Consideration and Adoption of Second Annual Report for SCV-GSA

SCV GSA Board Meeting

March 6, 2023

Item No. 3.2

Annual Report Overview

- Required by the Sustainable Groundwater Management Act (SGMA)
- Annual update of basin conditions and the progress implementing the Groundwater Sustainability Plan (GSP)
- Stakeholder involvement, GSA Board adoption, provision of report to the California Department of Water Resources (DWR)
- Nine sections relating to basin conditions, sustainability, and implementation

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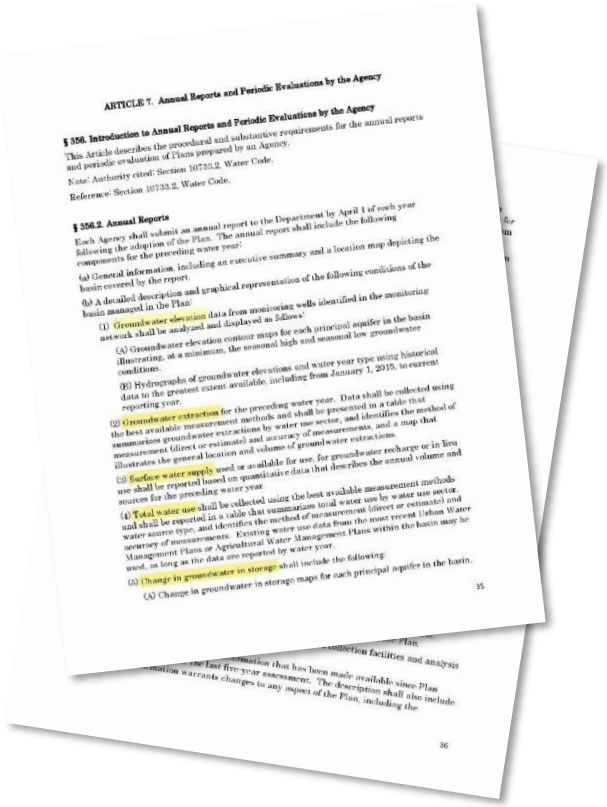
DWR Requirements for Annual Reports

1. Groundwater elevations
2. Groundwater extractions
3. Surface water supplies
4. Total water use
5. Change in groundwater in storage
6. Progress towards implementing the Groundwater Sustainability Plan



ARTICLE 7. Annual Reports and Periodic Evaluations by the Agency

§ 356. Introduction to Annual Reports and Periodic Evaluations by the Agency

This Article describes the procedural and substantive requirements for the annual reports and periodic evaluation of Plans prepared by an Agency.

Note: Authority cited: Section 10733.2, Water Code.

Reference: Section 10733.2, Water Code.

§ 356.2. Annual Reports

Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

(a) General information, including an executive summary and a location map depicting the basin covered by the report.

(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:

(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

(3) Surface water supply used or available for use, for groundwater recharge or in lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

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Scope of Annual Report

- Summarizes data collected through this most recent full water year (Water Year 2022; October 2021-September 2022)
- Describes progress towards implementing the Groundwater Sustainability Plan

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Summary of Conclusions Regarding Sustainability of Basin Operation

Sustainability Indicator	Above Minimum Thresholds and/or Trigger Levels?
Groundwater Elevations	Yes
Groundwater in Storage	Yes
Land Subsidence	Yes
Depletion of Interconnected Surface Water	Yes*
Degraded Groundwater Quality	Yes**

* Below at certain GDE monitoring locations due to survey issues
** Below in two management zones due to natural water quality

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Report Organization

Section	Topic
ES	Executive Summary
1	Introduction
2	Basin Setting and Monitoring Networks
3	Groundwater Elevations
4	Groundwater Extractions
5	Use of Surface Water and Imported Supplies
6	Total Water Use
7	Change in Groundwater in Storage
8	Progress toward Basin Sustainability
9	References
Appendices	A through E

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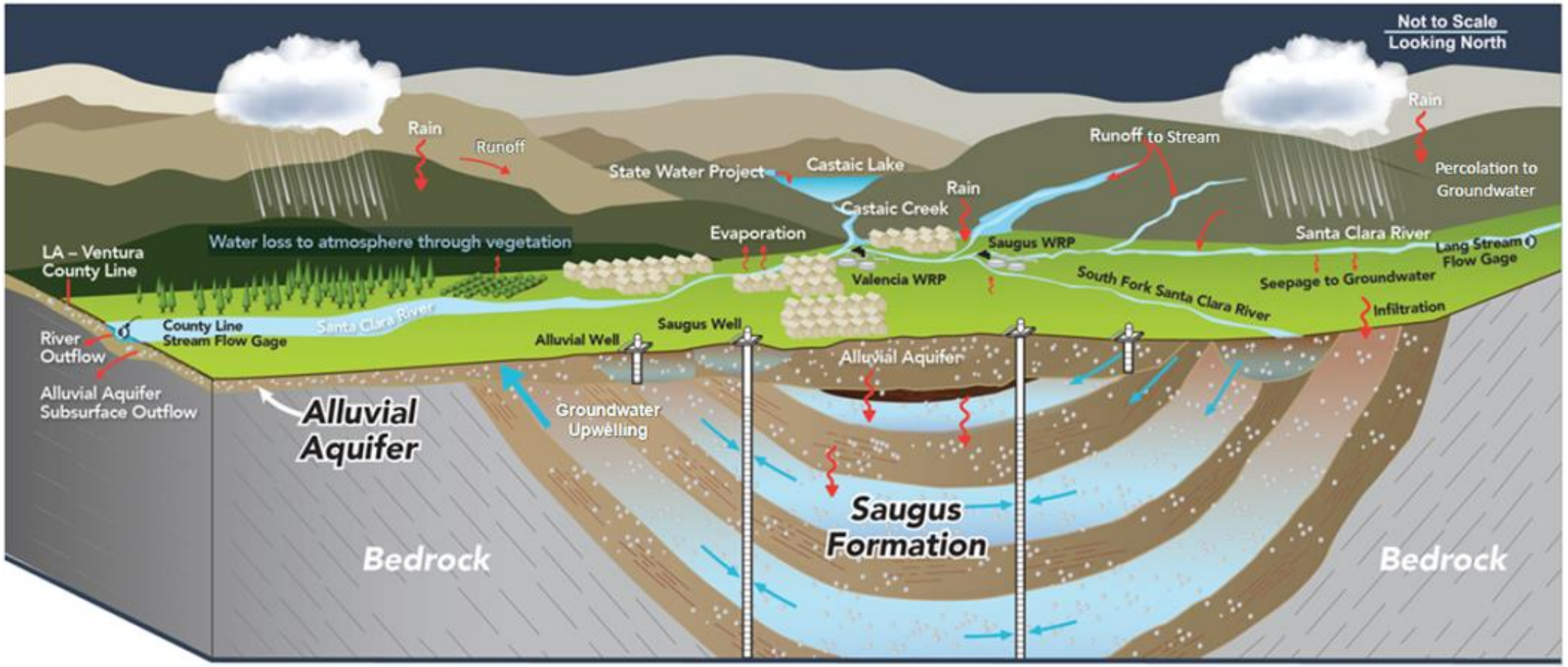
Section 2: Basin Setting

- Two principal aquifers (Alluvial Aquifer and Saugus Formation)



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Section 2: Basin Setting, Monitoring Network

- Precipitation and Climatic Periods (Wet, Dry, Normal)

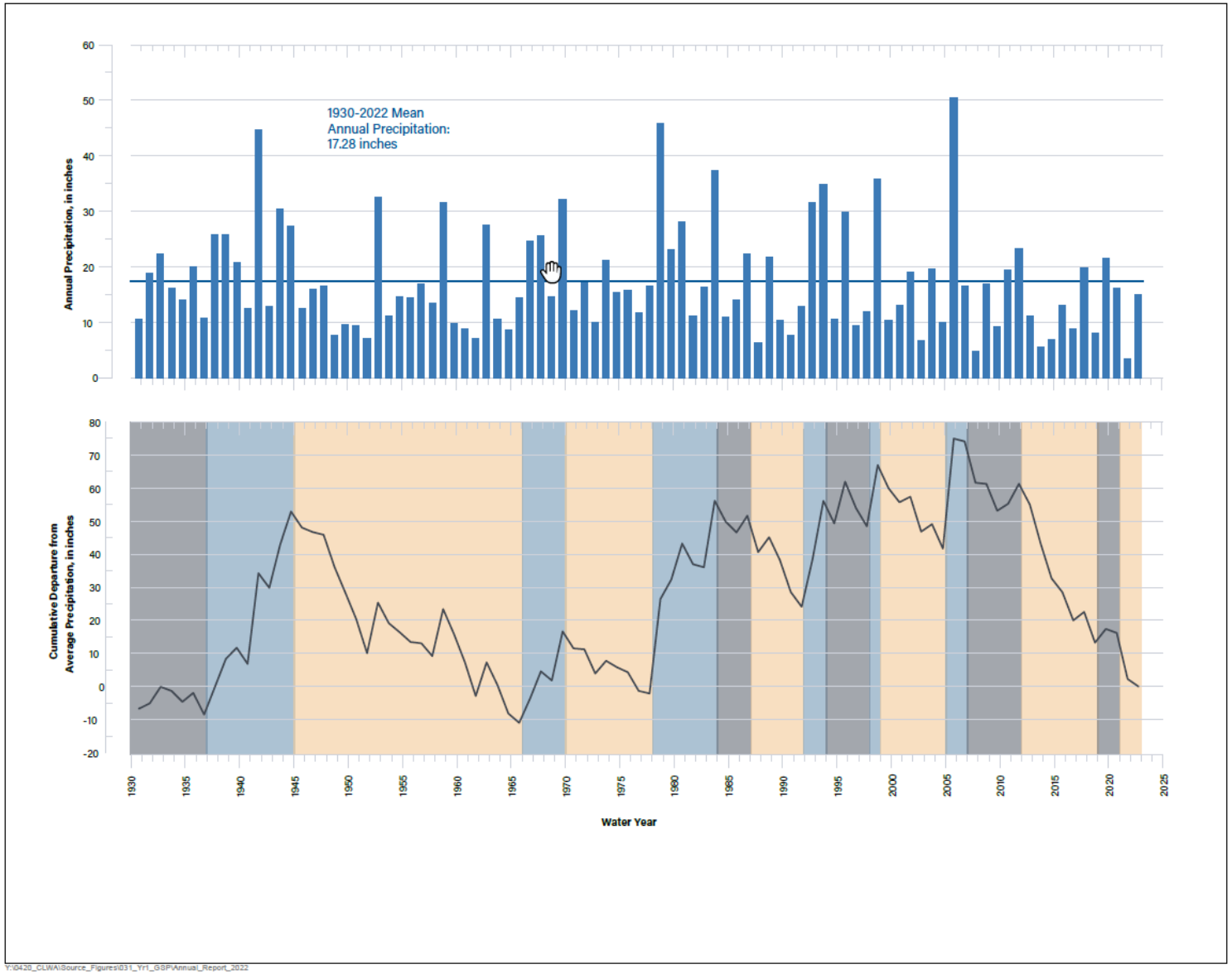

FIGURE 5

Annual Precipitation at the Newhall-Soledad (Newhall Fire Station #73) Rain Gage and Climatic Period Classification for the Santa Clara River Valley East Groundwater Subbasin

2022 Annual Report for the Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

LEGEND

- Cumulative Departure
- Mean Precipitation

Climatic Period Classification

- Wet
- Normal
- Dry

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Section 2: Basin Setting, Monitoring Network

- Precipitation and Climatic Periods (Using DWR Water Year Types)

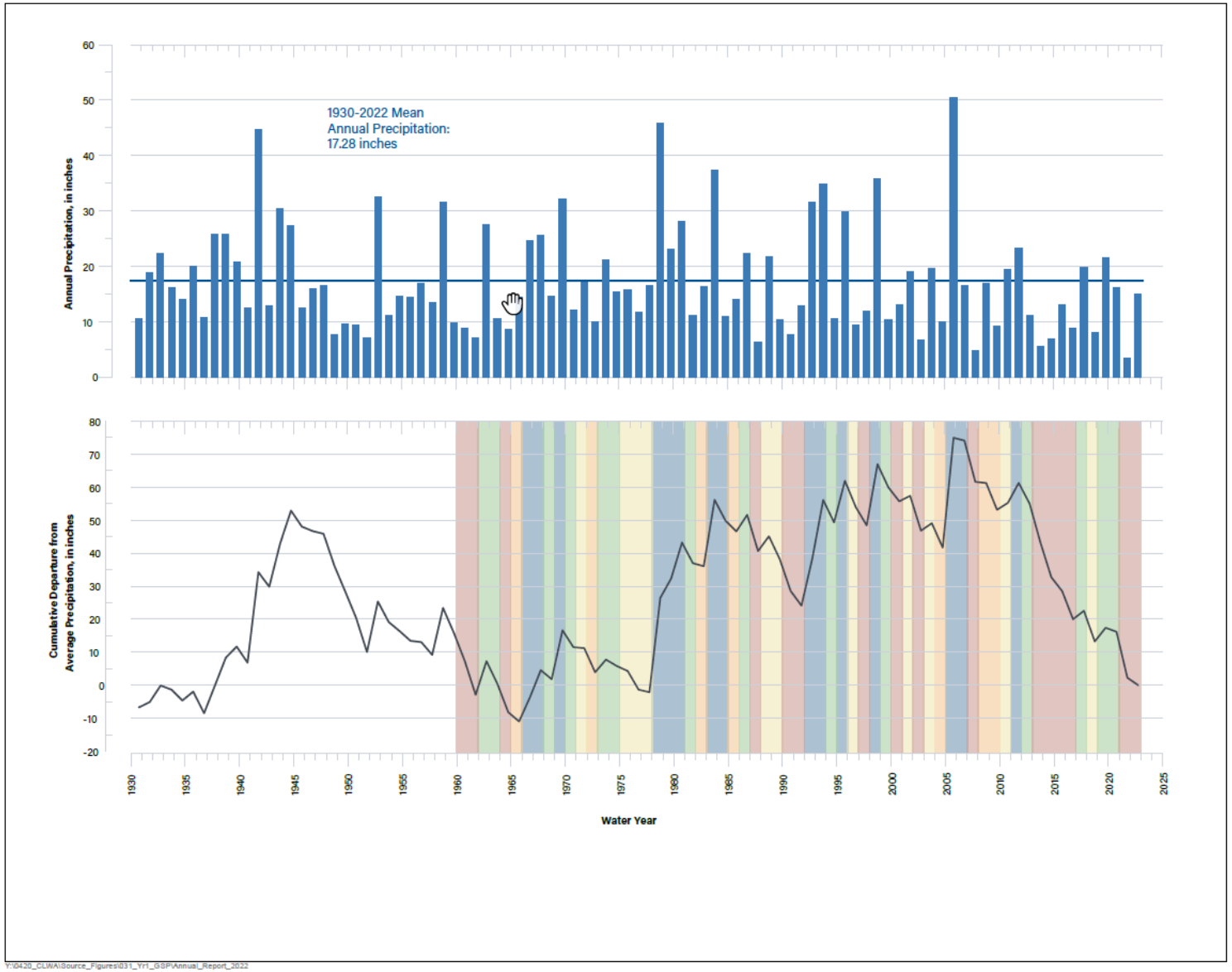

FIGURE 6

Annual Precipitation at the Newhall-Soledad (Newhall Fire Station #73) Rain Gage and Water Year Types for the Santa Clara River Valley East Groundwater Subbasin

2022 Annual Report for the Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

LEGEND

- Cumulative Departure
- Mean Precipitation

Water Year Type

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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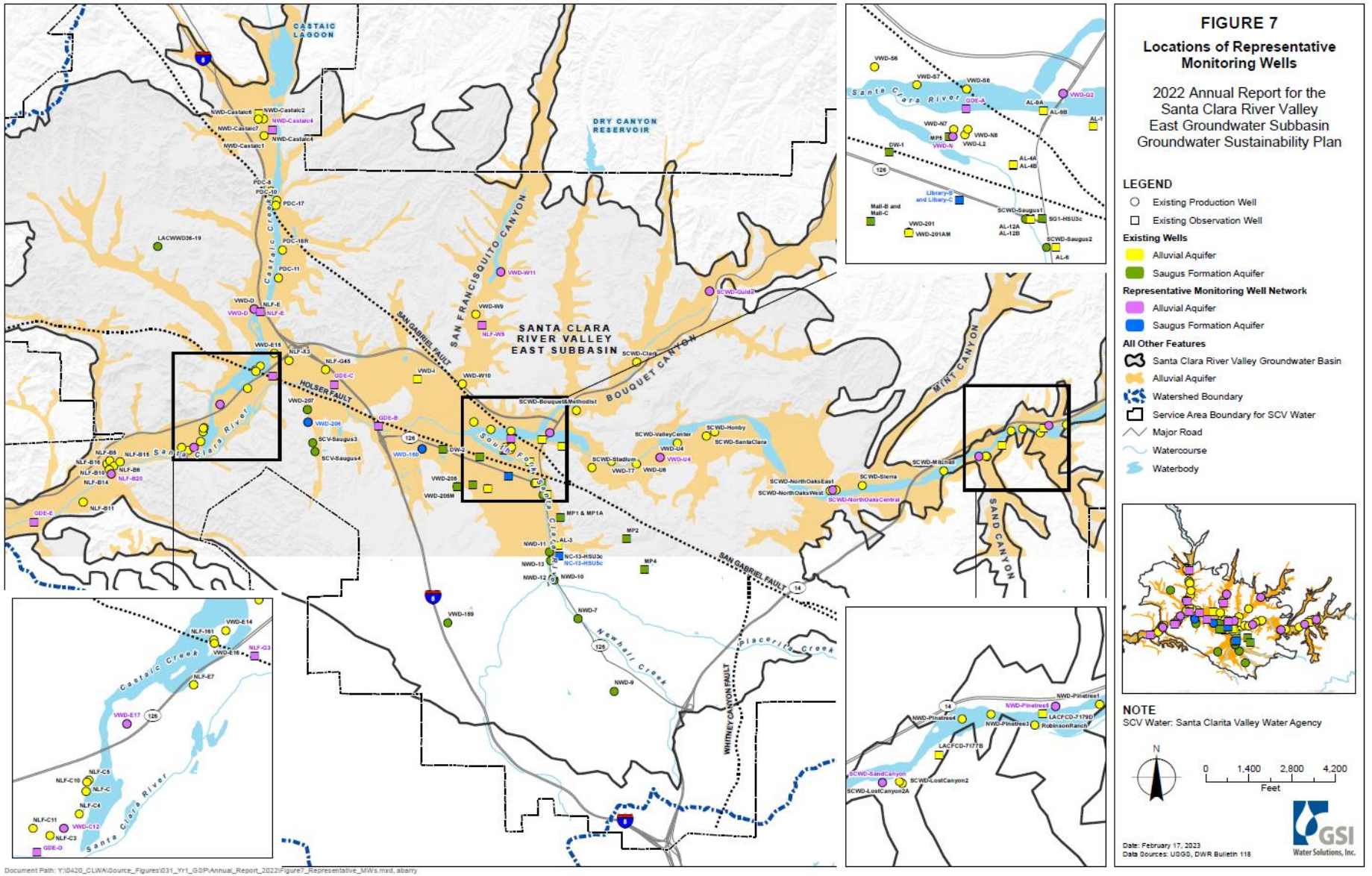
Section 2: Basin Setting, Monitoring Network

- Monitoring Network for Groundwater Elevations



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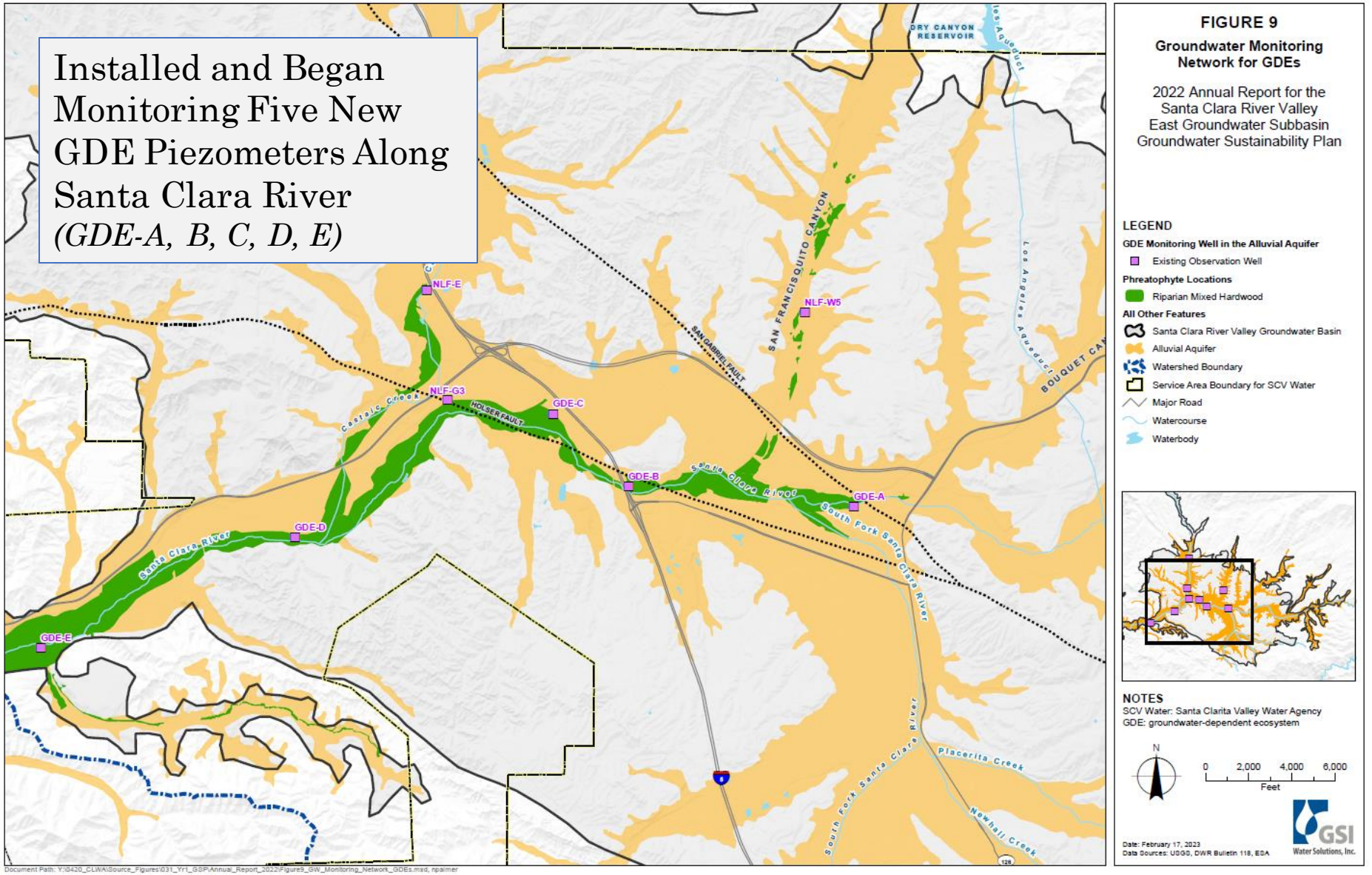
Section 2: Basin Setting, Monitoring Network

- Monitoring Network for Depletion of Interconnected Surface Water

Installed and Began Monitoring Five New GDE Piezometers Along Santa Clara River *(GDE-A, B, C, D, E)*



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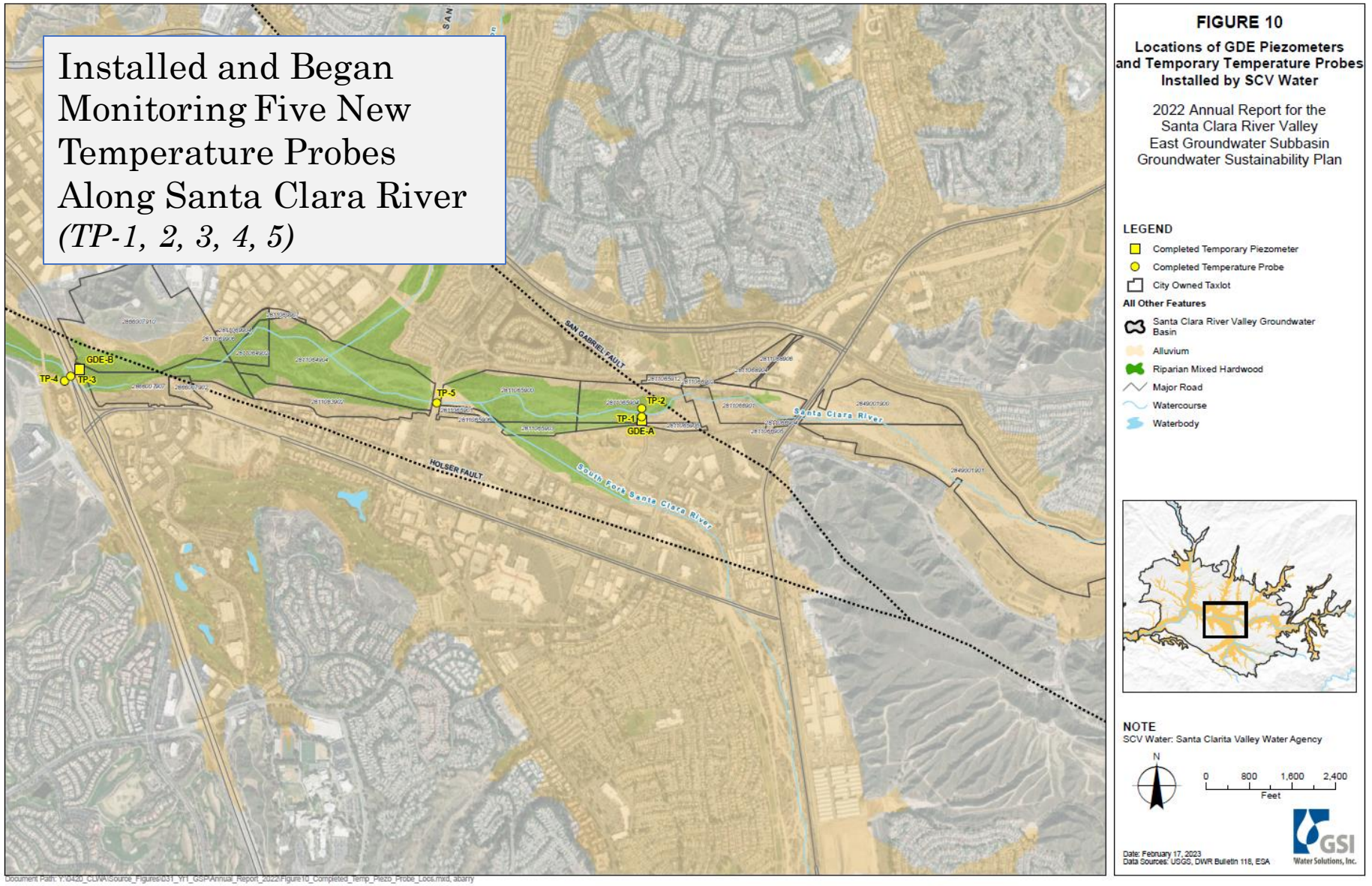
Section 2: Basin Setting, Monitoring Network

- Monitoring Network for Depletion of Interconnected Surface Water



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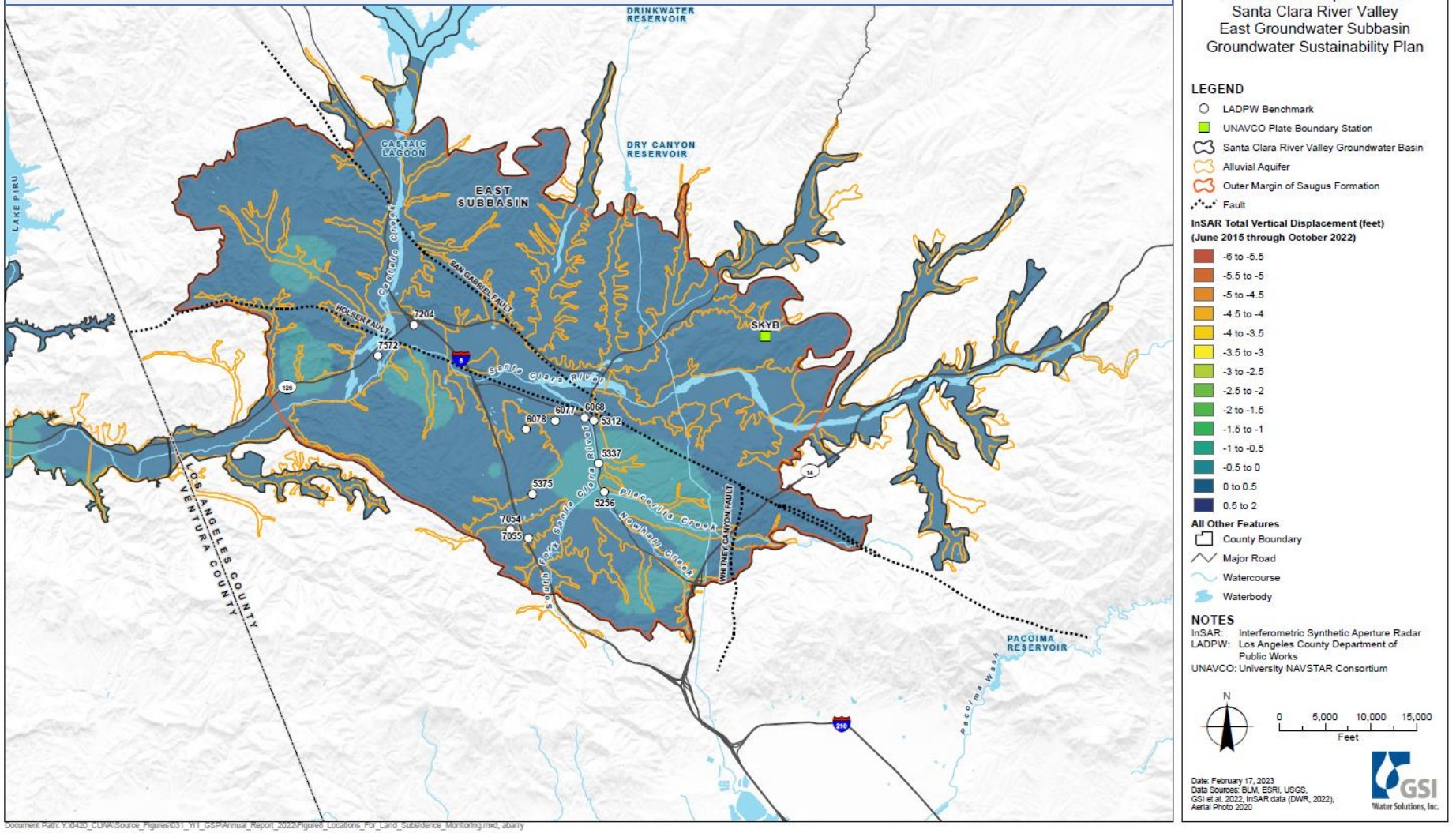
Section 2: Basin Setting, Monitoring Network

- Monitoring Network for Land Subsidence
  - Discussing benchmarks with LACDPW
  - Evaluated DWR InSAR Data for Water Year 2022



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Section 3: Groundwater Elevations

- Contour Map: Alluvial Aquifer for Seasonal-Low Conditions

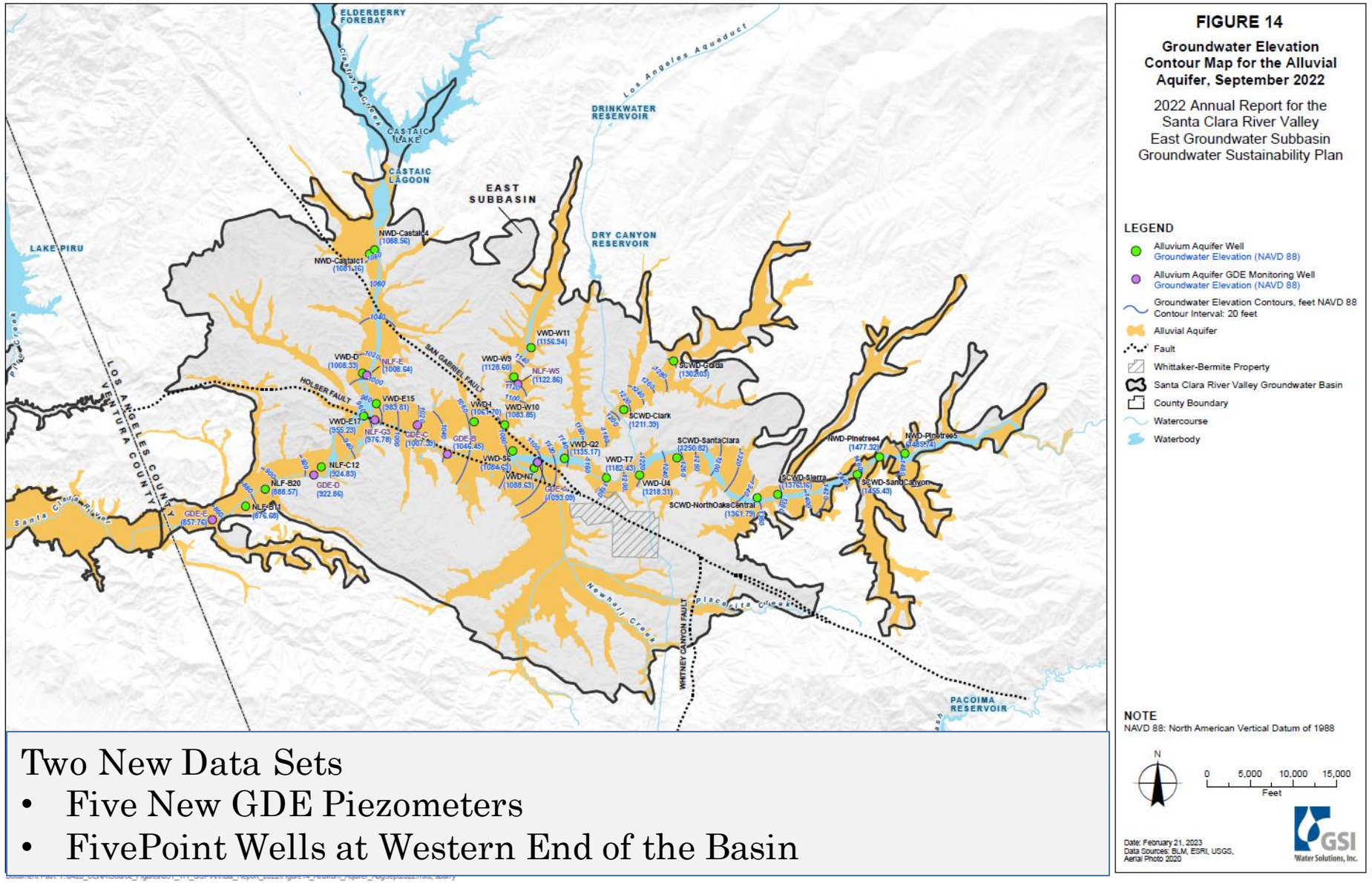

FIGURE 14

Groundwater Elevation Contour Map for the Alluvial Aquifer, September 2022

2022 Annual Report for the Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

LEGEND

- Alluvium Aquifer Well Groundwater Elevation (NAVD 88)
- Alluvium Aquifer GDE Monitoring Well Groundwater Elevation (NAVD 88)
- Groundwater Elevation Contours, feet NAVD 88 Contour Interval: 20 feet
- Alluvial Aquifer
- Fault
- Whittaker-Bermite Property
- Santa Clara River Valley Groundwater Basin
- County Boundary
- Watercourse
- Waterbody

NOTE
NAVD 88: North American Vertical Datum of 1988

N

0 5,000 10,000 15,000
Feet

Date: February 21, 2023
Data Sources: BLM, ESRI, USGS, Aerial Photo 2020

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Two New Data Sets

- Five New GDE Piezometers
- FivePoint Wells at Western End of the Basin

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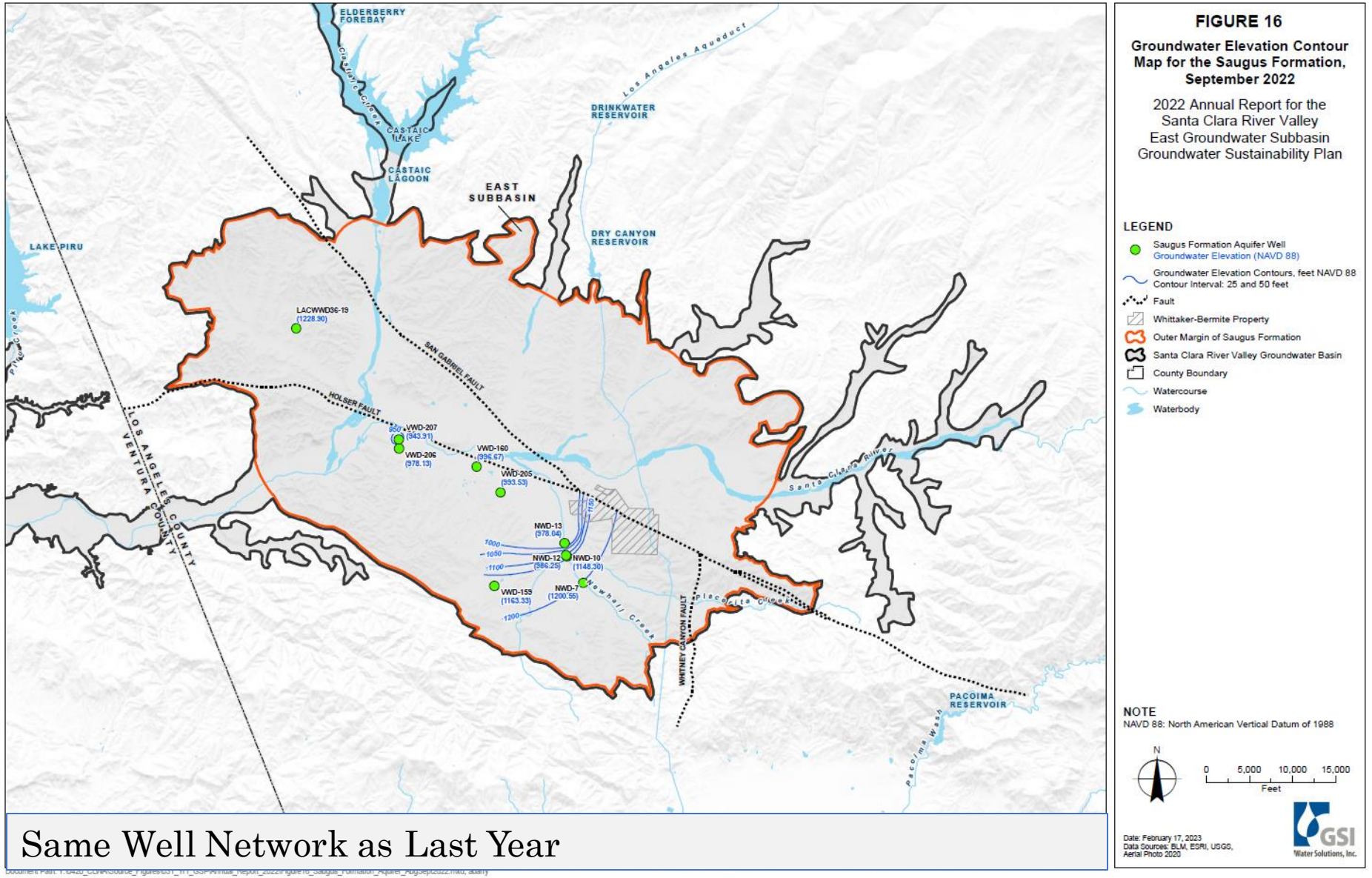
Section 3: Groundwater Elevations

- Contour Map: Saugus Formation for Seasonal-Low Conditions



Same Well Network as Last Year

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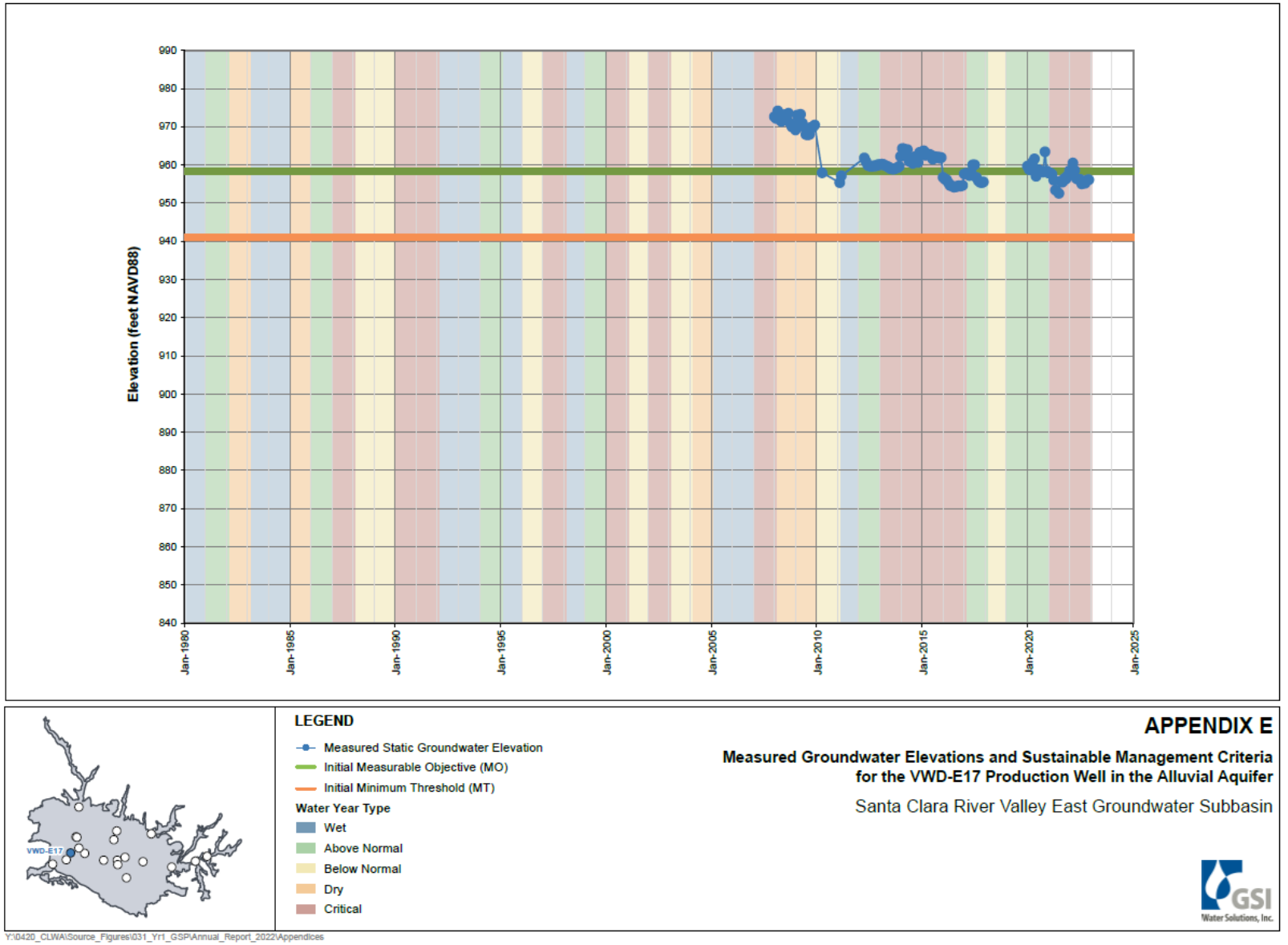
Section 3: Groundwater Elevations

- Hydrographs (Time-Series Plots) for Monitoring Network: Alluvial Aquifer



Western Portion of the Basin

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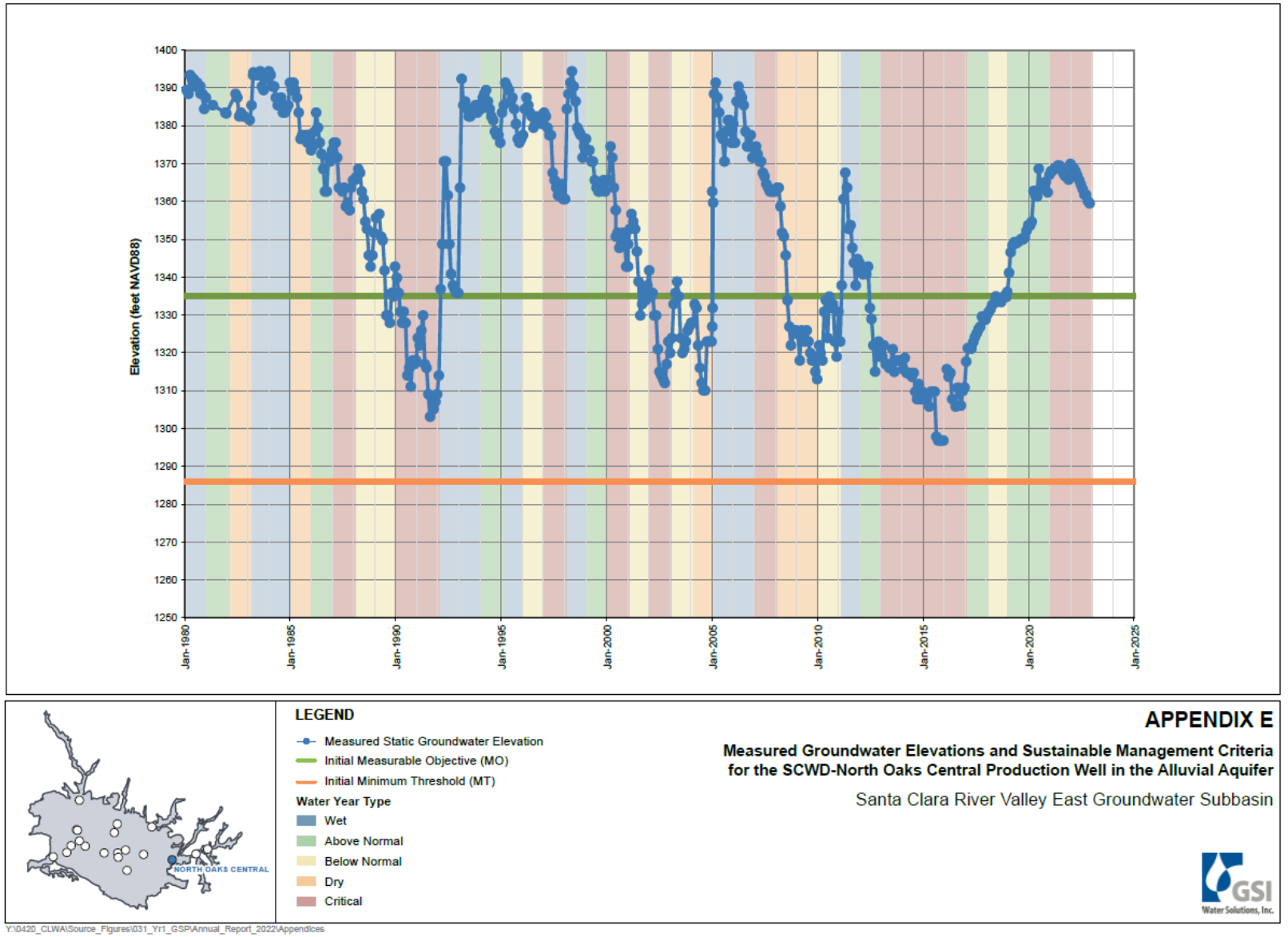
Section 3: Groundwater Elevations

- Hydrographs (Time-Series Plots) for Monitoring Network: Alluvial Aquifer



Eastern Portion of the Basin

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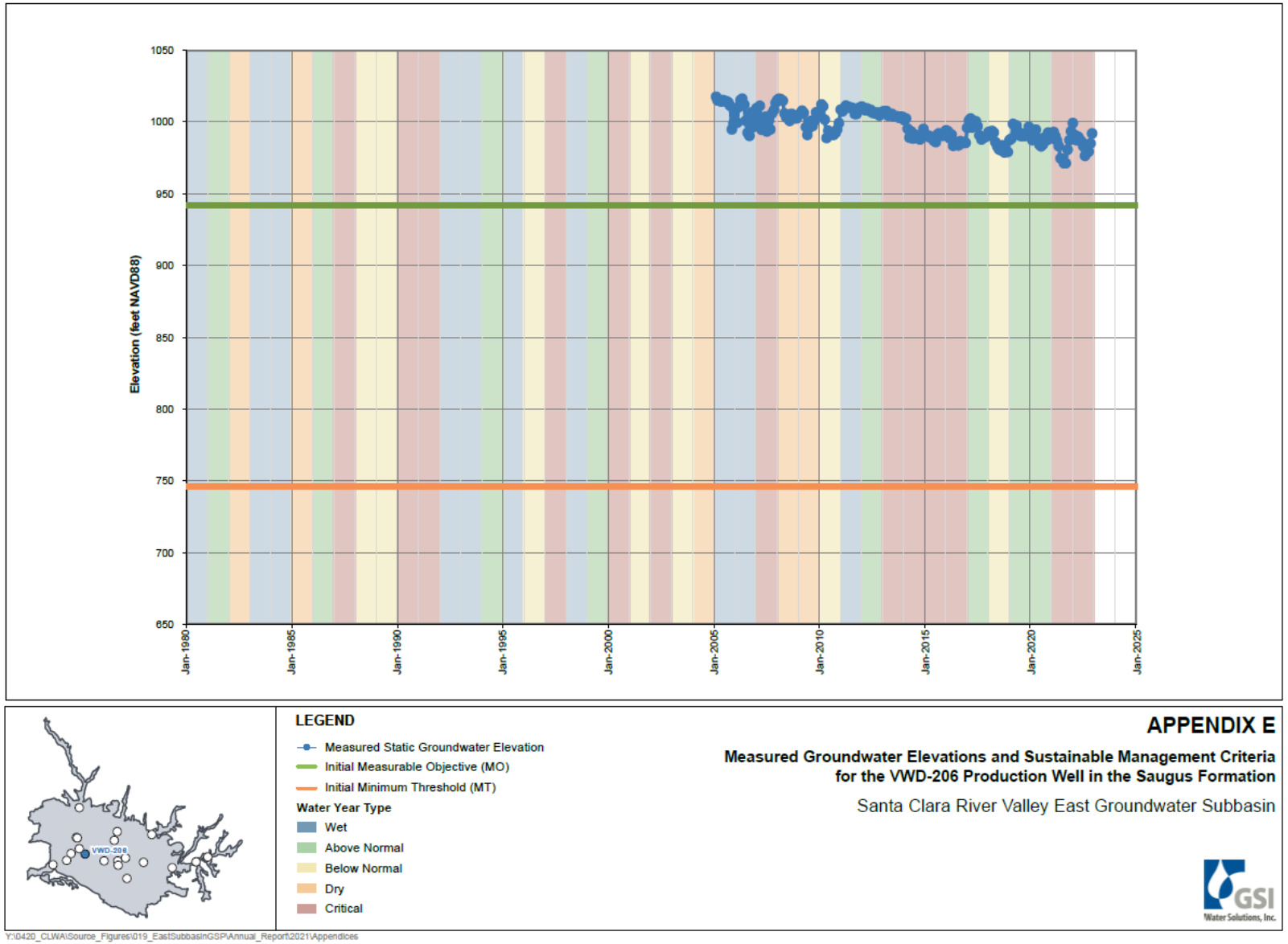
Section 3: Groundwater Elevations

- Hydrographs (Time-Series Plots) for Monitoring Network: Saugus Formation



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Section 4: Groundwater Extractions

- Utilizes data from meters, estimates where not metered or if data not available.
- Total groundwater use lower in 2022 than in 2021 but higher than in 2020

Table 8. Total Groundwater Extractions by Water Use Sector

Water Year	Municipal[1]	Rural Domestic	Small PWS[2]	Golf Courses[3]	Agricultural[4]	Whittaker-Bermite	Total
2020	19,041	500	1,338	706	8,013	469	30,067
2021	24,969	500	1,431	834	10,856	483	39,073
2022	23,206	500	2,322	343	11,815	497	38,683
Method of Measure	Metered	Estimated	Metered	Metered	Metered	Metered	—
Level of Accuracy	High	Low to Medium	High	Medium to High	Medium to High	Medium to High	—

Notes

Extraction volumes are in units of acre-feet.

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Section 5:
Use of Surface Water and Imported Supplies

- Two categories of imported supplies
  - State Water Project (SWP) supplies
  - Local imported supplies (water banks, water exchange programs, water purchase, Yuba Accord)

Table 9. Use of Imported, Recycled, and Other Surface Water Supplies

Water Year	SWP Imported Water[1,2]	Local Imported Water[1,2]	Total Imported Water[1, 2]	Recycled Water	Other Surface Water	Total
2020	37,575	8,514	46,089	496	0	46,585
2021	35,618	10,340	45,958	466	0	46,424
2022	30,226	9,332	39,558	335	0	39,893
Method of Measure	Metered	Metered	Metered	Metered	—	—
Level of Accuracy	Medium to High	Medium to High	Medium to High	High	—	—

Note

All use volumes are in units of acre-feet.

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Section 6: Total Water Use

- Imported water use was greater than municipal groundwater pumping
- Groundwater use and total water use were lower in 2022 than in 2021

Table 10. Total Water Use for Municipal Water Use Sector

Water Year	Groundwater	Imported Supplies	Recycled Water	Total
2020	19,041	46,089	496	65,626
2021	24,969	45,958	466	71,393
2022	23,206	39,558	335	63,099
Method of Measure	Metered and Estimated	Metered	Metered	—
Level of Accuracy	High to Low	High	High	—

Notes

All use volumes are in units of acre-feet.

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Section 7:
Changes in Groundwater in Storage

- DWR requires us to evaluate two categories of change:
  - Annual changes (year-by-year)
  - Cumulative change since January 1, 2015
- DWR also requires the evaluation to consider three geographic scales:
  - Basin as a whole
  - Each principal aquifer (Alluvial Aquifer and Saugus Formation)
  - Subareas within each principal aquifer

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Section 7:
Changes in Groundwater in Storage

- Storage changes **basin-wide**:
  - Fluctuates annually
  - Cumulative changes fluctuate despite persistent negative cumulative departure for rainfall

Table 12. Annual and Cumulative Changes in Groundwater in Storage Basin-Wide

Water Year	Annual Rainfall (inches)	Cumulative Departure (inches) for Annual Rainfall since the End of Water Year 2014[1]	Water Year Type[2]	Annual Change in Storage (acre-feet)	Cumulative Change in Storage after January 1, 2015 (acre-feet)
2015	13.07	-4.21	Critical	-16,997	-13,911
2016	8.78	-12.71	Critical	-16,553	-30,464
2017	19.84	-10.15	Above Normal	+18,163	-12,301
2018	8.00	-19.43	Below Normal	-16,193	-28,494
2019	21.42	-15.29	Above Normal	+32,471	+3,977
2020	16.07	-16.50	Above Normal	+5,268	+9,245
2021	3.38	-30.40	Critical	-23,985	-14,740
2022	15.00	-32.68	Critical	-10,206	-24,946

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Section 7:
Changes in Groundwater in Storage

- Storage changes reflect variations in both climate and groundwater extractions
  - Climate the larger contributor, as indicated by cumulative change curve

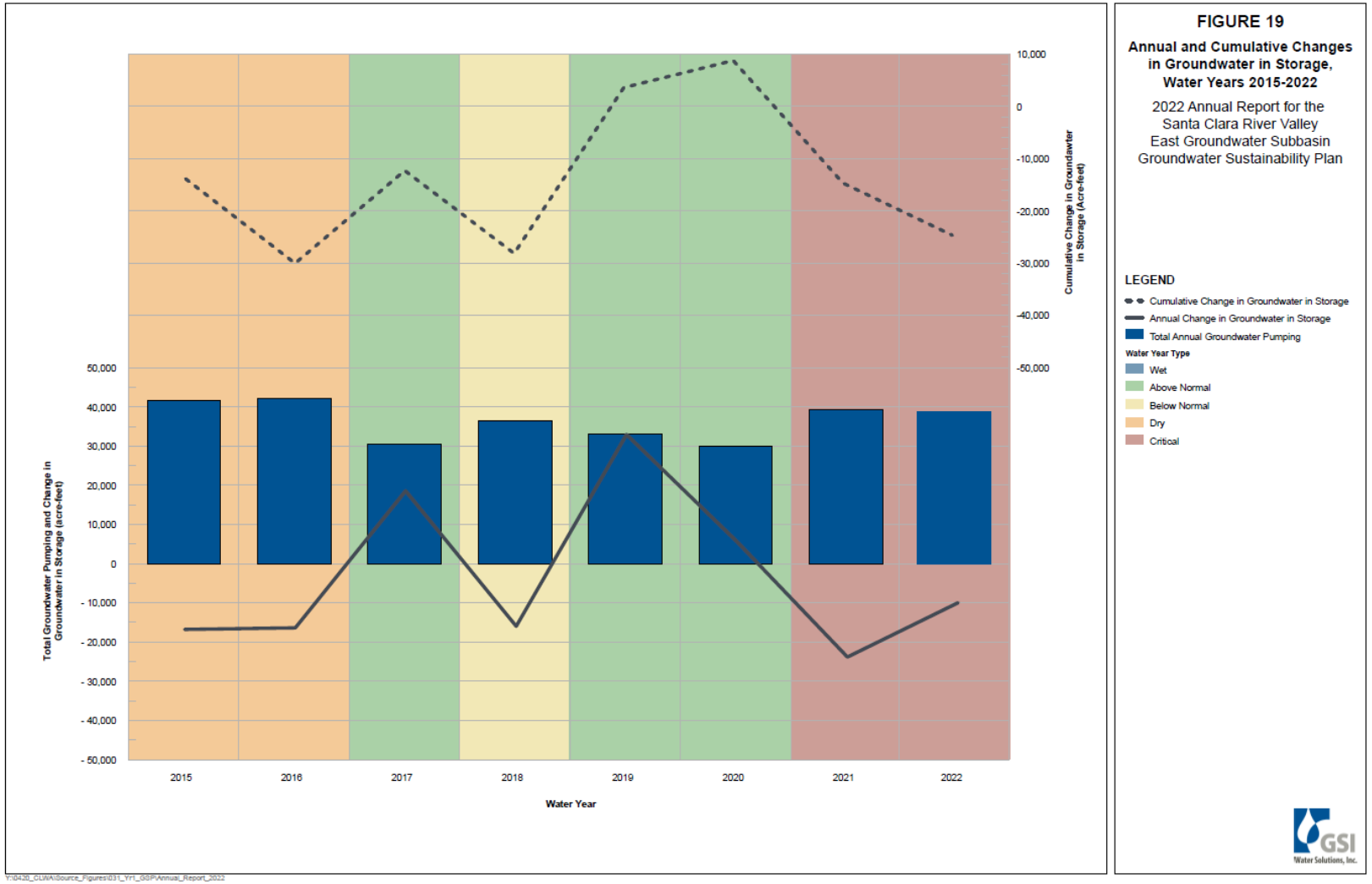

FIGURE 19

Annual and Cumulative Changes in Groundwater in Storage, Water Years 2015-2022

2022 Annual Report for the
Santa Clara River Valley
East Groundwater Subbasin
Groundwater Sustainability Plan

LEGEND

- Cumulative Change in Groundwater in Storage
- Annual Change in Groundwater in Storage
- Total Annual Groundwater Pumping

Water Year Type

- Wet
- Above Normal
- Below Normal
- Dry
- Critical

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Section 7:
Changes in Groundwater in Storage

- Storage changes for **each principal aquifer**
  - Both principal aquifers show annual fluctuations
  - Cumulative changes also fluctuate in both principal aquifers

Table 13. Annual and Cumulative Changes in Groundwater in Storage for the Two Principal Aquifers

Water Year	Annual Rainfall (inches)	Cumulative Departure (inches) for Annual Rainfall since the End of Water Year 2014[1]	Water Year Type[2]	Saugus Formation Annual Change in Storage (acre-feet)	Saugus Formation Cumulative Change in Storage after January 1, 2015 (acre-feet)	Alluvial Aquifer Annual Change in Storage (acre-feet)	Alluvial Aquifer Cumulative Change in Storage after January 1, 2015 (acre-feet)
2015	13.07	-4.21	Critical	-16,997	-12,512	0	-1,399
2016	8.78	-12.71	Critical	-16,136	-28,648	-417	-1,816
2017	19.84	-10.15	Above Normal	-91	-28,739	+18,254	+16,438
2018	8.00	-19.43	Below Normal	-9,555	-38,294	-6,638	+9,800
2019	21.42	-15.29	Above Normal	+14,704	-23,590	+17,767	+27,567
2020	16.07	-16.50	Above Normal	+5,059	-18,531	+209	+27,776
2021	3.38	-30.40	Critical	-12,772	-31,303	-11,213	+16,563
2022	15.00	-32.68	Critical	-6,798	-38,101	-3,408	+13,155

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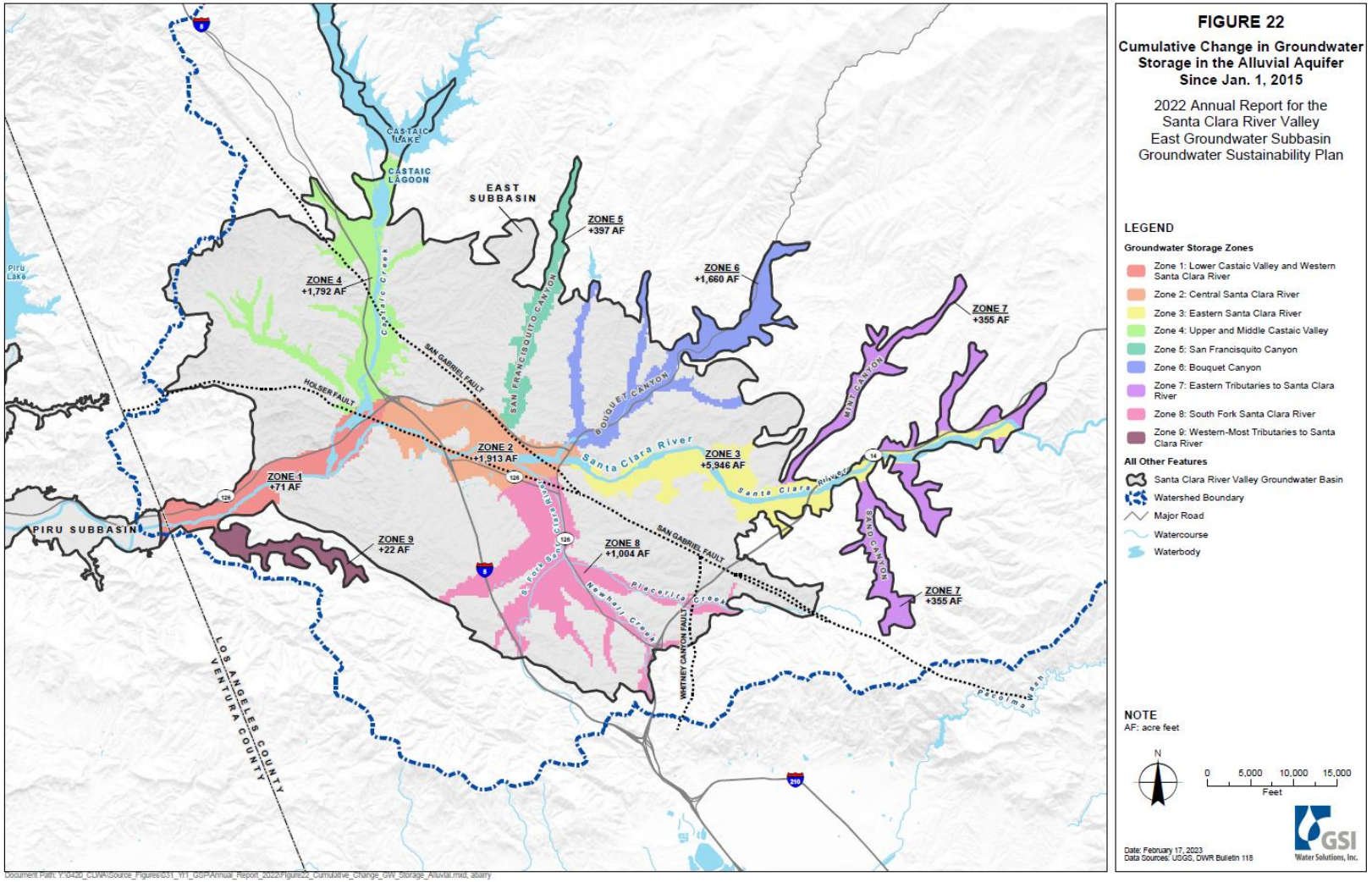
Section 7:
Changes in Groundwater in Storage

- Storage changes in **subareas of the Alluvial Aquifer**
  - Largest changes are in upland areas (eastern portion of Santa Clara River Valley, side canyons)



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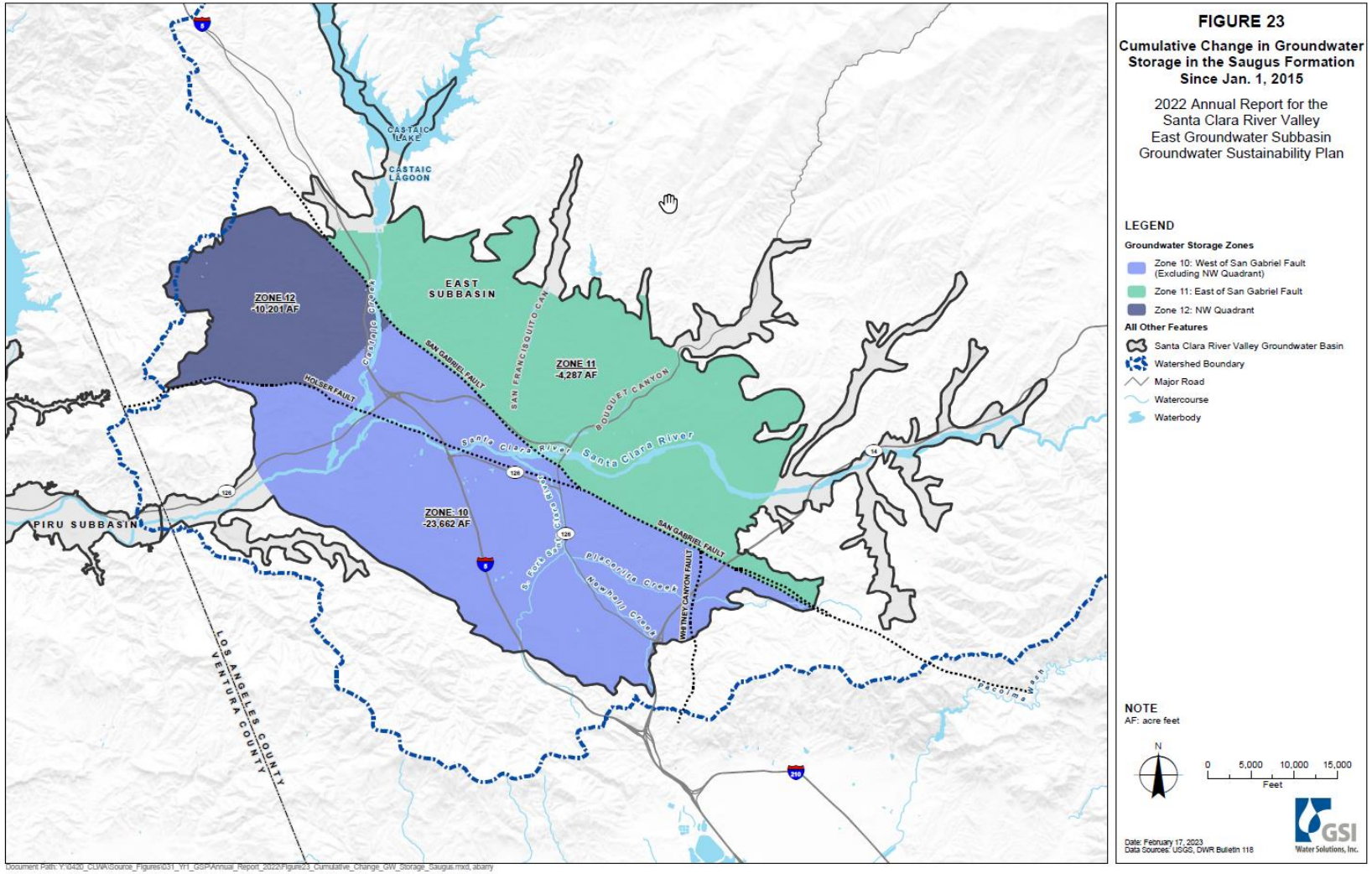
Section 7:
Changes in Groundwater in Storage

- Storage changes in **subareas of the Saugus Formation**
  - Largest changes are in the southwestern portion of the basin (where most pumping occurs)



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Section 8:
Progress Toward Basin Sustainability

Summary of Conclusions Regarding Sustainability of Basin Operation

Sustainability Indicator	Above Minimum Thresholds and/or Trigger Levels?
Groundwater Elevations	Yes
Groundwater in Storage	Yes
Land Subsidence	Yes
Depletion of Interconnected Surface Water	Yes*
Degraded Groundwater Quality	Yes**

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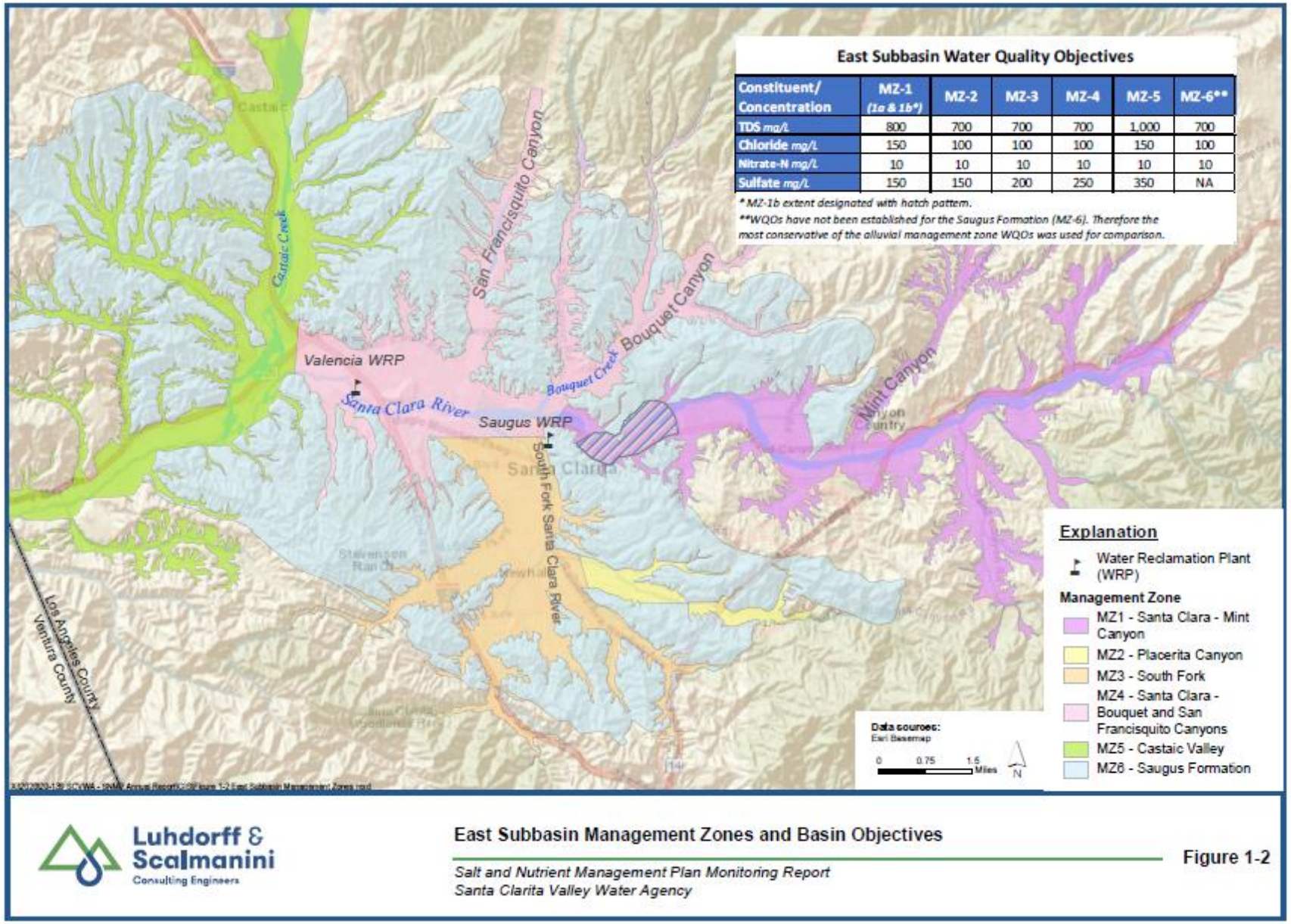
* Below at certain GDE monitoring locations due to survey issues
** Below in two management zones due to natural water quality

Salt Nutrient Management Zones



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Section 8:
Progress Toward Basin Sustainability

Progress Implementing the GSP

- GDE piezometers installed and surveyed; monitoring ongoing
- GDE studies, LiDAR survey, transect surveys across the river
- Planning continues for three other programs:
  - Land subsidence monitoring network
  - Water quality monitoring program for domestic wells
  - Non de minimis wells identification and reporting (greater than 2 AF/year)

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Section 8:
Progress Toward Basin Sustainability

Progress Implementing the GSP

- Supporting activities
  - Data management system (DMS)
  - Groundwater flow model refinements
  - Refinements of minimum thresholds and trigger levels using new data
  - Monitoring, reporting, and outreach
  - DWR grant application

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Recommendation

- That the SCV-GSA Board of Directors adopt the SCV-GSA Annual Report for Water Year 2022

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