Second Annual Report Water Year 2022
for the
Santa Ynez River Valley Groundwater Basin
Bulletin 118 Basin No. 3-15
Western Management Area
Groundwater Sustainability Agency

WMA

Western Management Area

March 22, 2023

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COVER PHOTOGRAPHS

Front Cover: Santa Ynez River flowing through the Lompoc Plain in the Western Management Area because of the summer and fall 2022 water rights releases from Bradbury Dam. The photograph was taken on September 12, 2022. Water rights releases are conducted by the U.S. Bureau of Reclamation following State Water Resources Control Board orders and the Cachuma Project Settlement Agreement and result in water being released from storage in Lake Cachuma.

Back Cover: National Agriculture Imagery Program (NAIP) natural color orthographic photo mosaic of Western Management Area photographed on May 21, 2022.

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

WESTERN MANAGEMENT AREA

Second Annual Report Water Year 2022

March 22, 2023

Final

Santa Ynez River Valley Groundwater Basin

Western Management Area

Groundwater Sustainability Agency Committee

Water Year 2022 (October 2021-September 2022)

City of Lompoc

Jeremy Ball, City Council, GSA Vice Chair
Kristin Worthley, City Staff (Alternate)

Santa Ynez River Water Conservation District

Steve Jordan, Director
Art Hibbits, Director (Alternate)

Vandenberg Village
Community Services District

Chris Brooks, Director, GSA Chair

Dan Redmon, *Director (Alternate) through January 31, 2022*

Ron Stassi, Director (Alternate)
as of February 1, 2022

Mission Hills
Community Services District

Myron Heavin, Director

Bruce Nix, Director (Alternate)

Santa Barbara County Water Agency

Joan Hartmann, District 3 Supervisor

Meighan Dietenhofer, County Staff (Alternate)

GSA Member Agency Staff Representatives:

Matt Young, Santa Barbara County Water Agency

Marliez Diaz, Santa Barbara County Water Agency

William J. Buelow, PG, GSA Coordinator
Santa Ynez River Water Conservation District

Kristin Worthley, City of Lompoc

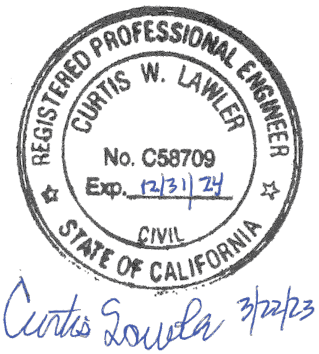
Brad Hagemann, Mission Hills Community Services District

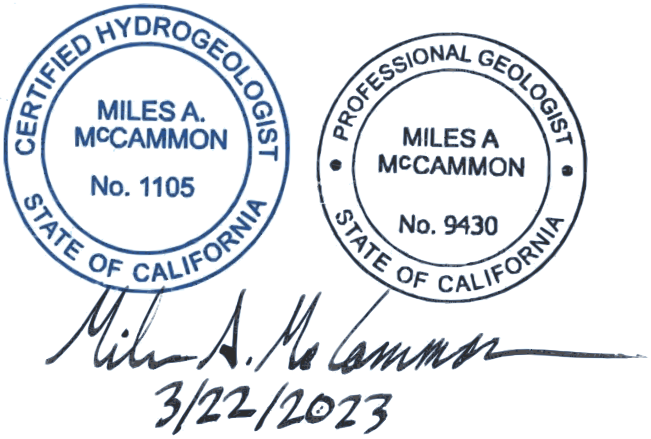
Joe Barget
Vandenberg Village Community Services District

Italicized indicates former committee members or staff representatives

PREPARERS

Stetson Engineers:





Curtis Lawler, PE (Project Manager)

Miles McCammon, CHG, PG

Scott Lowrie

Noah Wasserman

Robyn Krueger

John Gowan

Additional Thanks:

Oliver Page, PG
(Principal, Stetson Engineers)

Allan Richards, PE
(Principal, Stetson Engineers)

Ali Shahroody, PE
(Principal, Stetson Engineers)

ACKNOWLEDGMENTS

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List of Acronyms and Abbreviations

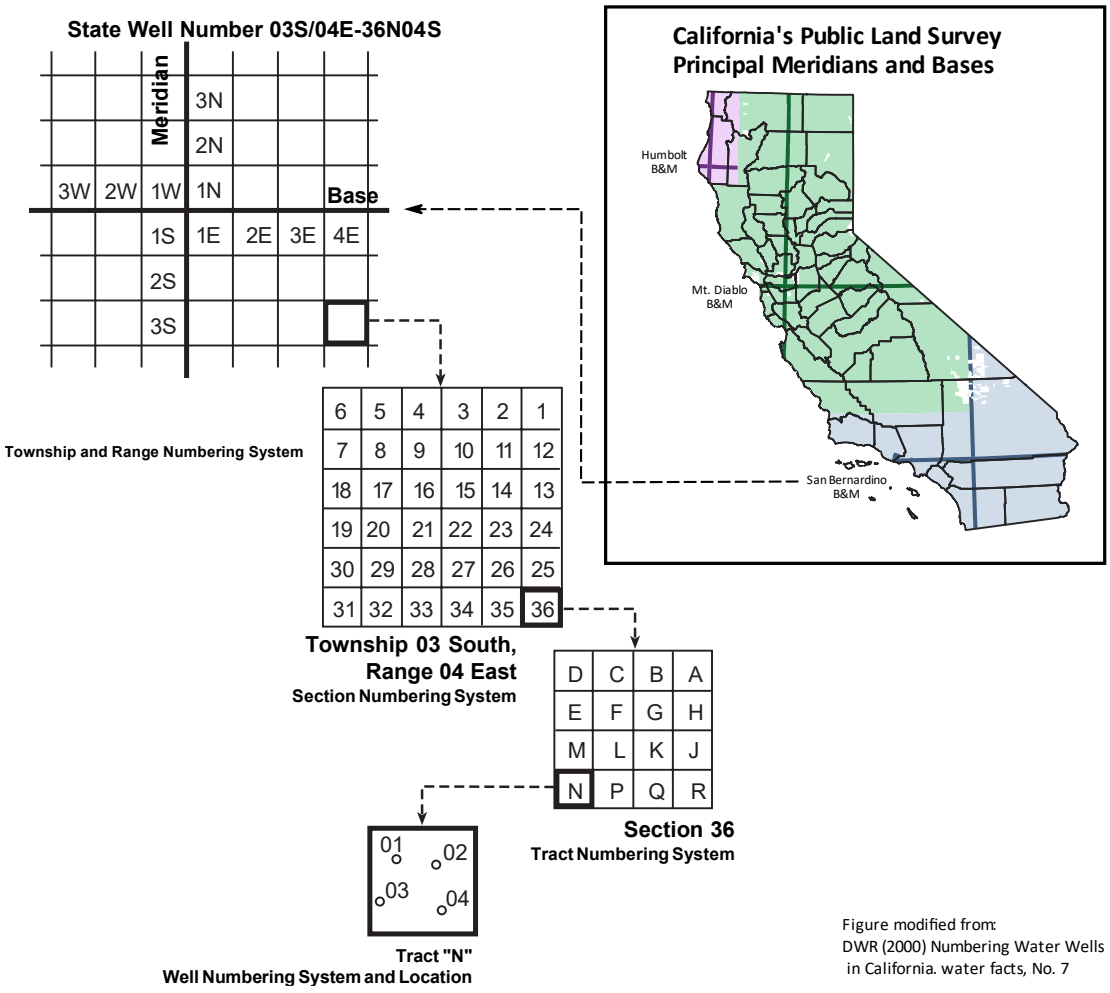
AF	acre-feet
AFB	Air Force Base
AFY	acre-feet per year
CCR	California Code of Regulations
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CGPS	Continuous Global Positioning System
CIMIS	California Irrigation Management Information System
CMA	Central Management Area
COMB	Cachuma Operation and Maintenance Board
CSD	Community Services District
CWC	California Water Code
DBID	Database Identification Number
DWR	Department of Water Resources
EMA	Eastern Management Area
ET	Evapotranspiration
FY	Fiscal Year (July 1 through June 30)
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
InSAR	Interferometric Synthetic Aperture Radar
LRWRP	Lompoc Regional Wastewater Reclamation Plant
mg/L	milligrams per liter
MHCSD	Mission Hills Community Services District
MODFLOW	Modular Three-Dimensional Finite-Difference Groundwater Flow Model
MOU	Memorandum of Understanding
NAIP	National Agriculture Imagery Program
PRISM	Parameter-elevation Regressions on Independent Slopes Model
RMW	Representative Monitoring Well

RWQCB	Regional Water Quality Control Board
SFB	Space Force Base
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
SYRA	Santa Ynez River Alluvium
SYRVGB	Santa Ynez River Valley Groundwater Basin
SYRWCD	Santa Ynez River Water Conservation District
USBR	United State Bureau of Reclamation
USGS	United States Geological Survey
VSFB	Vandenberg Space Force Base
VVCSD	Vandenberg Village Community Services District
WMA	Western Management Area
WR	Water Rights Order
WY	Water Year (October 1 through September 30)

WELL NUMBERING DESCRIPTION

A State Well Number assigned by the California Department of Water Resources (DWR), based on the public land grid which is organized by the Bureau of Land Management (BLM), is assigned to wells in Santa Ynez River Valley Groundwater Basin. The State Well Number includes the township, range, and section numbers in which a well is located. BLM subdivides each section in the public land grid into sixteen 40-acre tracts. Tracts are assigned a letter designation in an "S" shape pattern, as shown on the following page. Because all wells in the Santa Ynez River Valley Groundwater Basin use the San Bernardino ("S") baseline and meridian, this report generally omits the reference to the baseline and the meridian. For areas outside the official BLM Cadastral survey grid, an estimated grid is used to create this label. Much of the SYRVGB land is former Mexican Land grant land and not covered by the BLM Cadastral survey.

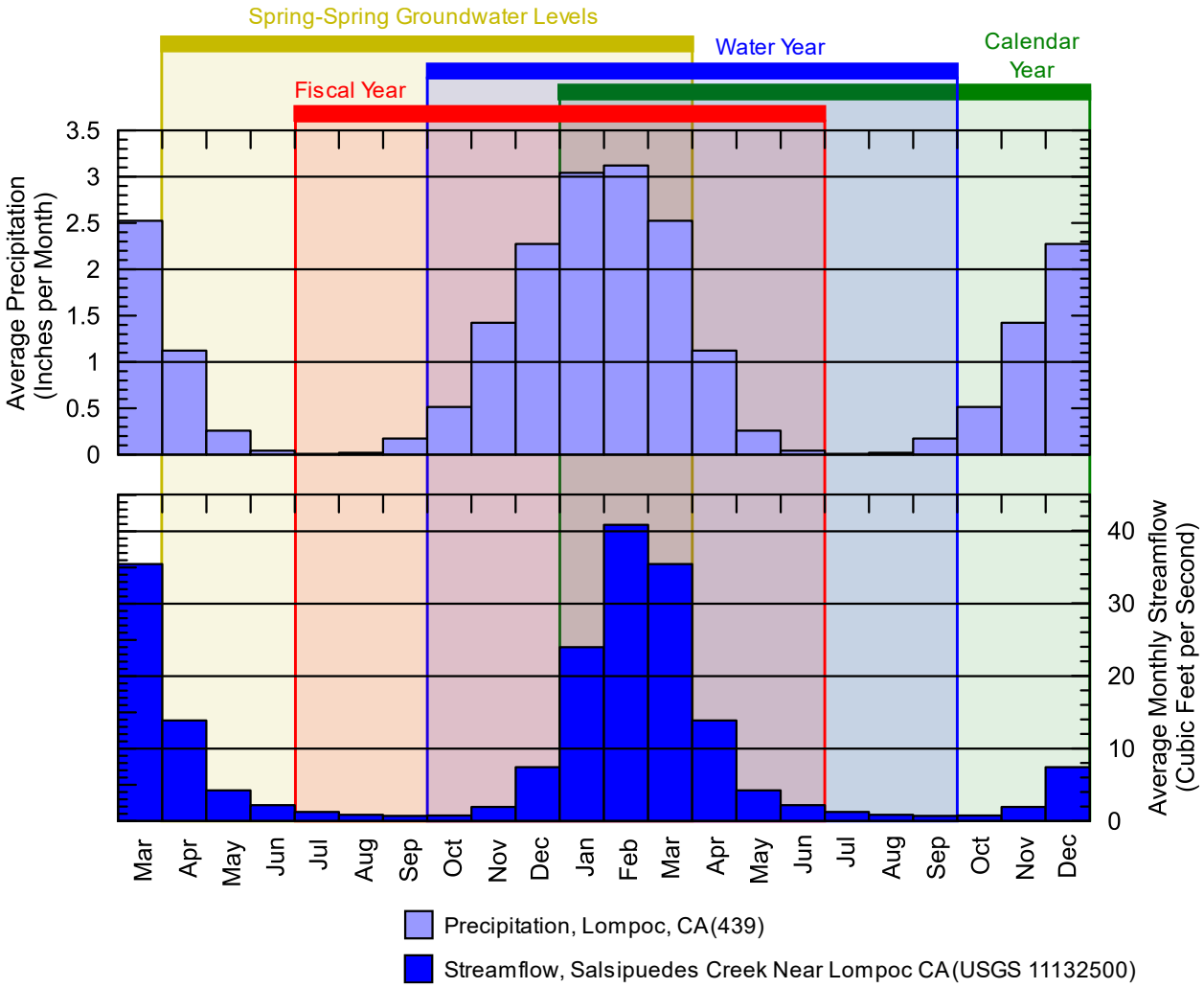
The USGS 15-digit well number based on degrees, minutes, and seconds of latitude (6 digits) and longitude (7 digits) and a sequential number (2 digits) are also shown on wells that are part of the USGS databases. The database management system for this project (sywater.info) additionally assigns a 4-digit unique database identification number (DBID) for each well.



California Department of Water Resources' Numbering System for Water Wells

WATER YEAR DESCRIPTION

Several different annual periods are used in managing Santa Ynez River Valley Groundwater Basin water resources: Water Year, Calendar Year, Fiscal Year and Water Year (July – June), and Spring-Spring Groundwater measurements. For the Sustainable Groundwater Management Act, Water Years are based on the period from October 1st to September 30th, (CWC Section 10721(aa)) which combines the early winter months at the end of a Calendar Year with the remainder of the winter months in the early part of the subsequent Calendar Year, better representing the year on a seasonal basis. Calendar Years are the traditional and commonly used annual period from January 1st to December 31st which starts and ends near the winter solstice. The Santa Ynez River Water Conservation District (SYRWCD) utilizes a Fiscal Year and Water Year (CWC Section 75507(a)) based on the annual period from July 1st to June 30th. Annual spring high groundwater levels are typically evaluated from March of one year to –March of a subsequent year. Finally, the Santa Barbara County Flood Control District annual hydrology reports use a September 1st to August 31st reporting year. The Figure below shows how most of these annual periods compare with the average monthly precipitation at Lompoc and the average monthly stream flow in Salsipuedes Creek at the stream gage.



- Water Year: October 1st to September 30th
- Calendar Year: January 1st to December 31st
- Fiscal Year/ Water Year (SYRWCD): July 1st to June 30th
- Spring-Spring Groundwater Levels: March to March

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EXECUTIVE SUMMARY

This is the second annual report for the Western Management Area (WMA). This report describes changes within the WMA and progress for Water Year (WY) 2022. WY 2022 started on October 1, 2021, and ended on September 30, 2022.

The WMA is the most western agency in the Santa Ynez River Valley Groundwater Basin (SYRVGB). The SYRVGB is in Santa Barbara County, within the Central Coast Region of California. DWR identifies the SWRVGB as basin number 3-15. The SYRVGB has three management agencies: Western (WMA), Central (CMA), and Eastern (EMA). The Department of Water Resources (DWR) designated the SYRVGB as a medium-priority groundwater basin. The WMA Groundwater Sustainability Agency (GSA) is implementing the Sustainable Groundwater Management Act (SGMA) law, which is overseen by the DWR.

In WY 2022, the WMA submitted its Groundwater Sustainability Plan (GSP) to DWR in January 2022. DWR has two years to complete a review of the WMA GSP. The WMA GSP indicated that the current WMA conditions are sustainable. The WMA GSP established sustainable management criteria for measuring progress toward groundwater sustainability. The WMA GSP recommended projects and management actions. These projects help maintain sustainability, avoid undesirable results, and avoid unsustainable groundwater conditions.

WY 2022 was a dry year in the WMA: it was the eleventh year of drought, and the last wet year in the WMA was 2011. WY 2022 was not the driest year during the drought, but there was little rain, and the Santa Ynez River was dry for most of the year. The largest reservoir on the Santa Ynez River, Lake Cachuma, had not spilled since WY 2011.

The estimated sustainable yield of the WMA is 26,000 to 27,000 acre-feet per year (AFY). Sustainable yield is the long-term average over the period of record. The total estimated groundwater storage change in the WMA during WY 2022 is a gain of 3,800 acre-feet (AF). The estimated total groundwater production in the WMA during WY 2022 was about 23,430 AF. Total use includes all water types including groundwater, surface water (surface and underflow), and imported water. The total estimated water use is about 28,270 AF.

The WMA has organized this Second Annual Report into the following chapters:

- General information (including Basin location) – Chapter 1
- Hydrologic conditions – Chapter 2
- Groundwater elevation data (including contours, with hydrographs as an appendix) – Chapter 3
- Water supply data (including groundwater extraction data) – Chapter 4
- Groundwater storage data – Chapter 5
- Progress towards GSP implementation and sustainability – Chapter 6.

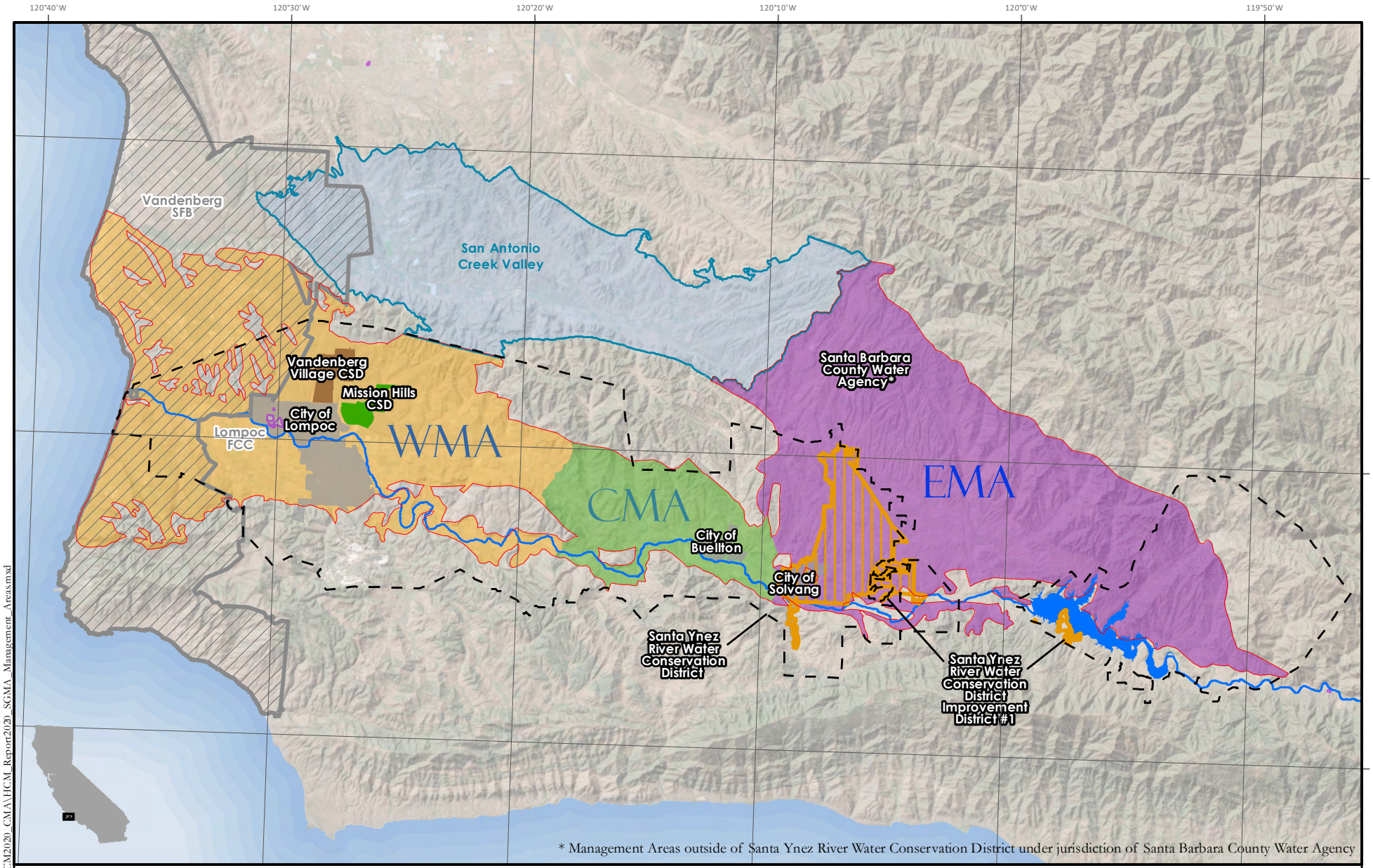
CHAPTER 1: GENERAL INFORMATION

The Western Management Area (WMA) Groundwater Sustainability Agency (GSA) is the responsible local agency for complying with Sustainable Groundwater Management Act (SGMA)[1] requirements in the western portion of the Santa Ynez River Valley Groundwater Basin (SYRVGB). Following the adoption of the Sustainable Groundwater Management Plan (GSP) for the WMA on January 5, 2022, the WMA GSP is required to submit an annual report every April 1st.[2] This second annual report for the WMA is prepared in coordination with the two other management areas within the SYRVGB and covers the water year 2022 (October 1, 2021 – September 30, 2022). **Figure 1-1** shows the location of all three management areas of the SYRVGB[3] and **Figure 1-2** shows the areas managed by the constituent public member agencies of the WMA: Santa Ynez River Water Conservation District (SYRWCD), City of Lompoc, County of Santa Barbara, Mission Hills Community Services District (MHCSD), and Vandenberg Village Community Services District (VVCSD). Although partially within the WMA, as a Federal Facility, Vandenberg Space Force Base (VSFB) is not subject to SGMA.

The SYRVGB is a groundwater basin located in central Santa Barbara County in the central coast region of California (Figure 1-1) which encompasses an area of approximately 133.7 square miles (85,595.5 acres), located within the larger Santa Ynez watershed. This area is geographically diverse, with east-west trending ranges of low mountains and hills interspersed with small to medium-sized valleys and perpendicular north and south-trending canyons that drain out of the mountains and hills.

In the SYRVGB there are eight public water agencies participating in SGMA, four of them in the WMA. **Table 1-1** summarizes the extent and member agencies of all three Management Areas of the SYRVGB. To be consistent with the California legislature's findings that "Groundwater resources are most effectively managed at the local or regional level"[4] the SYRVGB public water agencies divided the SYRVGB into three local management areas based on the geography and extent of local aquifers.

1 CWC Section 10720 et seq. and 23 CCR § 350 et seq.
2 CWC Section 10728, 23 CCR § 351(d), § 355.8, 353.4, 354.40, 355.6(b), 355.8, 356, 356.2.
3 23 CCR § 356.2(a) "[…] location map depicting the basin covered by the report."
4 Sustainable Groundwater Management Act, Uncodified Findings (a)(6)



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Western Management Area (WMA)
Central Management Area (CMA)
Eastern Management Area (EMA)

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
(DWR BULLETIN 118 BASIN NO. 3-105)
AND SGMA MANAGEMENT AREA BOUNDARIES

0 2 4 Miles

N

Sources:
NAIP (2018)
USGS National Elevation Dataset, 2002
Groundwater basin boundary from DWR Bulletin 118, 2018

FIGURE 1-1

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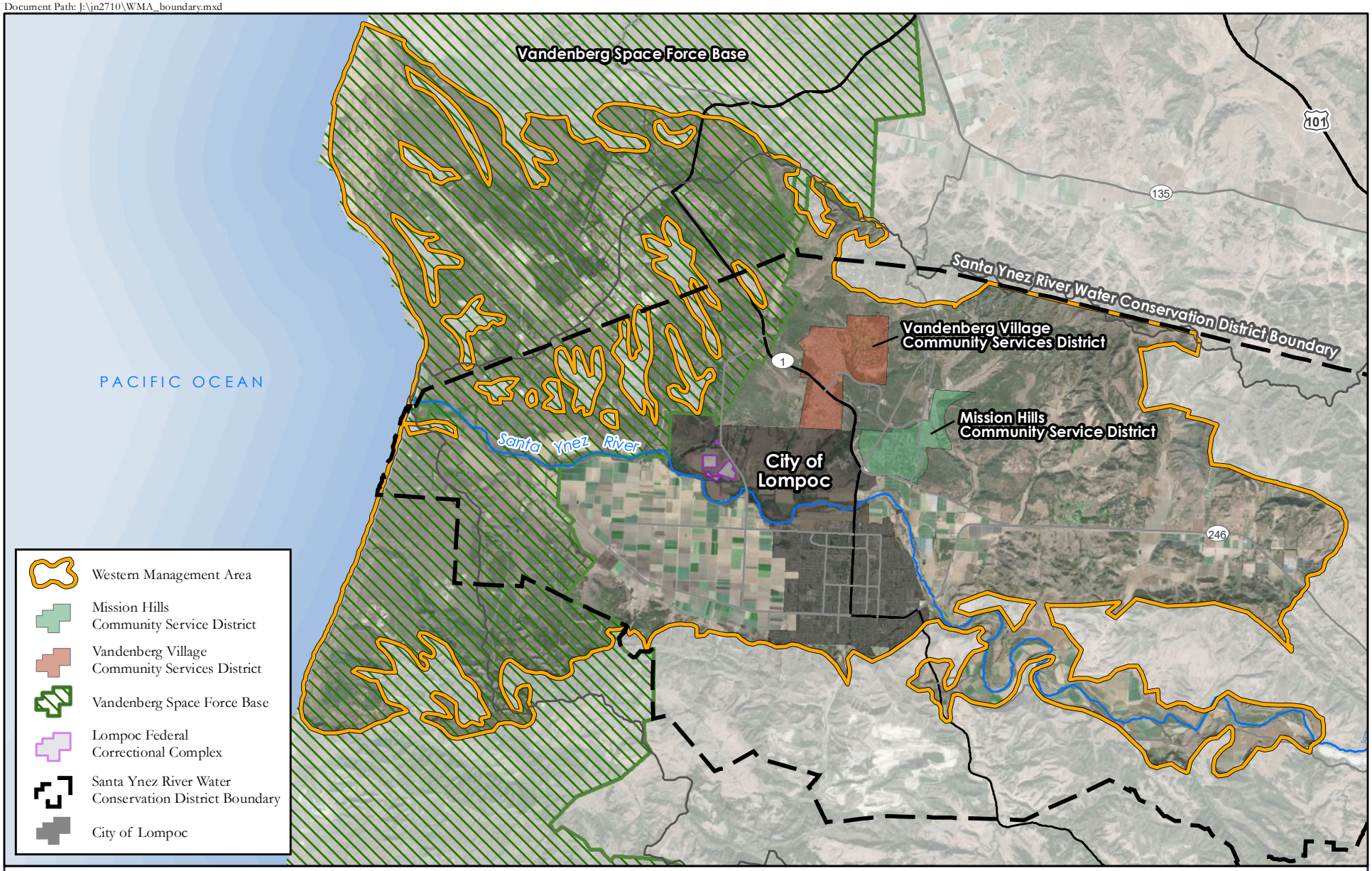

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

WESTERN MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 1 2 Miles

N

FIGURE 1-2

Table 1-1
Management Areas of the Santa Ynez River Valley Groundwater Basin

Management Area	Physical Description	Committee Member Agencies
WMA Santa Ynez River Valley Groundwater Basin Western Management Area Groundwater Sustainability Agency	133.7 square miles • Santa Ynez River alluvium west of Santa Rosa Park to the Lompoc Narrows • Lompoc Plain • Lompoc Terrace • Burton Mesa • Lompoc Upland • Santa Rita Upland.	• City of Lompoc • Vandenberg Village Community Services District • Mission Hills Community Services District • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency (non-voting member)
CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency	32.8 square miles • Santa Ynez River alluvium east of Santa Rosa Park to just west of the City of Solvang • Buellton Upland	• City of Buellton • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency (non-voting member)
EMA Santa Ynez River Valley Groundwater Basin Eastern Management Area Groundwater Sustainability Agency	150.9 square miles • Santa Ynez River alluvium from City of Solvang east • Santa Ynez Upland	• City of Solvang • Santa Ynez River Water Conservation District, Improvement District No.1 • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency

The WMA is bordered on the west by the Pacific Ocean, on the north by the Purisima Hills, on the east by the Central Management Area (CMA), and on the south by the White Hills. The WMA has two aquifers, an "Upper Aquifer" and a "Lower Aquifer." The Upper Aquifer consists of the current and historical deposits of the Santa Ynez River downstream of the Lompoc Narrows. The Lower Aquifer consists of older Paso Robles and Careaga Sand Formations. The Lower Aquifer is within a wide geologic syncline fold. **Figure 1-3** shows where these two aquifers are located within the WMA.

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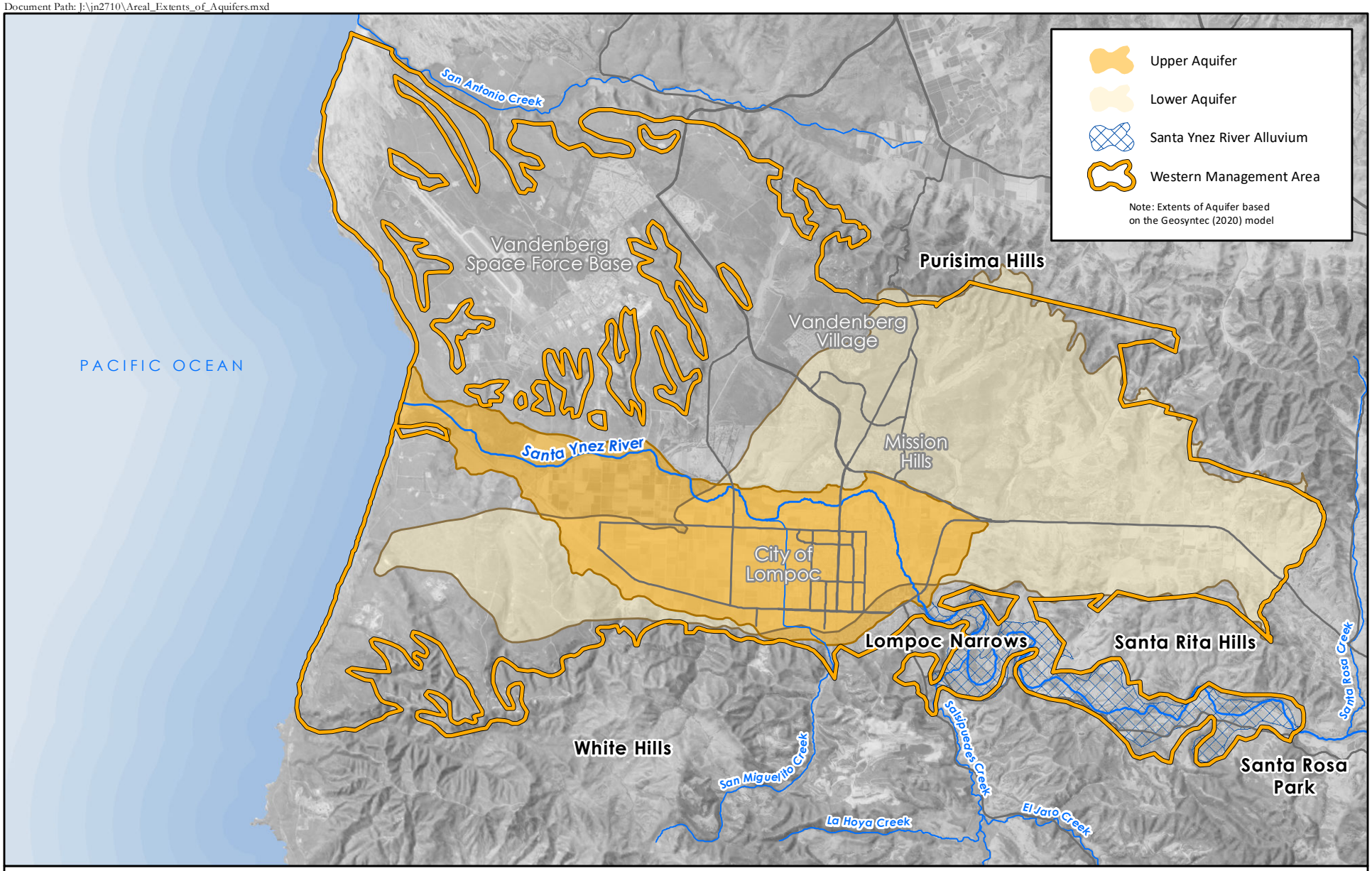

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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

AREAL EXTENTS OF THE PRINCIPLE AQUIFERS WESTERN MANAGEMENT AREA

0 1 2 Miles

Sources: NAIP (2018)

N

FIGURE 1-3

Surface water drains to the Pacific Ocean through the Santa Ynez River and its tributaries. The State Water Resources Control Board (SWRCB) administers Santa Ynez River water, including both surface water and underflow of the Santa Ynez River and the fully allocated surface water rights. Upstream reservoirs are operated by the United States Bureau of Reclamation (USBR) which physically controls the flows of the Santa Ynez River. USBR conducts releases to meet downstream surface water rights and for the benefit of fish. The SGMA statute excludes the WMA from altering the surface water rights of the Santa Ynez River.[5] The SWRCB has long considered the underflow of the Santa Ynez River as part of the river flows.

The WMA is a diverse area divided into six subareas[6] based on more homogeneous hydrogeologic and topographic characteristics. The six subareas are the Lompoc Plain, Lompoc Terrace, Lompoc Upland, Santa Rita Upland, Santa Ynez River Alluvium, and Burton Mesa. **Figure 1-4** shows the locations and extents of the subareas, and **Table 1-2** summarizes the sizes of each subarea.

Table 1-2
Summary of WMA Subareas by Area

WMA Subarea	Acres [A]	Square Miles
Lompoc Plain	18,780	29.3
Lompoc Terrace	10,560	16.5
Lompoc Upland	21,170	33.1
Santa Rita Upland	7,090	11.1
Santa Ynez River Alluvium	4,940	7.7
Burton Mesa	23,060	36.0
Total	**85,600**	**133.7**

[A] Rounded to the nearest 10 acres.

5 CWC Section 10720.5 (b) "Nothing in this part, or in any groundwater management plan adopted pursuant to this part, determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights."

6 Subareas are like and based on the Santa Ynez River Water Conservation District Annual Report subareas, also used for managing pumping in much of the WMA. Extents were adjusted to cover the entire Bulletin 118 Interim Update 2016 (DWR 2016a) basin boundary.

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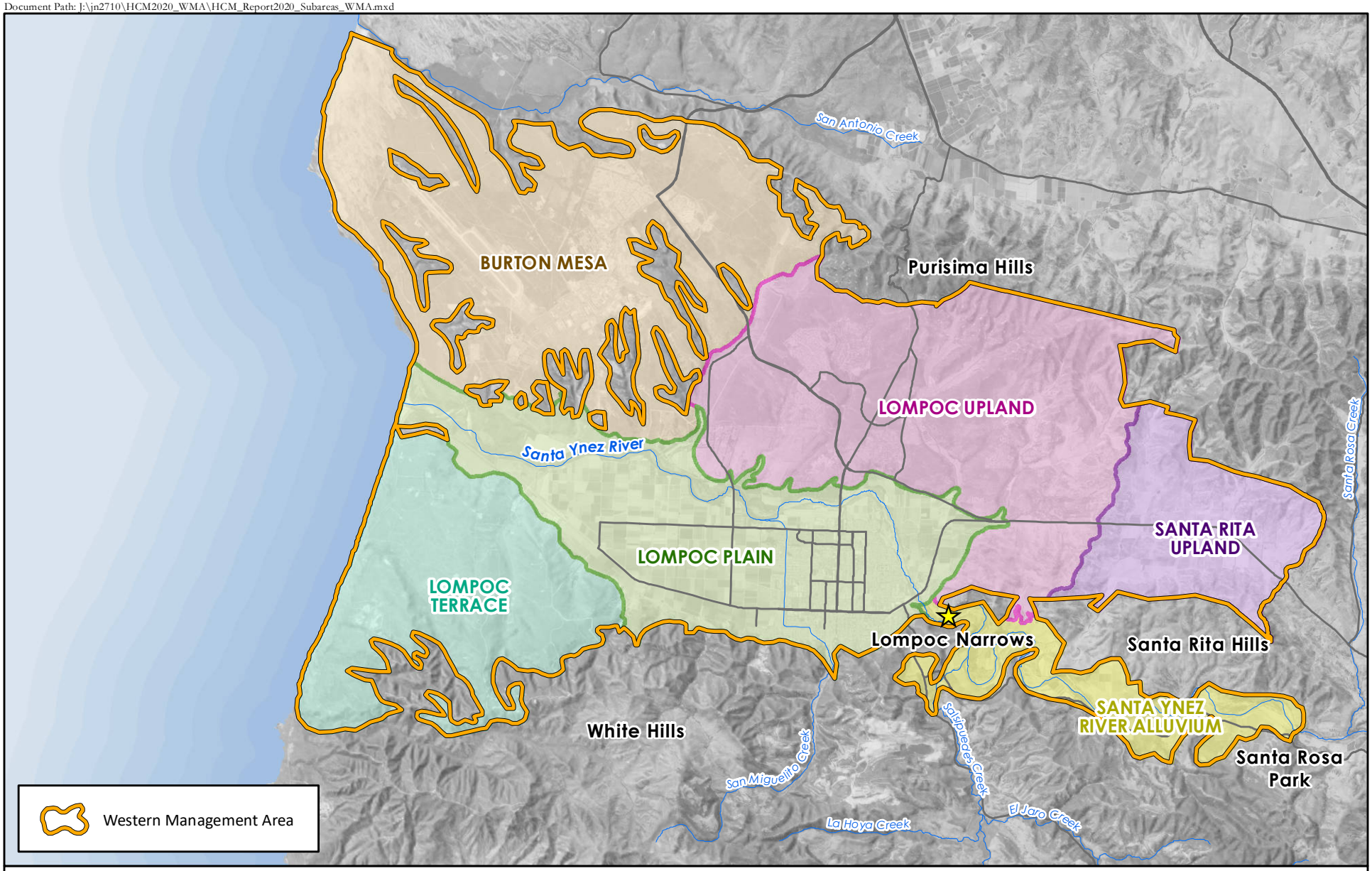

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

SUBAREAS
WESTERN MANAGEMENT AREA

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 1-4

1.1 PURPOSE OF ANNUAL REPORT

The California legislature identified the following items to include in the SGMA annual reports (California Water Code [CWC] Section 10728):

> *On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department containing the following information about the basin managed in the groundwater sustainability plan:*
>
> *(a) Groundwater elevation data.*
>
> *(b) Annual aggregated data identifying groundwater extraction for the preceding water year.*
>
> *(c) Surface water supply used for or available for use for groundwater recharge or in-lieu use.*
>
> *(d) Total water use.*
>
> *(e) Change in groundwater storage.*
>
> *(Added by Stats. 2014, Ch. 346, Sec. 3. (SB 1168) Effective January 1, 2015.)*

Appendix 1-A includes the SGMA statute and regulations related to the required elements of this annual report. In general, the annual report is required to describe progress toward implementing the GSP and groundwater conditions over the year.

Earlier published reports by the WMA provide historical information before the start of WY 2022. The WMA GSP (adopted on January 5, 2022, submitted to DWR on January 18, 2022) covered historical data through May 2021. The First Annual Report covered conditions for WY 2021 (October 1, 2020 - September 30, 2021) and additional water use and change in storage information for WYs 2019 and 2020 (October 1, 2018 – September 30, 2020). The WMA submitted the first annual report to DWR in March 2022. This Second Annual Report covers conditions for WY 2022 (October 1, 2021 - September 30, 2022).

1.2 SUSTAINABILITY GOAL AND UNDESIRABLE RESULTS

The WMA GSP identified the following sustainability goal for the SYRVGB:

> "The sustainability goal for the Santa Ynez River Valley Groundwater Basin is to manage groundwater resources in the WMA, CMA and EMA for the purpose of facilitating long-term beneficial uses of groundwater within the Basin. Beneficial uses of groundwater in the Basin include municipal, domestic, and agricultural and environmental supply. The sustainability goal is in part defined by the locally defined minimum thresholds and undesirable results. This GSP describes how the WMA GSA will maintain the sustainability of the Basin, and how the measures recommended in the GSP will achieve these objectives and desired conditions" (2022 WMA GSP, Section 3B.1 Sustainability Goal).

Under SGMA,[7] six indicators of sustainability were considered as part of the GSP.[8] The six sustainability indicators are listed as follows.

1. Chronic lowering of groundwater levels

2. Reduction of groundwater storage

3. Seawater intrusion

4. Degraded water quality

5. Land subsidence

6. Depletion of interconnected surface water

7 CWC Section 10721 (x), 23 CCR § 354.28(c), 23 CCR § 354.34(c),

8 23 CCR § 354.30(a) Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

1.3 NEW AND UPDATED PLANS, REPORTS, AND DATA OF NOTE DURING WATER YEAR 2022

Every year plans, reports, and data pertinent to the WMA are developed, updated, and released. **Table 1-3** summarizes notable relevant reports and plans that were released during WY 2022 (October 1, 2021 – September 30, 2022) which provide information for use in updating future GSPs.

Table 1-3
New Reports and Data during the Water Year 2022

Calendar Year	Month	Report Title
2021	November	California's Groundwater Update 2020 (Bulletin 118). California Department of Water Resources
2022	January	Groundwater Sustainability Plan. Santa Ynez River Valley Groundwater Basin Western Management Area.
2022	March	WY2021 Annual Monitoring Summary. The Biological Opinion for The Operation and Maintenance of the Cachuma Project on the Santa Ynez River in Santa Barbara County, California. Cachuma Operation and Maintenance Board Fisheries Division.
2022	March	Polonio Pass Water Treatment Plant Water Quality Table. Reporting Period of January-December 2021. Central Coast Water Authority.
2022	March	First Annual Report Water Year 2021 for the Santa Ynez River Valley Groundwater Basin. Santa Ynez River Valley Groundwater Basin Central Management Area.
2022	June	Forty-Fourth Annual Engineering and Survey Report on Water Supply Conditions of The Santa Ynez River Water Conservation District 2021-2022. FINAL June 1, 2022. Accepted by the Board of Directors of the Santa Ynez River Water Conservation District.
2022	June	COMB Sustainability Plan. Cachuma Operation & Maintenance Board

This WMA SGMA annual report uses the SGMA water year (October 1 to September 30) and includes data through September 30, 2022. One of the WMA member agencies, SYRWCD, produces an annual report (based on July 1 to June 30 water year[9]) entitled "Engineering Investigation and Report upon Ground Water Conditions"[10] which covers related topics to this SGMA report which is now in its 45th year. The SYRWCD report summarizes Santa Ynez River system conditions, basin surface water use, water purchased by contract, production within SYRWCD boundaries, expected future demand, and revenue from groundwater production. The SYRWCD's reports cover a different period than the SGMA annual reports and include projections of surface water and groundwater use through June 30, 2024.

9 CWC Section 75507 (a) "Water year" means July 1st of one calendar year to June 30th of the following calendar year.
10 CWC Section 75560 The district shall annually cause to be made an engineering investigation and report upon ground water conditions of the district.

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CHAPTER 2: BASIN CONDITIONS

The water year type is a classification of how wet or dry basin conditions are due to weather during the year. This is a potential cause of changes to groundwater conditions, as measured through groundwater levels, storage, and water quality. This chapter updates the "Hydrologic Characteristics" subsection of the Hydrogeologic Conceptual Model section of the GSP through the end of WY 2022.

Table 2-1 summarizes the precipitation and the water year type for the recent years of WY 2015 through WY 2022.

Table 2-1
Annual Precipitation and Water Year Classification for WMA, WY2015 through WY2022

Water Year	Lompoc City Hall		Hydrologic Year Type Classification USGS Gage 11132500 (Salsipuedes Creek)	
	Precipitation (in/year)	% Of Average [A]	Percentile Rank	Water Year Type Classification
2015	8.03	55%	0%	Critically Dry
2016	11.68	81%	2%	Critically Dry
2017	22.49	155%	73%	Above Normal
2018	8.29	57%	5%	Critically Dry
2019	20.44	141%	79%	Above Normal
2020	12.97	90%	33%	Dry
2021	10.78	75%	49%	Below Normal
2022	12.46	86%	22%	Dry

Years are color coded as follows: yellow indicates dry and critically dry years (below 40 percentile); blue indicates wet years (above 80 percentile); unshaded indicates years that were either in the below normal or above normal years (40 to 80 percentile). Percentages and percentiles are calculated from the respective periods of record.
[An] Average is calculated as the mean of the period of record (WY1955-WY2022).
Notes: WMA = Western Management Area; USGS = U.S. Geological Survey; SWRCB = State Water Resources Control Board; in/year = inches per year.
Source: Precipitation from Santa Barbara County - Flood Control District station #439 - Lompoc City Hall

2.1 PRECIPITATION

Within the WMA, direct annual average precipitation ranges from 12.7 inches per year at the Santa Ynez River estuary to 20.5 inches per year at a corner of the Lompoc Terrace. **Figure 2-1** shows the average precipitation within the WMA and adjacent watershed.[1] Orthographic lift effects are the primary driver of precipitation within the WMA, and portions of the WMA at lower elevations generally receive less direct precipitation. **Table 2-2** summarizes the annual average direct precipitation for the subareas of the WMA.

Table 2-2
Average Annual (1991-2020) Precipitation by WMA Subarea

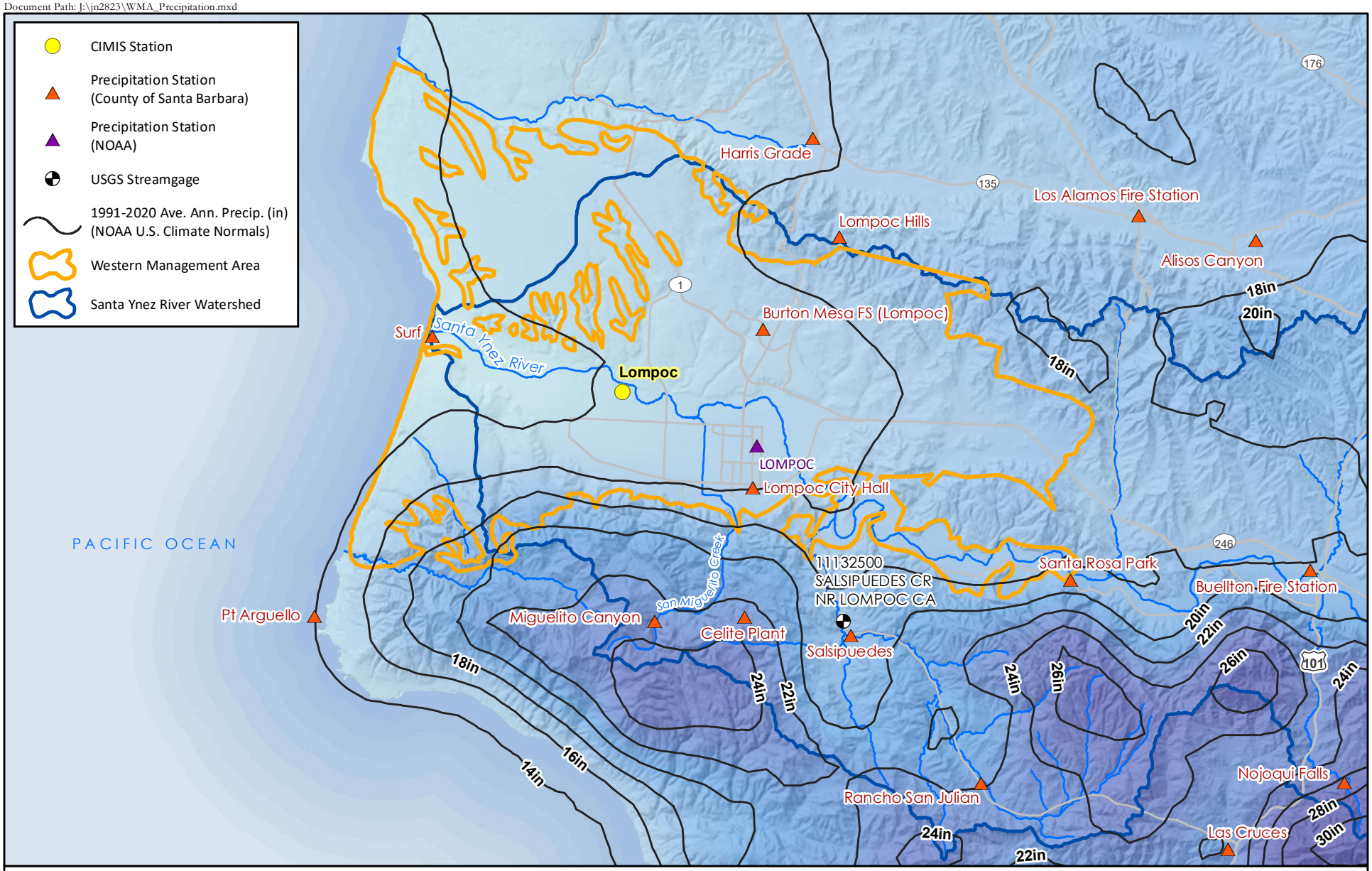
WMA Subarea	Size (Acres) [A]	Average Annual Precipitation Per Subarea (Average 1991-2020) inches per year		
		Average	Average Annual Minimum	Average Annual Maximum
Lompoc Plain	18,780	14.8	12.7	17.6
Santa Rita Upland	7,090	17.0	16.3	17.7
SYR Alluvium	4,940	17.0	15.6	18.4
Lompoc Upland	21,170	15.8	14.6	17.8
Burton Mesa	23,060	14.4	13.3	16.5
Lompoc Terrace	10,560	15.7	12.9	20.5

[A] Rounded to the nearest 10 acres.
Source: Derived from PRISM Climate Group (2021), Average Annual Precipitation 1991-2020.

The precipitation station at Lompoc City Hall is the primary gauge for precipitation within the WMA. Total precipitation during WY 2022 was 12.46 inches. **Figure 2-2** presents annual precipitation data from this station for WY 1955 to the present (WY 2022) and the cumulative departure from the mean (CDM). The CDM trends provide a representation of wet and dry periods within the overall period of record. On a CDM graph, a wet period is indicated with an upward trend over years. Conversely, a downward trend on the graph indicates a dry period.

[1] Average conditions here are updated to include newly released data for the period 1991-2020, compared to the GSP (including GSP Figure 2a.3-2) which used available data for the period 1981-2010.

Document Path: J:\jn2823\WMA_Precipitation.mxd



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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

PRECIPITATION STATIONS AND ISOHYETALS
1991-2020 CLIMATE NORMALS
WESTERN MANAGEMENT AREA

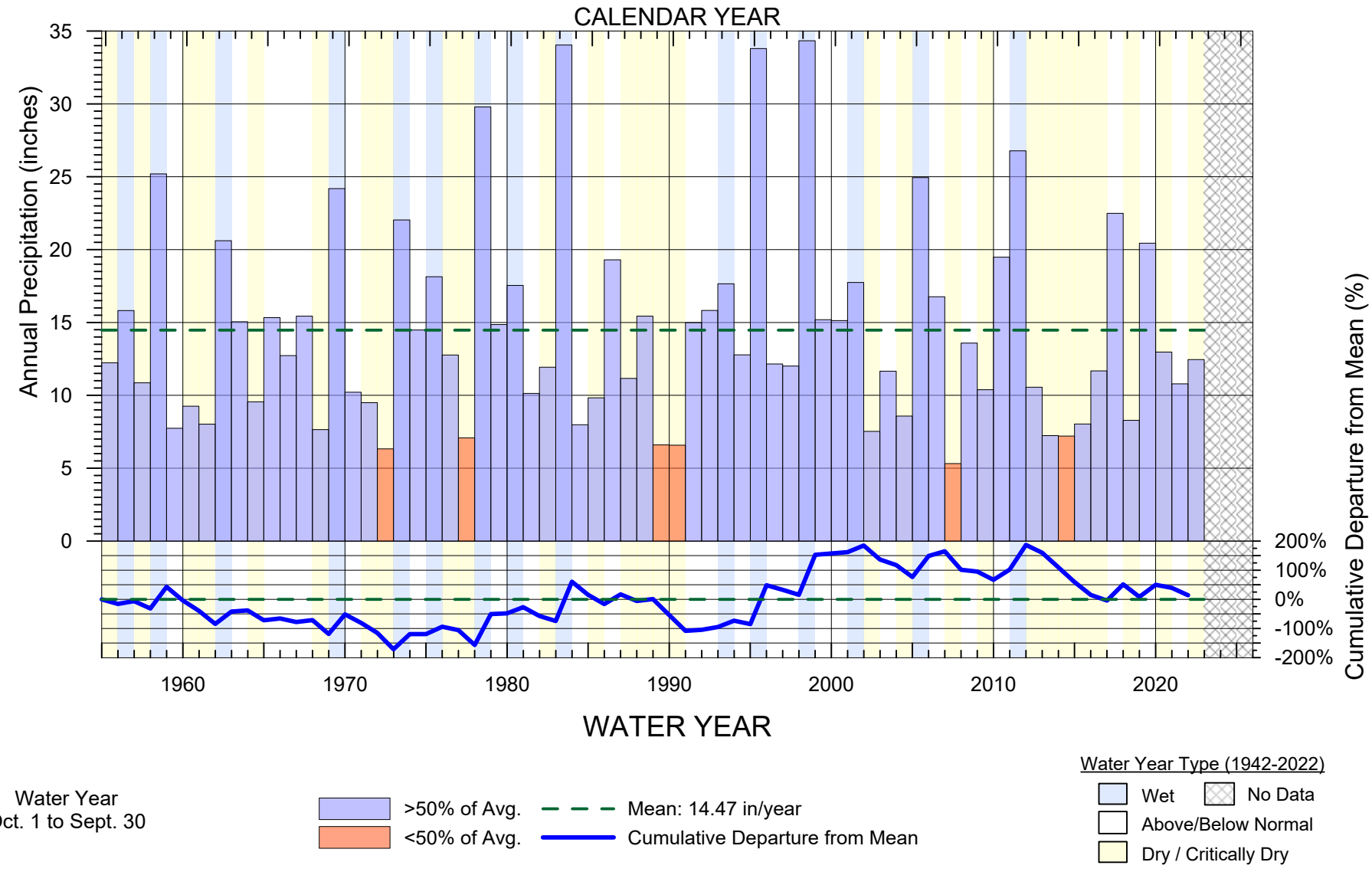
DRAFT

0 2 4 Miles

Source:
ESRI World Imagery (2018 Maxar)
NOAA (2020), WRCC (2020)

N

FIGURE 2-1



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WMA
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Western Management Area
Groundwater Sustainability Agency

LOMPOC CITY HALL
PRECIPITATION AND
CUMULATIVE DEPARTURE FROM MEAN
WY 1955 - 2022

Source: Santa Barbara County (2023)
Preciptiation Gage #439

FIGURE 2-2

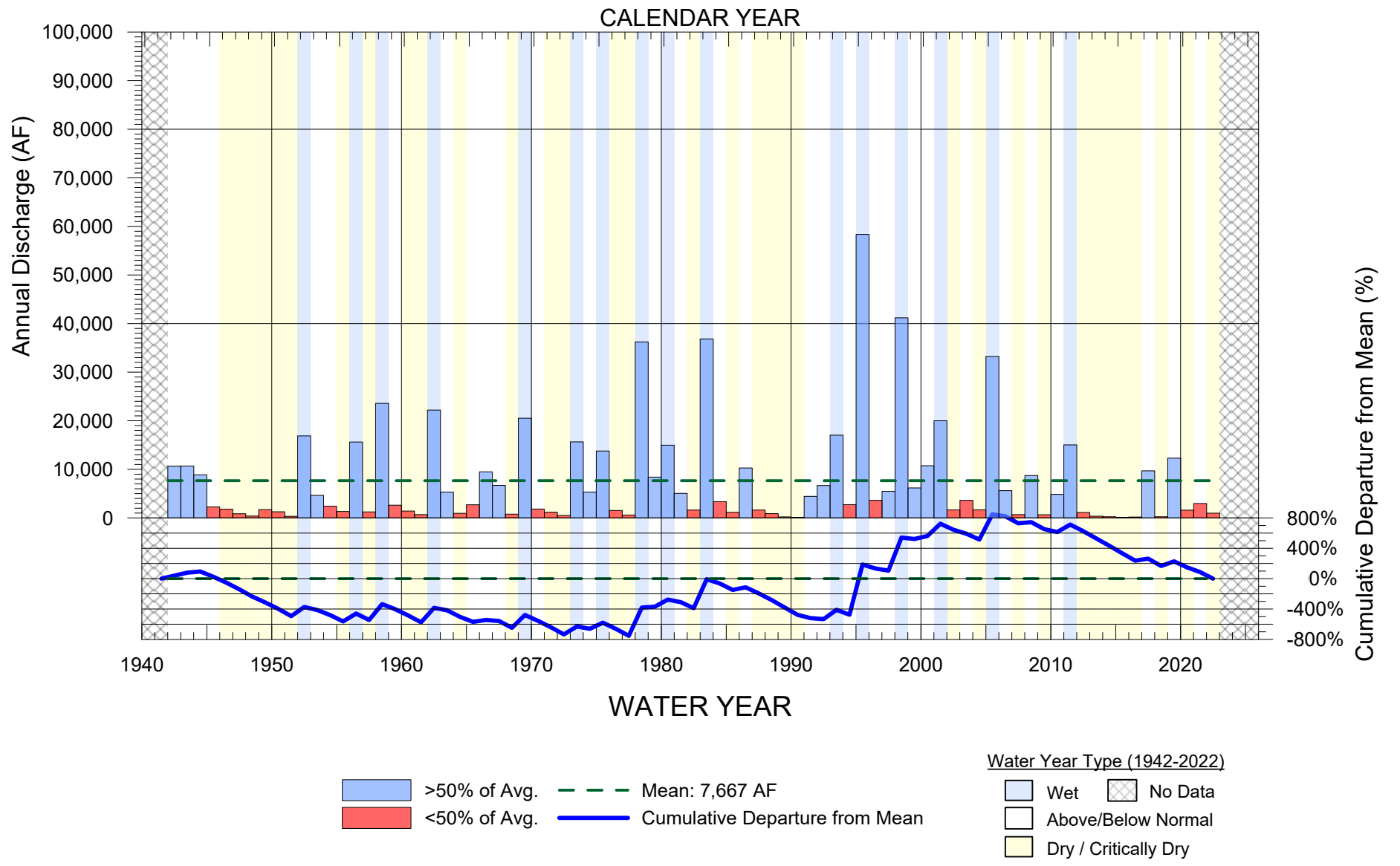
F:\DATA\2823\Analyses\2023-01 WY22 Precipitation CDM Graphs\Fig 2-02 WMA_Lompoc_City_Precip_CDM WY2022.grf 1/4/2023 M. McCammon

2.2 CLASSIFICATION OF 2022 WATER YEAR

The WMA classified WY 2022 as a dry year based on the Water Year Type. Water Year Type is a generalized characterization of the amount of water that is available in a year. It is a summary of general precipitation and streamflow conditions during the year. The relative ranking in the period of record is used to classify the hydrologic year types into one of five categories: critically dry (bottom 20th percentile), dry (20th to 40th percentile), below normal (40th to 60th percentile), above normal (60th to 80th percentile), and wet (80th to 100th percentile). The WMA and CMA use a method like the long-standing method used by the Cachuma Project operations such as the 2019 State of California Water Resources Control Board (SWRCB) Order WR 2019-0148.

Salsipuedes Creek flows at the stream gage (U.S. Geological Survey [USGS] gage 11132500) are used as the monitoring location for calculating water year types. The USGS Salsipuedes Creek streamflow gage is located on Salsipuedes Creek just below the confluence with El Jaro Creek and has a drainage area of 47.1 square miles (shown in Figure 2-1). The 81-year dataset for the Salsipuedes Creek stream gage spans 1942 through 2022 (in **Figure 2-3**) and represents unimpeded runoff due to the absence of upstream water diversions and storage reservoirs. Annual Salispuedes Creek flow data ordered by the amount of flow in each year is shown in **Figure 2-4**. WY 2022 is indicated in Figure 2-4, which shows that WY 2022 was a dry year compared to the period of record. The background colors on most time series figures in this report are derived from Figure 2-4 and likewise indicate the relative year type.

Conditions for recent years, WY 2015 through WY 2022 are summarized in Table 2-1. The basin was experiencing a historic drought. For the recent 10-year period WY 2013-2022, there were only two years, WYs 2017 and 2019, which were “Above Normal” or “Wet”, and, before January 2023, Lake Cachuma had not spilled since WY 2011.



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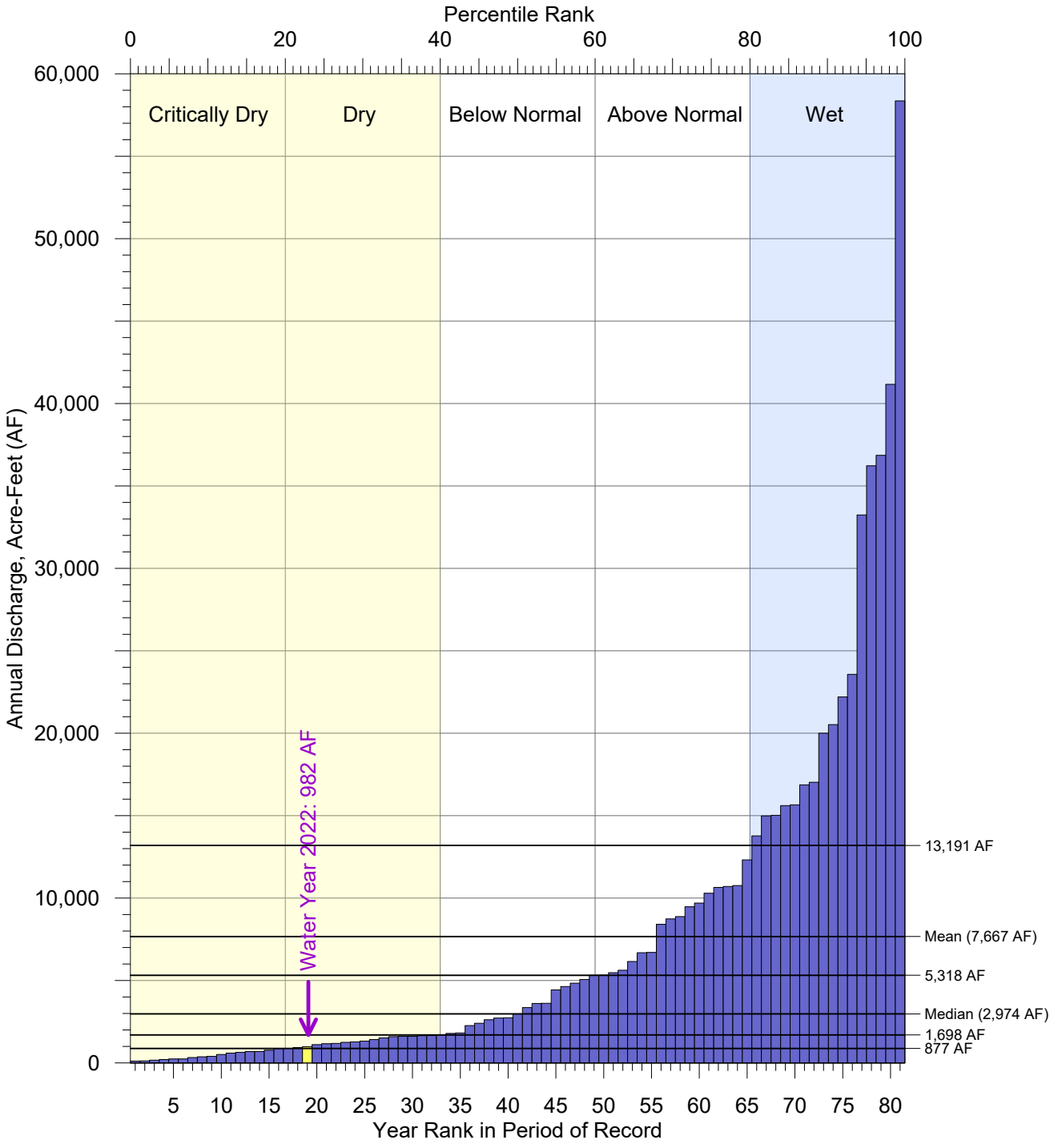
11132500 SALSIPUEDES CREEK NEAR LOMPOC
CUMULATIVE DEPARTURE FROM MEAN AND
PERIOD OF RECORD (WY 1942 - 2022)

Sources: USGS (2023) streamflow data

FIGURE 2-3

F:\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Salispuedes_CDM.grf 1/3/2023 M. McCammon

SANTA YNEZ RIVER ANNUAL FLOWS
11132500 SALSIPUEDES CREEK NEAR LOMPOC
PERIOD OF RECORD (WY 1942 - 2022)



Data Source: USGS (2023) streamflow data

WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

F:\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Salispuedes_Year_type.grf 1/4/2023 M. McCammon

The EMA is located farther from the Salsipuedes Creek stream gage than the WMA. The EMA has adopted a different method based on past and current years of precipitation data for a gage in the EMA (DWR, 2021).[2] The EMA classified WY 2022 as a “Critical” year. For the EMA method, a "Critical" indicates the rank of the water year type index is in the bottom 15th percentile of the period of record. Both methods for water year type meet the DWR requirements (DWR, 2021). The methods were selected in coordination with the entire Basin and based on the management needs of each GSA. Since these are different methods slight differences in water year type designation exist. The results from the two methods exhibit a robust match. Both methods support the same Basin-wide sustainability goals.

2 The DWR (2021) document states “GSAs may choose to use the SGMA WYT dataset as a resource in the development of their water budget but are not required to. GSAs have the option to develop their own water year types based on best available information (23 CCR Section 354.18d).”

CHAPTER 3: GROUNDWATER HYDROGRAPHS AND CONTOURS

Groundwater levels are a key indicator of sustainability in the basin. Groundwater levels directly impact the beneficial use of the Basin and correlate with or impact most of the groundwater sustainability indicators. The SGMA regulations require that GSP Annual Reports contain "*...groundwater elevation data from monitoring wells identified in the monitoring network [which] shall be analyzed and displayed*."[1]

The WMA assesses the following three SGMA sustainability indicators using groundwater level data:


Chronic lowering of groundwater levels


Reduction of groundwater storage (see Chapter 5)

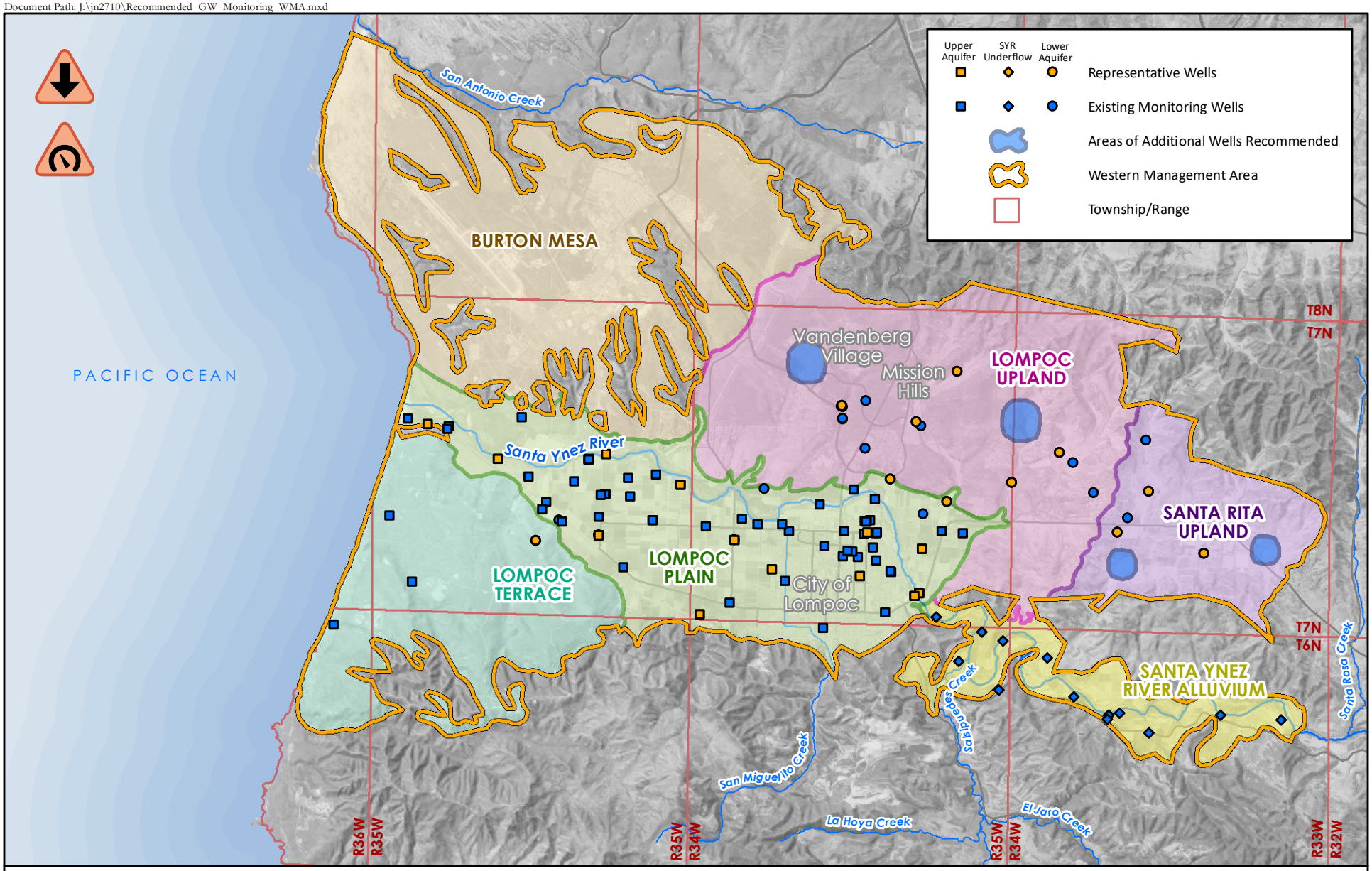

Depletion of interconnected surface water

3.1 GROUNDWATER ELEVATION DATA AND HYDROGRAPHS

Figure 3-1 is a map of the locations of groundwater monitoring network wells. Two appendices contain the groundwater level hydrographs[2]: **Appendix 3-A** which is Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels, and **Appendix 3-B** which is Groundwater Level Hydrographs for Assessing Surface Water Depletion. Several agencies collect groundwater level data in the WMA. In the WMA these agencies include Santa Barbara County Water Agency, the City of Lompoc, USBR, Vandenberg Village, and Mission Hills.

1 23 CCR § 356.2(b)(1)
2 23 CCR § 356.2(b)(1)(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.

Document Path: J:\jn2710\Recommended_GW_Monitoring_WMA.mxd



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WMA

Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

WMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

0 1 2 Miles

N

FIGURE 3-1

The SGMA water year runs from October 1st through September 30th. Seasonal high data is the data from March and April 2022. Seasonal low data is the data from October 2022. Fall data collection of water levels occurs in mid-October, less than a month after the end of the water year. This fall data is technically collected in WY2023. The WMA GSA considers this data as representative of the seasonal low conditions for WY2022.

3.2 GROUNDWATER ELEVATION CONTOUR MAPS

This GSP Annual Report must contain *"...elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions."*[3] according to the SGMA regulations. This Second Annual Report includes Spring 2022 (**Figure 3-2**) and Fall 2022 (**Figure 3-3**) contour maps. These correspond to the seasonal high and seasonal low groundwater conditions.

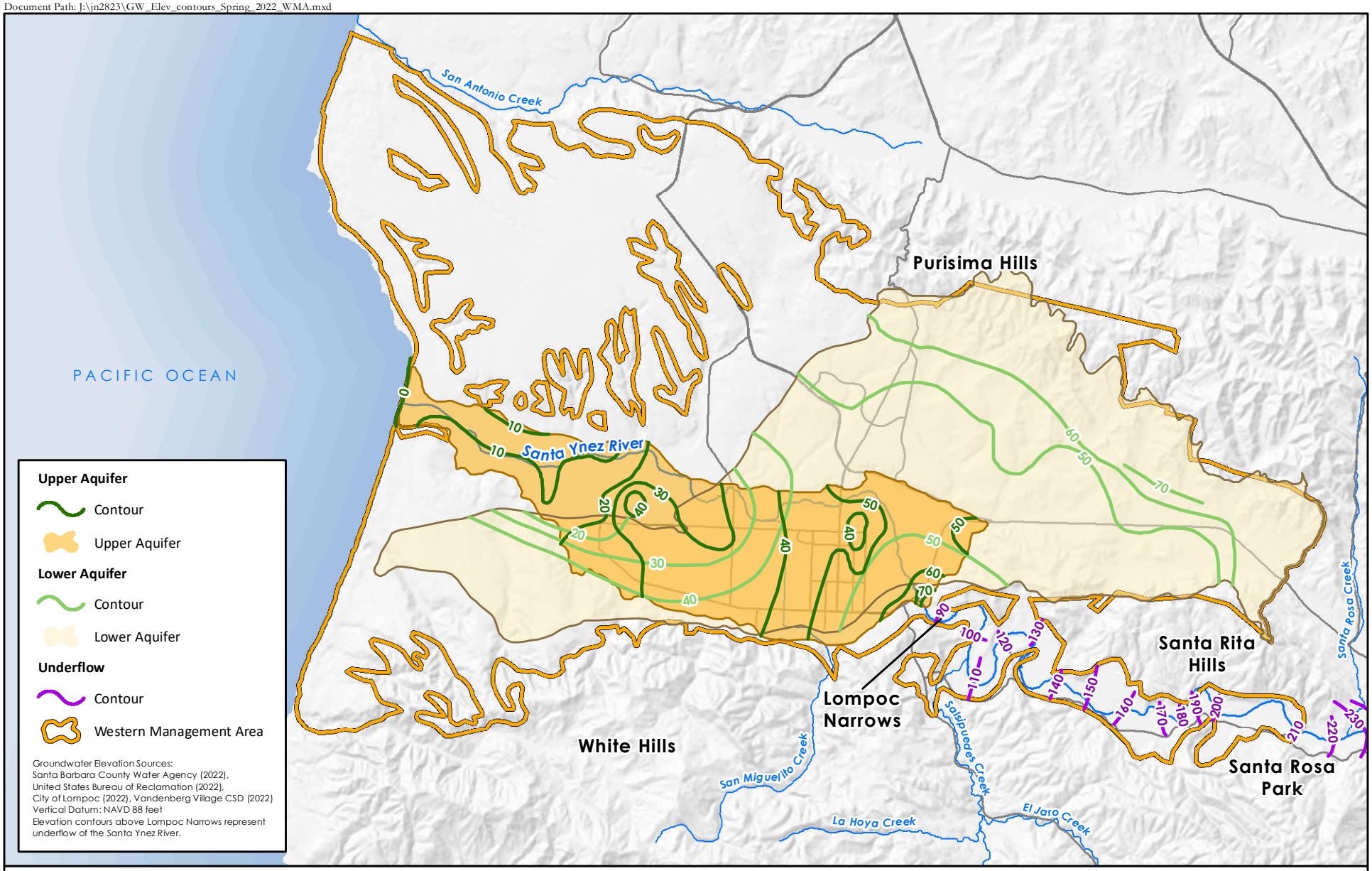
The WMA developed six sets of groundwater elevation contours for WY 2022, including. Fall 2021, Spring 2022, and Fall 2022 for the two principal aquifers and the river underflow. The Upper Aquifer consists of the Santa Ynez River deposits within the Lompoc Plain. The Lower Aquifer consists of the water-bearing Careaga Sand and Paso Robles Formations. River underflow occurs upstream of the Lompoc Narrows. SWRCB administers Santa Ynez River underflow as part of the river, so it is not a principal aquifer of the WMA.

3.2.1 Fall 2021 –Start of Year Seasonal Low Contours

The First Annual Report included Fall 2021 groundwater elevation contour map. The map for Fall 2021 represents conditions at the start of WY 2022. Please see the First Annual Report for the Fall 2021 map.

[3] 23 CCR § 356.2(b)(1)(A)

Document Path: J:\jn2823\GW_Elev_contours_Spring_2022_WMA.mxd



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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL HIGH
SPRING 2022
WESTERN MANAGEMENT AREA

DRAFT

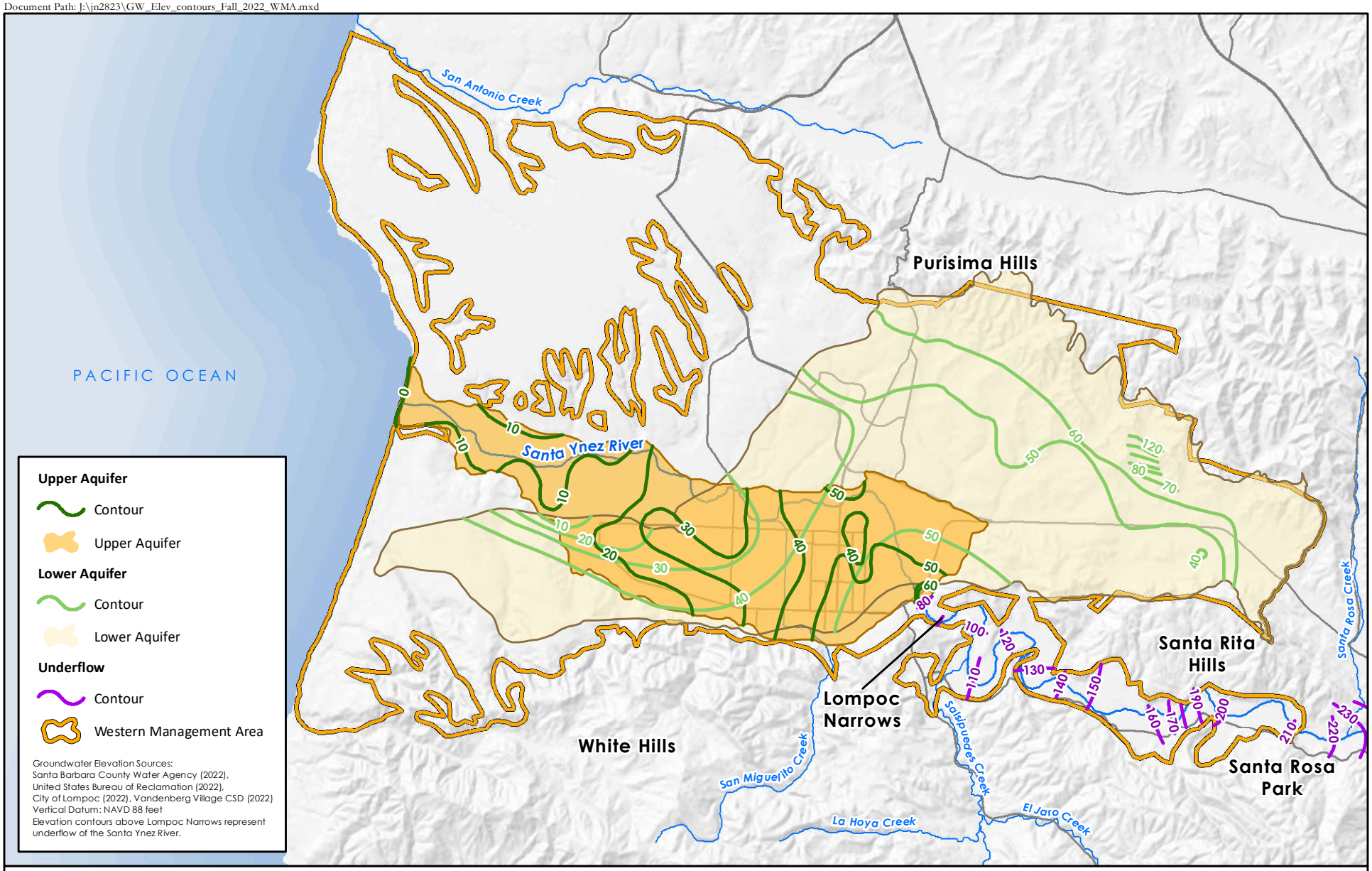
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
Lompoc (2022) and VVCSD (2022)

N

FIGURE 3-2

Document Path: J:\jn2823\GW_Elev_contours_Fall_2022_WMA.mxd



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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
FALL 2022
WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
Lompoc (2022) and VVCSD (2022)

N

FIGURE 3-3

3.2.2 Spring 2022– Seasonal High Contours

Figure 3-2 is a groundwater level contour map developed for Spring 2022, which is the seasonal high for WY 2022. Relative to Spring 2021, the Upper Aquifer indicated a lower water level in Spring 2022. This is more noticeable in the eastern Lompoc Plain. This is likely due to the amount of recharge from the Santa Ynez River and the dry conditions of WY 2022. The western Lompoc Plain is more like the previous year. The Lompoc Plain also has lower water levels in the Lower Aquifer compared to Spring 2021. The Lower Aquifer in the Lompoc Uplands and Santa Rita Uplands are about the same as the previous year.

3.2.3 Fall 2022 – End of Year Seasonal Low Contours

The Fall 2022 groundwater elevations represent the seasonal low groundwater levels for WY 2022. Figure 3-3 is a groundwater level contour map developed for this seasonal low. Relative to the start of WY 2022, in Fall 2021, the Upper Aquifer showed mixed results with some wells with rising water levels and some wells with lower water levels. The central and western Lompoc Plain was more consistent with Fall 2021. East of the Santa Ynez River showed an area of decline for Upper Aquifer. The Lower Aquifer in the Lompoc Plain showed a slight decline since the Fall of 2021, but the upland areas were about the same.

CHAPTER 4: WATER USE AND AVAILABLE SURFACE WATER

Water use is a major component of the water budget. The SGMA regulations require that "*…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.*"[1] This chapter of the Second Annual Report provides an update on water use in the Basin.

4.1 GROUNDWATER USE

Groundwater production within the WMA for both the Upper and Lower Aquifers is used for agricultural, domestic, municipal, and industrial purposes. Outside of the municipal users, most of the WMA is a mixture of rural areas with agriculture and some rural-suburban development. Groundwater production is reported semi-annually to the Santa Ynez River Water Conservation District (SYRWCD).

SYRWCD's semi-annual groundwater production data was converted to monthly values using monthly evapotranspiration (ET) from California Irrigation Management Information System (CIMIS) sites (see Figure 2-1 for CIMIS site locations). Municipal data provided by the City of Lompoc, Vandenberg Village CSD, and Mission Hills CSD was compiled into monthly data. Domestic and agricultural data for the fourth quarter (July-September) of WY 2022 was estimated using the reported data from the fourth quarter of the previous water year (WY 2021). **Figure 4-1** shows the monthly groundwater use in the WMA, and **Figure 4-2** shows the annual groundwater use for each water year.[2] **Figure 4-3** is a map showing the spatial distribution of WMA groundwater pumping during WY 2022. The Upper Aquifer annual groundwater use

1 23 CCR § 356.2(a) 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.

2 Figures in the GSP showed groundwater production based on the SYRWCD's Fiscal Year (July-June), production data presented here is recalculated to the Water Year (October-September) basis.

is shown in **Figure 4-4**, and Lower Aquifer annual groundwater use is shown in **Figure 4-5**. **Table 4-1** summarizes the groundwater production for WY 2022.

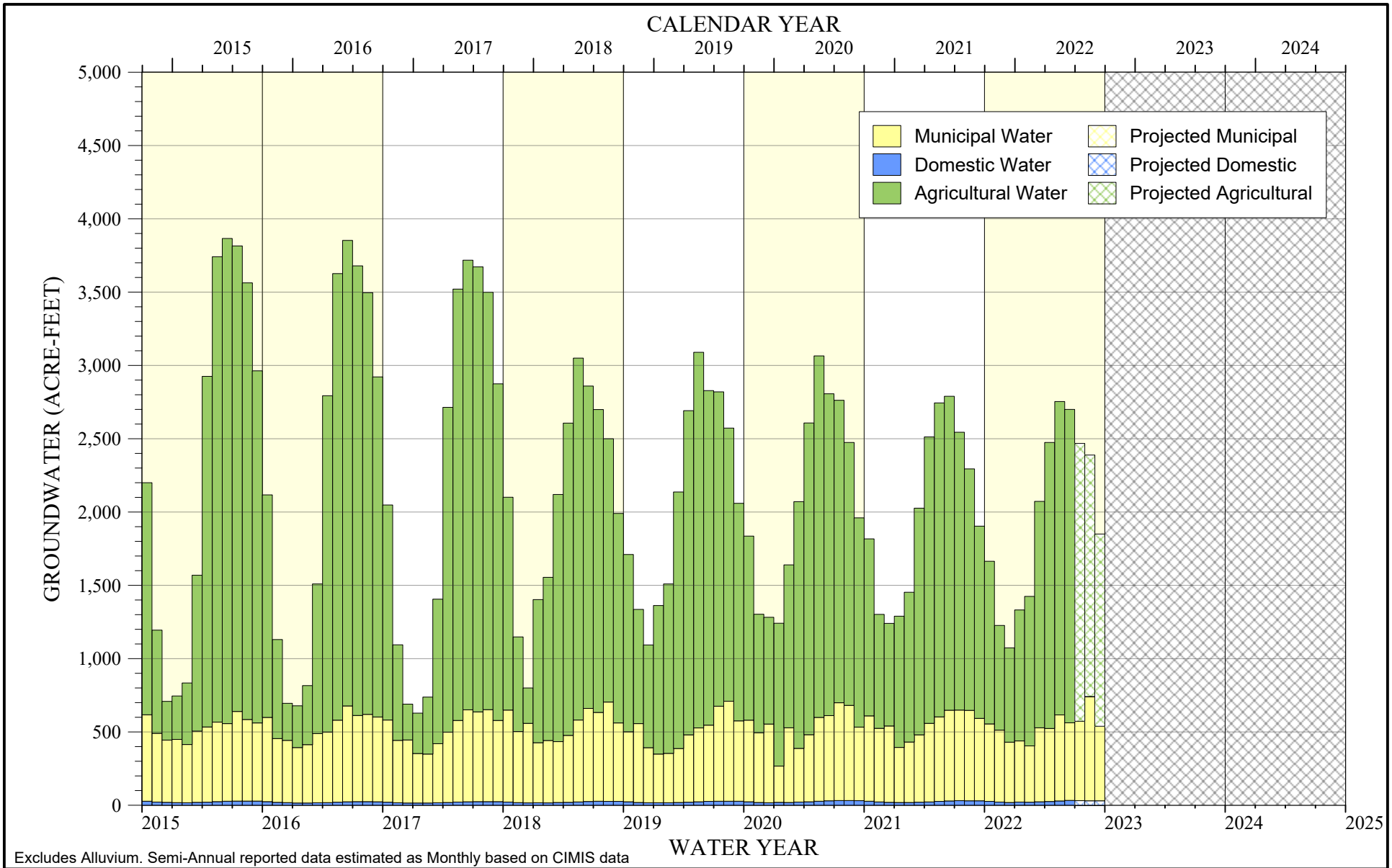
Table 4-1
Summary WMA Groundwater Extraction for Water Year 2022

Water Use Sector	Upper Aquifer	Lower Aquifer	Total	Method of Measurement	Estimated Accuracy
	Acre-Feet	Acre-Feet	Acre-Feet		Acre-Feet
Domestic	60	260	320	Self-Reported to SYRWCD	± 30 (~10%)
Agricultural	13,840	3,160	17,000	Self-Reported to SYRWCD may include estimates using crop usage, estimated for July-September using WY 2021 data	± 1,700 (~10%)
Municipal	4,240	1,870	6,110	Daily totalizer values	± 60 (~1%)
Total	**18,140**	**5,290**	**23,430**		**± 1,790**

SYRA pumping (SYRWCD Zone A) is managed as surface water and excluded from Table 4-1 (see Table 4-2).
All numbers rounded to the nearest 10 acre-feet.
Source: SYRWCD (2022), City of Lompoc (2022), MHCSD (2022), VVCSD (2022)

4.2 SURFACE WATER USE

The WMA relies on two surface water source types: local water and imported water. Local water includes both local tributary flows and the flows of the Santa Ynez River which are partially retained in Lake Cachuma. Imported water is from State Water Project (SWP) or the adjacent San Antonio Basin. Vandenberg Space Force Base (VSFB) is the sole water-importing entity in the WMA.



Excludes Alluvium. Semi-Annual reported data estimated as Monthly based on CIMIS data

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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

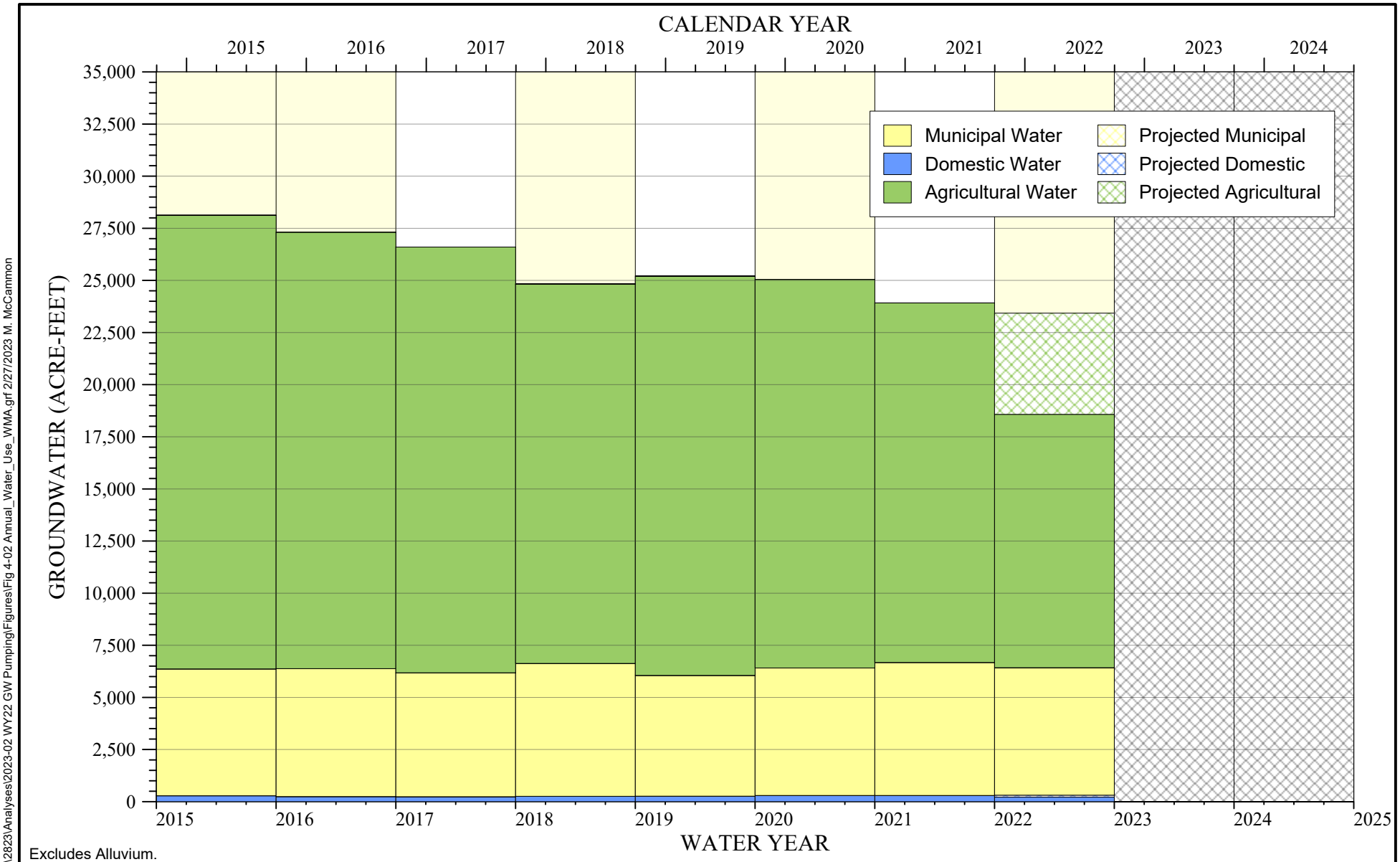
MONTHLY GROUNDWATER USE
TOTAL WESTERN MANAGMENT AREA

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Source: Santa Ynez River Water Conservation District (2023), City of Lompoc (2023), Mission Hills CSD (2023), Vandenberg Village CSD (2023)

FIGURE 4-1

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-01 Monthly_Water_Use_WMA.grf 2/27/2023 M. McCammon



Excludes Alluvium.

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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

ANNUAL GROUNDWATER USE
TOTAL WESTERN MANAGMENT AREA

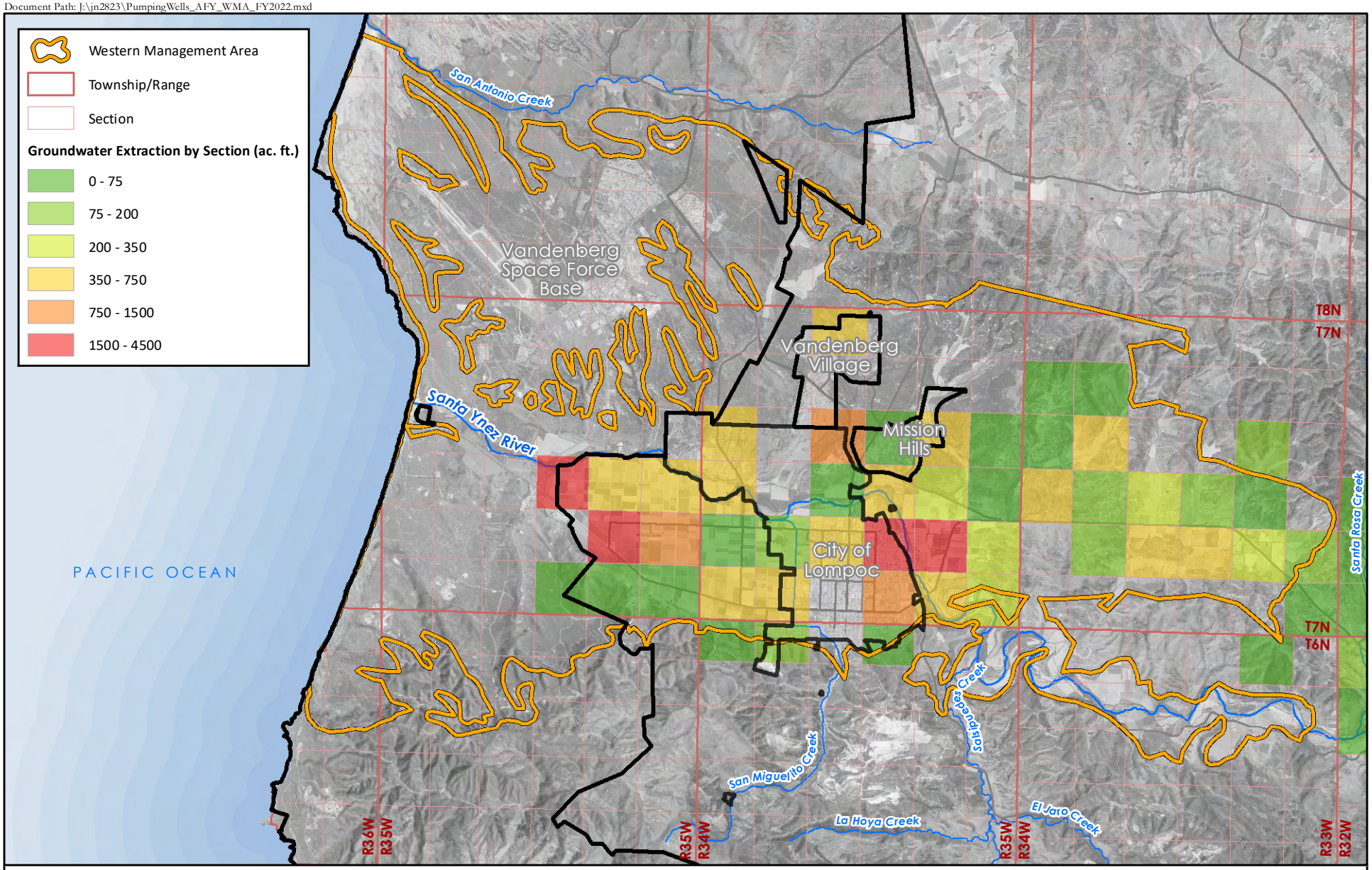
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Source: Santa Ynez River Water Conservation District (2023), City of Lompoc (2023), Mission Hills CSD (2023), Vandenberg Village CSD (2023)

FIGURE 4-2

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-02 Annual_Water_Use_WMA.grf 2/27/2023 M. McCammon

Document Path: J:\jn2823\PumpingWells_AFY_WMA_FY2022.mxd



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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

DRAFT

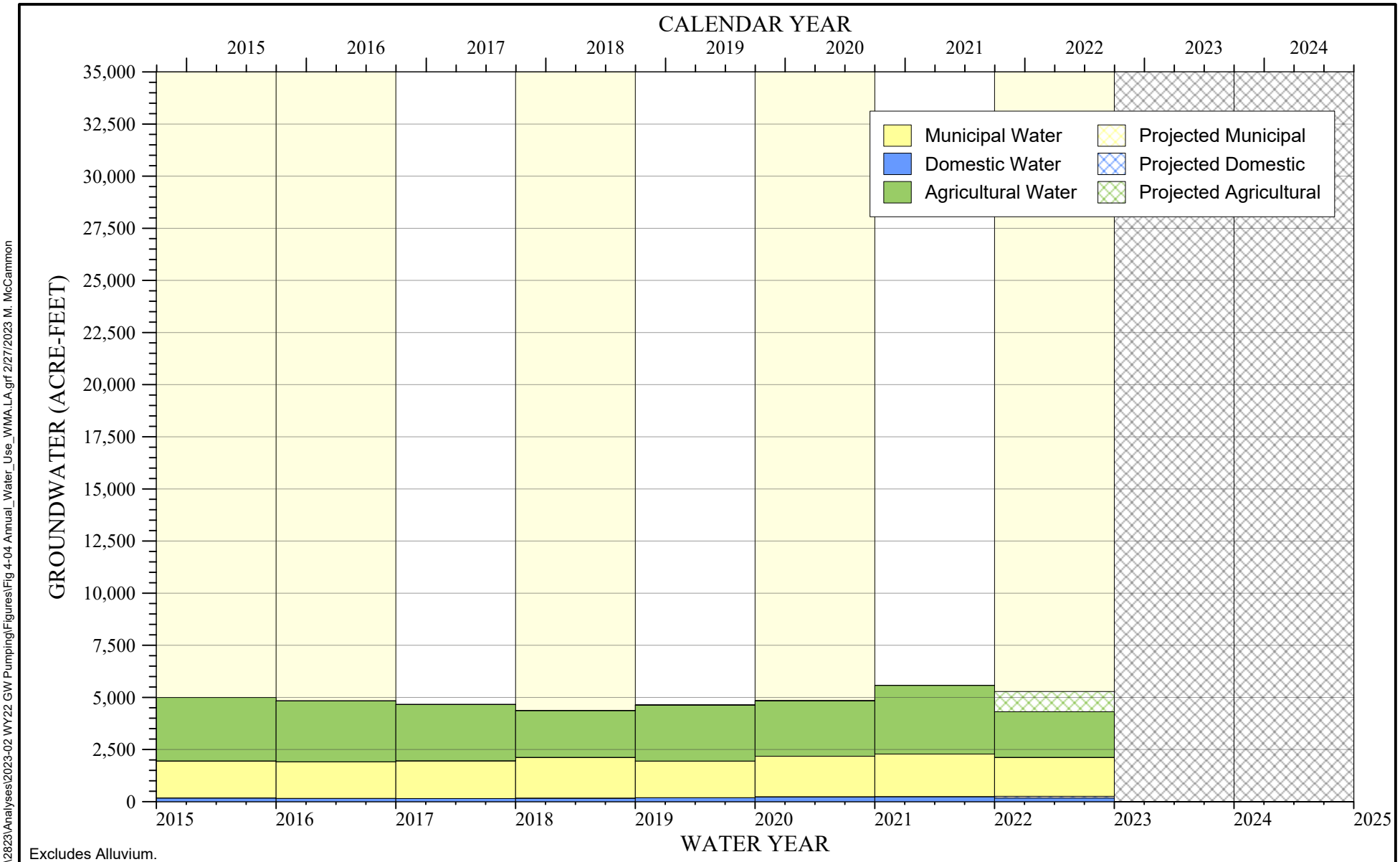
LOCATION AND VOLUME OF GROUNDWATER EXTRACTION 2022

Source: Santa Ynez River Water Conservation District (2023)

0 1 2 Miles

N

FIGURE 4-3



Excludes Alluvium.

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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

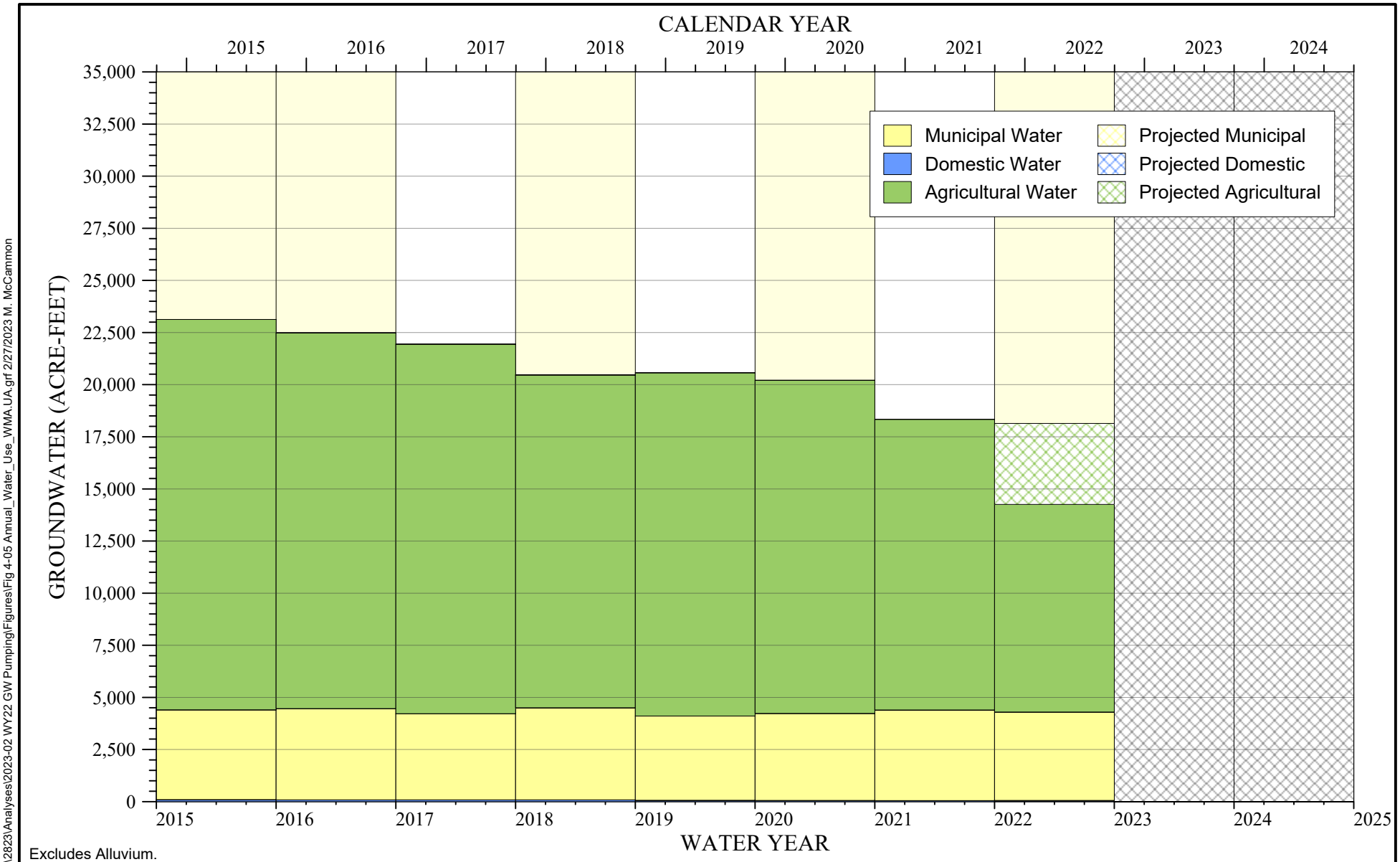
ANNUAL GROUNDWATER USE
LOWER AQUIFER
WESTERN MANAGMENT AREA

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Source: Santa Ynez River Water Conservation District (2023), City of Lompoc (2023), Mission Hills CSD (2023), Vandenberg Village CSD (2023)

FIGURE 4-4

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-04 Annual_Water_Use_WMA.LA.grf 2/27/2023 M. McCammon



Excludes Alluvium.

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

ANNUAL GROUNDWATER USE
UPPER AQUIFER
WESTERN MANAGMENT AREA

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Source: Santa Ynez River Water Conservation District (2023), City of Lompoc (2023), Mission Hills CSD (2023), Vandenberg Village CSD (2023)

FIGURE 4-5

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 GW Pumping\Figures\Fig 4-05 Annual_Water_Use_WMA.UA.grf 2/27/2023 M. McCammon

4.2.1 Surface Water Diversions Upstream of the Lompoc Narrows

Upstream of the Lompoc Narrows the SWRCB manages the underflow of the Santa Ynez River as surface water. This management follows the SWRCB water rights Order of 1973 (WR 73-37), as amended in 1989 (WR 89-18) and most recently amended in 2019 (WR 2019-0148). SWRCB considers water extracted from wells upstream of the Lompoc Narrows as Santa Ynez River diversions. Well pumpers from the underflow report the amount pumped to both the SYRWCD and the SWRCB. **Table 4-2** shows the total extraction of river wells upstream of the Lompoc Narrows in the WMA for WY 2022.[3]

Table 4-2
Summary WMA Surface Water Diversions for Water Year 2022

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre-Feet		Acre-Feet
Domestic	20	Self-Reported to SYRWCD	± 2 (~10%)
Agricultural	4,550	Self-Reported to SYRWCD may include estimates using crop usage, estimated for July-September using WY 2021 data	± 450 (~10%)
Municipal	0	NA	NA
Total	**4,570**		**± 450**

4.2.2 Water Imports

The Central Coastal Water Authority (CCWA) delivers imported water from the SWP to the SYRVGB since 1997. CCWA makes water deliveries at turnouts to water distribution systems. CCWA delivers to Lake Cachuma for the South Coast customers outside of the SYRVGB. The Cachuma Project Settlement Agreement allows for comingling of CCWA water with local water for water rights releases. Within the SYRVGB, four agencies contract with CCWA to provide for SWP deliveries: VSFB, the City of Buellton, the City of Solvang, and the Santa Ynez River Water Conservation District Improvement District Number 1. Of these, only the VSFB is located within the WMA.

[3] The SYRWCD records pumping in the Santa Ynez River Alluvium as Zone A.

In WY 2022 VSFB imported 268 acre-feet of water, all sourced from the SWP through the CCWA pipeline. This VSFB water makes it into WMA as wastewater through the Lompoc Regional Wastewater Reclamation Plant. **Figure 4-6** and **Table 4-3** show the annual imports through the CCWA pipeline to the WMA and the entire SYRVGB, updated through the end of WY 2022.

Table 4-3
Santa Ynez River Valley Groundwater Basin Water Imports
in Acre-Feet for Recent Years

Water Year	WMA	CMA	EMA	Total Basin
2015	109	0	2,125	2,234
2016	1,758	82	483	2,241
2017	1,924	293	3,272	5,196
2018	2,296	224	1,994	4,290
2019	2,361	268	3,290	5,651
2020	2,893	359	3,172	6,065
2021	2,239	200	2,251	4,490
2022	268	82	801	1,069

Source: CCWA (2023)

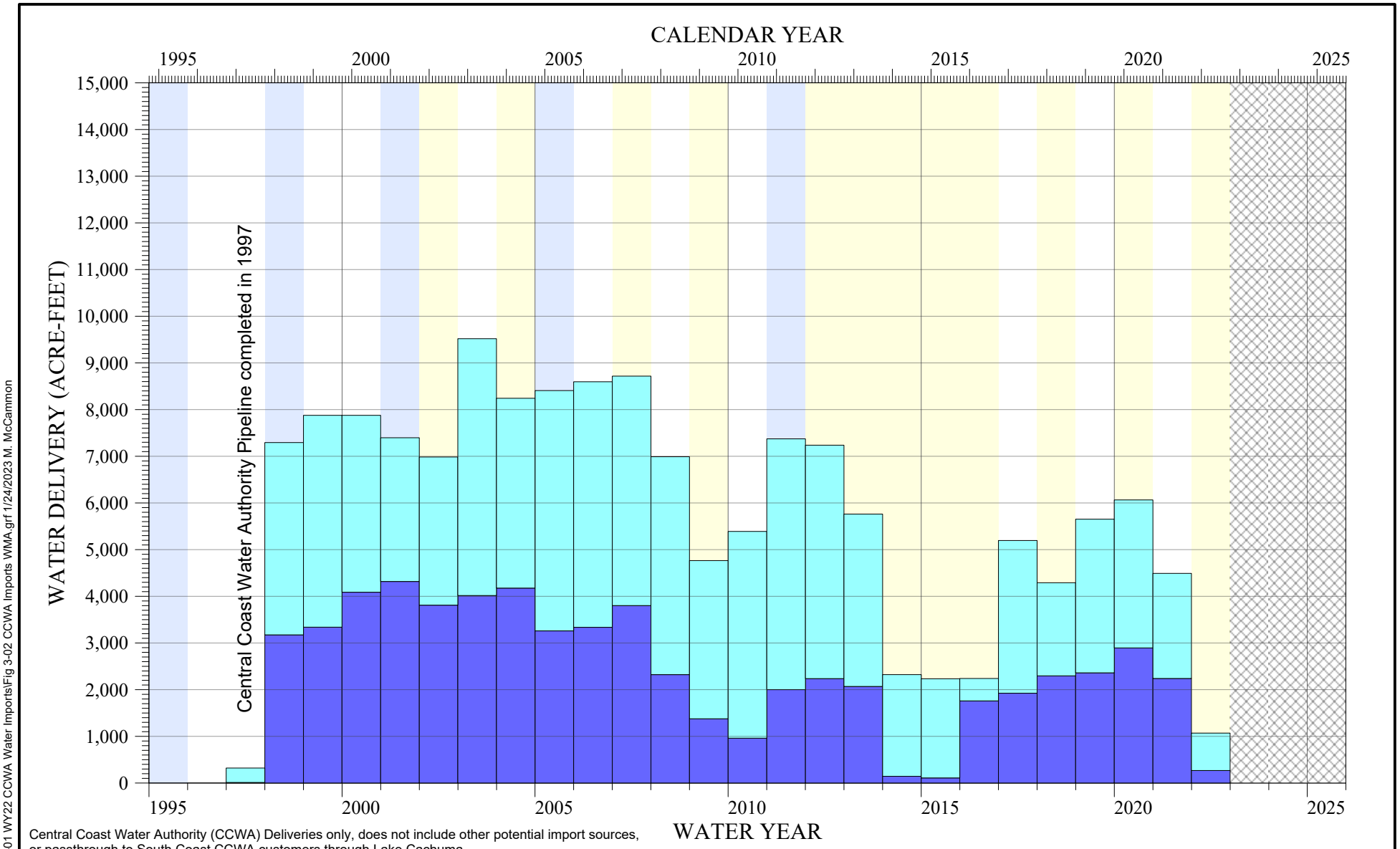
4.3 SURFACE WATER AVAILABLE FOR GROUNDWATER RECHARGE OR REUSE

During WY 2022, there were no projects within the WMA for direct groundwater recharge or in-lieu use.[4]

The Santa Ynez River and its underflow are within the jurisdiction of and regulated by the SWRCB. SWRCB regulates for beneficial purposes including supporting the steelhead trout (*Oncorhynchus mykiss, O. mykiss*) population.[5] Following the SWRCB, USBR releases water stored in Lake Cachuma to meet downstream water rights and support fish habitat.

4 23 CCR § 356.2(b)(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.

5 The Cachuma Operation and Maintenance Board (COMB) Fisheries Division conducts the monitoring of steelhead (*Oncorhynchus mykiss*) population in the Santa Ynez River and its tributaries. However, the COMB report comes out in the second quarter of the following water year, which is expected to be published concurrent or after this annual report.



Central Coast Water Authority (CCWA) Deliveries only, does not include other potential import sources, or passthrough to South Coast CCWA customers through Lake Cachuma.

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

ANNUAL WATER IMPORTS
CENTRAL COAST WATER AUTHORITY

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

Santa Ynez Imports
- Vandenberg SFB
- Non-WMA

Source: Central Coast Water Authority (2023)

FIGURE 4-6

F:\DATA\2823\Analyses\2023-01 WY22 CCWA Water Imports\Fig 3-02 CCWA Imports WMA.grf 1/24/2023 M. McCammon

During the summer and fall of WY 2022, USBR made water rights releases. These water rights releases started on August 8, 2022, and extended through October 5, 2022. During these 58 days, two thousand two acre-feet (2,002 AF) of water was delivered to the Lompoc Narrows to replenish the Santa Ynez River and adjacent underflow. Location of the Lompoc Narrows gage is shown on Figure 1-4.

Measurements at the Lompoc Narrows stream gauge represent more than 85% of all local surface water flows entering the WMA (Stetson, 2022). **Figure 4-7** shows flows of the Santa Ynez River at the USGS Streamflow gage 11133000 at Lompoc Narrows, downstream of the WMA-CMA boundary for WY 2015 through February 2023.

4.3.1 Treated Wastewater Sources

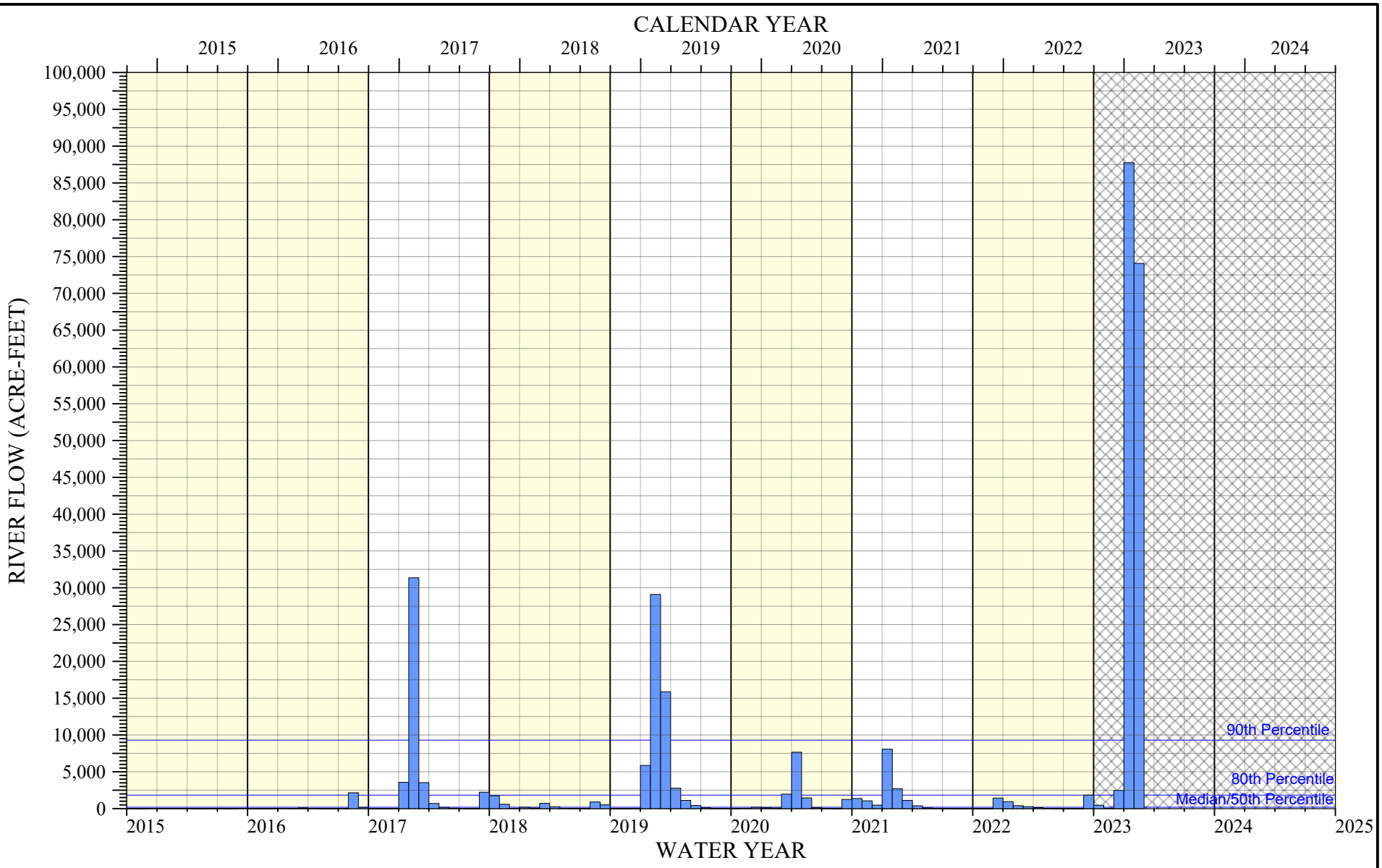
Wastewater in the WMA is managed by the City of Lompoc, the Federal Bureau of Prisons, Mission Hills CSD, Vandenberg Village CSD, and VSFB. Annual volumes of water collected by the Lompoc Regional Wastewater Reclamation Plant (LRWRP) and the Mission Hills CSD systems since 2015 are summarized in **Table 4-4**.

Table 4-4
Wastewater Influent Volumes

Water Year	Lompoc Regional Wastewater Reclamation Plant Influent	Mission Hills Community Services District Sewer Flows
	Acre-Feet per Year	Acre-Feet per Year
2015	3,334	212
2016	3,324	247
2017	3,439	265
2018	3,338	240
2019	3,392	300
2020	3,394	223
2021	3,329	196
2022	3,318	180

Source: City of Lompoc (2021, 2022, 2023), MHCSD (2021, 2022, 2023)

Most of the water from the LRWRP is tertiary treated and discharged to San Miguelito Creek near the confluence with the Santa Ynez River.



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MONTHLY SURFACE FLOW
SANTA YNEZ RIVER AT LOMPOC NARROWS
USGS STREAMGAGE 11133000

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Source: USGS NWIS (2023)

FIGURE 4-7

\\192.168.16.33\main\DATA\2823\Analyses\2023-01 WY22 SW Flow Statistics\Fig 4-07 Monthly_11133000_SANTA YNEZ R A NARROWS_WMA.grf 3/1/2023 M. McCammon

4.3.2 Reuse of Treated Wastewater Sources

The LRWRP has programs to enable the use of recycled water which can offset the use of groundwater. SWRCB Order WW0101, dated May 30, 2018, authorized up to 69 AFY of water used for local construction purposes.[6] In 2019, the Division of Drinking Water approved a Site Use Report approving irrigation use of LRWRP recycled water (WCI, 2021). Due to high costs, the City suspended the recycled water program during WY 2022.

4.4 TOTAL WATER USE

Total water use in the WMA during WY 2022 is comprised of groundwater supplies, surface water diversions upstream of the Lompoc Narrows, and imported SWP water. See Chapters 4.1 and 4.2 above for additional detail on these supplies. **Table 4-5** shows the summary of total water use by sector for the water year 2022. **Table 4-6** shows the summary of total water use by source for WY 2015-WY 2022. Total water use in the WMA was 28,270 AF in WY 2022.

Table 4-5
Summary WMA Total Water Use by Sector for Water Year 2022

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre-Feet		Acre-Feet
Domestic	340	Self-Reported to SYRWCD	± 30
Agricultural	21,550	Self-Reported to SYRWCD and estimates	± 2,200
Municipal	6,380	Daily totalizer values; Includes CCWA imports to VSFB	± 60
Total	**28,270**		**± 2,290**

6 "The authorized place of use for up to 62,000 gallons per day of treated wastewater for industrial uses is 7,488 acres within the City of Lompoc city limits and within 30 miles radius of Lompoc Regional Wastewater Reclamation Plant"

Table 4-6
Summary WMA Total Water Use by Source for Water Years 2015-2022

Water Year	Total Groundwater (Upper and Lower Aquifer)	Total Surface Water (River Well Pumping)	Total Imports (CCWA)	TOTAL WATER USE
	Acre-Feet per Year	Acre-Feet per Year	Acre-Feet per Year	Acre-Feet per Year
2015	28,120	5,260	110	33,490
2016	27,320	5,530	1,760	34,610
2017	26,600	5,770	1,920	34,290
2018	24,830	5,790	2,300	32,920
2019	25,210	4,460	2,360	32,030
2020	25,050	4,290	2,890	32,230
2021	23,910	4,590	2,240	30,740
2022	23,430	4,570	268	28,270

CHAPTER 5: GROUNDWATER STORAGE

Groundwater storage is one of the SGMA sustainability indicators. This chapter presents the changes in storage components required by the SGMA regulations:

> *"(5) Change in groundwater in storage shall include the following:*
>
> *(A) Change in groundwater in storage maps for each principal aquifer in the basin.*
>
> *(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year." (*23 CCR § 356.2(b))

Storage changes are calculated and mapped for the seasonal high (spring-to-spring) using a Thiessen polygon[1] method. This method uses water level observations at representative monitoring wells. In the WMA there is a longer period of record for seasonal high spring water levels than there is for seasonal low fall water levels. Agencies collected water levels from fewer wells during the fall. The WMA uses the spring-to-spring storage changes for trends due to this historical data collection.

[1] This method for tessellation goes by several names. Voronoi diagrams or Dirichlet tessellation are both names use in mathematics. The name Thiessen polygons comes from the application to hydrology.

5.1 CHANGE IN GROUNDWATER IN STORAGE MAPS

The SGMA regulations[2] require every Annual Report to contain *"change in groundwater in storage maps for each principal aquifer in the basin."* On the following maps, the polygon color indicates the change in groundwater storage. Blue indicates increased storage. Orange indicates decreased storage. Color intensity is relative to the area of the polygon. Darker colors indicate a greater change in storage per acre. Numbers shown in each polygon are the estimated volume change in acre-feet. **Figure 5-1** and **Figure 5-2** show spring change in storage.

The node of each polygon comes from existing representative monitoring wells (Figure 3-1). The area of each polygon is the area that is closest to the node point, compared to the other node points. The external boundary is the aquifer extent. The WMA uses the following equation to calculate the change in groundwater in storage for each polygon:

Change of Groundwater in Storage (acre-feet) = [area (acres)] x [Sy (unitless)] x [change in groundwater elevation (ft)]

Total Change of Groundwater in Storage (acre-feet) = Σ (Change in Storage for each Polygon)

Table 5-1 summarizes the total change in storage calculated for each aquifer for WY 2022.

Table 5-1
Estimated Change in Storage
By Aquifer in Acre-Feet

Period		Lower Aquifer	Upper Aquifer	Total
Seasonal High	Spring 2021 to Spring 2022	5,200	-1,400	3,800

Numbers rounded to the nearest 100 AF.

[2] 23 CCR § 356.2(b)(1)

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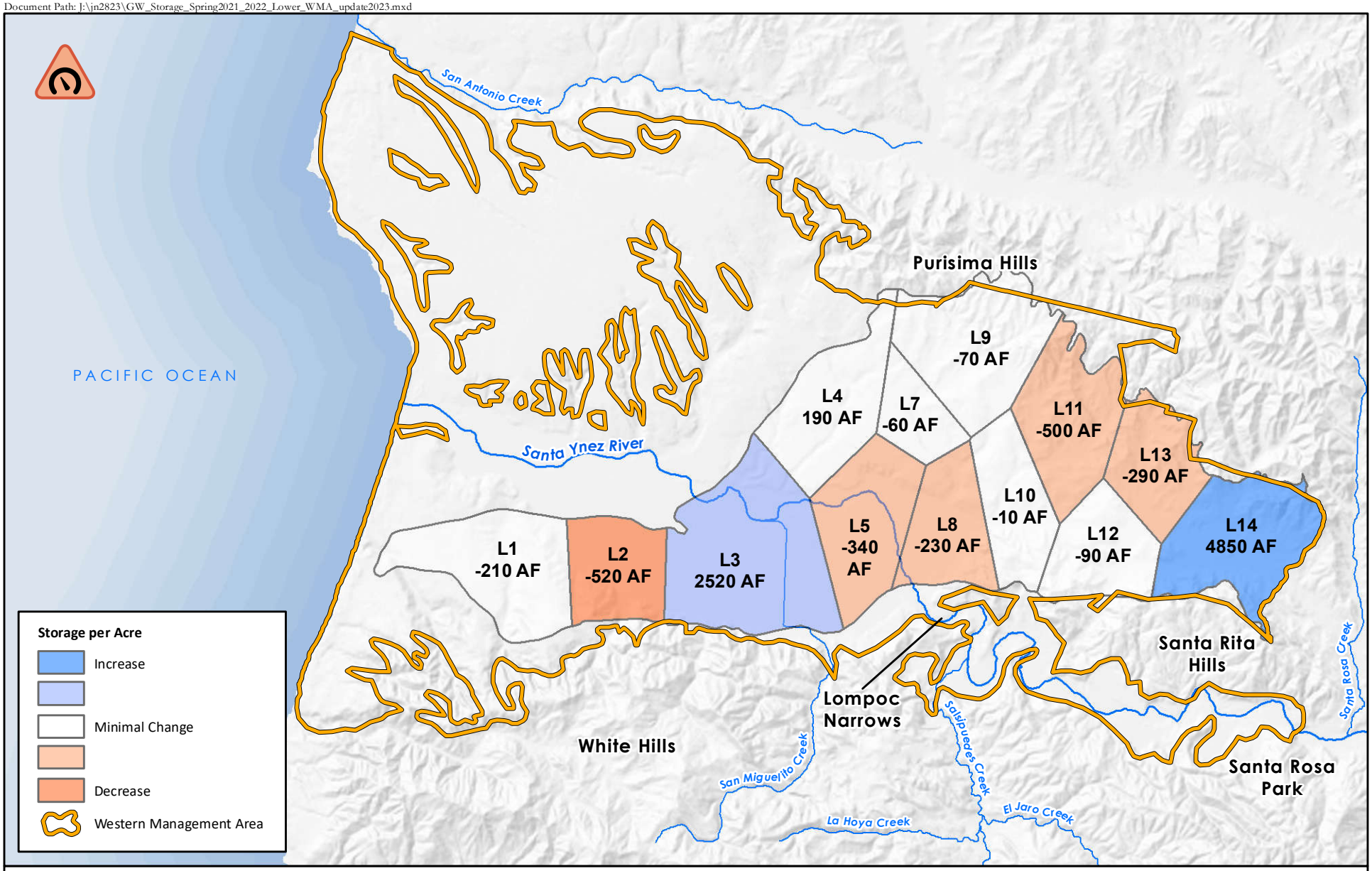

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CHANGE IN GROUNDWATER IN STORAGE
SPRING 2021-SPRING 2022
LOWER AQUIFER
WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 5-1

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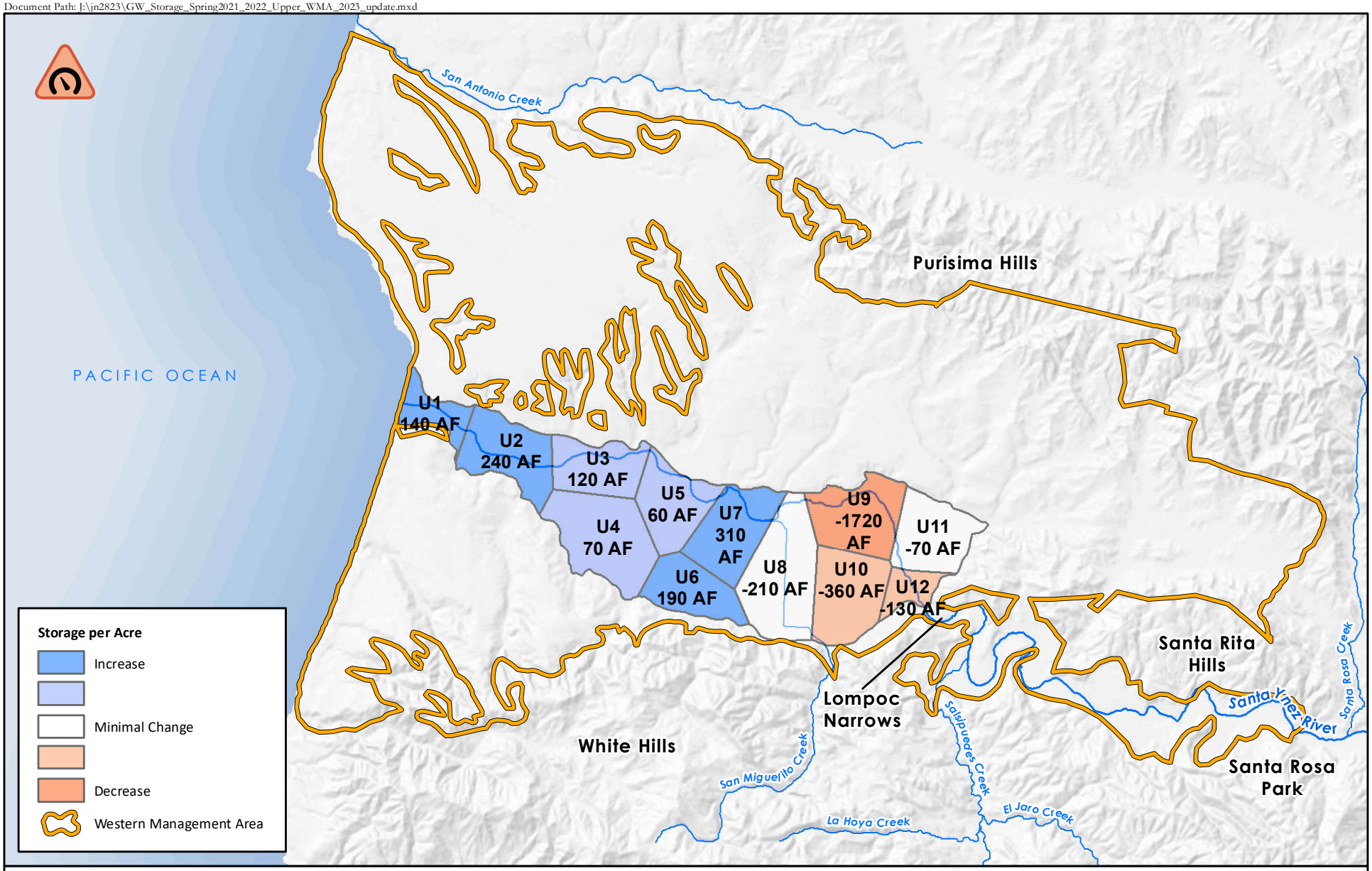

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CHANGE IN GROUNDWATER IN STORAGE
SPRING 2021-SPRING 2022
UPPER AQUIFER
WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 5-2

Spring 2021 to Spring 2022 change in storage is shown for the Lower Aquifer in Figure 5-1 and the Upper Aquifer in Figure 5-2. Total storage change for the WMA was a gain of 3,800 AF. Based on Figure 5-1, most areas of the Lower Aquifer showed a general decline in storage. Two polygons (L3, L14) showed large increases relative to the spring of 2021.The Lower Aquifer has a gain in storage of 5,200 AF. Based on Figure 5-2, most of the Upper Aquifer showed a general increase in storage over the previous Spring. However, one outlier polygon (U9) had a large decrease relative to spring 2021.The Upper Aquifer has a loss of 1,400 AF.

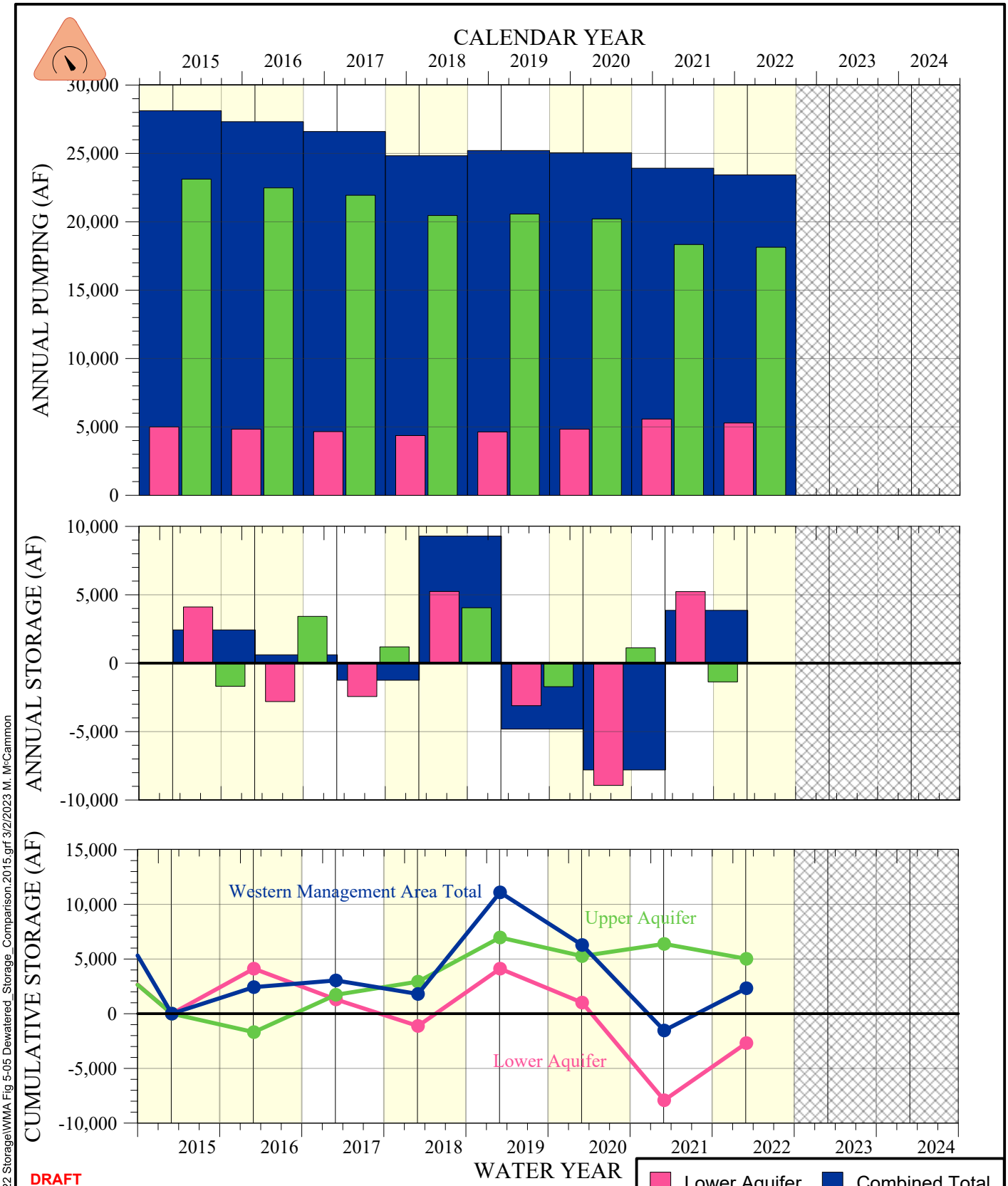
5.2 GROUNDWATER USE AND EFFECTS ON STORAGE

The SGMA regulations require that GSP Annual Reports contain "*A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year*."[3]

The Water Year Type is classified in Chapter 2 of this report using the same method as described in the WMA GSP. Updated groundwater use for WY 2022 is described in Chapter 4. The method for calculating the annual change in groundwater in storage is described earlier in this chapter. Annual storage change was calculated for historical years, including from WY 2015 through the present. In the WMA there is a longer period of record for seasonal high spring water levels than there is for seasonal low fall water levels. Agencies collected water levels from fewer wells during the fall. The WMA uses the spring-to-spring storage changes for trends due to this historical data collection.

Annual reported groundwater use for the WMA Upper Aquifer is compared to the annual change in Upper Aquifer groundwater storage in **Figure 5-3**. The Water Year classifications shown in this figure are consistent with the classification of water years shown in Figure 2-4. The top of Figure 5-3 shows the annual reported groundwater use for the WMA Upper Aquifer, Lower Aquifer, and combined. The middle of Figure 5-3 shows the annual change in storage for the Upper Aquifer, Lower Aquifer, and combined total, and the bottom of Figure 5-3 set shows the cumulative change for Upper Aquifer, Lower Aquifer, and combined total starting in March 2015.

[3] 23 CCR § 356.2(b)(5)(B)



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3/2/2023

Annual Pumping Data Includes Projected Data for WY2022Q4

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COMPARISON OF WATER YEAR, USE, ANNUAL STORAGE, AND CUMULATIVE STORAGE RELATIVE TO MARCH 2015

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 Storage\WMA Fig 5-05 Dewatered_Storage_Comparison.2015.grf 3/2/2023 M. McCammon

CHAPTER 6: PROGRESS TOWARDS GSP IMPLEMENTATION AND SUSTAINABILITY

The SGMA regulations (Appendix 1-A) require that the SGMA Annual Reports contain "*A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report*."[1] As indicated by the previous chapters discussing groundwater levels, water use, and storage, groundwater conditions within the WMA remain sustainable with no undesirable results for the SGMA sustainability criteria. Below summarizes the conditions within the WMA for the additional SGMA indicators.

The WMA GSP Implementation of general projects and management actions identified in the WMA GSP has begun. The WMA is in the process of taking the steps to ensure funding to complete the actions planned in the GSP.

6.1 SUSTAINABILITY INDICATORS

Analyses conducted for the WMA GSP indicate that current Basin conditions are sustainable with no current undesirable results, with no significant and unreasonable impacts occurring. This chapter discusses changes in the Basin concerning GSP-identified minimum thresholds, measurable objectives, and interim milestones[2] for both the previously discussed sustainability indicators of groundwater levels, storage, and interconnected surface water, as well as the remaining sustainability indicators.

Seawater intrusion

Degraded water quality

1 23 CCR § 356.2(a) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

2 23 CCR § 356.2(a) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.


Land subsidence


Interconnected surface water

6.1.1 Chronic Lowering of Groundwater Levels

Chapter 3 provided data and maps for the chronic lowering of groundwater levels sustainability indicator. The WMA GSP states the following regarding monitoring groundwater levels for undesirable results:

> "Spring groundwater elevations that drop below the established groundwater elevation minimum thresholds in more than 50% of the representative monitoring wells in the Upper Aquifer or 50% of the representative monitoring wells in the Lower Aquifer for two consecutive, non-drought years[3] would correspond to an undesirable result associated with chronic lowering of groundwater elevations."

Similarly, for measurable objectives and interim milestones, the WMA GSP states:

> "Measurable objectives are achieved when the 2011 groundwater elevation is reached in half of the representative monitoring wells (RMWs)."

The interim milestones were set to measurable objectives due to GSP finding that the WMA conditions were sustainable with no current undesirable results.

The WMA currently has twenty-six representative groundwater level monitoring wells, thirteen each in the Lower Aquifer (**Table 6-1**) and Upper Aquifer (**Table 6-2**). These tables compare the groundwater level elevations to the sustainable management criteria for each well. The sustainable management criteria include Measurable Objectives, Early Warning, and Minimum Thresholds. These tables show all wells were above their Minimum Threshold levels for WY 2022. No undesirable results related to water levels occurred in WY 2022.

[3] Two or more consecutive years that are classified as Dry or Critically Dry (Chapter 2, GC) will be defined as drought years. All other year types and combination of year types will be defined as non-drought years for the purpose of defining undesirable results under a groundwater sustainability plan.

Table 6-1
Groundwater Elevations for
Lower Aquifer Groundwater Levels (feet in NAVD88)

Name	ID	Measuring Point	Reference Values			Water Year 2021		Water Year 2022	
			Measurable Objective	Early Warning	Minimum Threshold	Spring	Fall	Spring	Fall
7N/35W-26L04	17	36.10	28	11	6	21	16	18	17
7N/34W-29N7	28	68.16	43	21	15	31	27	37	25
7N/34W-22J6	22	97.81	55	33	28	47	46	46	45
7N/34W-24N1	23	131.77	56	34	29	48	46	47	46
7N/35W-27P01	44	262.55	43	25	20	39	36	38	37
7N/34W-15D3	602	193.12	58	36	31	49	49	50	47
7N/34W-14F4	52	276.04	50	28	23	n/a	41	39	41
7N/34W-12E1	51	388.21	62	40	35	55	54	55	54
7N/33W-19D1	49	255.05	56	33	28	48	47	48	47
7N/33W-17M1	47	329.33	62	36	31	49	47	47	45
7N/33W-28D3	81	354.04	42	30	25	45	44	44	42
7N/33W-21G2	78	421.76	85	51	46	65	63	63	60
7N/33W-27G1	80	437.03	56	36	31	36	52	53	38

n/a = No available data
NAVD88 = North American Vertical Datum of 1988

Table 6-2
Groundwater Elevations for
Upper Aquifer Groundwater Levels (feet in NAVD88)

Name	ID	Measuring Point	Reference Values			Water Year 2021		Water Year 2022	
			Measurable Objective	Early Warning	Minimum Threshold	Spring	Fall	Spring	Fall
7N/35W-17M1	2	11.92	5	5	0	7	7	10	8
7N/35W-21G2	39	22.57	8	5	0	8	9	11	10
7N/35W-23B2	40	32.50	8	5	0	6	3	7	7
7N/35W-26L1	15	36.01	30	25	20	29	27	29	28
7N/35W-26L2	16	35.72	32	23	18	26	22	25	22
7N/35W-24J4	33	59.94	30	25	20	25	22	25	21
7N/34W-29N6	27	67.59	41	31	26	30	29	33	28
6N/34W-6C4	20	104.04	42	27	22	32	22	34	n/a
7N/34W-32H2	31	77.85	45	33	28	40	37	39	n/a
7N/34W-27F9	1162	99.40	56	42	37	60	44	44	43
7N/34W-34F6	501	101.40	57	39	34	54	51	51	47
7N/34W-26Q5	60	114.00	68	49	44	55	53	55	49
7N/34W-35K9	32	106.92	80	73	68	79	59	74	75

n/a = No available data
NAVD88 = North American Vertical Datum of 1988
Minimum threshold for 7N/34W-35K9 corrected based on 2020 water levels and corrected datum.

6.1.2 Reduction of Groundwater in Storage

Chapter 5 of this report addressed the reduction of groundwater in storage. In addition, progress towards sustainability for groundwater storage is tracked along with groundwater levels as discussed in Section 6.1.1.

6.1.3 Water Quality

The WMA GSP found "Groundwater quality in the WMA is currently suitable for agricultural, domestic, and municipal supply purposes." The GSP further describes the current groundwater quality monitoring in the WMA. Annual assessment of water quality is not listed under the SGMA statute and SGMA regulations on Annual Reports, see Appendix 1-A.

6.1.4 Seawater Intrusion

Seawater intrusion is the inflow of seawater into the aquifer and adversely affects groundwater quality, and therefore suitability for beneficial uses. Per SGMA regulations,[4] this is characterized by relatively high concentrations of chloride. The GSP identified the 500 mg/L chloride isocontour as the key indicator for assessing seawater intrusion.

Figure 6-1 shows the location of the estimated groundwater chloride isocontour for 2022. These were primarily based on chloride concentration at the wells 7N/35W-17K20, 7N/35W-21G2, 7N/35W-27F1, and 7N35W-22A3. **Figure 6-2** shows recent salinity, chloride, and sodium trends for the two western wells (7N/35W-17K2 and 7N/35W-21G2), and **Figure 6-3** shows recent salinity, chloride, and sodium for two of the more inland wells (7N/35W-27F1 and 7N35W-22A3). These two sets of graphs show relatively little change since 2015.

Piper diagrams are a common way to visually compare the major dissolved substances between water samples. It shows the relative electrical strength of the major ions in the water. Positively charged cations are on the left, and negatively charged anions are on the right. **Figure 6-4** shows water quality samples for Santa Ynez surface water and wells in the Lompoc Plain. Figure 6-4 indicates that the groundwater has a chemical composition that is between the river water and that of the ocean.

[4] 23 CCR § 356.28(c)(3) Seawater Intrusion. The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results. Minimum thresholds for seawater intrusion shall be supported by the following: […]

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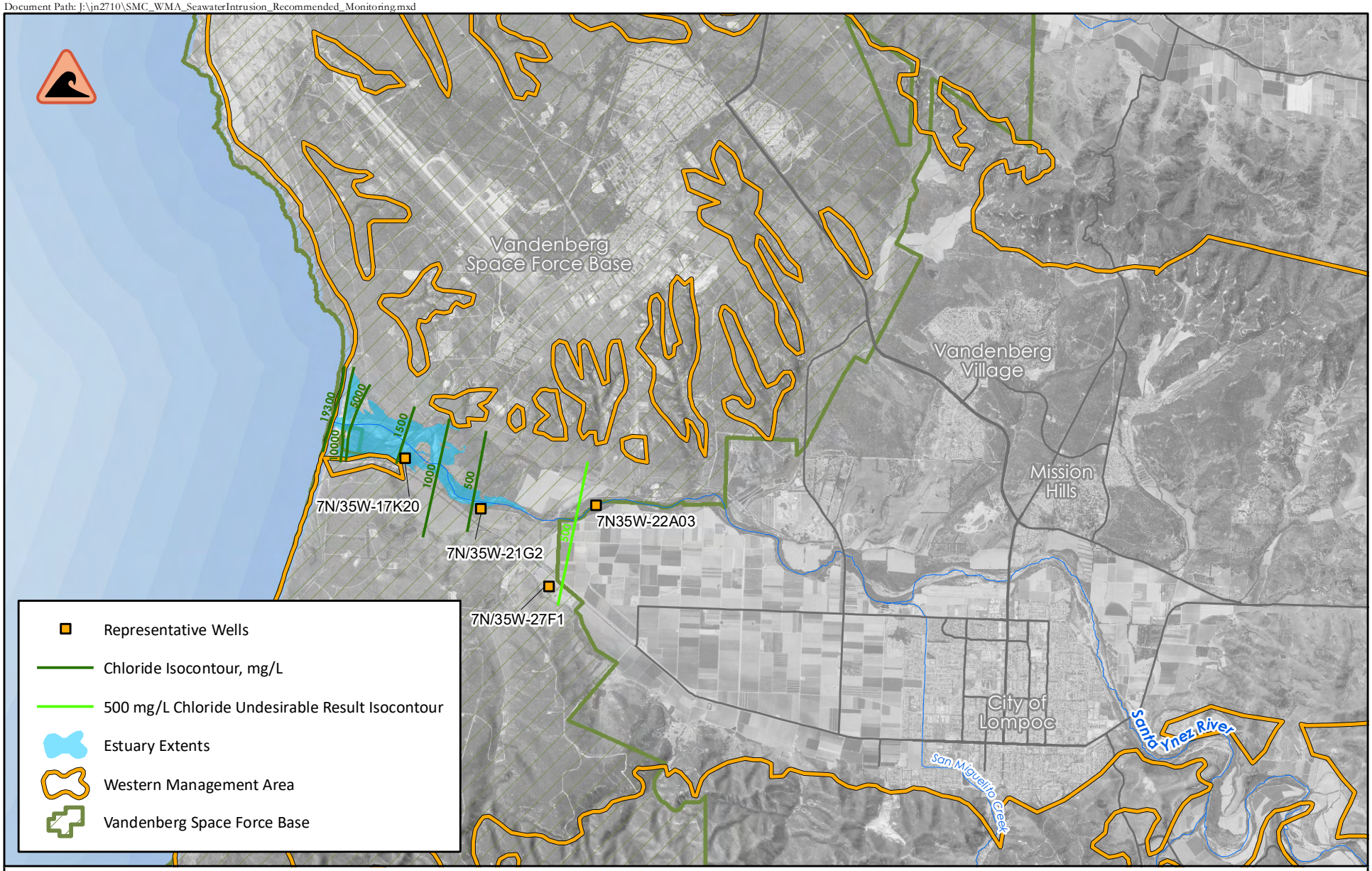

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WMA MONITORING NETWORK FOR SEAWATER INTRUSION

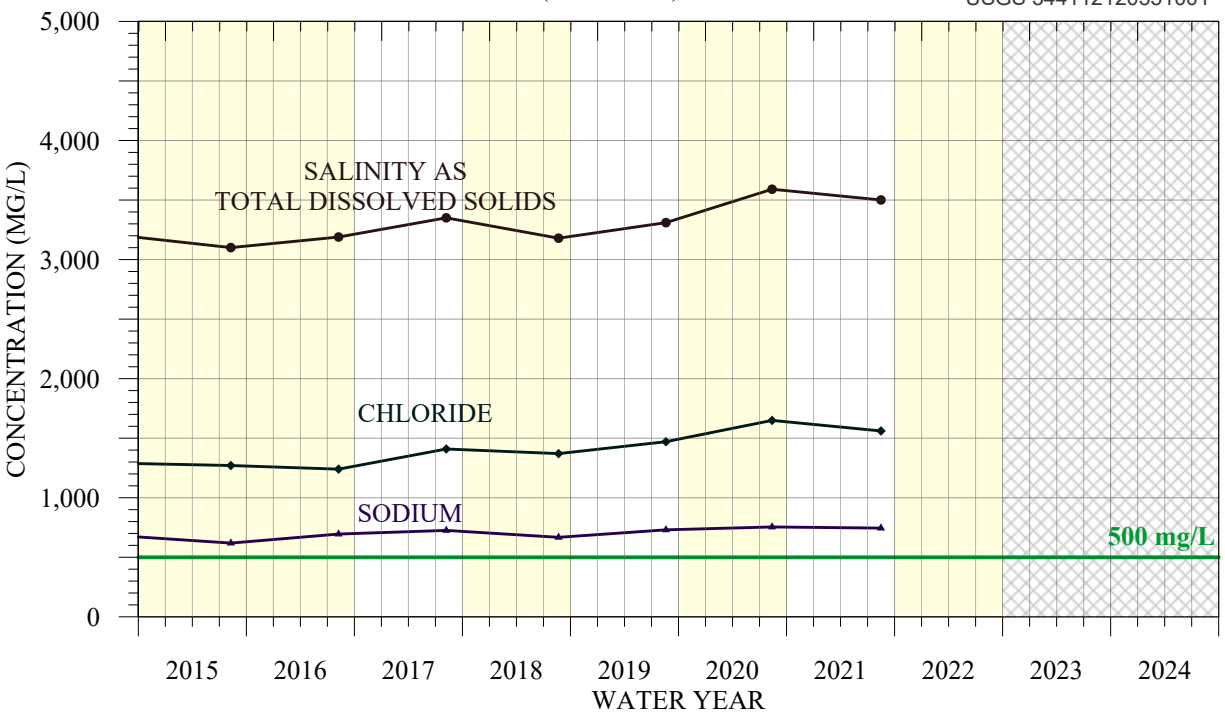
DRAFT

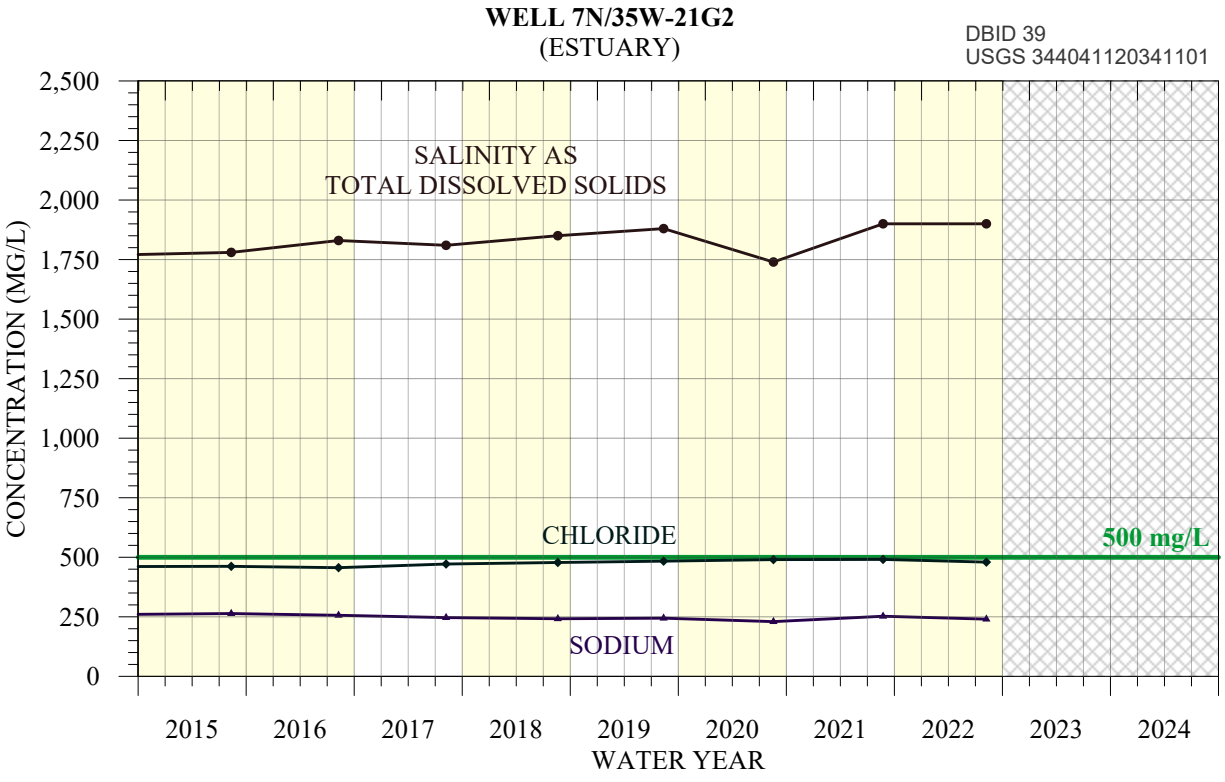
0 0.75 1.5 Miles

N

Sources:
Pacific States Marine Fisheries Commission (2018)
NAIP (2018)

FIGURE 6-1





Data Source: COSB (2023) and USGS (2022) water quality data.

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MAJOR WATER QUALITY TRENDS
SELECTED WELLS
LOMPOC PLAIN SUBAREA

Water Year Type (1942-2022)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

TDS
Chloride
Sodium

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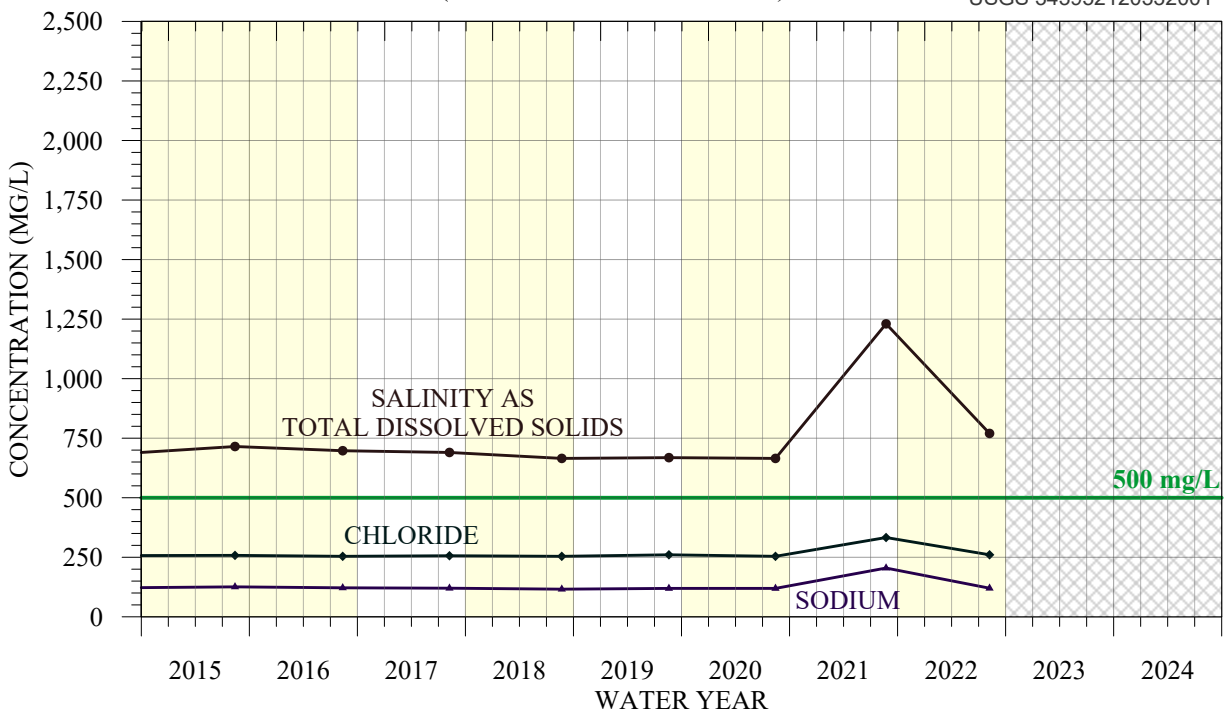

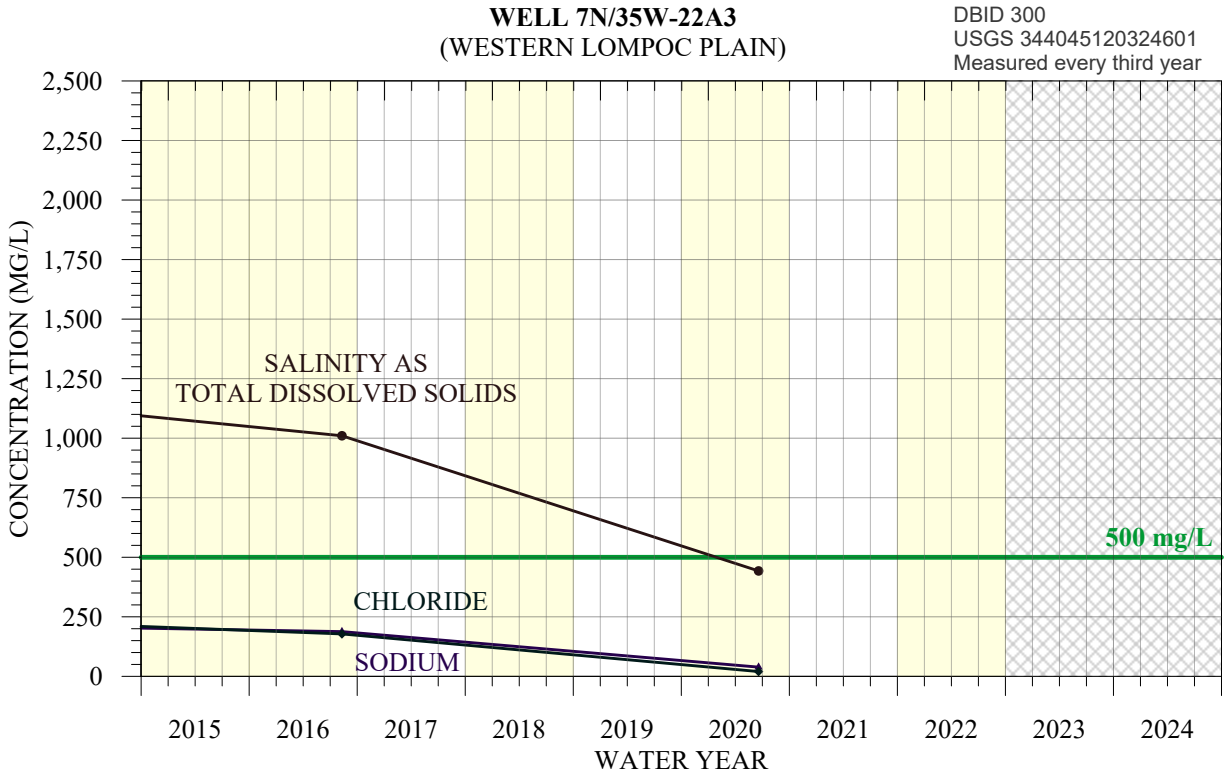

Data Source: COSB (2023) and USGS (2022) water quality data.

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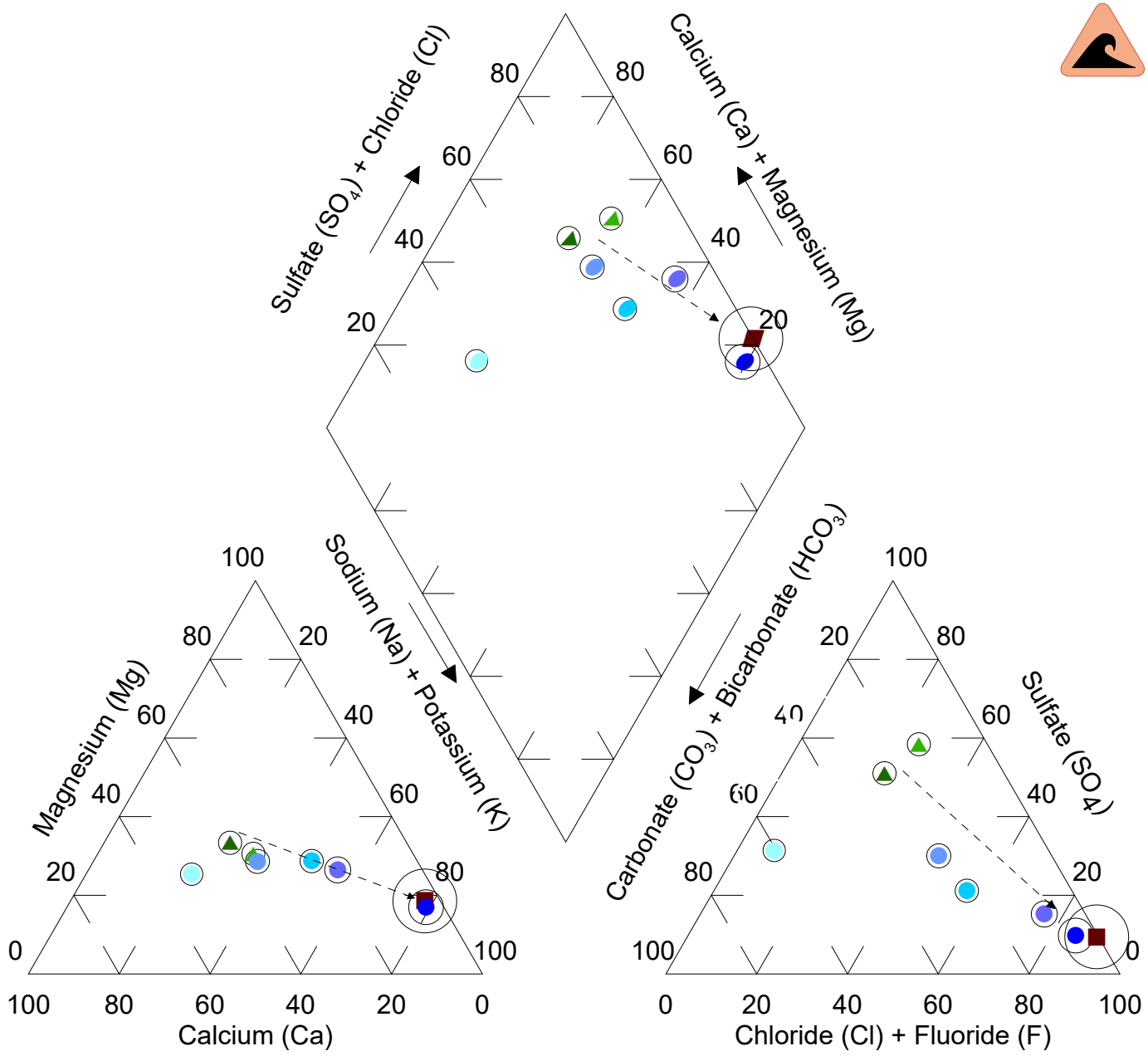
MAJOR WATER QUALITY TRENDS
SELECTED WELLS
LOMPOC PLAIN SUBAREA

Water Year Type (1942-2022)
Wet
No Data
Above/Below Normal
Dry / Critically Dry
TDS
Chloride
Sodium

F:\DATA\2823\Analyses\2023-01 WY21 Seawater\Fig 6-03 Seawater_Trends_Plain.grf 1/16/2023 M. McCammon



Symbol		USGS ID	Location	Sample Date	Salinity (mg/L)
▲	Plain SW	11135000	Santa Ynez River Lompoc	1/ 3/1980	1,117
▲	Plain SW	11135000	Santa Ynez River Pine Creek	12/19/1983	1,040
■	Ocean	-----	Seawater Composition	--------	35,000
●	Plain GW	344045120324601	Well 7N/35W-22A3	6/19/2020	443
●	Plain GW	343952120332001	Well 7N/35W-27F1	8/ 8/2022	770
●	Estuary GW	344041120341101	Well 7N/35W-21G2	8/ 8/2022	1,900
●	Estuary GW	344112120351001	Well 7N/35W-17K20	8/16/2021	3,500
●	Coast GW	344135120355201	Well 7N/35W-18H1	8/30/1963	10,800

Outer Circle is proportional to measured Total Dissolved Solids.

Data Source: COSB (2023), USGS (2022), and Hem (1985).

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LOWER SANTA YNEZ RIVER
PIPER DIAGRAM
WATER QUALITY INFLUENCE FROM
SEAWATER INTRUSION

F:\DATA\2823\Analyses\2023-01 WY21 Seawater\Fig 6-04 Lower Santa Ynez River Piper.grf 1/16/2023 M. McCammon

6.1.5 Land Subsidence

Significant land subsidence due to groundwater withdrawal is not occurring in the WMA. Conditions in the WMA are considered to have dropped below the land subsidence minimum threshold when both (1) a decline of six inches (a half foot) from the 2015 land surface elevation because of groundwater extractions, and (2) that decline interferes with either land use or infrastructure.

Two primary sources of data are used to characterize the movement of the land surface: remote sensing area data from Interferometric Synthetic Aperture Radar (InSAR), and point data from continuous global positioning system (CGPS). Both InSAR and CGPS methods provide absolute changes in elevation and do not differentiate between land subsidence resulting from excessive groundwater extraction and other sources of vertical movement such as tectonic movement. Significant lowering of ground levels indicated by these methods would need to be followed up to identify the cause.

The InSAR maps show the elevation change of the ground over a wide area between two points in time. **Figure 6-5** is a map comparison of October 2021 and October 2022, showing change over WY 2022. **Figure 6-6** is a map comparison of January 2015 and October 2022 which shows cumulative change since 2015. These two figures show that the vertical change is less than the InSAR method accuracy for most of the WMA.[5]

CGPS collects very high-resolution three-dimensional movement of a sensor over time. The LOMP station, located near Mission Hills (see **Figure 6-6**), is a CGPS station that has been in operation since May 15, 2015.[6] **Figure 6-7** graphs the horizontal movement (north-south, east-west) and vertical movement (up-down). Since 2015 the graph shows movement to the north of 11 inches and movement west of 8 inches. Vertical movement is down by less than an inch, with a date entry change in 2017. This lateral movement is aseismic tectonic movement, and not due to groundwater conditions.

Both InSAR and CGPS methods show there were no undesirable results related to land subsidence during WY 2022.

5 Reported as 18 mm (0.71 inches) vertical accuracy at 95% confidence level in Towill (2021).
6 Data at the USGS LOMP stations is through June 29, 2022, this is due to a telemetry issue related to a network configuration change (SCGN, 2023), and is expected to be temporary.

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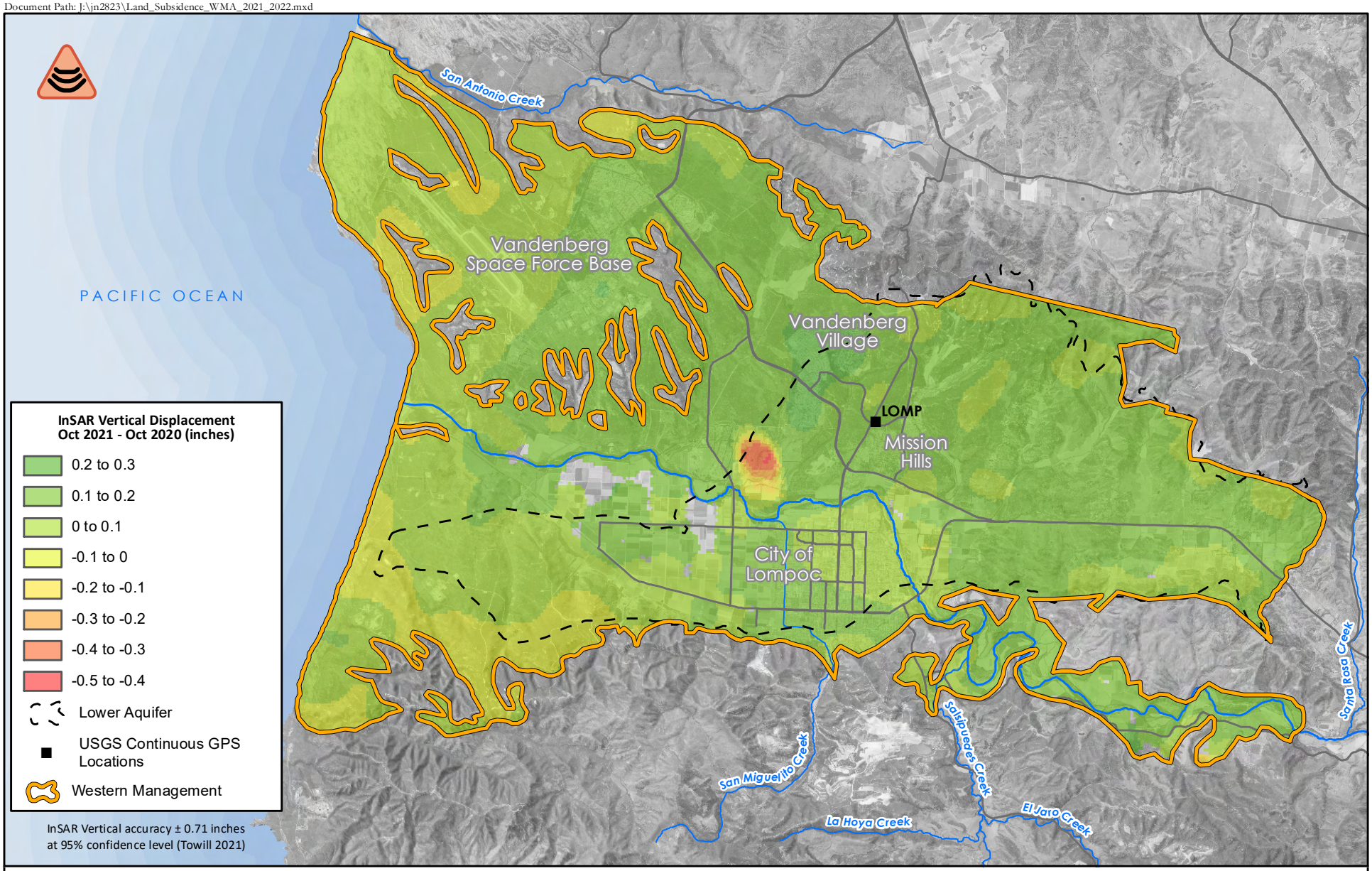


STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

LAND SUBSIDENCE
OCTOBER 2021 TO OCTOBER 2020
INSAR DATA
WITHIN WESTERN MANAGEMENT AREA

DRAFT

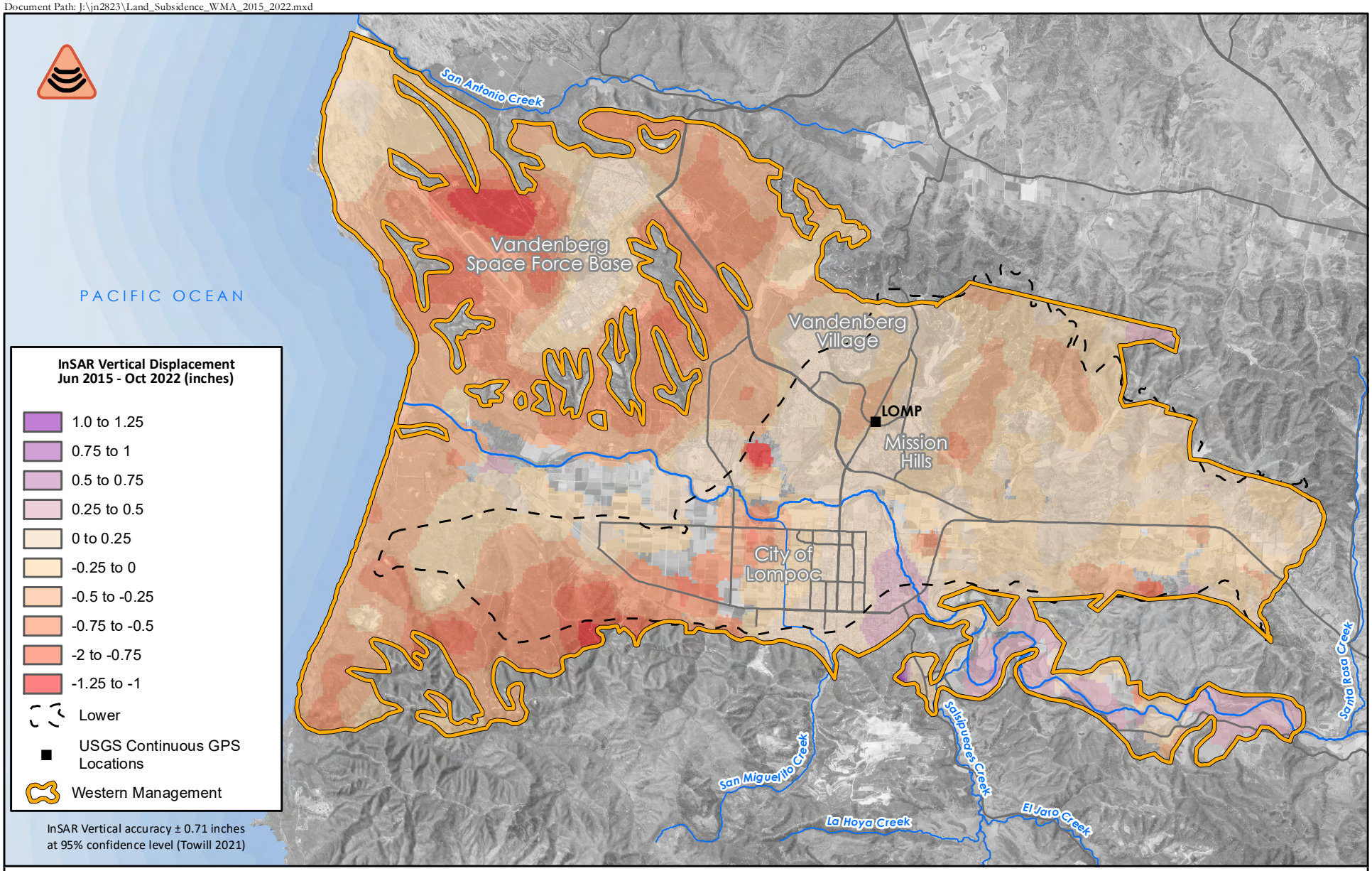
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018), DWR (2022)

N

FIGURE 6-5

Document Path: J:\jn2823\Land_Subsidence_WMA_2015_2022.mxd



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Western Management Area
Groundwater Sustainability Agency

LAND SUBSIDENCE
JUNE 2015 TO OCTOBER 2022
INSAR DATA
WITHIN WESTERN MANAGEMENT AREA

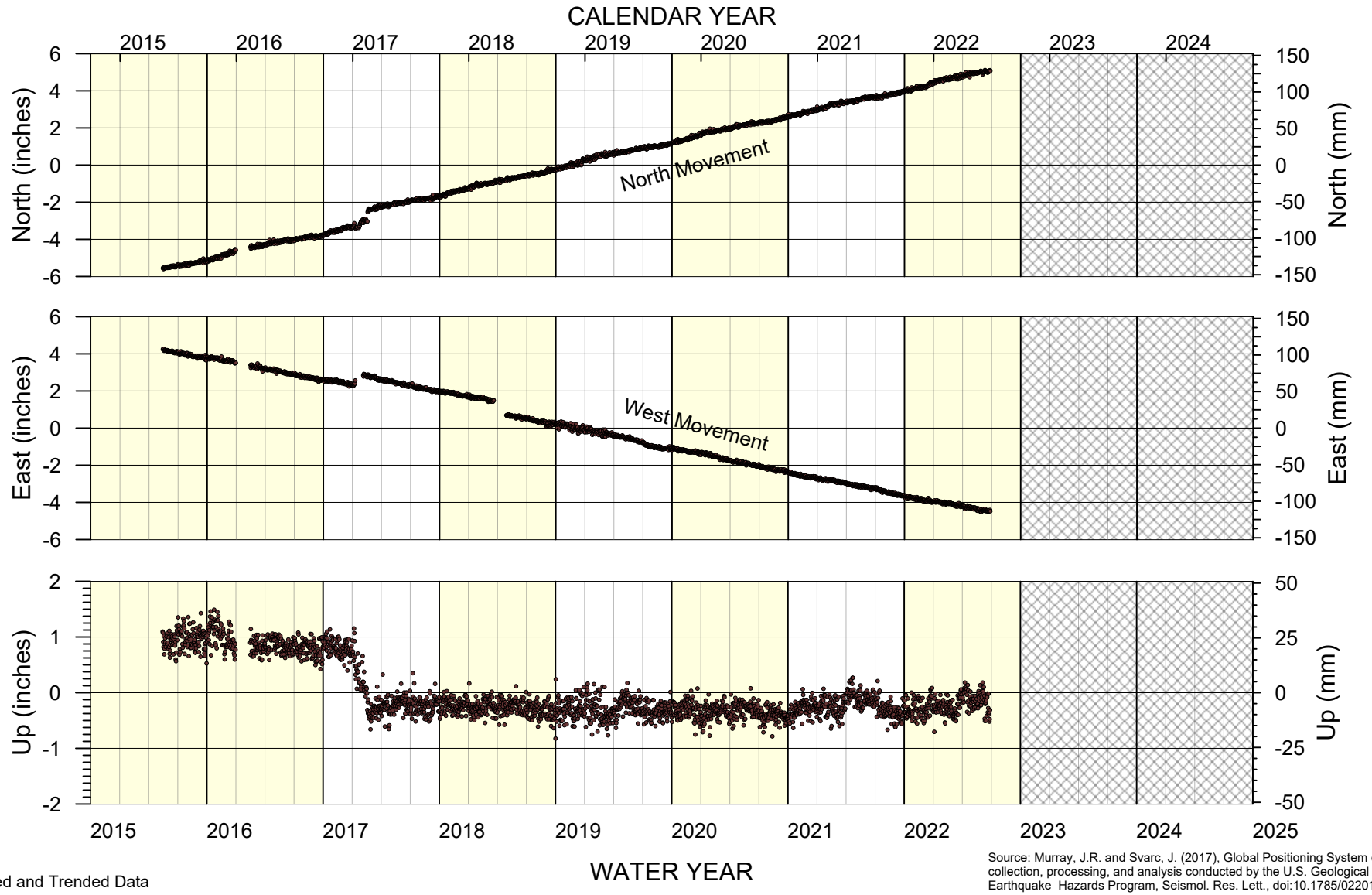
DRAFT

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018), DWR (2022)

N

FIGURE 6-6



Filtered and Trended Data

Source: Murray, J.R. and Svarc, J. (2017), Global Positioning System data collection, processing, and analysis conducted by the U.S. Geological Survey Earthquake Hazards Program, Seismol. Res. Lett., doi:10.1785/022016020 .

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Western Management Area
Groundwater Sustainability Agency

CONTINUOUS GLOBAL POSITIONING SYSTEM
LOMP STATION TRENDS
LAND SUBSIDENCE

Water Year Type (1942-2022)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

FIGURE 6-7

F:\DATA\2823\Analyses\2023-01 WY22 CGPS Land Subsidence\Fig 6-03 WMA_CGPS WY2022_shift.grf 1/10/2023 M. McCammon

6.1.6 Interconnected Surface Water and Groundwater Dependent Ecosystems

The SGMA sustainability indicator "depletion of interconnected surface water," is related to the effects of groundwater on surface water flows. Under SGMA, groundwater is water in the identified groundwater aquifers, and not the subsurface flow through a known and definite channel such as the underflows of the Santa Ynez River through its alluvial sediments. The SWRCB under Order WR 2019-0148, and earlier orders and decisions, regulates all flows of the Santa Ynez River. This regulation by the SWRCB extends to and includes the subsurface flows through the alluvial channel.

The groundwater level hydrographs presented in Appendixes 3-A and 3-B further address the potential depletion of interconnected surface water. As stated in the 2022 WMA GSP (Section 3b.2-6), groundwater elevations that would drop to below ten feet below 2020 groundwater elevations in two out of the three representative monitoring wells in the Upper Aquifer that for two consecutive non-drought[7] years would indicate significant and undesirable results for interconnected surface water and groundwater-dependent ecosystems. Similarly, the measurable objective and interim milestone (2022 GSP, Sections 3b.4-6 and 3b.5-6) established for the depletion of interconnected surface water are groundwater elevations equal to five feet below the channel thalweg of the Santa Ynez River. **Table 6-3** summarizes the groundwater elevations at the three wells used to measure potential impacts on surface water. This table shows that all wells had water levels above the minimum threshold during Water Year 2022.

Table 6-3
Groundwater Elevations for Interconnected Surface Water (feet in NAVD88)

Name	ID	Measuring Point	Reference Values		Water Year 2021		Water Year 2022	
			Measurable Objective	Minimum Threshold	Spring	Fall	Spring	Fall
7N/35W-21G2	39	23	4	0	8	8	11	9
7N/34W-29F2	167	65.39	41	31	39	38	36	35
7N/34W-35K9	32	106.9	77	68	79	59	74	75

NAVD88 = North American Vertical Datum of 1988.
The Measurable Objective is 5 feet below the channel thalweg.
The Minimum Threshold is 10 feet below the 2020 groundwater level or Mean Sea Level.
Minimum threshold for 7N/34W-35K9 corrected based on 2020 water levels and corrected datum.

[7] For this purpose, a year is a drought if it is two or more consecutive years that are classified as Dry or Critically Dry (see Chapter 2 for year classifications). All other year types and combination of year types will be defined as non-drought years for the purpose of defining undesirable results under a groundwater sustainability plan.

In WY 2022, all three representative monitoring wells were above their respective Minimum Thresholds. Two of the three wells were above the Measurable Objectives. The WMA met the groundwater elevation targets for interconnected surface water and groundwater-dependent ecosystems.

The Cachuma Operation and Maintenance Board (COMB) Fisheries Division monitors for migration of the Southern California Steelhead/rainbow trout (*O. mykiss*) in the Santa Ynez River from Lake Cachuma to the Pacific Ocean. The COMB publishes the WY 2022 report concurrently or after this annual report, and therefore conclusions from that report about WY 2022 are currently unavailable.

6.2 PLANNED FUTURE PROJECTS AND MANAGEMENT ACTIONS

The WMA GSP identified future projects and management actions to improve sustainability. **Table 6-4** is a summary of the projects and management actions envisioned in the GSP. **Table 6-5** identifies the expected additional water and the benefit-to-cost ratio. Completion is subject to funding and approval from the WMA GSA committee.

6.2.1 Implementation Progress During Water Year 2022 (February 2022-September 2022)

During WY 2022 the WMA published its first annual report. This report covered Water Year 2021 (October 2020-September 2021). On February 23, 2022, the WMA committee held a presentation on the annual report. On March 23, 2022, the WMA committee approved the first annual report. The final first annual report for Water Year 2021 is 150 pages including appendices. The WMA committee submitted it to DWR on March 30, 2022, before the April 1 deadline.[8]

[8] CWC Section 10728 "On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department [..]"

Table 6-4
Summary of WMA GSP Implementation Projects

Project Category	Task	Occurrence
Completing Ongoing Field Investigations	Surveying Representative Wells	One Time
	SkyTEM Airborne Geophysics	One Time
Monitoring Network Gaps	Video Logging and Sounding Wells	One Time
	Groundwater Level Monitoring Wells (Outreach)	One Time
	WQ Seawater Monitoring	Annual
	SW Gage Installation (planning)	One Time
Projects and Management Actions	Water Conservation	Annual
	Groundwater Extraction Fee Study	5 Year
	Feasibility Study for Recycled Water Project	One Time
	Feasibility Study for Bioswale Stormwater Retention	One Time
	Ban on Self-Regenerating Water Softeners	One Time
Improved Data Collection for Management	Update Well Registration Program	One Time
	Well Metering Requirement	One Time
Data Management	Data Updates	Annual
Reporting and Plan Updates	SMGA WY Annual Reports	Annual
	SGMA Five-Year Plan Assessment	5 Year

Table 6-5
Summary of Project and Management Actions in the WMA- Sustainability Benefits and Implementation Process

Timetable	Project and Management Action Title	Relevant Sustainability Indicators Affected						Required Permits	Estimated Additional Water (AFY)	Estimated Benefit: Cost Ratio
		Groundwater Levels	Reduction in Storage	Seawater Intrusion	Water Quality	Land Subsidence	Interconnected Surface Water			
Group 1- Initiated in the first three years	Water Conservation	x	x	x	x	x	x	None	1,000-2,000	High
	Groundwater Extraction Fees and Well Meters	x	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	1,000-2,000	High
	Recycled Water Project	x	x	x	x	x	x	Santa Barbara County, RWQCB, DWR, CEQA, SWRCB	2,500 - 3,500	Low to Medium
	Increased Stormwater Recharge	x	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	50-500	Low to Medium
	Ban on Water Softeners				x			None	0; minimal	High
Group 2 - Initiated if Early Warning Triggers	Water Rights Releases Request	x	x	x	x	x	x	None	0; minimal	High
	Supplemental Conditions on New Wells	x	x	x	x	x	x	None	50-500	High
Group 3 - Initiated if Minimum Thresholds Reached	Annual Pumping Allocation Plan	x	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	500-3,000	Medium to High

Timetable	Project and Management Action Title	Relevant Sustainability Indicators Affected						Required Permits	Estimated Additional Water (AFY)	Estimated Benefit: Cost Ratio
		Groundwater Levels	Reduction in Storage	Seawater Intrusion	Water Quality	Land Subsidence	Interconnected Surface Water			
Group 4 - Pending further decision by GSA to initiate	Non-native Vegetation Removal	x	x	x		x		Santa Barbara County, USACE, DWR, CDFW, CEQA	100 -1,000	Low to Medium
	Agricultural Land Retirement/ Pumping Allowance	x	x	x	x	x	x	CEQA	500-5,000	Low to Medium
	Santa Ynez River Lompoc Plain Recharge Pond Project	x	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	500-3,000	Low to Medium
	Supplemental Imported Water Program	x	x	x	x	x	x	Santa Barbara County, DWR, CEQA	500-1,000	Low to Medium
	Well-head pre-treatment to soften				x			Santa Barbara County, RWQCB, DWR, CEQA	0	Low to Medium
	Drought Mitigation - Pumping Optimization and Deepen Existing Wells				x			Santa Barbara County, DWR, CEQA	0	Low to Medium

USACE = United States Army Corps of Engineers, DWR = Department of Water Resources, CDFW = California Department of Fish and Wildlife, CEQA = California Environmental Quality Act, RWQCB = Regional Water Quality Control Board

During the third and fourth quarters of WY 2022, the WMA addressed the California Governor's Executive Order N-7-22 for Well Permits, and written verification from a Groundwater Sustainability Agency managing the basin. The WMA GSA passed Resolution WMA-2022-002 which established a fee and deposit for conducting well verifications to comply with the order. Staff worked on Groundwater Basin Well Metering Program. Additional items included work on future governance, joint powers authority, interim cost sharing, and long-term funding for WMA expenses including GSP Implementation Projects as well as annual reporting. Additional items addressed during the second half of the WY 2022 included the SkyTEM Airborne Geophysics dataset update and resulting updates to the geological and hydrogeological models.

In the latter half of WY 2022, the WMA conducted planning for eight projects. This included the development of grant funding requests. This included supporting resolutions through the WMA committee. These eight projects included:

1) Well Extraction Measurement Demonstration Projects and Basin Reporting Program.

2) Santa Ynez River Basin WMA, CMA, and EMA – SGMA Rate Study.

3) Basin GSPs 5-Year Update.

4) Monitoring Improvement and Expansion.

5) Stormwater Capture and Infiltration Project Designs.

6) Water Use Efficiency Strategic Plan.

7) Recycled Water Feasibility Study.

8) Grant Administration.

The objective of these projects is to achieve the stated goals of the GSP to avoid undesirable results and demonstrate progress towards measurable objectives. Successful completion of the projects will help ensure continued groundwater accessibility, not only for existing wells, but for all beneficial uses of water in the WMA.

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CHAPTER 7: REFERENCES

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CHAPTER 8: APPENDICES

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Chapter 1 – General Information

Appendix 1-A:

Portions of Sustainable Groundwater Management Act Statute and Regulations Specific to Annual Report Requirements Effective August 15, 2016

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Portions of Sustainable Groundwater Management Act Statute and Regulations Specific to Annual Report Requirements

CALIFORNIA WATER CODE
DIVISION 6. CONSERVATION, DEVELOPMENT, AND UTILIZATION OF STATE WATER RESOURCES
PART 2.74. SUSTAINABLE GROUNDWATER MANAGEMENT
CHAPTER 6. GROUNDWATER SUSTAINABILITY PLANS

Section 10728. Annual Reporting By Groundwater Sustainability Agency To Department

On the April 1 following the adoption of a groundwater sustainability plan and annually thereafter, a groundwater sustainability agency shall submit a report to the department containing the following information about the basin managed in the groundwater sustainability plan:

(a) Groundwater elevation data.

(b) Annual aggregated data identifying groundwater extraction for the preceding water year.

(c) Surface water supply used for or available for use for groundwater recharge or in-lieu use.

(d) Total water use.

(e) Change in groundwater storage.

CALIFORNIA CODE OF REGULATIONS
TITLE 23. WATERS
DIVISION 2. DEPARTMENT OF WATER RESOURCES
CHAPTER 1.5. GROUNDWATER MANAGEMENT
SUBCHAPTER 2. GROUNDWATER SUSTAINABILITY PLANS

ARTICLE 2. Definitions

§ 351. Definitions

The definitions in the Sustainable Groundwater Management Act, Bulletin 118, and Subchapter 1 of this Chapter, shall apply to these regulations. In the event of conflicting definitions, the definitions in the Act govern the meanings in this Subchapter. In addition, the following terms used in this Subchapter have the following meanings:

[...]

(d) "Annual report" refers to the report required by Water Code Section 10728

[..]

(am) "Water year" refers to the period from October 1 through the following September 30, inclusive, as defined in the Act.

ARTICLE 4. Procedures

§ 353.4. Reporting Provisions

Information required by the Act or this Subchapter, including Plans, Plan amendments, annual reports, and five-year assessments, shall be submitted by each Agency to the Department as follows:

(a) Materials shall be submitted electronically to the Department through an online reporting system, in a format provided by the Department as described in Section 353.2.

(b) Submitted materials shall be accompanied by a transmittal letter signed by the plan manager or other duly authorized person.

ARTICLE 5. Plan Contents
SUBARTICLE 4. Monitoring Networks

§ 354.40. Reporting Monitoring Data to the Department

Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.

ARTICLE 6. Department Evaluation and Assessment

§ 355.6. Periodic Review of Plan by Department

[...]

(b) The Department shall evaluate approved Plans and issue an assessment at least every five years. The Department review shall be based on information provided in the annual reports and the periodic evaluation of the Plan prepared and submitted by the Agency.

§ 355.8. Department Review of Annual Reports

The Department shall review annual reports as follows:

(a) The Department shall acknowledge the receipt of annual reports by written notice and post the report and related materials on the Department's website within 20 days of receipt.

(b) The Department shall provide written notice to the Agency if additional information is required.

(c) The Department shall review information contained in the annual report to determine whether the Plan is being implemented in a manner that will likely achieve the sustainability goal for the basin, pursuant to Section 355.6.

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.

§ 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.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.

ARTICLE 8. Interagency Agreements

§ 357.4. Coordination Agreements

[…]

(d) The coordination agreement shall describe a process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations.

Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-A:

Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels, Western Management Area

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APPENDIX 3-A: GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING CHRONIC DECLINE IN GROUNDWATER LEVELS, WESTERN MANAGEMENT AREA

WATER YEAR 2022

This appendix includes hydrographs, which are graphs of water levels in wells. These are the representative wells for monitoring groundwater level decline. As per the SGMA regulations, this includes the period from January 1, 2015 through the end of the Water Year 2022. Shown on these graphs are key SGMA criteria: measurable objective, early warning, and minimum threshold. The Appendix is organized into two sections: Upper Aquifer and Lower Aquifer.

The Groundwater Sustainability Plan (GSP) includes hydrographs of the long-term period of record. A copy of the GSP, water level data, and hydrographs are available at https://sywater.info .

LIST OF ACRONYMS AND ABBREVIATIONS

BGS	below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level
WMA	Western Management Area

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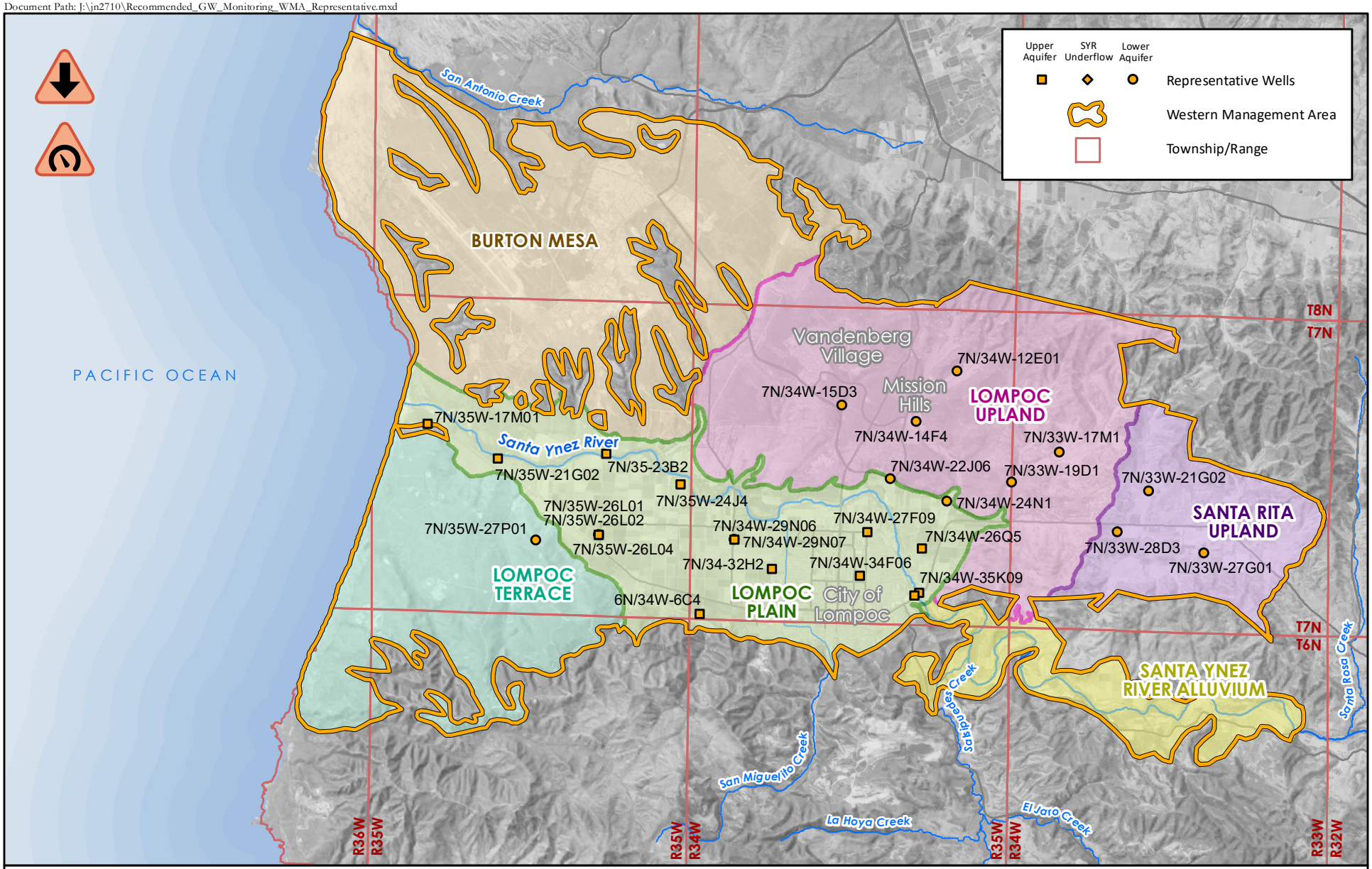

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WMA

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Western Management Area
Groundwater Sustainability Agency

WMA REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

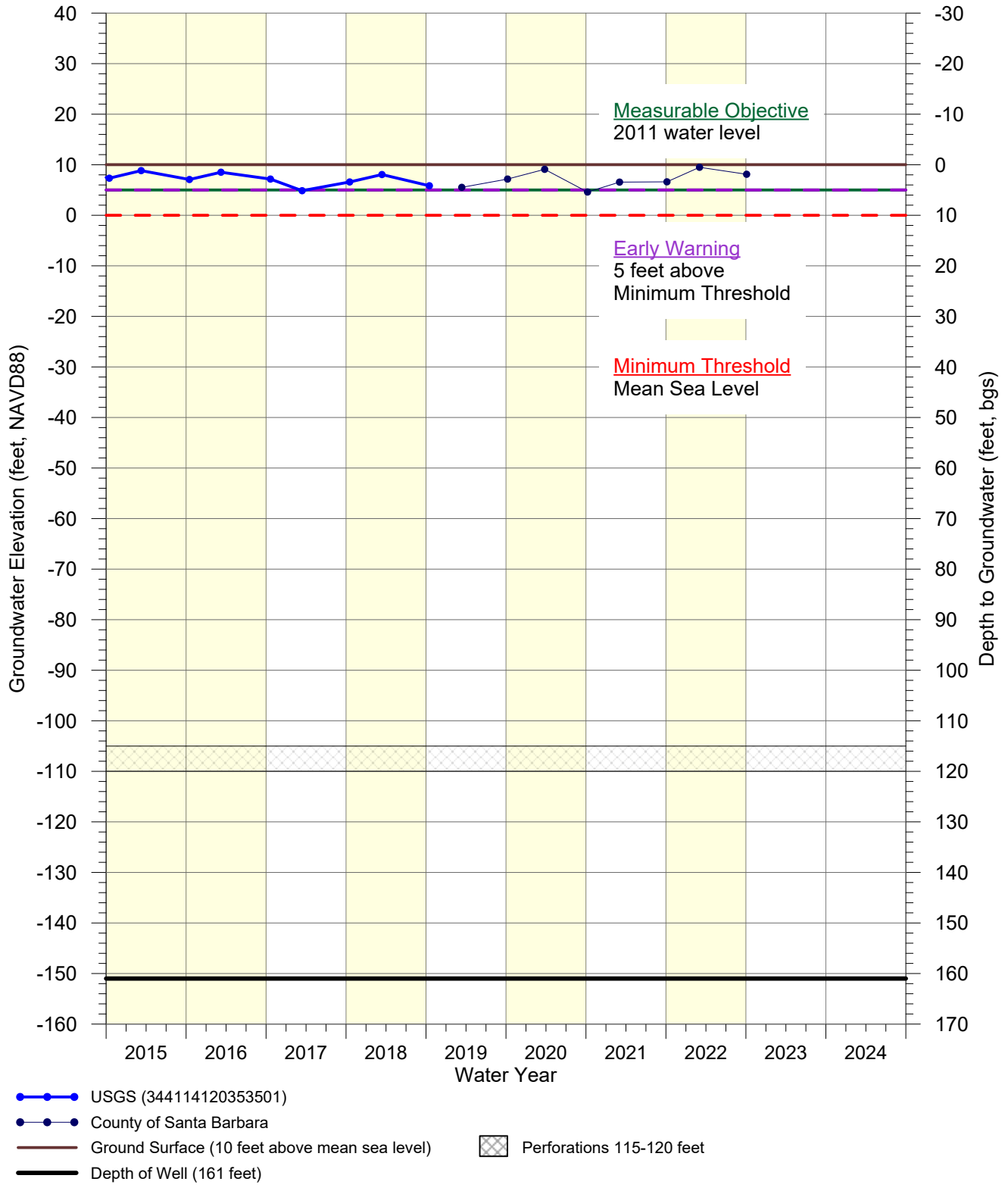
0 1 2 Miles

N

FIGURE A1-01

CASGEM ID
25268
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-17M1



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REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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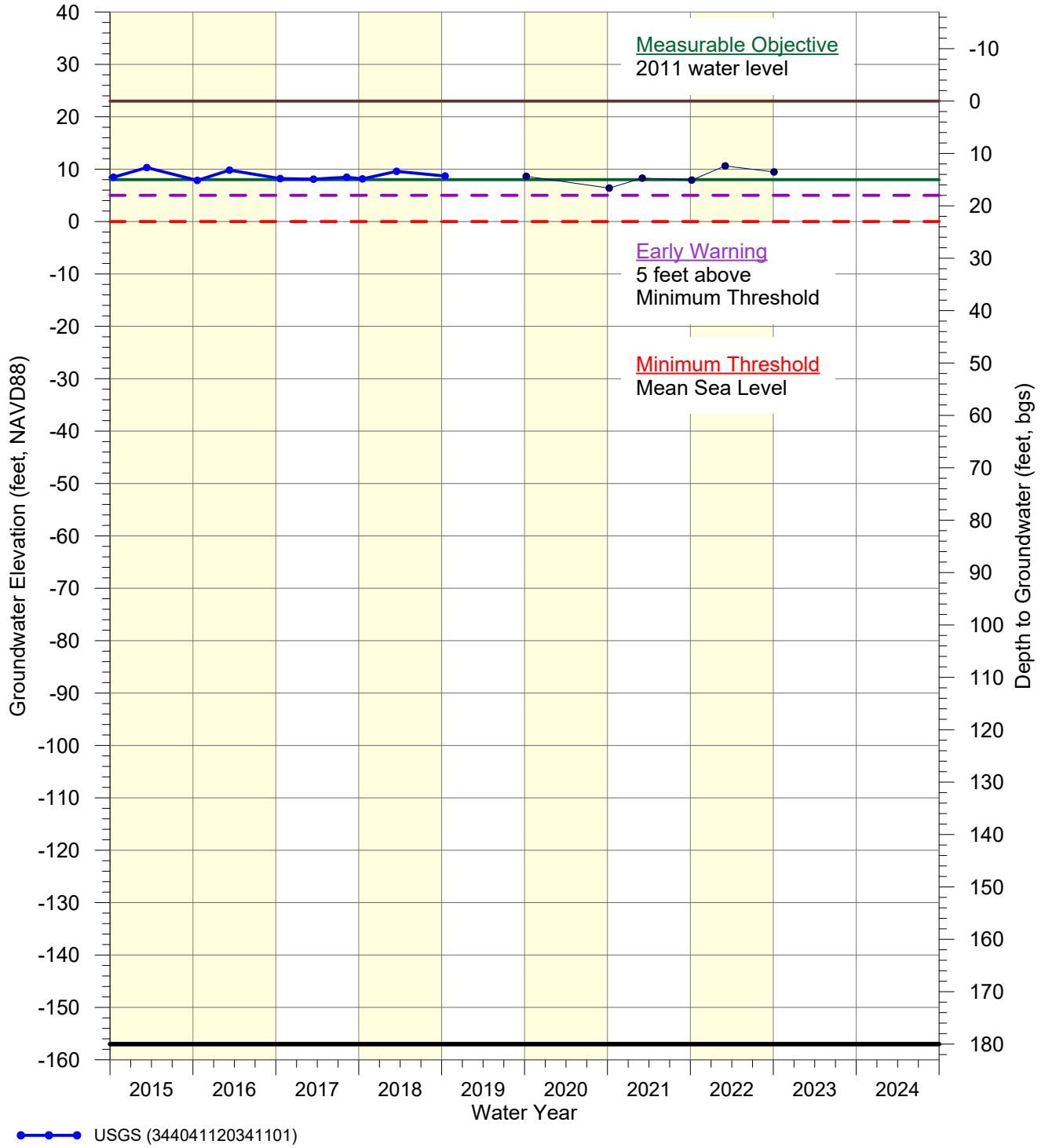
FIGURE A1-02

CASGEM ID
25271
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-21G2



USGS (344041120341101)
County of Santa Barbara
Ground Surface (23 feet above mean sea level)
Depth of Well (180 feet); Perforations TBD

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REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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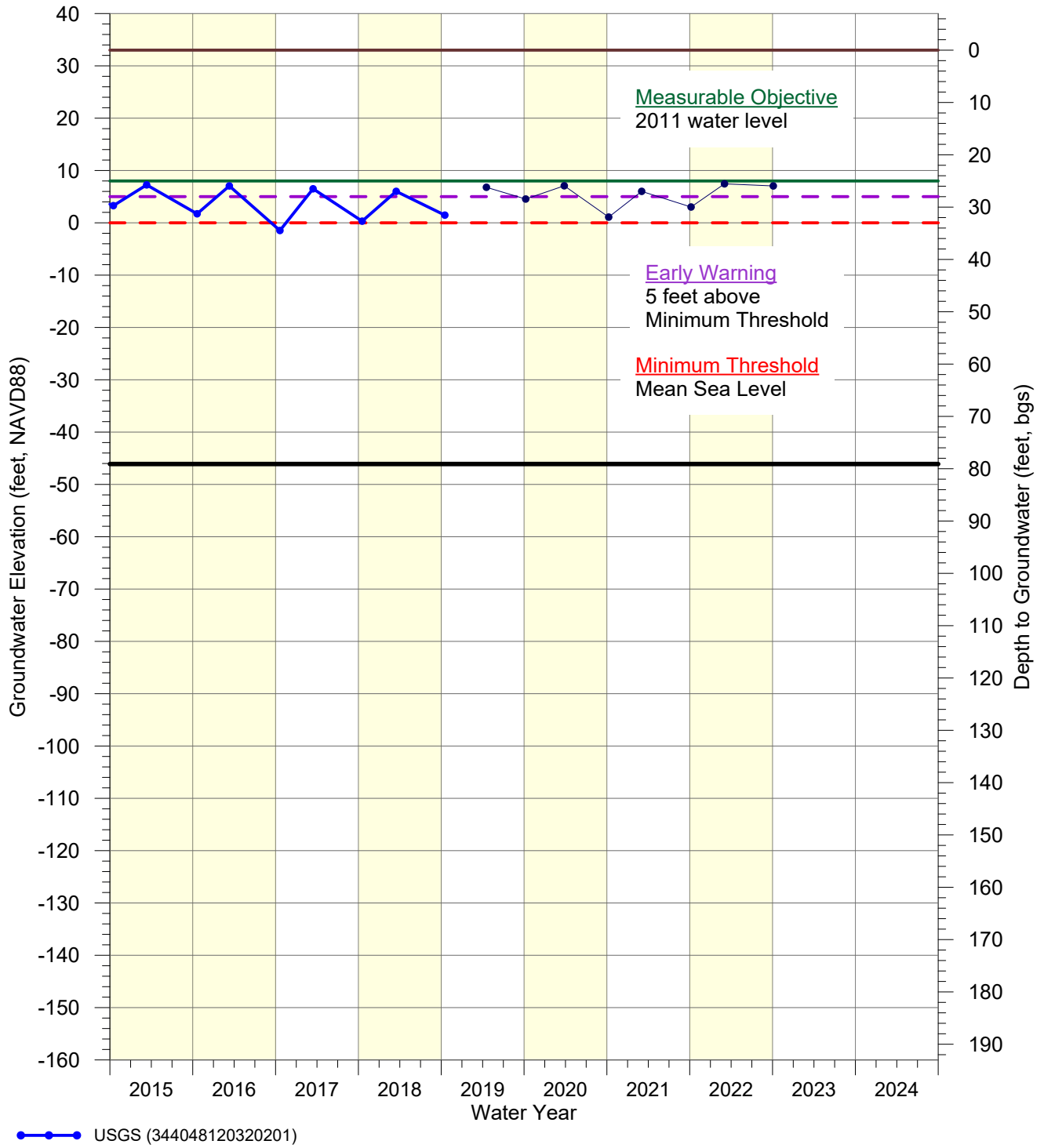
FIGURE A1-03

CASGEM ID
49171
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-23B2



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Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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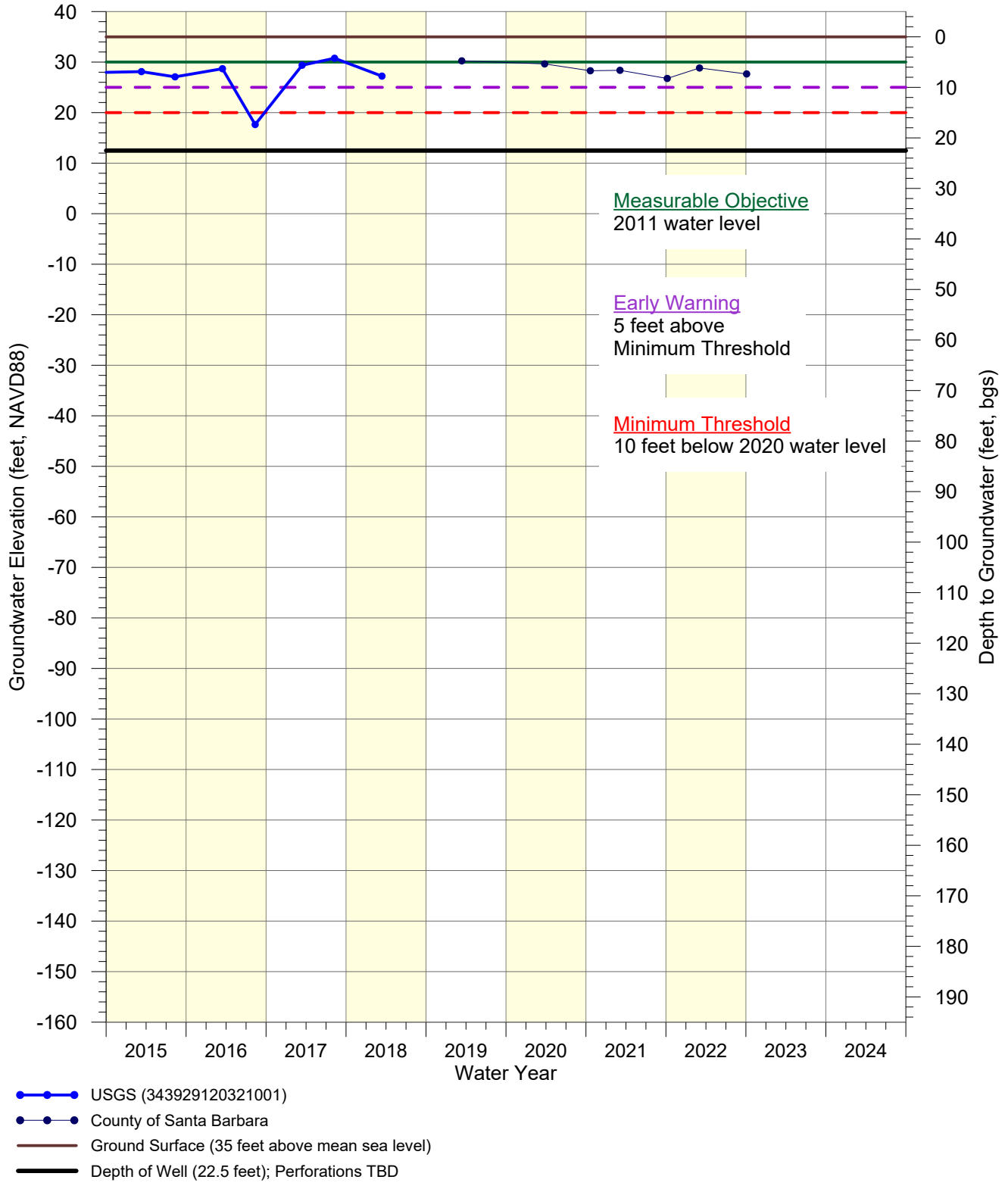
CASGEM ID
38297
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-26L1



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Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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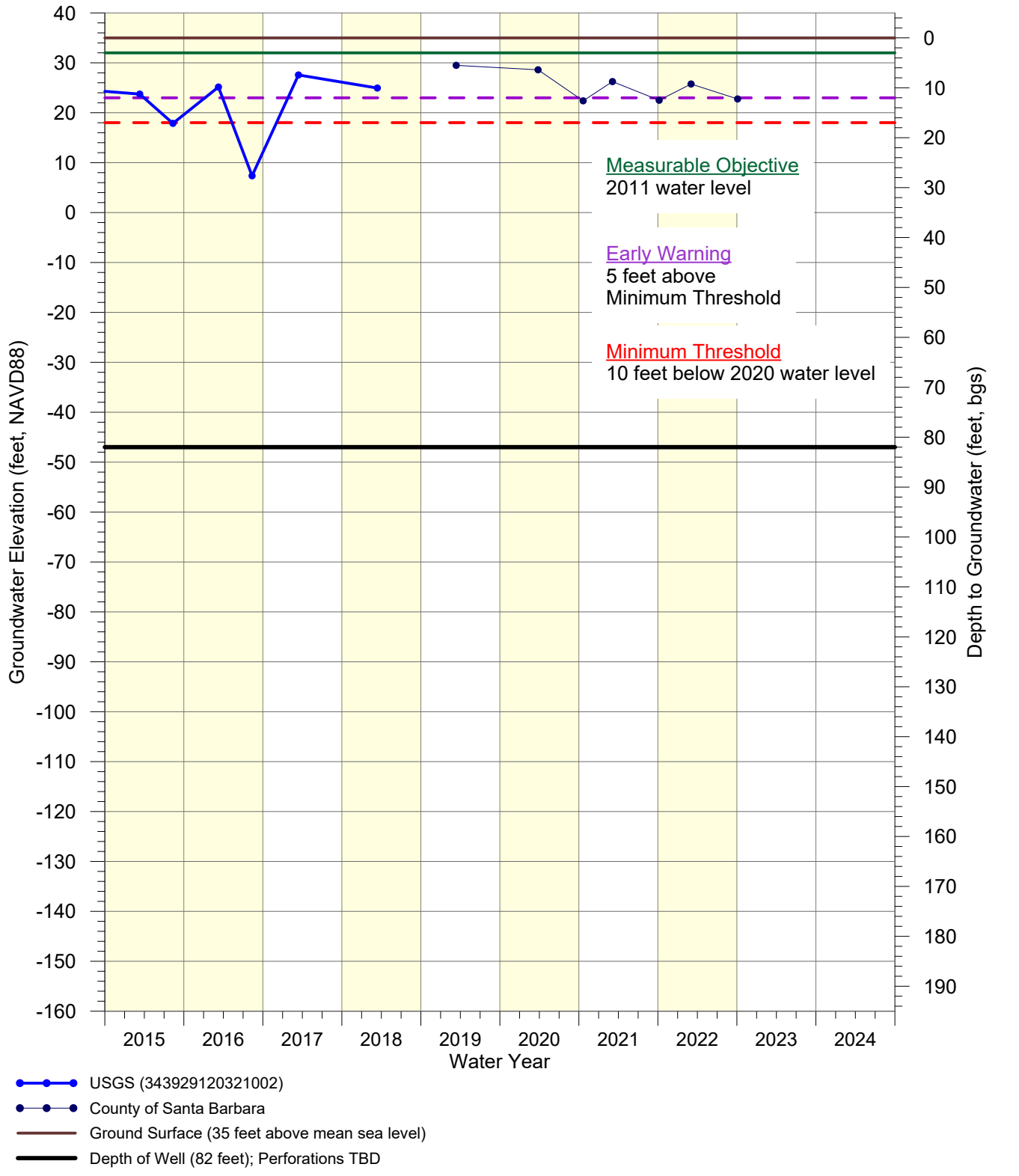
FIGURE A1-05

CASGEM ID
49162
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-26L2



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Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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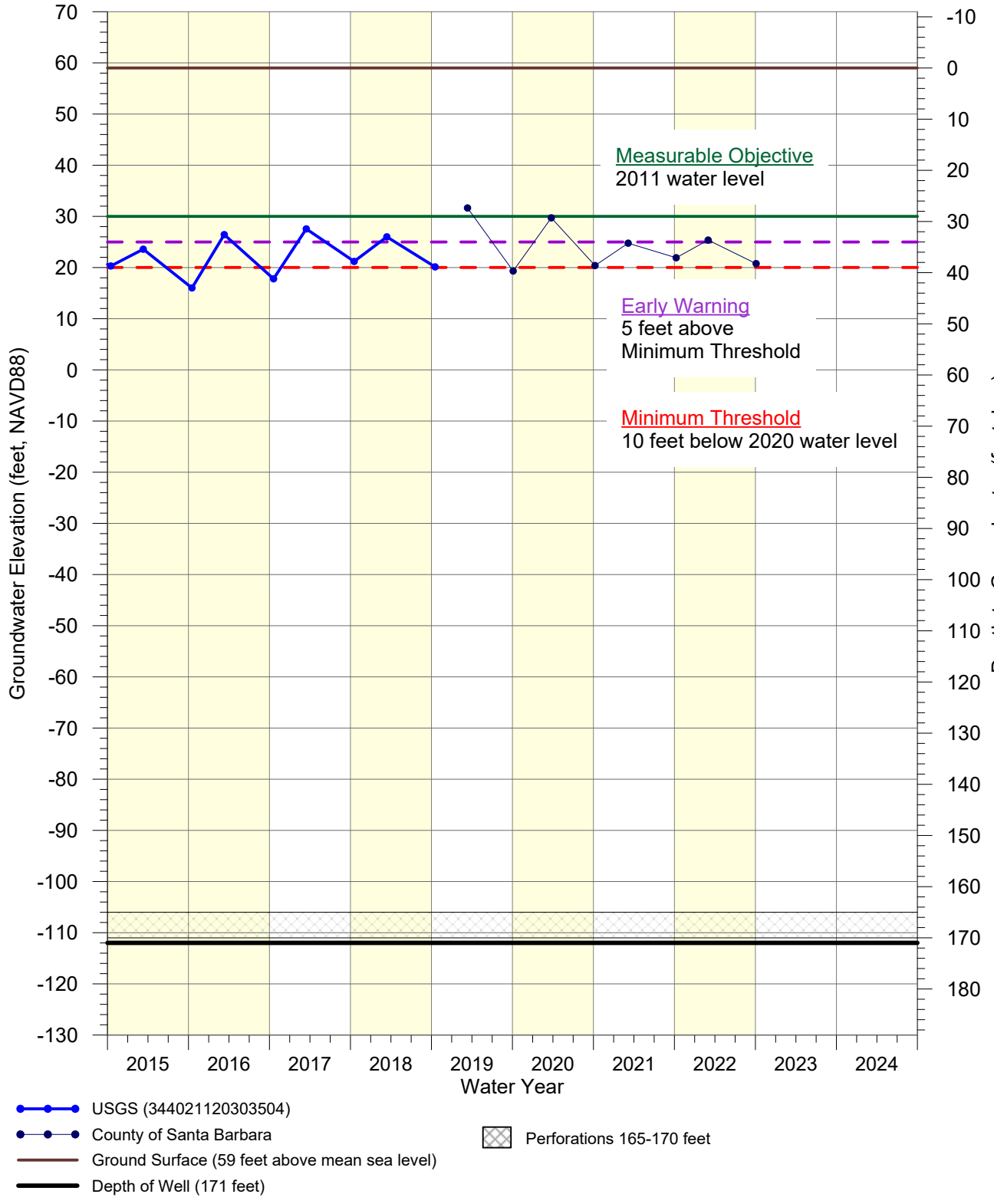
FIGURE A1-06

CASGEM ID
49146
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/35W-24J4



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Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

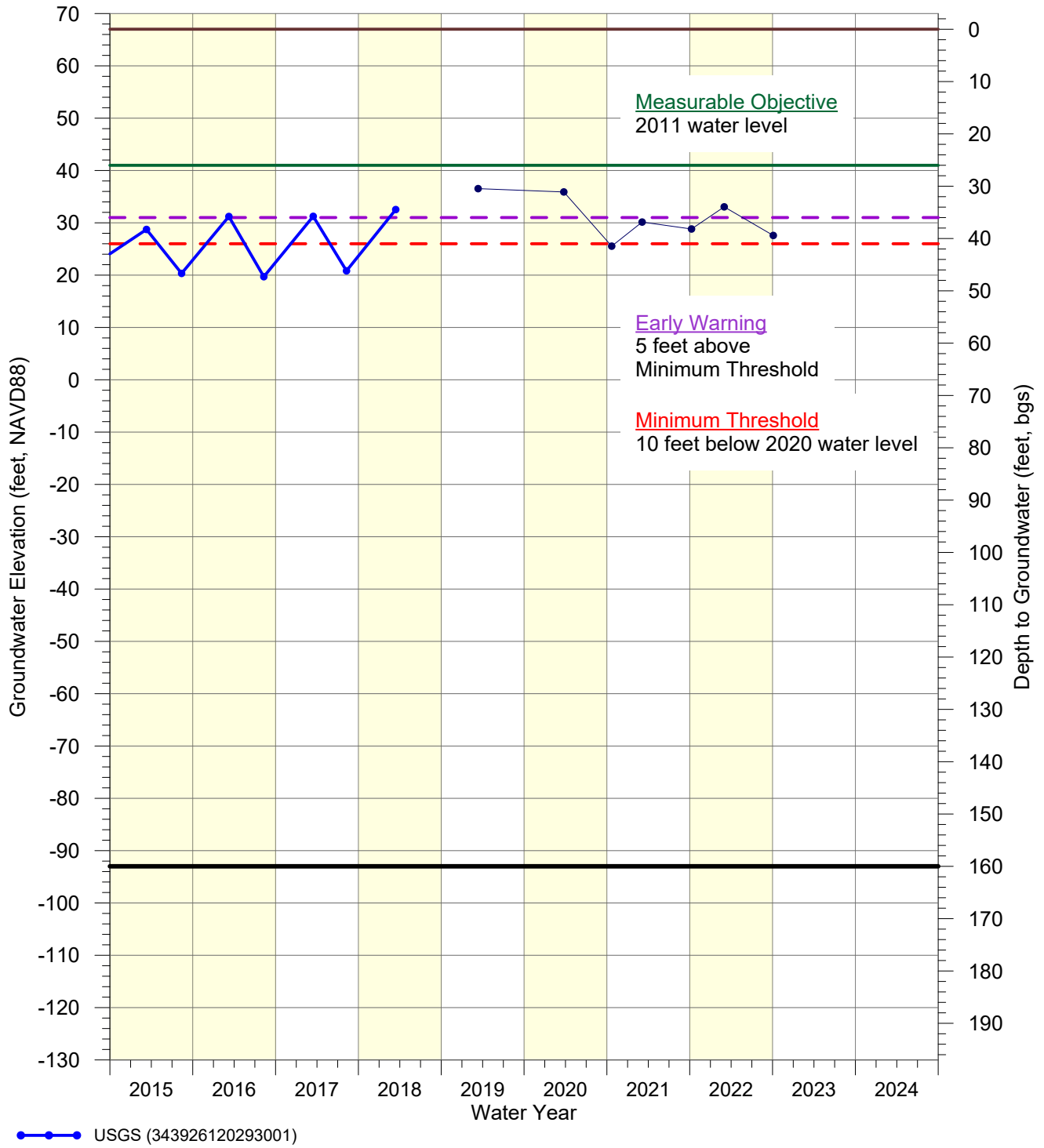
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-06 LP-U 33 24J4.grf 1/30/2023 M. McCammon

FIGURE A1-07

CASGEM ID
49148
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/34W-29N6



STETSON ENGINEERS INC.

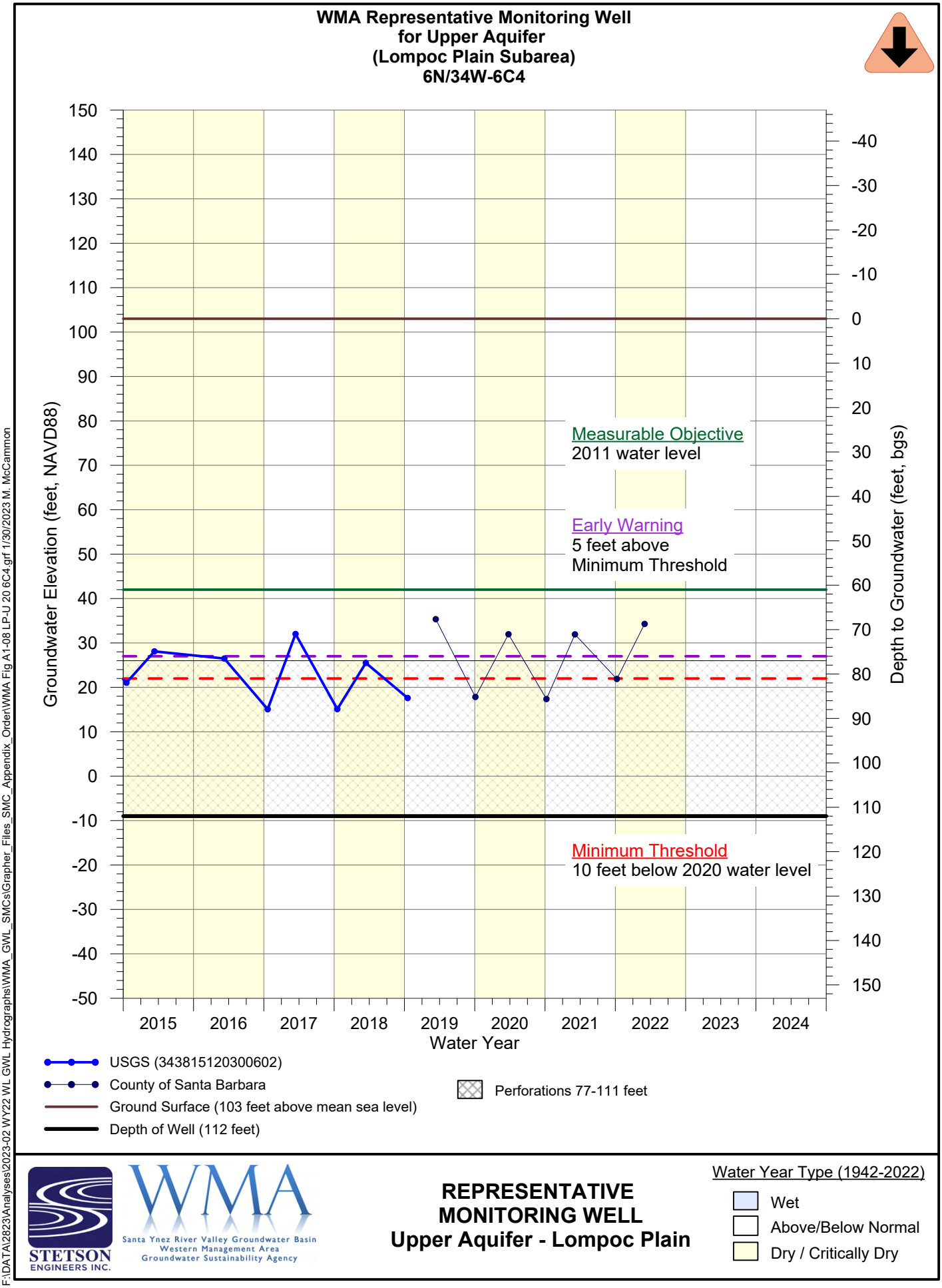
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-07 LP-U 27 29N6.grf 1/30/2023 M. McCammon

FIGURE A1-08



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

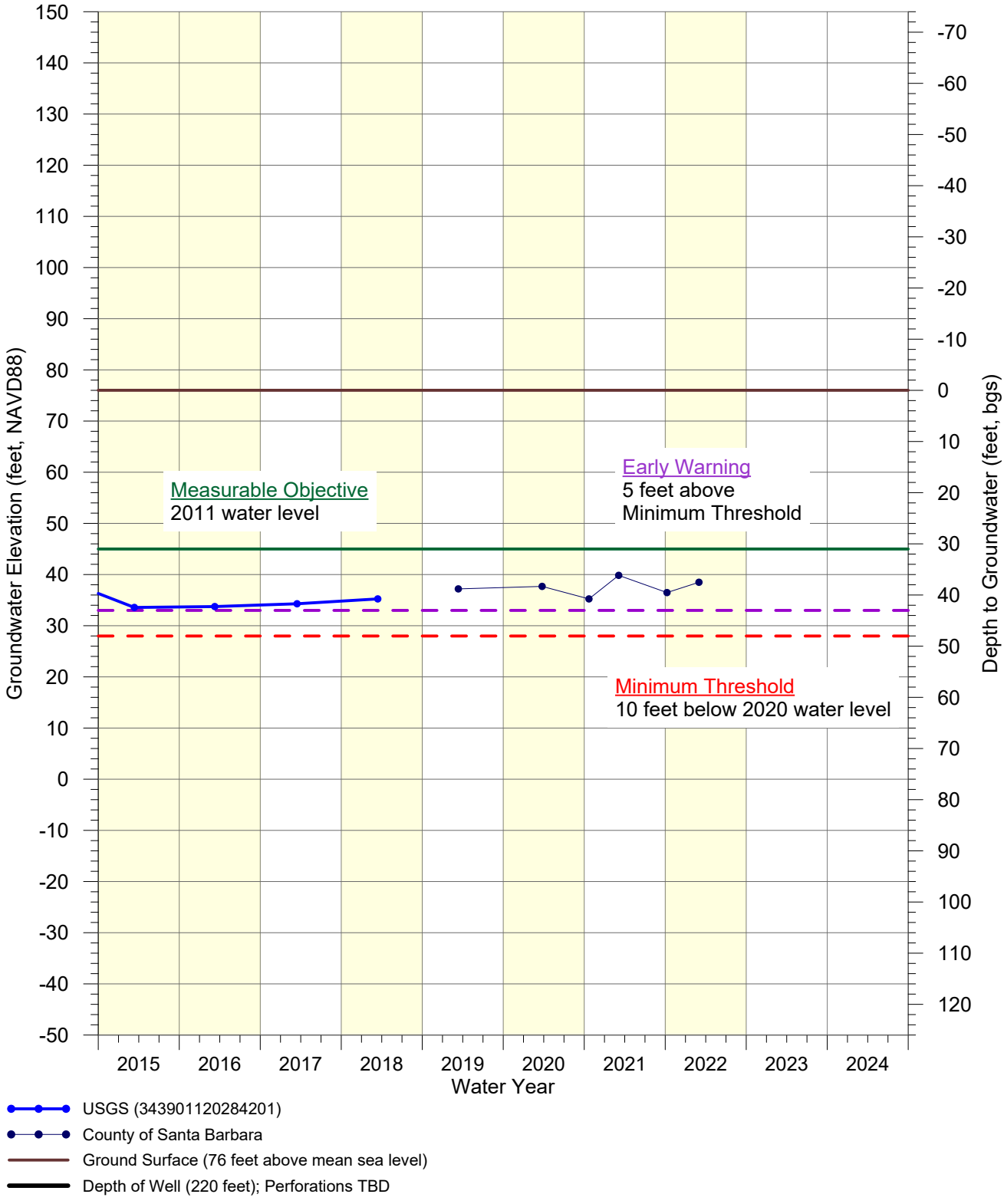
REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-08 LP-U 20 6C4.grf 1/30/2023 M. McCammon

CASGEM ID
49151
Voluntary

**WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/34W-32H2**



STETSON ENGINEERS INC.

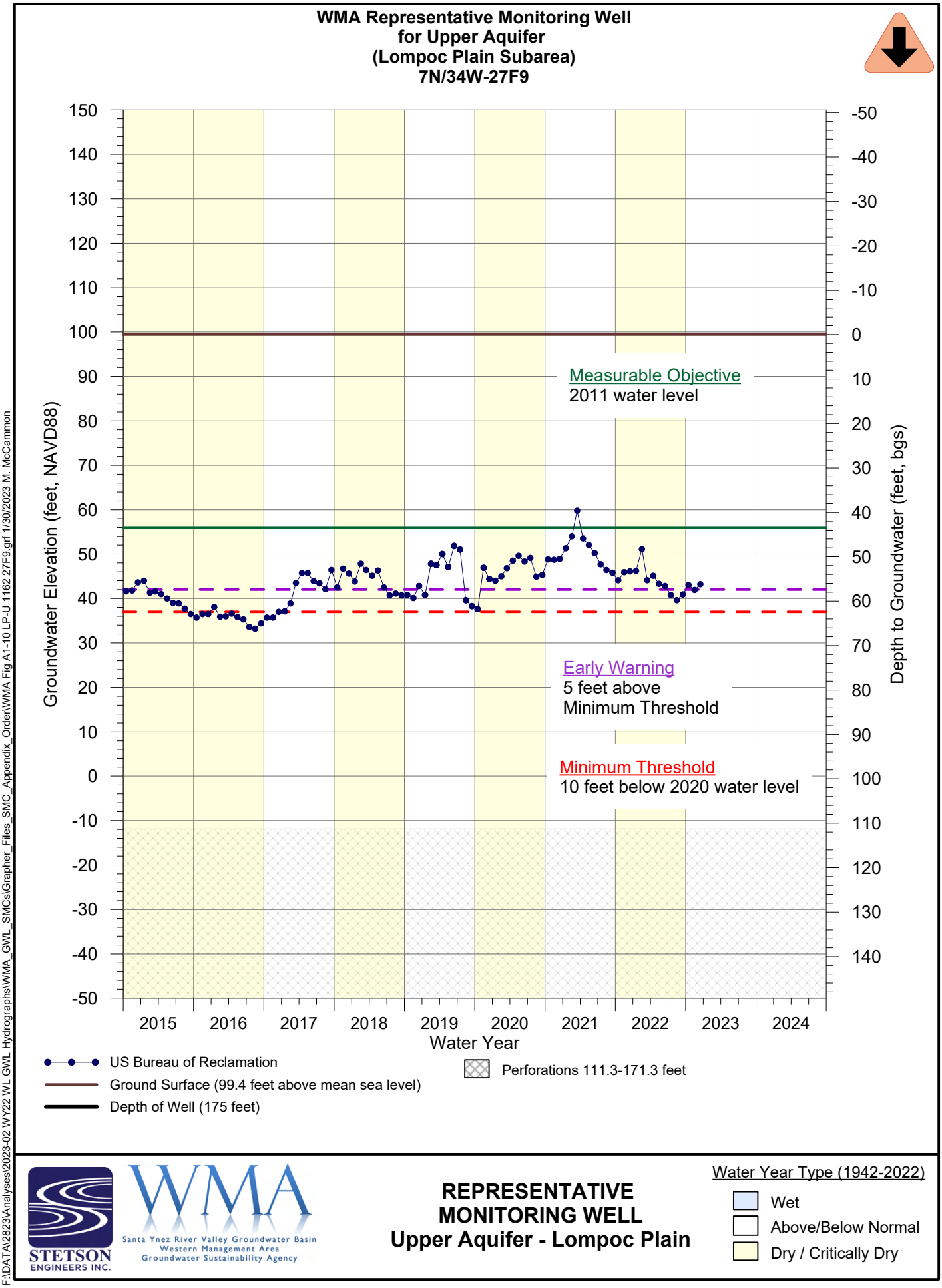
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

**REPRESENTATIVE
MONITORING WELL
Upper Aquifer - Lompoc Plain**

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-09 LP-U 31 32H2.grf 1/30/2023 M. McCammon

FIGURE A1-10



STETSON ENGINEERS INC.

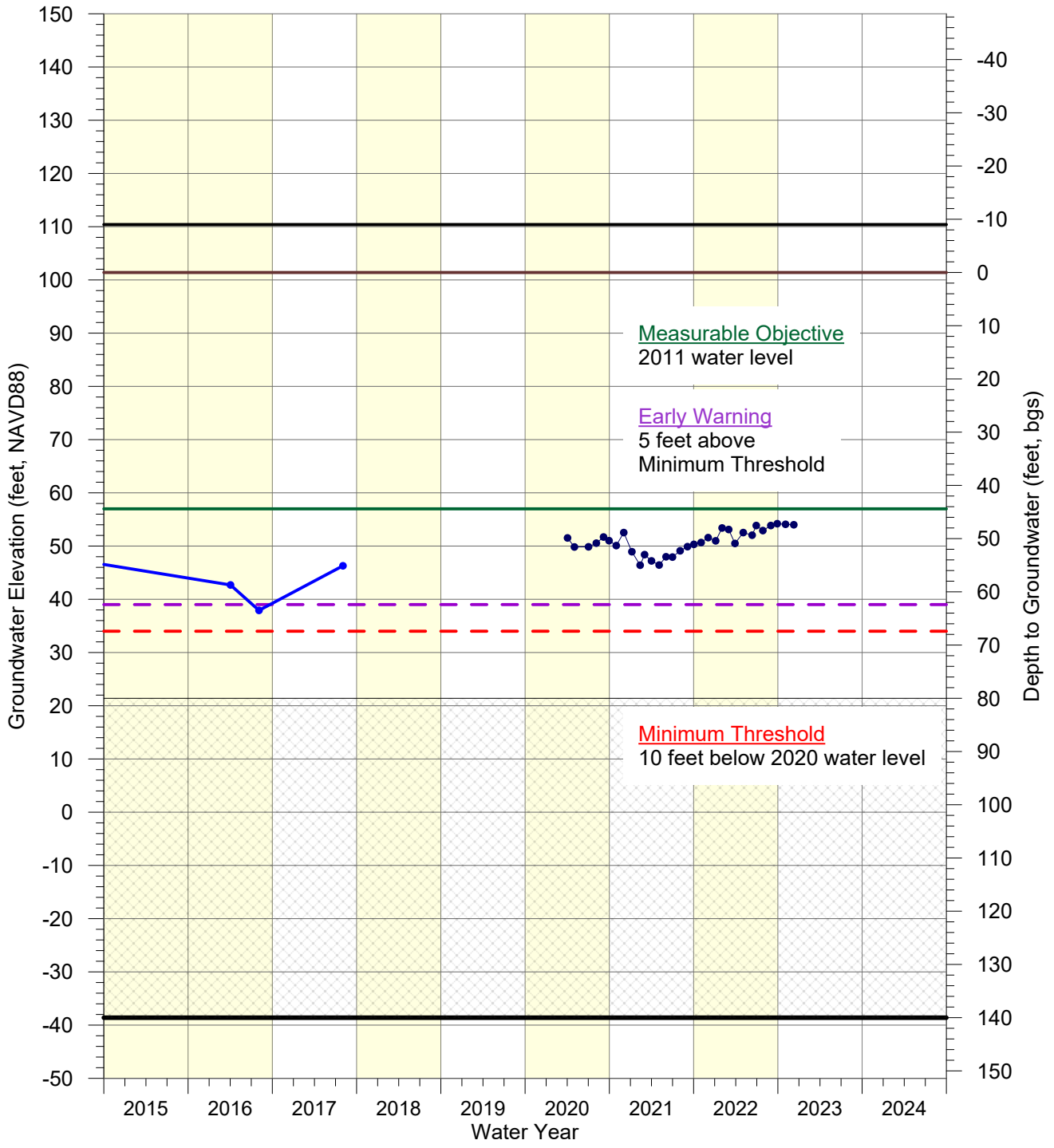
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-10 LP-U 1162 27F9.grf 1/30/2023 M. McCammon

WMA Representative Monitoring Well for Upper Aquifer (Lompoc Plain Subarea) 7N/34W-34F6



STETSON ENGINEERS INC.

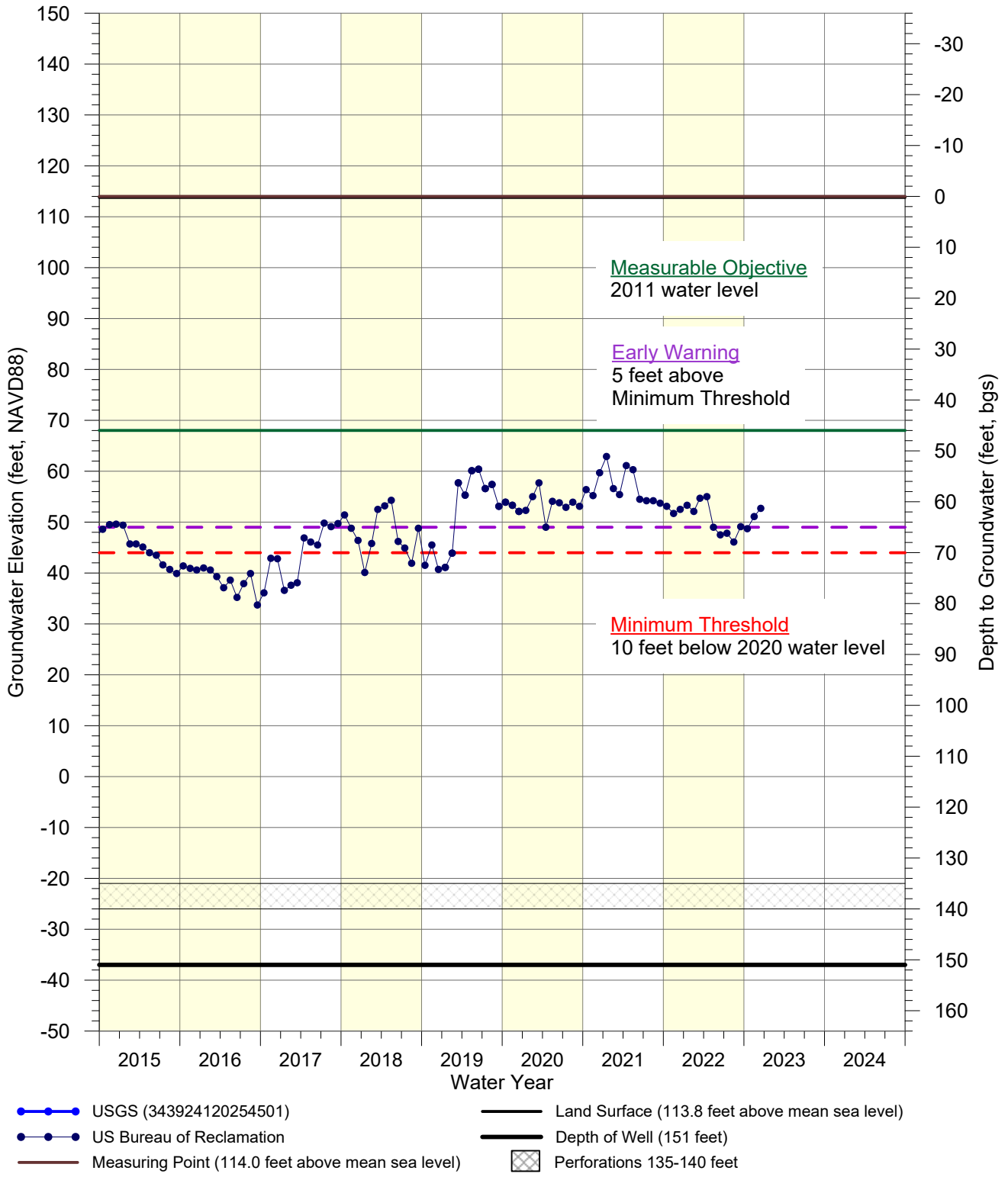
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-11 LP-U 501 34F6.grf 1/30/2023 M. McCammon

WMA Representative Monitoring Well for Upper Aquifer (Lompoc Plain Subarea) 7N/34W-26Q5



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

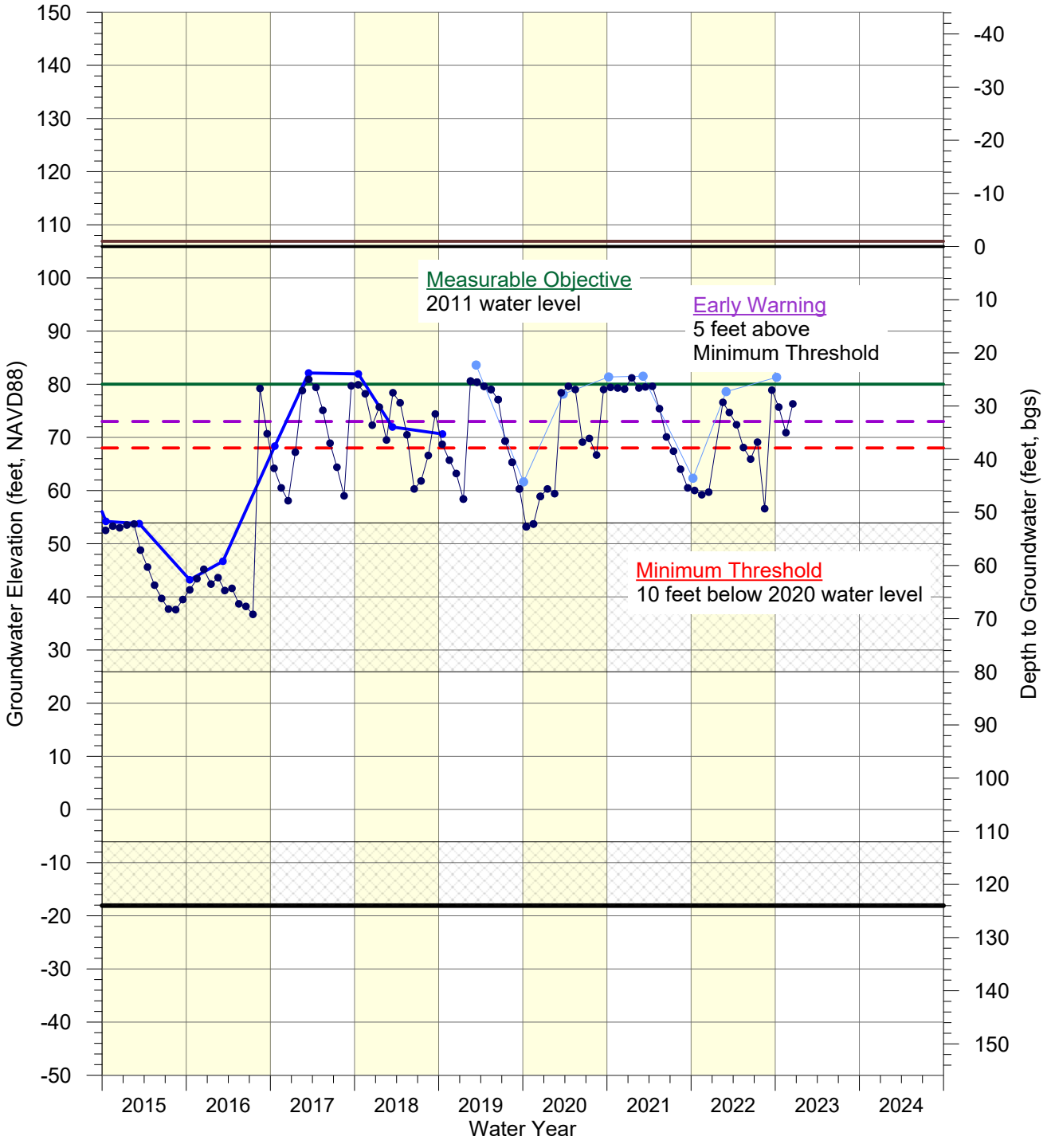
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-12 LP-U 60 26Q5.grf 1/30/2023 M. McCammon

FIGURE A1-13

CASGEM ID
49153
Voluntary

WMA Representative Monitoring Well
for Upper Aquifer
(Lompoc Plain Subarea)
7N/34W-35K9



US Bureau of Reclamation
USGS (343924120254501)
County of Santa Barbara
Measuring Point (106.9 feet above mean sea level)
Land Surface (105.9 feet above mean sea level)
Depth of Well (124 feet)
Perforations 52-80; 112-124 feet

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

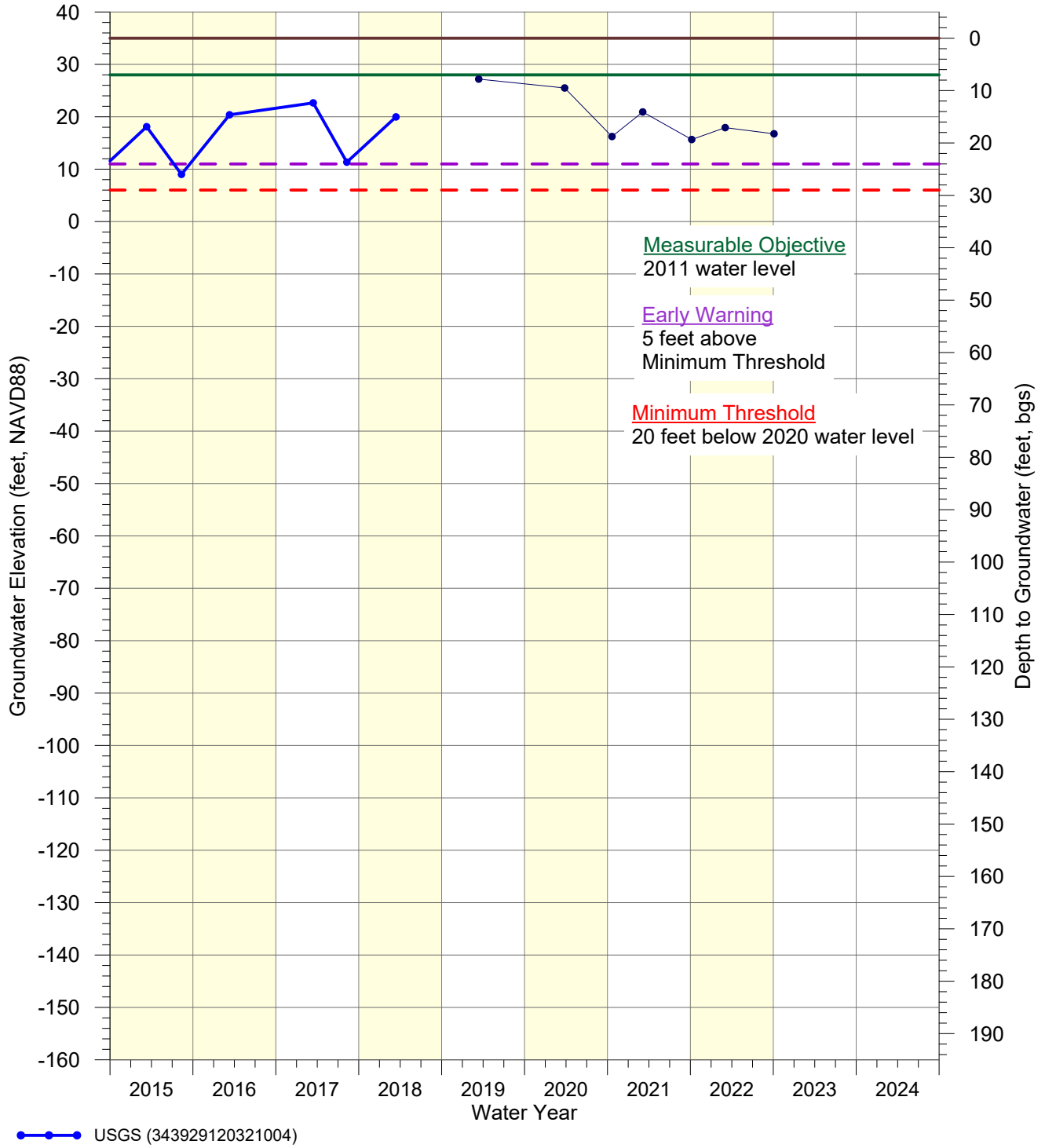
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files\WMA Fig A1-13 LP-U 32 35K9.grf 3/24/2023 M. McCammon

FIGURE A2-01

CASGEM ID
38298
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Plain Subarea)
7N/35W-26L4



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

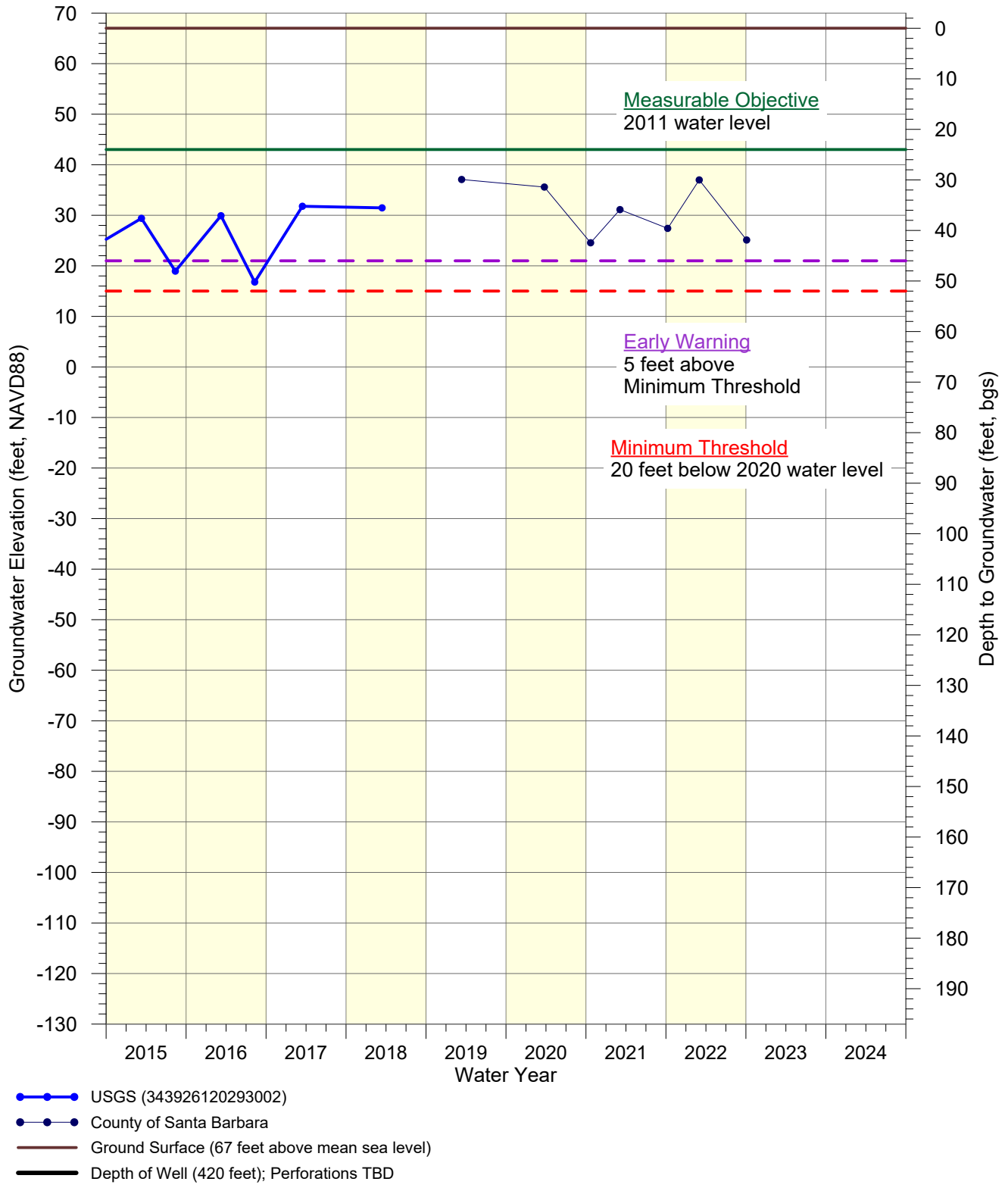
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-01 LP-L 17 26L4.grf 1/30/2023 M. McCammon

FIGURE A2-02

CASGEM ID
23538
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Plain Subarea)
7N/34W-29N7



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

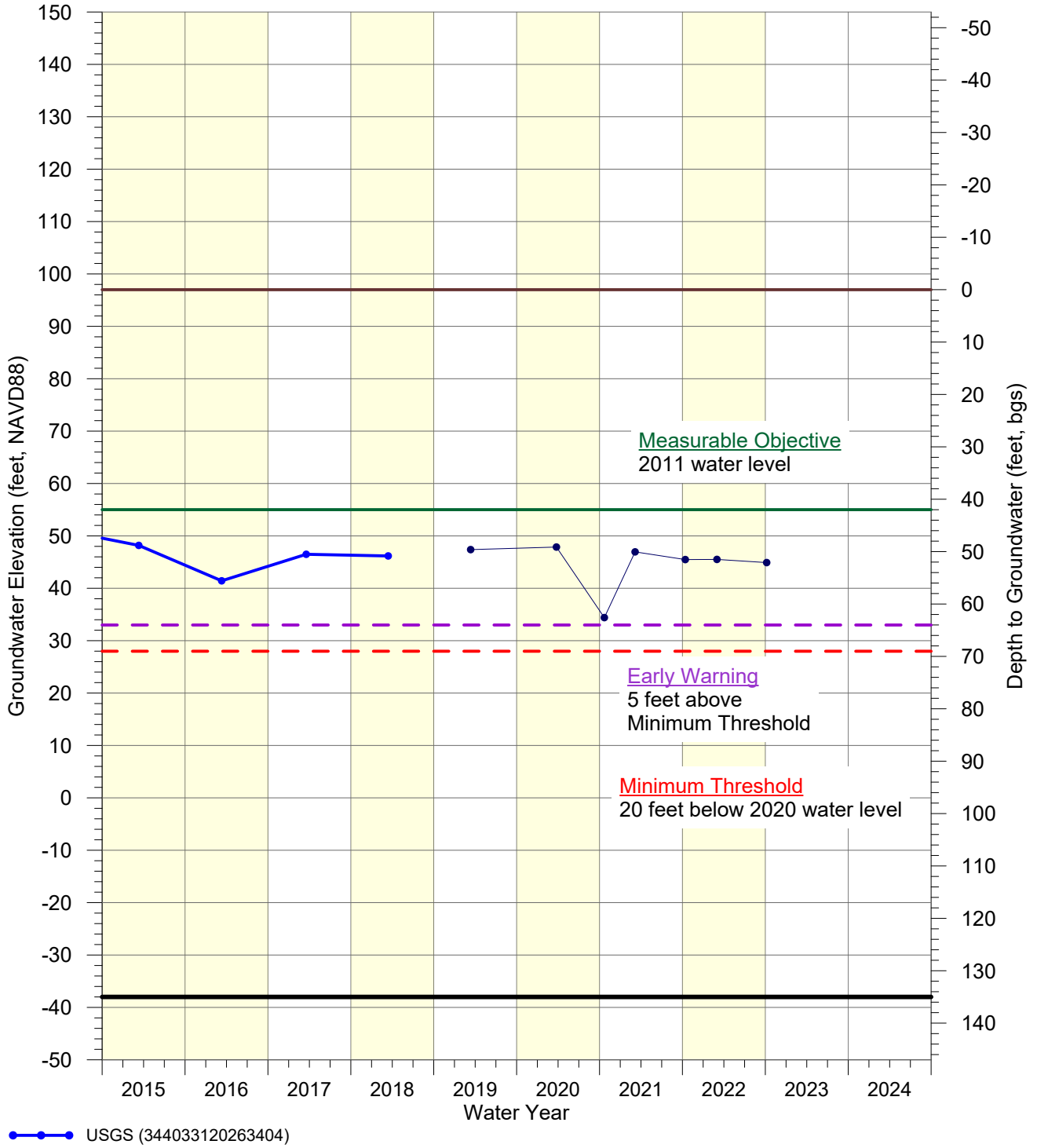
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-02 LP-L 28 29N7.grf 1/30/2023 M. McCammon

FIGURE A2-03

CASGEM ID
49155
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Plain Subarea)
7N/34W-22J6



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

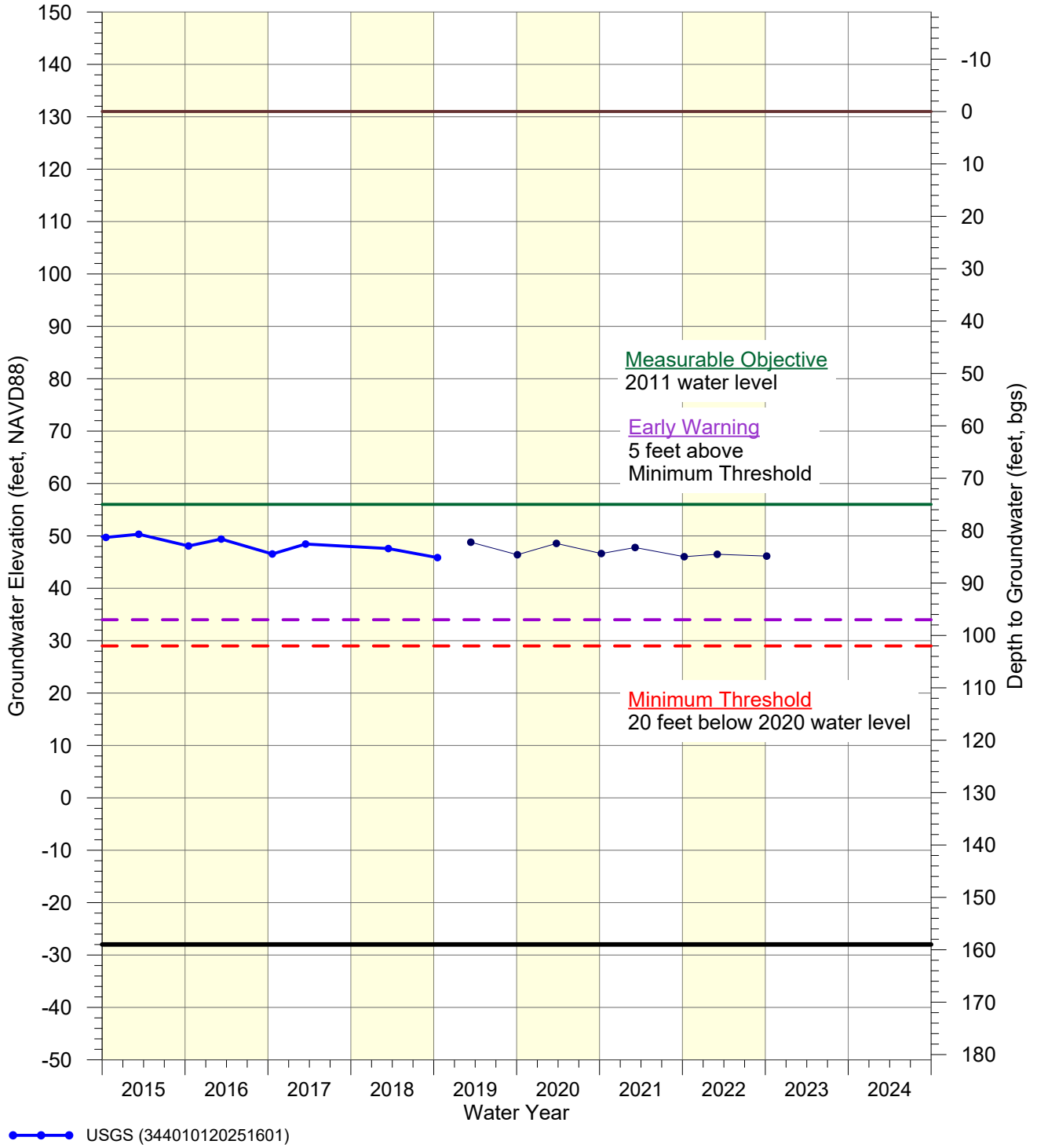
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-03 LP-L 22 22J6.grf 1/30/2023 M. McCammon

FIGURE A2-04

CASGEM ID
49156
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Plain Subarea)
7N/34W-24N1



USGS (344010120251601)
County of Santa Barbara
Ground Surface (131 feet above mean sea level)
Depth of Well (159 feet); Perforations TBD

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

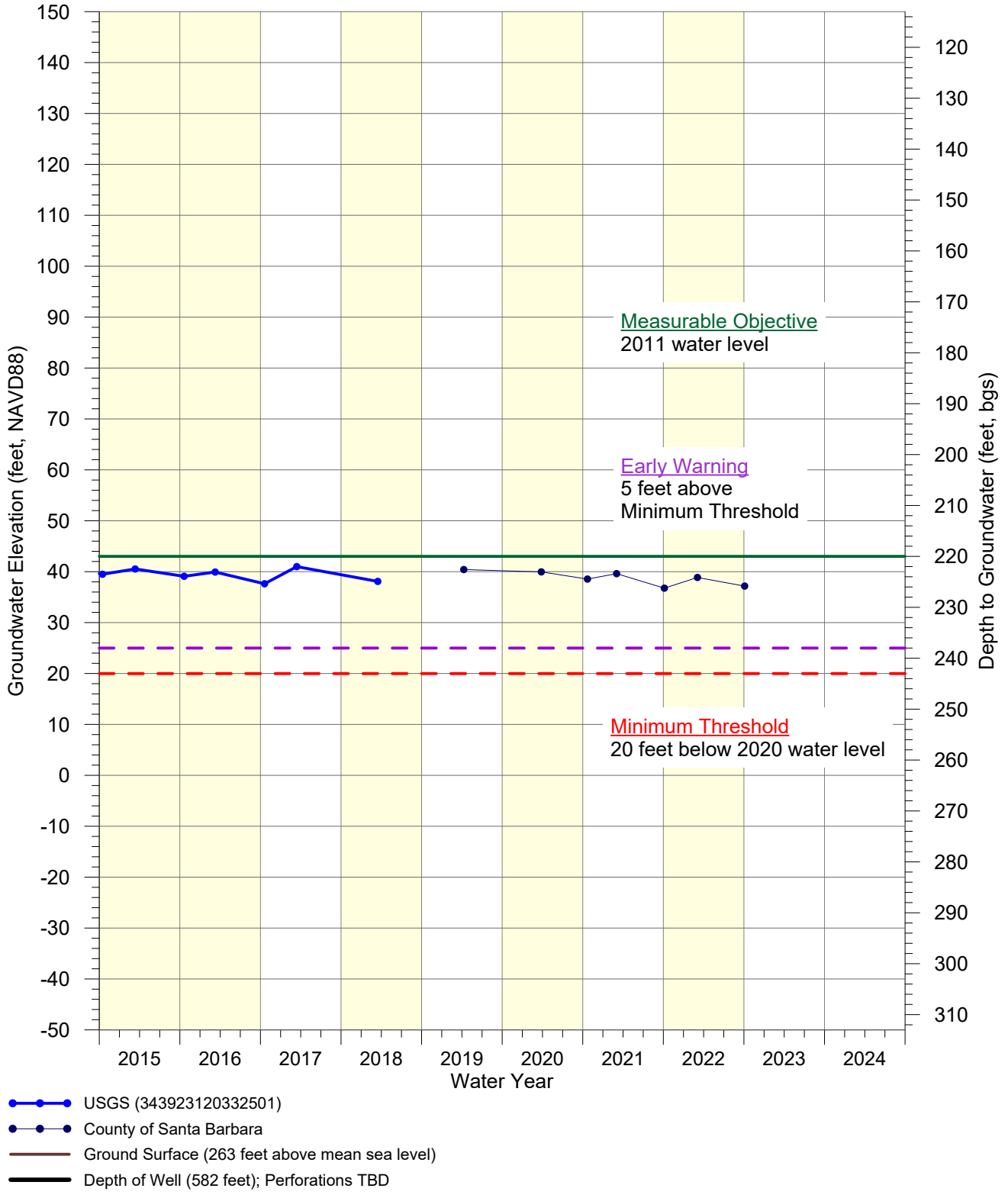
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-04 LP-L 23 24N1.grf 1/30/2023 M. McCammon

FIGURE A2-05

CASGEM ID
49168
Voluntary

WMA Representative Monitoring Well for Lower Aquifer (Lompoc Terrace Subarea) 7N/35W-27P1



STETSON ENGINEERS INC.

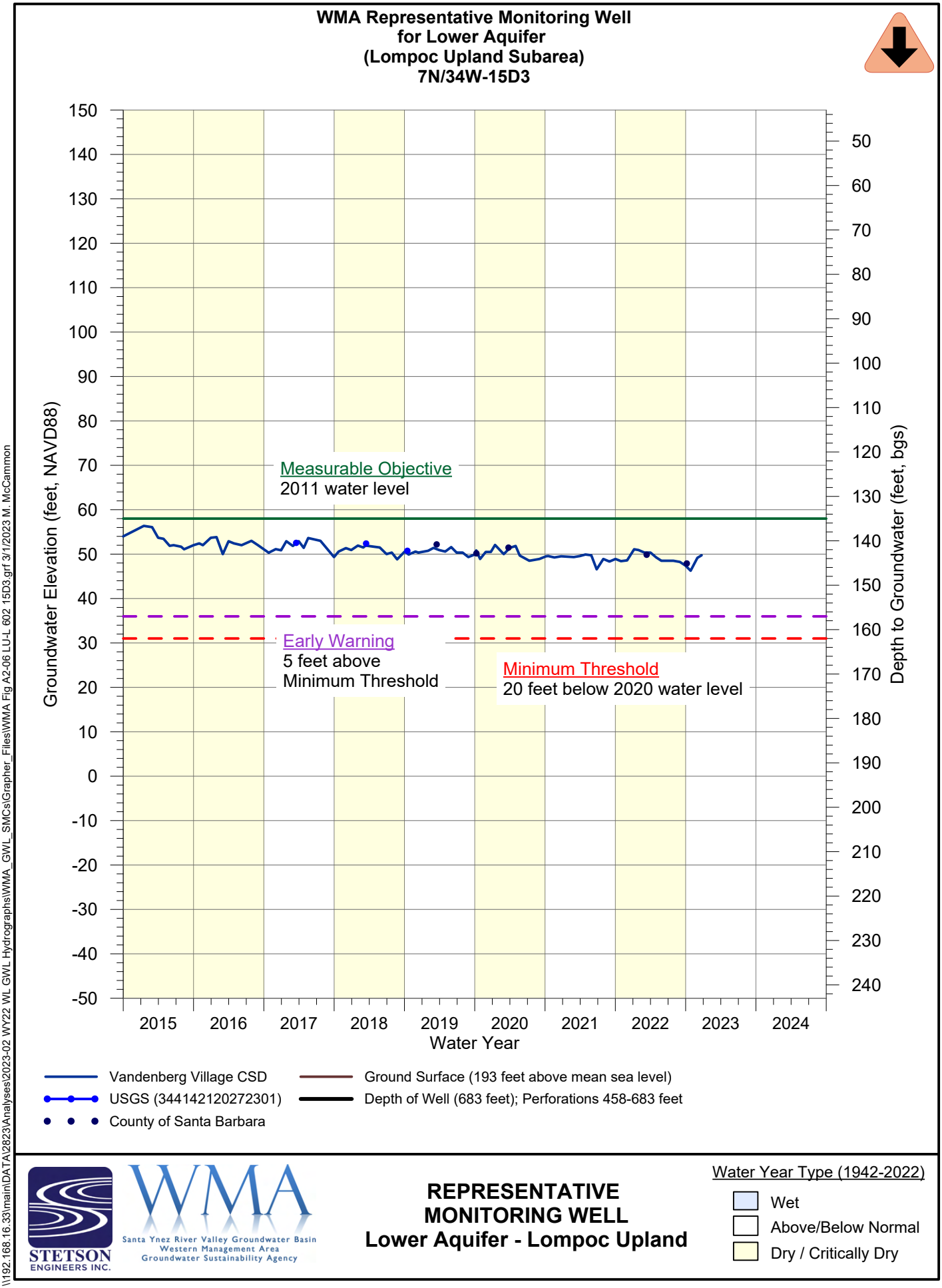
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Terrace

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-05 LT-L 44 27P1.grf 1/30/2023 Stetson

FIGURE A2-06



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

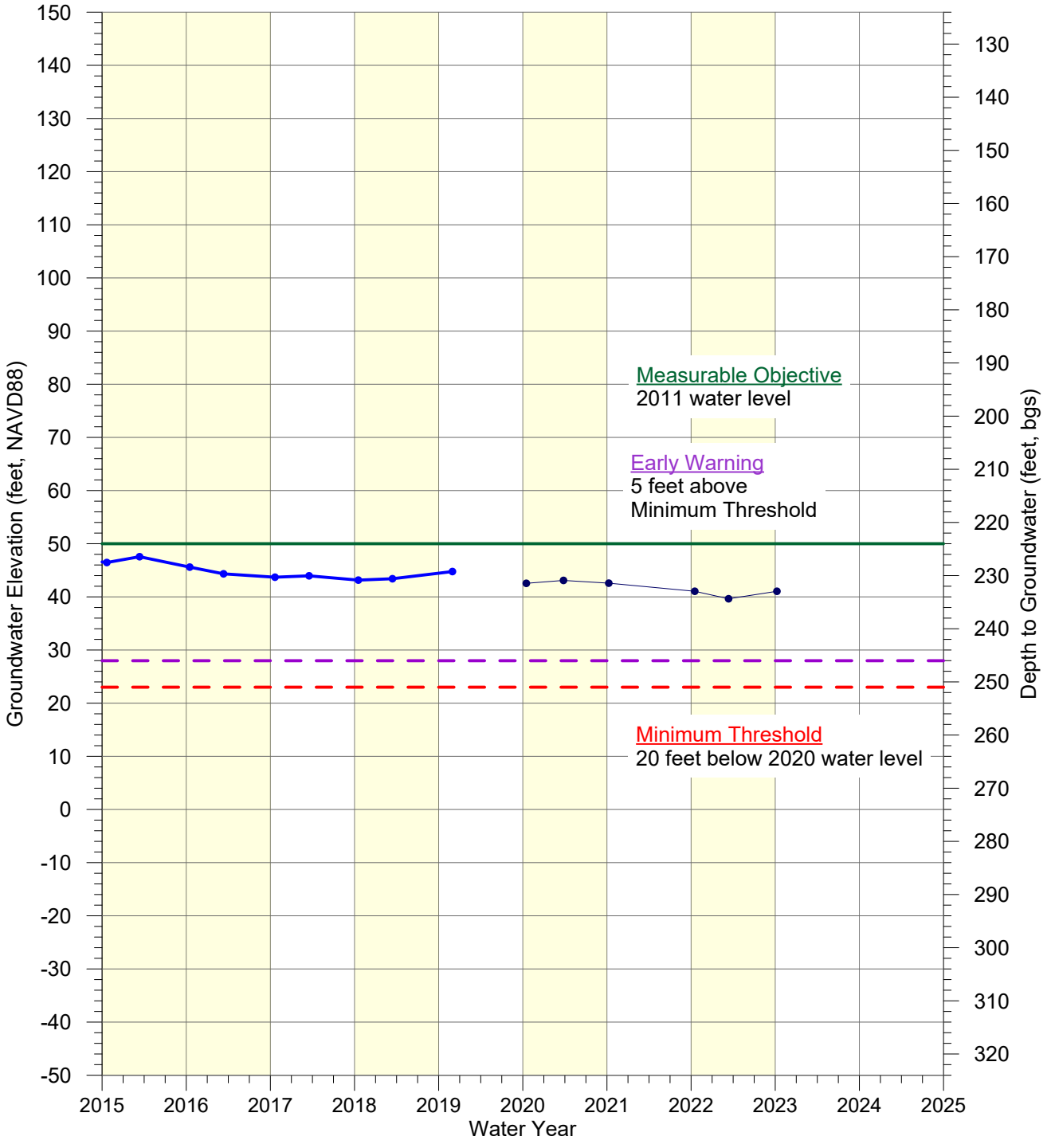
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

\\192.168.16.33\main\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files\WMA Fig A2-06 LU-L 602 15D3.grf 3/1/2023 M. McCammon

FIGURE A2-07

CASGEM ID
49142
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Upland Subarea)
7N/34W-14F4



USGS (344126120255201)
County of Santa Barbara
Ground Surface (274 feet above mean sea level)
Depth of Well (540 feet); Perforations TBD

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

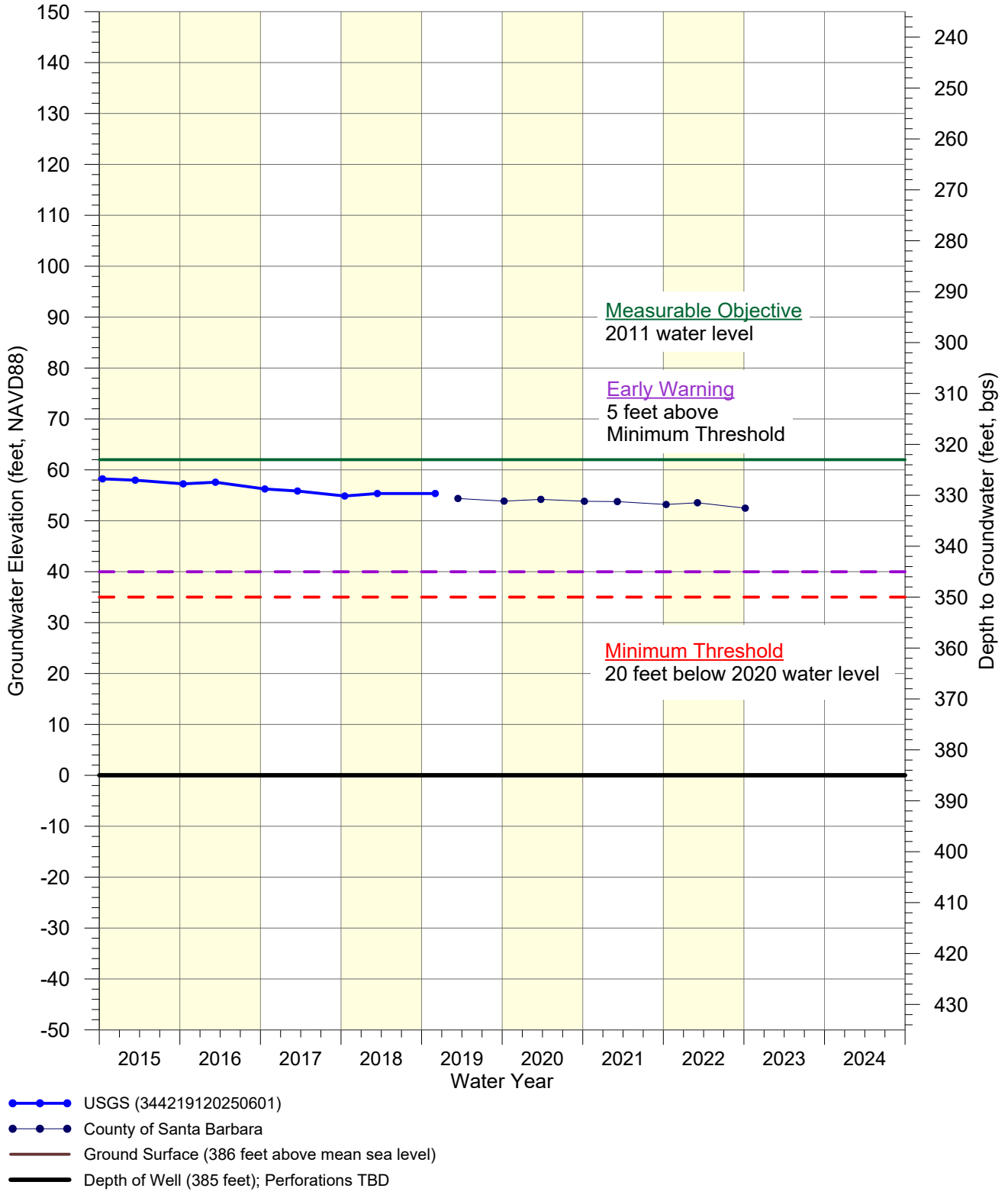
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-07 LU-L 52 14F4.grf 1/30/2023 M. McCammon

FIGURE A2-08

CASGEM ID
49139
CASGEM

**WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Upland Subarea)
7N/34W-12E1**



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Lompoc Upland**

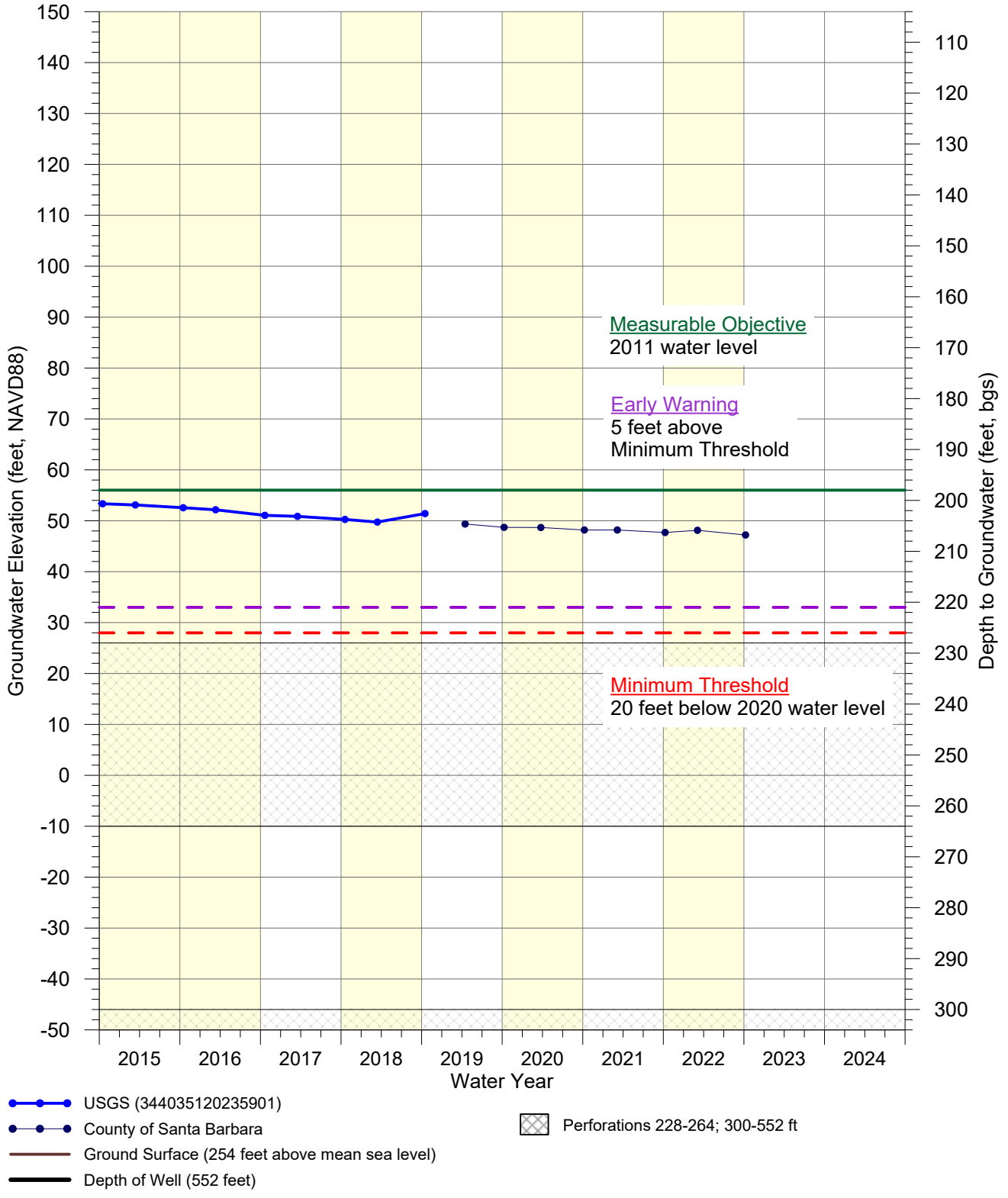
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-08 LU-L 51 12E1.grf 1/30/2023 M. McCammon

FIGURE A2-09

CASGEM ID
49143
Voluntary

WMA Representative Monitoring Well for Lower Aquifer (Lompoc Upland Subarea) 7N/33W-19D1



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

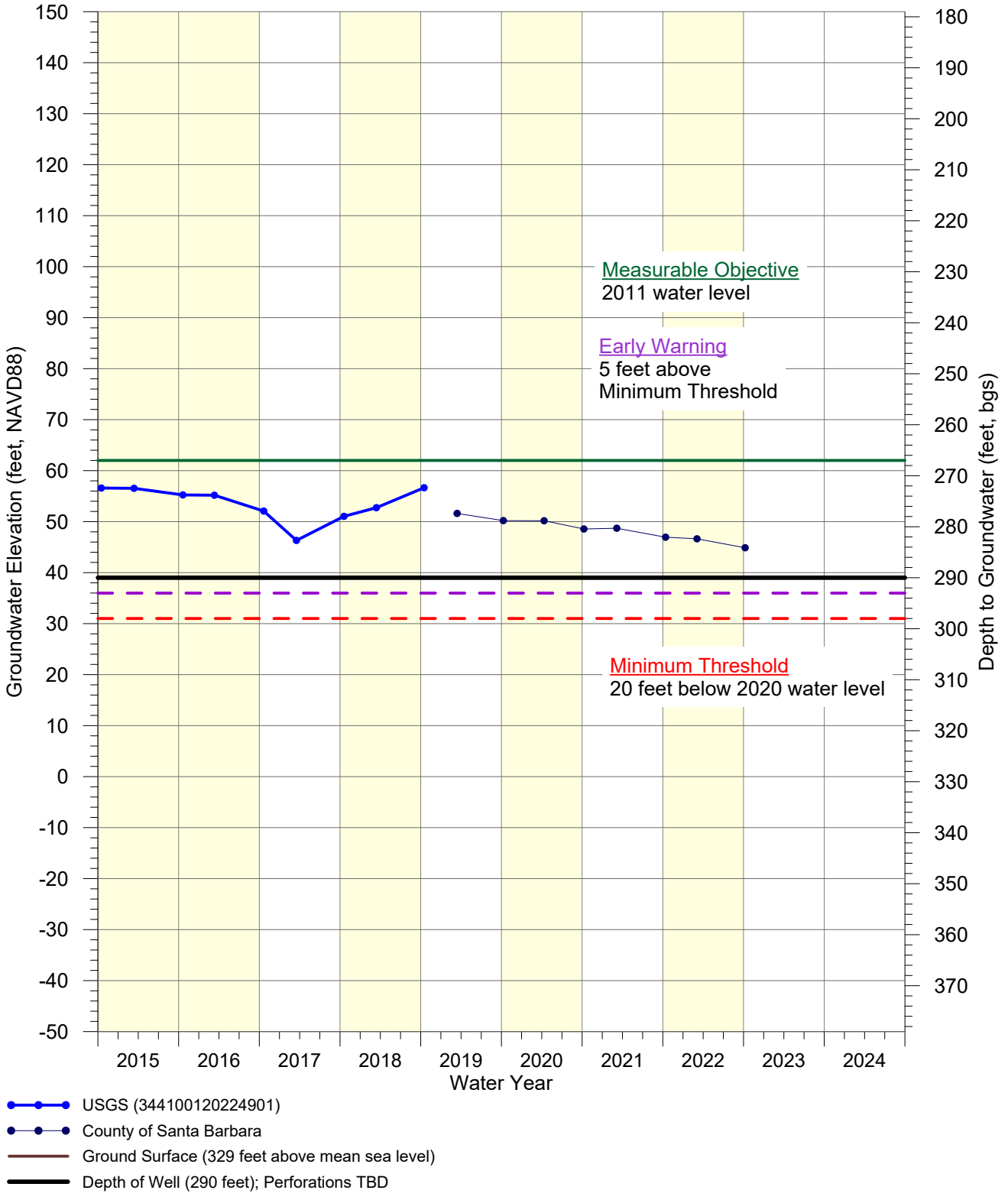
REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-09 LU-L 49 19D1.grf 1/30/2023 M. McCammon

CASGEM ID
49144
Voluntary

**WMA Representative Monitoring Well
for Lower Aquifer
(Lompoc Upland Subarea)
7N/33W-17M1**



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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Lompoc Upland**

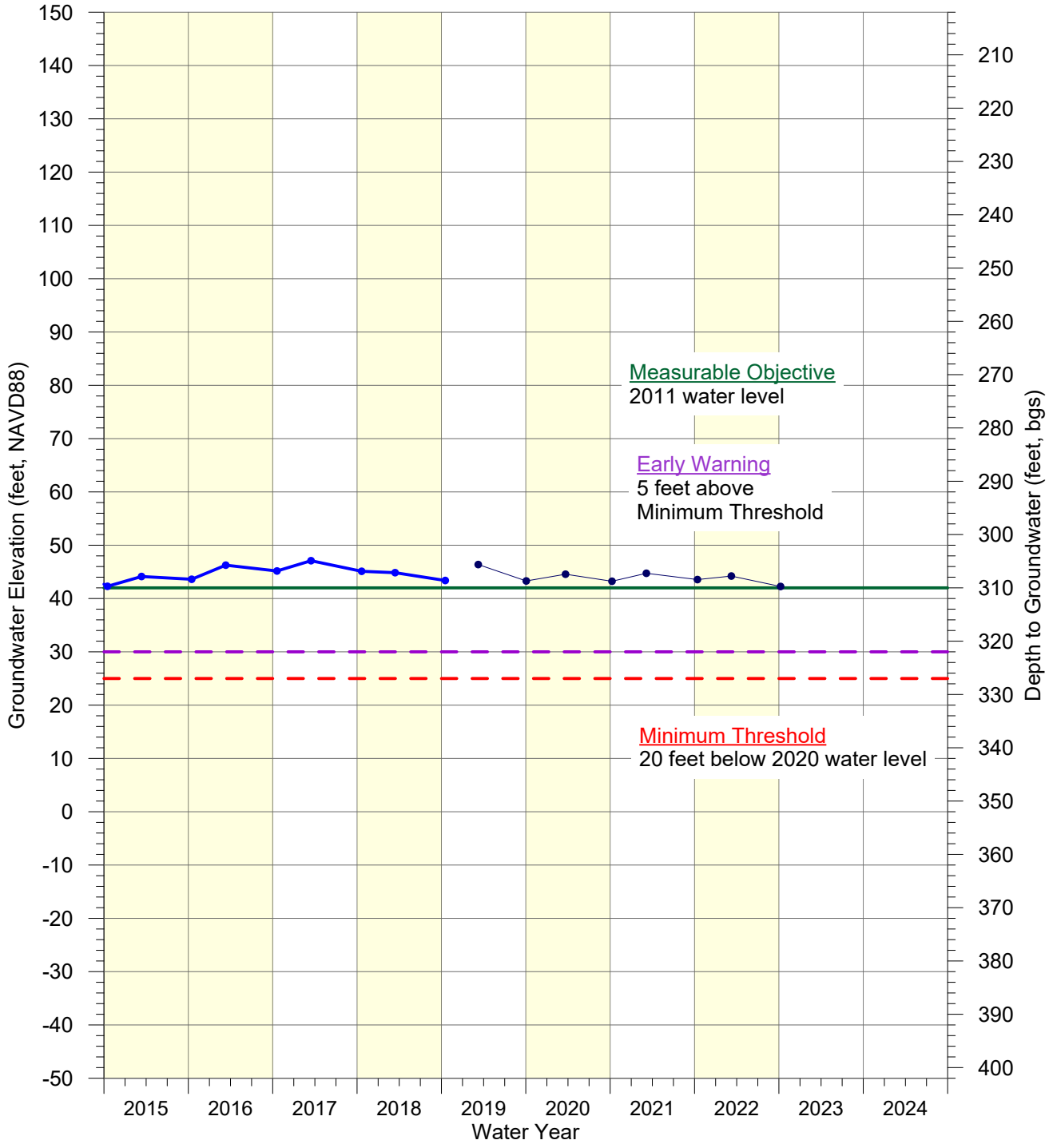
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-10 LU-L 47 17M1.grf 1/30/2023 M. McCammon

FIGURE A2-11

CASGEM ID
49129
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Santa Rita Upland Subarea)
7N/33W-28D3



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Santa Rita Upland

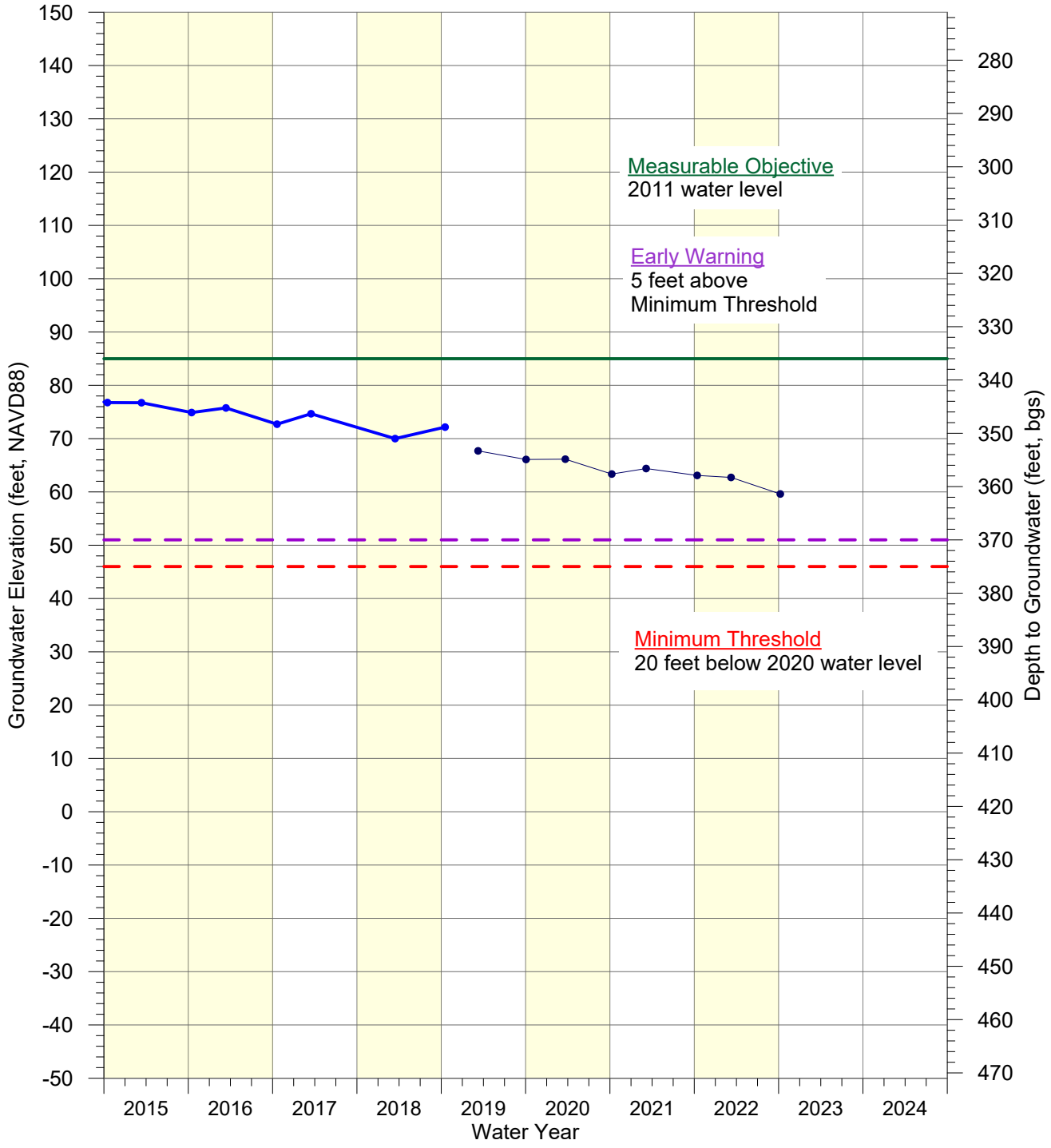
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-11 SR-L 81 28D3.grf 1/30/2023 M. McCammon

FIGURE A2-12

CASGEM ID
23686
Voluntary

WMA Representative Monitoring Well
for Lower Aquifer
(Santa Rita Upland Subarea)
7N/33W-21G2



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Santa Rita Upland

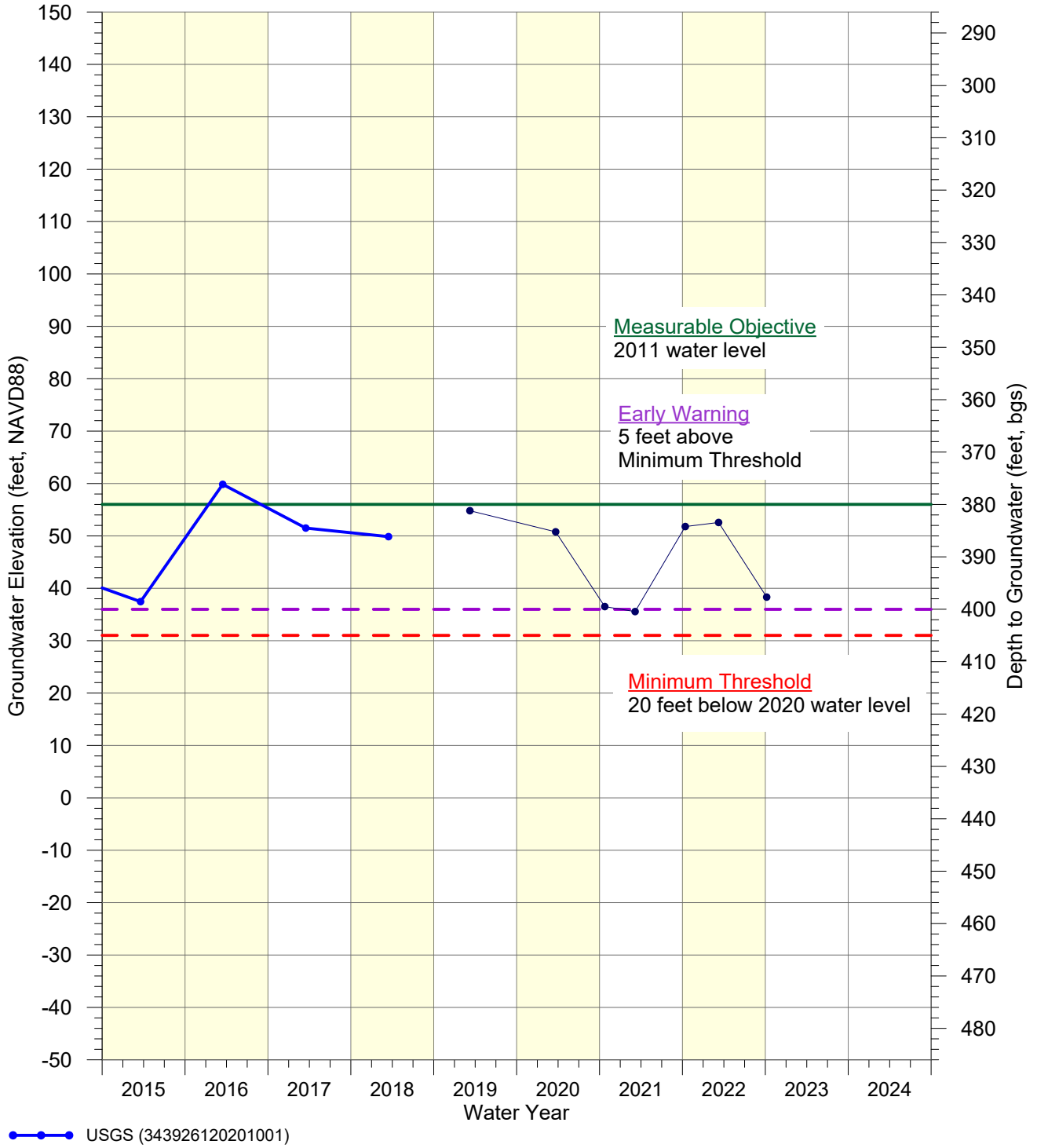
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-12 SR-L 78 21G2.grf 1/30/2023 M. McCammon

FIGURE A2-13

CASGEM ID
49132
Voluntary

**WMA Representative Monitoring Well
for Lower Aquifer
(Santa Rita Upland Subarea)
7N/33W-27G1**



USGS (343926120201001)
County of Santa Barbara
Ground Surface (436 feet above mean sea level)
Depth of Well (735 feet); Perforations TBD

STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Santa Rita Upland**

Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 WL GWL Hydrographs\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-13 SR-L 80 27G1.grf 1/30/2023 M. McCammon

Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-B:

Groundwater Level Hydrographs for Assessing Surface Water Depletion, Western Management Area

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APPENDIX 3-B:

GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING SURFACE WATER DEPLETION, WESTERN MANAGEMENT AREA

WATER YEAR 2022

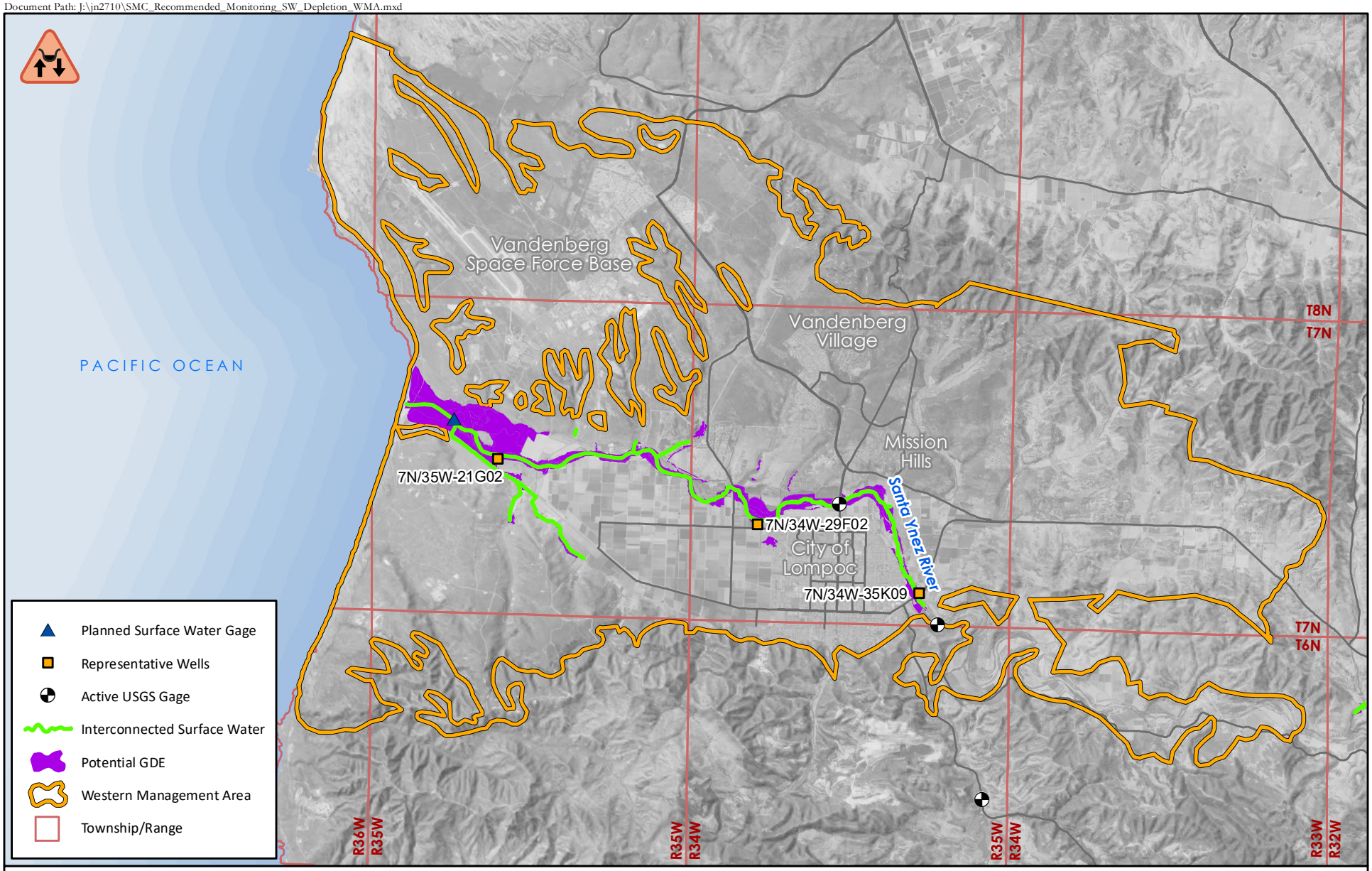
This appendix includes hydrographs, which are graphs of water levels in wells. These are the representative wells for monitoring potential surface water depletion. As per the SGMA regulations, this includes the period from January 1, 2015 through the end of the Water Year 2022. Shown on these graphs are key SGMA criteria: measurable objective, early warning, and minimum threshold.

The Groundwater Sustainability Plan (GSP) includes hydrographs of the long-term period of record. A copy of the GSP, water level data and hydrographs are available at https://sywater.info.

LIST OF ACRONYMS AND ABBREVIATIONS

BGS	below-ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level
WMA	Western Management Area

Document Path: J:\jn2710\SMC_Recommended_Monitoring_SW_Depletion_WMA.mxd



STETSON ENGINEERS INC.

WMA

Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

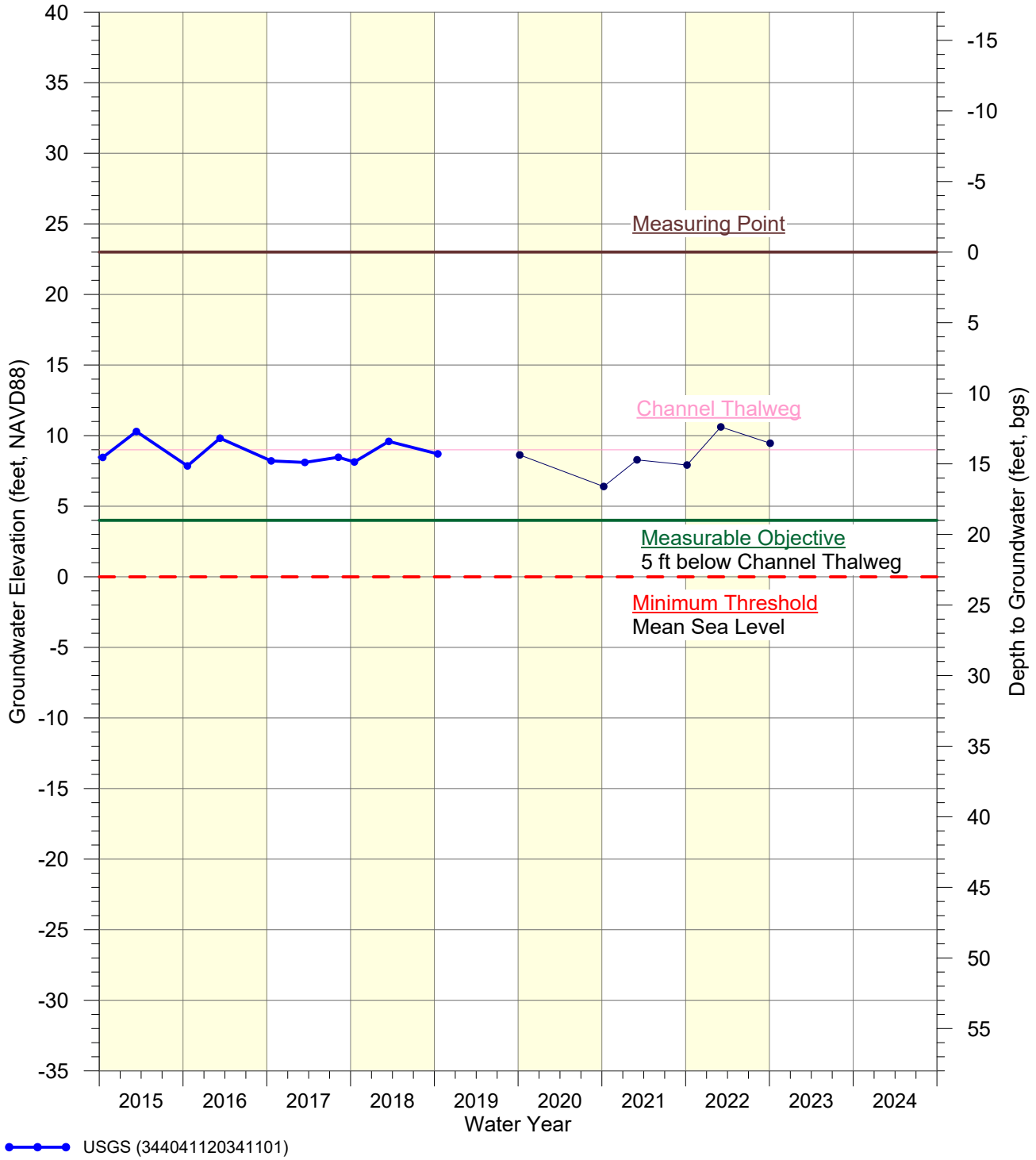
WMA REPRESENTATIVE MONITORING FOR INTERCONNECTED SURFACE WATER AND GROUNDWATER DEPENDENT ECOSYSTEMS

0 1 2 Miles

N

CASGEM ID
49153
Voluntary

WMA Representative Monitoring Well for Interconnected Surface Water and Groundwater Dependent Ecosystems (Lompoc Plain Subarea)
7N/35W-21G2



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

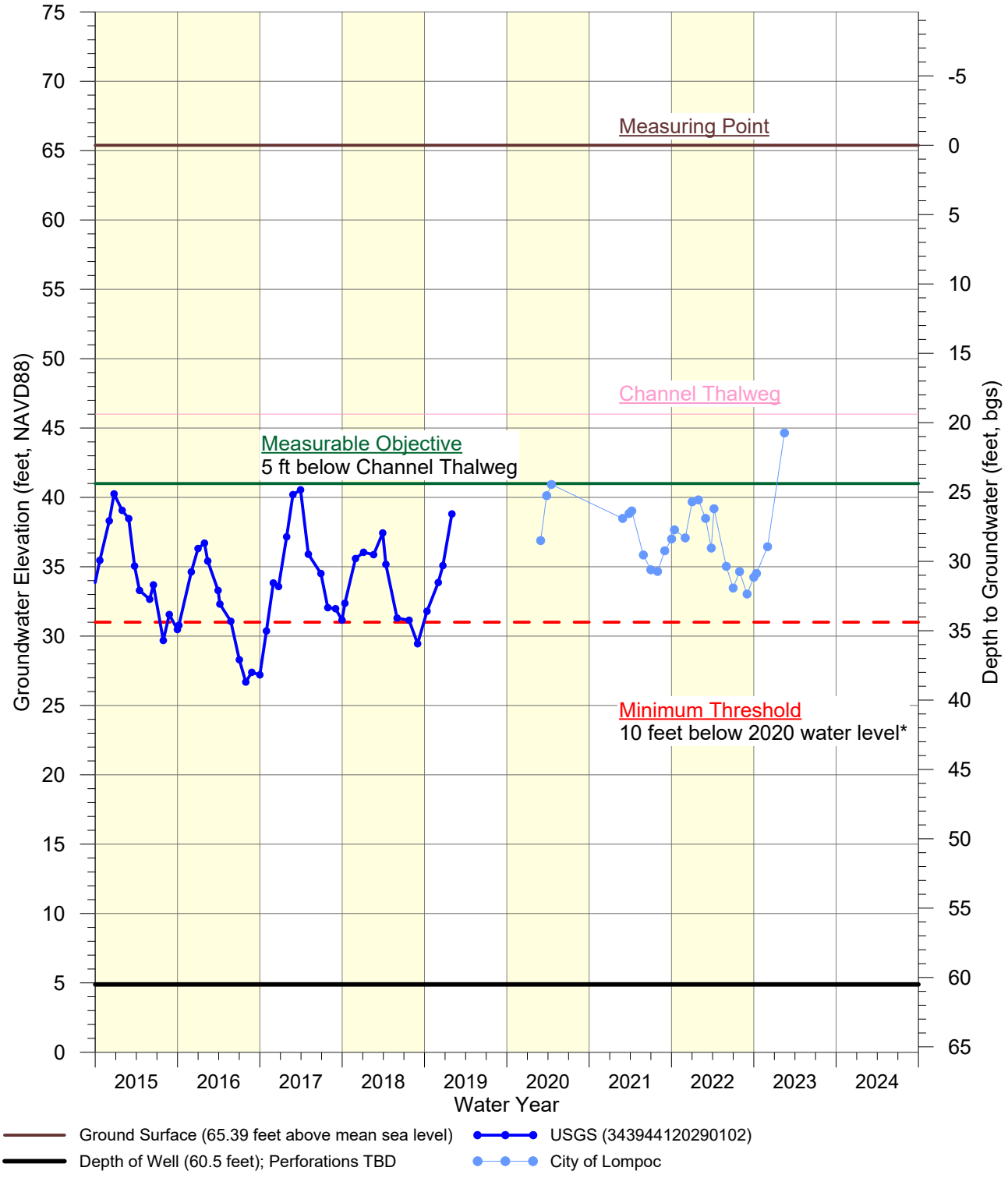
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 GDE GWL Hydrographs\WMA_GDE_Hydrograph_Grapher\WMA Fig B-01 LP-U-S 39 21G2.grf 1/30/2023 M. McCammon

FIGURE B-02

CASGEM ID
25271
Voluntary

WMA Representative Monitoring Well for
Interconnected Surface Water and Groundwater Dependent Ecosystems
(Lompoc Plain Subarea)
7N/34W-29F2



STETSON ENGINEERS INC.

WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

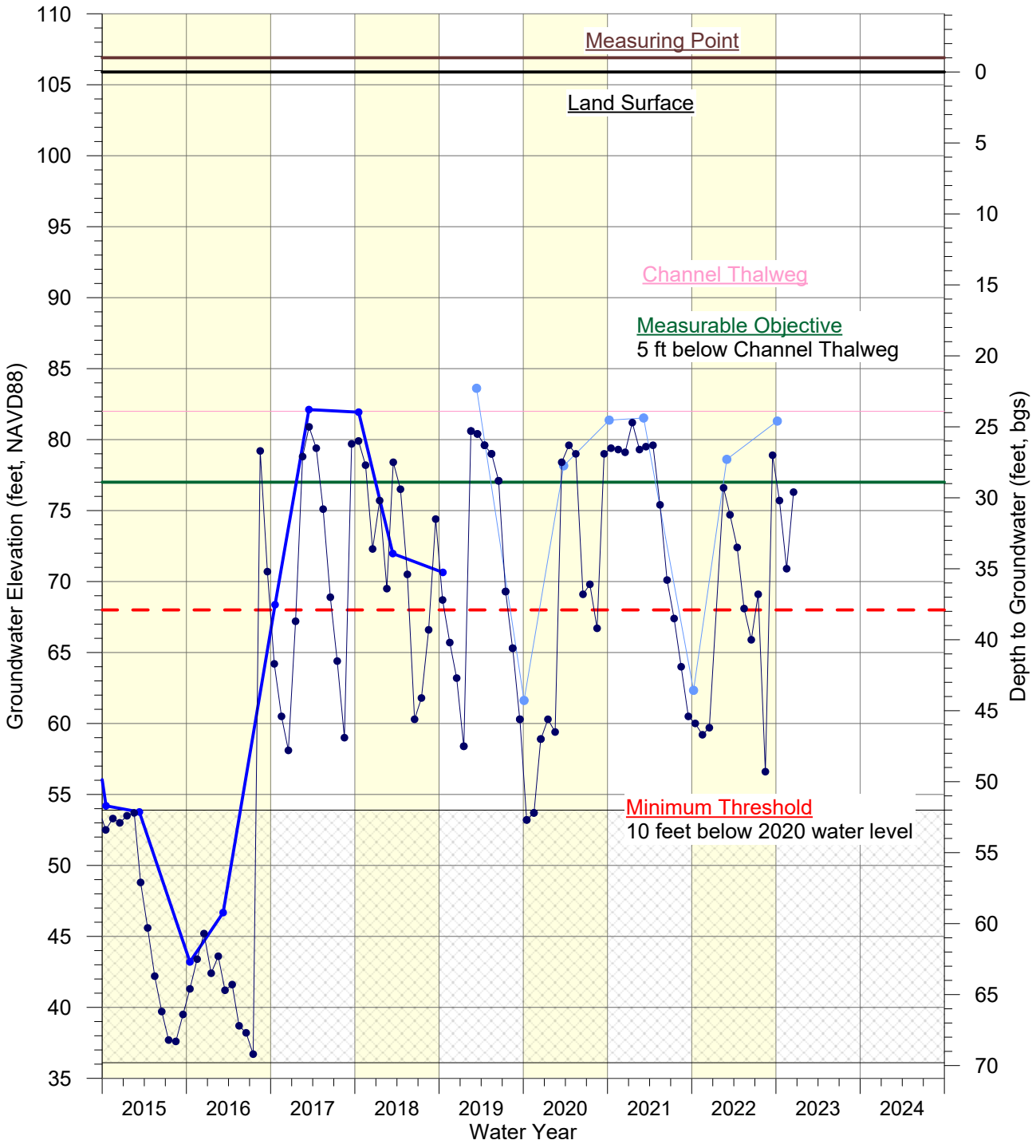
Water Year Type (1942-2022)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2823\Analyses\2023-02 WY22 GDE GWL Hydrographs\WMA_GDE_Hydrograph_Grapher\WMA Fig B-02 LP-U 167 29F2.grf 3/23/2023 M. McCammon

FIGURE B-03

CASGEM ID
36328
Voluntary

WMA Representative Monitoring Well for Interconnected Surface Water and Groundwater Dependent Ecosystems (Lompoc Plain Subarea)
7N/34W-35K9



US Bureau of Reclamation
USGS (343924120254501)
County of Santa Barbara
Land Surface (105.9 feet above mean sea level)
Measuring Point (106.9 feet above mean sea level)
Depth of Well (124 feet)
Perforations 52-80; 112-124 feet

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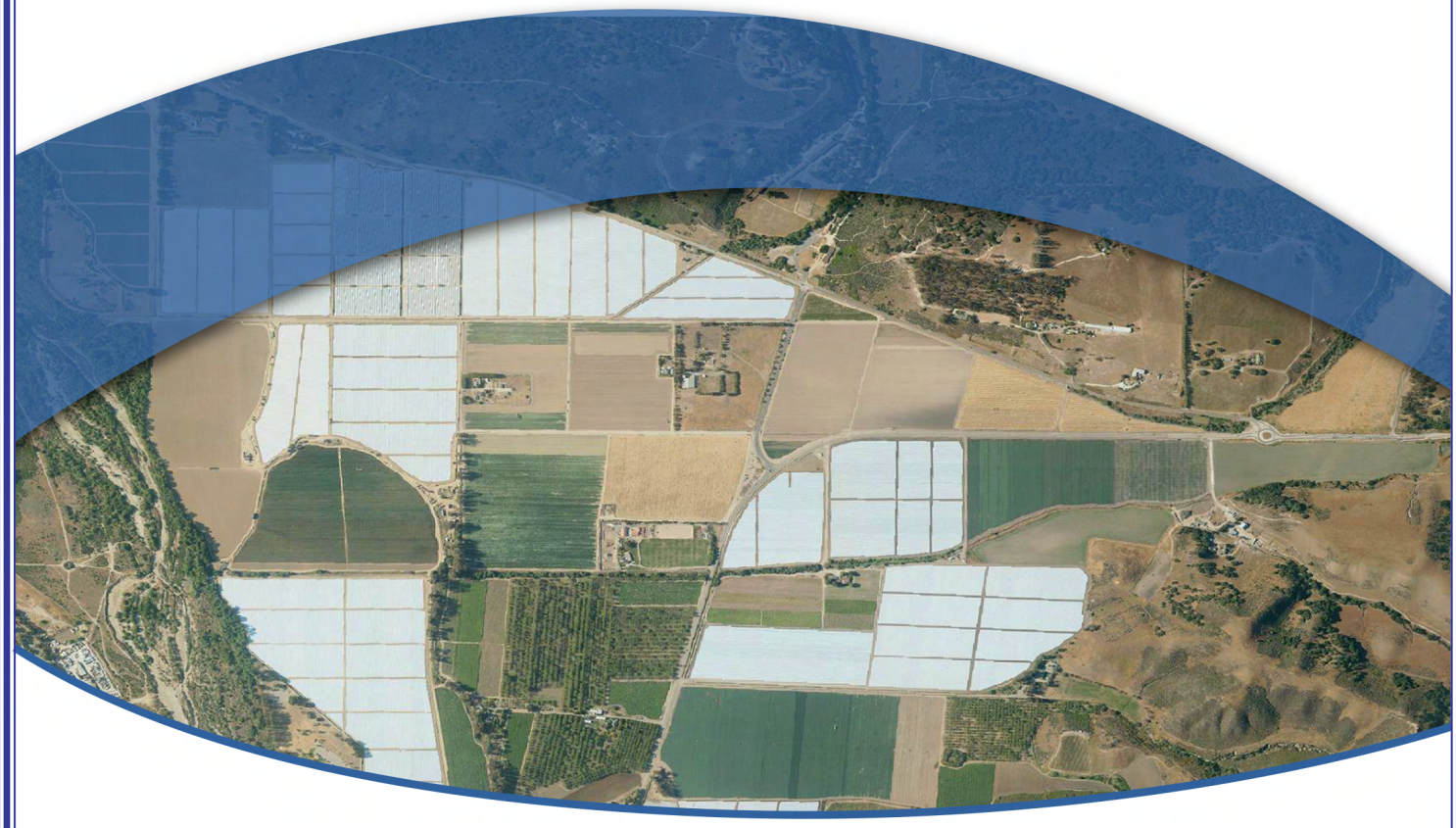
Second Annual Report Water Year 2022
Groundwater Sustainability Plan

WMA

Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency



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