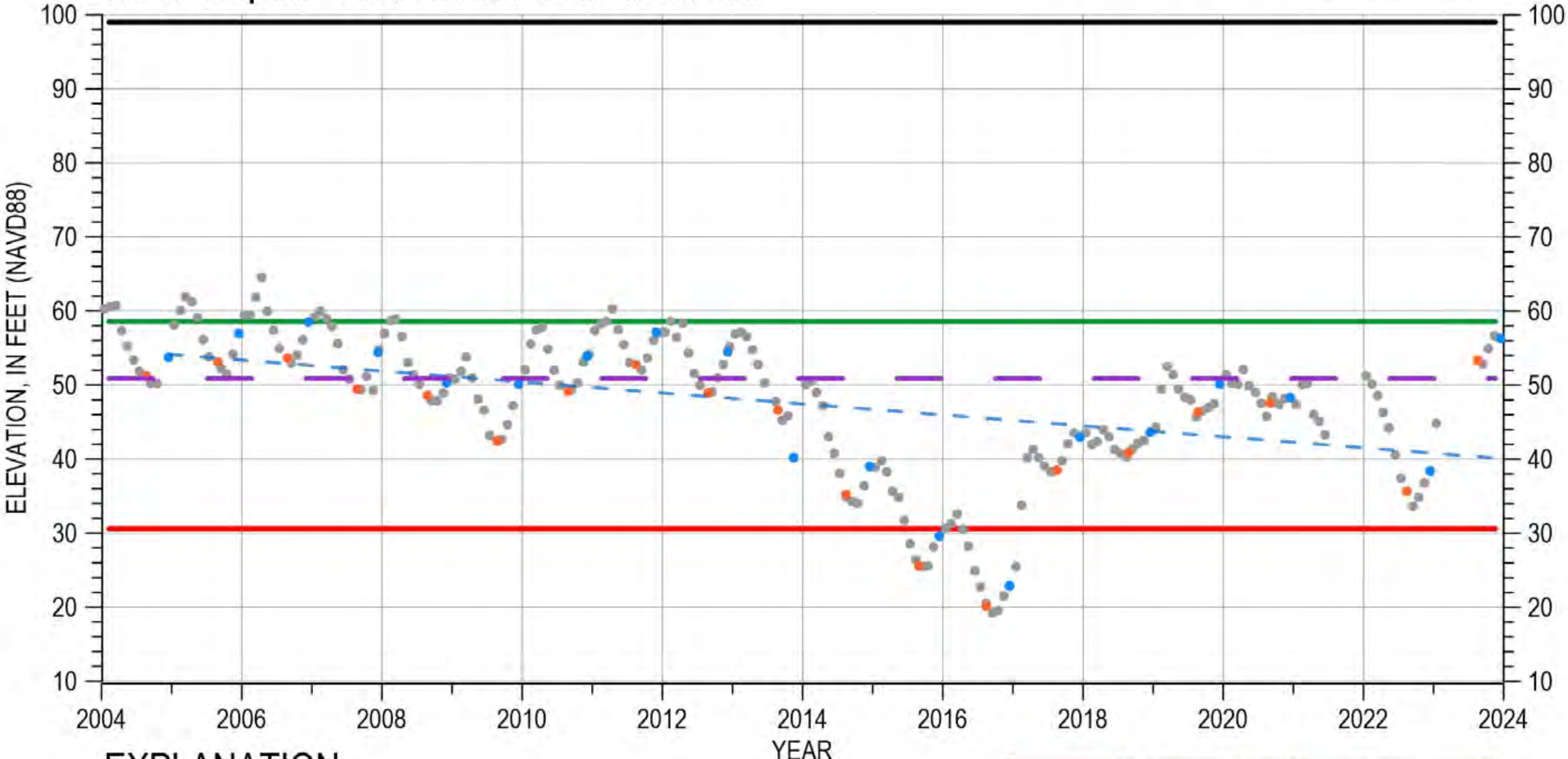
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



16S/04E-15D01

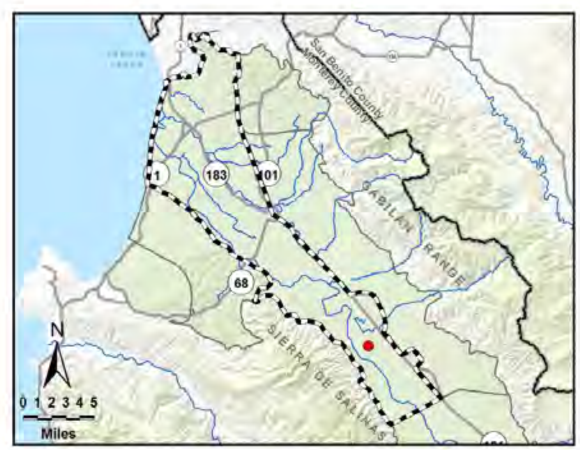
180-Foot Aquifer Perforated from -71 to -259 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

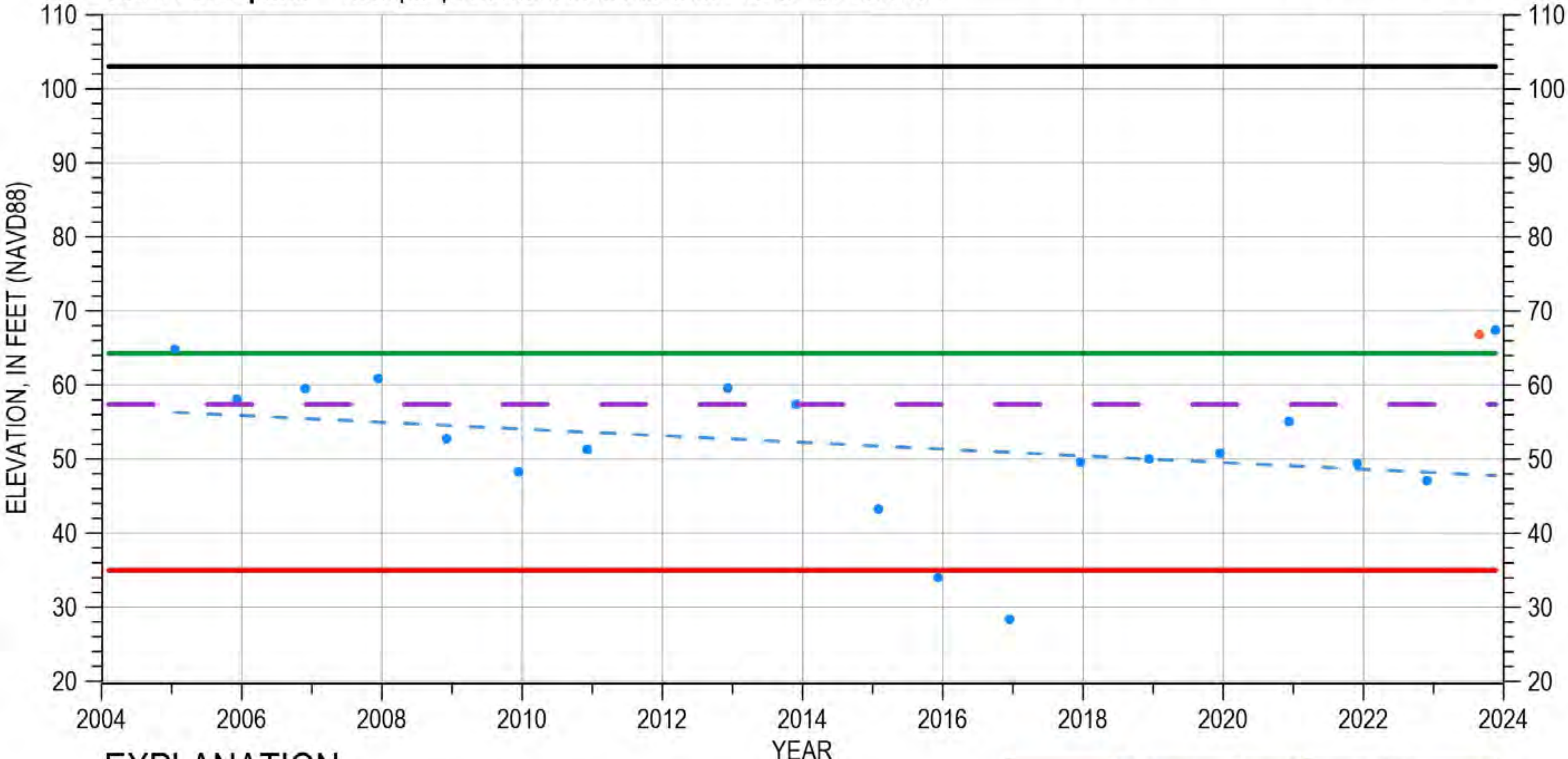
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/04E-15R02

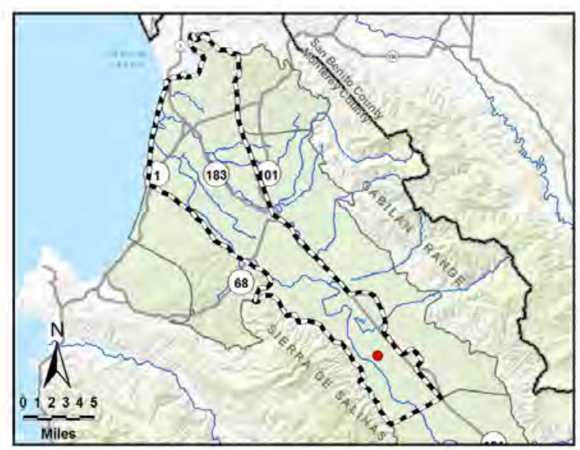
180-Foot Aquifer Multiple perforated intervals from -12 to -80 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

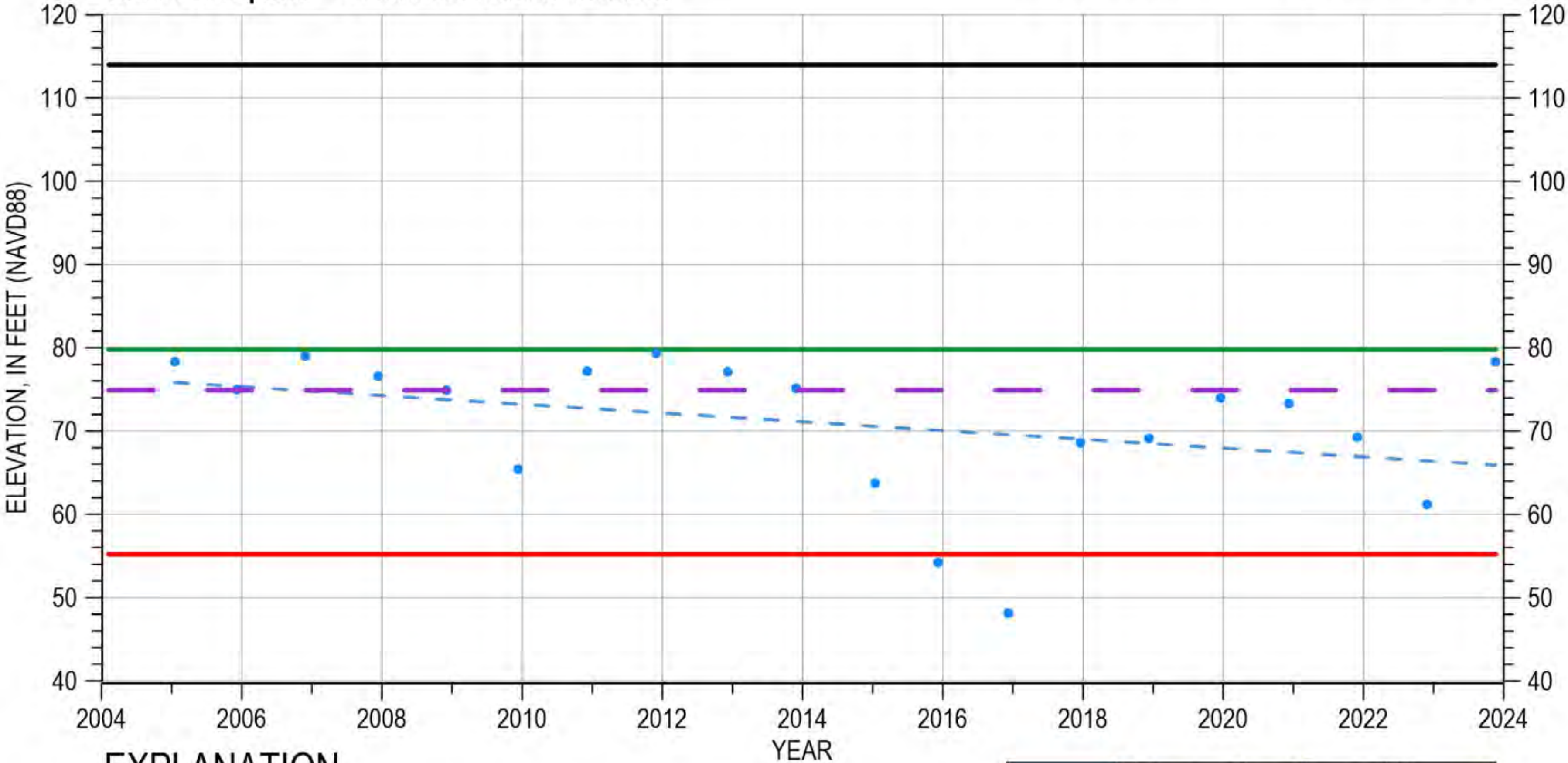
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



16S/04E-25C01

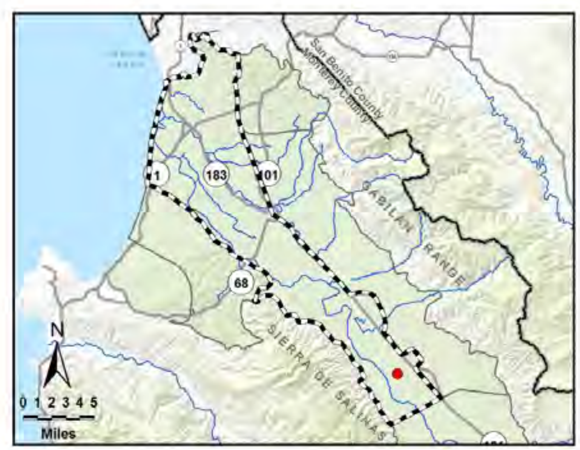
180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



EXPLANATION

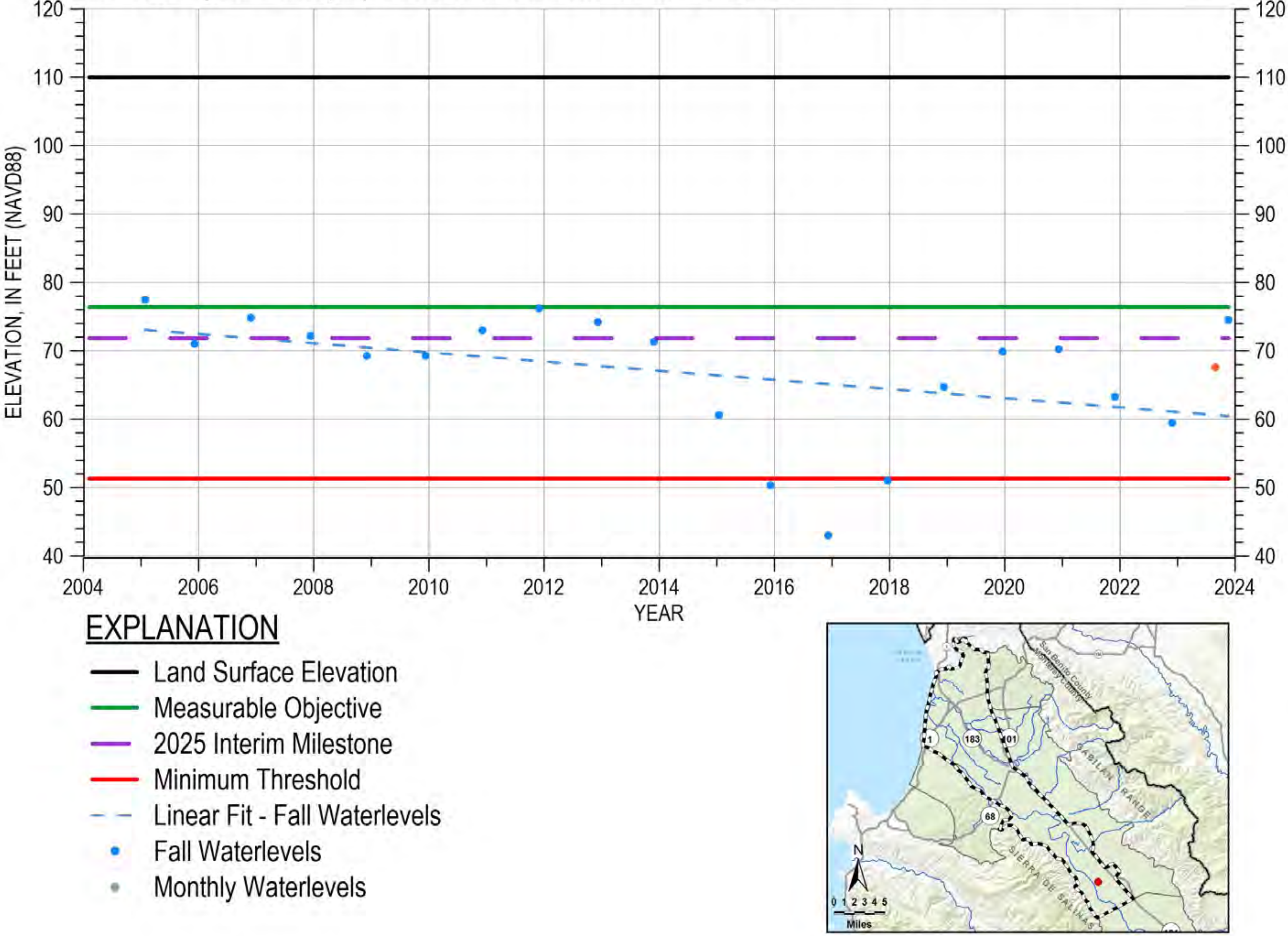
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels



16S/04E-25G01

400-Foot Aquifer Multiple perforated intervals from -322 to -438 feet msl

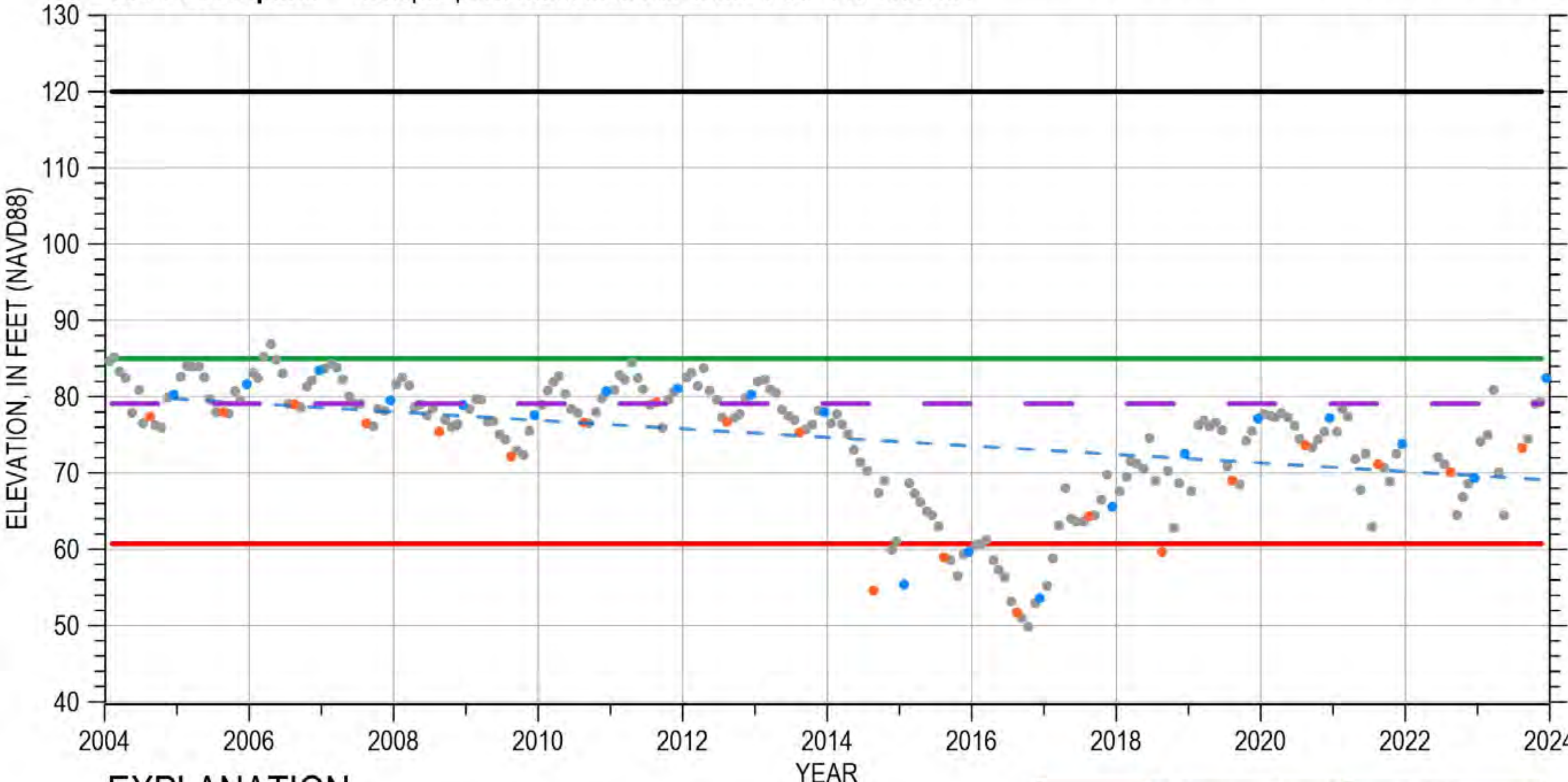
20 YEAR TREND HYDROGRAPH



16S/05E-30E01

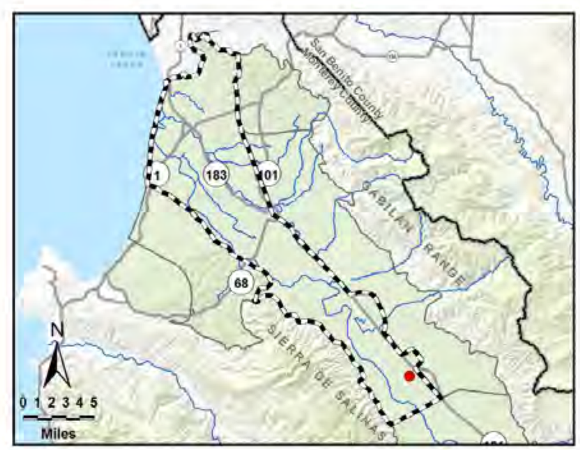
180-Foot Aquifer Multiple perforated intervals from -5 to -145 feet msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

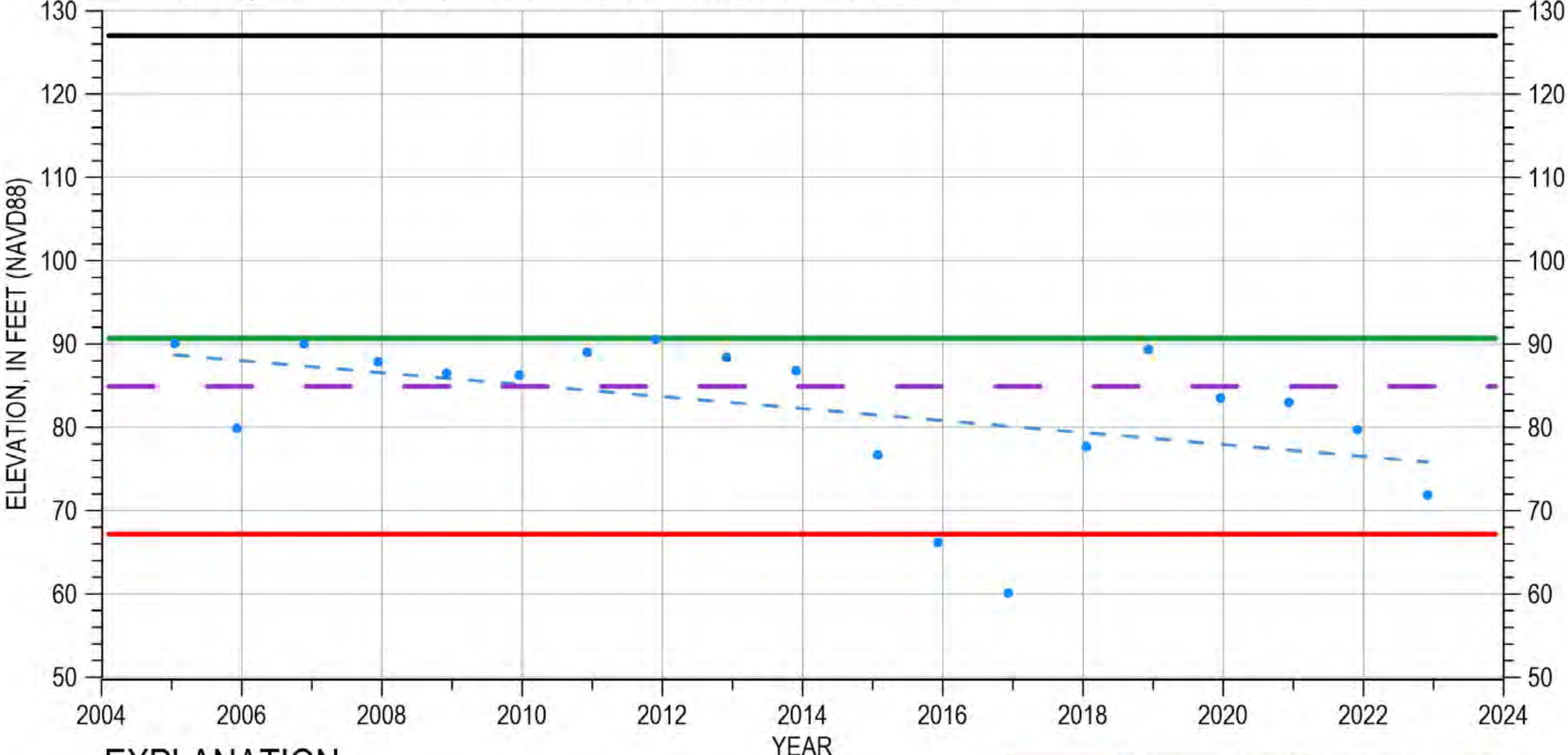
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



16S/05E-30J02

400-Foot Aquifer Multiple perforated intervals from -63 to -308 feet msl

20 YEAR TREND HYDROGRAPH



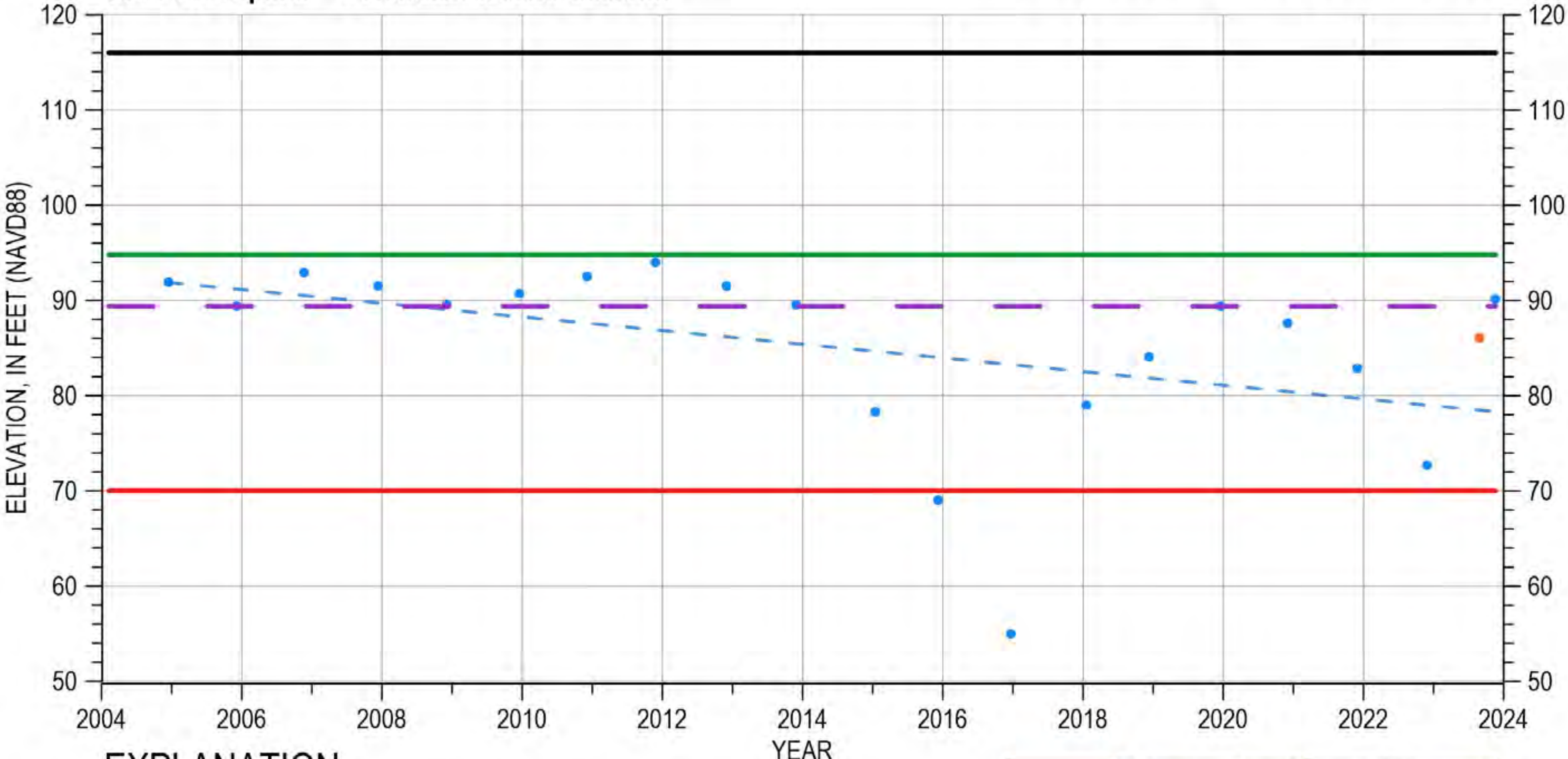
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

16S/05E-31M01

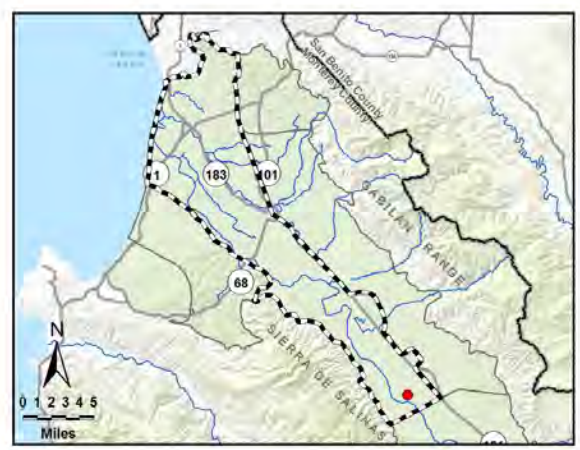
180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



EXPLANATION

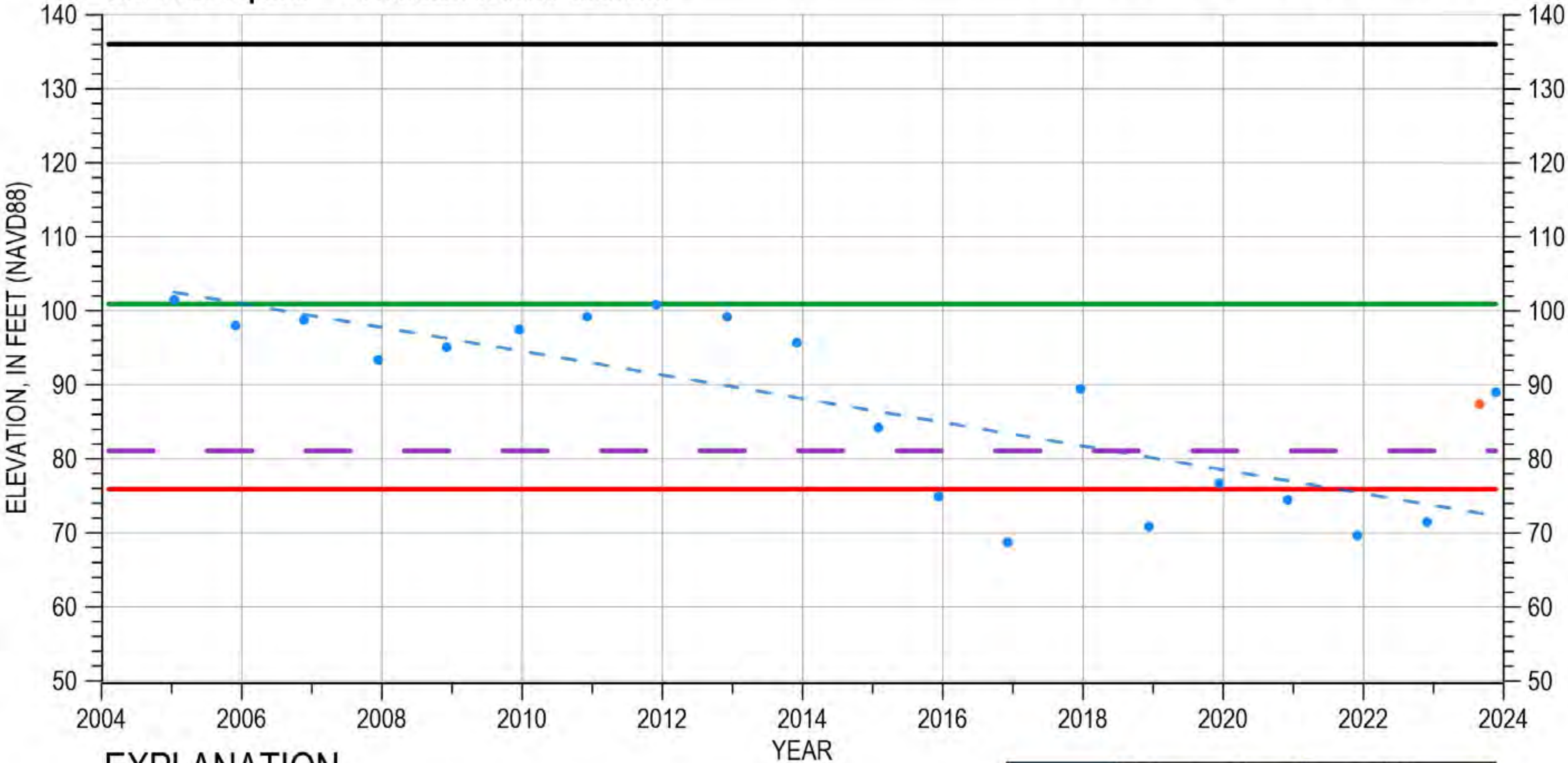
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



17S/04E-01D01

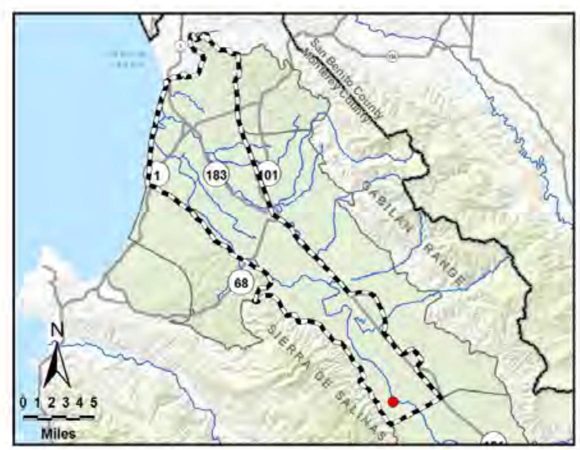
180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- Monthly Waterlevels



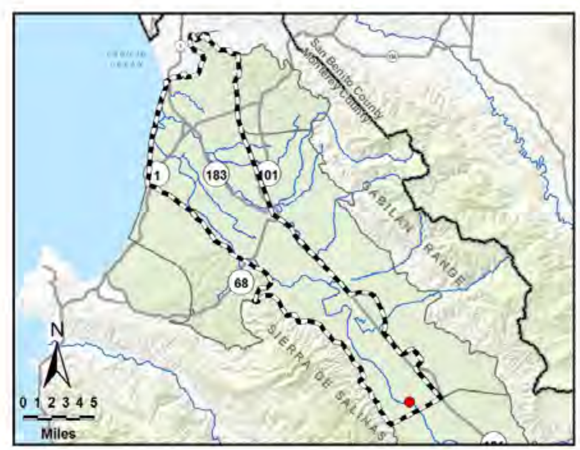
17S/05E-06C02

180-Foot Aquifer Perforated from 57 to 7 feet msl

20 YEAR TREND HYDROGRAPH

EXPLANATION

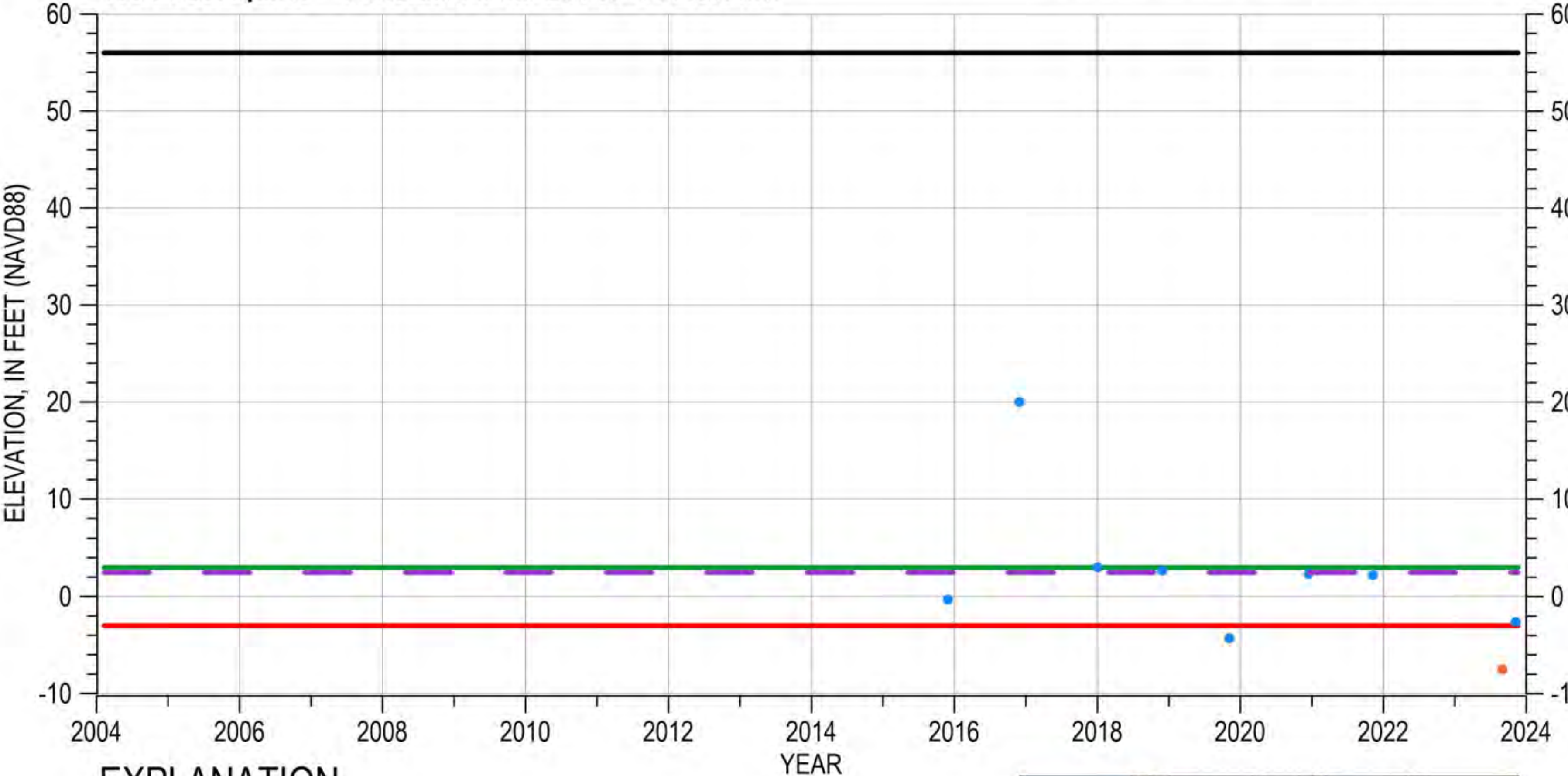
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



12S/02E-33H02

400-Foot Aquifer Perforated from -234 to -514 feel msl

20 YEAR TREND HYDROGRAPH



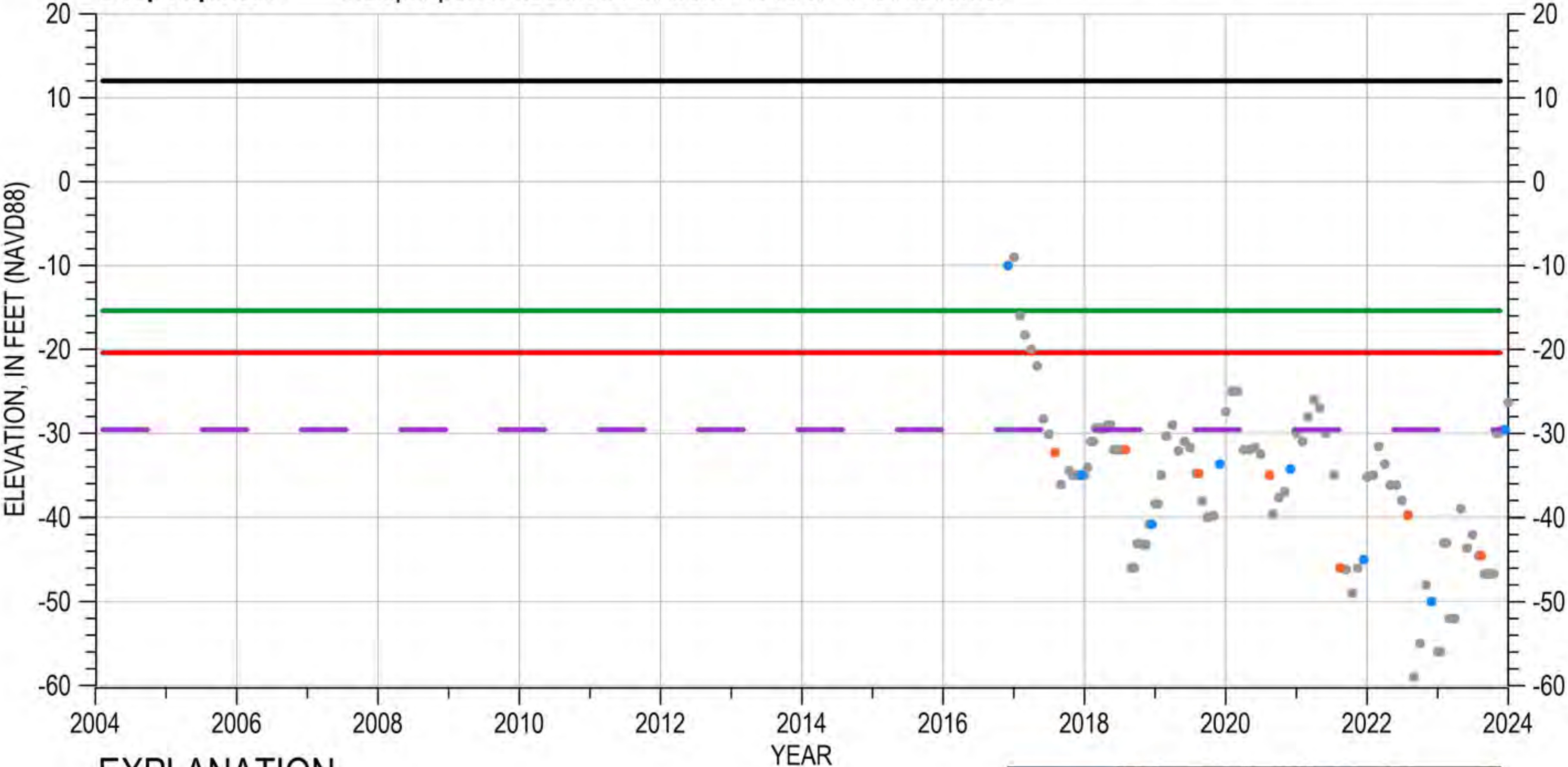
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

13S/02E-28L03

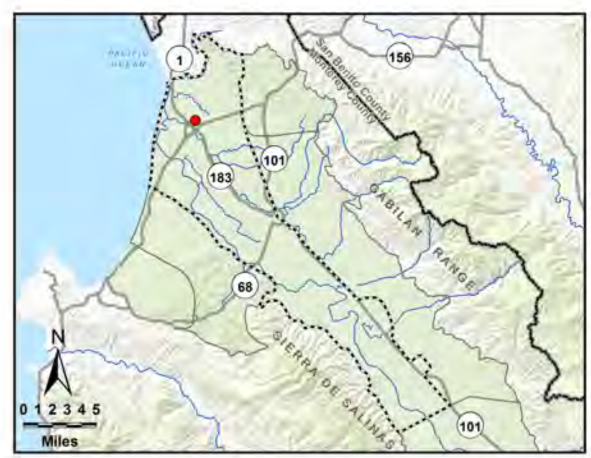
20 YEAR TREND HYDROGRAPH

Deep Aquifers Multiple perforated intervals from -1068 to -1438 feet msl



EXPLANATION

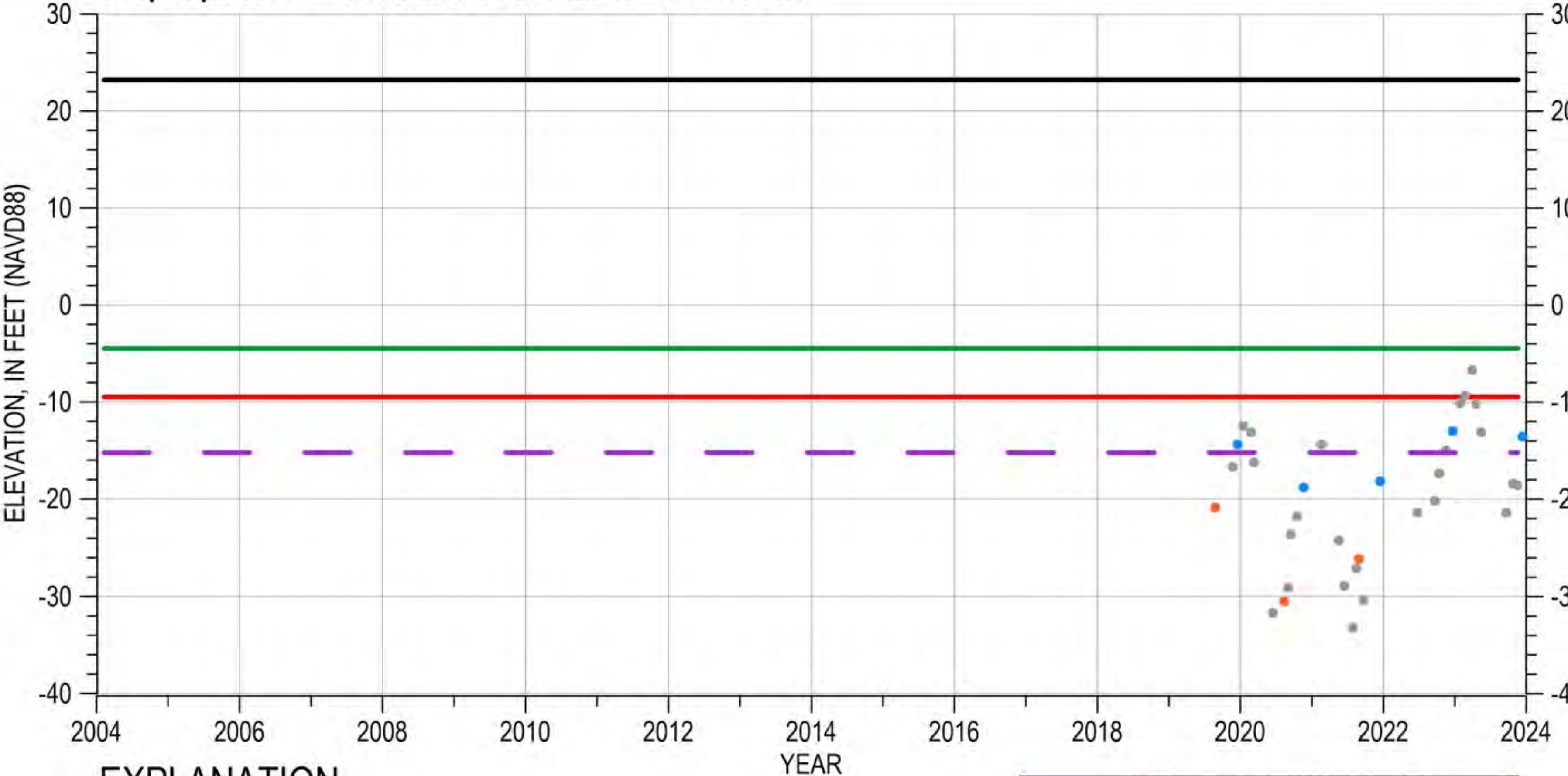
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



14S/02E-07J03

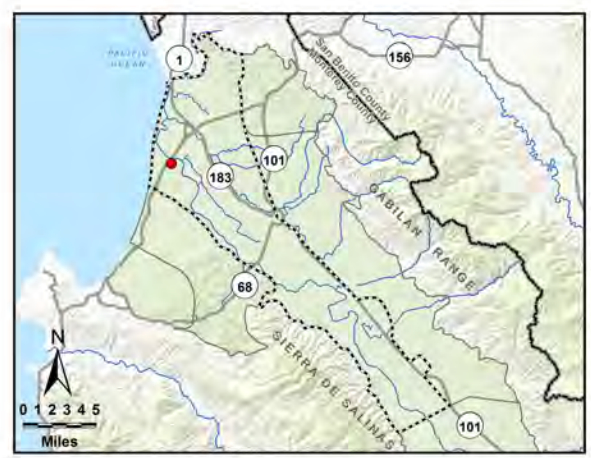
Deep Aquifers Perforated from -1427 to -1547 feet msl

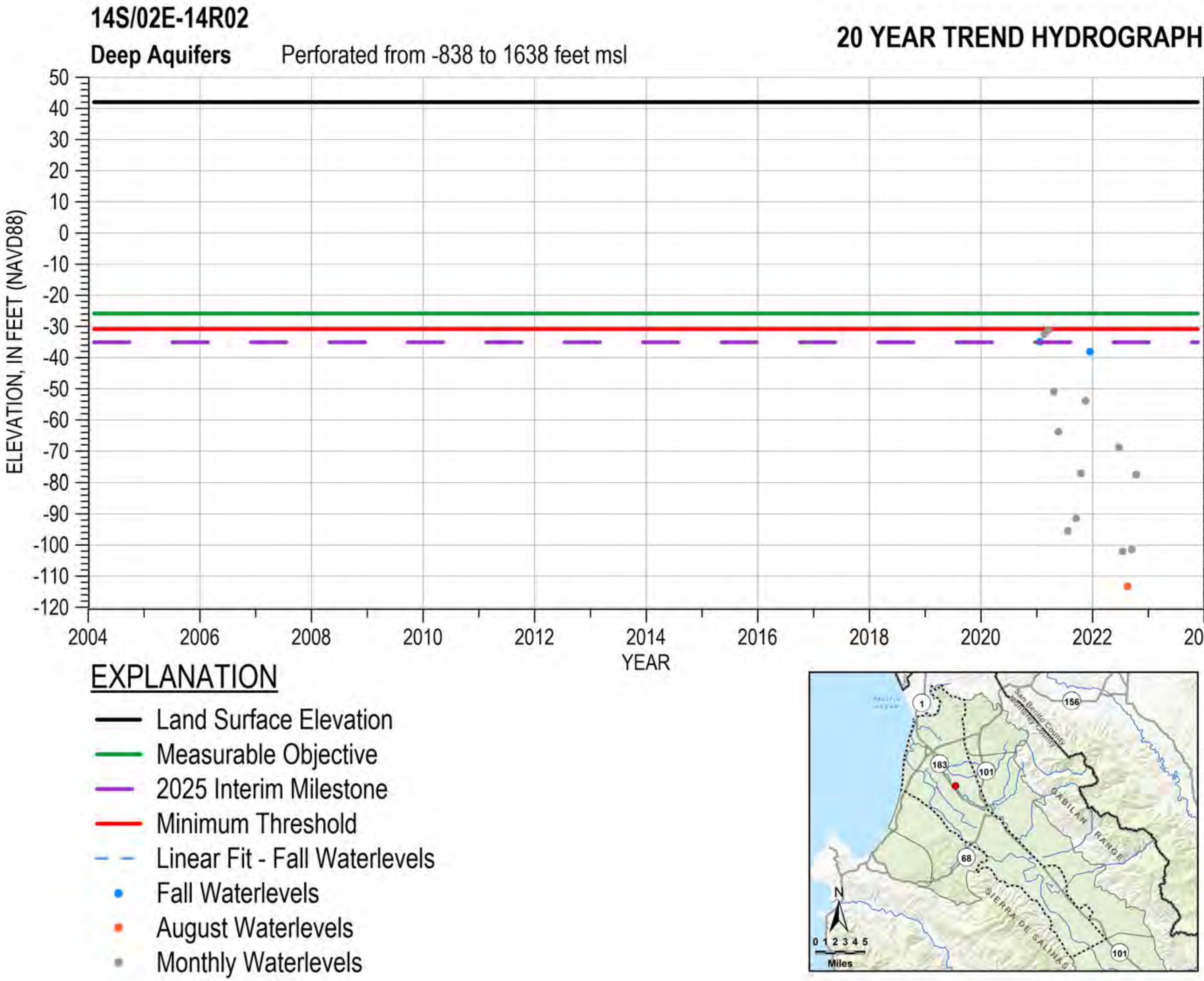
20 YEAR TREND HYDROGRAPH



EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



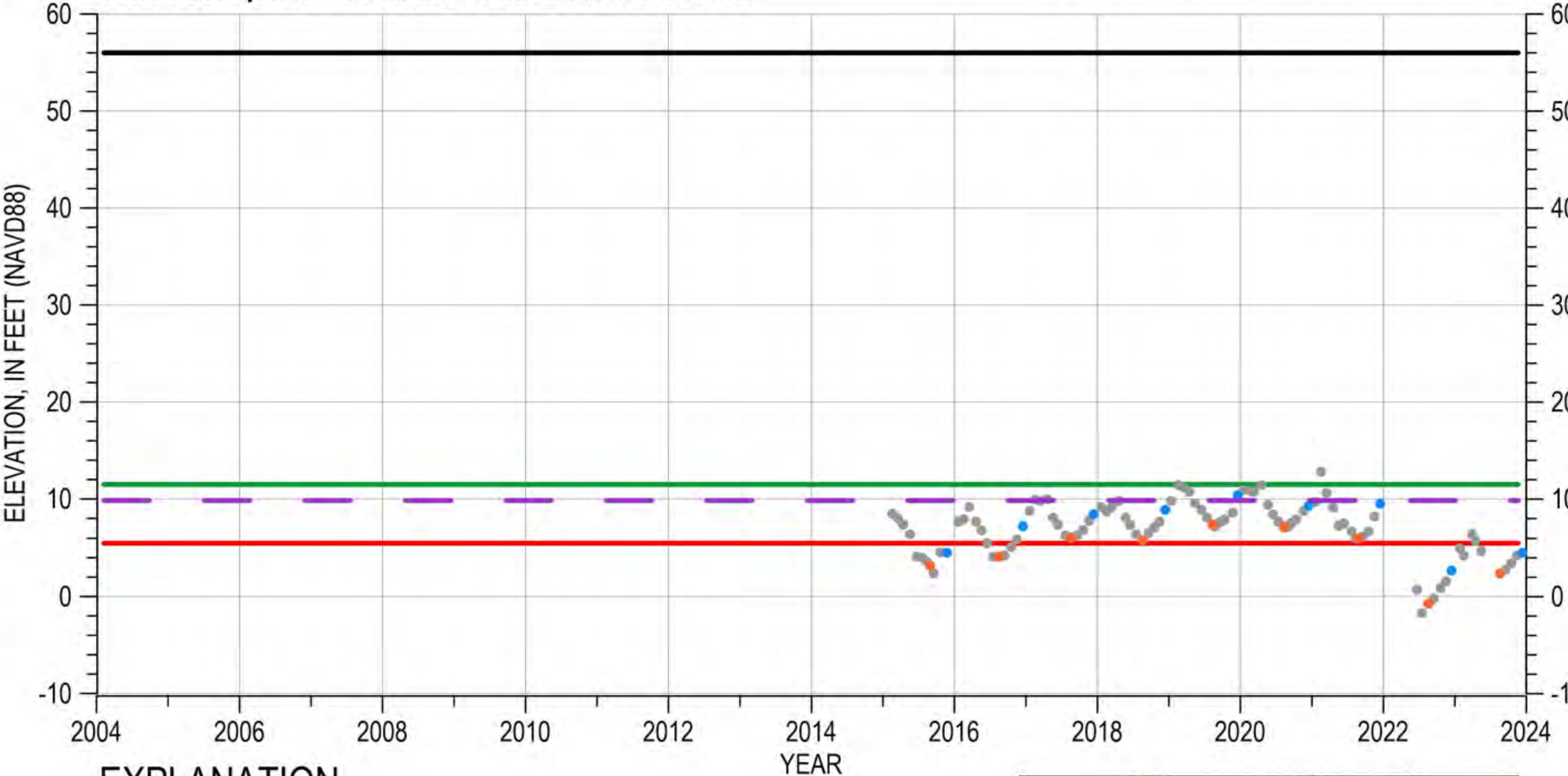


14S/02E-14R02
Deep Aquifers
Perforated from -838 to 1638 feet msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
156
1
183
101
68
101
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

14S/02E-17C02

180-Foot Aquifer Perforated from -24 to -84 feet msl

20 YEAR TREND HYDROGRAPH



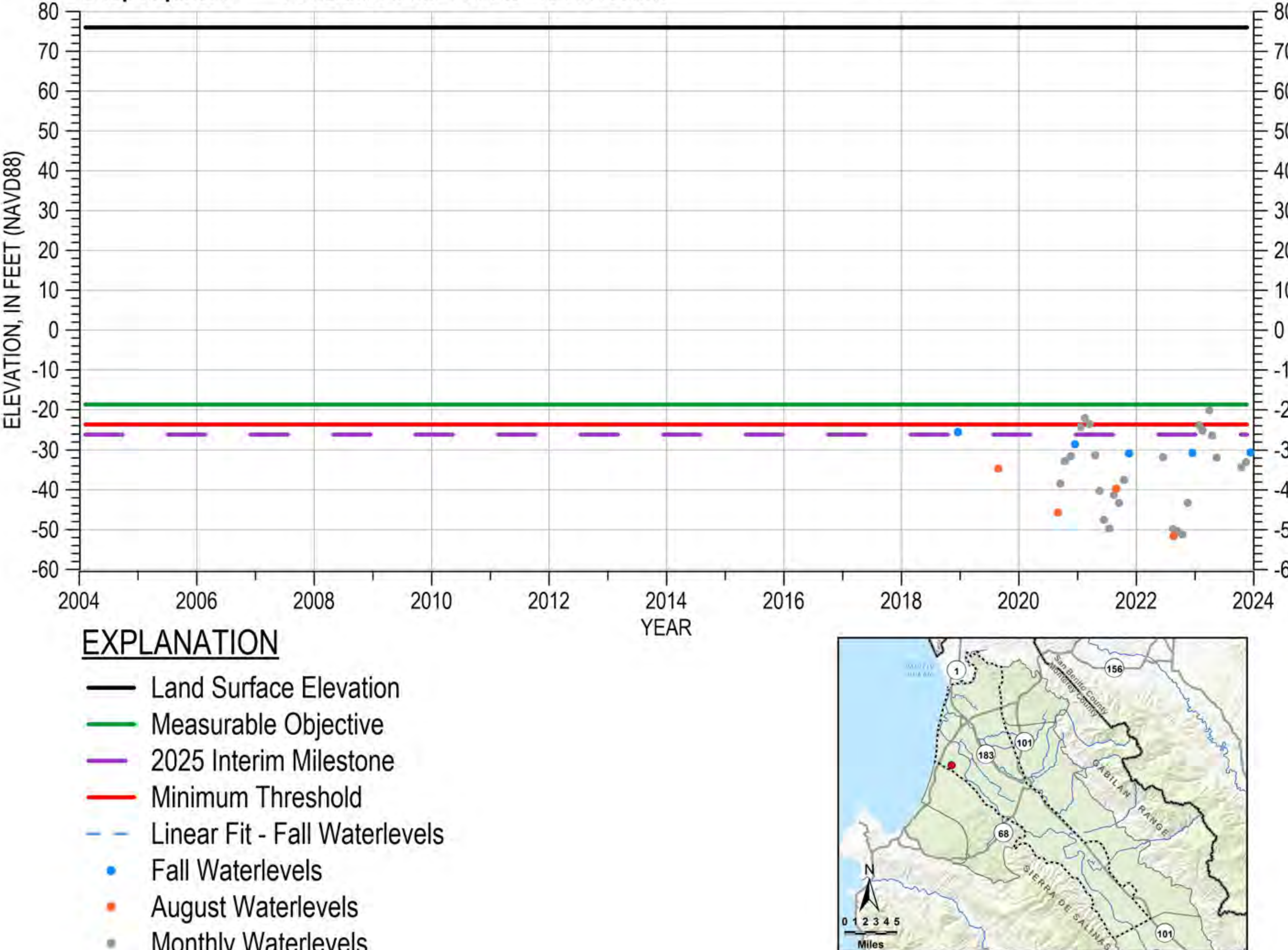
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-20E01

Deep Aquifers Perforated from -1044 to -1944 feet msl

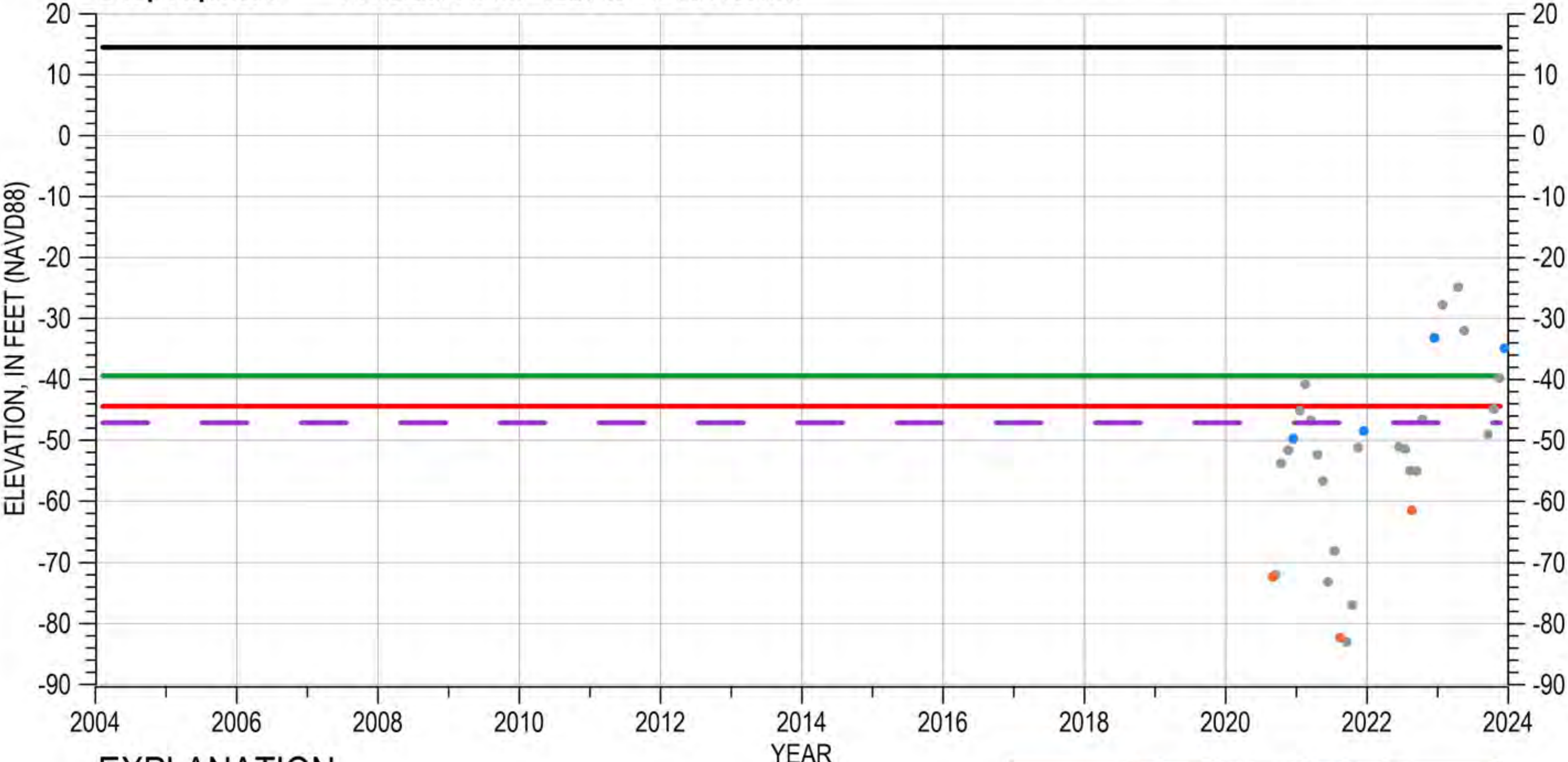
20 YEAR TREND HYDROGRAPH



14S/02E-21K04

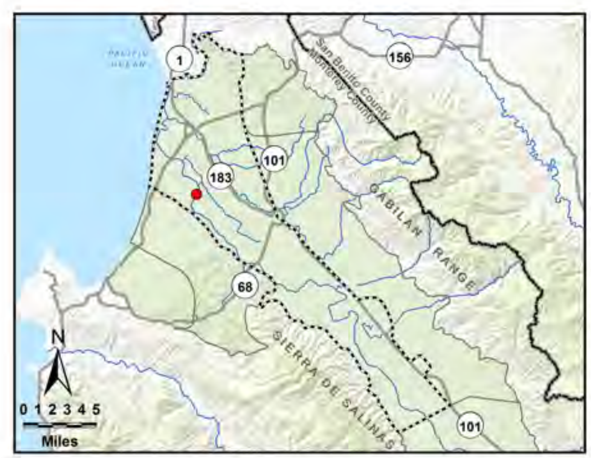
20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -1226 to -1786 feet msl



EXPLANATION

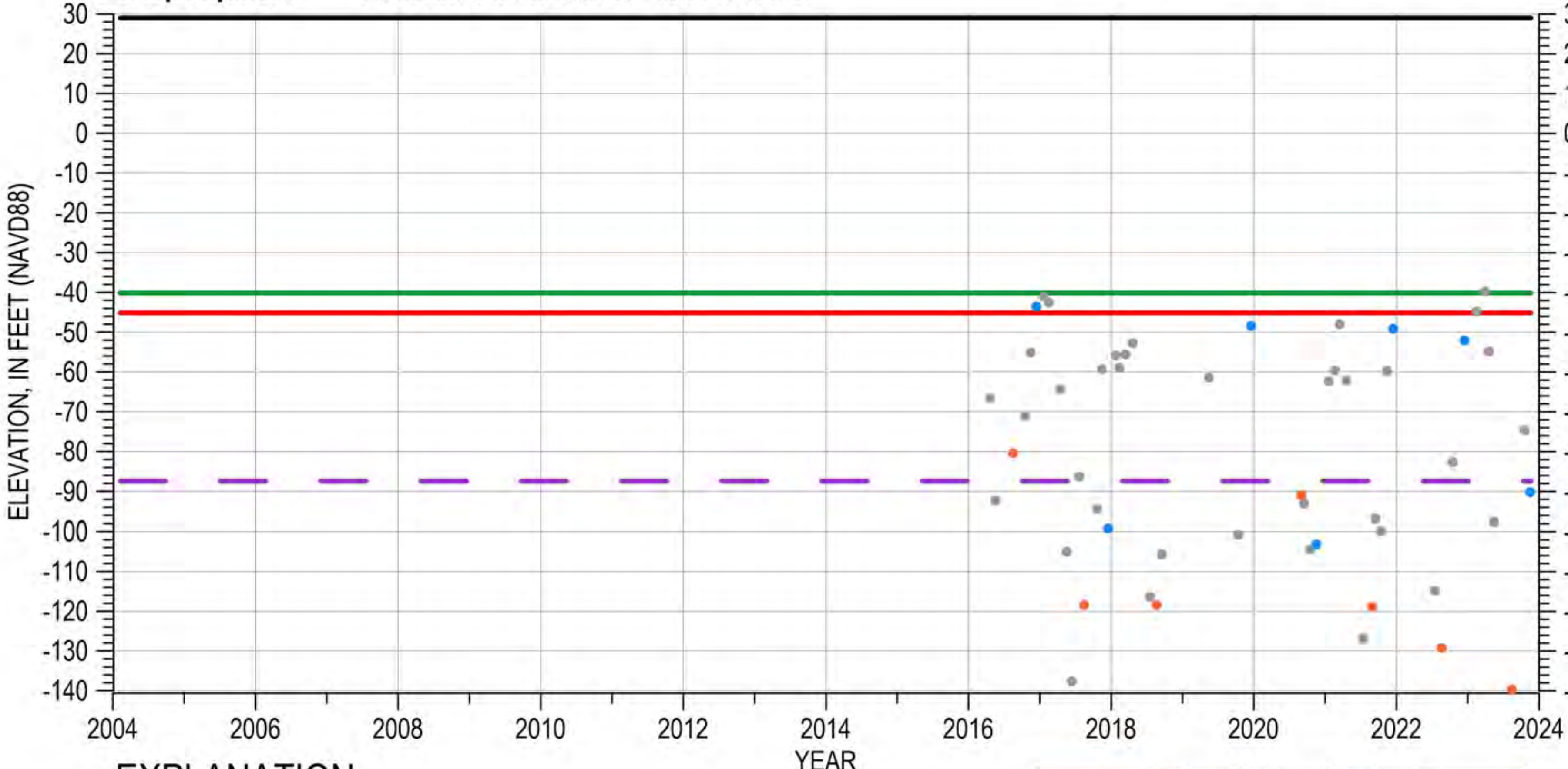
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

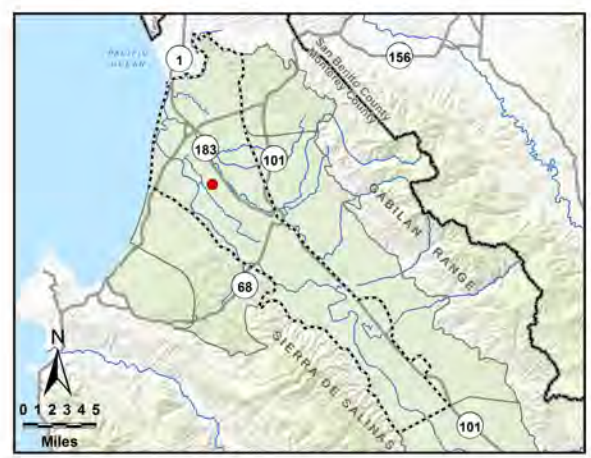


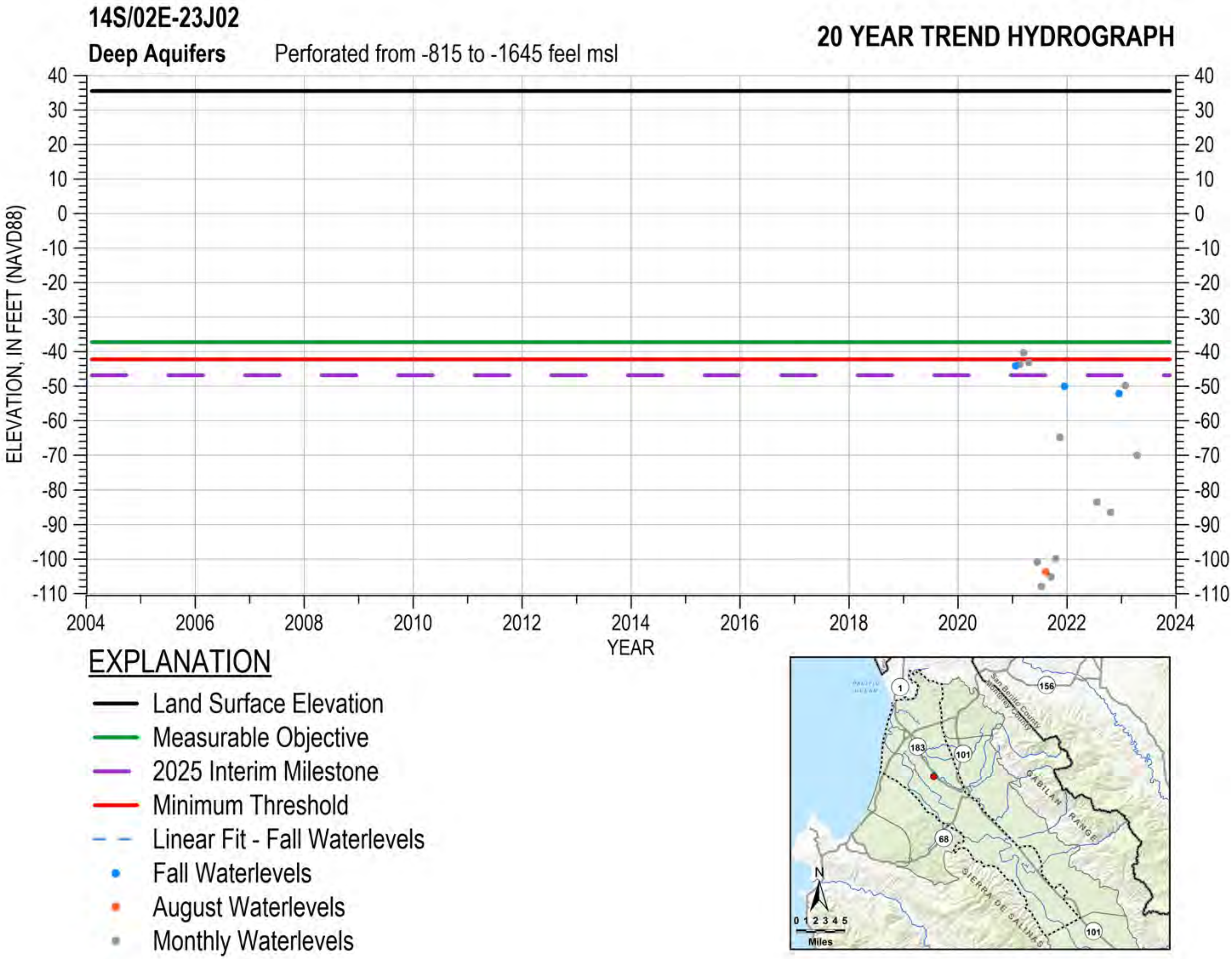
14S/02E-22A03

20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -951 to -1611 feet msl



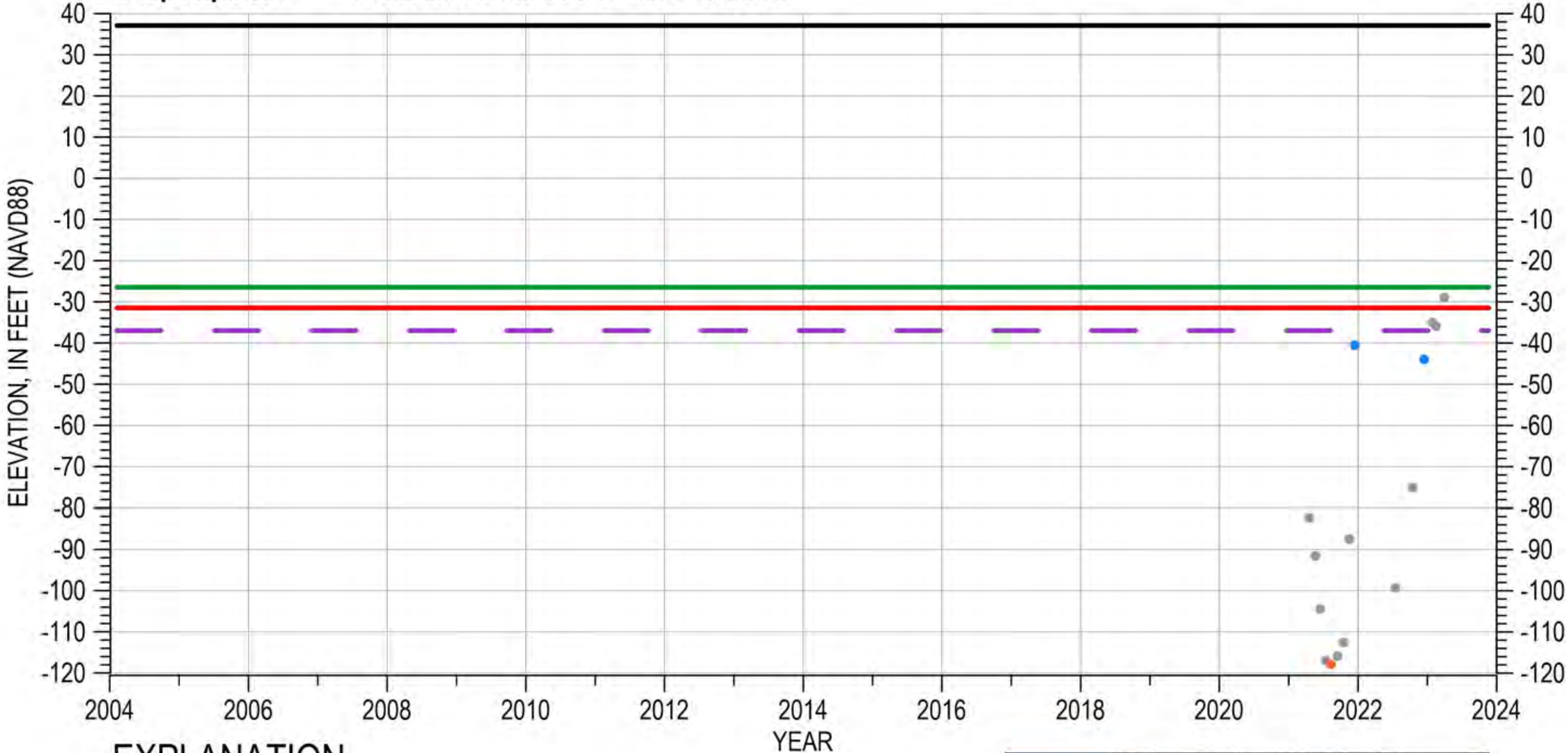



14S/02E-23J02
Deep Aquifers
Perforated from -815 to -1645 feel msl
20 YEAR TREND HYDROGRAPH
ELEVATION, IN FEET (NAVD88)
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
YEAR
EXPLANATION
Land Surface Elevation
Measurable Objective
2025 Interim Milestone
Minimum Threshold
Linear Fit - Fall Waterlevels
Fall Waterlevels
August Waterlevels
Monthly Waterlevels
1
156
183
101
68
101
GABILAN RANGE
SIERRA DE SALINAS
N
0 1 2 3 4 5
Miles

14S/02E-25A03

20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -773 to -1663 feel msl



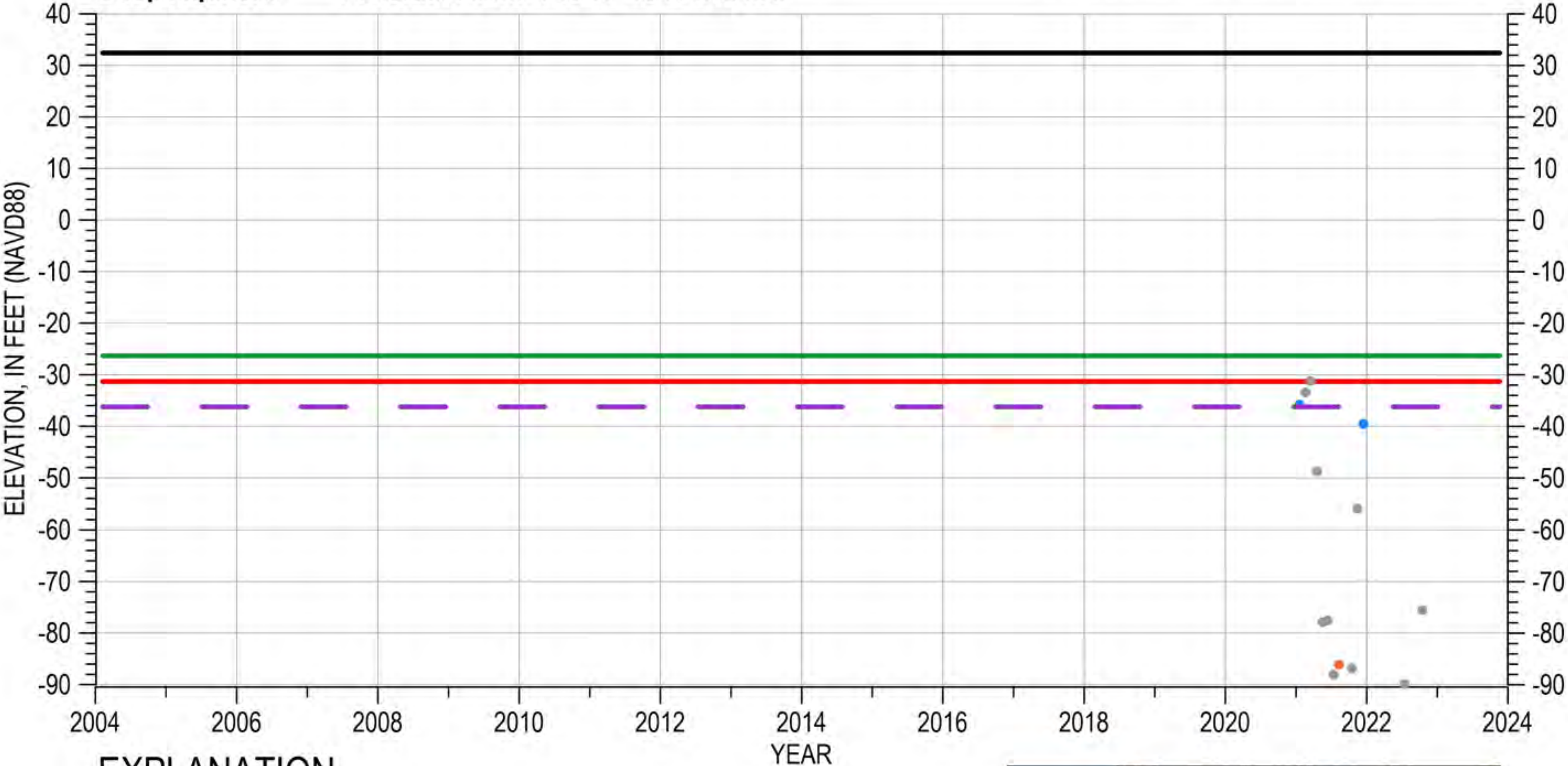
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-26G01

20 YEAR TREND HYDROGRAPH

Deep Aquifers Perforated from -788 to -1648 feel msl



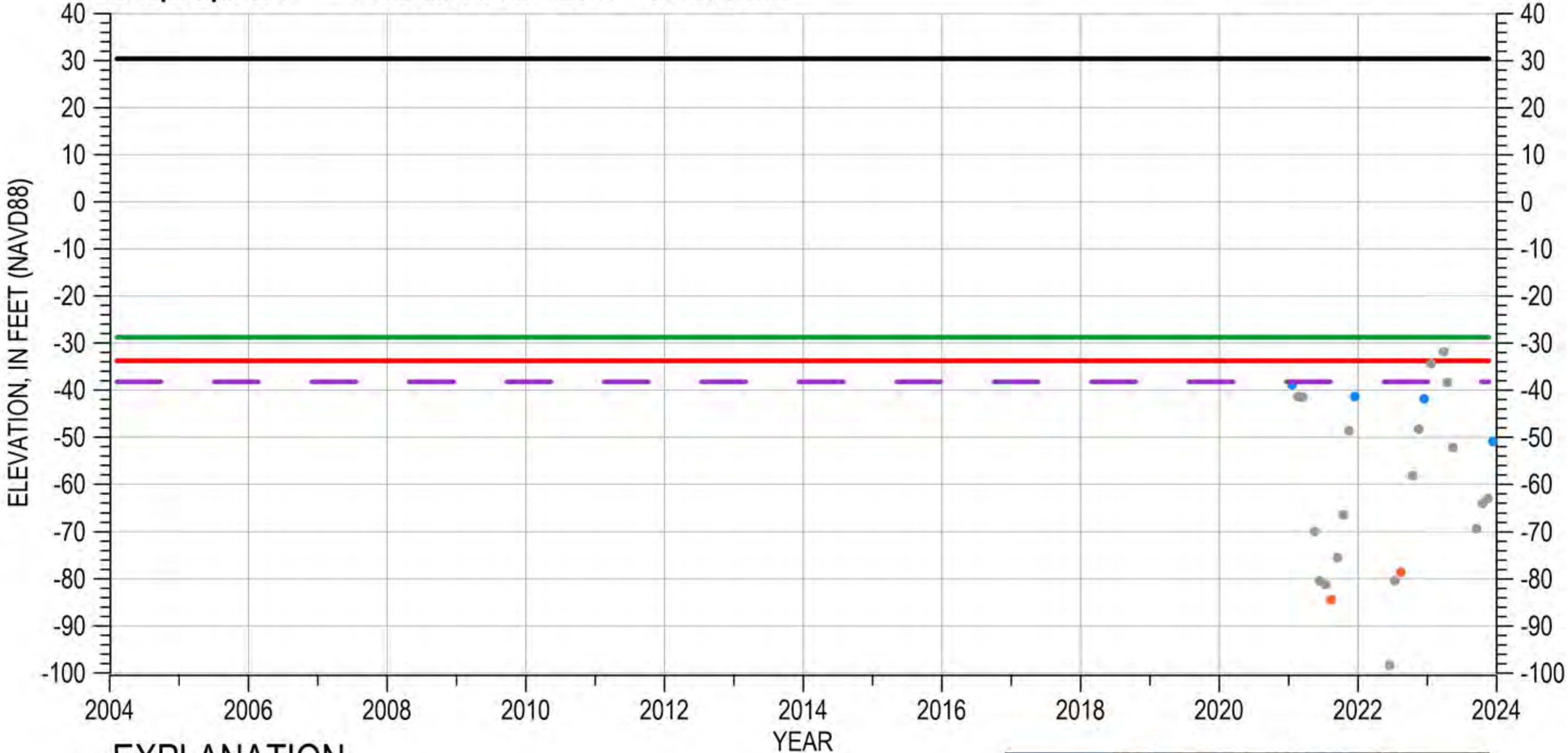
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-27K02

Deep Aquifers Perforated from -820 to -1650 feet msl

20 YEAR TREND HYDROGRAPH



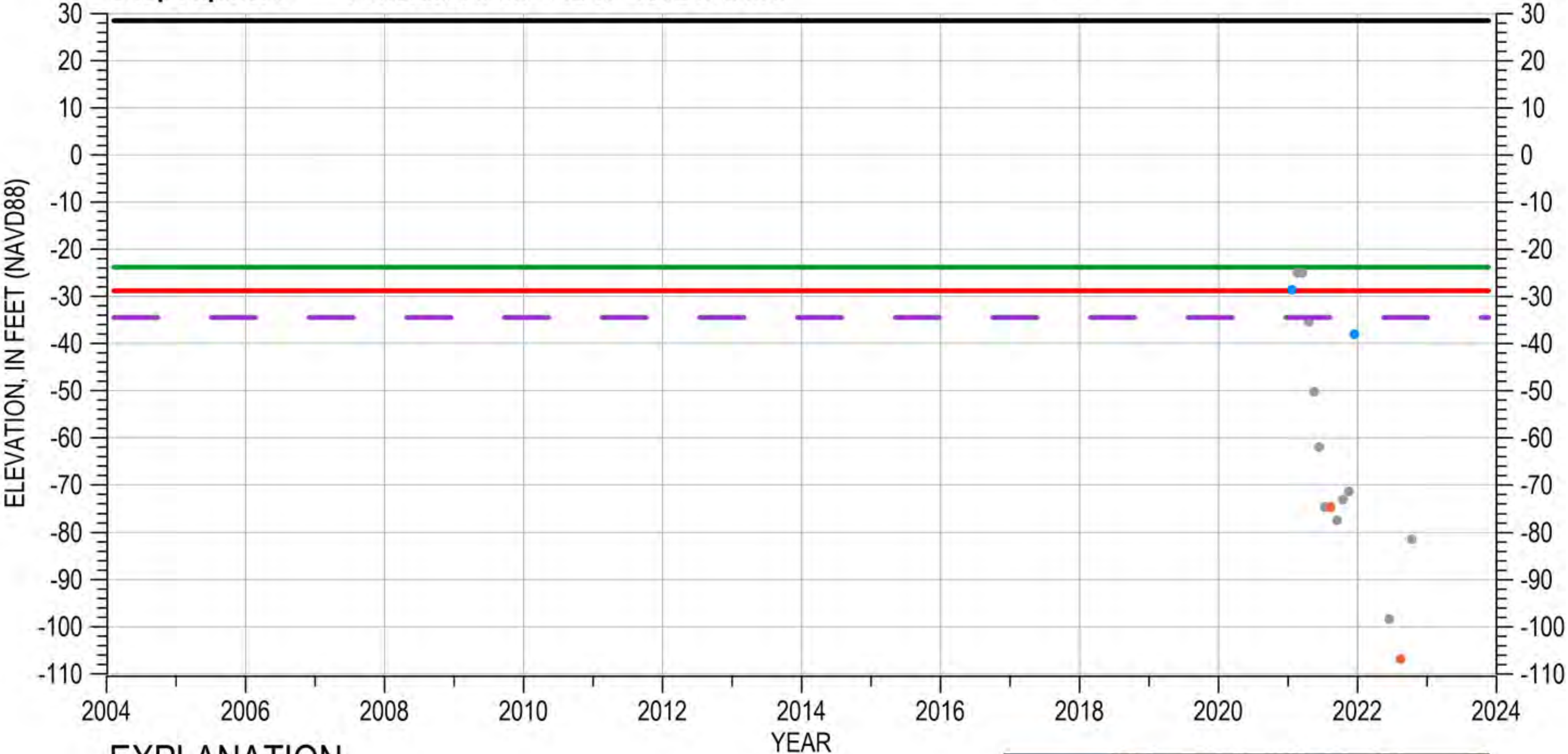
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/02E-35B01

Deep Aquifers Perforated from -842 to -1652 feel msl

20 YEAR TREND HYDROGRAPH



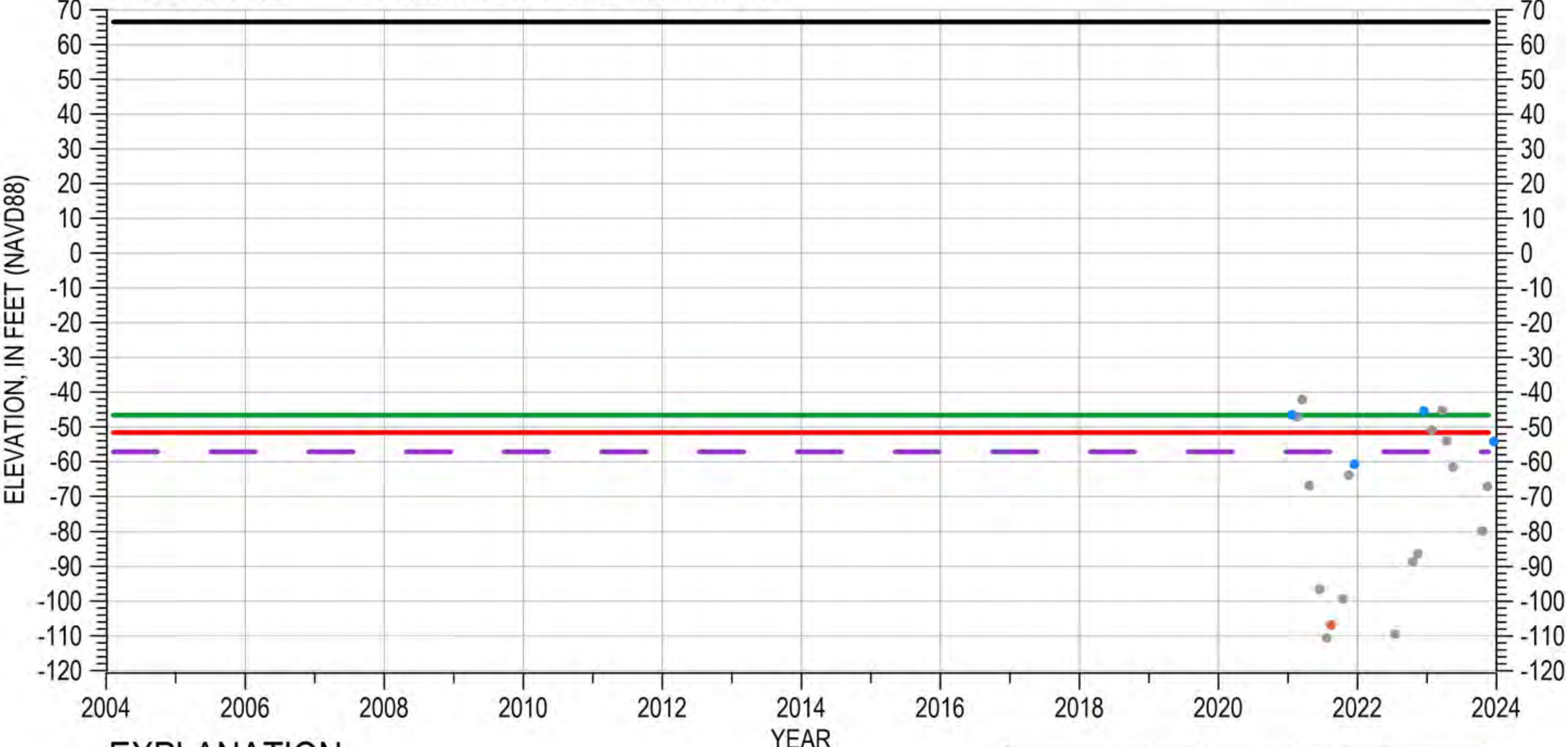
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels

14S/03E-19C01

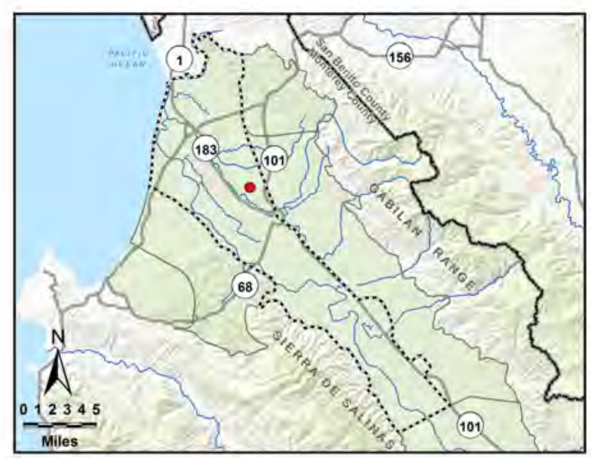
Deep Aquifers Perforated from -767 to -1657 feel msl

20 YEAR TREND HYDROGRAPH



EXPLANATION

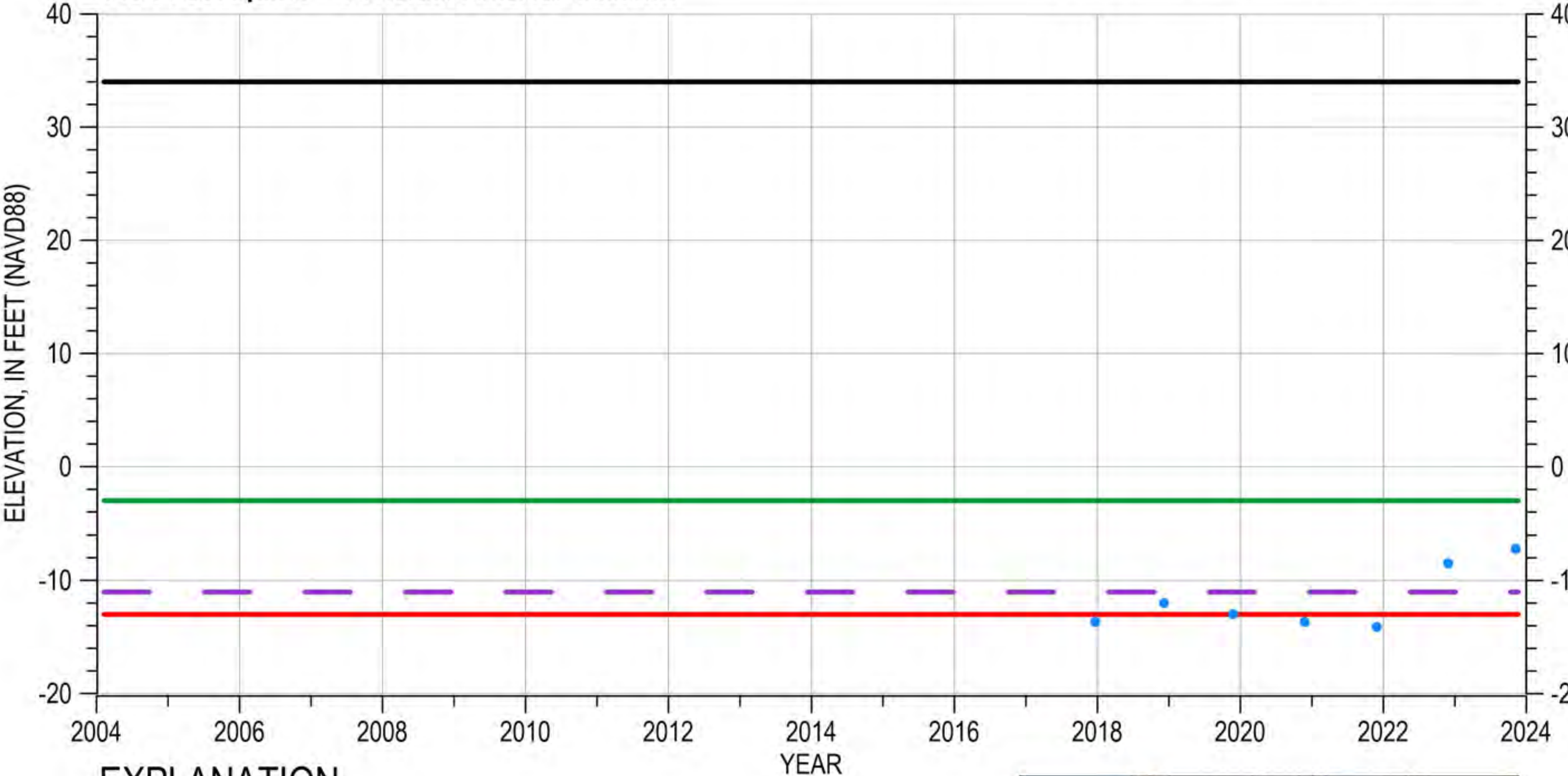
- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Fall Waterlevels
- August Waterlevels
- Monthly Waterlevels



15S/02E-12C01

180-Foot Aquifer Perforated interval unknown

20 YEAR TREND HYDROGRAPH



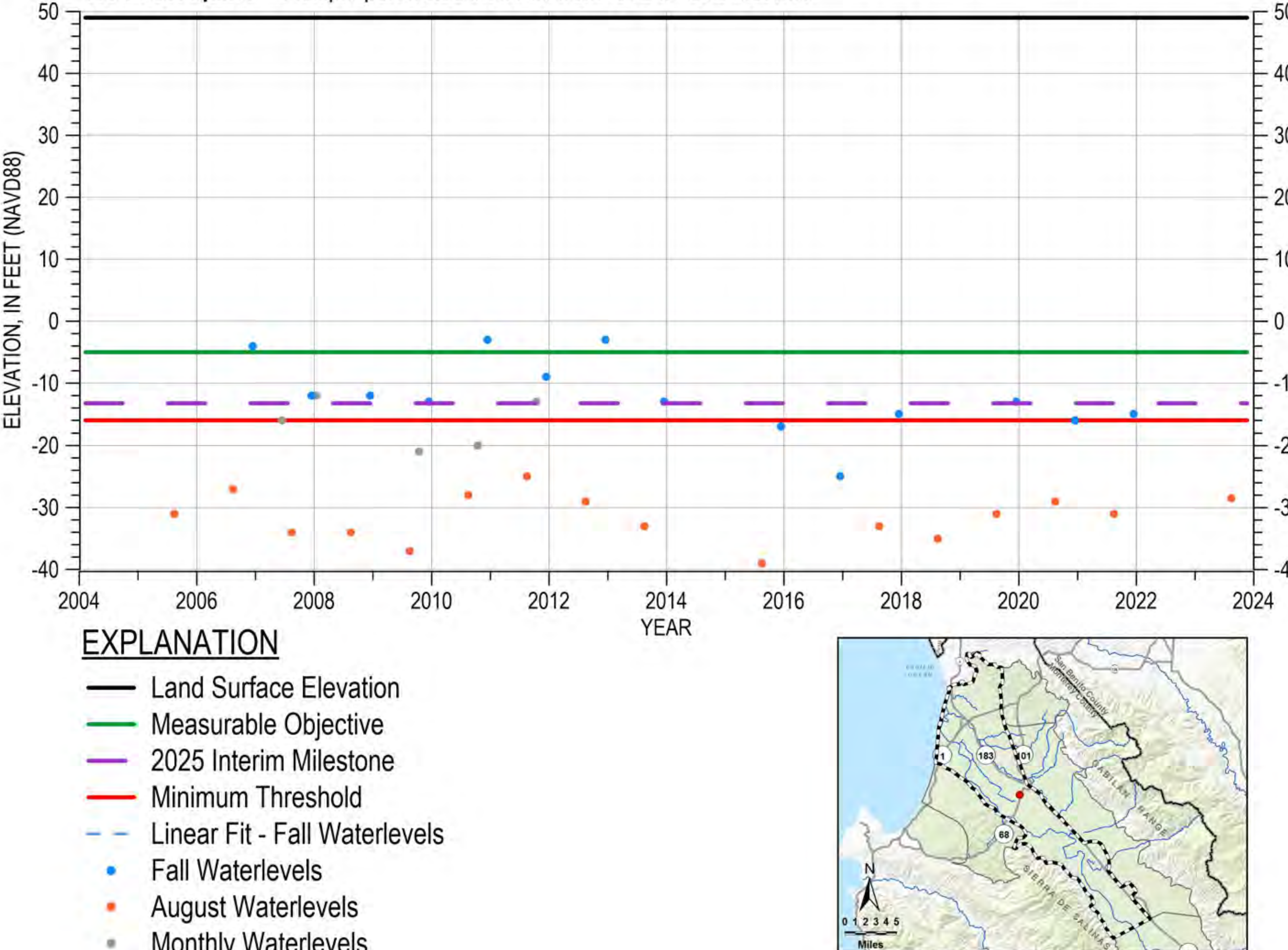
EXPLANATION

- Land Surface Elevation
- Measurable Objective
- 2025 Interim Milestone
- Minimum Threshold
- Linear Fit - Fall Waterlevels
- Monthly Waterlevels

15S/03E-05C02

400-Foot Aquifer Multiple perforated intervals from -312 to -392 feet msl

20 YEAR TREND HYDROGRAPH



Appendix 3B

New Deep Aquifers RMS Data and SMC Development

New Deep Aquifers Data

Since the submittal of the 180/400 Subbasin WY 2023 Annual Report, the Deep Aquifers Study has been completed, prompting revisions to the Deep Aquifers groundwater elevation monitoring network. To align with the recommendations of the Deep Aquifer Study, the SVBGSA expanded the number of RMS wells in the Deep Aquifers from 11 to 17 in the 180/400 Subbasin. In addition to these 17 wells, the SVBGSA recently installed 3 new Deep Aquifers monitoring wells (180/400-DA-1, 180/400-DA-2, and 180/400-DA-3) and is working with MCWRA to add an existing well (13S/02E-15M03) to the monitoring network. SVBGSA aims to include these additional wells in the WY 2024 Annual Report.

The expansion of the groundwater level monitoring network and installation of new wells allows for better coverage of the Deep Aquifers and therefore, for development of groundwater elevation contours. Figure 1 shows the fall 2023 groundwater elevations contours for the Deep Aquifers, which are mainly based on groundwater elevations collected from November to December. Groundwater elevations were collected in the 3 new Deep Aquifers monitoring wells during the installation process. November 2023 groundwater elevations were collected in 2 of the new Deep Aquifer wells (180/400-DA-1 and 180/400-DA-3). Well 180/400-DA-2 was not yet installed during fall 2023 so its June 2024 groundwater elevation is used to inform the fall 2023 groundwater elevation contours because it is the only well in the southern portion of the Deep Aquifers. Although this groundwater elevation does not align with the timing of fall groundwater elevation measurements, it helps inform general groundwater flow in the Deep Aquifers. These contours will enable estimation of change in storage in the Deep Aquifers in the WY 2024 annual report.

These contours were created using all Deep Aquifers groundwater elevations available. The Deep Aquifers comprise multiple formations, which can lead to differences in groundwater elevations in wells that are close in proximity. However, most wells are screened across multiple formations so only one set of contours were created for the Deep Aquifers.

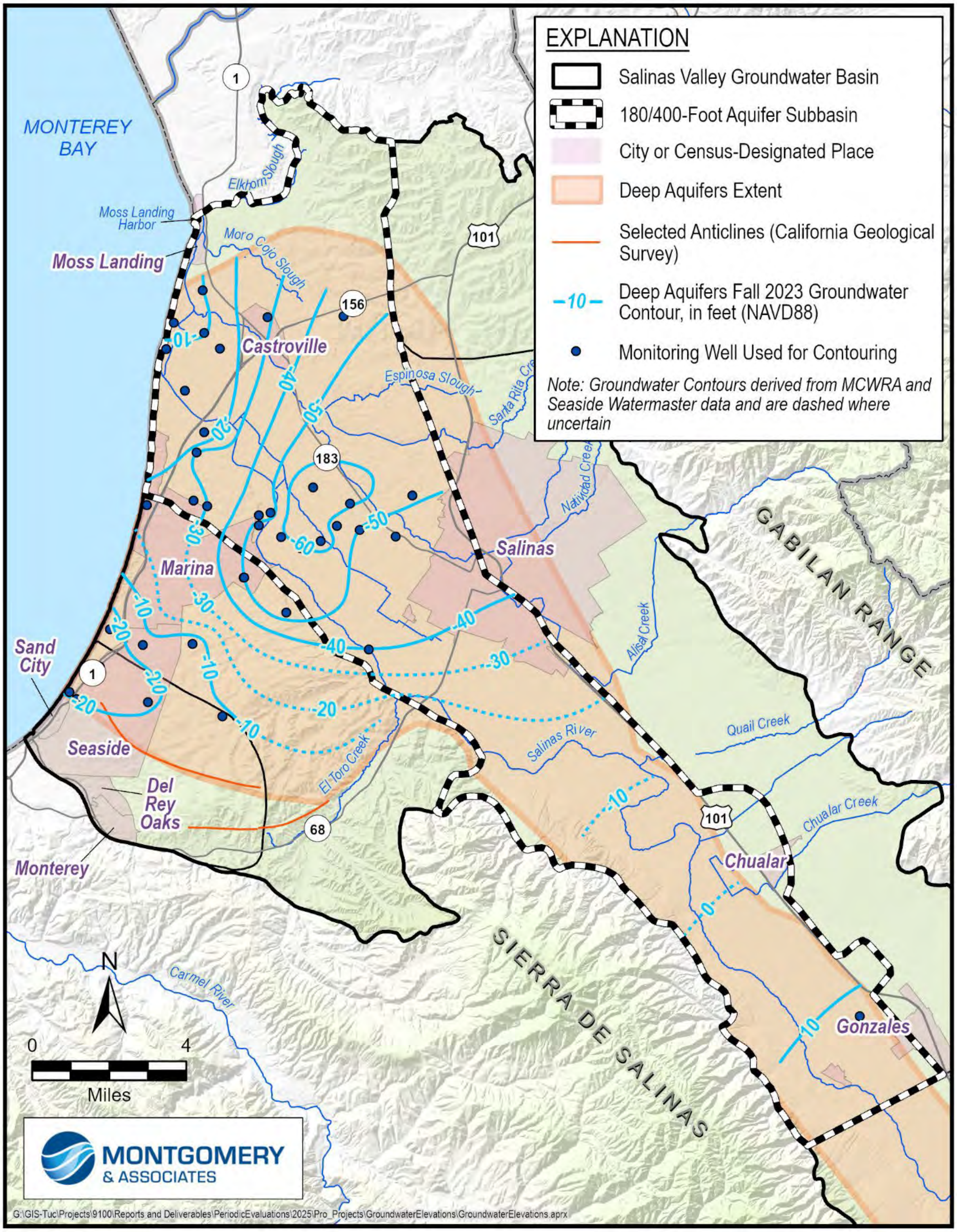


Figure 1. Fall 2023 Deep Aquifers Groundwater Elevation Contours

Sustainable Management Criteria Development

As new RMS wells are added to the groundwater elevation monitoring network, SMC for these wells must be developed. The groundwater levels SMC in the 180/400 Subbasin are based on historical (2003 and 2015) groundwater elevations. Most of the new Deep Aquifers RMS wells came online from 2020 to 2021 and therefore do not have 2003 or 2015 groundwater elevation measurements. Consequently, a different approach than that taken for RMS wells with historical groundwater elevation records was developed to determine the SMC for the new Deep Aquifers RMS wells.

Minimum Thresholds:

The minimum thresholds for the new Deep Aquifers RMS wells are based on an estimated 2015 groundwater elevation and were developed using the procedure outlined below:

1. Calculate rate of change from 2015 to 2021 for Deep Aquifers RMS wells that have historical groundwater elevation records.
2. Create spatially interpolated raster layer of the 2015 to 2021 rate of change using the wells with data available for this period.
3. Extract interpolated rate of change for Deep Aquifers RMS wells without historical groundwater elevation measurements.
4. Use interpolated rate of change to calculate an estimated 2015 groundwater elevation based on the measured 2021 groundwater elevation for the wells without historical records.
5. Add 1 foot to the estimated 2015 groundwater elevation to align with minimum thresholds for other RMS wells throughout the Subbasin.

Groundwater elevations from fall 2021 were used to establish the rate of change in step 1 above because 2021 is when the earliest groundwater elevation was measured in most new Deep Aquifers RMS wells without historical records.

Measurable Objectives and Interim Milestones:

The measurable objectives for the new Deep Aquifers RMS wells were developed by adding 5 feet to the minimum threshold to allow for operation flexibility. Additionally, the measurable objectives for the new RMS wells within 1 mile of the Monterey Subbasin boundary were reviewed to ensure that they were above the minimum thresholds of the nearest Deep Aquifers RMS wells in the Monterey Subbasin. The measurable objective for 1 RMS well (14S/02E-28H04) had to be adjusted to meet this condition; for this well, the measurable objective is 15 feet above the minimum threshold.

The interim milestones developed for the new Deep Aquifers RMS wells mirror that of other RMS wells throughout the Subbasin. Each interim milestone increases linearly from the 2020 groundwater elevation to the measurable objective. Where 2020 groundwater elevations are not available, 2021 groundwater elevations were used.

Table 1 specifies the minimum thresholds, interim milestones, and measurable objectives for the Deep Aquifers RMS wells. SMC were revised for 2 existing Deep Aquifers RMS wells to align with the new RMS wells. All other existing Deep Aquifers RMS wells have historical groundwater elevation measurements, and their SMC are set as those for RMS wells in other principal aquifers.

Table 1. Sustainable Management Criteria for Deep Aquifers Representative Monitoring Sites

Cadastral	Minimum Threshold	Interim Milestone 1	Interim Milestone 2	Interim Milestone 3	Measurable Objective
13S/01E-36J02	-4.2	-6.7	-3.8	-0.9	2
13S/02E-19Q03	-2.4	-5.1	-1.3	2.5	6.3
14S/02E-07J03[1]	-9.5	-15.2	-11.6	-8.1	-4.5
14S/02E-14R02[1]	-30.8	-35.1	-32.0	-28.9	-25.8
14S/02E-20E01[1]	-23.7	-26.1	-23.6	-21.2	-18.7
14S/02E-21K04[1]	-44.4	-47.1	-44.6	-42.0	-39.4
14S/02E-23J02[1]	-42.2	-46.8	-43.6	-40.4	-37.2
14S/02E-25A03[1]	-31.5	-37.0	-33.5	-30.0	-26.5
14S/02E-26G01[1]	-31.3	-36.2	-32.9	-29.6	-26.3
14S/02E-27K02[1]	-33.8	-38.2	-35.1	-31.9	-28.8
14S/02E-35B01[1]	-28.8	-34.5	-30.9	-27.4	-23.8
14S/03E-19C01[1]	-51.7	-57.2	-53.7	-50.2	-46.7
14S/02E-28H04[1]	-58.0	-67.6	-59.4	-51.2	-43.0
13S/02E-28L03[2]	-20.4	-29.6	-24.8	-20.1	-15.4
13S/02E-32E05	-9.2	-10.6	-6.6	-2.5	1.6
14S/02E-06L01	-7.2	-10.3	-5.9	-1.4	3
14S/02E-22A03[2]	-45.1	-87.4	-71.7	-55.9	-40.1
13S/02E-15M03	Well not yet monitored for groundwater elevations.				
180/400-DA-1	New monitoring well; monitoring began in fall 2023.				
180/400-DA-3					
180/400-DA-2					

[1]New Deep Aquifer RMS Well
[2]SMC revised to align with new RMS wells

Appendix 3C

Analysis of Relationship Between Seawater Intrusion, Groundwater Elevations, and Extraction

The seawater intrusion in the 180/400 Subbasin is driven by groundwater use and the presence of a pathway in the subsurface that enables its advancement. The effect of groundwater use on seawater intrusion can be difficult to quantify. However, seawater intrusion contours, groundwater elevations, and pumping data can be used to illustrate the relationship between seawater intrusion and groundwater use. This assessment is based on data collected by MCWRA. Figure 1 and Figure 2 show the seawater intrusion contours up to 2022, annual 2022 groundwater extraction, and change in August groundwater elevations from 2021 to 2022 for the 180-Foot and 400-Foot Aquifers, respectively. August groundwater elevations are used because MCWRA conducts water quality sampling for the seawater intrusion monitoring wells during the summer.

The extraction data shown on these figures are collected by MCWRA through GEMS. The aquifer designations used to categorize the GEMS data by aquifer were determined by MCWRA using well construction information in well completion reports or well permits if well completion reports are unavailable. Of the wells that reported extraction to GEMS in 2022, 84% had a flowmeter, 16% had an electrical meter, and less than 1% had an hour meter (MCWRA, 2023).

Seawater intruded acreage has increased annually during the evaluation period (WY 2019 to 2023) in the 400-Foot Aquifer and is the focus of this assessment. Figure 2 highlights in red the increase in seawater intruded acreage that occurred from 2021 to 2022. These areas are surrounded by pumping wells as shown by the pink bubbles. Note that most pumping in the Subbasin occurs during the summer, so the annual extraction shown on Figure 2 is likely a good representation of pumping distributions near the seawater intrusion front. Although more limited than at the pumping wells, August groundwater elevations decreased from 2021 to 2022 at many groundwater elevation monitoring wells along the new seawater intrusion areas that occurred in 2022. This suggests that pumping in these areas increased and likely contributed to additional seawater intrusion.

Similarly, Figure 1 illustrates a decrease in August groundwater elevations along portions of the 180-Foot Aquifer seawater intrusion front that indicates an increase in pumping. Despite the decrease in groundwater elevations, there was no seawater intrusion advancement from 2021 to 2022 in the 180-Foot Aquifer. This could be due to a lack of a potential pathway in the subsurface in the areas near decreasing groundwater elevations.

The advancement of seawater intrusion is not always directly related to changes in groundwater elevations and pumping. There is a density difference between the fresh water within the inland groundwater system and the saline water within the ocean and seaward groundwater system. This density difference is sufficient to influence groundwater flow and can induce seawater intrusion even without change in groundwater elevations due to pumping. However, seawater intrusion due to lowered groundwater elevations from pumping is predominant over density-dependent intrusion in Salinas Valley.

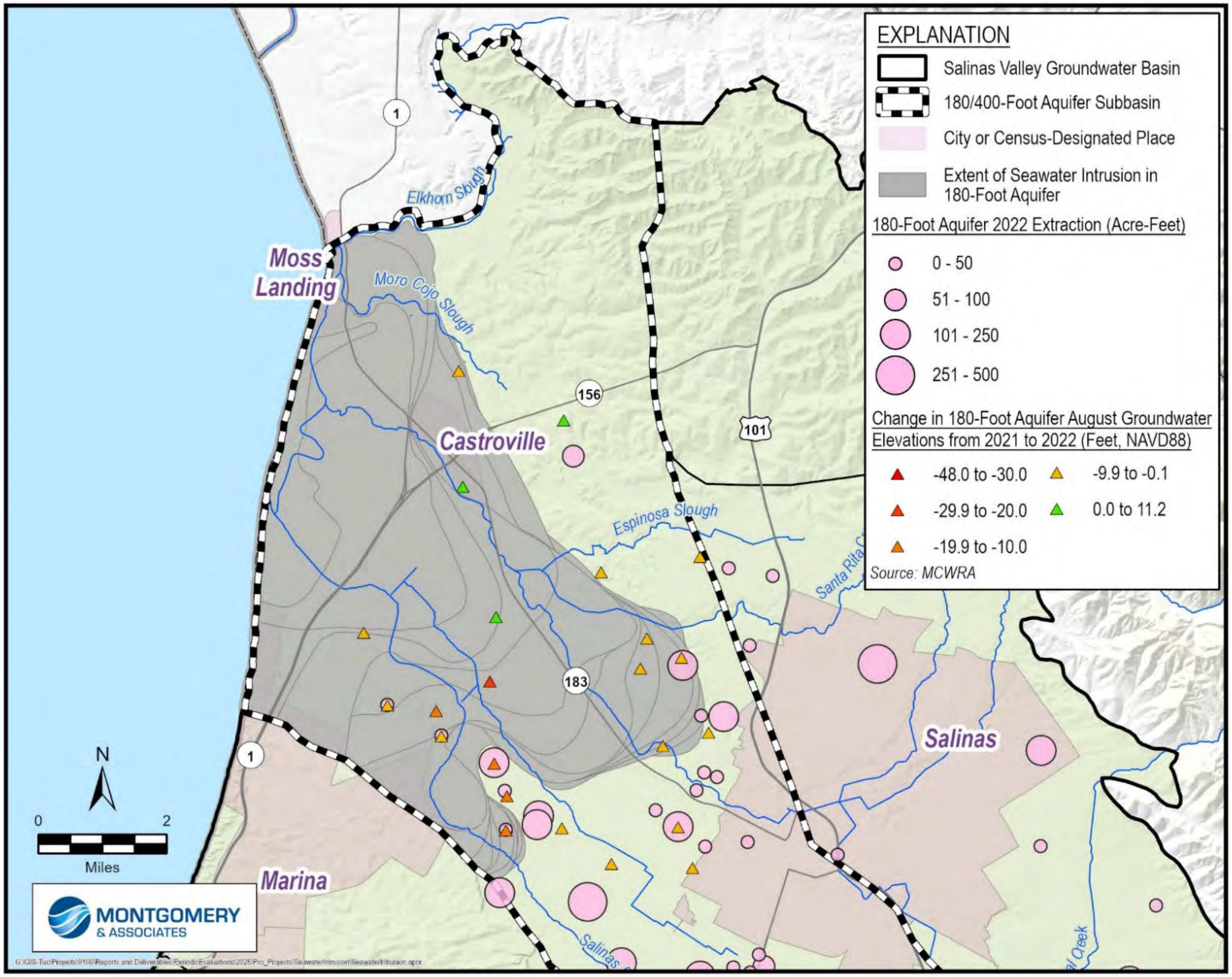


Figure 1. Seawater Intrusion Contours up to 2022 with Annual 2022 Extraction and Change in August Groundwater Elevations from 2021 to 2022 in the 180-Foot Aquifer

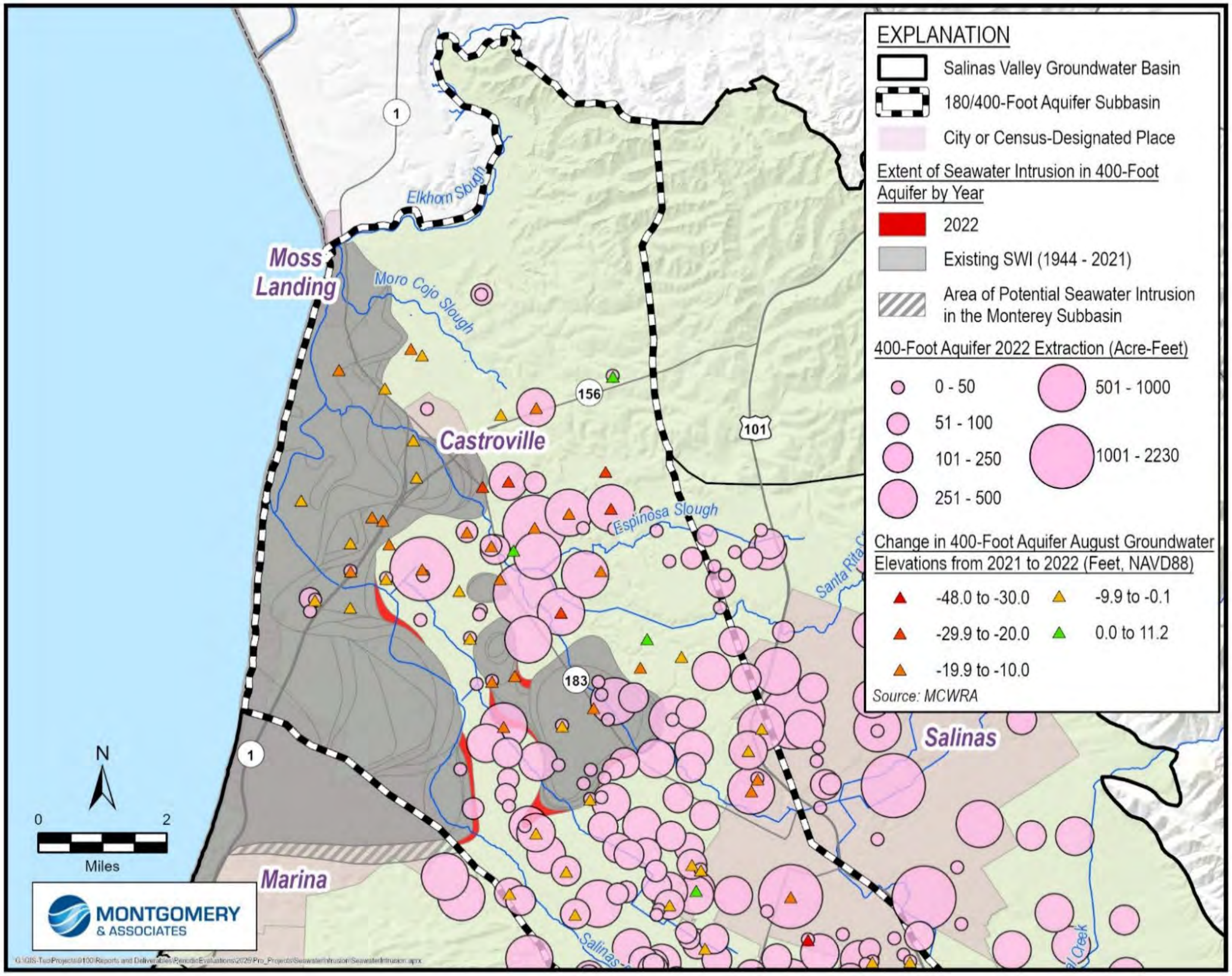


Figure 2. Seawater Intrusion Contours up to 2022 with Annual 2022 Extraction and Change in August Groundwater Elevations from 2021 to 2022 in the 400-Foot Aquifer

References

MCWRA (Monterey County Water Resources Agency). 2023. 2022 Groundwater Extraction Summary Report. https://www.countyofmonterey.gov/home/showdocument?id=125881&t=638308124679234895.

Appendix 3D

Annual Groundwater Quality Regulatory Limit Exceedances from 2017 to 2023

Groundwater quality is assessed using water quality data available for public water supply wells through the SWRCB's DDW. The CCRWQCB's ILRP dataset is used to evaluate water quality in on-farm domestic and irrigation wells. Each well type has its own set of COCs that are outlined in GSP Amendment 1. The State's Title 22 MCLs and SMCLs are used to assess water quality in public water system supply wells and on-farm domestic wells. For irrigation supply wells, water quality is compared to the COC levels that may lead to reduced crop production specified in the CCRWQCB's 2019 Basin Plan.

Table 1 lists the COCs for each well type and summarizes the number of wells that exceed the regulatory standard for any given COC from the GSP baseline year in 2017 through the most recent year of data in 2023. The exceedance values for each year are based on the last sample collected for each RMS well. Table 1 does not include all Title 22 constituents for drinking water wells, and not all listed COCs were sampled during the 7-year period. For a given year, if a COC had no exceedance or was not sampled, the recorded value in the table is zero. The ILRP on-farm domestic wells exhibited the most variability in exceedances between 2017 and 2023, which is likely due to the recently available ILRP data from CCRWQCB. Table 1 includes the updated 2017 baseline values that incorporate wells from the supplemental ILRP dataset provided by the CCRWCB.

In the 2017 to 2019 period, notable increases and fluctuations in the exceedances of the regulatory standards for the ILRP on-farm domestic wells occurred in 2017. In 2017, nitrate and specific conductance had 15 and 12 additional detections than in 2018, respectively, and was the only year with exceedances for chloride.

In the 2019 to 2023 evaluation period, notable increases in the regulatory exceedances are summarized by well type and corresponding years below:

DDW

- Specific Conductance: 2020 to 2021
- Total Dissolved Solids: 2021 to 2022

ILRP On-Farm Domestic Wells

- Nitrate + Nitrite (sum as nitrogen): Increases from 9 exceedances in 2019 to 35 in 2022 after a lapse in sampling in 2020 and 2021
- Specific Conductance: Increase from zero exceedances in 2021 to 39 and 41 in 2022 and 2023, respectively

Table 1. Annual Number of Wells Exceeding Regulatory Standard (2017-2023)

Constituent of Concern	Regulatory Exceedance Standard	Standard Units	2017	2018	2019	2020	2021	2022	2023
DDW Wells									
1,2,3-Trichloropropane	0.005	UG/L	0	2	2	2	2	2	2
Aluminum	1000 (MCL) 200 (SMCL)	UG/L	0	0	0	0	0	0	0
Arsenic	10	UG/L	2	1	1	1	1	2	1
Chloride	500	MG/L	1	1	0	1	1	2	1
Chromium	50	UG/L	0	0	0	0	0	0	0
Chromium, Hexavalent (Cr6)	10	UG/L	0	0	0	0	0	0	0
Di(2-ethylhexyl) phthalate	4	UG/L	0	0	0	0	0	0	0
Foaming Agents (MBAS)	0	MG/L	0	0	0	1	0	0	0
Gross Alpha radioactivity	15	pCi/L	3	3	1	3	1	2	1
Iron	300	UG/L	4	3	4	1	3	3	1
Manganese	50	UG/L	2	3	3	1	3	2	1
Methyl-tert-butyl ether (MTBE)	13 (MCL) 5 (SMCL)	UG/L	0	0	0	0	1	0	1
Nitrate (as nitrogen)	10	MG/L	7	7	8	10	10	10	9
Selenium	20	UG/L	0	0	0	0	0	0	0
Specific Conductance	1600	UMHOS/CM	2	3	1	1	4	3	1
Sulfate	500	UG/L	0	0	0	0	0	0	0
Total Dissolved Solids	1000	MG/L	2	1	2	2	2	4	2
ILRP On-Farm Domestic Wells									
Chloride	500	MG/L	9	0	0	0	0	0	0
Iron	300	UG/L	9	3	1	0	0	0	0
Manganese	50	UG/L	2	1	0	0	0	0	0
Nitrite	1	MG/L	0	0	0	0	0	0	0
Nitrate (as nitrogen)	10	MG/L	23	8	6	1	0	2	0
Nitrate + Nitrite (sum as nitrogen)	10	MG/L	11	2	9	0	0	35	35
Specific Conductance	1600	UMHOS/CM	19	7	3	1	0	39	41
Sulfate	500	MG/L	0	0	1	0	0	0	0
Total Dissolved Solids	1000	MG/L	11	8	5	1	0	0	1
ILRP Irrigation Wells									
Chloride	350	MG/L	22	6	3	0	0	0	0
Iron	5000	UG/L	2	0	0	0	0	0	0
Manganese	200	UG/L	2	0	1	0	1	0	0

Table 2 summarizes the data by the number of sampled wells and the percentage of exceedances for a given COC and year. Percentages of exceedances represent the number of wells with exceedances (Table 1) divided by the total number of wells that were sampled for that COC and year. The COCs that were not sampled for are indicated by a '- - ' in both the 'Sampled Wells' and '%' columns, whereas a percentage value of zero indicates that no exceedances were recorded in any of the sampled wells for that COC and year.

Hexavalent chromium (Cr6) was not sampled for any of the 7 years. The COCs that were sampled in only 1 of the 7 years include di(2-ethylhexyl) phthalate, foaming agents (MBAS), and nitrite. The COCs sampled in only 2 out of the 7 years include Methyl-tert-butyl ether (MTBE) and Manganese. The ILRP on-farm domestic wells exhibited the most variability in exceedances over the 7 years, while the DDW wells showed more stable trends, with slight increases in exceedances occurring during the 2019 to 2023 evaluation period.

Table 2. Annual Number of Sampled Wells and Percentage of Exceedances (2017-2023)

Constituent of Concern	2017		2018		2019		2020		2021		2022		2023	
	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%
DDW Wells														
1,2,3-Trichloropropane	--	--	2	100%	2	100%	2	100%	2	100%	2	100%	2	100%
Aluminum	1	0%	6	0%	2	0%	1	0%	2	0%	--	--	1	0%
Arsenic	21	10%	17	6%	24	4%	19	5%	14	7%	19	11%	19	5%
Chloride	25	4%	24	4%	28	0%	14	7%	24	4%	28	7%	17	6%
Chromium	14	0%	15	0%	18	0%	11	0%	15	0%	20	0%	15	0%
Chromium, Hexavalent (Cr6)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Di(2-ethylhexyl) phthalate	--	--	--	--	--	--	--	--	--	--	1	0%	--	--
Foaming Agents (MBAS)	--	--	--	--	--	--	1	100%	--	--	--	--	--	--
Gross Alpha radioactivity	13	23%	16	19%	17	6%	22	14%	24	4%	10	20%	17	6%
Iron	15	27%	11	27%	13	31%	5	20%	9	33%	10	30%	5	20%
Manganese	4	50%	4	75%	3	100%	1	100%	7	43%	5	40%	3	33%
Methyl-tert-butyl ether (MTBE)	--	--	--	--	--	--	--	--	1	100%	--	--	1	100%
Nitrate (as nitrogen)	80	9%	79	9%	87	9%	82	12%	82	12%	84	12%	78	12%
Selenium	13	0%	6	0%	16	0%	8	0%	9	0%	19	0%	14	0%
Specific Conductance	48	4%	31	10%	34	3%	33	3%	32	13%	31	10%	21	5%
Sulfate	22	0%	16	0%	26	0%	14	0%	20	0%	26	0%	14	0%
Total Dissolved Solids	25	8%	21	5%	27	7%	15	13%	24	8%	28	14%	17	12%
ILRP On-Farm Domestic Wells														
Chloride	58	16%	29	0%	10	0%	3	0%	2	0%	--	--	--	--
Iron	25	36%	11	27%	1	100%	1	0%	1	0%	--	--	--	--
Manganese	14	14%	3	33%	--	--	--	--	--	--	--	--	--	--
Nitrite	4	0%	--	--	--	--	--	--	--	--	--	--	--	--

Constituent of Concern	2017		2018		2019		2020		2021		2022		2023	
	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%	Sampled Wells	%
Nitrate (as nitrogen)	63	37%	31	26%	21	29%	6	17%	3	0%	6	33%	--	--
Nitrate + Nitrite (sum as nitrogen)	43	26%	10	20%	27	33%	--	--	--	--	88	40%	79	44%
Specific Conductance	84	23%	24	29%	7	43%	3	33%	2	0%	112	35%	111	37%
Sulfate	58	0%	30	0%	10	10%	3	0%	2	0%	--	--	--	--
Total Dissolved Solids	28	39%	29	28%	9	56%	3	33%	2	0%	--	--	4	25%
ILRP Irrigation Wells														
Chloride	271	8%	77	8%	62	5%	8	0%	12	0%	5	0%	--	--
Iron	49	4%	14	0%	7	0%	3	0%	3	0%	--	--	--	--
Manganese	37	5%	10	0%	4	25%	3	0%	2	50%	--	--	--	--

Appendix 3E

Subsidence Analysis

DWR's InSAR data is used to monitor land subsidence at monthly intervals in the 180/400 Subbasin.

An annual land subsidence map is included in each Annual Report. Since each year could contain measurement error, cumulative land subsidence is evaluated relative to the SMC for the Periodic Evaluation. Cumulative land subsidence for just the evaluation period is not available; however, cumulative land subsidence from June 2015 to October 2023 is available, which represents the maximum cumulative subsidence. Since the goal is no land subsidence, this period is used to review land subsidence over the evaluation period, shown on Figure 1. The yellow areas show where land subsidence has been less than 0.1 foot, the subsidence minimum threshold. The red areas show where land subsidence has been between 0.1 and 0.2 foot, which is slightly greater than the minimum threshold. The gray areas are data gaps in the InSAR dataset. There are 3 isolated locations in the Subbasin with apparent maximum cumulative subsidence greater than the minimum threshold of 0.1 foot.

The Land Subsidence minimum threshold is only related to inelastic subsidence due to groundwater elevation decline because elastic subsidence is recoverable and does not result in permanent or long-term impacts. Assessing whether small amounts of subsidence are elastic or inelastic can be difficult, and involves some uncertainty. To assess whether the subsidence is elastic or inelastic, land subsidence and groundwater elevations in all 3 aquifers are compared for the 3 locations where cumulative subsidence was above the minimum threshold. No Deep Aquifers groundwater elevation are available for the southern-most site; however, there is very little groundwater extraction from the Deep Aquifers in this area. Subsidence and groundwater elevation timeseries plots are displayed on Figure 2 through Figure 4 going from north to south. These figures plot groundwater levels and subsidence beyond the October 2023 end of the evaluation period to assess whether any recovery of elastic subsidence has occurred. The groundwater elevation monitoring well locations used for this comparison are shown on Figure 1.

These figures show that maximum cumulative subsidence, which ranged from 0.15 to 0.2 foot, was observed in fall 2022. This corresponds to the period when groundwater levels were at their lowest in most wells after 3 consecutive dry water years from 2020 to 2022. After fall 2022, groundwater levels and the land surface rebounded partially, likely due to groundwater level recovery in the wet water year 2023. This suggests that at least part, if not all of the subsidence minimum threshold exceedances are due to elastic subsidence, not inelastic subsidence. None of the 3 locations currently display cumulative subsidence more than the minimum threshold value of 0.1 foot. Since subsidence between 2015 and 2023 is predominantly elastic in all 3 locations, the apparent minimum threshold exceedances in 2022 do not constitute an undesirable result.

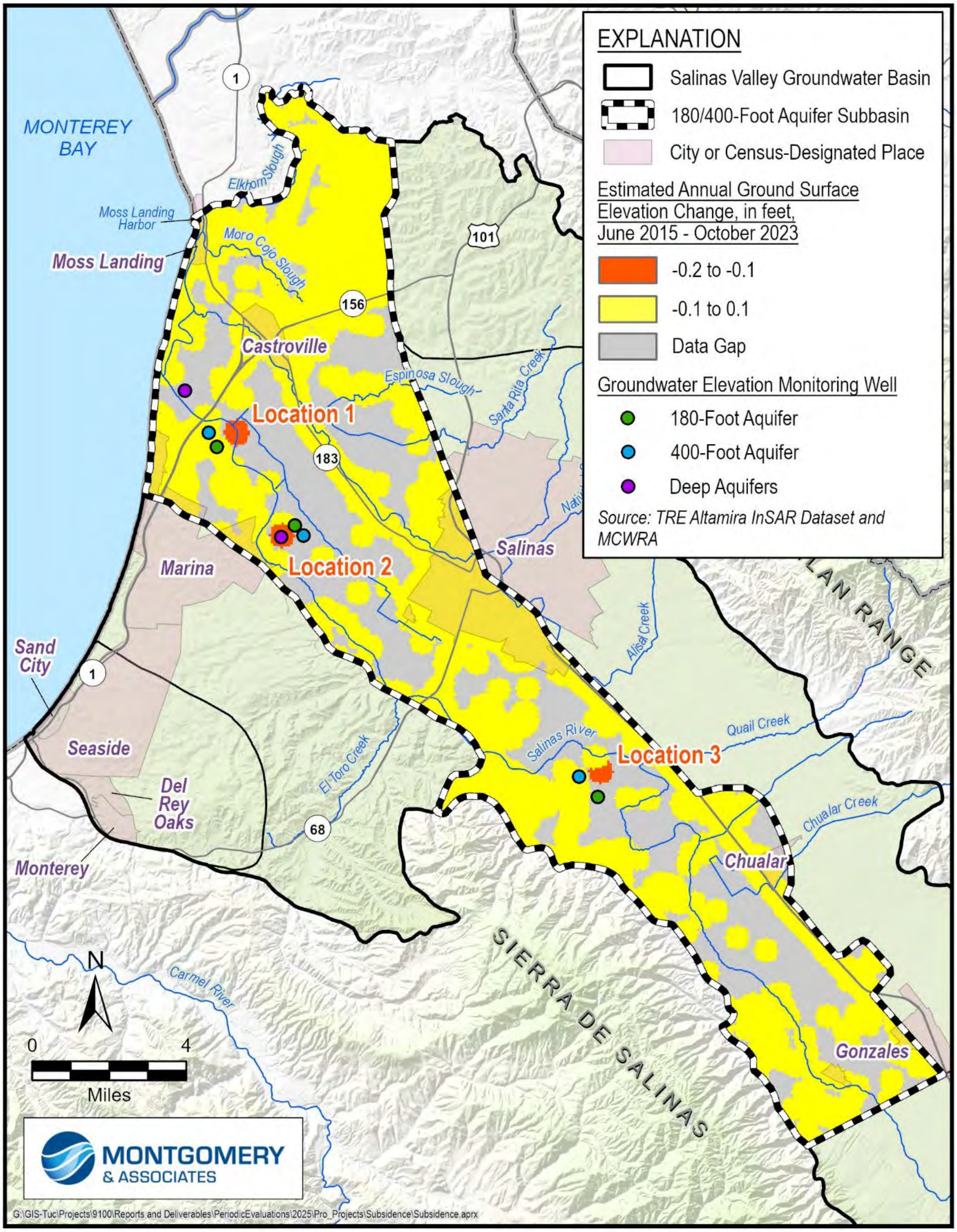


Figure 1. Locations with Cumulative Land Subsidence Greater than 0.1 ft from June 2015 to October 2023 and Nearby Groundwater Elevation Monitoring Wells

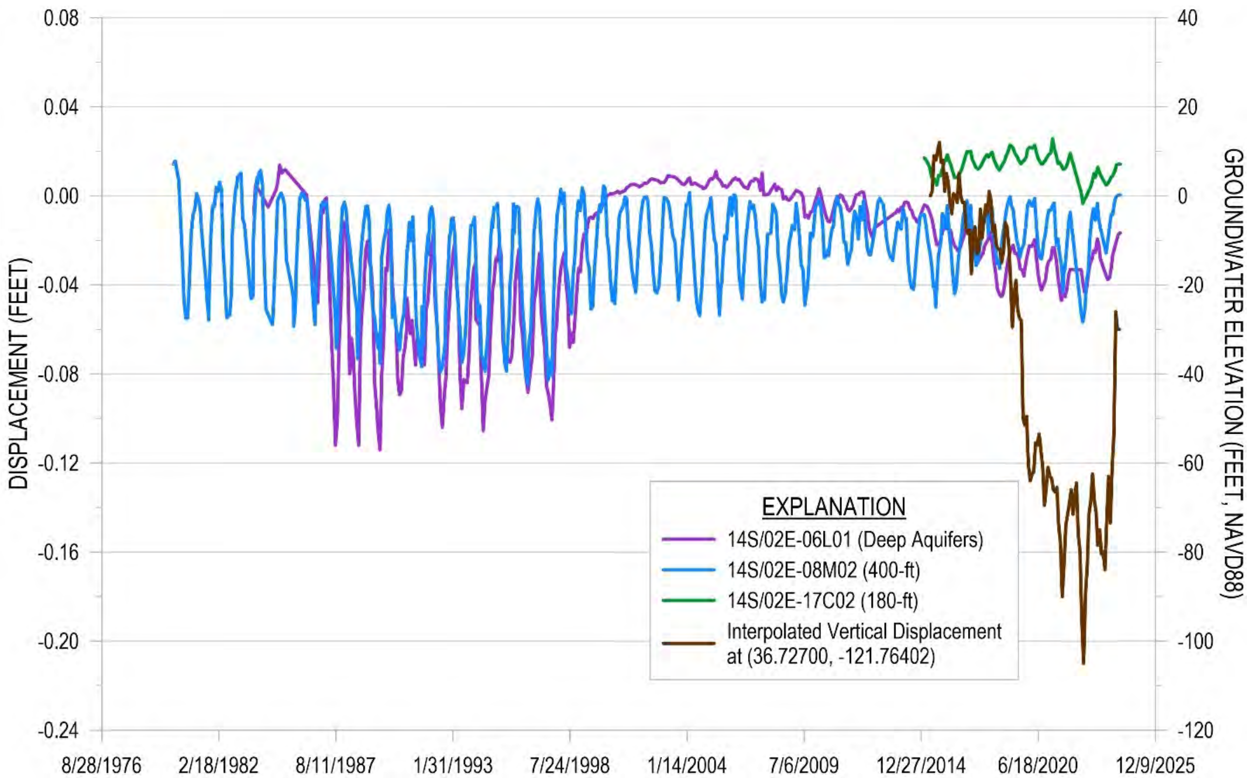


Figure 2. Interpolated Vertical Displacement Compared to Groundwater Elevations in the 180-Foot, 400-Foot, and Deep Aquifers at Location 1

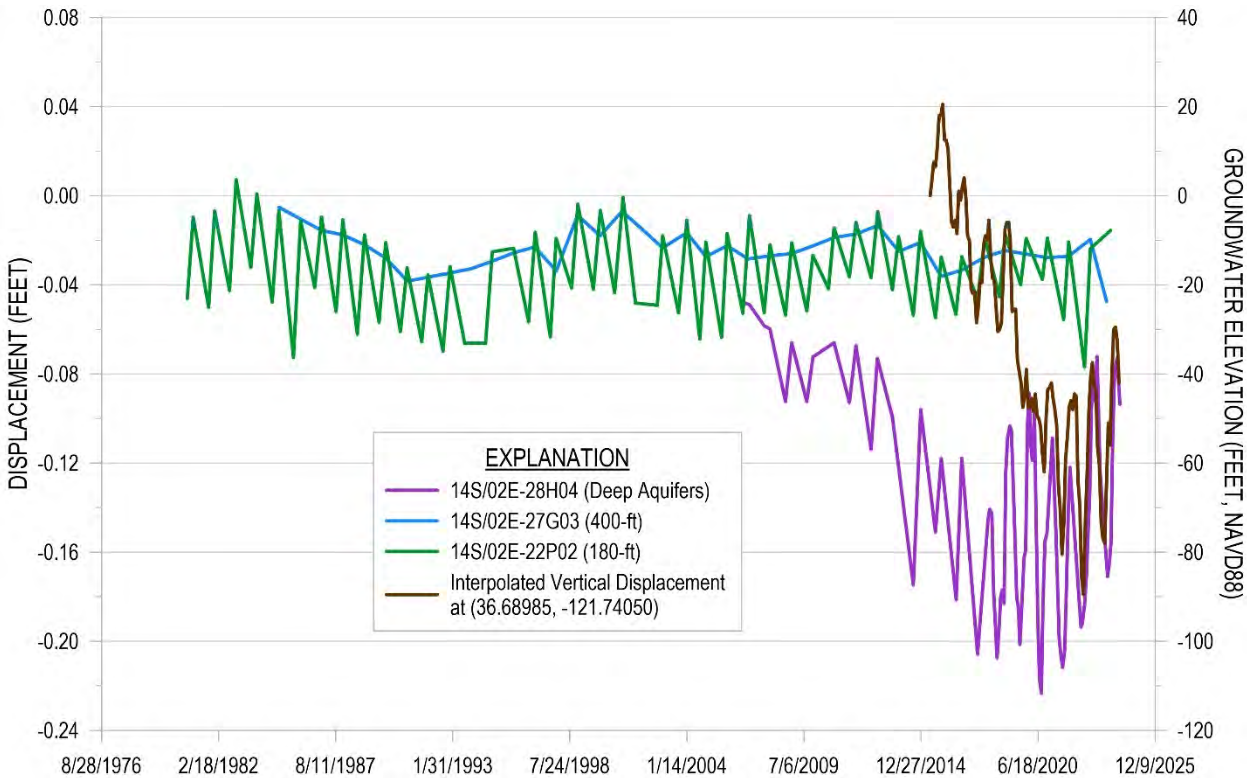


Figure 3. Interpolated Vertical Displacement Compared to Groundwater Elevations
in the 180-Foot, 400-Foot, and Deep Aquifers at Location 2

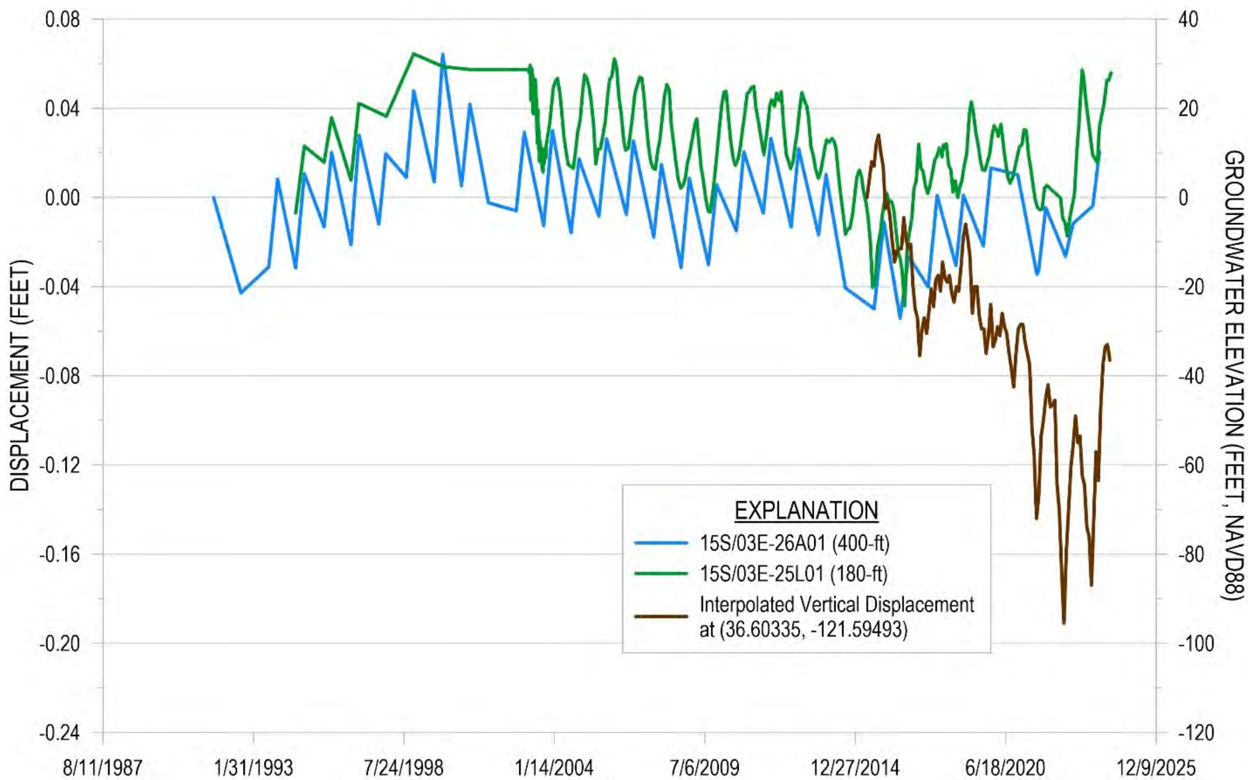


Figure 4. Interpolated Vertical Displacement Compared to Groundwater Elevations
in the 180-Foot and 400-Foot Aquifers at Location 3

Appendix 4A

Summary Memo of Brackish Groundwater Restoration Project Feasibility Study

Prepared for
SALINAS VALLEY BASIN
GROUNDWATER SUSTAINABILITY AGENCY

FEASIBILITY STUDY DRAFT SUMMARY REPORT

Brackish Groundwater Restoration Project

NOVEMBER 2024

carollo

1.0 Introduction

The Salinas Valley is one of the most productive agricultural areas in California. Located on the Central Coast, the valley starts in the Coast Range and follows the Salinas River north and west for 90 miles to exit out into Monterey Bay. The rich agricultural lands are irrigated by groundwater. In 2014, California passed the Sustainable Groundwater Management Act, requiring development of Groundwater Sustainability Plans or GSPs to address overdraft conditions.

Based on the groundwater conditions and projects identified in the 180/400-Foot Aquifer Subbasin GSP, the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA or GSA) has commissioned Carollo Engineers Inc. to prepare a Feasibility Study evaluating the Salinas Valley Brackish Groundwater Restoration Project (Brackish Groundwater Restoration Project or Project). The project team consisted of Carollo Engineers and Montgomery & Associates (M&A) led by the SVBGSA staff to evaluate the hydrogeologic conditions from a variety of project conditions, infrastructure layouts, and demand configurations.

The Feasibility Study follows the United States Bureau of Reclamation (USBR) guidelines and organization structure for a Title XVI feasibility study. Upon completion of the Feasibility Study, the GSA will submit to USBR for approval. This will enable the GSA to apply for additional funding in the future. A summary of the project findings is presented herein.

1.1 Goal and Objectives of Project

The goal of the Brackish Groundwater Restoration Project is to complete a technically and scientifically sound study that explores the feasibility of a seawater intrusion barrier and brackish water treatment and delivery project. The project aims to meet GSP sustainability goals and objectives related to addressing seawater intrusion in the critically over drafted 180/400-Foot Aquifer Subbasin, as well as to address related chronic declining groundwater levels below sea level in this subbasin and other adjacent over drafted subbasins.

Specific objectives of this study are:

1. Evaluate whether this project could effectively achieve GSP goals to mitigate seawater intrusion in the 180/400-Foot Aquifer Subbasin.
2. Estimate costs and benefits of potential project(s) (for range of volume of new water supply and end users) to be able to compare them to other options for projects and management actions under consideration by the GSA.
3. Lay out a road map of next steps for technical, permitting, CEQA and funding potential for implementation.

1.2 Purpose of this Summary Report

A Feasibility Study has been prepared complying with the requirements of the USBR requirements for a Title XVI Feasibility Study. Conforming the Feasibility Study to USBR requirements means that this report can be submitted to USBR for approval, which is the first step toward securing federal grant funding for implementation. However, the required USBR Feasibility Study format does not necessarily lay out a clear story for the reader. This summary report is intended to be a separate document from the Feasibility Study that highlights the efforts completed in a clear, concise brief document that can be distributed to the GSA committees and board, regional partners, stakeholders and regulatory agencies as needed.

2.0 PROBLEM AND NEED

2.1 Background

While the Salinas Valley has a long history of groundwater management, additional projects and/or management actions (PMAs) are needed to eliminate overdraft in several subbasins, address seawater intrusion, and conjunctively use supplemental sources of supply. The goal of the PMAs is to ensure groundwater resources are sustainable for long-term community, economic, and environmental benefits, and to avoid undesirable effects like lasting groundwater level declines, loss of groundwater storage, and groundwater quality degradation, including seawater intrusion.

Groundwater makes up over 95% of water used within the Salinas Valley providing water for domestic, agricultural and other beneficial uses. Agriculture in Salinas Valley heavily relies on groundwater, attributing to about 90% of the extractions in the basin. Agriculture provides 1 in 5 jobs in Monterey County and is important nationally in producing a diverse selection of produce . Groundwater extraction has been the primary source of water for the Salinas Valley for over 150 years.

The two shallowest aquifers by the coast, the 180-Foot and 400-Foot Aquifers shown in Figure 1, have a direct connectivity with the Pacific Ocean, providing a pathway for seawater intrusion. Seawater intrusion into the 180-Foot and 400-Foot Aquifers occurs due to groundwater levels dropping below sea level. The Deep Aquifers also have direct connectivity with the Pacific Ocean, and though they have not been impacted by seawater intrusion to date, they are at risk. Over many decades, Monterey County Water Resources Agency (MCWRA) has studied seawater intrusion and implemented several projects to halt the seawater intrusion.

Groundwater elevation contour maps prepared over more than two decades document a landward sloping groundwater gradient in the 180-Foot and 400-Foot Aquifers from the coast towards the City of Salinas and the Gabilan Mountain Range. A prominent and persistent groundwater characteristic in the Eastside Aquifer Subbasin is the large groundwater depression referred to as the Eastside trough. Groundwater levels in portions of the shallow and deeper zones of the Eastside Aquifer remain below sea level.

Since 1998, MWCRA and Monterey One Water (M1W) have cooperated to implement Monterey County Water Recycling Projects. The M1W's Regional Treatment Plant (RTP) provides treatment of wastewater to non-potable recycled water standards and delivers it to the Castroville Seawater Intrusion Project (CSIP) to augment groundwater supplies for agricultural irrigation on about 12,000 acres in the seawater intruded area near Castroville. In 2010, MCWRA began to operate the Salinas River Diversion Facility (SRDF) to add surface water to CSIP as part of the Salinas Valley Water Project, which operates the upstream reservoirs.

While investments in supplemental supply projects have slowed the rate of seawater intrusion, they have not fully addressed the problem. Groundwater elevations remain below sea level and have continued to decline especially during recent periods of drought. Following the 2014-2016 drought, MCWRA identified new islands of seawater intrusion

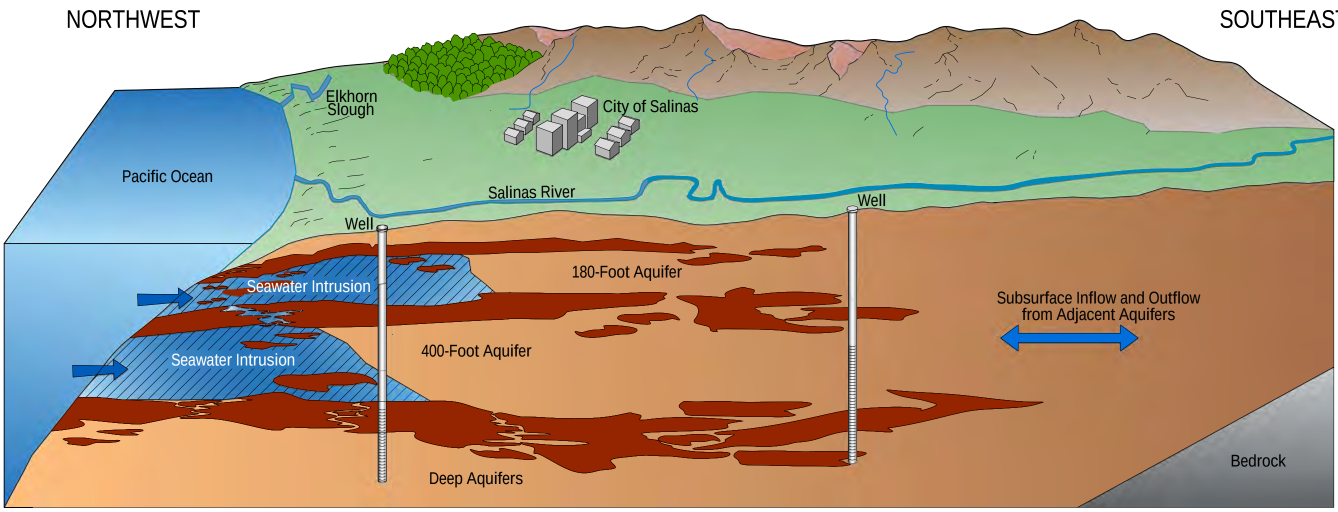


Figure 1. *Cross-section of Salinas Valley near Ocean*

in the 400-Foot Aquifer, prompting new investigations for actions to slow or halt the advancement of seawater intrusion.

Modeling of current and futures conditions (see Figure 2.a, 2.b) shows that groundwater levels are likely to continue to decline across the northern part of the Salinas Valley and that seawater will advance inland through the City of Salinas, compromising both agricultural and urban water supplies from Salinas to the coast. Continued groundwater extraction within and nearby the seawater intruded area, which includes the CSIP service area, is projected to be impacted by increasing chloride concentrations over time. As seawater intrusion has advanced, new wells have been drilled into the Deep Aquifers underlying the 180-Foot and 400-Foot Aquifers for a replacement supply. However, the Deep Aquifers are also over drafted and declining groundwater elevations have increased the risk of seawater intrusion in them.

Actions are needed to ensure the viability of current and future water supplies, especially within areas considered to be vulnerable due to the presence of pathways and conduits for seawater intrusion. The GSA has prepared a GSP as required by SGMA laying out potential projects, including this one, with the goal to develop a plan to address these problems.

2.2 Problem Statement

As discussed above, there is a history of groundwater concerns for the region as summarized below for
the entire Salinas Valley and the 180/400-Foot Aquifer Subbasin.

2.2.1 Valley Wide

- Groundwater is the primary source of water for all users in the Salinas Valley Basin.
- Supply and demand for groundwater is out of balance in parts of the valley.
- Groundwater levels over time have continued to decline.
- Future drought conditions present uncertainties from year to year, as does potential for flooding in extreme wet years.
- Existing infrastructure is aging and needs maintenance and improvements, some with significant costs.
- Potential supplemental supply projects come with significant costs and take time to implement.

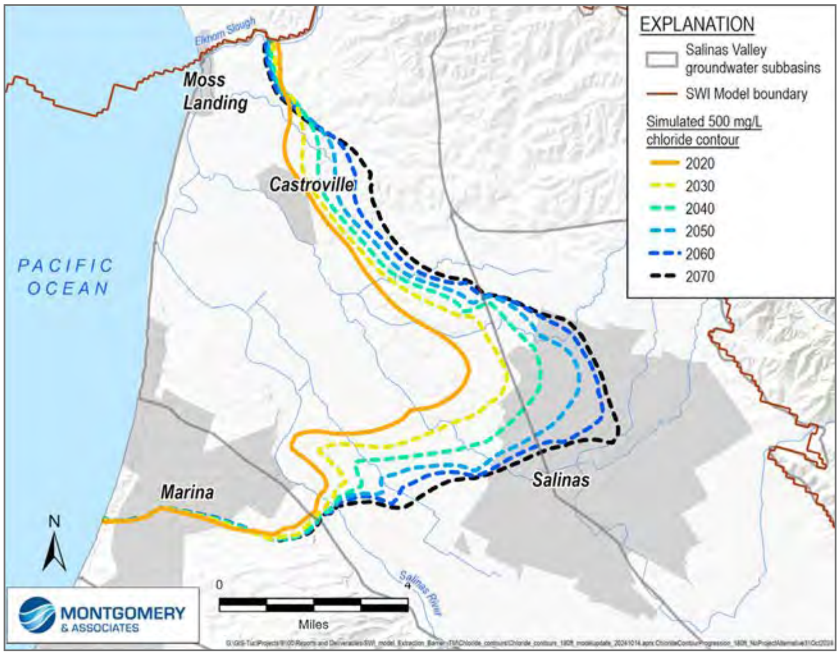


***Figure 2.a. Seawater** Intrusion Projections Under No Project Alternative in 180-foot Aquifer*

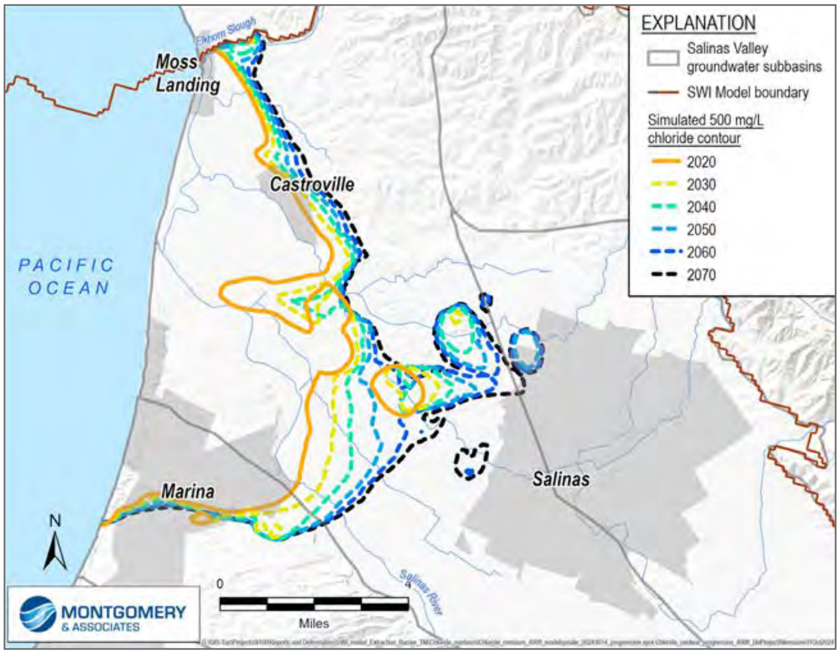


Figure 2.b. Seawater Intrusion Projections Under No Project Alternative in 400-foot Aquifer

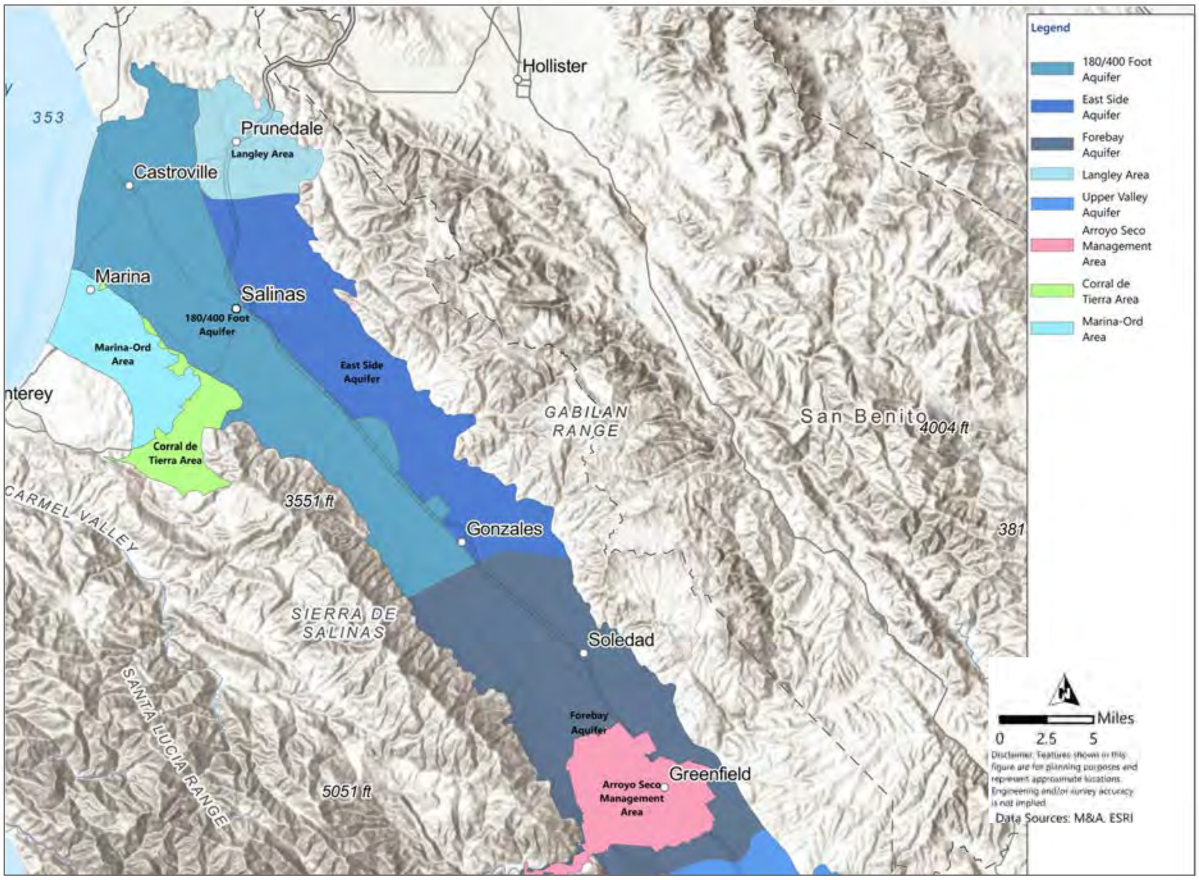


Figure 3. *Salinas Valley and Subbasins*

- Lack of cohesive regional water management has led to unsustainable groundwater conditions that pose a serious risk to current and future economic vitality of the Salinas Valley and Monterey County.
- Water quality degradation is a persistent issue.

2.2.2 180/400-Foot Aquifer Subbasin

- The Subbasin is defined by DWR as critically over drafted because of seawater intrusion.
- Seawater continues to move inland and the resulting brackish groundwater continues to impact wells.
  - Groundwater pumping continues within the CSIP area. These wells are at risk of increasing salinity over time.
  - Multiple MCWRA CSIP supplemental wells have been intruded and deemed no longer usable for irrigation.
  - Castroville, Salinas and Marina are disadvantaged communities with an at-risk water supply.
  - Castroville CSD water supply wells have been taken wells offline because of salinity increases.
- Groundwater elevations east of the seawater intrusion front remain below sea level and have continued to decline.
- On average, groundwater levels are declining with the steepest declines during periods of drought.
- Most pumping in the Subbasin occurs where supplemental recycled or surface water supplies are not available, inland of the seawater intrusion front.
- Extraction from all aquifers in the Subbasin occurs at a rate greater than it is recharged; inflows to the Deep Aquifers do not occur within a timescale for use/management. Confined aquifers recharge slowly.
- Currently, deep aquifers are not a long-term sustainable replacement supply for shallower aquifers that become impaired, because of the risk of seawater intrusion and additional undesirable results.

2.2.3 Eastside Aquifer Subbasin

- Subbasin is defined by DWR as high priority.
- On average, groundwater levels are declining with the steepest declines during periods of drought.
- Groundwater elevations east of the seawater intrusion front are below sea level and have continued to decline.

- Seawater continues to move inland towards the Subbasin.
- Pumping exceeds recharge by approximately 10,000 acre-feet per year.
- Subbasin has limited surface water that could recharge groundwater.
- Complex geology limits recharge to the depths that support many production wells.
- Decades of declining groundwater levels and loss of storage are challenging to recover.

3.0 CONCEPT FEASIBILITY

The GSA's Groundwater Sustainability Plan identified several projects that have been combined into this study:
1) a seawater intrusion extraction barrier,
2) development of a new regional water supply to offset groundwater use, and 3) injection of water into the groundwater basin to raise water levels, improve quality and further prevent seawater intrusion.

3.1 Project Concept

The concept for this project is to establish a string of extraction wells across the mouth of the aquifer, near the coast, to capture seawater on the coastal side of the wells and to start pulling back intruded seawater from the inland side of the wells. This extracted brackish groundwater would be then treated through reverse osmosis to remove salts and create a supply that meets potable water standards. The treated water would be distributed inland to offset groundwater users for both domestic and agricultural customers. The extraction wells and treatment would be run at a fairly steady flow rate to prevent seawater intrusion from leaking past the wells. This would result in times (particularly winter months) where more treated water is available than users demand. This excess treated water would be injected back into the groundwater basin inland along the edge of the seawater intrusion front to assist in raising groundwater levels to push the intruded zone back to the coast. The injection of the high-quality water would also improve groundwater quality. Graphic illustrations of the project concept and its components are shown in Figures 4 and 5.

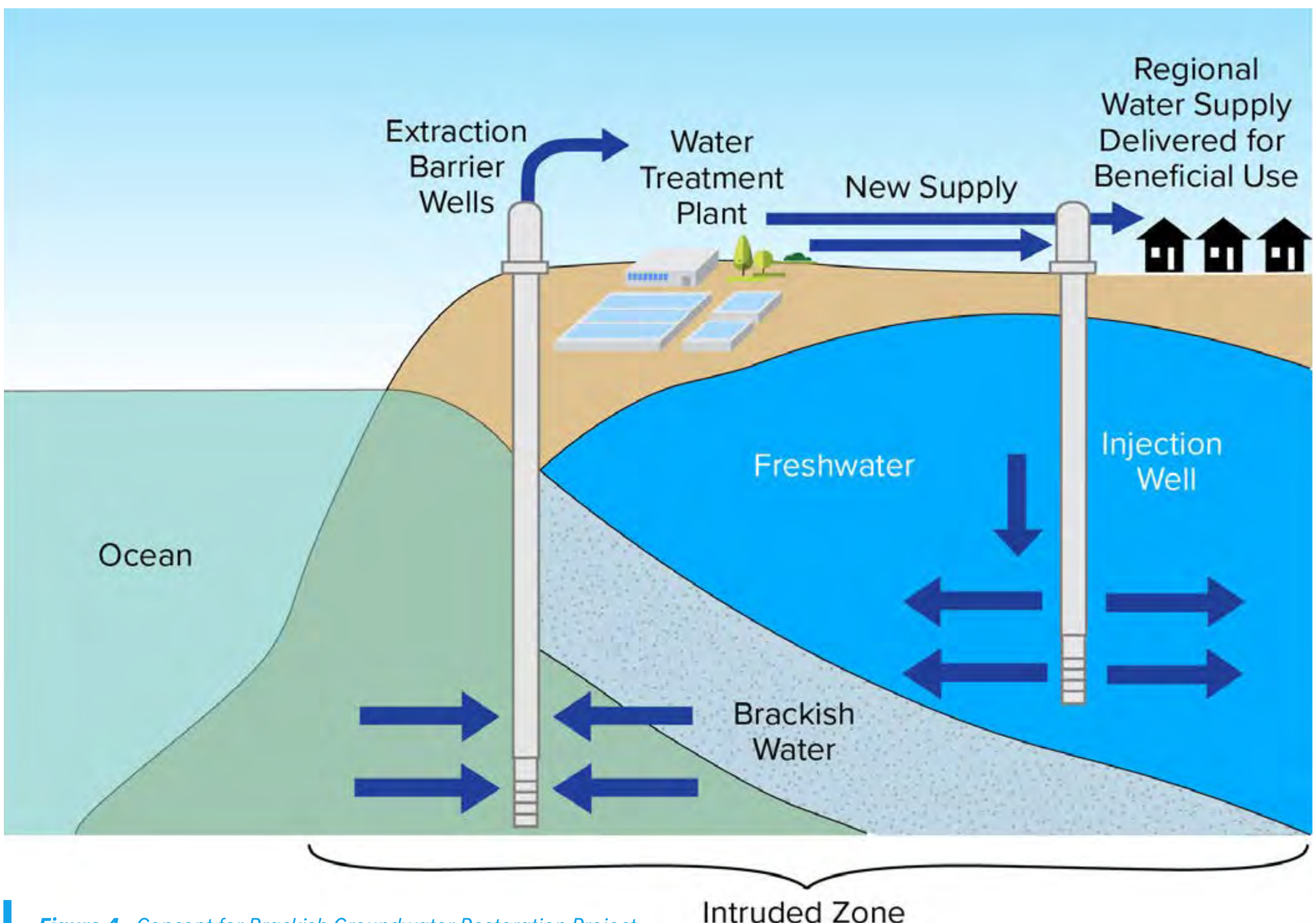


Figure 4. Concept for Brackish Groundwater Restoration Project

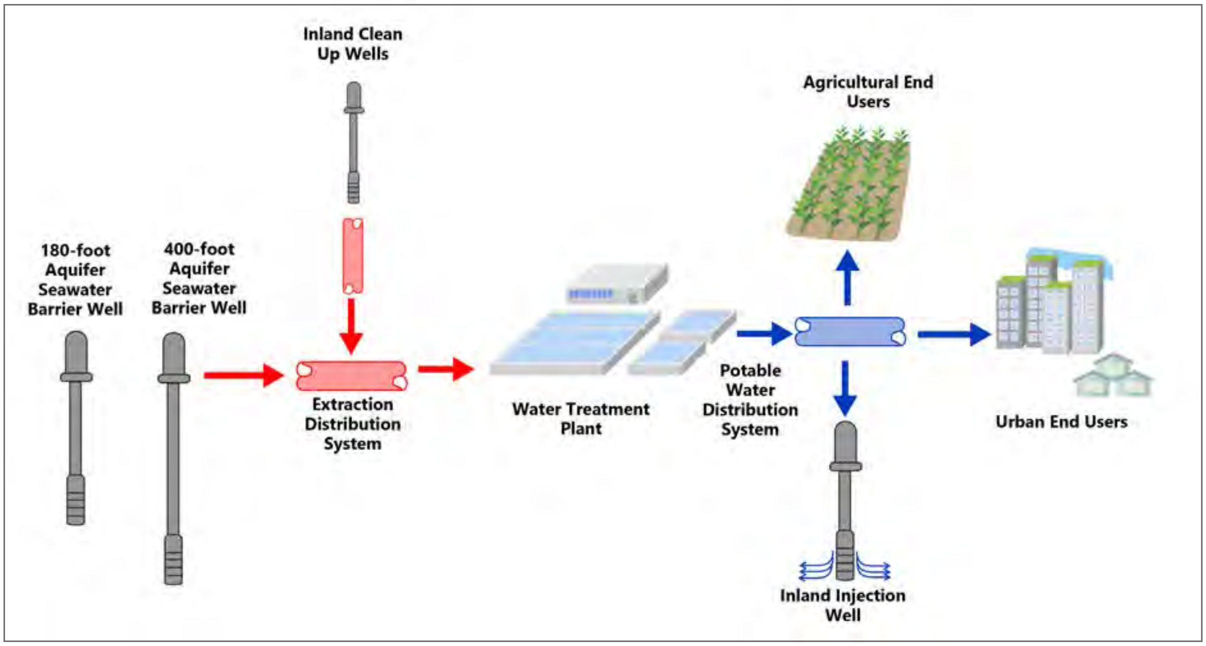


***Figure 5.** Components of Brackish Groundwater Restoration Project*

3.2 Project Feasibility

The project concept was developed over the course of many months working closely with Montgomery and Associates (M&A) groundwater modeling team to assess viability and performance of different configurations of extraction wells, groundwater user offsets and injection wells. Optimal extraction well configurations were determined by trying to strike a balance between avoiding coastal environmental resources and floodplains, while not placing the wells too far inland. Potential end users and locations for deliveries were identified through review of groundwater extraction, water use records and personal communication with utility representatives. The strategy of adding injection wells was evaluated by modeling configurations with and without the injection wells. The finding from these modeling runs was that injection wells augment the overall effectiveness of the project. The groundwater modeling activities that helped define this project are summarized in a separate report by M&A.

The modeling results concluded that the proposed project is technically feasible and provides many benefits to meet the GSP objectives, specifically:

- Reducing seawater intrusion in the 180/400-Foot Aquifers (to the 2017 extent of the 500 mg/l chloride isocontour).
- Maintaining and improving groundwater qualities that have been impacted by seawater intrusion.
- Providing a supplemental regional water supply for domestic and agricultural users.
- Restoring groundwater levels.

Once the overall project feasibility was determined, the project team worked on developing a suite of alternatives in more detail.

4.0 ALTERNATIVE DEVELOPMENT

4.1 Philosophy for Alternatives

In developing alternatives, a range of alternatives were considered that could “bookend” the options and best describe the potential benefits and accompanying costs. The project alternatives range in size, largely driven by the ability to meet different goals. Three alternatives were developed with the following goals:

- Small Alternative – to meet GSP minimum threshold of holding seawater intrusion to 2017 levels.
- Medium Alternatives – to be a reasonable project between the small and large alternative.
- Large Alternative – to meet GSP measurable objective of pulling back the seawater intrusion to Highway 1.

4.2 Project Alternatives

The number of extraction wells, amount of water delivered to end users, and the amount of water injected varies for each alternative. Deliveries to CSIP is a high priority to offset any groundwater use from their supplemental supply wells that is directly under the seawater intruded zone. Service to municipal/ and urban users in the vicinity of the intruded zone is also prioritized with an initial focus on offsetting 180/400 Foot Aquifers use by larger users and then to offset deep aquifer use, if enough supply is available. For all alternatives, the treatment would be provided by a reverse osmosis (RO) system designed to meet potable standards. The distribution pipelines used to deliver water to end users would be a common pipe, so all users must be delivered the same quality water. Agricultural water quality objectives for boron also required that the treatment with RO be configured in a two pass, two stage mode. This configuration would achieve a 70% recovery of water. These assumptions can be verified by pilot testing in the future. All of the RO reject concentrate (or brine) would be conveyed to the existing M1W ocean outfall for disposal. Due to the need to use the M1W outfall, the location for the RO treatment is assumed to be located near the M1W facility.

4.2.1 Small Alternative

The Small Alternative configuration is shown in Figure 6 and the supply and demands are summarized in Table 1. This alternative provides a significant supply to end users but does not meet all of their water demand. end users would maintain their existing groundwater systems to supplement supplies and to meet peak month demands.

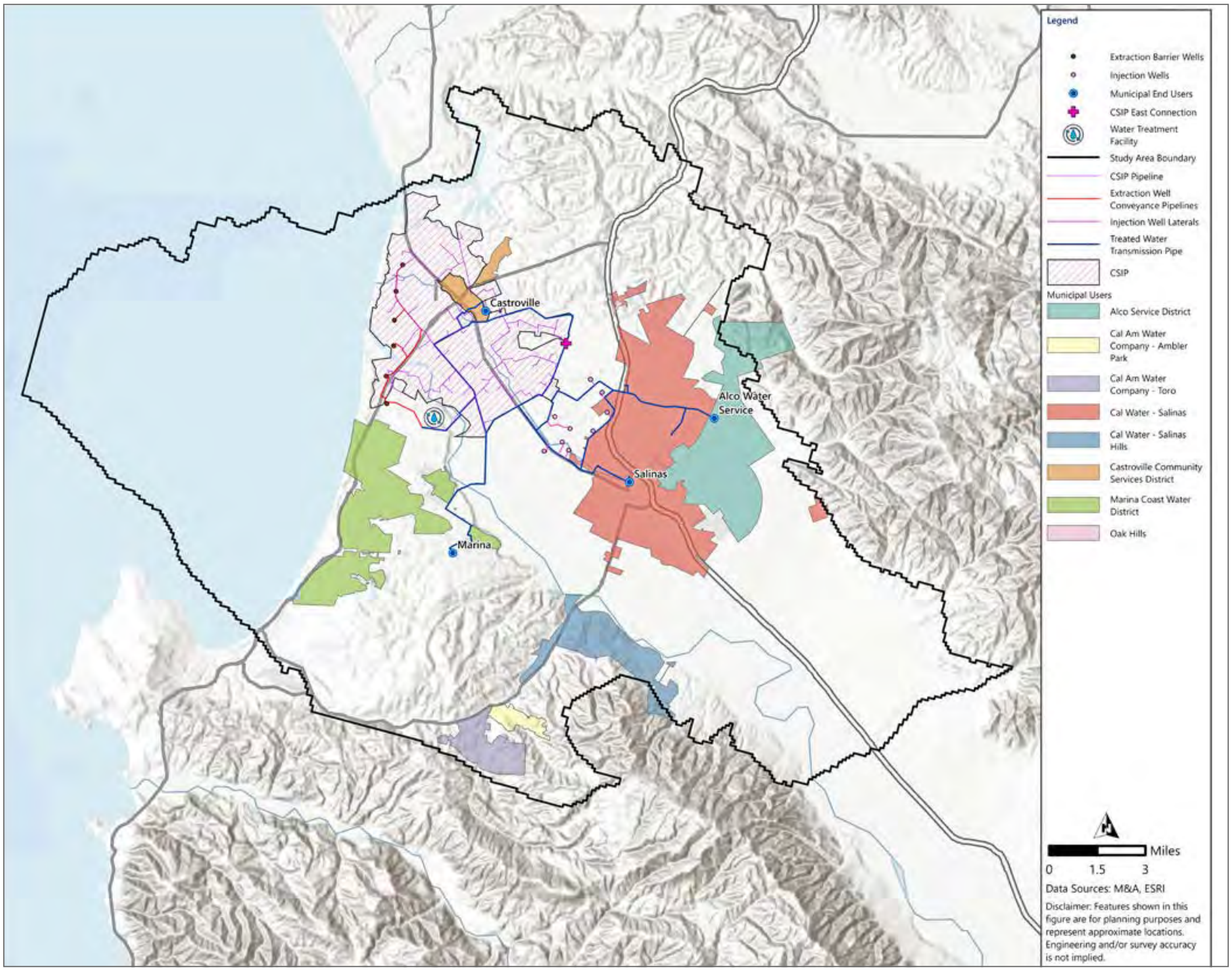


Figure 6. Small Alternative Configuration

TABLE 1. SMALL ALTERNATIVE SUPPLY AND DEMAND VOLUMES

Supply and Demand Elements: Small Alternative	
New Supply	
Number of Wells	6 in 180 ft and 6 in 400 ft aquifers
Total Extraction Capacity in 180-foot Aquifer, gpm	14,500
Total Extraction Capacity in 400-foot Aquifer, gpm	10,100
Total Extraction (gpm)	**24,600**
Total Extracted Volume (AFY)	**39,680**
Total Supply Volume AFY @ 70% Recovery	27,776
Demand Offset (AFY) (1)	
Alco Water Service	3,222
Cal Water - Salinas	10,152
Castroville Community Services District	738
Marina Coast Water District	1,697
CSIP	3,606
End User Demand (AFY)	**19,416**
Injection Volume (AFY)	8,593
Total Injected and End User Demand (AFY)	**28,008**

(1) *Municipal user demands based on the annual average groundwater extraction volumes from 180/400 Foot Aquifers from water year 2016 – 2020. CSIP demands are based on the actual volume of groundwater extraction capacity of the CSIP supplemental wells.*

The modeling results projected through 2070, presented in Figure 7, show that this alternative is able hold the seawater intrusion to the minimum threshold (2017) level in 400-Foot Aquifer, but is not quite able to meet this minimum threshold for the 180 Foot Aquifer as. Figure 7 also shows that the Small Alternative provides significant reduction in seawater intrusion as compared to the no project alternative. Figure 8 shows the modeled groundwater levels increase significantly inland due to the offset of groundwater pumping and the injection of water into the basin. There is a localized depression that forms around the project extraction wells. Mitigation measures to address this and other impacts would be included in the project should it proceed forward toward implementation.

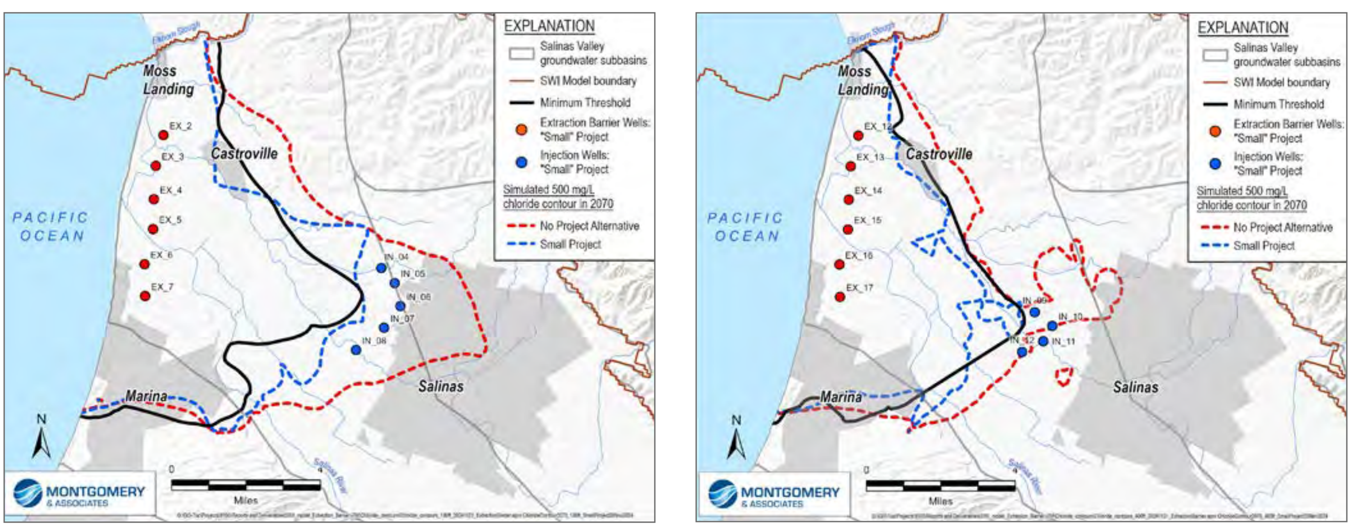


Figure 7. Small Alternative Modeling Results for Seawater Intrusion (Chloride levels) (180 and 400-foot aquifer left and right, respectively)

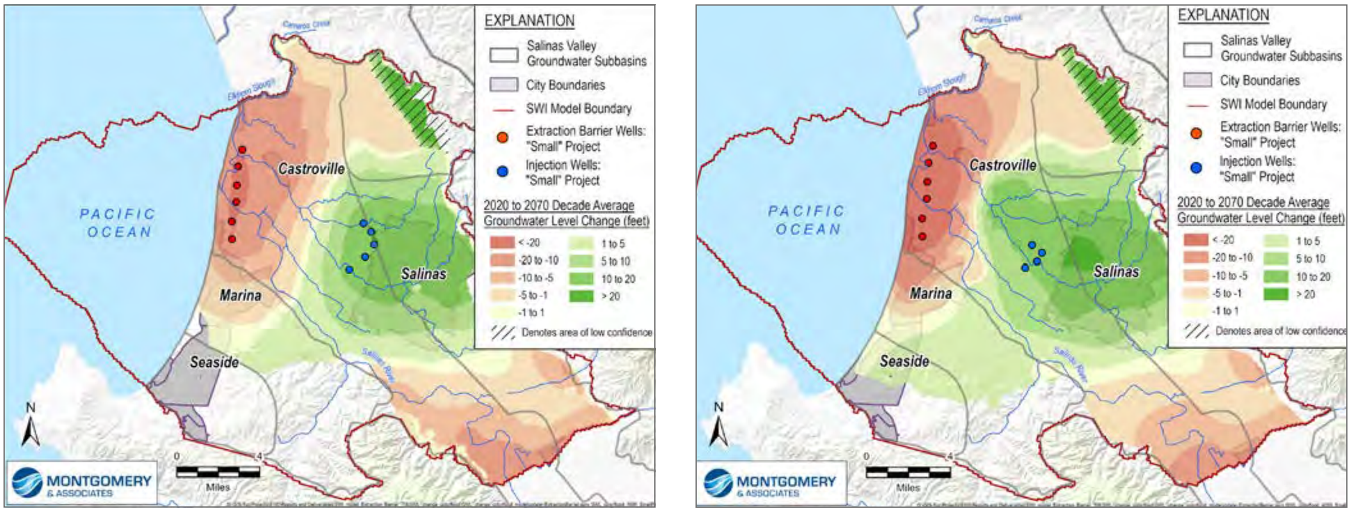


Figure 8. *Small Alternative Groundwater Levels Compared to No Project Alternative (180 and 400-foot aquifer left and right, respectively)*

4.2.2 Medium Alternative

The Medium Alternative configuration is shown in Figure 9 and the supply and demands summarized in Table 2. The Medium Alternative would have more extraction wells than the Small Alternative, expanding both north and south along the coast. The Medium Alternative would serve the same end users as the Small Alternative but would provide

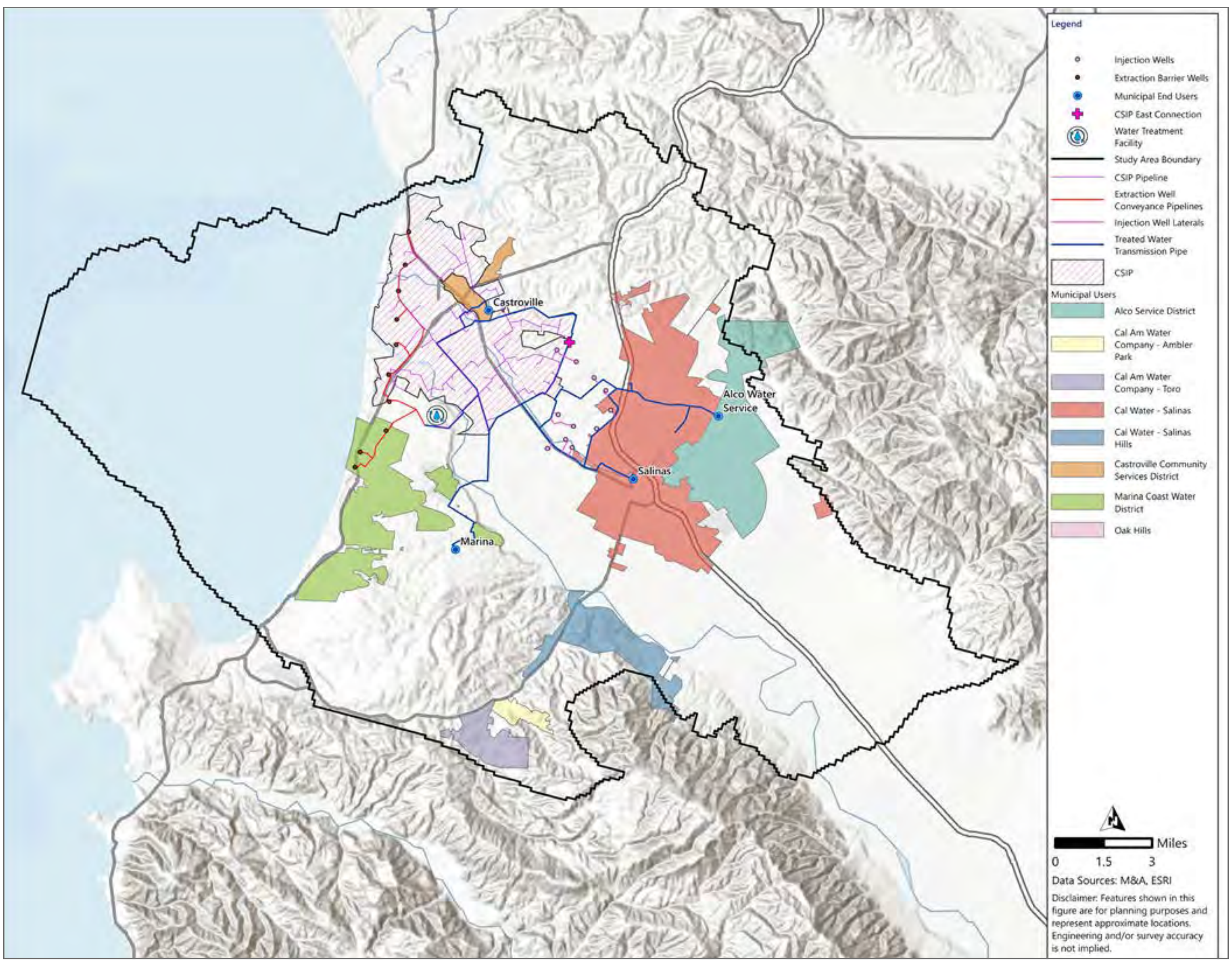


Figure 9. *Medium Alternative Configuration*

nearly all of the end users with their annual average demands. Peak demands would be provided by the end users' existing groundwater systems. As noted in Table 2, CSIP demand is equivalent to their current supplemental groundwater well pumping capacity which is representative of CSIP's current impact on the 180/400-Foot Aquifer. The medium alternative provides CSIP a supply of approximately 5,271 AFY which matches CSIP's 10-year historical groundwater extraction volume. However the hydrogeological model only considered a groundwater offset of 3,606 AFY, the current well capacity.

The modeling results projected though 2070 show that the Medium Alternative is able to hold the seawater intrusion to the minimum threshold (2017) level in both the 180-Foot and 400-Foot Aquifers, as well as to push the intruded zone back further toward the coast, as shown in Figure 10. Figure 11 shows the modeled groundwater levels increase significantly inland due to the offset of groundwater pumping and the injection of water into the basin. There is a localized depression that forms around the project extraction wells. Mitigation measures to address this and other impacts would be included in the project should it proceed forward toward implementation.

TABLE 2. MEDIUM ALTERNATIVE SUPPLY AND DEMAND VOLUMES

Supply and Demand Elements: Medium Alternative	
New Supply	
Number of Wells	10 in 180 ft and 10 in 400 ft aquifers
Total Extraction Capacity in 180-foot Aquifer, gpm	22,500
Total Extraction Capacity in 400-foot Aquifer, gpm	19,000
Total Extraction (gpm)	**41,500**
Total Extracted Volume (AFY)	**66,940**
Total Potable Volume AFY @ 70%	46,858
Demand Offset (AFY)[1]	
Alco Water Service	4,027
Cal Water – Salinas	14,503
Castroville Community Services District	738
Marina Coast Water District	3,217
CSIP	5,271
End User Demand Subtotal (AFY)	**27,757**
Injection Volume (AFY)	19,101
Total Injected and End User Demand (AFY)	**46,858**

1) Urban user demands based on the annual average groundwater extraction volumes from 180/400 ft aquifers from water year 2016 – 2020. CSIP demands based on average use of supplemental groundwater pumping from 180/400 ft aquifer from 2013 – 2023.

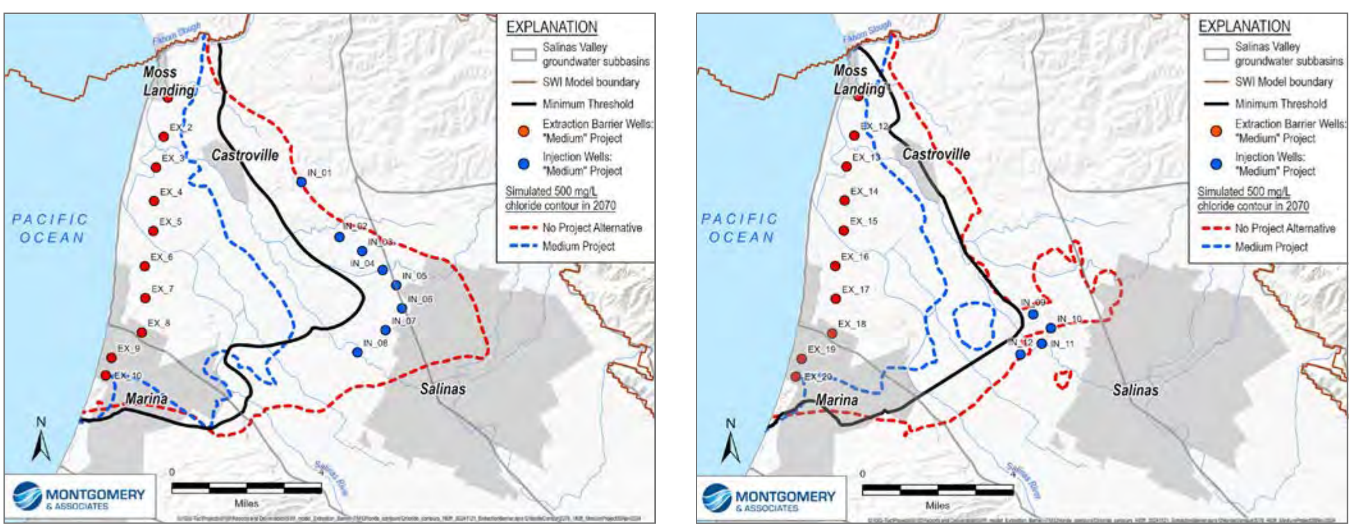


Figure 10. Medium Alternative Modeling Results for Seawater Intrusion (Chloride levels) (180 and 400-foot aquifer left and right, respectively)

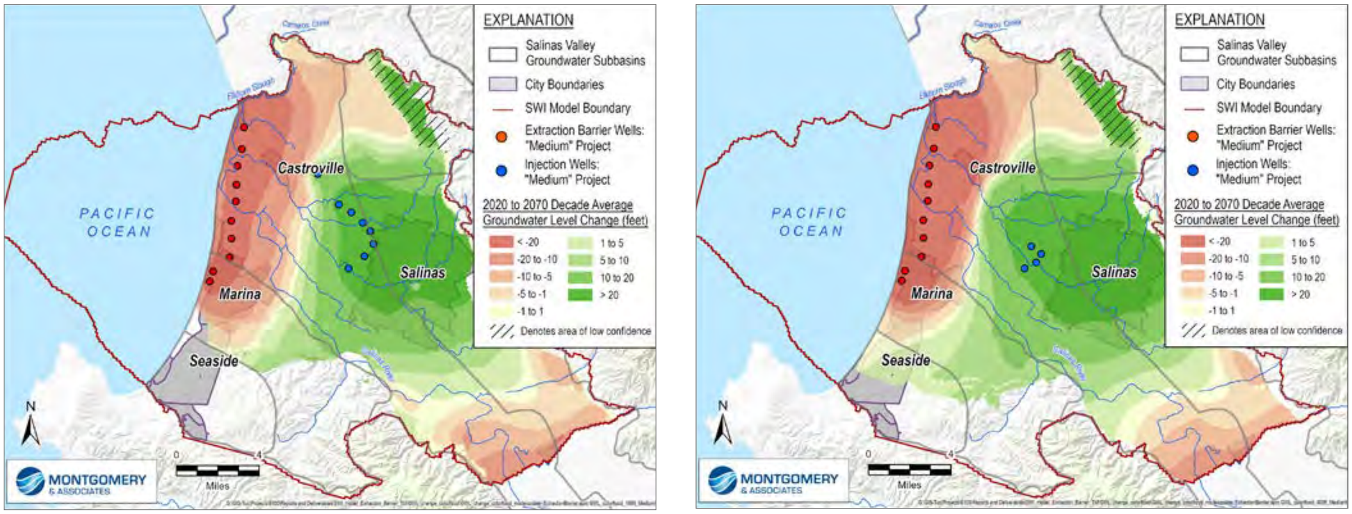


Figure 11. Medium Alternative Modeling Results on Groundwater Levels (180 and 400-foot aquifer left and right, respectively)

4.2.3 Large Alternative

The Large Alternative configuration is shown in Figure 12 and the supply and demands summarized in Table 3. The Large Alternative has more extraction wells than the Small or Medium Alternatives, expanding inland with additional "cleanup wells" that

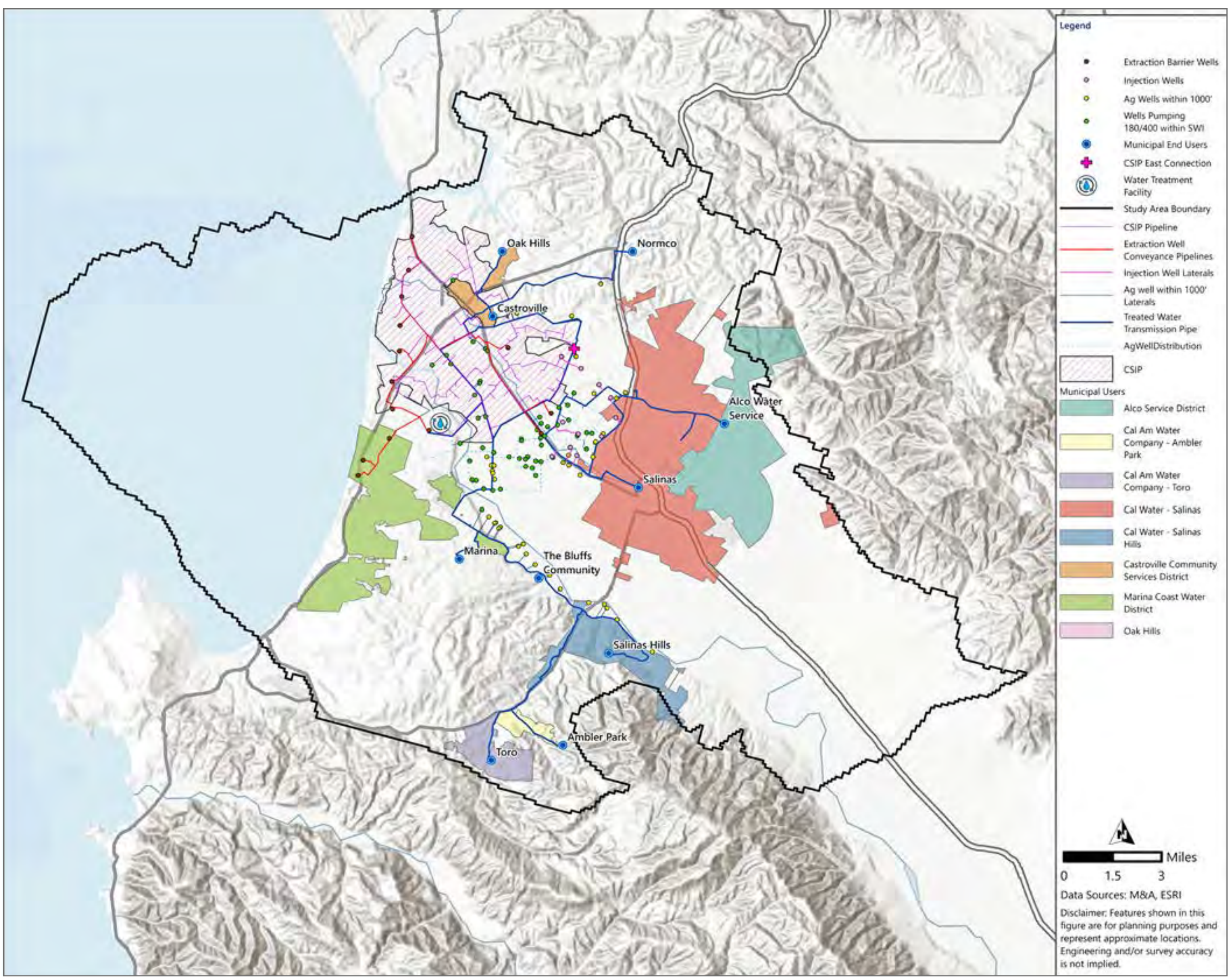


Figure 12. Large Alternative Configuration

would help remove poor quality brackish water from the basin to further restoration. The Large Alternative expands the end users out to all the smaller satellite municipal systems in the project vicinity, as well as serves agricultural end users along the way to municipal urban end users. Peak demands would still be provided by the end users' existing groundwater systems, but end users are supplied with 100% of their historical annual average. Similarly to the Medium Alternative, the Large Alternative provides approximately, 5,271 AFY to CSIP, matching the 10-year historical groundwater extraction volume. However, the hydrogeological model only considered a groundwater offset of 3,606 AFY, the current well capacity.

The modeling results projected through 2070 show that the Large Alternative pulls the seawater intrusion back to well below the minimum threshold (2017) level in both the 180-Foot and 400-Foot Aquifers, as shown in Figure 13. However, this alternative is not able to meet the measurable objective of pulling the intruded zone all the way back to Highway 1 by 2070. Figure 14 shows the modeled groundwater levels increase significantly inland due to the offset of groundwater pumping and the injection of water into the basin. There is a localized depression that forms around the extraction wells. Mitigation measures to address this and other impacts would be included in the project should it proceed forward toward implementation.

TABLE 3. LARGE ALTERNATIVE SUPPLY AND DEMAND VOLUMES

Supply and Demand Elements: Large Alternative	
Extraction Wells	
Number of Wells	14 in 180 ft and 14 in 400 ft aquifers
Total Extraction Capacity in 180-foot Aquifer (gpm)	32,022
Total Extraction Capacity in 400-foot Aquifer (gpm)	28,019
Total Extraction (gpm)	**60,042**
Total Extraction Volume (AFY)	**96,847**
Total Potable Volume AFY @ 70%	67,793
Demand Offset (AFY)[1]	
Alco Water Service	4,027
Cal Water - Salinas	14,503
Castroville Community Services District	738
Marina Coast Water District	3,217
CSIP (offsetting supplemental groundwater use)	5,271
Cal Water - Salinas Hills	1,806
All Ag well within 180/400 and Other within SWI	6,034
Ag wells within 1,000 Feet of Potable Water Transmission Main	2,390
Satellite Municipal Facilities (Normco, Toro, Oak Hills, Ambler Park)	765
End User Demand Subtotal	**38,752**
Injection Volume (AFY)	26,168
Total Injected and End User Demand (AFY)	**64,920**

1) Urban user demands based on the annual average groundwater extraction volumes from 180/400 ft aquifers from water year 2016 – 2020. CSIP demands based on average of supplemental groundwater pumping from 180/400 ft aquifer from 2013 – 2023.

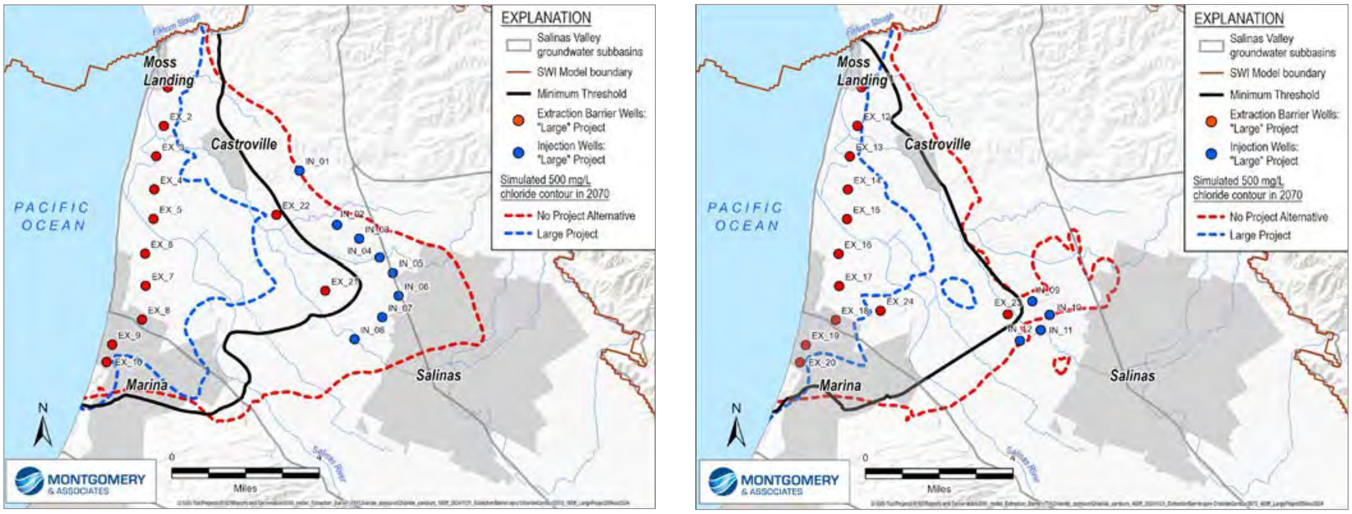


Figure 13. *Large Alternative Modeling Results for Seawater Intrusion (Chloride levels) (180 and 400-foot aquifer left and right, respectively)*

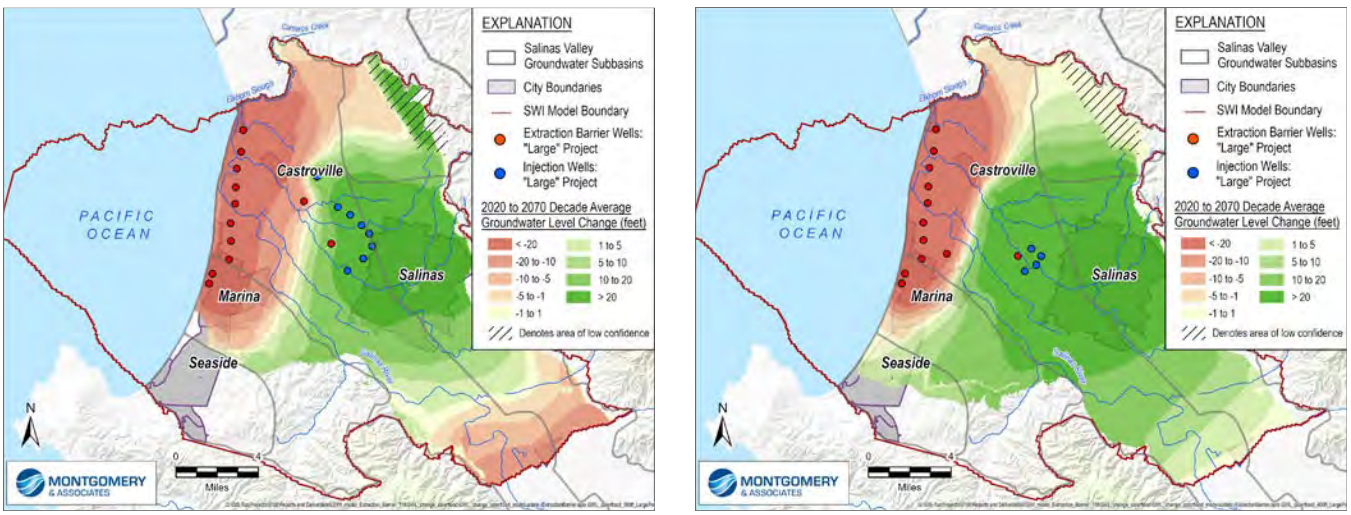


Figure 14. *Large Alternative Modeling Results on Groundwater Levels (180 and 400-foot aquifer left and right, respectively)*

4.3 Costs and Benefits

4.3.1 Estimated Project Costs

Project costs for the small, medium and large alternatives were developed at a Class 5 planning level of certainty. This means that all cost estimates had a minimum 30% contingency applied to their direct market or material costs, additionally a construction administration contingency factor of 25% was applied to the project direct costs, along with Monterey County sales tax of 7.75% on half of all direct construction costs. All project construction costs were escalated to July 2030 at a rate of 0.25% per month (4% per year) to account for inflation. Furthermore, alternatives were developed using industry standard design criteria and engineering assumptions for infrastructure development. Further detailed engineering planning, analysis, and design will be needed if the project is to continue forward.

The project financing includes the following assumptions listed in Table 4. The Small, Medium, and Large Alternative Project costs are shown in Table 5. Typical of most large infrastructure projects, it was assumed that the project would be financed through a federal or state low interest loan program (e.g. SRF or WIFIA) with a 30-year repayment period. The projected lifecycle of the project was assumed to be the same as the hydrogeological modeling, which is through the year 2070 resulting in a total lifecycle of 40 years. Lastly inflation was assumed at 2.25% per year as estimated by the Federal Reserve Bank of Cleveland for a 10-year expected inflation project. The discount rate is set at 2.75% which is the US Bureau of Reclamation recommendation for the evaluation of plans for water and related land resources.

TABLE 4. ASSUMPTIONS FOR COST ESTIMATING

Project Cost Estimate and Financing Term Assumptions	
Project Construction Contingency	30%
Construction Administration Contingency	25%
Sales Tax	7.75% (Monterey County)
Escalation to Midpoint of Construction	0.25% per month
Inflation rate	2.25%
Discount Rate	2.75%
Low Interest Financing Interest Rate	4%
Loan Term (years)	30
Projected Lifecycle (years)	40

TABLE 5. COST COMPARISON OF ALTERNATIVES

Project Cost Element	Small Alternative	Medium Alternative	Large Alternative
Extraction Well Sites	$43,600,000	$53,450,000	$58,700,000
Clean Up Well Sites	N/A	N/A	$10,300,000
Outfall Cleaning and Modifications	$6,250,000	$6,250,000	$6,250,000
Extraction Distribution	$38,900,000	$58,250,000	$97,200,000
Potable Water Distribution Transmission Mains	$142,800,000	$163,450,000	$233,900,000
Potable Water Booster Pump	$7,000,000	$11,000,000	$15,400,000
Injection Well Sites	$37,300,000	$37,300,000	$47,200,000
ROC Storage	$2,100,000	$3,500,000	$4,950,000
Land Costs	$3,100,000	$11,200,000	$11,600,000
1,000-foot Agricultural Wells Laterals	N/A	N/A	$11,650,000
Offset MCWRA Wells Laterals	N/A	N/A	$12,100,000
Water Treatment Facility	$335,000,000	$522,000,000	$758,000,000
Construction Subtotal	**$616,050,000**	**$866,400,000**	**$1,267,250,000**
Soft Costs at 17% (Planning, Permitting, Design, Administration, Legal, Construction Management) Subtotal	$104,730,000	$147,290,000	$215,440,000
Grand Total Project Cost	**$720,780,000**	**$1,013,690,000**	**$1,482,690,000**
Total Project Annual O&M Costs	$69,334,000	$106,655,000	$147,621,000
Estimated Annual Loan Repayment Amount	$41,682,779	$58,621,793	$85,744,110
Estimated Total Annual Costs	$111,016,779	$165,276,793	$233,365,110
Net Present Value of Project Lifecycle Costs	$3,283,577,291	$4,939,768,373	$6,930,634,896
Net Present Value of Project Annual Costs	$82,089,432	$23,494,209	$173,265,872
Total Water Supply Yield (AFY)	28,008	46,858	64,920
Estimated Annualized Unit Costs	**$2,931**	**$2,365**	**$2,669**

Notes:
1. All costs include: 30 percent Construction Contingency, Monterey County Sales Tax of 7.75 percent applied to 50 percent of costs, and 0.25 percent monthly escalation to July 2030 as the estimated midpoint of construction.

4.3.2 Anticipated Project Benefits

There are a multitude of project benefits associated with the Brackish Groundwater Restoration Project. The SVBGSA is working on defining the benefits of the project as compared to doing nothing. In future versions, there will be a monetization of benefits, however at this time, the benefits are discussed qualitatively.

The benefits of the three alternatives fall into three major areas:

1. **Preserving Agricultural Production Value** This benefit can be estimated from the value of land that would be lost to seawater intrusion without the project. The total agricultural land use that falls within the seawater intrusion boundary is modeled as 27,835 acres by 2070 under the no project scenario. If this area becomes unsuitable for agricultural use due to the inability to irrigate, then the land could represent a future loss in agricultural production across the County. Monterey County agriculture plays an important role in both economic and social aspects of the region. The value of productive irrigated farmland ranges from $25,000 to $80,000 per acre in Monterey County (Trends in Agricultural Land and Lease Values, 2023). Agriculture's value extends beyond the fields, supporting a wide array of related businesses—from input suppliers and processors to distributors and service providers—while generating jobs and income that sustain local communities. Projects that help keep irrigated land in productive farming uses support the local economy and communities.
2. **Improving Affected Wells in Intruded Area** Approximately up to 149 wells fall between the no project alternative (2070 seawater intrusion zone) and the Brackish Groundwater Restoration Project chloride boundaries. If this project was not implemented, water quality would continue to degrade due to seawater intrusion. All of these wells would need to either be abandoned or deepened to reach a water supply that can provide a quality suitable to meet drinking water standards and for irrigation. However, the Deep Aquifers are currently in overdraft and are not a viable or sustainable long-term replacement supply; nor is there certainty that the water quality in the Deep Aquifer would remain suitable throughout the area. The total usage of groundwater for these 149 wells is 30,077 AFY. The proposed project would protect the water quality of these wells.

3. **Providing Alternative Water Supply** If the region was required to develop an alternative water supply because of poor quality in the existing supply wells, there are few options available. Other supply alternatives including demand management and aquifer storage and recovery (using Salinas River water) are being studied by the SVBGSA. Developing a new surface water supply of sufficient volume would require: 1) significant surface water rights and flows, 2) expensive diversion and treatment facilities, and 3) new delivery infrastructure (either direct deliveries, storage or injection wells). So far, it does not appear that there are sufficient water rights or reliable surface water flows available to provide similar groundwater offsets as the Brackish Groundwater Restoration Project.

The ongoing studies for other alternatives to this project will inform the development of potential benefits. Monetization of the benefits will be calculated in the future when there is enough information available. A USBR Feasibility Study requires monetized benefits, and the effort will inform the economic viability of the project.

5.0 SUMMARY AND NEXT STEPS

5.1 Summary

The Brackish Groundwater Restoration Project is shown through this feasibility study to be technically viable and able to meet GSP goals. While the project costs for all three alternatives are astounding, this would be a significant new water supply project, equivalent to other large new water supply projects being developed in California such as:

- The 50,000 AFY and $1.74 Billion Echo Water and Harvest Water Project in Sacramento: The EchoWater Project is the Sacramento Area

Regional Wastewater Treatment Plant upgrades to supply safe and reliable treatment for discharge into the Sacramento River and for recycled water use for irrigation by agriculture. The Harvest Water Project includes the recycled water conveyance facility infrastructure for agricultural distribution.

- The 34,000 AFY and $1.5 Billion (Phase 1) Pure Water San Diego project: Pure Water San Diego is a multi-year program that will provide nearly half of San Diego's water supply by 2035 to significantly reduce the reliance on imported water from the California Aqueduct and Colorado River. This project will utilize wastewater and treat it to a drinking water quality through indirect potable reuse. Pure Water San Diego is split into two phases with Phase 1 including a treatment facility and conveyance infrastructure and Phase 2 a treatment expansion.
- The 195,000 AFY and $5-10 Billion Hyperion 2035 Project: The Hyperion 2035 project will help the Los Angeles region to achieve their goal of recycling 100 percent of available wastewater influent at Hyperion and sourcing 70 percent of L.A.'s potable water locally by 2035 through the City's Green New Deal. This project is a potable reuse project and includes major treatment infrastructure upgrades and has a target completion date of December 2035.

The annualized unit cost for each of this project's alternatives is shown in Table 5 at less than $3000/AFY, which is comparable to many of the recycled water projects being implemented across California to provide a drought proof, reliable source of potable water. While this cost is much greater than the existing cost to pump groundwater, as shown by the historical problems in the region, it is not sustainable to continue the current pumping practices. The regional benefits provided by this project would allow the spreading of costs out to a broader area rather than only charging the specific end users of the new water supply. The GSA will investigate ways to cost share for implementation of regional projects.

5.2 Next Steps

Should SVBGSA decide to move forward with one of these alternatives, it will be necessary to address the following project components in implementing the project (listed in no specific order):

- Continue to position for grant funding for planning, design, environmental and construction costs.
- Line up end users, regional support and agreements for participation, funding, ownership and operation of project.
- Develop financial plan and rate study.
- Design and construct the recommended alternative.
- Obtain permits and clearances from applicable regulatory agencies (RWQCB, SWRCB, State and Federal Agencies).
- Conduct environmental process (California Environmental Quality Act [CEQA] and National Environmental Policy Act [NEPA] compliance and compliance documents).

5.2.1 Additional Research and Evaluation

Looking toward future implementation, there are three areas that would benefit from additional research prior to design/environmental analysis/construction: 1) a reverse osmosis pilot to determine effectiveness and required treatment configuration, 2) additional groundwater quality data, and 3) an injection well pilot.

5.2.1.1 Reverse Osmosis Pilot/Demonstration

This feasibility study was conducted with relatively limited data on groundwater quality in the seawater intruded zone as most of the wells in this zone have been destroyed. The limited data was used with water quality modeling to estimate the size and configuration required for the RO brackish water desalination. Additional data and piloting would be beneficial to refine design criteria. There are several items related treatment to that would be helpful to better understand prior to design:

1. Better define intruded water quality.
2. Is pretreatment for iron and manganese needed?
3. Is a 2-pass system configuration for RO needed for boron removal?
4. What is the water quality of the RO concentrate (brine)?
5. What % recovery can be achieved?

These items could be investigated through additional groundwater sampling and a reverse osmosis pilot. Currently, the Castroville Community Services District (CCSD), a disadvantaged community in the project area, has had to abandon wells that have been affected by seawater intrusion due to elevated TDS and chlorides. CCSD is interested in developing a brackish water desalting project to treat their Well #3 that pulls from the 400-Foot Aquifer as an interim solution for their water supply until this (or another) project moves forward with developing new water supplies that can serve CCSD. Doing a brackish water desalting pilot project for Well #3 would provide valuable information regarding water quality, treatment efficacy and performance, and provide design criteria for a larger scale system. As a future end user for this regional project, Castroville's Well #3 Desalter Project can serve as an important demonstration and pilot for a future full scale, regional project.

5.2.1.2 Additional Groundwater Data

In addition to the research needed for brackish water desalting, more water quality data in the intruded zone is needed to better define the treatment design. While CCSD's Well #3 can provide some of the needed data, it is recommended that monitoring wells be installed across the zone of where proposed extraction would occur to obtain a broader groundwater quality data set in the existing intruded area. Monitoring wells could be placed in the approximate location of each of the proposed extraction wells and data collected at regular intervals to better define the TDS, chlorides, and general minerals that would be in the extracted water that could affect the RO treatment. Monitoring wells would need to be paired to achieve testing of both the 180 ft and 400 ft aquifers. Development of monitoring wells in the vicinity of the proposed wells would inform the effort for moving forward with full scale well drilling and implementation as easements and coordination with property owners will be critical to both efforts (monitoring wells and extraction wells).

5.2.1.3 Pilot Injection Well

This project proposes to inject treated water when there is excess volume not used by the urban and agricultural end users. It is expected that the injection would be seasonal, primarily during late fall, winter and early spring months when temperatures and precipitation reduce user demands. Injection of RO treated water is not a new concept as it has been used in recycled water groundwater recharge projects for many decades. However, each soil and aquifer have its own characteristics and the injection rates and need for maintenance can vary significantly across different locations. To help better define the local characteristics, it is suggested that injection be piloted, preferably with treated water. This would require drilling an injection well and equipping it with suitable (permanent) underground infrastructure so the well could be used for full scale use in the future. The above ground infrastructure (pumps, electrical, VFDs…) could be a temporary installation for the duration of the pilot test and equipped for permanent use later. Conversely, the well could be fully equipped for the pilot, but at a higher cost. If the Castroville Well #3 Desalter Pilot Project RO system is installed, this water could be used for the injection pilot.

5.2.2 Implementation Schedule

Table 6 presents a preliminary implementation schedule for the Brackish Groundwater Restoration Project.

TABLE 6. EXAMPLE IMPLEMENTATION SCHEDULE

Description	Start Year	
Project Planning		
Additional studies to determine end users and finalize size of project	2025	2027
Partnering and framework for implementation	2025	2027
Financial planning and rate studies	2026	2028
Pilot/Demonstration Phase – RO pilot, GW monitoring, GW injection		
Planning/Permitting/CEQA	2025	2026
Technical Design	2025	2026
Construction	2026	2027
Operation/Testing	2027	2029
Environmental Documentation for Full Project		
Environmental Impact Report (EIR)	2027	2029
Full Project Implementation		
Technical Design	2027	2030
Construction	2030	2034
Permitting	2027	2034

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Appendix 5A

HCM Update Data, Methods, and Results

MONTGOMERY & ASSOCIATES
Water Resource Consultants

Groundwater experts since 1984

TECHNICAL MEMORANDUM

DATE: December 18, 2024 **PROJECT #:** 9100

TO: Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA)

FROM: Victoria Hermosilla, P.G., Abby Ostovar, Ph.D., Tiffani Cañez, Derrik Williams, P.G., C.Hg.

REVIEWED BY: Amy Woodrow, MCWRA, Joe Oliver, P.G.

PROJECT: Salinas Valley Hydrogeological Conceptual Model (HCM) Update

SUBJECT: 180/400-Foot Aquifer Subbasin HCM Update: Data, Methods, and Findings

INTRODUCTION

The Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) and partner agencies have analyzed new information and filled data gaps identified in the 180/400-Foot Aquifer Subbasin (Subbasin, or 180/400 Subbasin) Groundwater Sustainability Plan (GSP) (SVBGSA, 2020). Montgomery & Associates (M&A) used this new information to update the Subbasin's Hydrogeologic Conceptual Model (HCM) to better inform management decisions and prepare the 5-year Periodic Evaluation. To acquire and analyze data, M&A worked with partner agencies including Marina Coast Water District Groundwater Sustainability Agency (MCWD GSA) and their consultant EKI Environment & Water, Monterey County Water Resources Agency (MCWRA), and California American Water. The updated HCM strengthens and refines the geologic model that forms the basis for the groundwater flow modeling.

The HCM update focused on key areas where new data indicated an updated understanding was needed. The primary updates to the HCM included the following:

- Refining the extents and depths of coastal aquitards including the Salinas Valley Aquitard (SVA), and incorporating data-supported gaps and thin-spots in the 180/400 Aquitard
- Updating the thickness of the 400-Foot Aquifer in the southern portion of the Subbasin
- Refining the location and depth of the Deep Aquifers based on results of the Deep Aquifers Study
- Updating the depth of the bedrock surface and offshore geology

- Refining the boundary of the 180/400 Subbasin with the Corral de Tierra portion of the Monterey Subbasin

This memo summarizes the data used, the analyses and methods employed, and the findings for the updated 180/400 Subbasin HCM.

DATA

The data used to update the HCM include published cross sections and reports, well completion reports (WCRs), numerical groundwater flow model layers, geophysical data, and geologic maps, as detailed in the following subsections.

Published Cross Sections and Reports

The 2020 GSP and 2022 GSP Amendment 1 summarized published cross sections and reports. For this HCM update, the following reports and cross sections were re-reviewed, compared with new data and information, and incorporated into the revised HCM. These included:

- *Hydrogeologic Investigation of Salinas Valley Basin in the Vicinity of Fort Ord and Marina Salinas Valley, California - Final Report* (Harding ESE, 2001)
- *El Toro Groundwater Study Monterey County, California (*GeoSyntec, 2007)
- *Accompanying Documentation Geologic Map and Cross-Sections from El Toro to Salinas Valley (*GeoSyntec, 2010)
- *Deep Aquifer Investigation - Hydrogeologic Data Inventory, Review, Interpretation and Implications (*Feeney and Rosenberg, 2003)
- *Final Report, Hydrostratigraphic Analysis of the Northern Salinas Valley* (Kennedy/Jenks, 2004)
- *Hydrogeologic Report on the Deep Aquifer, Salinas Valley, Monterey County, California* (Thorup, 1976 and 1983)
- *Map Series — Monterey Canyon and Vicinity, California: U.S. Geological Survey Open-File Report 2016–1072* (Dartnell et al, 2016)
- *Deep Aquifers Study* (M&A, 2024a)

Well Completion Reports (WCRs)

WCRs helped refine geologic interpretations, and included important information such as driller-observed lithology, screen intervals, and date of well installation. Some WCRs were more detailed than others with more frequent lithologic descriptions, electric logs (e-logs), and other construction or water level details.

M&A obtained WCRs through the California Department of Water Resources (DWR) Online System for Well Completion Reports (OSWCR) database, the Monterey County Health Department (MCHD), MCWRA, other collaborating partner agencies, and private entities. In particular, MCWRA provided hundreds of well completion reports that were primarily used to update and refine the depths and thicknesses of the aquitards in key areas.

Numerical Groundwater Flow Model Layers

Previous and current groundwater flow models reflect various conceptual understandings of the Subbasin. Models reviewed for the HCM update included:

- The Salinas Valley Geologic Model (Sweetkind, 2023) defines the spatial extent, depth, and distribution of geologic material textures for the provisional Salinas Valley Integrated Hydrologic Model (SVIHM). It is being developed by the USGS, which covers the entire Salinas Valley and includes a geological framework with documentation.
- The Monterey Subbasin Groundwater Flow Model (MBGWFM) (EKI, 2022). This model was developed for MCWD and informed the 2022 Monterey Subbasin GSP. It covers the Monterey Subbasin and adjacent part of the 180/400 Subbasin southwest of the Salinas River.
- The Seaside Subbasin Model (HydroMetrics Water Resources, 2009). This model was developed for the Seaside Basin Watermaster and covers the Seaside Subbasin and adjacent part of the Monterey Subbasin.
- The Salinas Valley Seawater Intrusion Model (SWI Model) (M&A, 2023; 2024b). This model was developed by M&A for SVBGSA and the County of Monterey in 2023 and covers the coastal area of the Salinas Valley north of Chualar. It was updated based in part on the HCM updates included in this memo in 2024.

These models were primarily used to compare and refine the depths and thicknesses of the hydrostratigraphic layers within the Salinas Valley Groundwater Basin HCM update.

Geophysical Data

The following 3 primary types of geophysical data were used in this HCM update:

- Airborne Electromagnetic (AEM) resistivity data. These data were collected by the California Department of Water Resources (DWR) and SVBGSA between 2020 and 2023, and provide a broad coverage of general lithologic trends.

- Borehole resistivity data. These geophysical data are collected in boreholes prior to well installation and provided detailed interpretation of localized lithology.
- Seismic data. Seismic data used in this HCM update were from the USGS (Dartnell *et al.*, 2016) and provided stratigraphic information about offshore geology.

The first 2 types of data are electrical resistivity data, which are collected by sending electrical pulses into the subsurface and receiving signals back. The third type of geophysical data, seismic data, are collected from measuring the reflected, refracted, and direct waves from an active wave source, such as an explosion or hammer impact.

AEM Data

AEM surveys measure the resistivity of both solid and liquid materials in the subsurface over large areas. Lower resistivity materials are clays, silts, and/or higher total dissolved solids (TDS) water. Higher resistivity materials are sands and gravels, some types of bedrock, and/or lower TDS water. AEM data are useful for filling gaps between known data points such as wells. This effort focused on reviewing and analyzing the lower resistivities at various target depths where aquitards are expected.

Three sets of AEM surveys were used to fill data gaps, confirm other data, and refine the primary aquifers and aquitards. These data came from the following sources:

- DWR Survey Area 1, 2020 (DWR, 2020)
- DWR Survey Area 8, 2022 (DWR, 2022)
- Deep Aquifers Survey, 2023 (M&A, 2024)

E-logs/Borehole geophysical logs

Borehole geophysical logs measure the resistivity of materials in the subsurface adjacent to a borehole. Like AEM data, borehole geophysics can help qualitatively differentiate between clays, silts, sands and gravels, high TDS water, and low TDS water. Borehole geophysics data show much more detail than AEM data, but only reflect conditions immediately adjacent to a borehole. Several borehole geophysical logs used were sourced from other studies or included with WCRs.

Seismic Data

Seismic data are collected from measuring the reflected, refracted, and direct waves from an active wave source such as an explosion or hammer impact. The seismic waves travel through the subsurface, reflect off various lithologic surfaces, and return to the ground surface. Based on the timing of the waves, investigators can determine the locations and general rock types of the subsurface lithology up to a few kilometers below land surface. Seismic survey data from the *Seismic Study in Monterey Bay* (Dartnell *et al.*, 2016) were used to refine the offshore portion of the HCM.

Geologic Maps

Geologic maps provide a visual representation of the rocks, formations, and structures encountered at land surface. The 3 primary maps used for this HCM update were the Rosenberg 2001 Monterey Couty digital geologic map, the Clark *et al.*, 2002 surface geologic map of the Spreckels quadrangle, and the subsequently revised version of the onshore and offshore geology derived from the Dartnell *et al.*, 2016 Seismic Study in Monterey Bay. These geologic maps supplemented other data during the HCM update by verifying surface expressions of the various lithologic units.

METHODS

Geologic visualization software was used to update the Subbasin hydrostratigraphy through the following steps:

1. Integrating and reviewing the data using Leapfrog Geo visualization software.
2. Prioritizing data based on reliability and availability.
3. Selecting the best data to define the new hydrostratigraphic layers.
4. Contouring the data to create new hydrostratigraphic layers within Leapfrog Geo software.

Geologic Visualization Software

Developed by Seequent, Leapfrog Geo software was the primary 3D visualization software used to relate and analyze the different types of data described above. All data were imported into the software and methodically reviewed and compared to each other.

Data Prioritization

Various data have differing levels of confidence. The list below demonstrates the general hierarchy of confidence in the various data types used in this analysis, starting with the data with the most confidence.

1. Geologic maps
2. Published cross sections and reports, unless more recent data were available
3. Borehole logs (well completion reports and e-logs)

4. AEM and seismic data
5. Numerical groundwater flow models

Concurrently using multiple data sources can improve confidence in geologic interpretations. For example, confidence in AEM data can be significantly improved when it is combined and coordinated with geologic maps.

Data are not uniformly distributed throughout the 180/400 Subbasin. Wells and associated WCRs are more concentrated in areas with more infrastructure, whereas AEM flightlines cover areas with less or no infrastructure. Therefore, hydrogeologic interpretations are more strongly influenced by availability of data in different areas.

Hydrogeologic interpretations initially focused on areas with a higher density of multiple data types to cross validate in these data. Developing a confidence in any data type allowed analyses using those data to expand horizontally and vertically and revise the HCM as needed.

The decision-making procedures for updating the HCM generally used the following guidelines. These guidelines do not represent a decision-making hierarchy, rather they are a group of guidelines that interact in various ways based on circumstances in each particular area of focus.

- Newer geologic maps were prioritized over older geologic maps.
- Newer published cross sections were prioritized over older published cross sections, unless there was higher confidence in older cross sections based on the author and how the sections correlated with other data.
- Geologic maps provided anchor locations for the geologic surface contacts, including bedrock contacts, where available.
- The hydrostratigraphy was refined by jointly using AEM data, WCRs, and published cross sections in places where the various data types overlapped. This strengthened confidence in AEM data interpretation.
- Where AEM data and cross sections did not align, well logs used to develop the cross section were reviewed and used in conjunction with the AEM data.
- AEM data were the primary data source for hydrostratigraphic interpretation in areas with limited borehole data.
- E-logs and published cross sections were used where AEM data were not available and were correlated with the nearest AEM data.
- WCRs were used as verification and interpolation points for key priority areas.

- Places with no other nearby data relied on the SVIHM geologic model or other groundwater flow model layers to interpolate the hydrostratigraphic layers.

Figure 1 shows an example of an analysis that encompasses many types of data and shows how they are correlated to provide a cohesive understanding of the hydrostratigraphy. The cross section on Figure 1 was exported from the Leapfrog software and spans the 180/400, Monterey, and Seaside Subbasins. Hydrostratigraphy in the north (left on Figure 1) is based primarily on well completion reports, with finer sediments highlighted in blue. Hydrostratigraphy in the center of Figure 1 is based on AEM data, with finer sediments highlighted in blue. An unpublished mapping of the top of the Monterey Formation (Rosenberg, 2009) provided structural data in the south, as well as locations of surface outcrops of Monterey Formation highlighted with yellow disks. The only data not shown are published cross-sections, e-logs, and surface geology; however, in this location they were also reviewed for confirmation of other data. Through careful analysis and integration of all data types, a new bedrock surface was developed, shown in pink mesh and green contour lines in Figure 1.

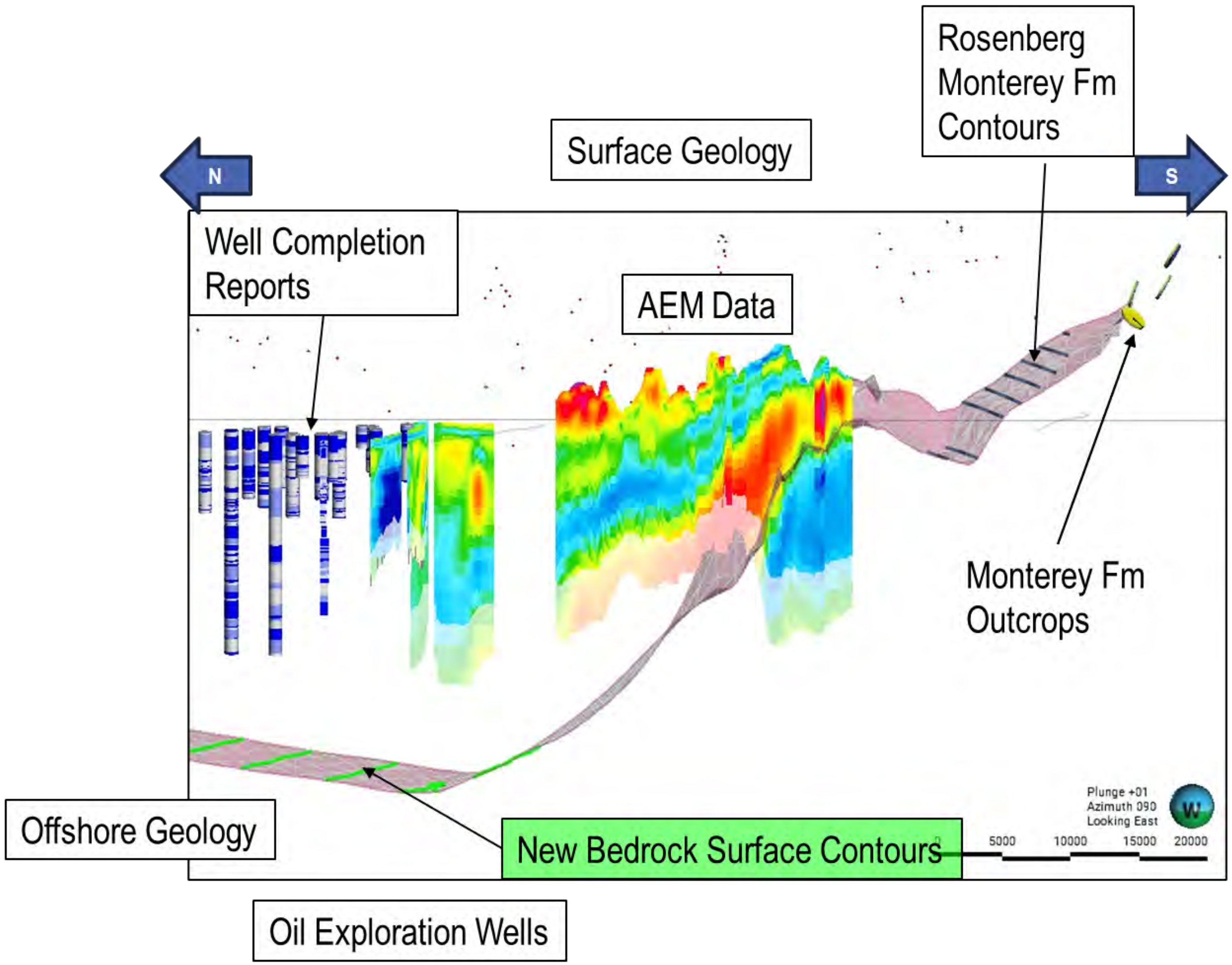

Figure 1. Example of Different Types of Data Juxtaposted in Leapfrog Geo Software

Across the Subbasin, hydrostratigraphic decision-making was prioritized from deepest to shallowest layers. The bedrock surface was the first priority and was modified using AEM data, oil exploration wells, and the Salinas Valley Geological Framework. After revising the bedrock surface, the location and depth of the aquitard between the 400-Foot Aquifer and Deep Aquifers was revised based on the Deep Aquifers Study (M&A, 2024). Following that, the aquitard between the 400-Foot Aquifer and 180-Foot Aquifer and SVA were revised based on AEM data and additional WCRs. The respective aquifers were assumed to exist between the aquitards and the bedrock.

RESULTS/FINDINGS

Results of the 5 primary HCM updates listed in the introduction are detailed below.

Extents and Gaps in Shallow Aquitards

Principal Data Used: WCRs, published cross sections, AEM data, Salinas Valley Geological Framework

M&A updated the extents and thicknesses of the coastal aquitards that factor into vertical migration of seawater intrusion between aquifers. Previous groundwater flow models, all of which were developed based on hydrogeologic data available at the time of their development, provided a starting point for the 3D extents and depths of aquitards. Where newer data indicated the aquitards should be refined from previous models, more in-depth mapping was completed, such as through analysis of driller-observed lithology. From these analyses, as well as MCWRA's efforts to identify thin spots and gaps in the aquitards, M&A added them to show where brackish waters could potentially migrate through the aquitards into other aquifers. This effort focused on 3 aquitards: the SVA, the Intermediate Aquitard between the Upper 180-Foot Aquifer and the Lower 180-Foot Aquifer, where present, and the 180/400-Foot Aquitard.

SVA

The lateral extent and thickness of the SVA was refined based on Survey Area 1 (DWR, 2020), Survey Area 8 (DWR, 2022), and Deep Aquifers Survey (M&A, 2024) AEM data, published cross sections, well completion reports, and information in the SVIHM and MBGWFM. The revised extent of the SVA is shown on Figure 2.

Near the coast, the extent and thickness of the aquitard was refined based on a more thorough review of WCRs and cross sections from the *Final Report, Hydrostratigraphic Analysis of the Northern Salinas Valley* (Kennedy/Jenks, 2004). Farther inland, AEM data and WCRs were used to refine the extent and previously noted gaps in the SVA. The SVA was re-interpreted as a portion of an extensive shallow clay; the SVA being the distinct blue-gray marine-deposited clay, and the more extensive body of shallow clay including more brown and red derived from continental deposition. The SVA is part of a larger system of shallow clays in other areas of the Salinas Valley as shown on Figure 2. These clays extend into parts of the Eastside, Langley, and Forebay Subbasins; however, they are likely not from a marine depositional environment. Most shallow clays found in the Eastside Subbasin are from alluvial deposits and were defined using AEM data. The SVA near the Fort Ord area in the Monterey Subbasin is based primarily on the extent delineated in the *Final Report, Hydrogeologic Investigation of the Salinas Valley Basin in the Vicinity of Fort Ord and Marina* (Harding ESE, 2001). Near the Fort Ord area, from northeast to southwest, the SVA starts as a single thicker layer of clay that overlies the 180-Foot Aquifer. At the Salinas River, the SVA transitions to several layers of clay that separate multiple aquifers as shown on Figure 3. These several layers of clay include the Intermediate Aquitard discussed below.

<u>Intermediate Aquitard</u>

As the 180-Foot Aquifer approaches the Monterey Subbasin near the coast, it separates into the Upper and Lower 180-Foot Aquifer with the Intermediate Aquitard in between. The conceptual understanding of the Intermediate Aquitard was updated using AEM data and WCRs and in collaboration with EKI. This aquitard only exists in a limited portion of the 180/400 Subbasin; the upper and lower portions of the 180-Foot Aquifer are not separated by a distinct aquitard throughout most of the Subbasin. Figure 3 shows how the Intermediate Aquitard separates the Upper 180-Foot Aquifer from the Lower 180-Foot Aquifer just outside of the 180/400 Subbasin in the Monterey Subbasin.

<u>180/400 Aquitard</u>

The extent and thickness of the 180/400 Aquitard was refined using data from previous studies including the *Hydrogeologic Investigation of Salinas Valley Basin in the Vicinity of Fort Ord and Marina Salinas Valley, California* (Harding ESE, 2001) and the *Final Report, Hydrostratigraphic Analysis of the Northern Salinas Valley* (Kennedy/Jenks, 2004). Additionally, data from several WCRs and AEM data were used to validate many of the aquitard's thin spots. The refined extent of the aquitard is shown on Figure 4.

The revised interpretation shows this aquitard as uneven in thickness and intermittently present. Several newer wells have been added to the analysis, and carefully reviewed with other data. The holes in the aquitard to the south were added through the use of AEM data. Additionally, this aquitard was linked to clays in the alluvial fans in the Eastside Subbasin to represent connectivity of correlative low permeability zones (as higher clay contents), despite not being from the same depositional environment. Figure 4 shows an interfingering zone that indicates where the blue clay that defines the 180/400 Aquitard becomes less dominant than in other areas of the northern 180/400 Subbasin. In this area both red and blue clay can be found in WCRs, which seem to be indicative of the sedimentary interfingering sequence of fluvial, marine, and eolian deposits of the Aromas Sands (Fugro West, Inc., 1995). In the Marina-Ord Area, a portion of the 180/400 Aquitard is shown as intermittent because groundwater elevations in the 180- and 400-Foot Aquifers are similar, as illustrated on Figure 5 by EKI Environment & Water.

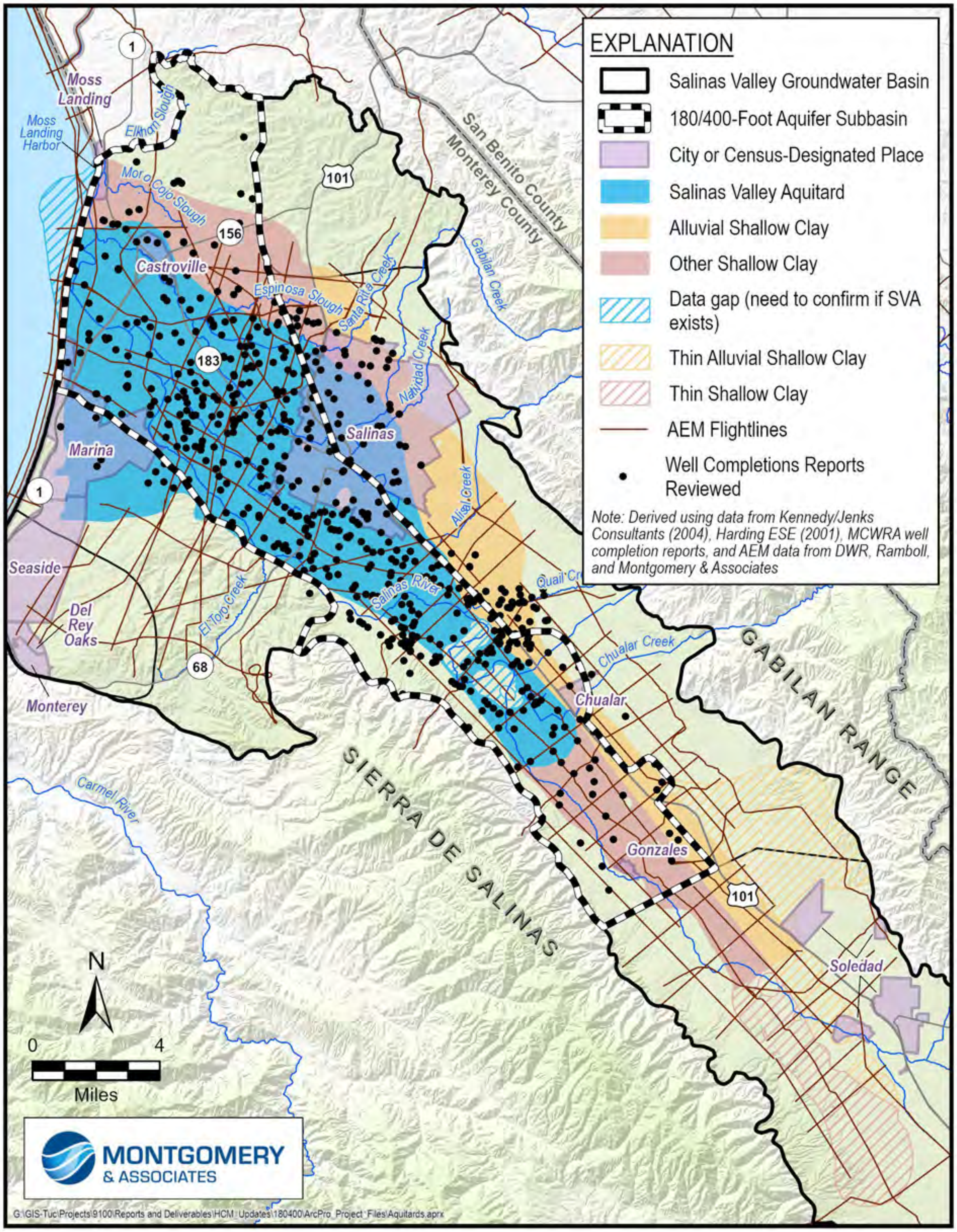

Figure 2. Updated Understanding of the SVA and Shallow Clays with Key Data Sources

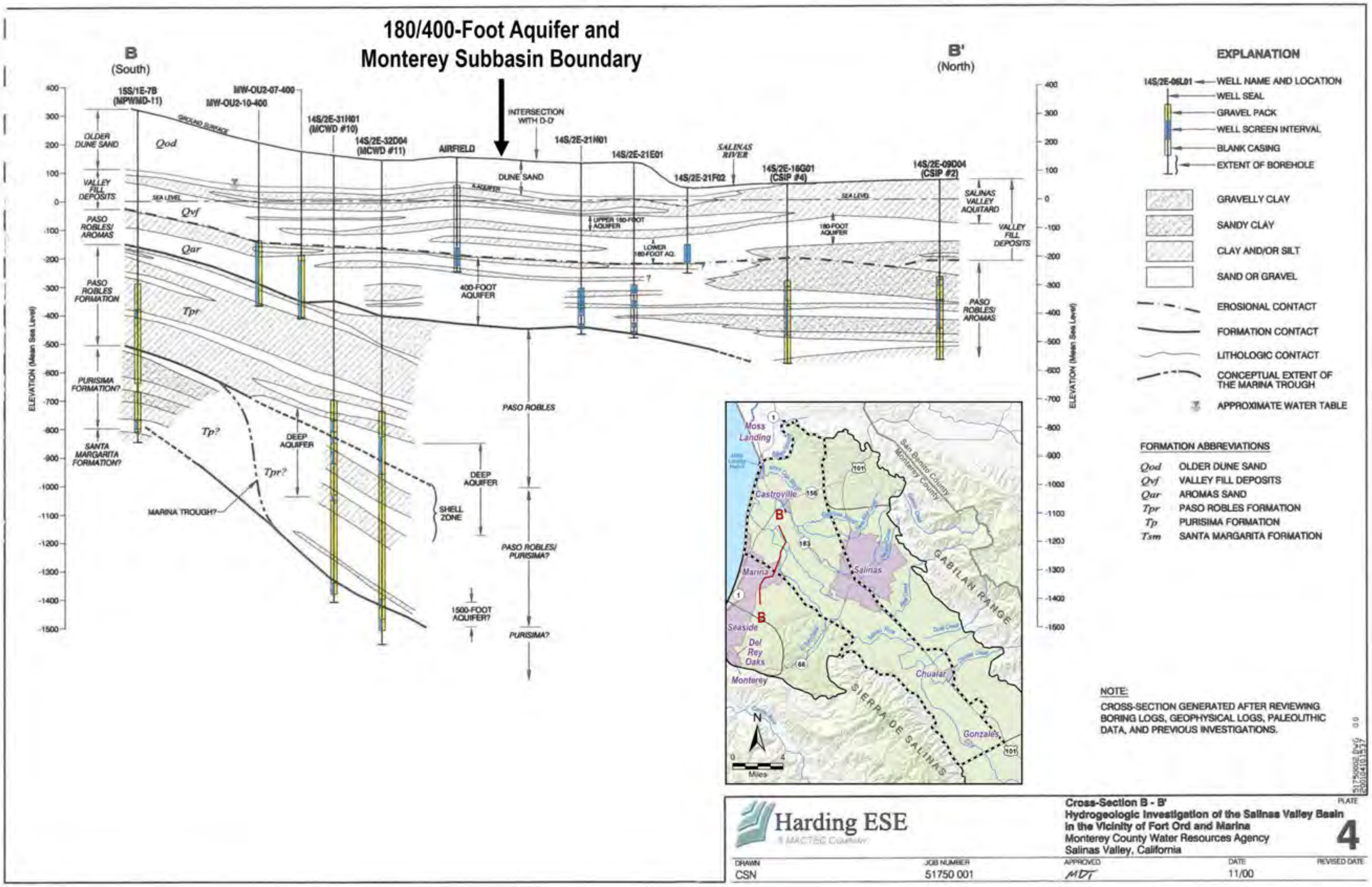

Figure 3. Cross Section of SVA and Intermediate Aquitard (adapted from Harding ESE, 2001)

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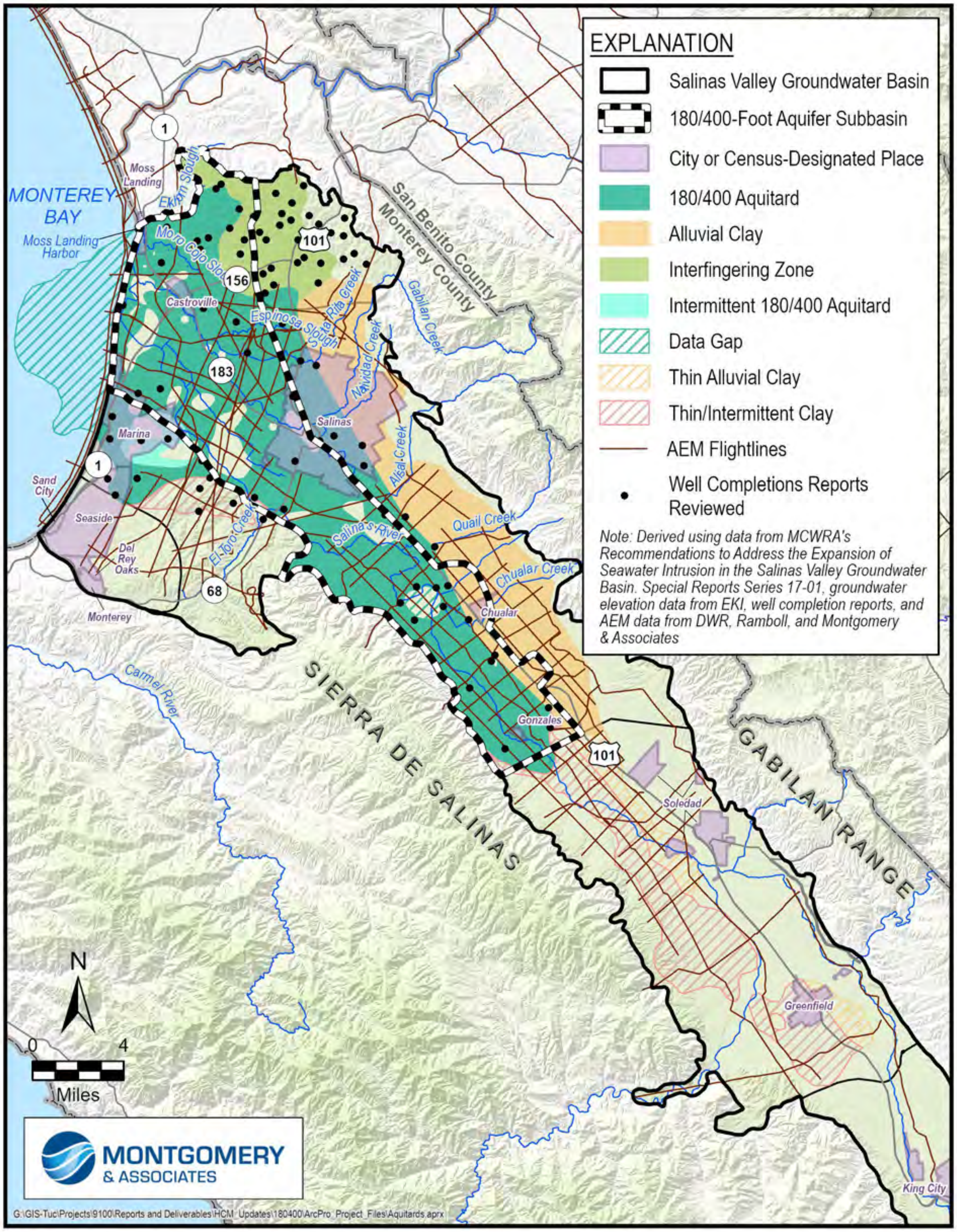

Figure 4. Updated Understanding of the 180/400 Aquitard

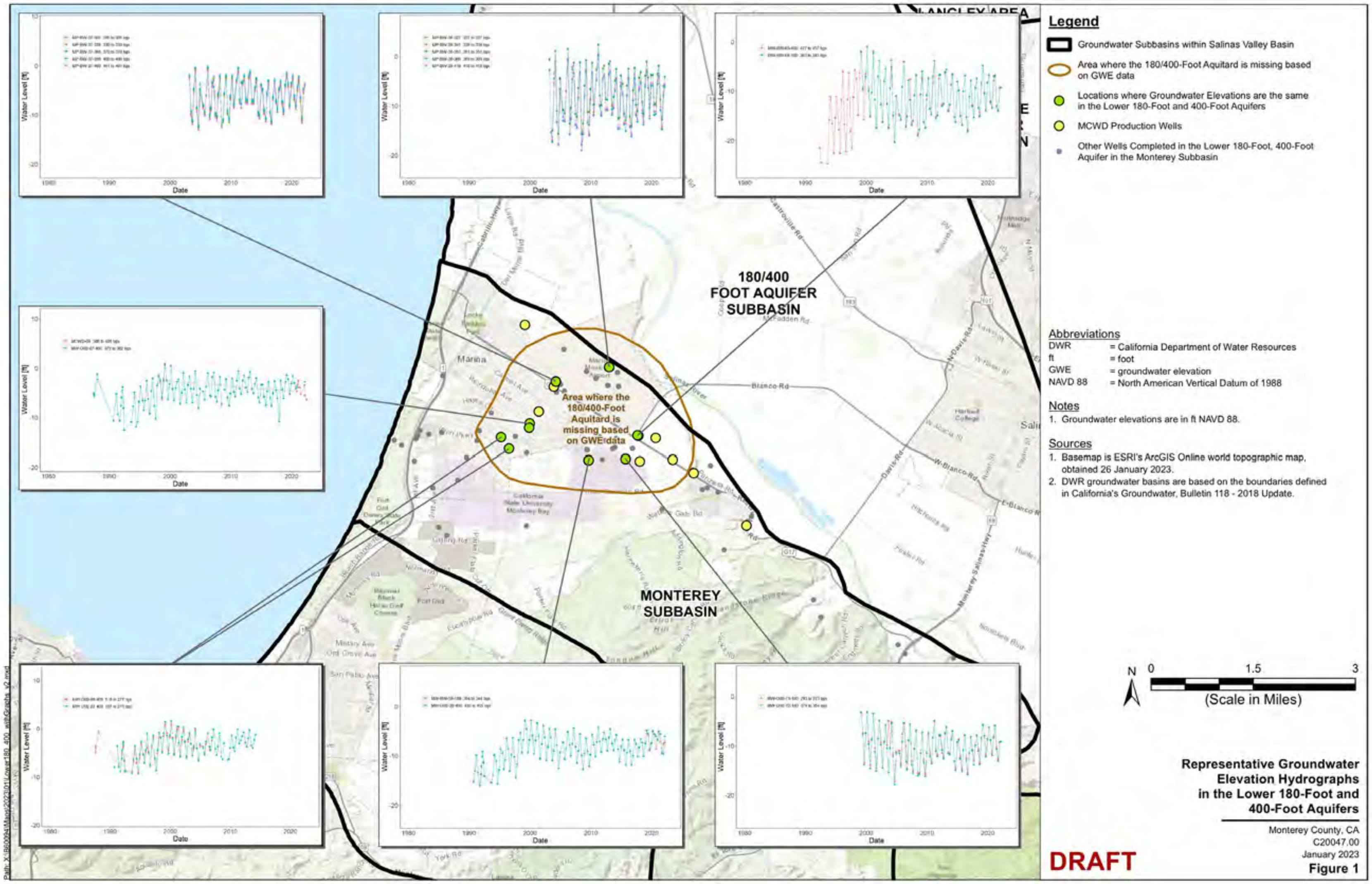

Figure 5. Hydrographs with Similar Groundwater Elevation in the 180- and 400-Foot Aquifers in the Marina-Ord Area

400-Foot Aquifer Thickness

Principal Data Used: AEM data, Salinas Valley Geological Framework

The 400-Foot Aquifer's thickness is defined by the distance between the base of the 180/400-Foot Aquitard and the top of the 400/Deep Aquitard. Previous interpretations of the 400/Deep Aquitard were that it was fairly consistent in depth and thickness along the main axis within the 180/400 Subbasin. The 400-Foot Aquifer was understood to have a thickness of up to 450 feet, averaging 250 feet thick, and ranging anywhere from 200 to 700 feet below land surface based on WCRs and published cross sections.

AEM data gathered for the *Deep Aquifers Study* (M&A, 2024) provided a much more refined view of the depth of the 400/Deep Aquitard, which in turn improved the conceptual understanding of the 400-Foot Aquifer's thickness. The Deep Aquifers Study found that the 400/Deep Aquitard extends southward throughout the Subbasin, generally following the trough shape of the Salinas Valley Basin. The Aquitard both deepens and thickens southward, which results in the 400-Foot Aquifer thickening southward.

These new data show that the 400-Foot Aquifer is still generally encountered at the previously estimated initial depth below ground surface (bgs): approximately 200 ft bgs. However, the revised conceptual model shows the aquifer extends up to approximately 1,000 ft bgs to the top of the 400/Deep Aquitard. This results in a significantly thicker aquifer than previously known. Figure 6 shows the revised elevation of the bottom of the 400-Foot Aquifer in the Subbasin and revised thickness of the 400-Foot Aquifer.

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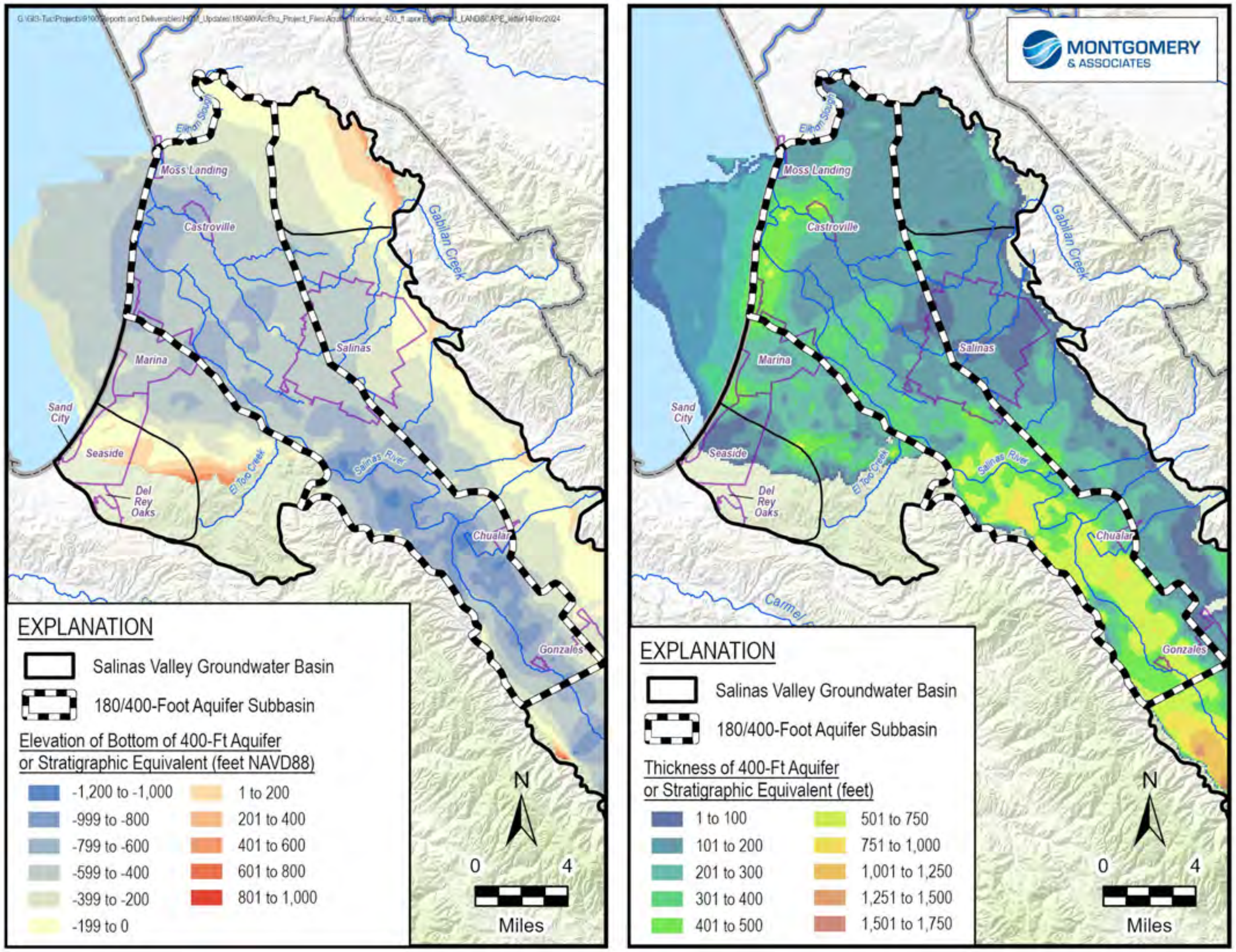

Figure 6. Revised Bottom Elevation and Thickness of 400-Ft Aquifer or Stratigraphic Equivalent

400/Deep Aquitard and Deep Aquifers' Extent

Principal Data Used: Previously published studies, AEM data, WCRs

The Deep Aquifers' extent was revised by incorporating results and data from the *Deep Aquifers Study* (Study) (M&A, 2024). Attachment A to the Study details the data, methods, and extent findings, which are summarized here.

No cohesive description of the Deep Aquifers' depth and extent existed prior to the Study. The previous understanding of the Deep Aquifers focused on the coastal areas of the 180/400 and Monterey Subbasins, where the majority of the deep wells were installed. The *Deep Aquifer Investigation - Hydrogeologic Data Inventory, Review, Interpretation and Implications* (Feeney and Rosenberg, 2003) detailed the geology that constitutes the Deep Aquifers and summarized the known Deep Aquifers wells' screened intervals, extraction, and locations.

The *Hydrogeologic Report on the Deep Aquifer, Salinas Valley, Monterey County, California* (Thorup, 1976) defined the Deep Aquifers as the entirety of the Paso Robles Formation within the Salinas Valley Basin and developed recharge and storage estimates assuming the whole formation was the Deep Aquifers. Other studies and analyses generally defined the Deep Aquifers based on the presence of the overlying 400-Foot Aquifer or MCWRA-designated Deep Aquifers wells, but notably there was no defined extent.

The updated understanding of the Deep Aquifers presented in the Study focused on the presence of the 400/Deep Aquitard to delineate the Deep Aquifers from the shallower principal aquifers. The Deep Aquifers incorporate all the productive zones below the 400/Deep Aquitard, including the previously named 800-Foot, 900-Foot, 1,100-Foot, and 1,500-Foot Aquifers; and comprise portions of the Paso Robles Formation, Purisima Formation, and Santa Margarita Sandstone. Insufficient data exist to divide the Deep Aquifers into distinct component horizons.

The Study delineated the lateral extent of the Deep Aquifers throughout the majority of the 180/400 Subbasin and into adjacent and nearby subbasins. The extent of the Deep Aquifers in the 180/400 Subbasin is shown on Figure 7, which also shows the extent defined in the Deep Aquifers Study. This figure includes areas marked as the uncertain extent, where current data are not sufficient to conclusively determine if the Deep Aquifers are present.

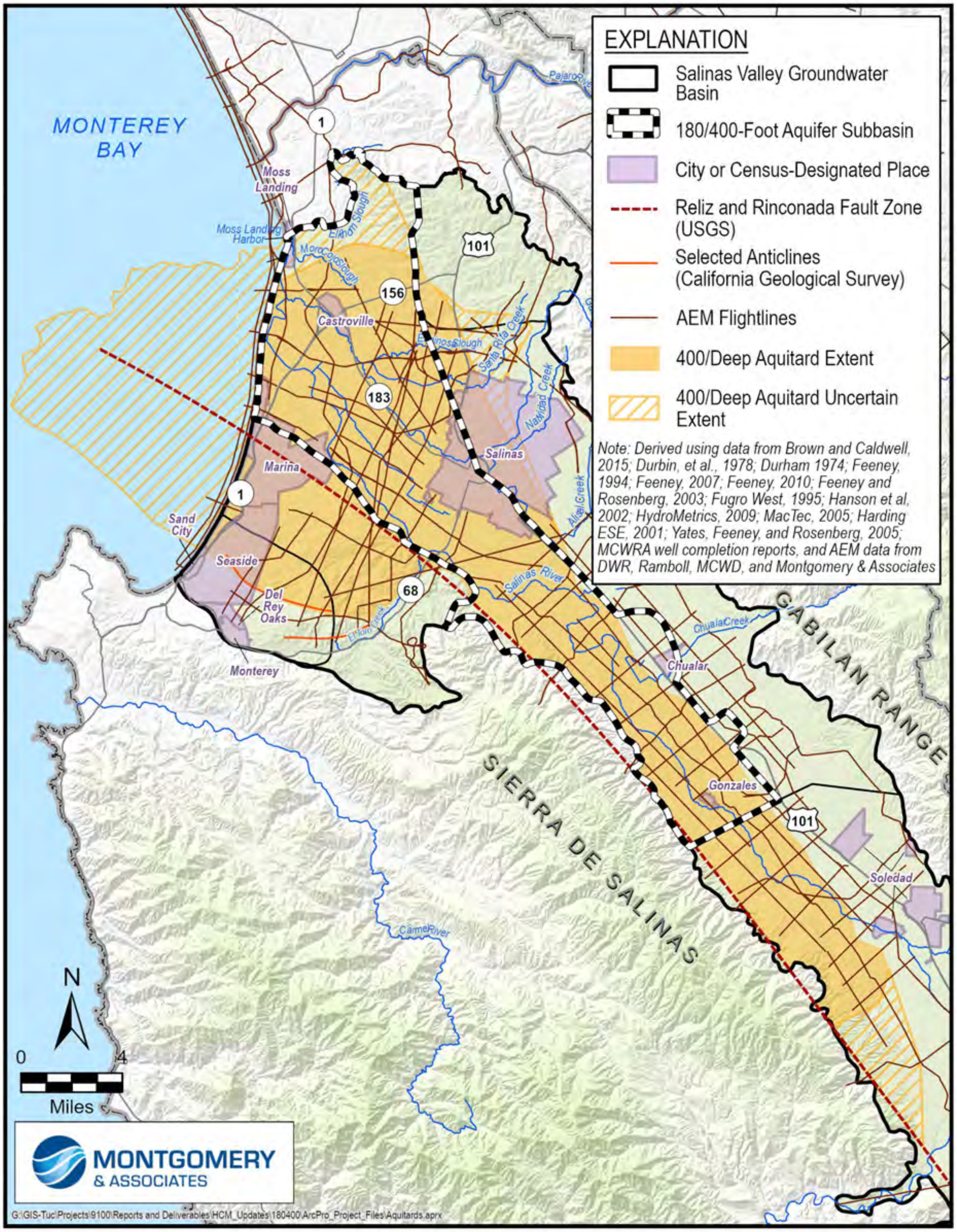

Figure 7. Updated Deep Aquifers Extents, as Determined by the Deep Aquifers Study (M&A, 2024)

Top of Bedrock and Offshore Hydrostratigraphy

Principal Data Used: Oil exploration wells, AEM data, SVIHM geologic model, seismic data, surface geology maps, and bathymetry

The Monterey Formation and granitic rocks comprise the primary bedrock units. This surface defines the bottom elevation of what is considered usable aquifer. Previous conceptualization of the top of bedrock surface is based on the 1978 Durbin model (Durbin *et al.*, 1978) that relied on geophysical gravity studies. This surface conforms to a traditional bathtub shape, generally dipping down toward the Sierra de Salinas and tilting up toward the coast. The Salinas Valley Geological Framework (Sweetkind, 2023) generally follows this same conceptualization. For this HCM update, the onshore portion of the 180/400 Subbasin is consistent with this same conceptualization, with only minor adjustments along the coastline based on lithology from several deep oil exploration wells.

Top of bedrock elevations deviate from the SVIHM elevations for the offshore area adjacent to the 180/400 Subbasin. The revisions are based on oil exploration wells previously mentioned, mapped outcrops of bedrock in Monterey Bay (Dartnell *et al.*, 2016, and Wagner *et al.* 2002), and seismic reflection cross sections (Dartnell *et al.*, 2016). The combination of these data and lack of known significant faulting offsets indicates the top of bedrock surface extends offshore with the same, gently sloping upward trend as onshore to nearly flat. This also follows the same slightly upward slope as in the B – B' geologic cross section in Feeney and Rosenberg (2003).

M&A updated the offshore hydrostratigraphy above bedrock based on more recent offshore geologic maps and the most recent bathymetry data (seafloor topography). These updates provide a refined conceptualization of how the aquifers interact with the ocean in Monterey Bay. The primary modifications to the offshore hydrostratigraphy consisted of connecting geologic units to outcrops from the most recent offshore geologic maps, smoothing and revising the offshore hydrostratigraphy, and updating it based on the bathymetry data available from NOAA (NOAA, 2024). Units that have not been mapped as outcropping offshore were assumed to pinch between the coastline and Monterey Canyon following the similar pinch outs as the SVIHM.

Figure 8 shows a cross section extending offshore of the revised hydrostratigraphic interpretation. The updated bedrock surface, shown in grey, is a relatively flat-lying layer with no substantial discontinuities between the coastline and Monterey Canyon. Figure 8 also shows the revised hydrostratigraphy above the Monterey Formation, and how the various units outcrop along the wall of Monterey Canyon. Included on Figure 8 are drillholes with bedrock contact and the AEM surveys, which were used in the analysis where surveys indicated bedrock contact.

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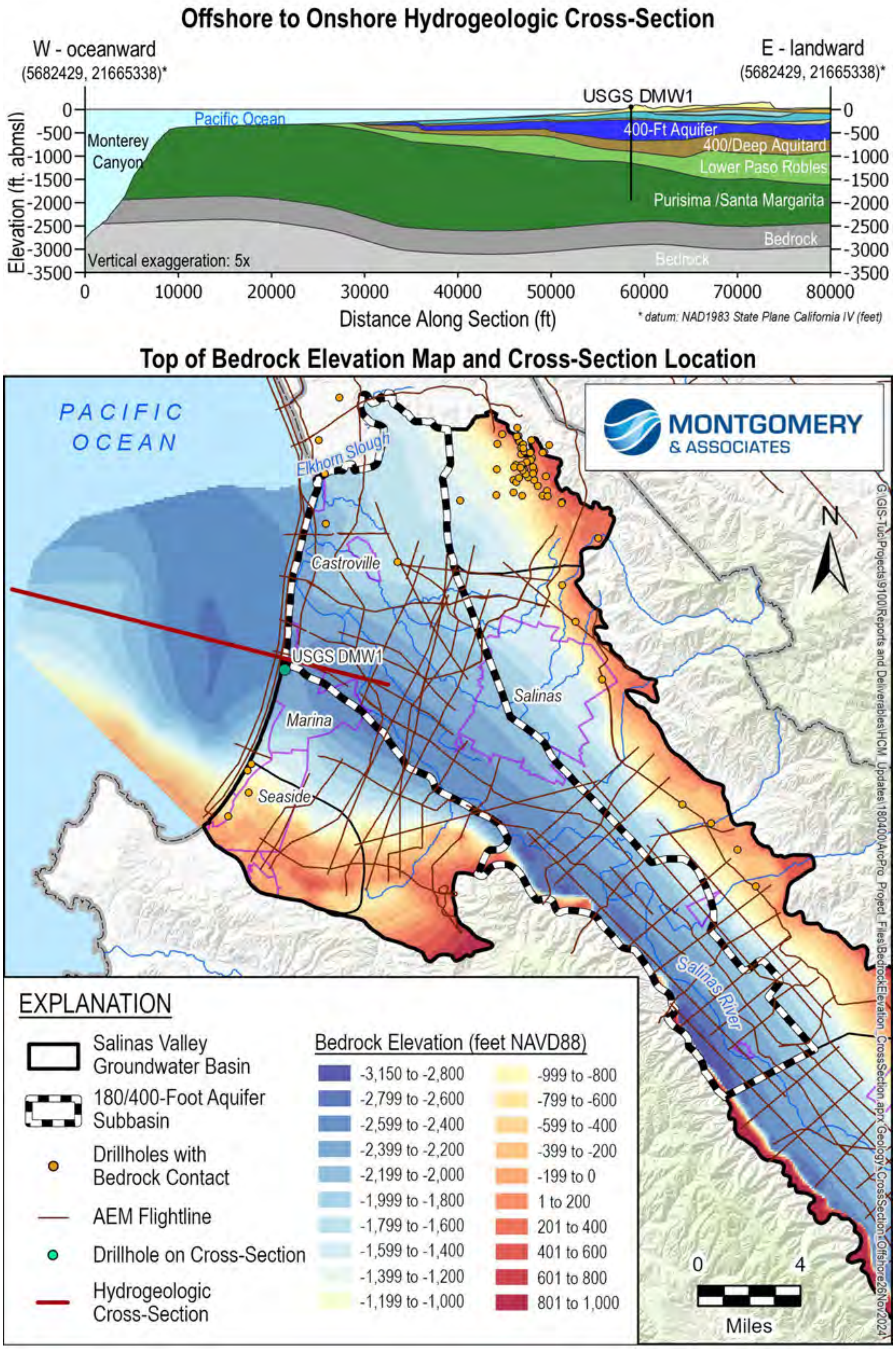

Figure 8. Revised Conceptual Understanding of Offshore Bedrock and Hydrostratigraphy

Boundary of the 180/400 Subbasin with the Corral de Tierra

Principal Data Used: AEM data, published cross sections, surface geology maps

The relationship between the 180/400 Subbasin and the El Toro Primary Aquifer System has been poorly defined due to a lack of data across the subbasins' boundary. Previous conceptualizations of the connectivity were based on the unpublished mapping of the Monterey Formation surface contours (Rosenberg, 2009). The aquifers in the El Toro area were assumed to follow the contours of the mapped Monterey Formation surface, and conceptually connect with the Deep Aquifers and/or other aquifers of the 180/400 Subbasin. There was limited understanding regarding whether the principal aquifers and aquitards in the 180/400-Foot Aquifer Subbasin flowed across or were truncated by the Reliz Fault, but it was generally thought that water flowed from the El Toro area into the 180/400 Subbasin.

Cross-section X_1-Z in the *Geologic Map and Cross-Sections from El Toro to Salinas Valley* (Geosyntec, 2010), as shown in the Monterey Subbasin GSP (MCWDGSA and SVBGSA, 2022), shows some uplift of the bedrock. AEM data collected in the Corral de Tierra Area revealed that along the Highway 68 corridor, as the 180/400 Subbasin boundary is approached, the Monterey Formation reaches the surface and then dives steeply near the Reliz Fault, as shown in Figure 9, along with the location of AEM surveys, of which relevant lines were used in the analysis. These data suggest that groundwater flow between the El Toro area and the 180/400 Subbasin is likely limited. This interpretation is similar to what was shown on Cross-section X_1-Z (Geosyntec, 2010). This subbasin boundary remains an area of uncertainty due to the geologic complexity, and this conceptual understanding may be updated in the future with more refined data.

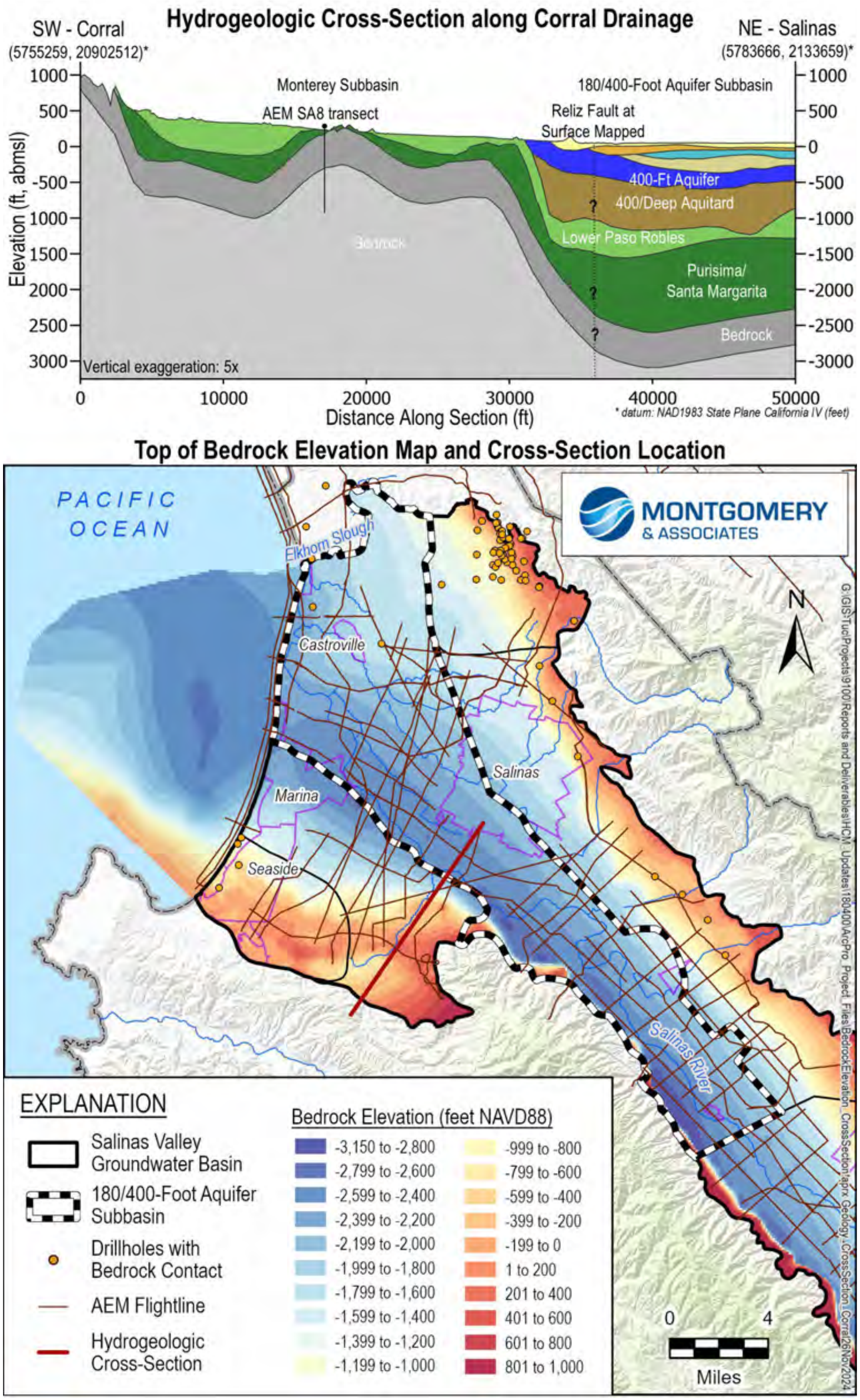

Figure 9. Revised Layers Across the Subbasin Boundary near Toro Creek

CONCLUSIONS

The HCM included in the 2020 180/400 Subbasin GSP used the best available analyses and published reports. The SVBGSA has collected and analyzed significant amounts of new data to refine and update the conceptual model. This update provides clear refinements for the overall Subbasin.

The following include principal updates to the HCM:

- The gaps previously found in the coastal aquitards have been refined and incorporated into the shallower coastal aquitards, which could be important for allowing vertical migration of brackish groundwater.
- The 400-Foot Aquifer in the southern portion of the Subbasin is thicker than previously understood, based on the refined depth of the 400/Deep Aquitard.
- The Deep Aquifers are deeper and more extensive than previously mapped, based on information from the *Deep Aquifer Study* (M&A, 2024).
- The offshore bedrock surface and hydrostratigraphy, smoothing the units from onshore geology to offshore mapped surface geology.
- The aquifers in the El Toro area of the Monterey Subbasin do not appear to be well connected to the aquifers in the 180/400 Subbasin, however, this is an area with remaining conceptual uncertainty.

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Appendix 5B

GDE Identification and a GDE Monitoring Standard Operating Procedures (SOP)

Identification and Mapping of Groundwater Dependent Ecosystems in the 180/400-Foot Aquifer Subbasin

December 2024

Prepared for the Salinas Valley Basin Groundwater Sustainability Agency
Prepared by the Central Coast Wetlands Group

CCWG
Central Coast Wetlands Group

Introduction

The Sustainable Groundwater Management Act (SGMA) requires all beneficial users, including Groundwater Dependent Ecosystems (GDEs), must be considered during development and implementation of Groundwater Sustainability Plans (Water Code § 10723.2). SGMA requires all GDEs within a groundwater basin be identified, monitored and assessed to ensure there are no adverse impacts to these systems due to groundwater conditions.

The process for identifying and mapping GDEs in the 180/400-Foot Aquifer Subbasin (180/400 Subbasin) was developed with guidance from documents developed by The Nature Conservancy (TNC) (Rhode et al. 2018, Rhode et al. 2020), TNC staff and San Francisco Estuary Institute (SFEI) staff with subject matter expertise, and Dr. Melissa Rhode. Additionally, this process was developed with feedback from local stakeholders as part of the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) convened Groundwater Dependent Ecosystem Working Group, which met seven times between July 2023 - April 2024.

Identification and mapping of GDEs in the 180/400 Subbasin included a desktop review and analysis of groundwater and habitat datasets. Additionally, field-based baseline condition monitoring was conducted for select GDEs identified through the desktop process.

There are inherent uncertainties in the identification of GDEs due to the difficulty of directly measuring an ecosystem's reliance on groundwater. While there are methods for directly measuring the extent to which vegetation and waterbodies are reliant on groundwater, these methods are highly resource intensive and are not considered a reasonable or necessary approach by subject matter experts. This process instead relied on proxy measures based on the best available science and groundwater and habitat mapping data. If these datasets are updated, so should the identification and mapping of GDEs in this subbasin. Due to the inherent uncertainties, this process aimed to be conservative in the identification of GDEs and err on the side of being more inclusive in the mapping of these ecosystems.

Additionally, the goal of this identification and mapping process was not to identify every plant and waterbody dependent on groundwater, but rather ensure there was adequate identification of GDEs across the whole subbasin. This approach takes the perspective that if there are no adverse impacts to identified GDEs, then any additional ecosystems missed in the process will also be protected under SVBGSA management activities and decisions. Subject matter experts consulted in the development of this identification process support this perspective, and encourage spending enough resources on identification and mapping to get adequate coverage while spending more focus and resources on monitoring and assessment to protect GDEs from adverse impacts.

Desktop Identification and Mapping

State and local habitat mapping datasets were filtered to identify where ecosystems potentially dependent on groundwater are located in the subbasin. Groundwater elevation and ground surface elevation data were used to determine how deep the groundwater table was in relation to the ground surface across the subbasin. This depth to groundwater table was layered with the habitat datasets to identify locations in the subbasin where the groundwater table was reasonably high enough to expect the above ecosystem to be able to access groundwater as one of its water sources. The resulting set of ecosystems potentially reliant of groundwater was further filtered to exclude areas overlying non-principal aquifers and corrected as needed for errors in habitat mapping, such as large areas clearly in agricultural production based on aerial imagery.

The datasets used and steps taken to develop a map of GDEs in the 180/400 Subbasin are described in more detail in the following sections.

Datasets

The desktop-based process of identifying and mapping GDEs in the 180/400-Foot Aquifer used local groundwater elevation data, ground surface elevation data, state and local habitat mapping datasets, and TNC guidance on the rooting depth of plant species known to be groundwater dependent.

Habitat Data

Natural Communities Commonly Associate with Groundwater

The Natural Communities Commonly Associated with Groundwater (NCCAG) dataset is a compilation of phreatophytic vegetation, regularly flooded natural wetlands and riverine areas, and seeps and springs identified from 48 publicly available state and federal agency datasets. This dataset does not account for local groundwater elevations and areas identified in the dataset are considered potentially dependent on groundwater. Two potential GDE types are identified in NCCAG, wetlands and terrestrial vegetation (Figure 1). This dataset was developed by a working group comprised of staff from Department of Water Resources, California Department of Fish and Wildlife, and The Nature Conservancy (Klausmeyer et al. 2018). GDE subject matter experts recommend using NCCAG as a starting point for identifying GDEs within groundwater subbasins and modifying the dataset based on local habitat and groundwater data.

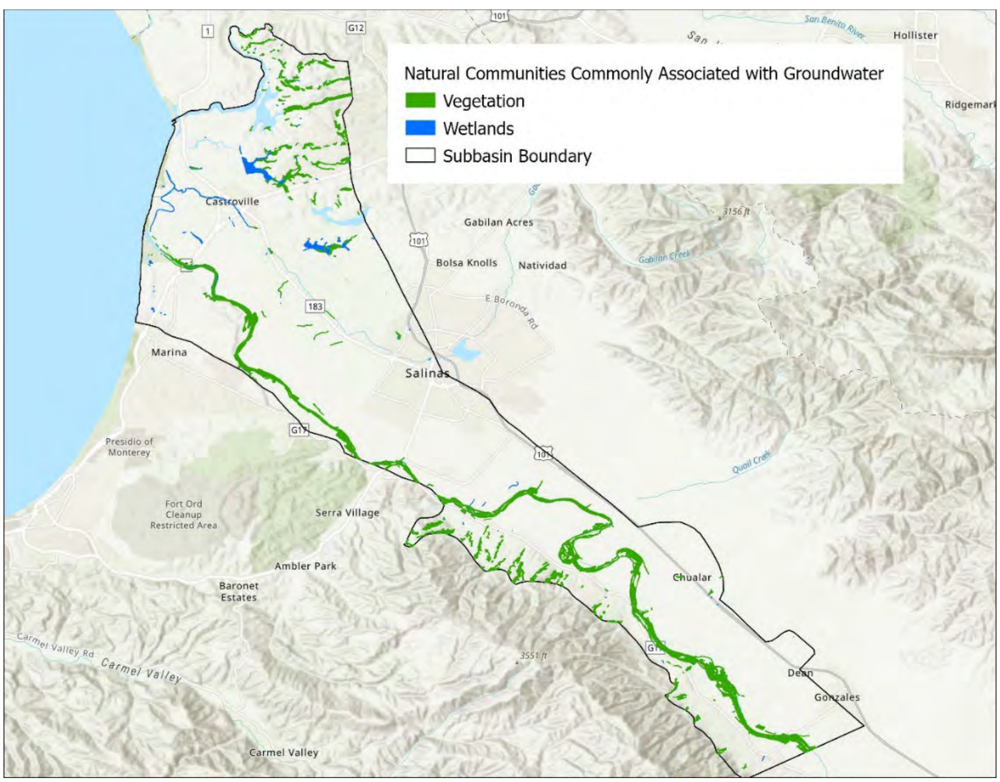

Figure 1. Natural Communities Commonly Associated with Groundwater dataset focused on the 180/400 Subbasin (Klausmeyer et al. 2018).

Elkhorn Slough Enhanced Lifeform Habitat Mapping

To supplement NCCAG with local habitat data, the Elkhorn Slough Enhanced Lifeform Habitat Mapping dataset was used in the GDE identification process. The Elkhorn Slough Watershed lifeform mapping was developed by Elkhorn Slough National Estuarine Research Reserve, Elkhorn Slough Foundation, and National Oceanic and Atmospheric Administration (ESF et al. 2020) (Figure 2). This mapping effort includes habitat and land use types not suitable as potential GDEs, such as annual cropland and developed land. Only habitat types determined through best professional judgement to be consistent with the GDE definition were included for further consideration (Table 1) (ESF et al. 2020).

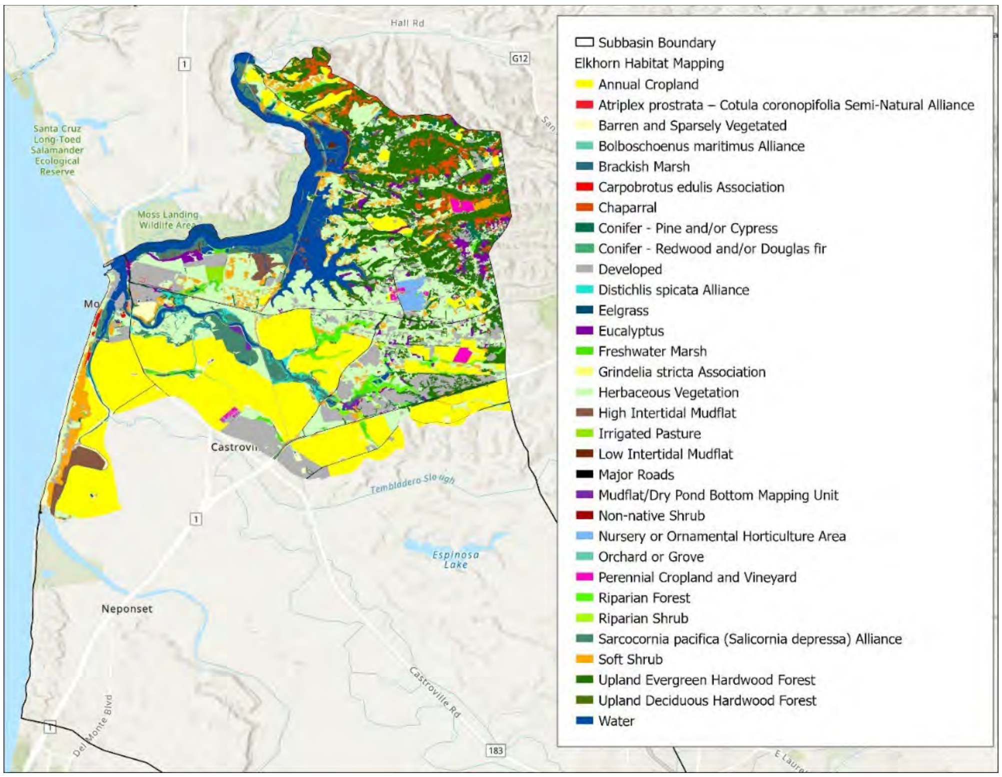

Figure 2. Elkhorn Slough Watershed lifeform mapping (ESF et al. 2020).

Table 1. Elkhorn Slough Watershed lifeform mapping habitat classes retained as potential GDEs and description of retained habitat classes from dataset metadata supporting documentation (ESF et al. 2020).

Habitat Class	**Description**
Brackish Marsh	Partner designated wetland areas that have been tidal wetland in the past but are no longer exposed to salt water because of diking or dams. Vegetation is primarily freshwater species, but the soil still retains salt.
Saltgrass (*Distichlis spicata*) alliance	Salt and brackish marshes dominated or co-dominated by Distichlis spicata, Frankenia salina and/or Jaumea carnosa. Non-native grasses including Avena spp. and Bromus hordeaceus may have high cover and Sarcocornia pacifica may be present as a sub-dominant.
Freshwater Marsh	Wetland herbaceous vegetation dominated by or characterized by Schoenoplectus, Typha, Bolboschoenus glaucus, Carex barbarae, C. densa, C. nudata, C. serratodens, Cirsium fontinale, Euthamia occidentalis, Hoita orbicularis,

	Juncus arcticus, Lepidium latifolium, Leymus triticoides, or Mimulus guttatus. Stands are found along streams, ditches, shores, bars, and channels of river mouth estuaries; around ponds and lakes; and in sloughs, swamps, and freshwater to brackish marshes as well as settings where saturated soil or standing water throughout the growing season are a characteristic. Absolute tree and/or shrub cover is less than 10%.
Habitat Class	**Description**
Gumplant (Grindelia stricta) alliance	Grindelia stricta dominates or co-dominates with Frankenia salina, Sarcocornia pacifica along upper banks of tidal channels and raised tidal marshes.
Riparian Forest	Areas where woody vegetation >15 feet is at least 10% absolute cover. Areas dominated by riparian tree species that require perennial water, such as species of Alnus, species of Salix, species of Populus, and/or species of Fraxinus.
Riparian Shrub	Short (canopy height <= 15 feet) vegetation dominated by riparian species that require perennial water, such as species of Alnus, species of Salix, species of Populus, and/or species of Fraxinus.
Upland Evergreen Forest	Areas where woody vegetation >15 feet is at least 10% absolute cover; hardwoods strongly dominate the tree canopy (>70% relative tree cover); Deciduous hardwoods dominate or co-dominate the canopy. Upland deciduous hardwoods Include Aesculus californica, Acacia melanoxylon, Juglans californica.

Additional Local Habitat Datasets

If needed or available in the future, additional local habitat datasets can be added to the GDE identification process to supplement and enhance the initial set of ecosystems potentially dependent on groundwater under consideration.

Elevation Data

2019 Fall Shallow Groundwater Elevation Contours

Monterey County Water Resources Agency (MCWRA) conducts a groundwater elevation monitoring programs in the Salinas Valley Groundwater Basin and provided the groundwater elevation contour data used for this identification and mapping effort. Fall shallow groundwater elevation contour data from 2019 was used to identify groundwater dependent ecosystems in the 180/400 Subbasin. This was a conservative approach, including the broadest number of GDEs in initial identification because 2019 was a wet year with high groundwater elevations post 2014 when SGMA took effect. The fall groundwater elevation contours are developed from measurements taken from mid-November to December after the end of the irrigation season and before seasonal recharge from winter precipitation increases groundwater levels; the fall measurements represent the seasonal high.

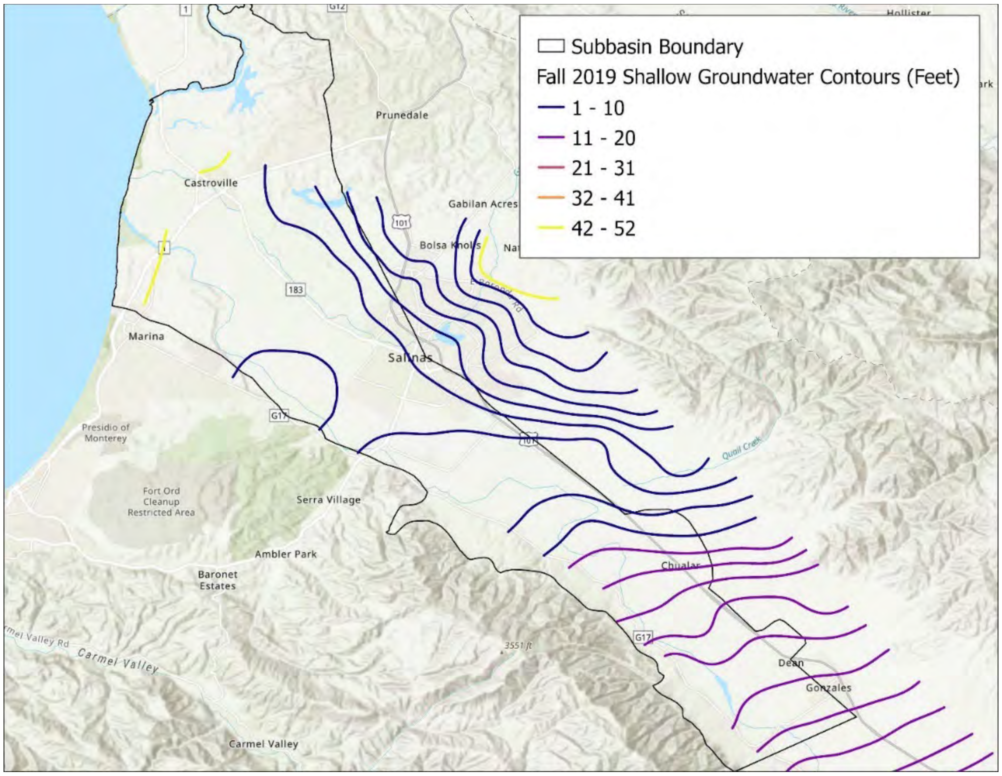

Figure 3. Shallow groundwater elevation contours (feet) based on Fall 2019 MCWRA monitoring.

Digital Elevation Model (DEM) Ground Surface Elevation

A digital elevation model (DEM) is a representation of the bare ground (excluding surface objects such as trees and buildings) topographic surface of the Earth. The DEM used for this identification and mapping effort was developed by the U.S. Geological Survey (USGS) at a 30-meter resolution (USGS 2024).

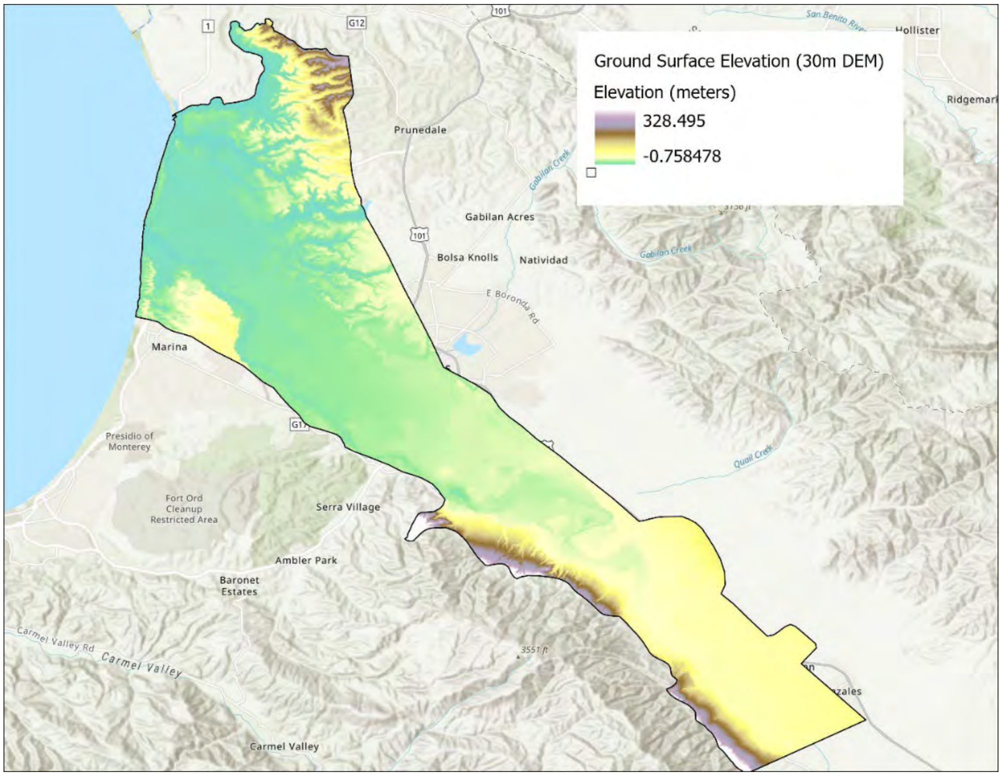

Figure 4. Digital Elevation Model (DEM) ground surface elevation (meters) in the 180/400 Subbasin (USGS 2024).

Salinas Valley Aquitard Extent

The Salinas Valley Aquitard is a clay layer that ranges from 25-100 feet thick and is generally found less than 150 feet below the ground surface. The Salinas Valley Aquitard overlies and confines the 180-Foot Aquifer, separating the shallow sediments and groundwater above the aquitard from the 180-Foot Aquifer. Potential GDEs located above the known extent of the Salinas Valley Aquitard were excluded from the map due to being reliant on the groundwater from the shallow sediments above the Salinas Valley Aquitard, which is hydrologically separate from groundwater within the 180-Foot Aquifer. These shallow sediments are not considered a principal aquifer because there is no extraction from the shallow sediments that is “significant and economic” (California Code of Regulations, Title 23 § 351). Based on the best available hydrogeologic data, ecosystems above the shallow sediments are not impacted by groundwater management in principal aquifers in the 180/400 Subbasin.

Hydrogeologists are still updating the geographic extent of the Salinas Valley Aquitard and periodic updates on the boundaries are provided. When these updates occur, the map of GDEs will be updated to reflect the best available knowledge.

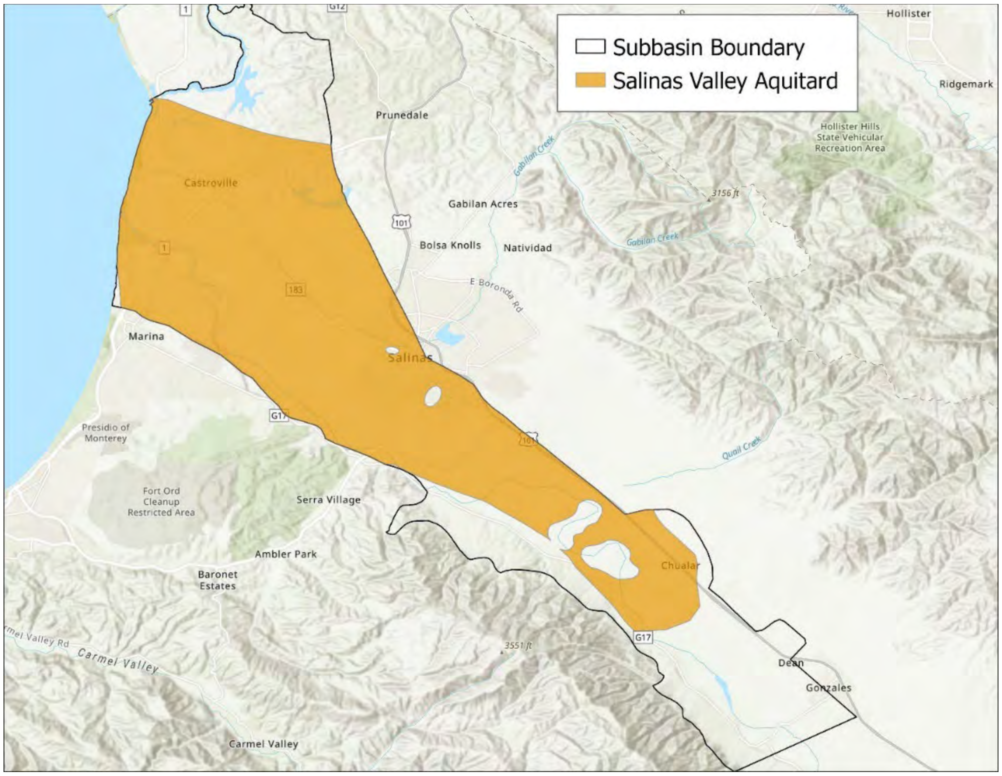

Figure 5. Confirmed extent of Salinas Valley Aquitard as of July 2024.

Verification of Ecosystem Connection to Groundwater

To determine if the starting set of ecosystems potentially dependent on groundwater, based on local and state habitat mapping datasets (Figure 6), are GDEs, it is necessary to determine how deep the groundwater table is below the ground surface. If the groundwater table is 200 ft below the ground surface, it is highly unlikely that groundwater is able to support the vegetation or wetland above it. However, if the groundwater table is 5 ft below the ground surface, it is highly likely that groundwater is able to support the above vegetation or wetland.

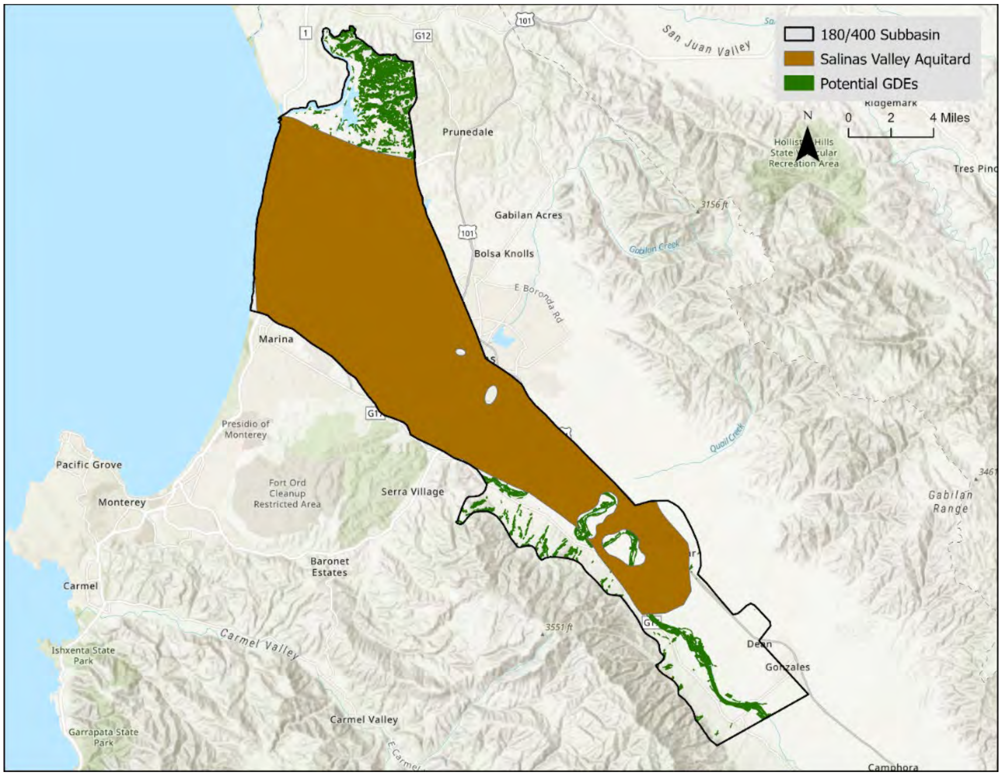

Figure 6. Set of ecosystems potentially dependent on groundwater, based on state and local habitat mapping datasets. Areas above the current known extent of the Salinas Valley Aquitard are excluded from consideration based on a recommendation from the SVBGSA Advisory Committee.

The Fall 2019 Shallow Groundwater Contours describe groundwater elevation in relation to sea-level. The DEM data describes the ground surface elevation in relation to sea-level. To determine the depth from the surface down to the groundwater table across the 180/400 Subbasin, the groundwater elevation (groundwater contours) was subtracted from the ground surface elevation (DEM) (Figure 7). However, in order to complete this subtraction, the groundwater contours, which are provided by MCWRA as topographic lines, had to be turned into a continuous surface to ensure there was a groundwater elevation measurement for every point in the subbasin. This was accomplished using the Inverse Distance Weighting (IDW) interpolation method to estimate missing data and turn the contours into a continuous surface (Figure 8).

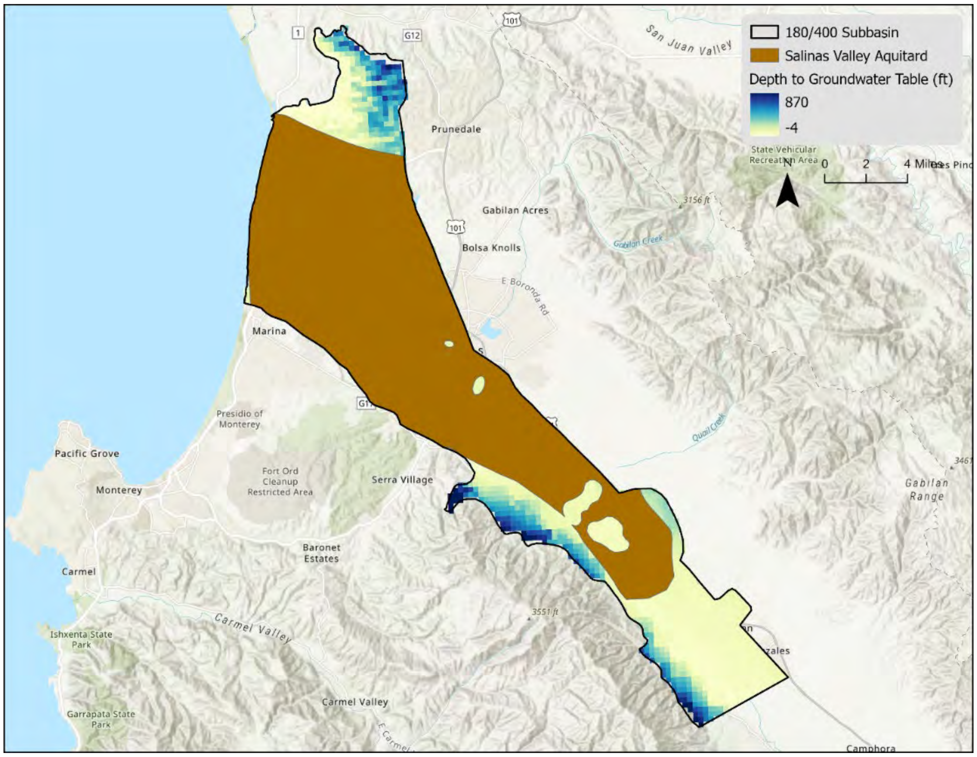

Figure 7. Distance from the ground surface to the groundwater table, or depth to groundwater table (feet).

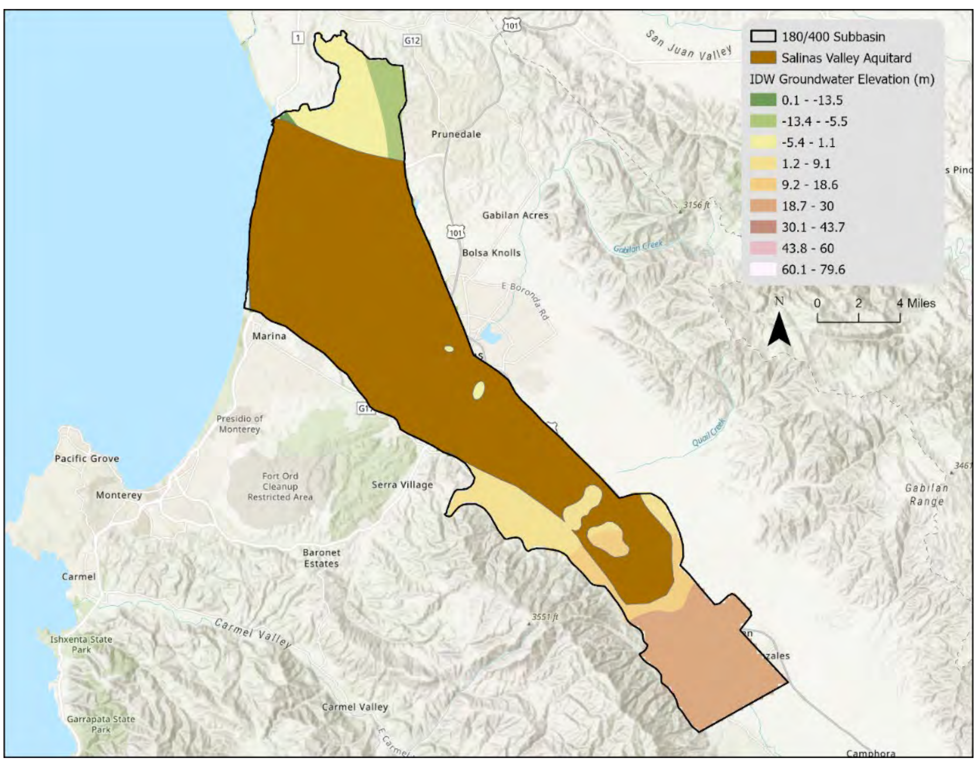

Figure 8. Continuous surface of groundwater elevations. Fall 2019 Shallow Groundwater Contour data provided by MCWRA was interpolated using Inverse Distance Weighting (IDW) to create the continuous surface of groundwater elevations.

With depth to groundwater table data for the entire subbasin, the starting set of habitat data can be overlayed to determine where the groundwater table is reasonably high enough to support the above ecosystems. Guidance developed by subject matter experts at The Nature Conservancy was consulted to determine how close to the surface the groundwater table is to be reasonably assumed a water source for the above ecosystem (Rhode et al. 2018). Based on this guidance, if the groundwater table is greater than 30 feet below the ground surface, the ecosystem at the surface is likely not reliant on groundwater. This is because most vegetation does not have roots deep enough to reach the water table below 30 feet. Oak trees are an exception to this generalized rule, as Oak trees have been shown to have roots that reach up to 80 feet below the ground surface (Howard 1992). For this reason, in areas mapped as having Oak trees as the dominant plant species, the depth to groundwater cutoff for including the ecosystem as a GDE was 80 feet. For all other areas the cutoff was 30 feet. Figure 9 shows the resulting map of groundwater dependent ecosystems in the 180/400 Subbasin.

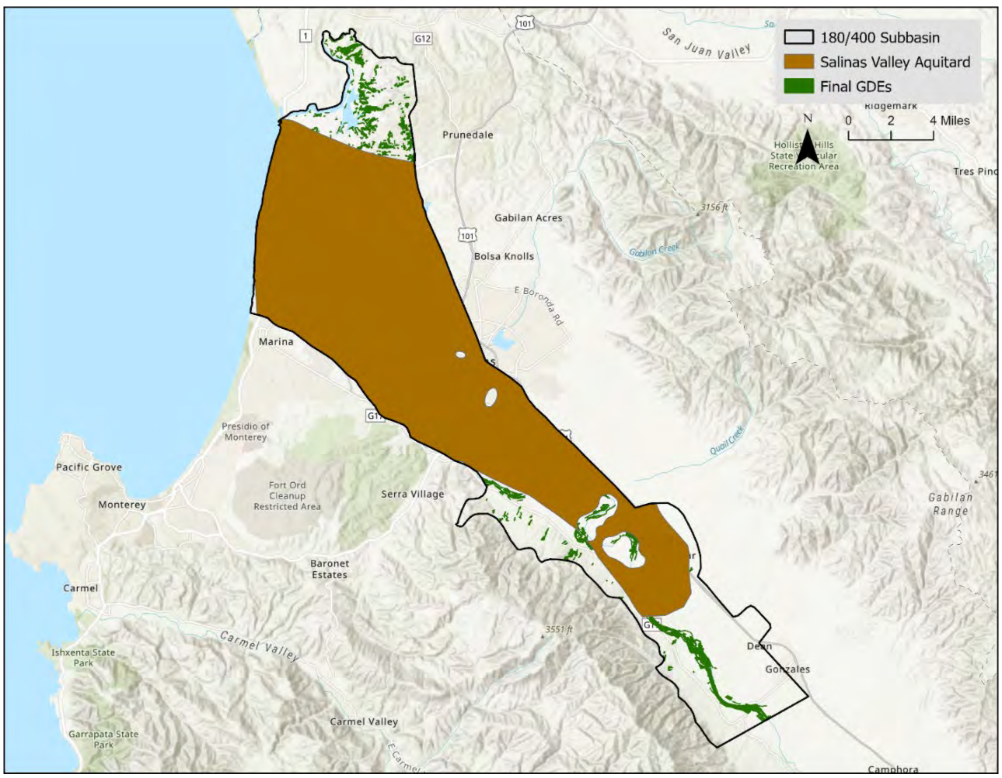

Figure 9. All identified GDEs within the 180/400 Subbasin, this set of GDEs is considered up to date as of November 2024.

Inherent Uncertainty and an Iterative Process

There are inherent uncertainties in the identification of GDEs due to the difficulty of directly measuring an ecosystem's reliance on groundwater. The process relies on the best available data and guidance from subject matter experts to develop a map of ecosystems reasonably assumed to be dependent on groundwater as one of their water sources. This identification process does not result in a perfectly accurate map of GDEs. However, it does result in a representative and characteristic map of GDEs in the 180/400 Subbasin. Subject matter experts consider this a sufficient level of identification from which the

SVBGSA can fulfill the GDE monitoring and assessment requirements under SGMA to ensure no adverse impacts to GDEs. This process should be considered iterative and subject to updates if additional guidance from the California Department of Water Resources becomes available, or updates to groundwater and/or habitat datasets become available.

Removing large areas of irrigated vegetation (crops or landscaping)

While the goal of this identification and mapping process is not to identify every plant and waterbody dependent on groundwater, but ensure adequate identification of GDEs across the whole subbasin, one exception to modifying the starting habitat datasets is to correct any large mapping inaccuracies. This includes any large areas of irrigated vegetation such as acreage in agricultural production or large areas of landscaping. The map of identified GDEs was visually checked with a satellite imagery basemap for any such areas. No mapping inaccuracies were found in the 180/400 Subbasin at this time.

Categorizing GDEs into Units

The final step in developing a map of GDEs in the 180/400 Subbasin was to group the identified GDEs into units based on shared hydrogeology and association with the same aquifer (Figure 10). The purpose of grouping GDEs into these units is to assist with monitoring and assessment for adverse impacts GDEs. If an adverse impact to a GDE within a unit is detected, understanding which additional GDEs may be impacted based on a shared relationship to the underlying aquifer can focus and guide monitoring activities. Hydrogeologists familiar with the aquifers and geomorphology of the Salinas Valley Basin were consulted to develop the units for GDEs in the 180/400 Subbasin, this resulted in eight GDE units (Figure 11).

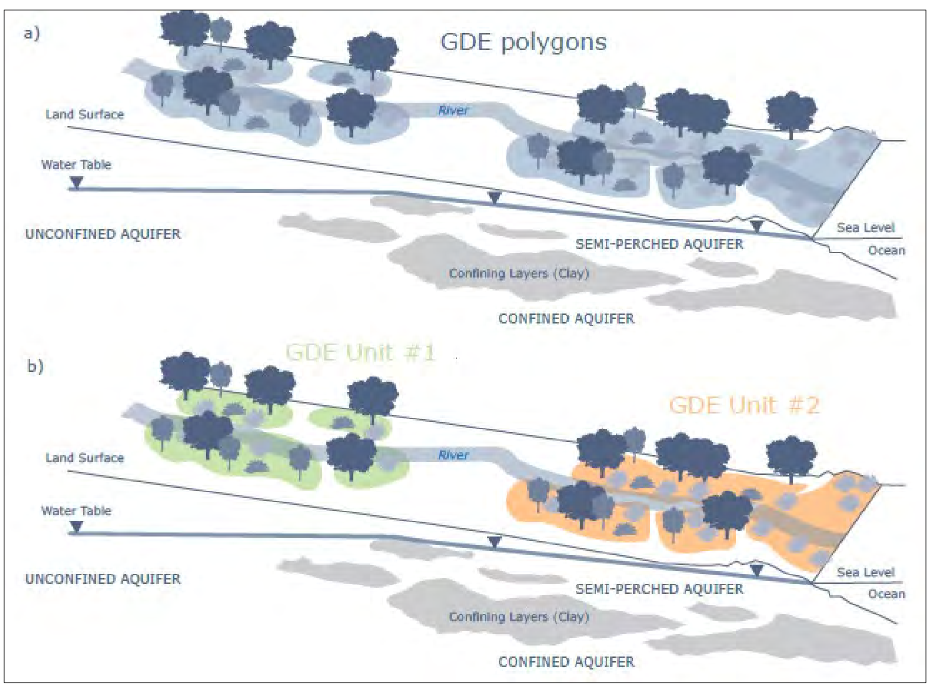

Figure 10. Illustration of grouping GDEs into units based on shared association with an aquifer. a) GDEs not separated into units, b) GDEs separated into two units, Unit #1 is associated with an unconfined aquifer, Unit #2 is associated with a semi-perched aquifer above a confined aquifer. Image Credit: Rhode et al. 2018

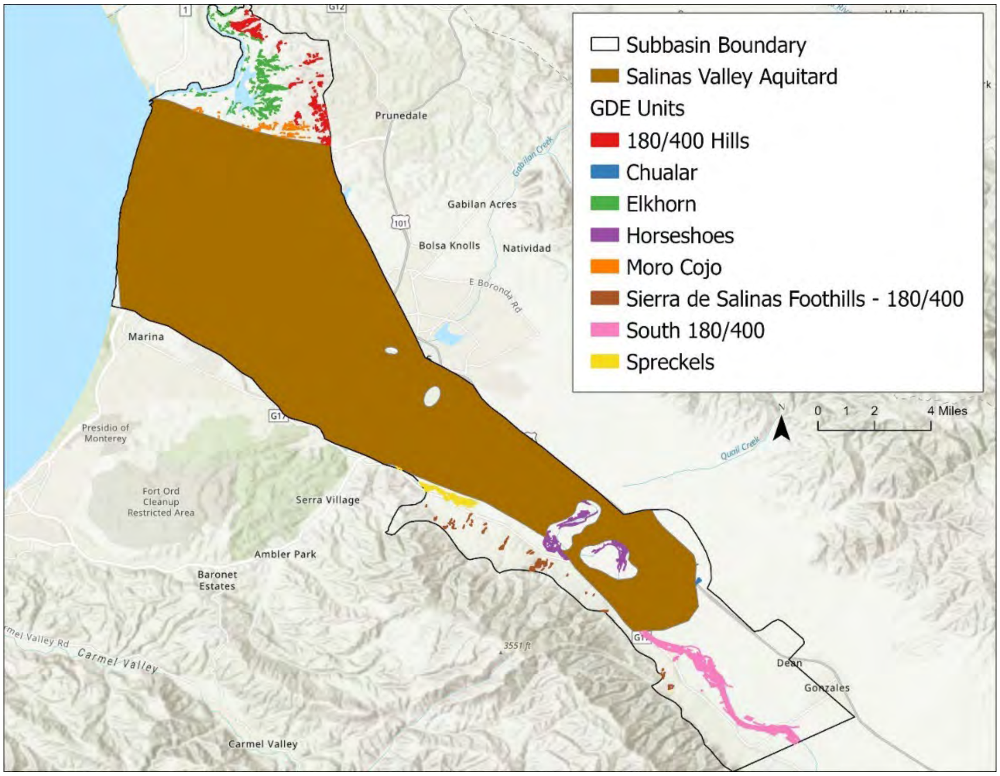

Figure 11. Map of identified GDEs, up to date as of November 2024 and including GDE units delineated by hydrogeologists familiar with the Salinas Valley Basin.

Field-based Baseline Condition Monitoring of Select GDEs

This field-based baseline condition monitoring of GDEs in the 180/400 Foot Aquifer followed the field-based monitoring methods described in the *Groundwater Dependent Ecosystem Monitoring and Assessment Protocol for the Salinas Valley Basin* (Monitoring and Assessment Protocol). For this baseline monitoring, the California Rapid Assessment Method (CRAM) was conducted at 14 sites within areas mapped as GDEs in the 180/400 Subbasin. Site selection and the results of those assessments are summarized here.

Site Selection

The site selection guidelines outlined in the Monitoring and Assessment Protocol were followed when selecting a subset of GDEs to conduct CRAM assessments including prioritizing ecologically important locations, ensuring the selection is representative of GDEs across the subbasin, and selecting GDEs close to shallow monitoring wells when possible.

In the 180/400 Subbasin there are three locations identified as drought refugia (Rhode et al. 2024). Drought refugia are areas of habitat that stay wet and/or green for longer than their surroundings. These areas have been classified as ecologically important in the Monitoring and Assessment Protocol. Of the three GDES identified as drought refugia, CRAM was conducted at two (Table 2), access permission to conduct the assessment was not secured for the third.

In order to have a subset of GDEs that are representative of GDEs across the subbasin, the aim was to select two locations for CRAM assessments within each GDE unit (Table 2, Figure 12). This was not always possible due to either the size of the GDE unit – as was the case with the Chualar unit, difficulties securing access permission – as was the case with the Sierra de Salinas Foothills unit, or lack of appropriate sites to conduct CRAM – as was the case with the 180/400 Hills. For situations where there is a lack of appropriate sites: CRAM assessments must be conducted in wetlands, which can include ponds and lakes, riverine systems, seeps and springs, and variety of other habitats. However, GDEs are not limited to wetlands and can include terrestrial vegetation with root systems deep enough to reach the water table, such as Oak woodlands. The 180/400 Hills GDE unit consists entirely of Oak woodland habitats, and as such there was no appropriate location to conduct a CRAM assessment within that unit.

Table 2. CRAM assessment locations listed by site number and describing whether the assessment location was within an identified drought refugia, near an appropriate monitoring well, and what GDE unit the assessment location was within. Drought refugia determined by Rhode et al. 2024.

Site	Drought Refugia (Y/N)	GDE Unit	Proximity to Monitoring Well (Y/N)*
1	No	Elkhorn	Yes
2	No	Elkhorn	Yes
3	No	Elkhorn	Yes
4	No	Moro Cojo	Yes
5	No	South 180/400	Yes
6	No	South 180/400	No
7	No	Spreckles	No
8	Yes	Spreckles	No
9	Yes	South 180/400	No
10	No	Sierra de Salinas Foothills – 180/400	Yes
11	No	Moro Cojo	No
12	No	Chualar	No
13	No	Horseshoes	Yes
14	No	Horseshoes	No

* Proximity to monitoring wells marked yes if a well identified as appropriate for monitoring GDEs by hydrogeologists was located within 1.5 miles of the CRAM assessment site (distance recommended by Chappelle et al. 2023)

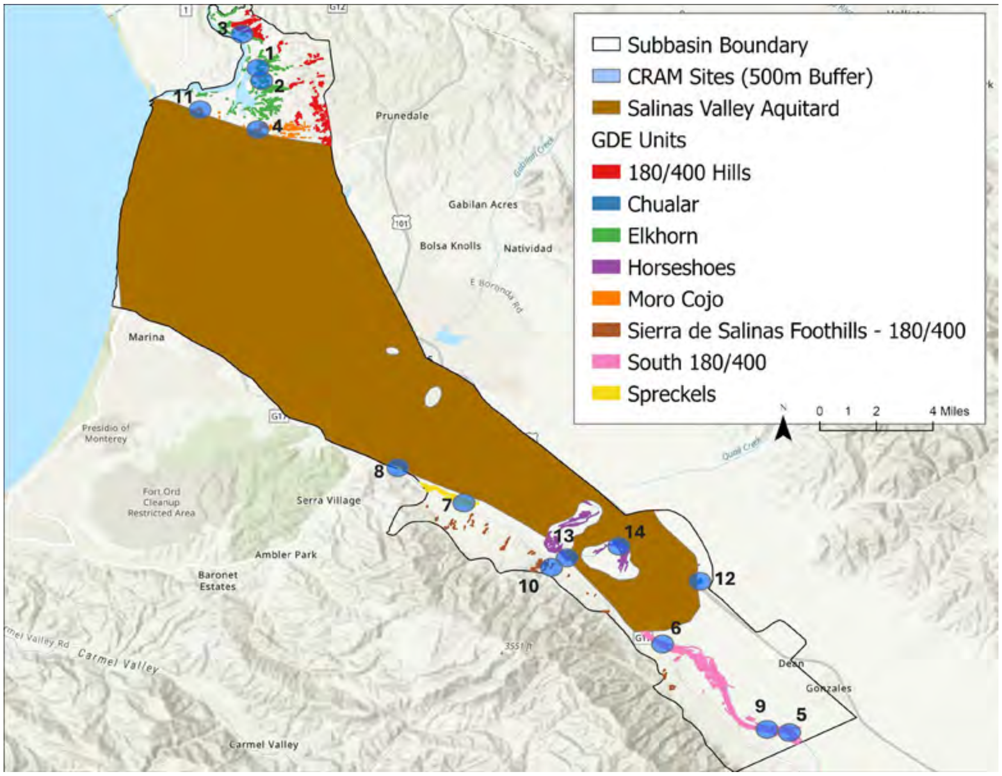

Figure 12. Approximate location of CRAM assessments, sites buffered by 500m circle (blue) to anonymize locations. Numbers indicate site number and correspond to Site in Table 2.

Baseline CRAM Scores

Each CRAM assessment area is evaluated according to the four universal attributes and associated metrics/submetrics of CRAM using the correct CRAM module for each GDE. The four universal attributes are:

- **Buffer and Landscape Context** - measured by assessing the quantity and condition of adjacent aquatic areas as well as extent and quality of the buffering environment adjacent to the assessment area (AA).
- **Hydrology** - assesses the sources of water, the stream channel stability, and the hydrologic connectivity of rising flood waters in the stream.
- **Physical Structure** - measured by counting the number of patch types found within the AA and the topographic complexity of the marsh plain.
- **Biotic Structure** - assesses the site based on several factors including the number of plant vertical layers, the number of different species that are commonly found in the marsh, the percent of the common species that are invasive, and the horizontal and vertical heterogeneity of the plant communities.

These four attributes are consistent for all wetland modules of CRAM. Each of the four attribute categories is comprised of a number of metrics and submetrics that are evaluated in the field and scored on a letter grading scale corresponding to a set numeric score: D (3), C (6), B (9), A (12) (Table 3). Each of the four attribute categories are then converted to a scale of 25 through 100, and the average of these four scores is the final CRAM Index score, also ranging on a scale from 25 (lowest possible) to a maximum of 100.

CRAM assessments for selected GDEs were conducted between Sept 13 – Nov 1, 2024. Scores are summarized visually in Figures 13 and 14, with all metric, sub-metric, attribute and index scores listed in Table 3. Site photos of each CRAM assessment area are included at the end of this report to provide a sense of each location.

CRAM index scores for the assessed GDEs ranged from 40-80 with five of the 14 assessments receiving an index score of 65 (Figure 13). Hydrology and buffer/landscape attribute scores generally higher than biotic structure and physical structure attributes (Figures 14). Eight of the 14 assessment locations were on the main stem of the Salinas River. For these sites it was common for the biotic structure attribute score to be negatively impacted by dense areas of *Arundo donax*, an invasive plant. It was common for the physical structure attribute score to be negatively impacted by the planar nature of the channel of the river, lacking rapids, riffles and deep pools, and it was common for buffer and landscape context attribute score to be positively impacted by the wide floodplain of the Salinas River. These general observations are not true of every assessment area on the Salinas River, and certainly not true of every GDE assessed for this baseline monitoring, but they may provide insight into the score ranges and trends. However, it is important to note that these CRAM assessments are intended to provide a baseline from which to compare future CRAM assessments. The SVBGSA is not responsible for improving the condition of GDEs, rather ensuring groundwater management does not negatively impact these systems. Following recommendations outlined in the Monitoring and Assessment Protocol, next steps using this baseline data could include, examining groundwater elevation data in monitoring wells near CRAM assessment areas, establishing new shallow monitoring wells near CRAM assessment areas that currently are not within 1.5 miles (distance per recommendation in Chappell et al. 2023) of an appropriate monitoring well, and conducting CRAM assessments in these same assessments areas in 5 years to measure any changes in condition in relation to the baseline established here.

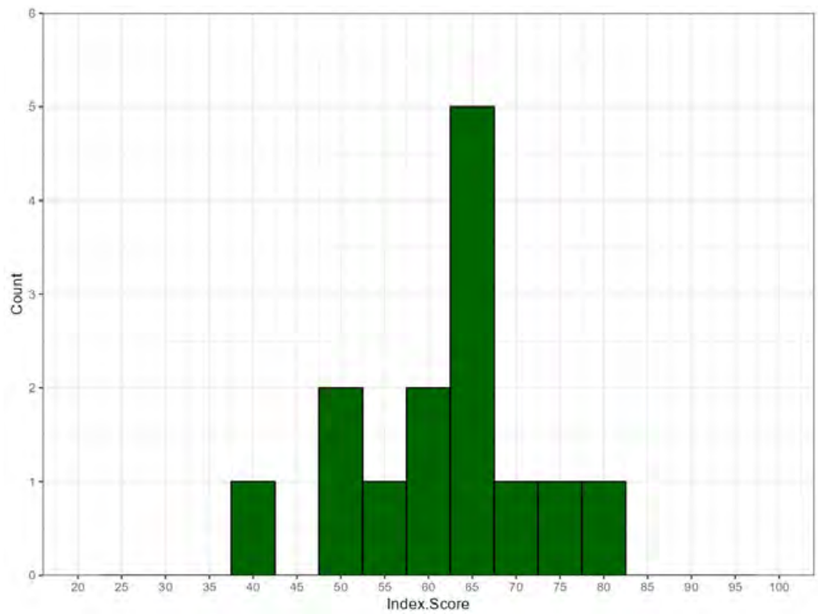

Figure 13. Histogram of CRAM Index Scores for 14 sites assessed for baseline monitoring. CRAM index scores can range from 25-100, y-axis indicates number of sites that received each score.

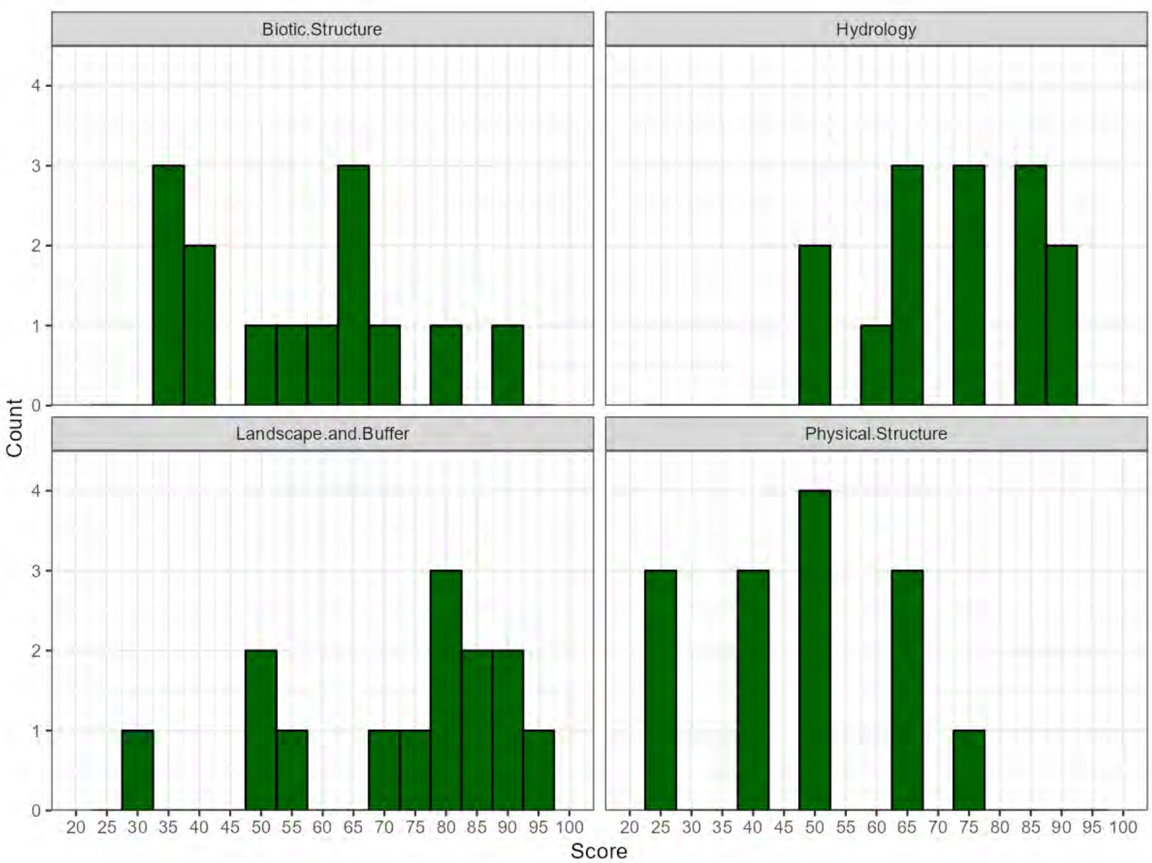

Figure 14. Histograms of scores from 14 assessments for baseline monitoring for each of the four universal CRAM attributes. Scores for each attribute can range from 25-100, y-axis indicates the number of sites that received each score

Table 3. CRAM assessment scores for GDEs assessed in the 180/400 Subbasin.

CRAM Attribute	**CRAM Metrics and Sub-metrics**	**Gabilan Watershed GDE CRAM Assessments**													
		Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	**Site 7**	**Site 8**	**Site 9**	**Site 10**	**Site 11**	**Site 12**	**Site 13**	**Site 14**
Buffer and Landscape Connectivity	Landscape Connectivity	9	6	9	3	12	12	12	12	12	3	3	3	12	12
	% of AA with Buffer	12	12	12	6	12	12	12	12	12	12	12	9	12	12
	Average Buffer Width	12	12	6	9	9	9	9	3	9	9	12	3	3	12
	Buffer Condition	9	9	9	12	9	6	9	9	6	9	6	3	9	9
	Attribute Score	**81**	**68**	**74**	**52**	**90**	**83**	**90**	**81**	**83**	**53**	**48**	**29**	**81**	**93**
Hydrology	Water Source	9	9	9	6	6	6	6	6	6	12	9	6	6	6
	Hydroperiod/ Channel Stability	12	9	12	12	6	9	9	9	9	9	12	6	9	9
	Hydrologic Connectivity	9	9	12	12	6	3	9	9	12	12	9	12	12	6
	Attribute Score	**83**	**75**	**92**	**83**	**50**	**50**	**67**	**67**	**75**	**92**	**83**	**67**	**75**	**58**
Physical Structure	Structural Patch Richness	589	3	9	3	6	3	6	6	6	3	6	3	3	3
	Topographic Complexity	6	6	9	9	9	3	6	9	6	3	6	3	6	6
	Attribute Score	**63**	**38**	**75**	**50**	**63**	**25**	**50**	**63**	**50**	**25**	**50**	**25**	**38**	**38**
Biotic Structure	Number of plant layers	12	9	12	9	9	6	9	9	6	3	12	9	9	12
	Number of co-dominants	9	3	9	3	6	3	6	6	3	3	6	3	3	6
	Percent Invasive plants	9	12	9	12	6	9	12	9	9	12	12	3	9	6
	Horizontal Interspersion	9	6	9	6	6	6	6	6	3	3	9	6	3	9
	Vertical Biotic Structure	6	6	12	9	6	3	3	9	3	3	9	3	3	6
	Attribute Score	**69**	**58**	**88**	**67**	**53**	**42**	**50**	**64**	**33**	**33**	**78**	**39**	**36**	**64**
	Index Score	**74**	**60**	**82**	**63**	**64**	**50**	**64**	**68**	**60**	**51**	**65**	**40**	**57**	**63**

180/400 Subbasin Baseline GDE Monitoring CRAM Site Photos

Site 1

Site 2

Site 3

Site 4

Site 5

GDE 6


Site 7


Site 8


Site 9


Site 10


Site 11


Site 12


Site 13


Site 14

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Groundwater Dependent Ecosystem Monitoring and Assessment Protocol for the Salinas Valley Basin

May 2024

Prepared for the Salinas Valley Basin Groundwater Sustainability Agency
Prepared by the Central Coast Wetlands Group

CCWG
Central Coast Wetlands Group

Introduction

The Sustainable Groundwater Management Act (SGMA) requires that all beneficial users, including Groundwater Dependent Ecosystems (GDEs), must be considered during development and implementation of Groundwater Sustainability Plans (Water Code § 10723.2). SGMA requires all GDEs within a groundwater basin to be identified, monitored and assessed to ensure there are no adverse impacts to these systems due to groundwater conditions.

The objective of this monitoring protocol is to detect when the condition of a GDE is declining, where further decline would be expected to result in long-term adverse impacts to the ecosystem. When such declines in condition are detected, the GDE must be flagged for further investigation into the root cause of the decline to determine if it is related to groundwater management activities. For the purposes of GDE monitoring, ecosystem condition is primarily defined through vegetation health and vigor since this metric can be most readily tied to groundwater conditions. If groundwater levels are lowered below a depth that vegetation roots can access, a decline in vegetation vigor due to the loss of the water source would be an expected result and defined as an adverse impact.

This monitoring protocol for GDEs in the Salinas Valley Basin was developed with guidance from documents developed by The Nature Conservancy (TNC) (Rhode et al. 2018, Rhode et al. 2020), TNC staff and San Francisco Estuary Institute (SFEI) staff with subject matter expertise, and Dr. Melissa Rhode. Additionally, this monitoring protocol was developed with feedback from local stakeholders as part of the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) Groundwater Dependent Ecosystem Working Group, which met seven times between July 2023 - April 2024.

Two-pronged Approach

This GDE monitoring protocol uses a two-pronged approach to maximize efficiencies of cost and labor while ensuring GDEs are adequately monitored and assessed to effectively detect adverse impacts. Monitoring includes a desktop-based component and a field-based component. The desktop-based monitoring is conducted annually for all mapped GDEs while the field-based monitoring is conducted once every five years at a subset of mapped GDEs. Detailed procedures for both monitoring components are described in the following sections. As will become clear, while both monitoring components are reasonable and useful tools for monitoring and assessing GDEs, neither can directly relate declining ecosystem condition to decreasing groundwater levels. Making this direct causal connection to groundwater management would need to be a subsequent hydrogeological analysis to investigate groundwater level trends in the area around the GDE. However, it is important to make informed inference between any declines in GDE condition and groundwater levels wherever possible. To that end this protocol also includes considerations for siting additional shallow water table monitoring wells, appropriate for monitoring groundwater at a depth the roots of groundwater dependent vegetation can reach, to be added to the existing monitoring well network.

Desktop-Based Monitoring

The desktop-based GDE monitoring consists of monitoring changes over time using a remotely sensed satellite data derived metric named the Normalized Derived Vegetation Index (NDVI). NDVI is a quantified measurement of vegetation greenness and has been demonstrated as a valid proxy for measuring vegetation health and vigor (TNC 2024). NDVI values for a given GDE can be compared over time, and if statistically significant declines are detected, the GDE will be flagged for further investigation into the cause of the declining NDVI values.

Calculating NDVI

NDVI is calculated using near infrared (NIR) and visible red light (red) bands taken from satellite imagery to measure how much of these bands of light are absorbed versus reflected by a surface (Figure 1). The higher the NDVI value, the greener, and healthier, the vegetation. NDVI values range from -1.0 to 1.0, Table 1 provides a general guide to interpreting NDVI values.

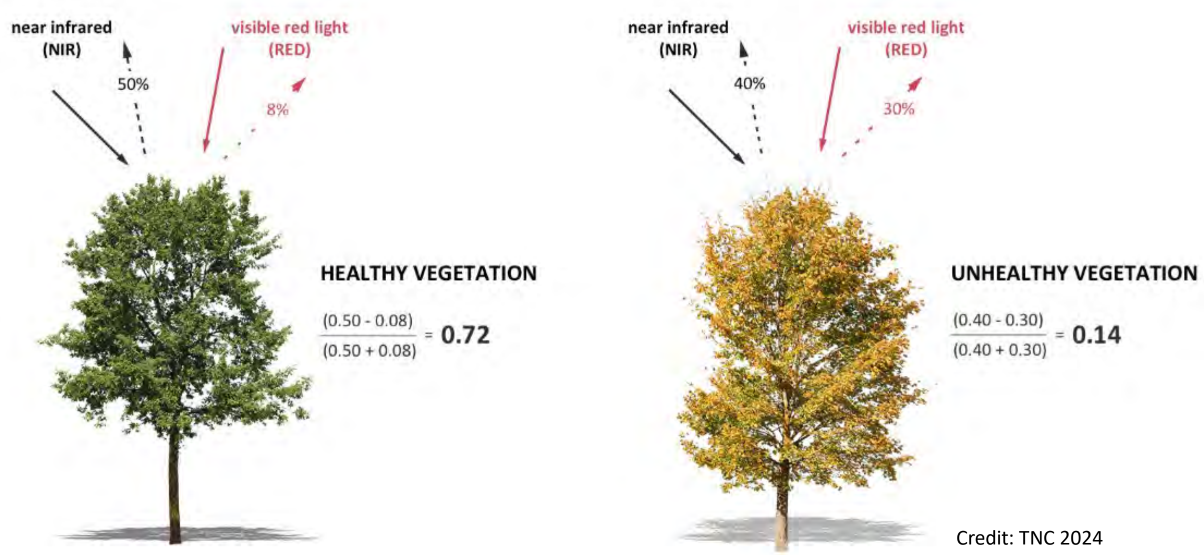

Figure 1. This graphic depicts how NDVI is calculated and gives an example of how much light is absorbed versus reflected by healthy, green vegetation compared to unhealthy, less green vegetation. As vegetation greenness declines, the percentage of reflected light increases (image credit: TNC 2024).

The following equation is used to calculate NDVI values from satellite derived NIR and visible red light (red) bands (Rouse et al. 1974):

$$NDVI = (NIR - red)/\ NIR+red$$

Table 1. Guide to interpreting NDVI values, a description of which surfaces correspond to NDVI value ranges (USGS 2018)

NDVI Value Range	Corresponding Surface
-1.0 – 0.1	Areas of barren rock, sand, snow, urban development or any other highly reflective surface
0.1 – 0.5	Sparse or senescing vegetation
0.5 – 1.0	Dense, green vegetation

NDVI values can be calculated for one point in time, based on a single satellite image. However, for monitoring purposes it is more useful to consider the average NDVI value over a period of time to better characterize the vegetation vigor of a GDE rather than rely on a single point in time. The daily NDVI values for a GDE should be averaged annually between June 1 – September 30. This is the driest time of year when GDE vegetation is likely most reliant on groundwater (TNC 2024).

TNC has developed an online mapping tool that provides NDVI calculations for GDEs across California from 1985 – 2022, called GDE Pulse (TNC 2024). GDE Pulse provides a great starting point for desktop-based GDE monitoring. However, additional GDEs have been identified in the Salinas Valley based on local data and therefore, GDE Pulse, using the statewide GDE dataset, is not sufficient for SVBGSA monitoring purposes. It is instead recommended that NDVI values for GDEs be calculated from publicly available Landsat satellite imagery (USGS Earth Explorer) to ensure all GDEs are included in this desktop-based monitoring.

Analyzing and Reporting NDVI

Analysis of NDVI values includes two steps: the first is determining how NDVI are changing over time and if there is an increasing or decreasing trend at each GDE; the second is determining when a decreasing trend in NDVI values is substantial enough to trigger additional investigations into the cause of the declining vegetation vigor.

Assessing NDVI Trends Over Time

The statistical test "Mann Kendall Test for Monotonic Trends" (Mann Kendall Test) should be used to assess how dry season annual average NDVI values change over time. The Mann Kendall Test is a non-parametric test that is not as sensitive to extreme outliers as other statistical tools for assessing trends over time, such as linear regression. Considering there could be large changes in NDVI values from year to year due to rainfall patterns and other climatic variables, the Mann Kendall test is an appropriate test for this application. Additionally, there is local precedent for using the Mann Kendall test for environmental data; Central Coast Water Quality Preservation, Inc. uses the same statistical test to assess trends in their Cooperative Monitoring Program water quality data over time (Central Coast Water Quality Preservation, Inc. et al 2023).

The direct output of the Mann Kendall Test is a statistic called Tau, which can range from -1 to 1. A Tau of -1 indicates an extremely decreasing trend, a Tau of 1 indicates an extremely increasing trend. A p-value is also reported with each Tau; the p-value indicates whether a trend is significant or not (Table 2). The standard practice for determining significance is to check for a p-value of less than 0.05. In this application the standard practice is followed, with a trend classified as significantly increasing or decreasing (depending if the Tau is negative or positive) if the p-value is less than 0.05. However, here it is also of value to determine if NDVI values have a neutral trend over time or an increasing or decreasing trend, even if those trends are not large enough to be significant. Therefore, an additional range of p-values are suggested in Table 2 to classify trends in NDVI values.

Table 2. Classification of p-values into levels of significance. Whether a trend is increasing or decreasing depends on the sign of the Tau statistic (positive = increasing, negative = decreasing).

P-value range	**Trend classification**
0 - 0.05	Significantly increasing or decreasing
0.05 – 0.7	Increasing or decreasing
0.7 – 1.0	Neutral

The Mann Kendall Test should be calculated for NDVI values in a moving window of 5 years. Table 3 gives an example of a moving window of 5-year intervals. This time frame for analysis was chosen since it balances reducing the noise of tracking NDVI values from year to year with picking up on longer term trends, while still remaining sensitive enough to indicate decreasing trends on a time scale that is biologically relevant for GDE vegetation.

Table 3. Example NDVI trend analysis over a 5-year moving window interval using historic NDVI data for GDEs in the Salinas Valley (data provided by TNC, TNC 2024). Example reporting period from 2018-2022.

GDE Unique Identifier	2013 - 2018	2014 - 2019	2015 - 2020	2016 - 2021	2017 - 2022
29224	Neutral	Neutral	Increasing	Increasing	Increasing
29260	Decreasing	Decreasing	Decreasing	Significantly Decreasing	Decreasing
29424	Decreasing	Decreasing	Significantly Decreasing	Significantly Decreasing	Significantly Decreasing
30912	Neutral	Increasing	Increasing	Increasing	Increasing
37491	Neutral	Increasing	Increasing	Significantly Increasing	Significantly Increasing
37501	Significantly Increasing	Significantly Increasing	Neutral	Neutral	Neutral

Detecting Adverse Impacts with NDVI Values

GDEs should be flagged for further investigation into their condition and possible causes for declining vegetation vigor if NDVI value trends for that GDE meet the following criteria:

- Three consecutive 5-year windows with a Significantly Decreasing trend. As an example, GDE 29424 in Table 3, would be flagged under this criterion. Even if the GDE shows an improving trend in NDVI values in subsequent 5-year windows, it should still be flagged for further investigation.
- Five consecutive 5-year windows with a combination of either a Decreasing or Significantly Decreasing Trend. As an example, GDE 29260 in Table 3 would be flagged under this criterion. If all five 5-year windows for GDE 29260 were Decreasing, this GDE would still be flagged for further investigation.

Flagging a GDE using the above criteria based on NDVI value trends does not automatically mean that GDE is experiencing adverse impacts to ecosystem condition due to declining groundwater levels. Monitoring NDVI values alone is not sufficient for drawing causal conclusions about the impact of groundwater management on GDE condition. Rather sustained trends of decreasing NDVI values are an indicator that the ecosystem is experiencing adverse impacts and further investigation is required to determine the root cause. The criteria for flagging GDEs were defined in an effort to be sensitive to decreases in ecosystem condition while allowing for variation in rainfall patterns and short drought periods vegetation can likely recover from. As with all components of this monitoring protocol, these criteria should be periodically evaluated and modified as necessary to best detect adverse impacts to GDEs.

Field-Based Monitoring

The field-based GDE monitoring consists of monitoring changes in ecosystem condition over time using the California Rapid Assessment Method (CRAM). CRAM is a standardized, scientifically validated, rapid habitat assessment tool for wetland monitoring, developed with support from the US Environmental Protection Agency. It is designed to assess the overall condition of a wetland based on visible indicators relative to the least impacted reference conditions. CRAM is based on the concept that the structure and complexity of a wetland is indicative of its capacity to provide a range of functions and services (Solek et al. 2018). Though CRAM is designed for assessing ambient conditions within watersheds throughout the state, it can also be used to assess changes in habitat condition for locations of interest over time such as GDEs.

While CRAM is designed to be a rapid assessment, because it is a field-based tool it is a more resource-intensive monitoring tool than the desktop-based monitoring of NDVI values over time. For that reason, only a subset of GDEs will be selected for CRAM assessments. Considerations for selecting these GDEs for CRAM assessments are discussed in the following section. The concept for monitoring and assessing GDEs with CRAM is similar to that of monitoring and assessing NDVI values. CRAM assessments will be completed in the same location within each selected GDE, and the scores will be compared over time. If significant declines in CRAM score are detected the GDE will be flagged for further investigation into the cause of the decreasing CRAM score.

Site Selection for CRAM Assessments

There are two main factors to consider when selecting which subset of GDEs will be monitored with CRAM assessments: ecological importance, and proximity to an appropriate monitoring well. In addition, GDEs selected for CRAM assessments should be well distributed across each subbasin to characterize the subbasin as best as possible despite the site-specific nature of CRAM. Also, safety and land access permission must be checked and prioritized when finalizing site selection for CRAM assessments.

Ecological Importance

Since selected GDEs will receive more focused monitoring, with more data to detect adverse impacts, it is appropriate for these sites to have greater habitat value. To determine which GDEs have the greatest habitat value it is recommended to identify which GDEs are drought refugia, have recent observations of threatened and endangered species, and/or are nominated as ecologically important by local subject matter experts.

Drought refugia are areas of habitat that stay wet and/or green for longer than their surroundings. By staying wet and green for longer these refugia continue to provide quality habitat for species when the surrounding areas have become too dry to be suitable habitat, thus providing a resource for maintaining sensitive species' populations through periods of drought. Researchers have developed a robust methodology for identifying drought refugia across California and have made their findings publicly available (Rhode et al. 2024). Wherever drought refugia in this dataset overlap with identified GDEs, those GDEs should be included in the subset for CRAM monitoring.

Ecological importance can also be defined based on recent observations of threatened and endangered species in identified GDEs, or classification of a GDE as critical habitat for one of these species. The California Natural Diversity Database (CNDDB) is an inventory of the status and locations of rare plants and animals across the state and includes identification of critical habitat. This database can be cross referenced with identified GDEs, and areas of overlap should be considered for CRAM monitoring. Additionally, local researchers and subject matter experts should be consulted to identify areas of ecological importance that may not appear in either CNDDB or in the drought refugia dataset.

Water Table Monitoring Wells

While both CRAM and NDVI values can provide valuable information about the condition of GDEs, neither can draw a causal link between declining habitat condition and groundwater levels. To link groundwater levels to changes in habitat condition requires a monitoring well, screened to monitor shallow groundwater, in close proximity to a GDE. One recommendation for measuring proximity to a GDE is if an appropriate monitoring well is within 1.5 miles of an identified GDE (Chappelle et al. 2023), however, whether that distance is appropriate for local use should be assessed further. To maximize the use of CRAM assessment data, GDEs selected for this focused monitoring should be located as close as possible to existing water table monitoring wells, or in locations being considered for the construction of additional water table monitoring wells.

Conducting CRAM Assessments

CRAM assessments must be conducted by two certified CRAM practitioners. Locally held CRAM trainings where new practitioners can become certified are generally offered annually in either Moss Landing or San Jose (https://www.cramwetlands.org/training). The time required to conduct an assessment can range between 2-3.5 hours depending on ease of access and the complexity of the site. For GDE monitoring CRAM assessments should be conducted between June 1 – September 30, as this is the driest time of year when groundwater is likely to be a more prominent water source for supporting vegetation and any surface water present. CRAM monitoring of selected GDEs should be conducted in 5-year intervals. Changes in habitat condition are not likely to be detected if CRAM assessments are conducted on an annual basis, and 5 years is considered both sufficient and relevant for detecting adverse impacts to GDEs (S. Pearce, pers comm).

Additionally, CRAM must be conducted in an area defined as a wetland. To assist in the identification of an area appropriate for conducting a CRAM assessment. The California Rapid Assessment Method for Wetlands User's Manual (CWMW, 2013) provides the definition of a wetland and riparian under which CRAM was developed and each CRAM Field Guidebook provides a flow chart to ensure practitioners are using the correct module for the wetland type being assessed. While there is a large overlap between the definition of wetland and riparian habitats appropriate for CRAM assessments and the definition of GDEs, the overlap is not complete. Oak woodlands are one habitat type that may be identified as groundwater dependent, but where it may not be appropriate to conduct a CRAM assessment. These habitats generally consist of upland plant species and do not have hydrology or soils that fall under the wetland or riparian definition, however due to the deep rooting systems of Oak trees they may still rely on groundwater for one of their water sources and therefore be classified as a GDE. The inclusion of Oak tree dominated habitats as GDEs is discussed further in the *Identification and Mapping of Groundwater Dependent Ecosystems in the 180/400-Foot Aquifer Subbasin*.

CRAM Score Analysis

Calculating CRAM Scores

Each CRAM assessment area is evaluated according to the four universal attributes and associated metrics/submetrics of CRAM using the correct CRAM module for each GDE. The four universal attributes are:

- **Buffer and Landscape Context** - measured by assessing the quantity and condition of adjacent aquatic areas as well as extent and quality of the buffering environment adjacent to the assessment area (AA).
- **Hydrology** - assesses the sources of water, the stream channel stability, and the hydrologic connectivity of rising flood waters in the stream.
- **Physical Structure** - measured by counting the number of patch types found within the AA and the topographic complexity of the marsh plain.
- **Biotic Structure** - assesses the site based on several factors including the number of plant vertical layers, the number of different species that are commonly found in the marsh, the percent of the common species that are invasive, and the horizontal and vertical heterogeneity of the plant communities.

These four attributes are consistent for all wetland modules of CRAM. Each of the four attribute categories is comprised of a number of metrics and submetrics that are evaluated in the field and scored on a letter grading scale corresponding to a set numeric score: D (3), C (6), B (9), A (12) (Table 4). Each of the four attribute categories are then converted to a scale of 25 through 100, and the average of these four scores is the final CRAM Index score, also ranging on a scale from 25 (lowest possible) to a maximum of 100.

Table 4. Structure of CRAM attributes, metrics, and sub-metrics

Attribute	Metric (m) or Sub-metric (s)
Buffer and Landscape Context	Landscape Connectivity (m)
	Buffer (m)
	Percent of AA with Buffer (s)
	Average Buffer Width (s)
	Buffer Condition (s)
Hydrology	Water Source (m)
	Hydroperiod (m)
	Hydrologic Connectivity (m)
Physical Structure	Structural Patch Richness (m)

	Topographic Complexity (m)
Biotic Structure	Plant Community (m)
	Number of Plant Layers (s)
	Number of Co-dominant Plant Species (s)
	Percent Invasive Plants (s)
	Horizontal Interspersion and Zonation (m)
	Vertical Biotic Structure (m)

Detecting Adverse Impacts with CRAM Scores

When monitoring for changes in habitat condition, it is appropriate to track either the final CRAM Index score or any of the four attribute scores, or all five scores. One key question when monitoring the change in scores over time is how to determine when a change in score is reflective of a true change in habitat condition. CRAM developers acknowledge that a certain amount of variation in scores is expected due to differences in practitioners conducting the assessments. While this is mitigated by requiring all prospective practitioners attend a training to become certified, requiring all CRAM assessments to be conducting by two practitioners, and providing a detailed guidebook for each CRAM module, the tool is not perfectly precise. To understand when a change in score is reflective of a true difference in habitat condition, CRAM developers have created a 90% confidence level for each of the five scores (Table 5) (Solek et al. 2018).

Table 5. Is one score greater than another? This table provides a guide for when two scores can be considered different with 90% confidence (Solek et al. 2018).

Type of Score	**90% Confidence Level**	**Examples**
Index	7 points	You can be 90% sure that one final index score is higher than another if their difference is ≥ 7 points
Buffer and Landscape Condition Attribute	4 points	You can be sure that one final buffer and landscape attribute score is higher than another if their difference is ≥ 4 points
Hydrology Attribute	10 points	You can be sure that one final hydrology attribute score is higher than another if their difference is ≥ 10 points
Physical Structure Attribute	17 points	You can be sure that one final physical attribute score is higher than another if their difference is ≥ 17 points
Biological Structure Attribute	11 points	You can be sure that one final biological attribute score is higher than another if their difference is ≥ 11 points

For the purposes of monitoring GDEs to detect when adverse impacts occur, it is recommended to track all five scores, the Index and four attributes, to monitor for score decreases as specified in Table 5. While a change in score outside of the 90% confidence level for any of the attributes or Index should be flagged for further investigation, particular emphasis should be placed on changes to the Biological Structure Attribute score. Changes in this attribute are most likely to be reflective of changes in the water supply available to support vegetation. Any substantial decrease in scores should not automatically be attributed as an adverse impact due to groundwater management, and instead be considered a flag to investigate the root cause of the decrease.

Next Steps

As stated in the Introduction, the monitoring protocol described here should be considered a foundation from which to build off. The following are identified next steps to continue developing a GDE monitoring and assessment protocol.

Siting Water Table Wells

Siting and installing additional monitoring wells specifically aimed at monitoring the shallow groundwater accessible to roots of groundwater dependent vegetation is a crucial next step in developing an effective GDE monitoring approach. These additional wells will help SVBGSA staff understand when an adverse impact to a GDE is likely due to declining groundwater levels.

Calculating NDVI

While the process of coding and automating the calculation of NDVI values from satellite imagery should be straightforward, the volume of data will be large and require adequate computing power and data storage capacities. Identifying an organization with the computing capacity to process and store large amounts of data is a necessary next step in continuing to develop a GDE monitoring and assessment protocol.

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Appendix 5C

Updated Water Budgets

1 WATER BUDGETS

Periodic evaluations must include updated current and projected water budgets. This appendix summarizes the estimated water budgets for the 180/400 Subbasin, including information required by the GSP Regulations and information that is important for developing an effective plan to achieve sustainability.

Water budgets provide an estimation of the total annual volume of surface water and groundwater entering and leaving the basin and the change in the volume of groundwater in storage for different time periods. Water budgets are a tool to help understand the volume of groundwater flows and how they have changed over time. Since there are no direct measures of several components of the water budget, groundwater flow models are the best available tools to use to develop water budgets. Models are periodically updated, and with each update the water budget estimates are refined. This is the third water budget produced for the 180/400 Subbasin: the first was included in the 2020 GSP; the second was developed in 2022 to align with the 2022 Salinas Valley GSPs and is included in GSP Amendment 1; and this third water budget was developed in 2024 for inclusion in the GSP 2025 Evaluation.

1.1 Overview of Water Budget Development

The water budgets are presented in 2 subsections: (1) historical and current water budgets and (2) future water budgets. Within each subsection a surface water budget and groundwater budget are presented.

Historical and current water budgets are developed using a provisional version of the SVIHM[1], developed by the USGS. The SVIHM is a numerical groundwater-surface water flow model that is constructed using version 2 of the MODFLOW-OWHM code (Boyce *et al.*, 2020). This code is a version of the USGS groundwater flow code MODFLOW that estimates agricultural supply and demand through the Farm Process. Future water budgets are developed using a provisional version of the Salinas Valley Operational Model (SVOM), developed by the USGS and MCWRA. The SVOM is a numerical groundwater-surface water flow model constructed with the same framework and processes as the SVIHM. However, the SVOM is designed for simulating future scenarios and includes complex surface water operations in the Surface Water Operations (SWO) module.

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[1] These data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the USGS. No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

Water budgets described in the approved 2020 GSP were developed using the best tools and methods available at the time. After the release and approval of the 2020 GSP, the USGS released provisional versions of the SVIHM and SVOM to the SVBGSA for use in developing GSPs for the Salinas Valley Basin. In 2022, the SVIHM and SVOM were used to develop the water budgets included in GSP Amendment 1 for the 180/400 Subbasin, which align with the water budgets in the 2022 GSPs of the Eastside Aquifer, Langley Area, Forebay Aquifer, and Upper Valley Aquifer Subbasins. Since the development of the water budgets in 2022, the USGS released updated provisional versions of the SVIHM and SVOM. The most recent versions were used to update the water budgets for this GSP 2025 Evaluation.

The models have not yet been publicly released by the USGS. The models and how they were used for developing the GSP are briefly described in GSP Amendment 1. Details regarding source data, model construction, and model calibration will be summarized in more detail once the model and associated documentation are publicly available from the USGS.

1.1.1 Water Budget Components

The water budget is an inventory of the Subbasin's surface water and groundwater inflows and outflows. Some components of the water budget can be measured, such as groundwater pumping from metered wells, precipitation, and surface water diversions. Other components are not easily measured and can be estimated using groundwater models such as the SVIHM; these include unmetered agricultural pumping, recharge from precipitation and applied irrigation, and change in groundwater in storage. Figure 1 presents a general schematic diagram of the hydrogeologic conceptual model that is included in the water budget (DWR, 2020b). Figure 2 delineates the zones and boundary conditions of the SVIHM.

The water budgets for the Subbasin are calculated within the following boundaries:

- Lateral: The perimeter of the 180/400 Subbasin within the SVIHM is shown on Figure 2.
- Bottom: The base of the groundwater subbasin is considered to be the base of the usable and productive unconsolidated sediments, or the top of the Monterey Formation (Durbin *et al.* 1978). This ranges from less than 800 feet below ground surface in the far north of the Subbasin to almost 2,600 feet deep along the Subbasin's southwestern edge. The water budget is not sensitive to the exact definition of this base elevation because the base is defined as a depth below where there is not significant inflow, outflow, or change in storage.
- Top: The top of the water budget area is above the ground surface, so that surface water is included in the water budget.

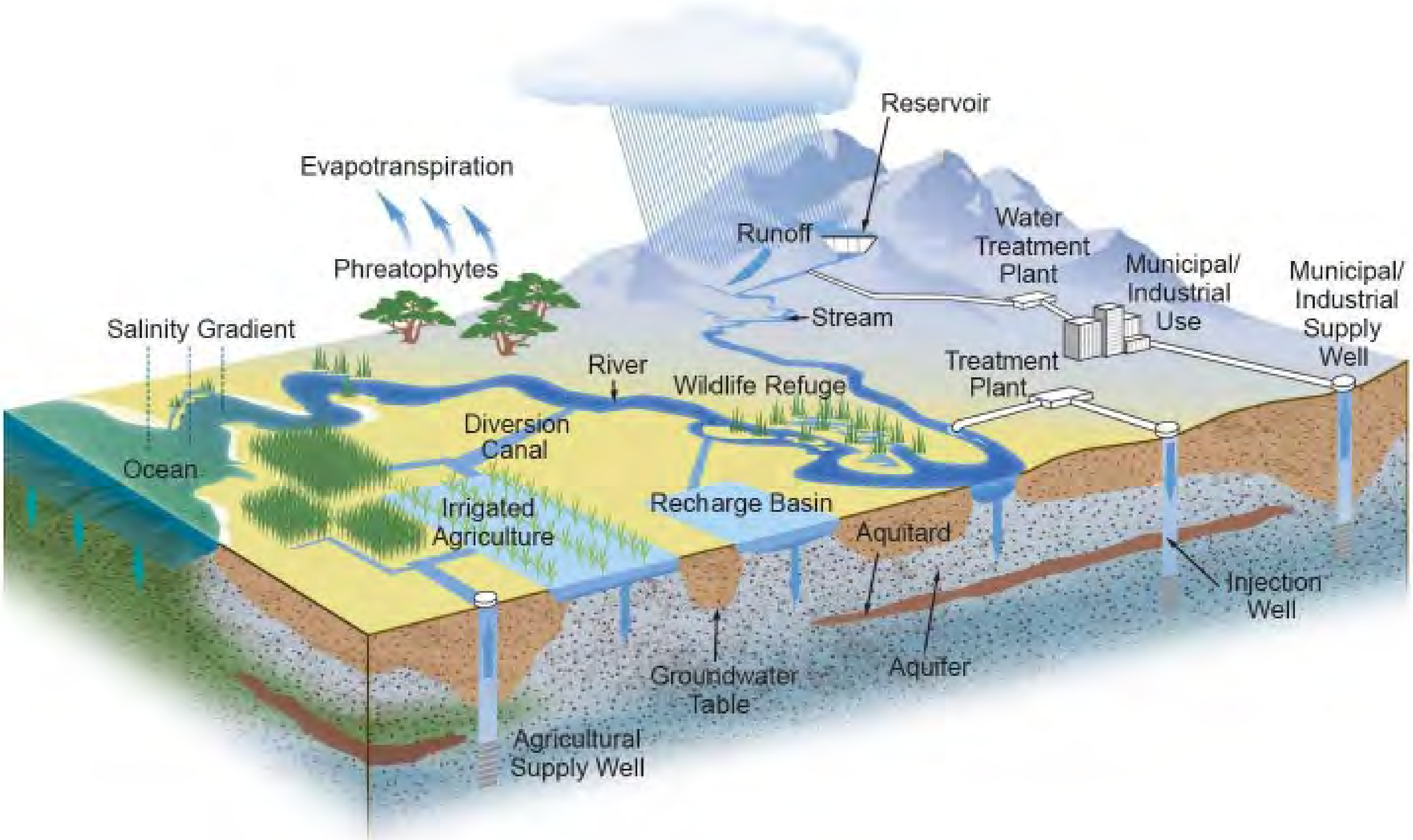


Figure 1. Schematic Hydrogeologic Conceptual Model (from DWR, 2020b)

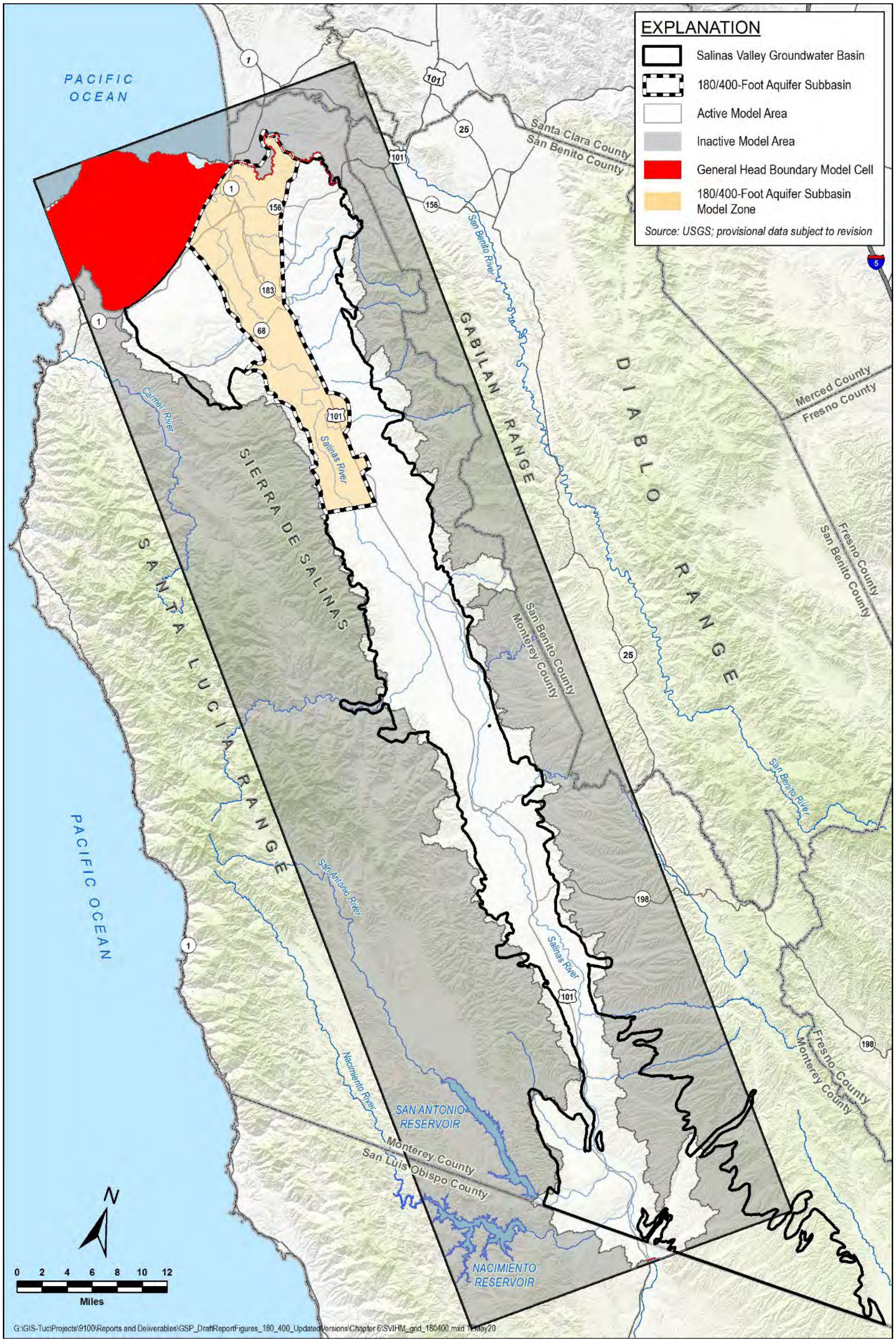


Figure 2. Subbasin Border and Boundary Conditions for the Salinas Valley Integrated Hydrologic Model

The 180/400 Subbasin water budget includes the following components:

<u>Surface Water Budget:</u>

- Inflows
  - Runoff of precipitation
  - Surface water inflows from streams and canals that enter (or can potentially enter) the Subbasin, including Salinas River, Chualar Creek, Quail Creek, Alisal Creek, Salinas Reclamation Canal, Santa Rita Creek, and several other smaller creeks
  - Groundwater discharge to streams
- Outflows
  - Stream discharge to groundwater
  - Stream diversions
  - Outflow to the ocean and neighboring subbasins from the Salinas River and other smaller streams

<u>Groundwater Budget:</u>

- Inflows
  - Deep percolation from precipitation and applied irrigation
  - Stream discharge to groundwater
  - Subsurface inflows from the following:
    - The Forebay Subbasin
    - The Langley Subbasin
    - The Eastside Subbasin
    - The Pajaro Valley Basin
    - The Monterey Subbasin
    - The Pacific Ocean (seawater intrusion)
    - The surrounding watersheds that are not in other DWR subbasins
- Outflows
  - Riparian evapotranspiration (ET)
  - Groundwater pumping, including municipal, industrial, and agricultural
  - Groundwater discharge to streams

- Groundwater discharge to agricultural drains
- Subsurface outflows to the following:
    - The Forebay Subbasin
    - The Langley Subbasin
    - The Eastside Subbasin
    - The Pajaro Valley Basin
    - The Monterey Subbasin
    - The Pacific Ocean
    - The surrounding watersheds that are not in other DWR subbasins

The difference between groundwater inflows and outflows is equal to the change of groundwater in storage.

1.1.2 Water Budget Timeframes

Periodic evaluations should include updated current and projected water budgets. Since newer versions of the SVIHM and SVOM are available, a historical water budget is also included.

All annual water budgets are developed for complete water years, which averages the monthly variation in the model. Selected time periods for the historical and current water budgets are summarized in Table 1 and on Figure 3. and described in Sections 1.1.2.1 and 1.1.2.2.

Table 1. Summary of Historical and Current Water Budget Time Periods

Time Period	Proposed Date Range	Water Year Types Represented in Time Period	Rationale
Historical	WY 1980 - 2018	Dry: 12 Dry-Normal: 7 Normal: 5 Wet-Normal: 3 Wet: 12	Provides insights on water budget response to a wide range of variations in climate and groundwater use over an extensive period of record. Begins and ends in years with average precipitation.
Current	WY 2017 - 2018	Dry: 1 Wet: 1	Best reflection of current land use and water use conditions based on best available data.

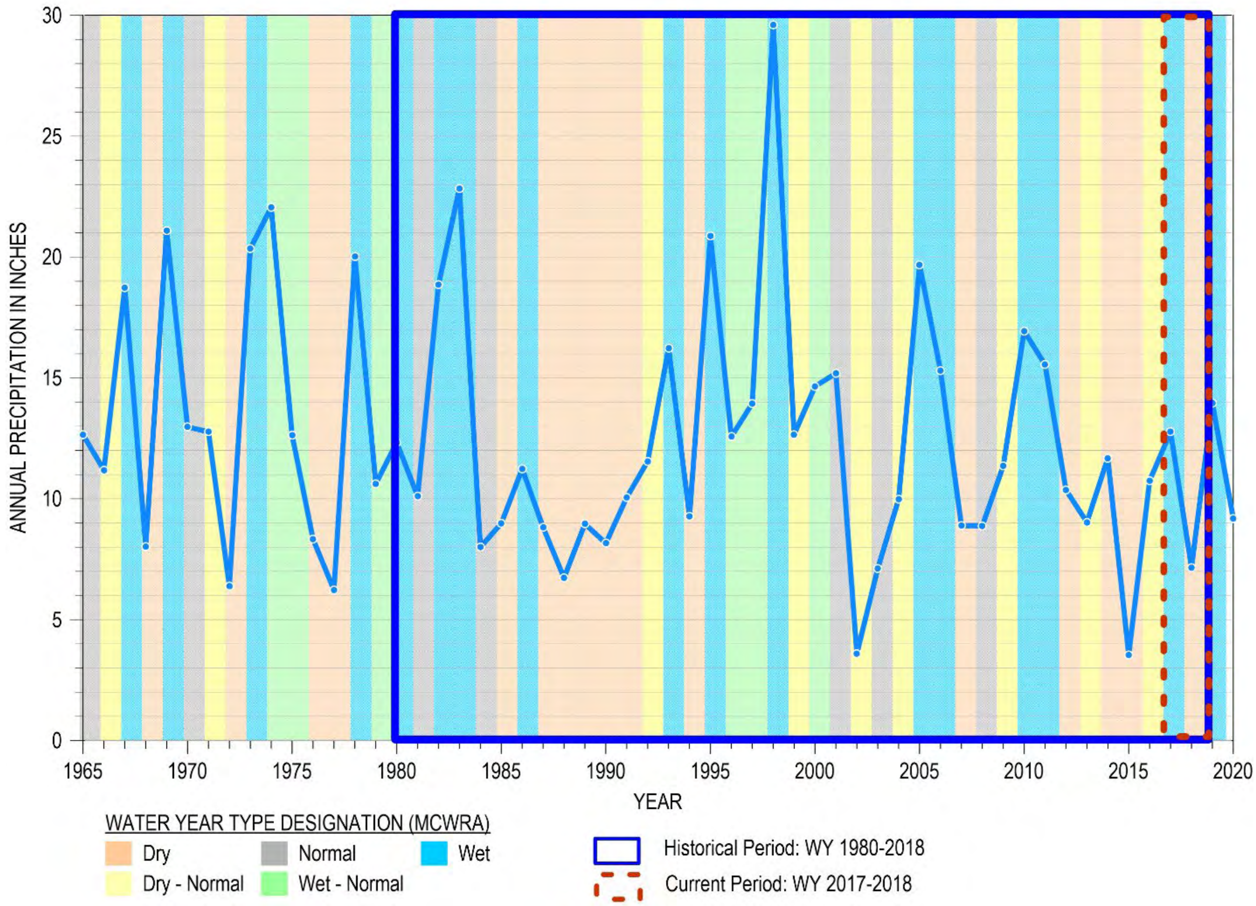


Figure 3. Climate and Precipitation for Historical and Current Water Budget Time Periods

1.1.2.1 Historical Water Budgets Time Period

The historical water budget is intended to evaluate how past land use and water supply availability has affected aquifer conditions. The historical water budget helps develop an understanding of how historical conditions concerning hydrology, water demand, and surface water supply availability and reliability have impacted the ability to operate the basin within the sustainable yield.

The historical water budget is computed using results from the SVIHM groundwater flow model for the period from October 1980 through September 2018. The SVIHM simulation covers WY 1967 - 2018; however, model results for years before 1980 were not used for this water budget due to potential limitations and uncertainties in the provisional SVIHM. WY 1980 - 2018 comprise a representative period with both wet and dry periods in the Subbasin (Table 1, Figure 3).

1.1.2.2 Current Water Budget Time Period

The current water budget is intended to allow the GSAs and DWR to understand the existing supply, demand, and change in storage under recent population, land use, and hydrologic conditions. Current conditions are generally the most recent conditions for which adequate data are available and that represent recent climatic and hydrologic conditions. Since the SVIHM includes data through 2018, the current water budget is the average of 2017 and 2018.

The current water budget is also computed using the SVIHM groundwater flow model and is based on WY 2017 through 2018. WY 2017 and 2018 are classified as wet and dry, respectively. An average of these 2 years is reflective of recent patterns of groundwater use and surface water use. Although this period appropriately meets the regulatory requirement for using the "…most recent hydrology, water supply, water demand, and land use information" (23 California Code of Regulations § 354.18 (c)(1)), WY 2017 and 2018 may underestimate water availability because the period was preceded by multiple dry or dry-normal years.

1.1.2.3 Future Projected Water Budgets Time Period

The projected water budget is intended to quantify the estimated future baseline conditions. The projected water budget estimates the future baseline conditions concerning hydrology, water demand, and surface water supply over a 50-year planning and implementation horizon.

Future projected conditions are based on model simulations using the SVOM numerical flow model, using current reservoir operations rules, projected climate change scenario, and estimated sea level rise. The projected water budget represents 51 years of future conditions. Following DWR guidance on implementing climate change factors, the future water budget simulations do not simulate a 51-year projected future, but rather simulate 51 likely hydrologic events that may occur in 2070.

1.2 Overview of Data Sources for Water Budget Development

Table 2 provides the detailed water budget components and known model assumptions and limitations for each. A few water budget components are directly measured, but most water budget components are either estimated as input to the model or simulated by the model. Uncertainty exists in all regional models; however, the USGS and cooperating agencies selected inputs to the provisional SVIHM using best available data to reduce the level of uncertainty. Models estimate groundwater flow based on the available data; as more data becomes available and models are updated, estimates will improve. The water budgets for the 180/400 Subbasin are based on a provisional version of the SVIHM, with limited documentation of model construction. The model is in internal review at the USGS, and a final version will not be released until 2025. Nonetheless, the provisional SVIHM's calibration error is within reasonable bounds for the 180/400 Subbasin. Therefore, the model is the best available tool for estimating water budgets for the GSP 2025 Evaluation.

As GSP implementation proceeds, the SVIHM will be updated and recalibrated with new data to better inform model simulations of historical, current, and projected water budgets. Model assumptions and uncertainty will be described in future updates after model documentation is released by the USGS.

Table 2. Summary of Water Budget Component Data Source from the Salinas Valley Integrated Hydrologic Model

Water Budget Component	Source of Model Input Data	Limitations
Surface Water Inflows		
Inflow from Streams Entering Basin	Simulated from calibrated model for all creeks	Not all creeks are gauged
Groundwater Discharge to Streams	Simulated from calibrated model	Based on calibration of streamflow to available data from gauged creeks
Overland Runoff	Simulated from calibrated model	Based on land use, precipitation, and soils specified in model
Surface Water Outflows		
Streambed Recharge to Groundwater	Simulated from calibrated model	Based on calibration of streamflow to available data from gauged creeks and groundwater level data from nearby wells
Diversions	Simulated from calibrated model	Based on calibration of streamflow to available data from gauged creeks
Outflow to Streams Leaving Basin	Simulated from calibrated model for all creeks	Not all creeks are gauged
Groundwater Inflows		
Streambed Recharge to Groundwater	Simulated from calibrated model	Based on calibration of streamflow to available data from gauged creeks and groundwater level data from nearby wells
Deep Percolation of Precipitation and Irrigation Water	Simulated from demands based on crop, acreage, temperature, and soil zone processes	No measurements available; based on assumed parameters for crops and soils
Subsurface Inflow from Adjacent Basins and Surrounding Watershed Other than Neighboring Basins	Simulated from calibrated model	Limited groundwater calibration data at adjacent subbasin boundaries
Subsurface Inflow from Ocean	Simulated from calibrated model	Seawater intrusion assumed equal to groundwater flow from the ocean across coastline
Groundwater Outflows		
Groundwater Pumping	Agricultural pumping is estimated by calibrated model, based on reported land use. Simulated urban pumping is based on reported and estimated pumping.	Domestic pumping not simulated in model.
Groundwater Discharge to Streams	Simulated from calibrated model	Based on calibration of streamflow to available data from gauged creeks and groundwater level data from nearby wells
Groundwater Discharge to Drains	Simulated from calibrated model	Based on calibration of the surface water network and groundwater level data from nearby wells
Subsurface Outflow to Adjacent Basins and Ocean	Simulated from calibrated model	Limited calibration data at adjacent subbasin boundaries
Riparian Evapotranspiration	Simulated from calibrated model	Based on representative plant group and uniform extinction depth
Change in Groundwater Storage		
Change in Groundwater Storage	Simulated from calibrated model	Based on calibration of groundwater levels to available measurements

1.3 Historical and Current Water Budgets

Water budgets for the historical and current periods are presented below. The surface water budgets are presented first, followed by the groundwater budgets. These water budgets are based on the provisional SVIHM and are subject to change in the future. Water budgets will be updated in future periodic evaluations.

1.3.1 Historical and Current Surface Water Budget

The surface water budget accounts for the inflows and outflows for the streams within the Subbasin. This includes streamflows of rivers and tributaries entering and exiting the Subbasin, overland runoff to streams, and stream-aquifer interactions. Evapotranspiration by riparian vegetation along stream channels is estimated by the provisional SVIHM as part of the groundwater system and is accounted for in the groundwater budget.

Figure 4 shows the surface water network simulated in the provisional SVIHM. The model accounts for surface water flowing in and out across the subbasin boundary. For this water budget, boundary inflows and outflows are the sum of all locations that cross the Subbasin boundary. In some instances, a simulated stream might enter and exit the Subbasin boundary at multiple locations such as Salinas River, Chualar Creek, and Natividad Creek/Reclamation Canal. The Salinas Valley Aquitard, which extends over much of the Subbasin, limits connectivity between surface water and principal aquifers where present.

Figure 5 shows the surface water budget for the historical period, which also includes the current period. Table 3 shows the average values for components of the surface water budget for the historical and current periods. Positive values are inflows into the stream system and negative values are outflows from the stream system. Boundary stream inflows and boundary stream outflows are an order of magnitude greater than any other component of the surface water budget. The flow between surface water and groundwater in the Subbasin is generally net negative, which indicates more deep percolation of streamflow to groundwater than groundwater discharge to streams. To account for model uncertainty, surface water budget values are presented rounded to the nearest thousand AF/yr for flows averaging more than 1,000 AF/yr and to the nearest 100 AF/yr for flows less than 1,000 AF/yr. The surface water budget does not balance perfectly due to rounding.

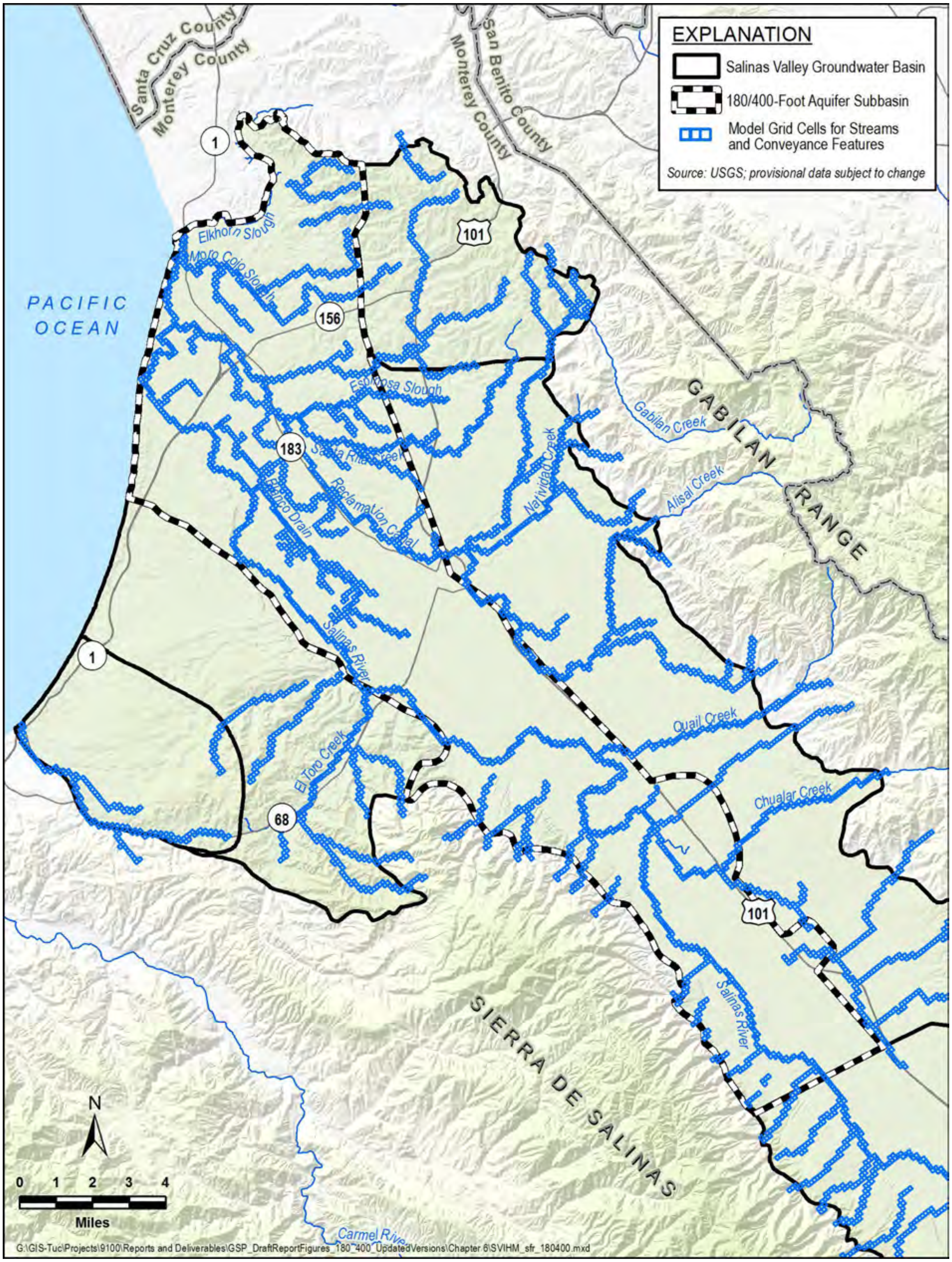


Figure 4. Surface Water Network in the 180/400 Subbasin from the Salinas Valley Integrated Hydrologic Model

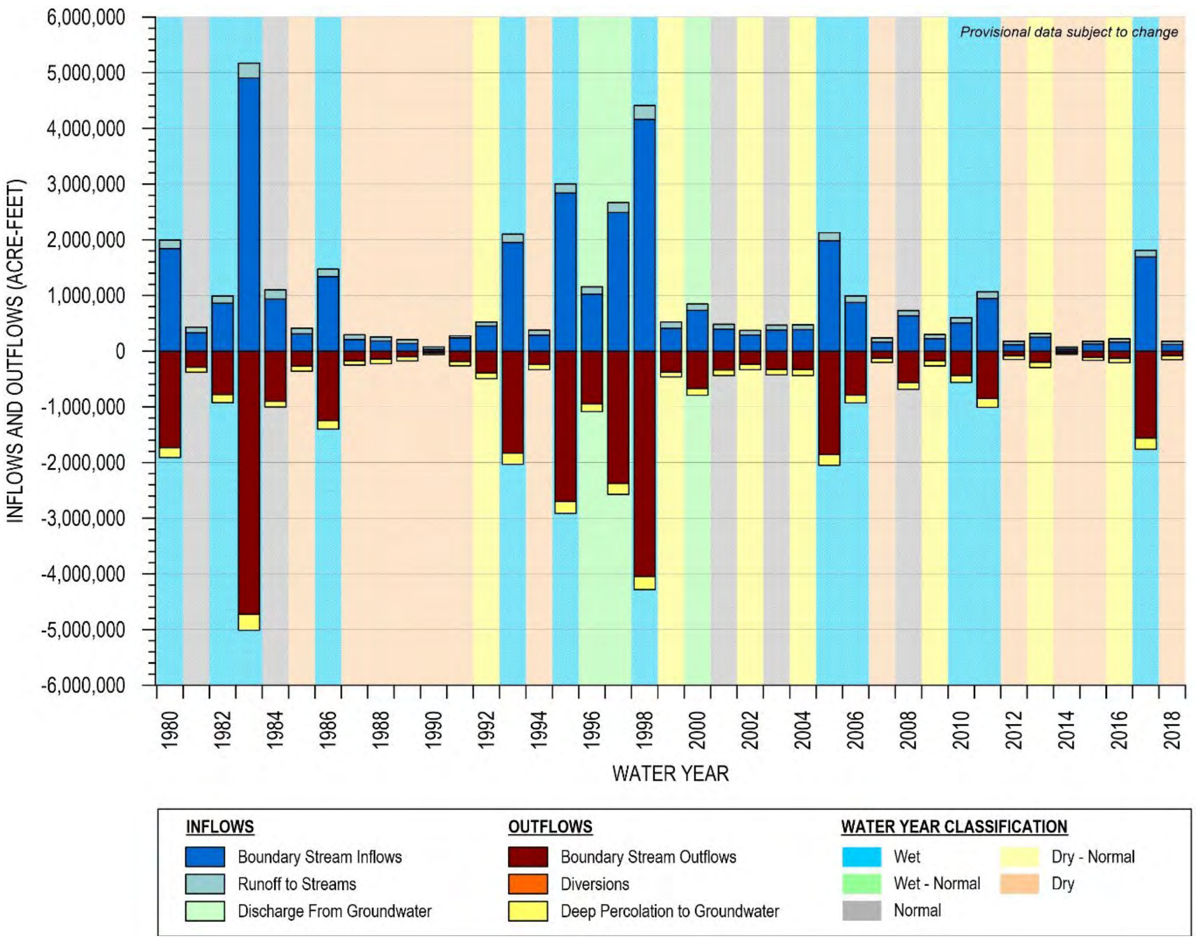


Figure 5. Historical and Current Surface Water Budget

Table 3. SVIHM Simulated Surface Water Budget Summary

	Historical Average (WY 1980-2018)	Current (WY 2017-2018)
Boundary Stream Inflows	896,600	907,100
Runoff to Streams	54,900	53,800
Direct Precipitation	300	300
Net Flow between Surface Water and Groundwater	-120,700	-138,100
Boundary Stream Outflows	-830,500	-819,300
Diversions	-600	-3,900

Values are in AF/yr

Note: provisional data subject to change.

1.3.2 Historical and Current Groundwater Budget

The groundwater budget accounts for the inflows and outflows to and from the Subbasin's aquifers, based on results from the SVIHM. This includes subsurface inflows and outflows of groundwater at the Subbasin boundaries, recharge, pumping, evapotranspiration, and net flow between surface water and groundwater.

Figure 6 shows SVIHM estimated annual groundwater inflows for the historical and current time periods. Total average annual inflows is about 208,000 AF/yr for the historical period and 219,000 AF/yr for the current period; however, inflows vary substantially from year to year. Table 4 provides average groundwater inflows for the historical and current periods. The dominant inflow components are deep percolation of streamflow and deep percolation of precipitation and applied irrigation. Deep percolation of streamflow is greater on average but also varies more than deep percolation of precipitation. Values of less than 50,000 to greater than 200,000 AF/yr are common for simulated deep percolation of streamflow. The most consistent groundwater flows into the Subbasin are subsurface inflows from adjacent areas. Freshwater subsurface inflows range between 22,000 and 33,000 AF/yr. For these water budgets, inflow from the ocean is counted as an inflow even though it is not usable. Seawater inflows across the coastal boundary are between 6,000 and 11,000 AF/yr. These seawater inflows are less than the change in usable storage due to seawater intrusion, as calculated in Chapter 5 of GSP Amendment 1, because the inflow represents full-strength seawater. However, the seawater mixes with fresh groundwater, and the unusable amount of groundwater is much greater than the full-strength seawater. In 2023, the SVBGSA developed a variable density groundwater model to help understand this relationship.

Figure 7 shows the SVIHM estimated groundwater outflows for the historical and current time periods. Outflows vary from year to year; however, the annual variation is dampened compared to the inflows. Table 5 provides the SVIHM estimated average groundwater outflows of the historical and current periods. The greatest groundwater outflow is pumping. Averaged over the historical period, groundwater pumping accounts for more than 60% of all groundwater outflows in the Subbasin. In the driest water years, such as 1990, it accounts for closer to 70% of the total groundwater outflows. Total average annual groundwater outflow was about 218,000 AF/yr for the historical period and about 191,000 AF/yr for the current period. All outflows are shown as negative values.

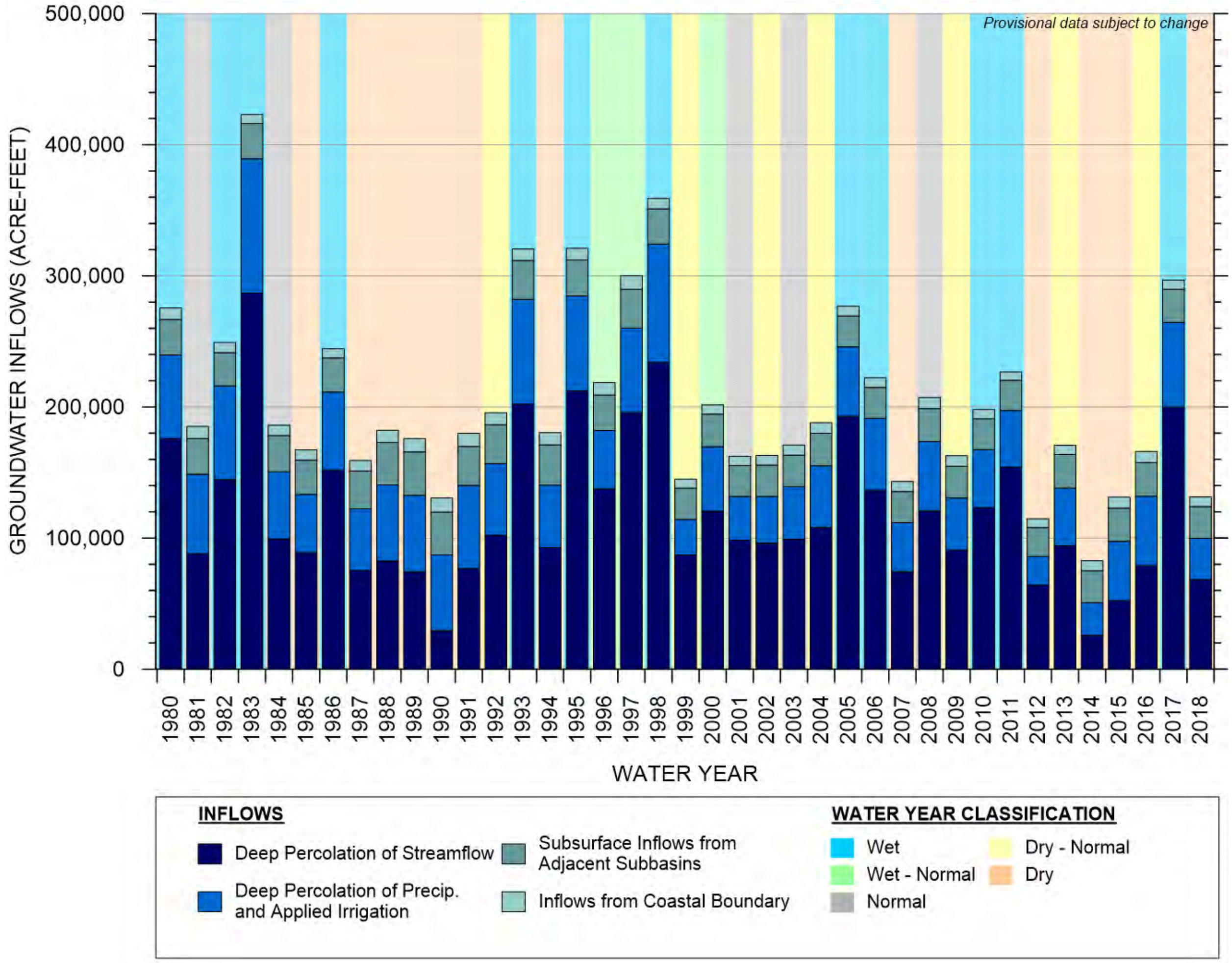


Figure 6. SVIHM Simulated Inflows to the Groundwater System

Table 4. SVIHM Simulated Groundwater Inflows Summary

	Historical Average (WY 1980-2018)	Current (WY 2017-2018)
Deep Percolation of Streamflow	121,100	138,700
Deep Percolation of Precipitation and Applied Irrigation	52,200	48,200
Subsurface Inflow from Adjacent Areas	26,300	24,700
Inflow Across Coastline	8,100	7,100
Total Inflows	207,700	218,700

Values are in AF/yr

Note: provisional data subject to change

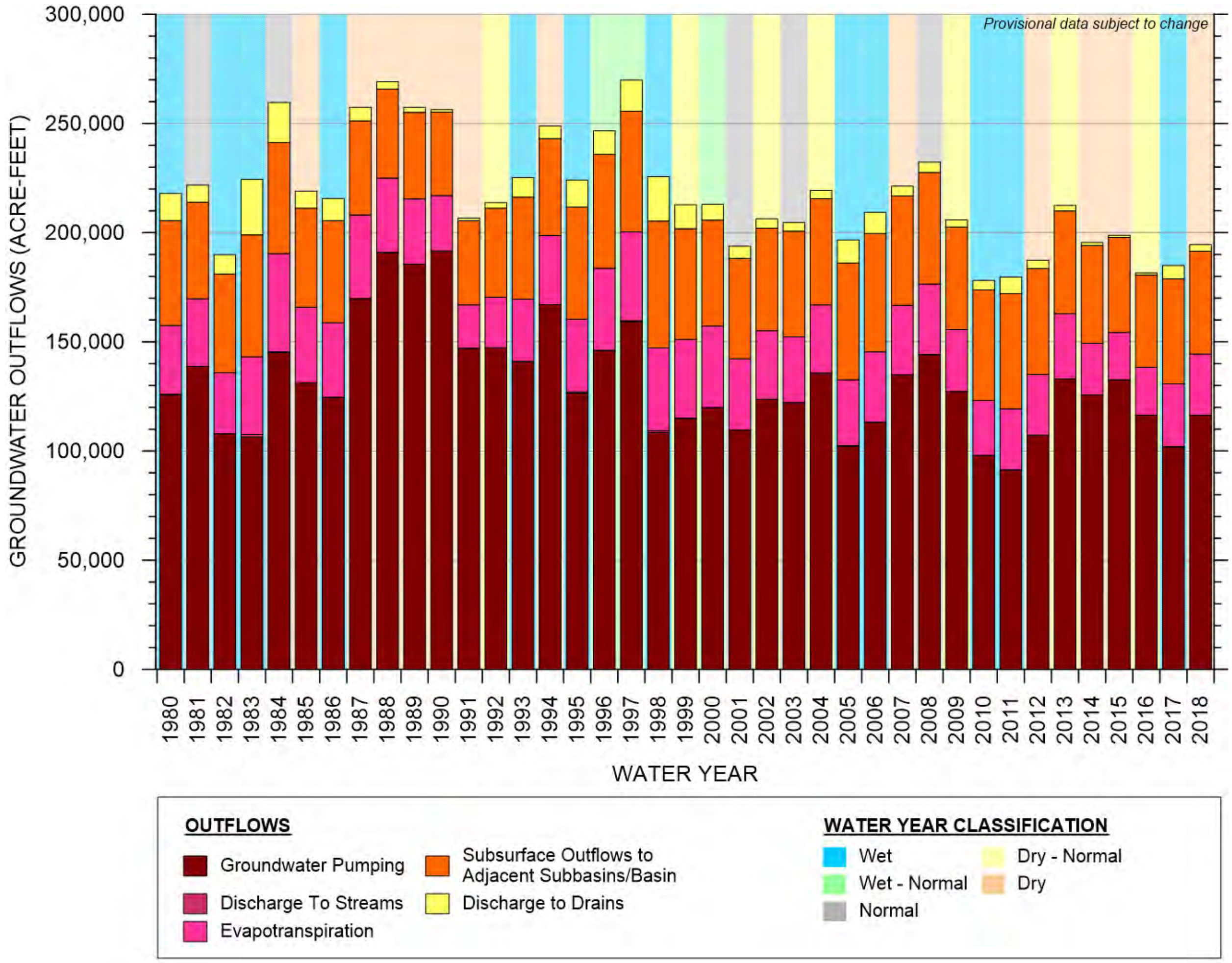


Figure 7. SVIHM Simulated Outflows from the Groundwater System

Table 5. SVIHM Simulated Groundwater Outflows Summary

	Historical Average (WY 1980-2016)	Current (WY 2017-2018)
Groundwater Pumping	-131,400	-109,100
Groundwater Evapotranspiration	-31,200	-28,500
Subsurface Outflows to Adjacent Areas	-47,500	-47,500
Subsurface Outflows to Ocean	-300	-300
Discharge to Streams	-400	-500
Discharge to Agricultural Drains	-7,200	-4,500
Total Outflows	-218,000	-190,400

Values are in AF/yr

Note: provisional data subject to change

Table 6 and Figure 8 show SVIHM simulated groundwater pumping by water use sector. More than 85% of groundwater pumping in the Subbasin is used for agricultural purposes. Groundwater pumping varies from year to year; however, total pumping in the Subbasin has generally decreased since its peak in the 1980s and 1990s. Municipal and agricultural pumping are simulated in the SVIHM; however, domestic pumping, including *de minimis* pumping, is not included in the model, including pumping that occurs from a well with a discharge pipe of less than 3 inches. The SVIHM does not simulate domestic pumping because it is a relatively small portion of overall groundwater pumping in Salinas Valley Basin, and it is not included in the 180/400 Subbasin water budget. The historical average in Table 6 is not strictly comparable to the GEMS historical average because the time periods used to calculate the averages are different.

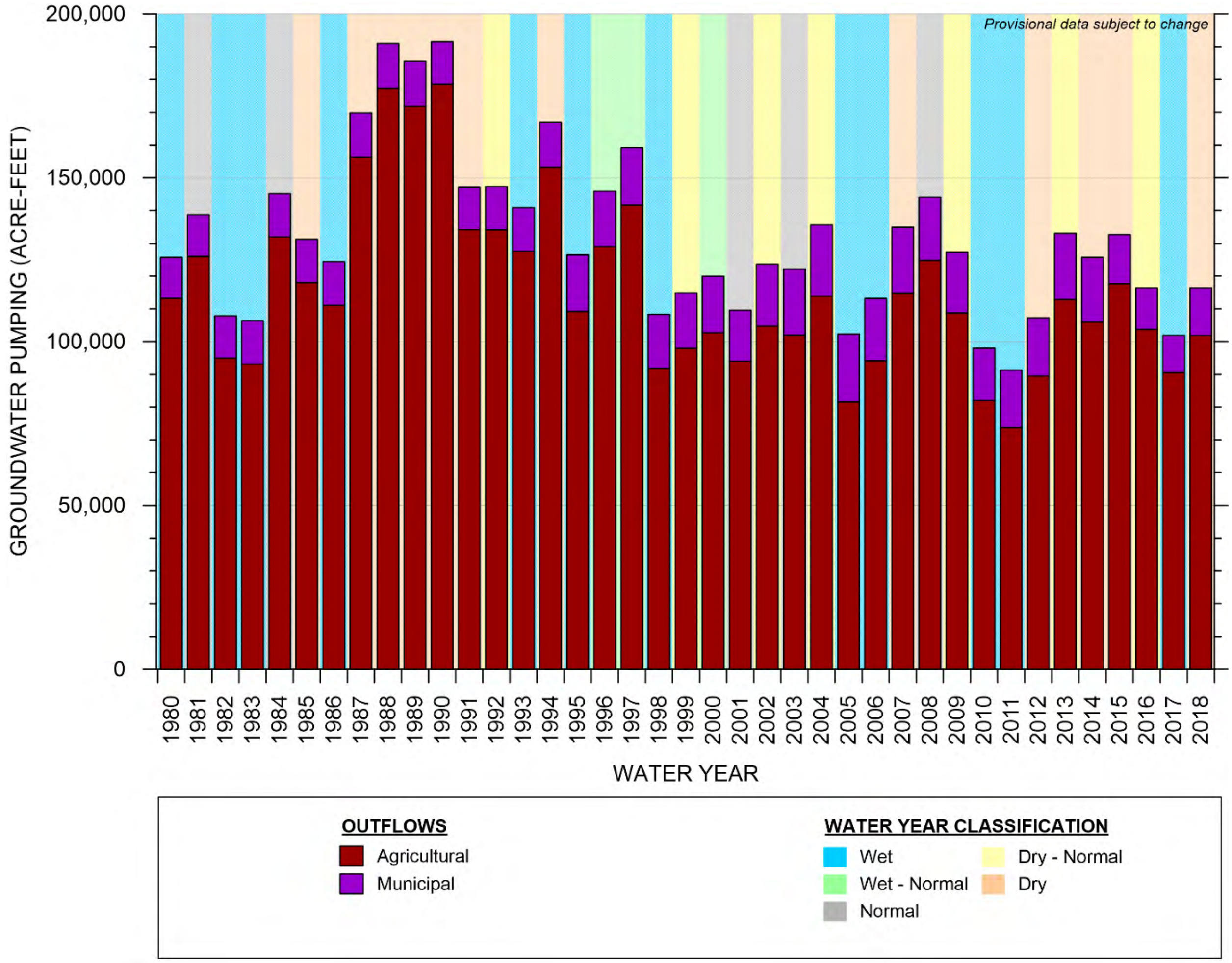


Figure 8. SVIHM Simulated Groundwater Pumping by Water Use Sector

Table 6. SVIHM Simulated and Groundwater Pumping by Water Use Sector

	Simulated		GEMS	
	Historical Average (WY 1980-2018)	Current (WY 2017-2018)	Historical Average (WY 1995-2018)	Current (WY 2017-2018)
Municipal & Industrial	-15,900	-13,000	-14,200	-12,200
Agricultural	-115,500	-96,100	-111,000	-102,000
Total Pumping	-131,400	-109,100	-125,200	-114,200

Values are in AF/yr

Note: provisional data subject to change.

Figure 9 shows SVIHM estimated net subsurface flows entering and exiting the Subbasin by watershed and neighboring subbasin. Table 7 shows SVIHM estimated historical mean and current year subsurface flows. These results are from the SVIHM; however, modeling completed for the Monterey Subbasin with the Monterey Basin Groundwater Flow Model, which is better calibrated and more reliable than the SVIHM in the Monterey Subbasin, shows a net flow from the Monterey Subbasin into the 180/400 Subbasin of 12,300 AF/yr from 2004 to 2018. Additional efforts will be made to reconcile the discrepancies in cross-boundary flow terms between the SVIHM and Monterey Basin Groundwater Flow Model once the final SVIHM is made available by the USGS, and the water budget will be updated accordingly in future periodic evaluations.

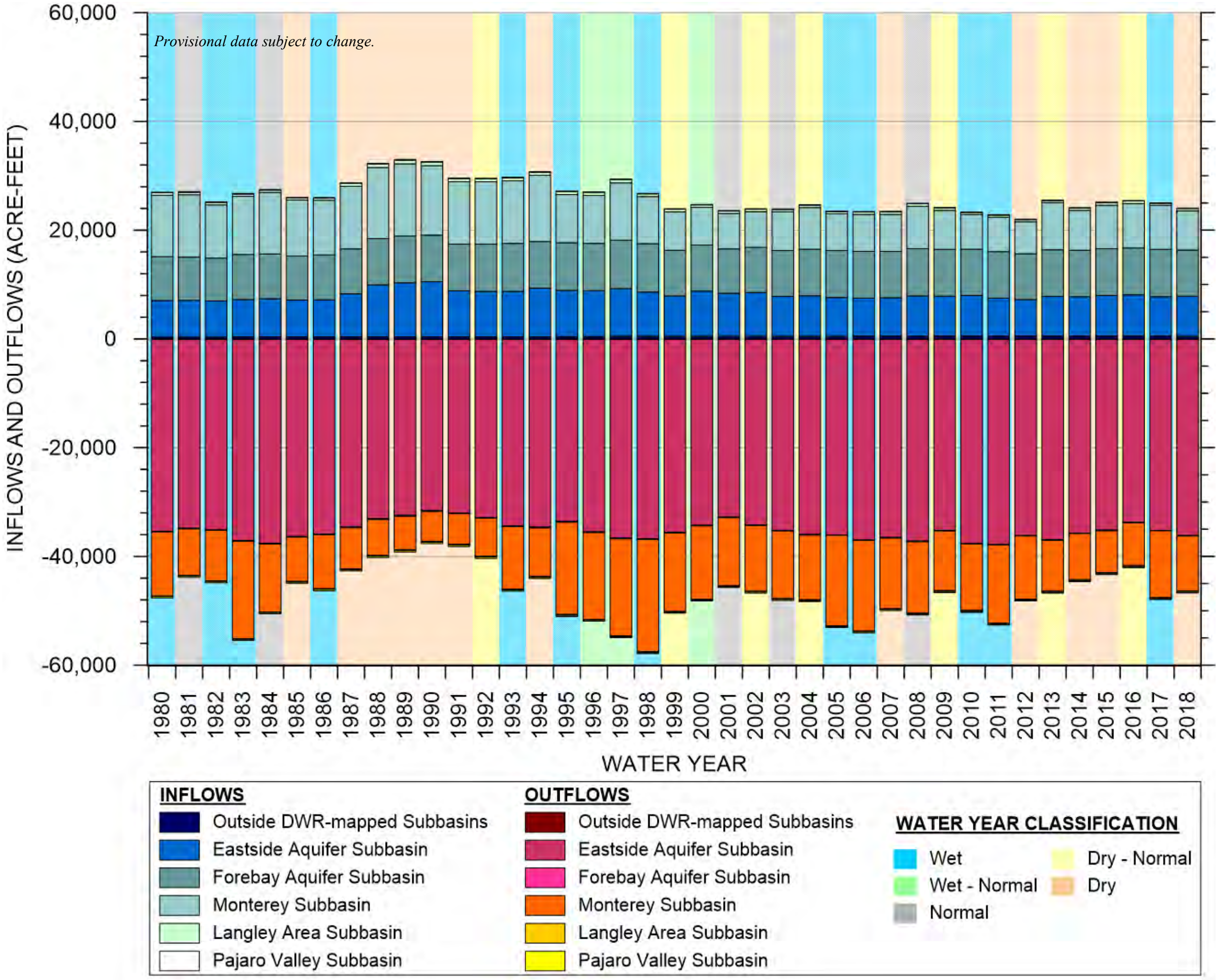


Figure 9. SVIHM Simulated Subsurface Inflows and Outflows from Watershed Areas and Neighboring Basins/Subbasins

Table 7. SVIHM Simulated Net Subbasin Boundary Flows

	Historical Average (WY 1980-2018)	Current (WY 2017-2018)
Eastside Subbasin	-27,500	-28,300
Forebay Subbasin	8,400	8,500
Monterey Subbasin	-2,500	-3,500
Langley Subbasin	300	200
Pajaro Valley Basin	-300	-100
Outside Areas	400	400

Values are in AF/yr

Note: provisional data subject to change

Change in Salinas Valley groundwater storage can be due to groundwater level changes or seawater intrusion. The water budget inflows and outflows listed above only relate to the change in storage due to groundwater level changes. However, total change in usable groundwater storage is estimated with the sum of change in usable storage from continued migration of the seawater intrusion front and the change in storage from groundwater level changes outside of the seawater intruded area. Each component is discussed separately below.

A negative change in groundwater storage due to groundwater level changes indicates groundwater storage depletion associated with groundwater level declines; while a positive value indicates groundwater storage accretion associated with groundwater level rise. Averaged over the historical period, the SVIHM estimates that the 180/400 Subbasin is in overdraft by 10,100 AF/yr. Model results represent storage loss from all aquifer layers, including shallow sediments. However, this simulated overdraft contains significant variability and uncertainty due to the preliminary calibration of the provisional version of the SVIHM used for this GSP 2025 Evaluation. Figure 10 shows considerable variability in change in storage from one year to the next. In water year 1983, inflows exceeded outflows by more than 200,000 AF, while in 1990 outflows exceeded inflows by more than 100,000 AF. The current period represents a snapshot in time showing variability within the model simulation and is not necessarily representative of actual current conditions. Based on the simulated results from the SVIHM, this GSP 2025 evaluation considers 10,100 AF/yr as the historical average annual decline in storage due to change in groundwater elevations.

Seawater intrusion degrades groundwater quality, making the groundwater unusable for most municipal or agricultural uses. Seawater that flows into the basin mixes with fresh water and renders it unusable, typically when the chloride concentration is above 500 mg/L. Therefore, the 500 mg/L chloride isocontour is considered the limit of usable groundwater in storage. Groundwater within the 500 mg/L isocontour is a mix of fresh groundwater and seawater, and it represents the extent of the non-usable groundwater interface at a given time.

Change in usable storage from seawater intrusion in the 180/400 Subbasin is calculated from MCWRA's annual seawater intrusion maps, since the SVIHM does not specifically simulate seawater intrusion. Mapped contours indicate that the rate of loss of usable groundwater storage is greater than the simulated groundwater flow rate across the coastal boundary. This is because the simulated rate of groundwater flow across the coastal boundary represents the amount of full-strength seawater entering the Valley, but much more groundwater than the full-strength seawater is unusable as it mixes with fresh water. The loss of groundwater in storage due to seawater intrusion in the 180/400 Subbasin is estimated to be 12,600 AF/yr, based on isocontours from 1995 through 2019.

Furthermore, the change in groundwater storage calculated by the SVIHM is not comparable to, and should not be equated with, the calculated change in usable groundwater in storage. The

SVIHM water budget is an accounting of all flows across the subbasin boundaries, not an estimate of usable groundwater.

1.3.3 Historical and Current Groundwater Budget Summary

The main groundwater inflows into the Subbasin are (1) deep percolation of precipitation and irrigation water, (2) subsurface inflow from adjacent DWR groundwater basins and subbasins, and (3) stream recharge. Groundwater pumping is the predominant groundwater outflow. The smaller outflow terms are subsurface outflows to adjacent subbasins, evapotranspiration, discharge to streams, and flows to agricultural drains.

Figure 10 shows the entire groundwater water budget from the SVIHM, including annual change in groundwater storage. Changes in groundwater storage are strongly correlated with changes in deep percolation of precipitation and stream flows. For example, 1983 and 1998 were comparatively very wet years and represent the greatest increases in deep percolation and, correspondingly, the greatest increases in groundwater storage over the historical period. Estimated cumulative change in groundwater storage has steadily declined over time with slight increases in response to wet periods.

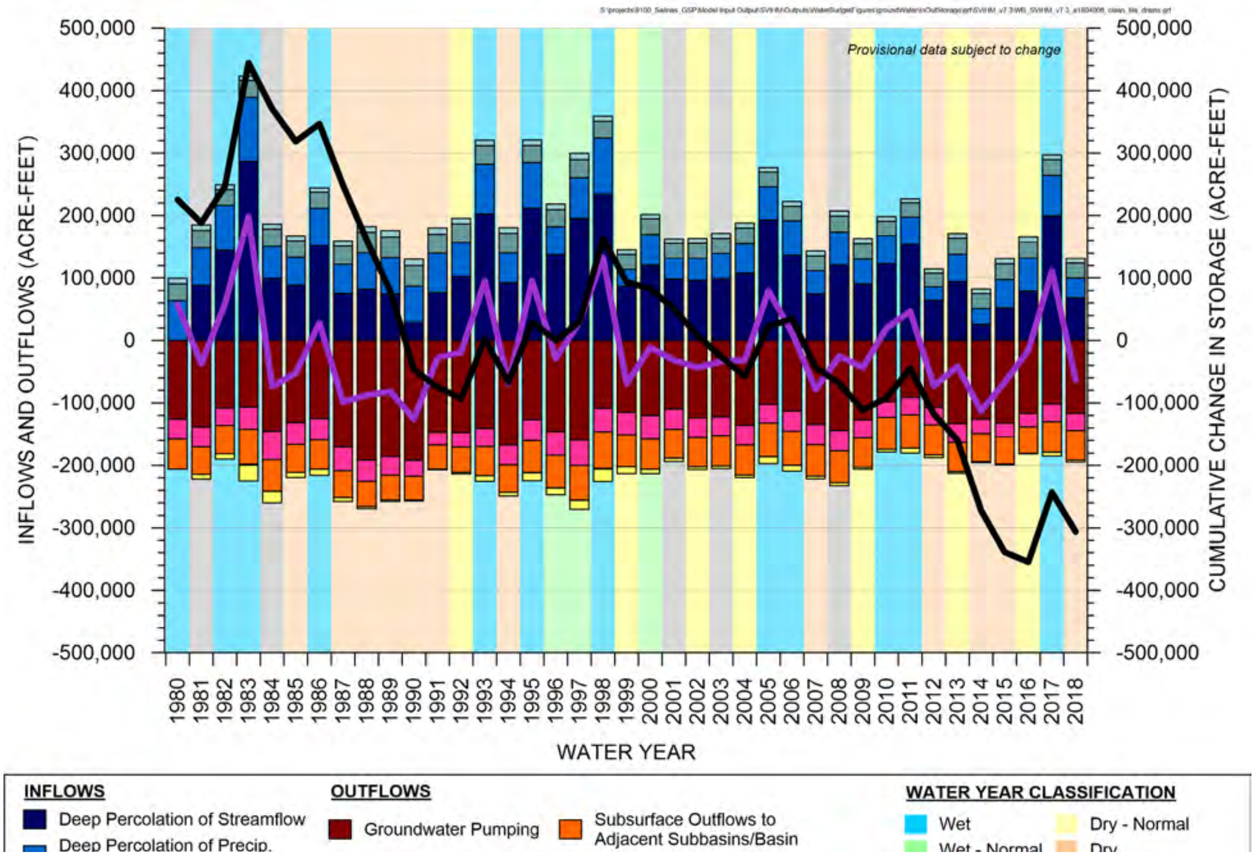


Figure 10. SVIHM Simulated Historical and Current Groundwater Budget

The SVIHM estimated the average historical annual decline in storage due to change in groundwater levels to be 10,100 AF/yr.

A comparison of the historical and current groundwater budgets is shown in Table 8. The values in the table are based on the inflows and outflows presented in previous tables. Negative values indicate outflows or depletions. Historical average decline in usable storage (overdraft) is 10,100 AF/yr. Inflow across coastline is shown in Table 8 as an inflow because it is represented in the models as seawater flow into the Subbasin at the coastline; however, seawater intrusion into the Subbasin contributes to the loss in usable storage. The SVIHM does not account for water quality. When factoring loss of usable storage due to seawater intrusion, the total loss of usable storage is considerably higher than if only loss of storage due to groundwater levels alone was considered. This table is informative in showing the relative magnitude of various water budget components; however, these results are based on a provisional model and will be updated in future periodic evaluations.

Table 8. Summary of Groundwater Budget

	Historical Average (WY 1980-2018)	Current (WY 2017-2018)
Net Inflows		
Net Stream Exchange	120,700	138,200
Deep Percolation of Precipitation and Applied Irrigation	52,200	48,200
Net Coastal Inflow	7,800	6,900
Net Outflows		
Groundwater Pumping	-131,400	-109,100
Net Flow from Adjacent Subbasins/Basin	-21,200	-22,800
Flow to Drains	-7,200	-4,500
Groundwater Evapotranspiration	-31,200	-28,500
Net Change In Storage (overdraft)		
Change in Storage due to Groundwater Levels	-10,100	28,700

Values are in AF/yr

Note: provisional data subject to change. This groundwater model does not factor in loss of usable storage due to seawater intrusion. The water budget does not balance exactly due to a combination of model error and presenting rounded water budget components.

1.3.4 Historical and Current Sustainable Yield

The historical and current sustainable yields reflect the amount of Subbasin-wide pumping reduction needed to balance the water budget, resulting in no net decrease in storage of usable groundwater. The sustainable yield has been estimated as:

Sustainable yield = pumping + change in storage due to groundwater levels
+ change in storage due to seawater intrusion

Table 9 provides an estimate sustainable yield based on results from the SVIHM and observed seawater intrusion. The simulated change in groundwater storage is used for this calculation, as well as the observed seawater intrusion estimate previously described, which is related to the change in volume of usable water rather than flow across the coastline. These values are the likely range of the sustainable yield of the Subbasin. As previously described in Section 1.3.3, historical average loss of storage due to water levels is 10,100 AF/yr. The total estimated historical loss of storage for the Subbasin is 22,700 AF/yr, which is the sum of storage loss due to seawater intrusion (12,600 AF/yr) and net storage loss due to groundwater level changes (10,100 AF/yr). Using this estimate of loss in storage and based on the historical average water budget, the best estimate of sustainable yield for the Subbasin is 108,700 AF/yr. In addition to the inherent uncertainty that exists in all numerical models, this estimate is based on results from a provisional version of the SVIHM. Sustainable yield estimates will be refined and improved in future periodic evaluations.

Table 9. Historical Sustainable Yield within the 180/400 from Simulated Pumping, Change in Storage, and Mapped Seawater Intrusion Areas

	Historical Average (WY 1980-2018)
Total Subbasin Pumping	131,400
Change in Storage due to Groundwater Levels	-10,100
Change in Storage due to Seawater Intrusion	-12,600
Estimated Sustainable Yield	108,700

Values are in AF/yr

Note: Pumping is shown as positive value for this computation. Change in storage and pumping values are based on the SVIHM and seawater intrusion is based on mapped areas of intrusion, as previously described in the text.

1.4 Projected Water Budgets

An updated version of the SVOM was used to develop the 2070 projected water budget. The projected water budgets shows anticipated conditions by the end of the 50-year GSP planning and implementation horizon if current management and land use continues. It may be used to help plan PMAs, along with other tools and analyses. These future baseline conditions include hydrology, water demand, and surface water supply over 51 years of potential future conditions. Following DWR guidance on incorporating climate change, the projected water budget is the average of 51 simulated likely hydrologic years that may occur in 2070.

The SVOM model used to develop the 2070 projected water budget simulates future hydrologic conditions with a central tendency climate change scenario applied. The assumptions for the climate change scenario are based on data provided by DWR (2018). The projected water budget is based on a provisional version of the SVOM and will be updated in future periodic evaluations.

1.4.1 Assumptions Used in Projected Water Budget Development

Model information and assumptions summarized in this section are based on provisional documentation on the model. Additional information will be provided in the USGS model report, when released. These assumptions are not policy decisions regarding management that should occur, but rather are intended to provide a reasonable projected water budget that represents what may occur independent of new PMAs. Future modeling may be used to understand the projected water budget under different assumptions.

The SVOM simulations used to develop the projected water budget simulations include the following assumptions:

- Land Use: The land use is assumed to be static, including crop types and water demands, aside from a semi-annual change to represent crop seasonality. The annual pattern is repeated every year in the model. Land use specified in the model by USGS reflects the 2017 land use.
- Agricultural Pumping: The SVOM derives agricultural pumping through a USGS modeling process called the Farm Process, whereby agricultural demand is driven by evapotranspiration, crop type, and crop coefficient, and it is met through available precipitation, surface water and recycled water where available, and groundwater extraction for the remaining quantity needed. Since land use is held constant and the climate change scenario includes a warmer future, agricultural demand and groundwater pumping is higher than in the historical water budget.
- Municipal and Industrial Pumping: Urban growth is assumed to be static to remain consistent with land use assumptions. If urban growth is infill, this assumption may result in an underestimate of net pumping increases and an underestimate of the Subbasin's future overdraft. If urban growth replaces agricultural irrigation, the impact may be minimal because urban growth will replace existing agricultural water use.
- Reservoir Operations: The reservoir operations reflect MCWRA's current operational rules. In the SVOM, Nacimiento and San Antonio Reservoir receive inflow based on the precipitation and runoff in the watershed model, and releases are made according to the operational rules.
- Stream Diversions: The SVOM explicitly simulates only 2 stream diversions in the Salinas Valley Basin: Clark Colony and the Salinas River Diversion Facility (SRDF). The Clark Colony diversion is located along Arroyo Seco and diverts stream water to an agricultural area nearby. The SRDF came online in 2010 and diverts water from the Salinas River to the Castroville Seawater Intrusion Project (CSIP) area. Clark Colony diversions are repeated from the historical record to match the water year. SRDF diversions are made throughout the duration of the SVOM whenever reservoir storage and streamflow conditions allow during the period from April through October. For purposes of the projected water budgets, SRDF diversions are specified at a rate of 18 cubic feet per second.
- Recycled Water Deliveries: Recycled water has been delivered to the CSIP area since 1998 as irrigation supply. The SVOM includes recycled water deliveries throughout the duration of the model.

Modifications were made to the SVOM to incorporate anticipated climate change, in accordance with recommendations made by DWR in their *Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development* (DWR, 2018). The following datasets were modified to account for projected climate change in 2070:

- Regional climate data including precipitation and potential evapotranspiration
- Streams flows along the margins of the model
- Direct precipitation and evapotranspiration on the San Antonio and Nacimiento Reservoirs
- Streamflow into the San Antonio and Nacimiento Reservoirs
- Sea level

Additional modifications include modifying SRDF diversions and CSIP supplemental wells maximum pumping capacity to be more in line with reported values.

Climate Data

DWR provided climate change datasets that were derived by taking the historical interannual variability from 1915 through 2011 and increasing or decreasing the magnitude of events based on projected changes in precipitation and temperature from general circulation models. These datasets of climate projections for 2070 conditions were derived from a selection of 20 global climate projections recommended by the Climate Change Technical Advisory Group as the most appropriate projections for California water resources evaluation and planning. Years after 2011 were adapted based on SVOM climate scenarios and the climate change adjustments for similar hydrologic years.

Streamflow

DWR provided monthly adjustment factors for unimpaired streamflow throughout California. For the Salinas Valley, these factors are provided for each major watershed, and streamflows along the margins of the Basin are modified by them. As with the climate data, climate change factors were extended beyond 2011 through using the factors on similar hydrologic years.

Sea Level

DWR guidance recommends using a single static value of sea level rise for each of the climate change scenarios (DWR, 2018). For the 2070 scenario, the DWR-recommended sea level rise value of 45 centimeters is used.

1.4.2 Projected Surface Water Budget

Average projected surface water budget inflows and outflows for the 2070 water budget are quantified in Table 10. As with the current water budget, the boundary stream inflows and outflows are much greater than the other components.

Table 10. SVOM Projected Average 2070 Surface Water Inflow and Outflow Components with Climate Change

Projected Climate Change Timeframe	2070
Boundary Stream Inflows	891,100
Runoff to Streams	46,300
Direct Precipitation	300
Net Flow between Surface Water and Groundwater	-112,900
Boundary Stream Outflows	-819,500
Diversions	-5,300

Values are in AF/yr

Note: provisional data subject to change

1.4.3 Projected Groundwater Budget

Average projected groundwater budget inflows for the 2070 climate change assumptions are quantified in Table 11. The biggest contributors to groundwater inflows are deep percolation of stream flow and deep percolation of precipitation and applied irrigation.

Table 11. SVOM Projected Average 2070 Groundwater Inflow Components with Climate Change

Projected Climate Change Timeframe	2070
Deep Percolation of Stream Flow	130,100
Deep Percolation of Precipitation and Applied Irrigation	71,600
Inflow from Eastside Subbasin	8,600
Inflow from Forebay Subbasin	8,400
Inflow from Monterey Subbasin	9,900
Inflow from Langley Subbasin	400
Inflow from Pajaro Valley Basin	200
Inflow from Surrounding Watersheds	500
Inflow Across Coastline	8,300
Total Inflows	238,000

Values are in AF/yr

Note: provisional data subject to change

Average annual SVOM projected groundwater budget outflows for the 2070 water budget are quantified in Table 12. As in the historical and current water budgets, the greatest outflow is groundwater pumping. Negative values are shown in Table 12 to represent outflows. Groundwater pumping is 12% greater than the historical water budget, which is mainly due to the warmer climate change assumptions driving higher evapotranspiration to maintain the same crops. This water budget does not represent any policy decisions regarding future pumping, but rather estimates future pumping and other inflows and outflows if current urban pumping and agricultural land use is maintained in the future.

Table 12. SVOM Projected Average 2070 Groundwater Outflow Components with Climate Change

Projected Climate Change Timeframe	2070
Groundwater Pumping	-147,300
Flows to Drains	-8,600
Flow to Streams	-2,200
Groundwater Evapotranspiration	-36,800
Outflow to Eastside Subbasin	-35,700
Outflow to Forebay Subbasin	-200
Outflow to Monterey Subbasin	-11,400
Outflow to Langley Subbasin	-200
Outflow to Pajaro Valley Basin	-600
Outflow to Surrounding Watersheds	-100
Outflow Across Coastline	-300
Total Outflows	-243,400

Values are in AF/yr
Note: provisional data subject to change

The SVOM projects average annual overdraft from groundwater levels to be 2,300AF/yr for 2070. It does not account for loss of usable storage due to seawater intrusion; however, seawater intrusion is included in the projected sustainable yield. Average annual loss of groundwater storage due to changes in groundwater levels is less in the projected water budget than in the historical water budget, even though there is no change in land use. Loss of annual groundwater storage is likely due primarily to the applied climate change assumptions. The DWR climate change scenario generally includes warmer and wetter conditions, which has greater precipitation and streamflow and increases agricultural groundwater pumping due to higher evapotranspiration. While the model includes increased precipitation from climate change, it does not account for the frequency and magnitude of storm events. If storm events concentrate precipitation within short periods, more water may run off than infiltrate. Regarding future recharge, more analysis needs to be done.

Combining Table 11 and Table 12 yields the SVOM projected net groundwater inflow and outflow results for the 2070 water budget with climate change. These flows are shown in Table 13. Negative values indicate outflows or depletions. Projected average annual overdraft in 2070 due to groundwater levels is estimated to be 2,300 AF/yr. Inflow across the coastal boundary is shown as an inflow in the table because it represents seawater flow into the Subbasin in the model. Water budget estimates will be refined in the future with improved versions of the model.

Table 13. Average SVOM Projected Annual Groundwater Budget with Climate Change Conditions

	2070
Net Inflows	
Net Stream Exchange	127,900
Deep Percolation of Precipitation and Applied Irrigation	71,600
Net Coastal Inflow	8,000
Net Outflows	
Groundwater Pumping	-147,300
Net Flow from Adjacent Subbasins/Basin	-20,200
Flow to Drains	-8,600
Groundwater Evapotranspiration	-36,800
Net Change In Storage (overdraft)	
Change in Storage due to Groundwater Levels	-2,300

Values are in AF/yr

Note: provisional data subject to change. The water budget does not balance exactly due to a combination of model error and rounded water budget components.

SVOM projected groundwater pumping by water use sector is summarized in Table 14. Because the model assumes static urban growth, future municipal and industrial pumping may result in underestimates of net pumping increases and the Subbasin's future overdraft. The 2070 model simulations predict that agriculture will account for about 90% of pumping. Similar to the SVIHM, domestic pumping is not included in the SVOM future projections simulation since it is a minimal part of the Subbasin's pumping.

Table 14. SVOM Projected Annual Groundwater Pumping by Water Use Sector

	2070	Historical Average (WY 1980-2018)
Municipal & Industrial	-14,800	-15,900
Agricultural	-132,500	-115,500
Total Pumping	-147,300	-131,400

Values are in AF/yr

Note: provisional data subject to change

1.4.4 Projected Sustainable Yield

Projected sustainable yield is the long-term pumping that can be sustained once all undesirable results have been addressed. However, it is not the amount of pumping needed to stop undesirable results before sustainability is reached. The SVBGSA recognizes that depending on the success of various proposed projects and management actions there may be some years when pumping must be held at a lower level to achieve necessary rises in groundwater elevation. The actual amount of allowable pumping from the Subbasin will be adjusted in the future based on the success of projects and management actions.

Average annual change in usable storage is due to both groundwater level change and seawater intrusion that renders the area within the 500 mg/L chloride isocontour generally unusable. This projected water budget estimates this through summing the change in groundwater storage due to groundwater levels from the SVOM 2070 simulation with the average annual change in storage due to seawater intrusion from the Seawater Intrusion Model 2070 No Project Scenario. The seawater intrusion was calculated in a similar manner as the historical seawater intrusion, using the simulated 2020 and 2070 500 mg/L chloride isocontours, average thickness of each aquifer, and effective porosity. The 2070 No Project Scenario model run did not simulate climate change; however, model runs with climate change simulated similar chloride isocontours.

To retain consistency with the historical sustainable yield, projected sustainable yield has been estimated as:

Sustainable yield = pumping + change in storage due to groundwater levels
+ change in storage due to seawater intrusion

The variable density Seawater Intrusion Model will be used to further evaluate the Subbasin-side pumping reductions and/or other PMAs that will be necessary to prevent additional net decreases in storage of usable groundwater from seawater intrusion. The SWI Model and/or the SVOM will be used to refine estimates of projected sustainable yield accordingly in future periodic evaluations. For this sustainable yield discussion and associated computations, groundwater pumping outflows are reported as positive values, which is opposite of how the values are reported in the water budget tables. The projected sustainable yield value will be updated in future periodic evaluations as more data are collected and additional analyses are conducted and the SVOM improved.

Although the sustainable yield values provide guidance for achieving sustainability, simply reducing pumping to within the sustainable yield is not proof of sustainability. Sustainability must be demonstrated through the Sustainable Management Criteria (SMC). Table 15 provides estimates of the future sustainable yield. As described for the historical sustainable yield, data indicate that the Subbasin has historically been in overdraft (on the order of 22,700 AF/yr decline in groundwater storage). The estimated total projected loss of storage for the Subbasin is 10,400 AF/yr, which is the sum of storage loss due to seawater intrusion (8,100 AF/yr) and net storage loss due to groundwater level changes (2,300 AF/yr). Using this estimate of loss in storage, the projected sustainable yield for the Subbasin is 136,700 AF/yr, based on the projected average water budget. This is higher than the historical sustainable yield in part due to greater groundwater recharge in the future associated with the applied climate change assumptions. In addition to the inherent uncertainty that exists in all numerical models, this estimate is based on results from a provisional version of the SVOM. Sustainable yield estimates will be refined and improved in future periodic evaluations.

Table 15. Projected Sustainable Yields for the 180/400 Subbasin Derived from GEMS, Observed Groundwater Levels, and Mapped Seawater Intrusion Areas

	2070 Projected Sustainable Yield	Historical Average (WY 1980-2018)
Total Subbasin Pumping	147,300	131,400
Change in Storage due to Groundwater Levels	-2,300	-10,100
Change in Storage due to Seawater Intrusion	-8,100	-12,600
Estimated Sustainable Yield	136,700	108,700

Values are in AF/yr

Note: Pumping is shown as positive value for this computation. Change in storage value is based on observed groundwater measurements and seawater intrusion is based on mapped areas of intrusion, as previously described in the text for historical water budgets.

Table 15 includes the adjusted estimate of historical sustainable yield for comparison purposes. Although the sustainable yield values provide guidance for achieving sustainability, simply reducing pumping to within the sustainable yield is not proof of sustainability. Sustainability must be demonstrated through the SMC. The sustainable yield value will be modified and updated as more data are collected and more analyses are performed.

1.4.5 Uncertainties in Projected Water Budget Simulations

Models are mathematical representations of physical systems. They have limitations in their ability to represent physical systems exactly and due to limitations in the data inputs used. There is also inherent uncertainty in groundwater flow modeling itself, since mathematical (or numerical) models can only approximate physical systems and have limitations in how they compute data. However, DWR (2018) recognizes that although models are not exact representations of physical systems because mathematical depictions are imperfect, they are powerful tools that can provide useful insights.

There is additional inherent uncertainty involved in estimating water budgets with projected climate change based on the available scenarios and methods. The DWR recommended 2070 central tendency scenarios that are used to develop the projected water budgets with the SVOM provide a dataset that can be interpreted as the most likely future conditions. There is an approximately equal likelihood that actual future conditions will be more stressful or less stressful than those described by the recommended scenarios (DWR, 2018).

As stated in DWR (2018):

> *"Although it is not possible to predict future hydrology and water use with certainty, the models, data, and tools provided [by DWR] are considered current best available science and, when used appropriately should provide GSAs with a reasonable point of reference for future planning."*

1.5 Subbasin Water Supply Availability and Reliability

Water is not imported into the 180/400 Subbasin. However, a significant portion of the Subbasin's recharge is derived from reservoir releases that regulate Salinas River streamflow. The historical water budget incorporates years when there was little availability of surface water flow and groundwater elevations declined as a result. Figure 5 shows that when Salinas River flows were low, deep percolation to groundwater was also low. Declines in groundwater levels during these years contributed to chronic groundwater storage loss and seawater intrusion during the historical period. The projected water budgets are developed with the SVOM, which is based on historical surface water flows and groundwater conditions, and therefore projected water budgets incorporate reasonable fluctuations in water supply availability. MCWRA plans to revise the Habitat Conservation Plan (HCP) for the Salinas River, which may change the current reservoir release schedule. A revised reservoir release schedule could influence the reliability of groundwater recharge.

1.6 Uncertainties in Water Budget Calculations

As previously described, the level of accuracy and certainty is highly variable between water budget components. A few water budget components are directly measured, but most water budget components are either estimated inputs to the model, simulated by the model, or adjusted to account for model errors and limited calibration to storage loss and seawater intrusion. Additional model uncertainty stems from an imperfect representation of natural condition and is reflected in model calibration error. However, inputs to the models are carefully selected by the USGS using best available data, the model's calculations represent established science for groundwater flow, and the model calibration error is within acceptable bounds. Therefore, the models are the best available tools for estimating water budgets. The model results are provisional and subject to change in future periodic evaluations after the models are released by the USGS.

The following list groups water budget components in increasing order of uncertainty.

- Measured: metered municipal, agricultural, and some small water system pumping
- Simulated primarily based on climate data: precipitation, evapotranspiration, irrigation pumping
- Simulated based on calibrated model: all other water budget components

Simulated components based on calibrated model have the most uncertainty because those simulated results encompass uncertainty of other water budget components used in the model in addition to model calibration error.

Appendix 6A

Changes to RMS Monitoring Networks

The SVBGSA's monitoring networks comprise existing wells monitored by MCWRA as well as new monitoring wells installed by SVBGSA that will also be monitored by MCWRA. Of the existing wells, a subset was selected as RMS for the groundwater elevation and ISW monitoring networks. The seawater intrusion wells are no longer considered RMS wells because the seawater intrusion SMC are not measured at specific wells as described in the main text of the GSP 2025 Evaluation. All new wells installed by SVBGSA are RMS wells.

In GSP Amendment 1, the sustainability indicator for reduction of groundwater storage was revised to calculate change in storage based on change in groundwater elevations and advancement of the seawater intrusion front. Together, the groundwater elevation and seawater intrusion monitoring networks form the groundwater storage monitoring network. The SVBGSA's groundwater quality and land subsidence monitoring networks are dependent on other agencies' monitoring programs and are not discussed here.

Table 1 contains a list of the SVBGSA's RMS wells, the sustainability indicator the wells monitor, the year they were added to the network, and the year and reason for their removal from the network, if applicable. The RMS wells are labeled as "SGMA Representative," while the seawater intrusion wells are labeled as "SGMA." Many of the same wells are in multiple networks, as shown in Table 1. This table also notes whether the well was already in a monitoring network and was then included in another. For example, most of the groundwater elevation RMS wells in the 2020 GSP were included as part of the groundwater storage RMS monitoring network in GSP Amendment 1 when the groundwater storage SMC metric was changed. The year the well was first included in any of the monitoring networks is the year listed under the "Year Added to Network" field.

The main text of the GSP 2025 Evaluation includes maps summarizing the changes in the groundwater elevation, seawater intrusion, and ISW RMS networks. However, the seawater intrusion maps did not include labels with well names like the groundwater elevation and ISW RMS network maps. Figure 1, Figure 2, and Figure 3 show the seawater intrusion maps with well names for easy reference to Table 1 for the 180-Foot, 400-Foot, and Deep Aquifers, respectively.

Table 1. Representative Monitoring Network Changes

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
12S/02E-33H02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/01E-36J02	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-10K01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-19Q03	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
13S/02E-21N01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
13S/02E-21Q01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
13S/02E-24N01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-26L01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-27P01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-28L03	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-31N02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-32E05	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
13S/02E-32J03	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (Annual Report WY 2022)		
13S/02E-33R01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (Annual Report WY 2022)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-02C03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-03F03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/02E-03F04	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/02E-05K01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (Annual Report WY 2022)		
14S/02E-06L01	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/02E-08M02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
14S/02E-10P01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/02E-11A02	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-11A04	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-11M03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-12B02	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/02E-12B03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-12Q01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
14S/02E-13F03	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-16A02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/02E-17C02	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-18B01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		Removed from groundwater elevation and storage monitoring network in GSP 2025 Evaluation; still used for seawater intrusion monitoring
14S/02E-21L01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-22A03	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-22L01	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from groundwater elevation RMS network and seawater intrusion monitoring network because the well was destroyed.
14S/02E-26H01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/02E-27A01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/02E-27G03	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/02E-28C02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		Removed from groundwater elevation and storage monitoring network in GSP 2025 Evaluation; still used for seawater intrusion monitoring
14S/02E-34A03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-34B03	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-36E01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-36G01	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-18C01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/03E-18C02	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/03E-19G01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (Annual Report WY 2022)		
14S/03E-20C01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/03E-29F03	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/03E-30G08	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
14S/03E-31F01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
14S/03E-31L01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/02E-01A03	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/02E-02G01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/02E-12A01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/02E-12C01	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
15S/03E-03R02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-04Q01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-05C02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-08F01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-09E03	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-10D04	400-Foot and Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		Removed from groundwater elevation and storage monitoring network in GSP 2025 Evaluation; still used for seawater intrusion monitoring
15S/03E-13N01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-14P02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-15B01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-16F02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
15S/03E-16M01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
15S/03E-17E02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from groundwater elevation and storage RMS network because aquifer designation was revised.
15S/03E-17M01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
15S/03E-17P02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-25L01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-26A01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
15S/03E-26F01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/03E-28B02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/04E-29Q02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
15S/04E-31A02	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-04C01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-05M02	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-08H03	400-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
16S/04E-10R02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-11D51	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		Removed from groundwater elevation and storage monitoring network in GSP 2025 Evaluation; still used for seawater intrusion monitoring
16S/04E-13R02	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-15D01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network.
16S/04E-15R02	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/04E-25C01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (Annual Report WY 2022)		
16S/04E-25G01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/05E-30E01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
16S/05E-30J02	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
16S/05E-31M01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
17S/04E-01D01	180-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2022 (GSP Amendment)		
17S/05E-06C02	180-Foot Aquifer	SGMA Representative	SGMA Representative	SGMA	N/A	2020 (GSP)		Additionally established as reduction in groundwater storage RMS well in 2022 GSP Amendment 1; well was already in groundwater elevation RMS network and seawater intrusion monitoring network.
13S/01E-25R01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-15M01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-15R02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-15R03	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-20J01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-28L02	180-Foot and 400-Foot Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-28M02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-31A02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-34G01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-34G02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-34J50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-34M01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-35H01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
13S/02E-36F50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/01E-13J01		N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because there is no well completion report available for this well and the aquifer designation is unknown.
14S/02E-01C01	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-02A02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-03H01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-03M02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-03P01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-03R02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-04H01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-05C03	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-05R03	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-07J03	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-08C03	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-09D04	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-09N02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-10H01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-10M02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-10N51	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-11A03	Shallow Sediments	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because the well is not in a principal aquifer.
14S/02E-11B01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-13E50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-13F02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-13G01	180-Foot and 400-Foot Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-14R02	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-14R50	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-15A01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-15L02	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-15N01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-15P01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-19G01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-20B01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-20E01	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-21K04	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-21L02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-22J02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-22P02	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-22R01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-23G02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-23J02	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-23P02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-24E01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-24P02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-24Q01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-25A03	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-25D51	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26A10	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26C50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26D01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-26G01	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-26J03	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-26J04	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26N03	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26N50	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-26P01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-27C02	180-Foot and 400-Foot Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-27F02	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-27J02	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-27K02	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-28H04	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-29C01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-34A04	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/02E-34M01	Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
14S/02E-35B01	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/02E-36F03	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-07D50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-07K51	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-07P02	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-07P50	400-Foot and Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-18E03	180-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2024 (Periodic Evaluation)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/03E-18E04	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-18P51	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-19C01	Deep Aquifers	SGMA Representative	SGMA Representative	SGMA	N/A	2022 (GSP Amendment)		Additionally established as reduction in groundwater elevation and storage RMS well in GSP 2025 Evaluation; well was already in seawater intrusion monitoring network.
14S/03E-30E03	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-30F01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-31B01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
14S/03E-31F02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/02E-01Q50	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/02E-02A01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
15S/02E-03B05	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/03E-03N58	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/03E-05R52	400-Foot and Deep Aquifers	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/03E-07K01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
15S/03E-08L01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
16S/04E-03K01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
16S/04E-08H01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
16S/04E-08H02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2020 (GSP)		Added to ISW RMS network for 2022 GSP Amendment and removed from ISW RMS network Annual Report 2022; still used for seawater intrusion monitoring.
16S/04E-08H04	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2020 (GSP)		Removed from groundwater elevation in 2022 GSP Amendment 1; still used for seawater intrusion monitoring.
16S/05E-31P01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2022 (GSP Amendment)		
16S/05E-31P02	180-Foot Aquifer	N/A	N/A	SGMA	SGMA Representative	2022 (GSP Amendment)		
17S/05E-06C01	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2020 (GSP)		Removed from groundwater elevation in 2022 GSP Amendment 1; still used for seawater intrusion monitoring.
13S/02E-29D03	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Well destroyed
13S/02E-32A02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (WY 2022 Annual Report)	Well destroyed
14S/02E-05F04	400-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Well destroyed
13S/02E-29D04	180-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Well can't be sampled
13S/02E-13N01	180-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Well can't be sampled

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
16S/04E-27B02	180-Foot Aquifer	N/A	N/A	N/A	N/A	2022 (GSP Amendment)	2022 (WY 2022 Annual Report)	Well can't be sampled
14S/01E-24L02	Deep Aquifers	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well is not in the Subbasin.
14S/01E-24L03	Deep Aquifers	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well is not in the Subbasin.
14S/01E-24L04	Deep Aquifers	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well is not in the Subbasin.
14S/01E-24L05	Deep Aquifers	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well is not in the Subbasin.
14S/02E-04G02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-09K02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-10E02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-14A01	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-14L03	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-15C02	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-16G01	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
14S/02E-22B01	400-Foot Aquifer	N/A	N/A	N/A	N/A	2020 (GSP)	2022 (GSP Amendment)	Removed from seawater intrusion monitoring network because the well was destroyed.
13S/02E-32H01	180-Foot Aquifer	N/A	N/A	SGMA	N/A	2024 (Periodic Evaluation)		

Well	Aquifer	Chronic Lowering of Groundwater Levels Indicator	Reduction in Groundwater Storage Indicator	Seawater Intrusion Indicator	Depletion of Interconnected Surface Water Indicator	Year Added to Network	Year Removed from Network	Notes
13S/02E-32H02	400-Foot Aquifer	N/A	N/A	SGMA	N/A	2024 (Periodic Evaluation)		
13S/02E-15M03	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2024 (Periodic Evaluation)		Not monitored for groundwater elevations by MCWRA yet.
DA-1	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2024 (Periodic Evaluation)		
DA-2	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2024 (Periodic Evaluation)		
DA-3	Deep Aquifers	SGMA Representative	SGMA Representative	N/A	N/A	2024 (Periodic Evaluation)		
ISW-1	180-Foot Aquifer	N/A	N/A	N/A	SGMA Representative	2024 (Periodic Evaluation)		
14S/02E-15K01	400-Foot Aquifer	SGMA Representative	SGMA Representative	N/A	N/A	2024 (Periodic Evaluation)		

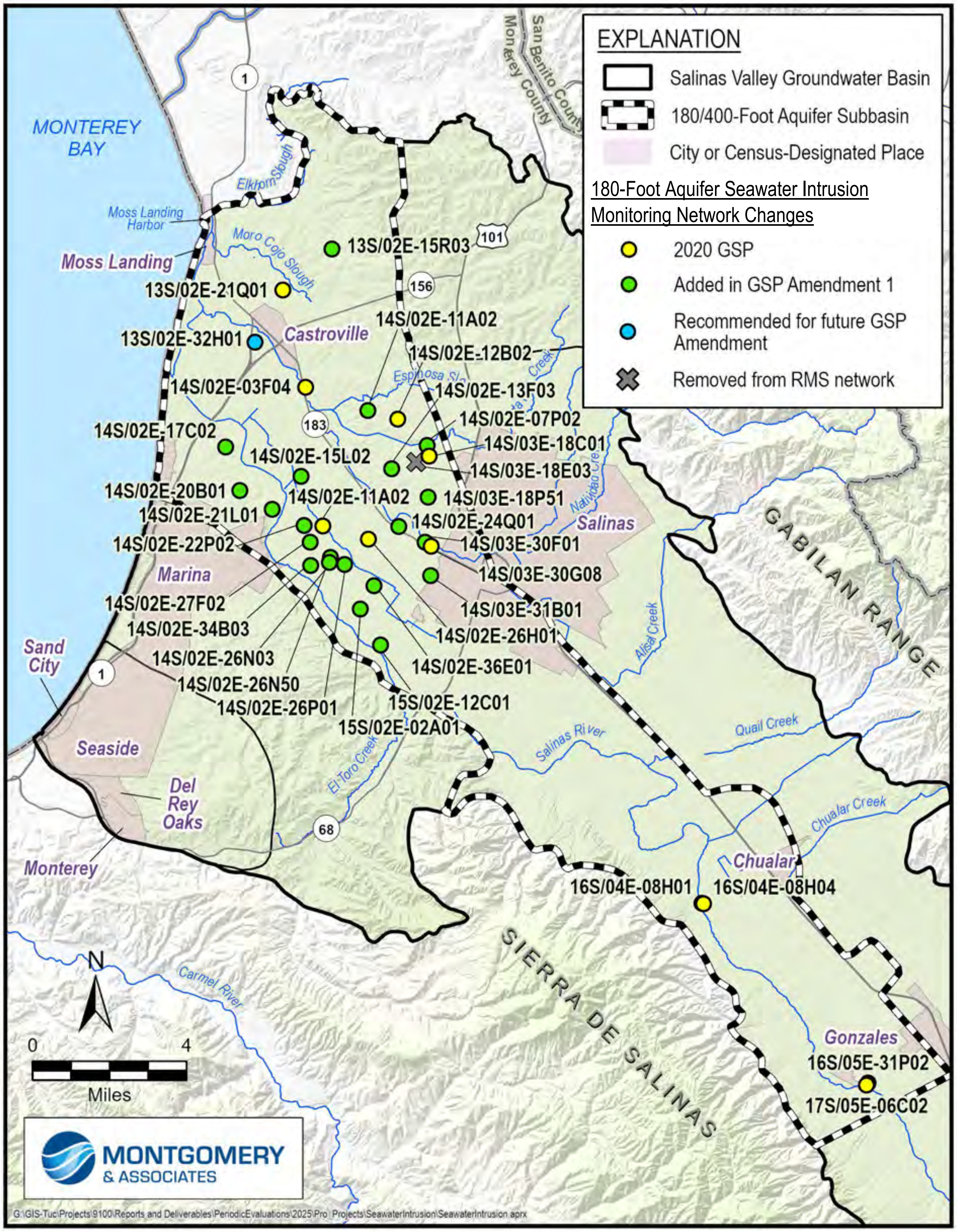
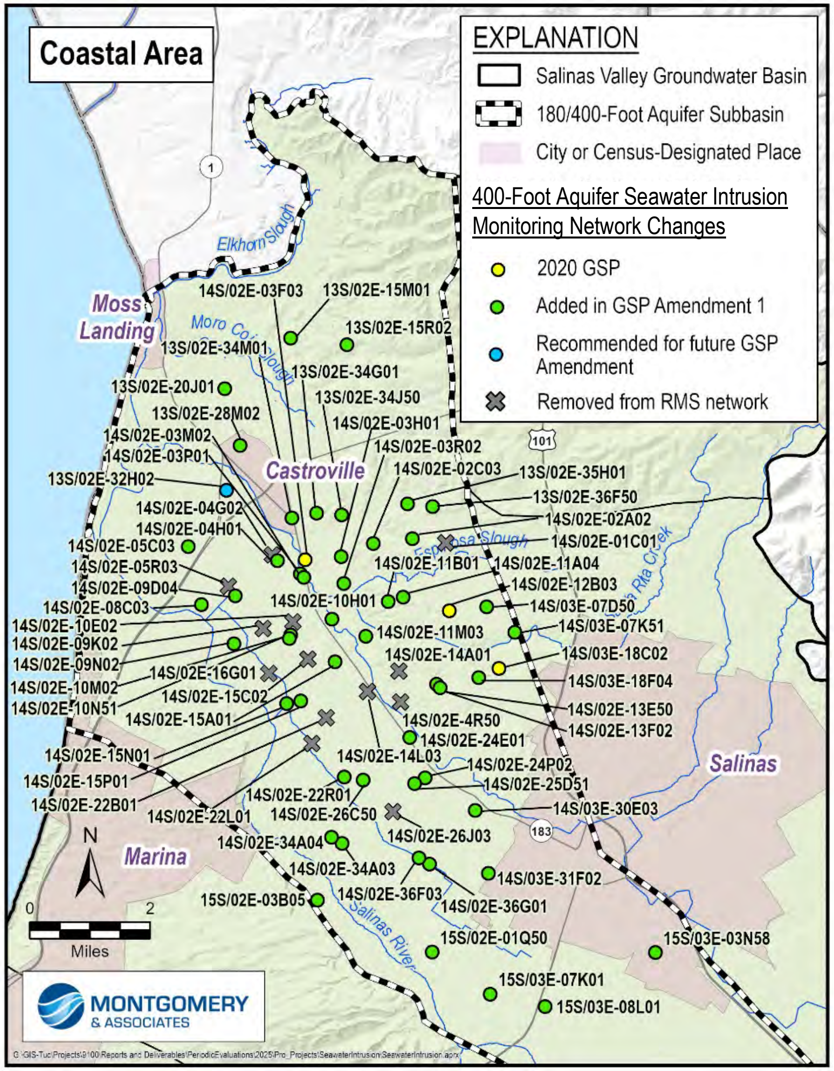


Figure 1. 180-Foot Aquifer Seawater Intrusion Monitoring Network to Reference Table 1



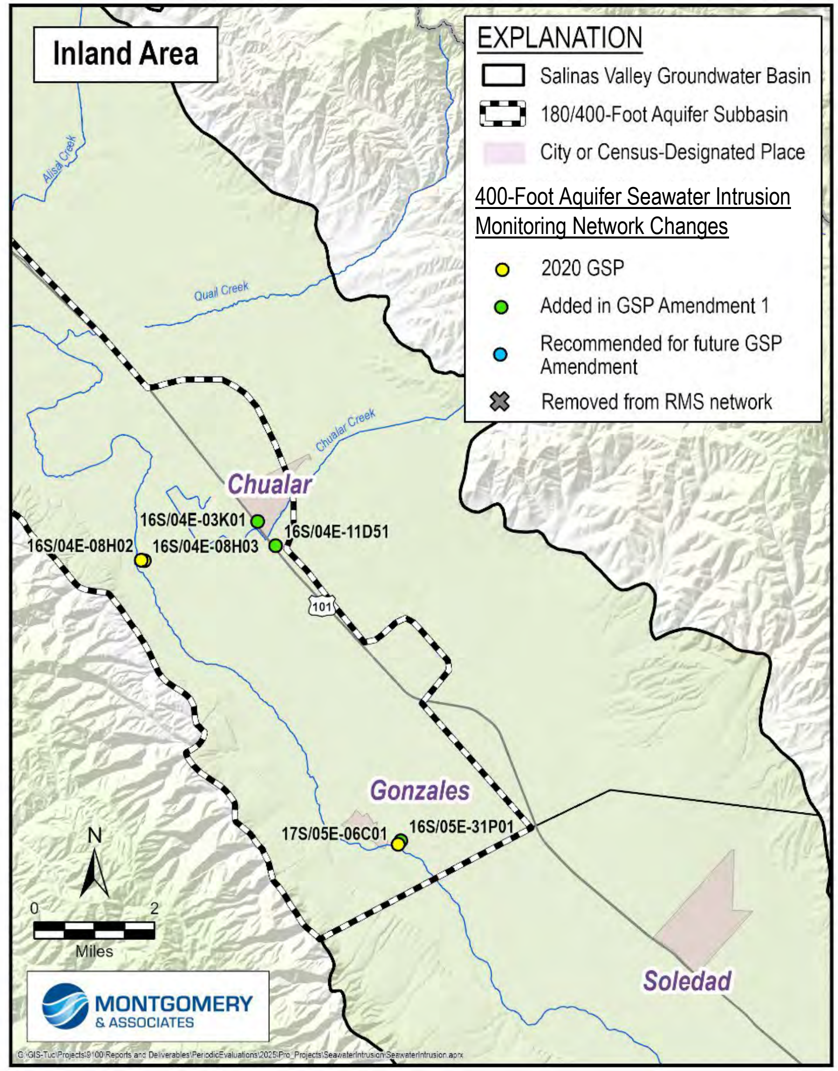


Figure 2. 400-Foot Aquifer Seawater Intrusion Monitoring Network to Reference Table 1

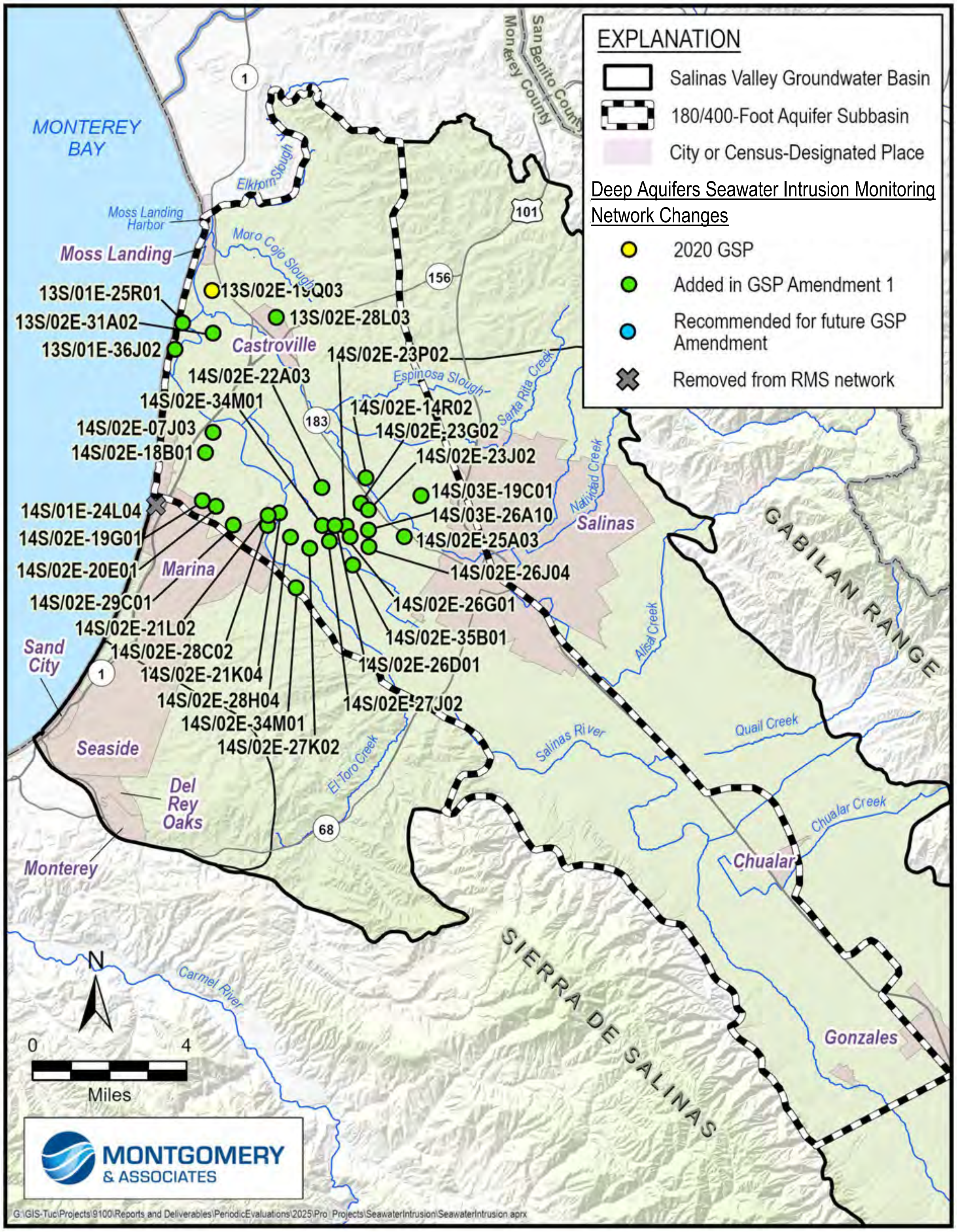


Figure 3. Deep Aquifers Seawater Intrusion Monitoring Network to Reference Table 1