First Annual Report Water Year 2021
for the
Santa Ynez River Valley Groundwater Basin
Bulletin 118 Basin No. 3-15
Central Management Area
Groundwater Sustainability Agency

DRAFT

CMA
Central Management Area

March 2022

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Cover Photographs

Front / Back Cover: National Agriculture Imagery Program (NAIP) orthographic photo mosaic of Central Management Area photographed on May 22, and May 23, 2020.

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

CENTRAL MANAGEMENT AREA

First Annual Report Water Year 2021

March 2022

Committee Draft

Santa Ynez River Valley Groundwater Basin

Central Management Area

Groundwater Sustainability Agency Committee

Water Year 2021 (October 2020-September 2021)

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ACKNOWLEDGEMENTS

The Central Management Area Groundwater Sustainability Agency Committee and Stetson Engineers Inc. would like to thank and acknowledge the many stakeholders, entities, and private citizens who have contributed their time and expertise to develop this First Annual Report.

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LIST OF ACRONYMS AND ABBREVIATIONS

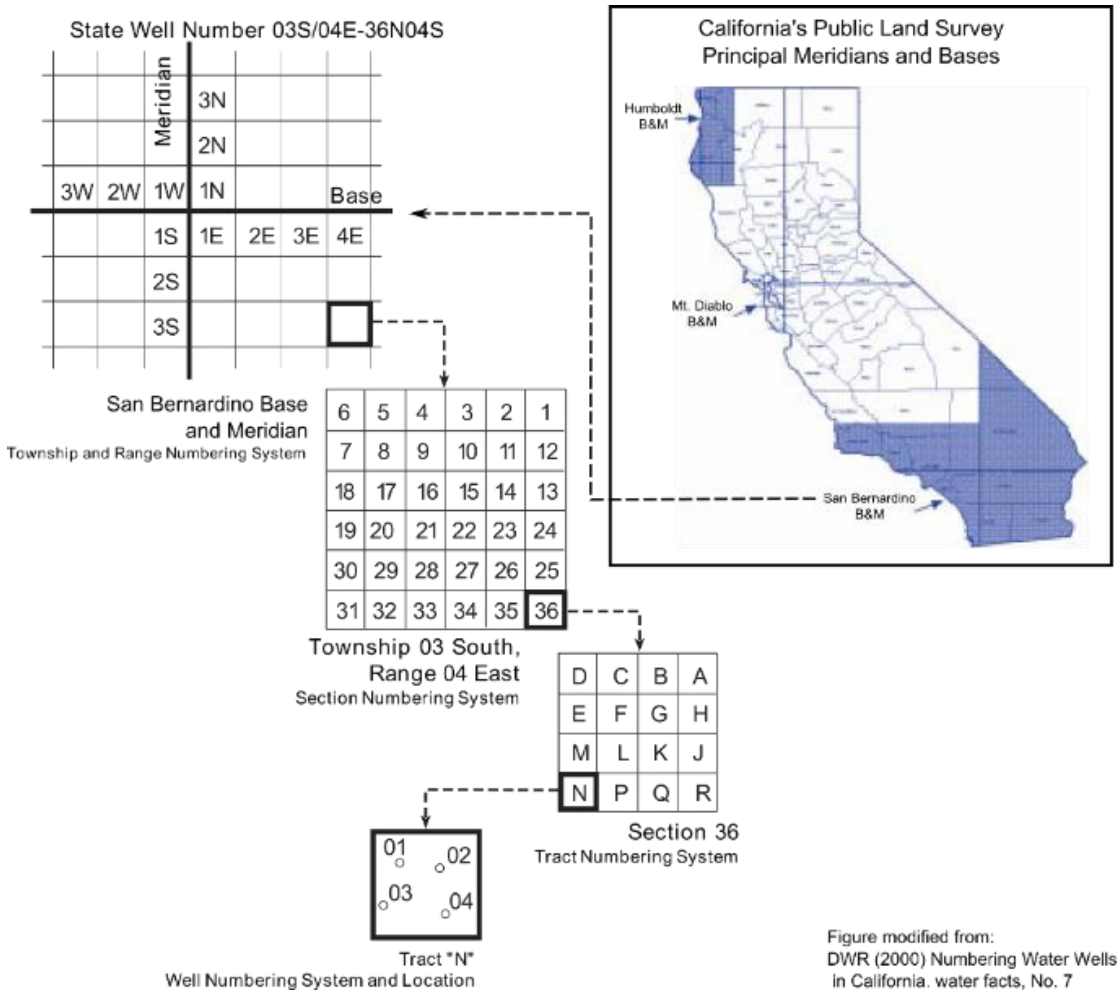
AF	acre-feet
AFB	Air Force Base
AFY	acre-feet per year
CCR	California Code of Regulations
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CGPS	Continuous Global Positioning System
CIMIS	California Irrigation Management Information System
CMA	Central Management Area
COMB	Cachuma 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
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 (NAIP)
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

Wells in Santa Ynez River Valley Groundwater Basin have a unique State Well Number assigned by the California Department of Water Resources (DWR) based on the public land grid. The State Well Number includes the township, range, and section numbers in which a well is located. Each section in the public land grid is further subdivided into sixteen 40-acre tracts, which are assigned a letter designation as shown on the following page. Because all wells in the Santa Ynez River Valley Groundwater Basin use the San Bernardino ("S") base line and meridian, the reference to base line and meridian is generally omitted from the well numbers identified in this report. Wells constructed on lands that are not part of the official Bureau of Land Management Cadastral survey grid, such as Mexican Land grants land map, are projected onto an estimated grid of the township, range, and section.

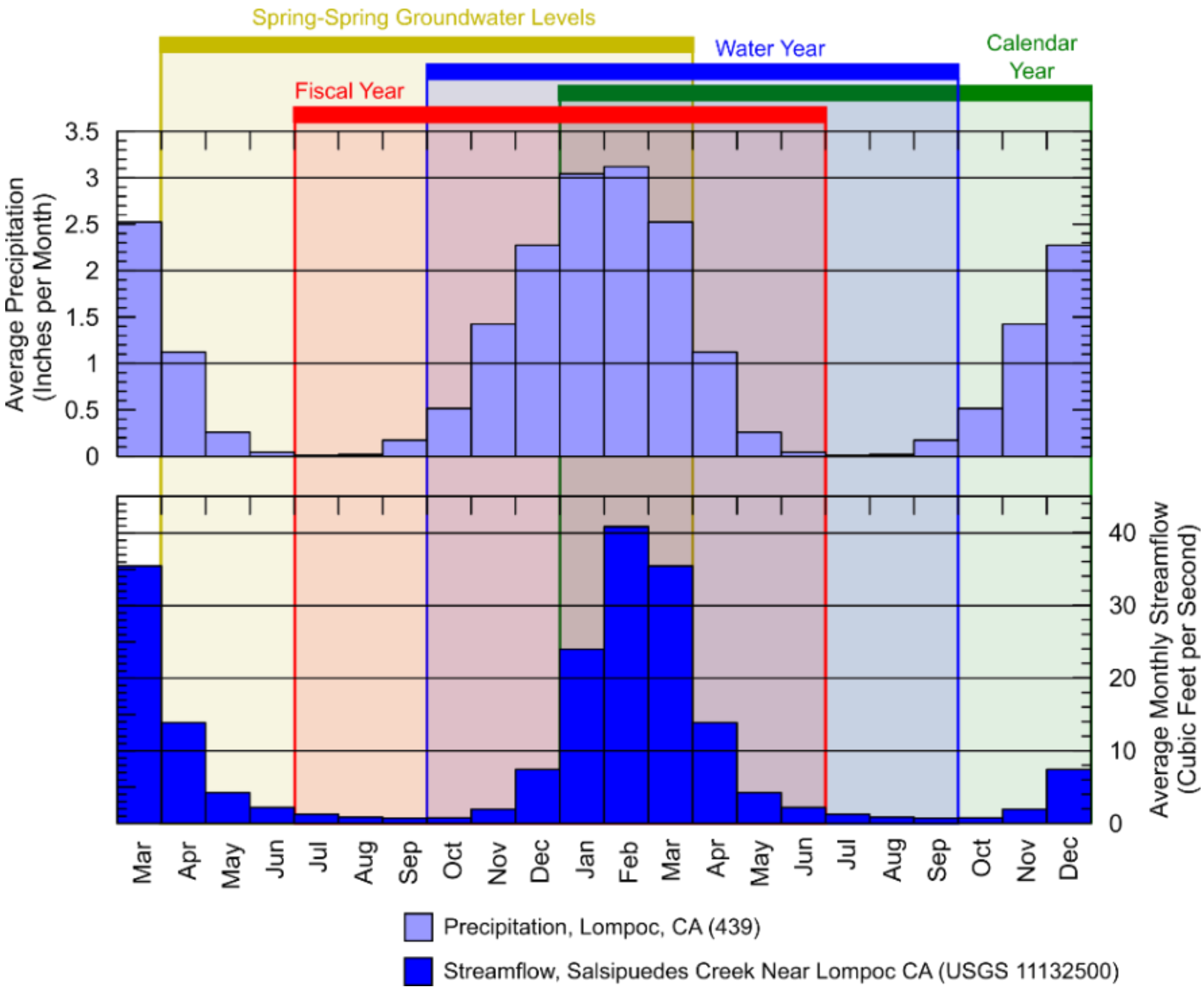
The USGS 15-digit well number based on degrees, minutes, and seconds of latitude (6 digits) and longitude (7 digits) and sequential number (2 digits) are also shown on wells that are part of the USGS databases. Finally, a 4-digit unique database identification number (DBID) is used in the database management system that was created for this project to connect well information from various sources.



California Department of Water Resources' Numbering System for Water Wells

WATER YEAR DESCRIPTION

Several different annual time periods are used in managing Santa Ynez River Valley Groundwater Basin water resources: Water Year, Calendar Year, Fiscal Year and Water Year (SYRWCD), 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

EXECUTIVE SUMMARY

A Groundwater Sustainability Plan (GSP) for the Central Management Area (CMA) of the Santa Ynez River Valley Groundwater Basin (SYRVGB or Basin) was adopted by the CMA Groundwater Sustainability Agency Committee on January 5, 2022, and was submitted to California Department of Water Resources (DWR) on January 18, 2022 (January 2022 GSP) (Stetson, 2022). The CMA Groundwater Sustainability Agency (GSA) has prepared and submits this First Annual Report to DWR in connection with the January 2022 GSP for the SYRVGB, DWR Basin 3-15, in compliance with the Sustainable Groundwater Management Act (SGMA). This First Annual Report presents data and other information regarding the Basin conditions for Water Year (WY) 2021 (October 1, 2020 through September 30, 2021), as required by the SGMA. In addition, data in the GSP for water use, including groundwater extraction, and changes in groundwater storage are provided for water years 2019 and 2020.

DWR classified the SYRVGB as a medium priority groundwater basin, and analyses for the CMA GSP indicate that current Basin conditions are sustainable with no current undesirable results (defined as significant and unreasonable impacts to sustainability indicators).

The SYRVGB is currently experiencing a historic drought. WY 2021 was classified as Below Normal for the CMA. For the recent 10-year period 2012-2021, there were no "Wet" years, and only two years, WYs 2017 and 2019 which were "Above Normal." Lake Cachuma has not spilled since WY 2011.

The sustainable yield of the CMA is estimated to be 2,800 acre-feet per year (AFY). The estimated groundwater storage change in the CMA during WY 2021 is a loss of 210 acre-feet (AF). Total groundwater production in the CMA during WY 2021 is estimated to be 1,810 AF. Total water use in the CMA during WY 2021 is estimated to be 6,990 AF which includes both groundwater production, surface water river well diversions of Santa Ynez River underflow, and imported water.

The January 2022 GSP for the CMA recommended projects and management actions to maintain sustainability, and to manage the CMA within the sustainable yield to help avoid undesirable results and unsustainable groundwater conditions. Sustainable management criteria were established for measuring progress towards groundwater sustainability.

This First Annual Report provides an update on Basin conditions and Basin management activities organized into the following chapters:

- General information (including Basin location) – Chapter 1
- Hydrologic conditions – Chapter 2
- Groundwater elevation data (including contours, with hydrographs as 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 Central Management Area (CMA) is the central portion of the Santa Ynez River Valley Groundwater Basin (SYRVGB) located in northern Santa Barbara County in the central coast region of California (**Figure 1-1**).[1] The SYRVGB encompasses an area of approximately 32.8 square miles (21,023.8 acres). The CMA is bordered on the west by the Western Management Area (WMA), on the north by the Purisima Hills, on the east by the Eastern Management Area (EMA), and on the south by hills along the Santa Ynez River floodplain. Surface water from the Basin drains to the Pacific Ocean, through the Santa Ynez River and its tributaries. Surface water rights in the SYRVGB are administered by the State Water Resources Control Board.

The CMA Groundwater Sustainability Agency (GSA) is responsible for complying with Sustainable Groundwater Management Act (SGMA)[2] requirements, including preparation of an annual report[3] every year for the Central portion of the SYRVGB. Two additional annual reports are also being prepared in coordination with this CMA annual report for the other management areas within the SYRVGB: the Western Management Area (WMA) and the Eastern Management Area (EMA). **Table 1-1** summarizes the extents and member agencies of all three Management Areas of the SYRVGB.

On May 23, 2016, SYRVGB public water agencies within the SYRVGB executed a Memorandum of Understanding (MOU) dividing the SYRVGB into three management areas and creating the CMA. The CMA GSA committee consists of the City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency (**Figure 1-2**). The CMA filed a notice of intent to form a GSA with the DWR and became the exclusive GSA for the CMA on February 2, 2017. A coordination agreement between the WMA, CMA, and EMA was prepared (including Resolution CMA-2021-002 on November 15, 2021) and became effective January 1, 2022 to ensure coordinated management of the entire SYRVGB.

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

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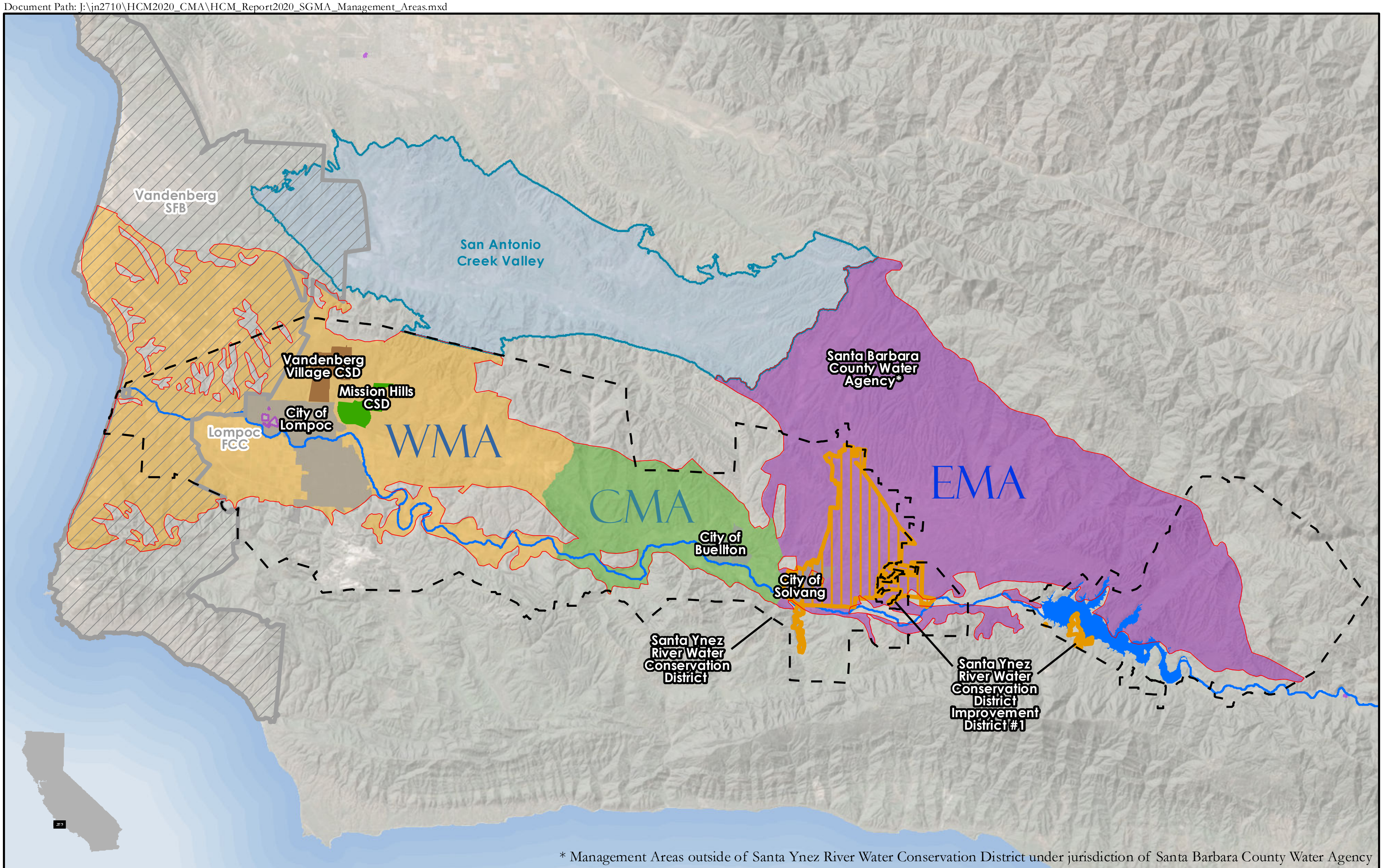

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SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
(DWR BULLETIN 118 BASIN NO. 3-105)
AND SGMA MANAGEMENT AREA BOUNDARIES

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

FIGURE 1-1

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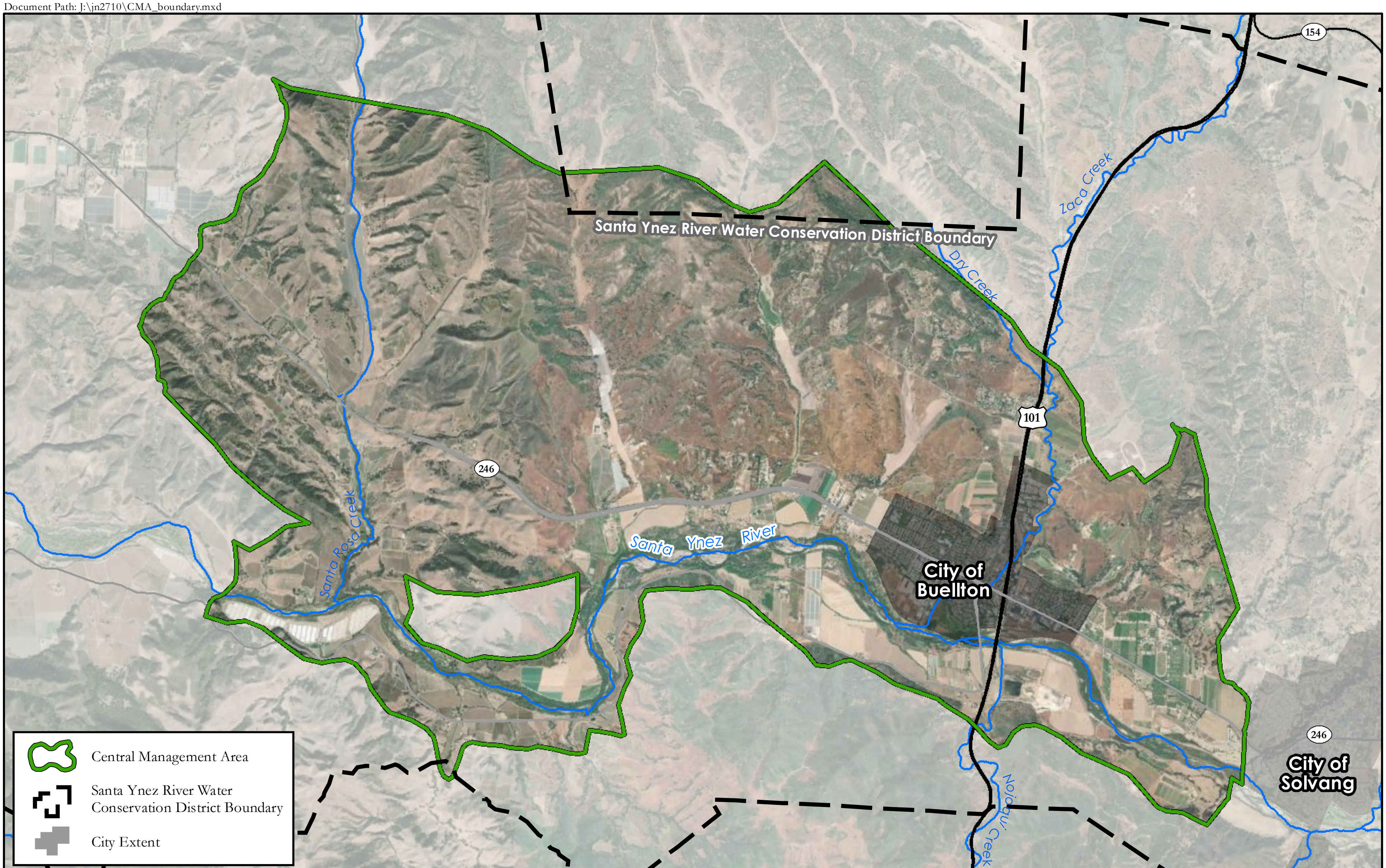

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CENTRAL MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 0.5 1 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 Groundwater Suitability Plan (GSP) for the CMA (Stetson, 2022) was adopted by the CMA Groundwater Sustainability Agency Committee Resolution CMA-2022-001 on January 3, 2022 and was submitted to DWR on January 18, 2022. The time period for the data and analyses addressed in the January 2022 GSP was generally through May 2021, although particular analyses utilized data and information that ended on dates earlier or later than May 2021. This First Annual Report under the GSP covers conditions for Water Year (WY) 2021 which is the period from October 1, 2020 through September 30, 2021. In addition, data in the GSP for water use, including groundwater extraction, and changes in groundwater storage are provided for water years 2019 and 2020.

The GSP includes extensive descriptions of the CMA Plan Area and Hydrogeologic Conceptual Model. The Plan Area descriptions include discussions of the geographies of stakeholders, adjudications, population, land use, and regulatory environment. The Hydrogeologic Conceptual Model addresses more of the physical and natural environment including geology, principal aquifers, hydrologic characteristics, and characterization of major water flow components including water use and protection of natural species.

The CMA is a diverse area and divided into two subareas[4] based on more homogeneous hydrogeologic and topographic characteristics. The two subareas are the Buellton Upland and the Santa Ynez River Alluvium. **Figure 1-3** shows the locations and extents of the subareas and **Table 1-2** summarizes the sizes of each subarea.

Table 1-2
Summary of CMA Subareas by Area

CMA Subarea	Acres [A]	Square Miles
Buellton Upland	14,220	22.2
Santa Ynez River Alluvium	6,800	10.6
Total	**21,020**	**32.8**

[A] Rounded to nearest 10 acres.

The January 2022 CMA GSP included a review of the geology in the area and identified the extents of principal aquifers within the CMA. A single principal aquifer was identified in the CMA, the "Buellton Aquifer" consisting of the Paso Robles and Careaga Sand Formations, which are two geologic formations described as mostly unconsolidated gravels, sands, silts, and clays located in a wide geologic syncline fold. **Figure 1-4** shows the extents of this aquifer. An AEM geophysics study planned to be completed in WY 2022 is expected to provide additional detailed information that could potentially revise the current extents of the Buellton Aquifer. Additionally shown in Figure 1-4 is the "Santa Ynez Alluvium" which are river deposits that are in a known and definite subterranean channel and water flowing through them is administered by the State Water Resources Control Board the same as surface water and considered Santa Ynez River underflow (2022 CMA GSP, Appendix 1d-B).

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

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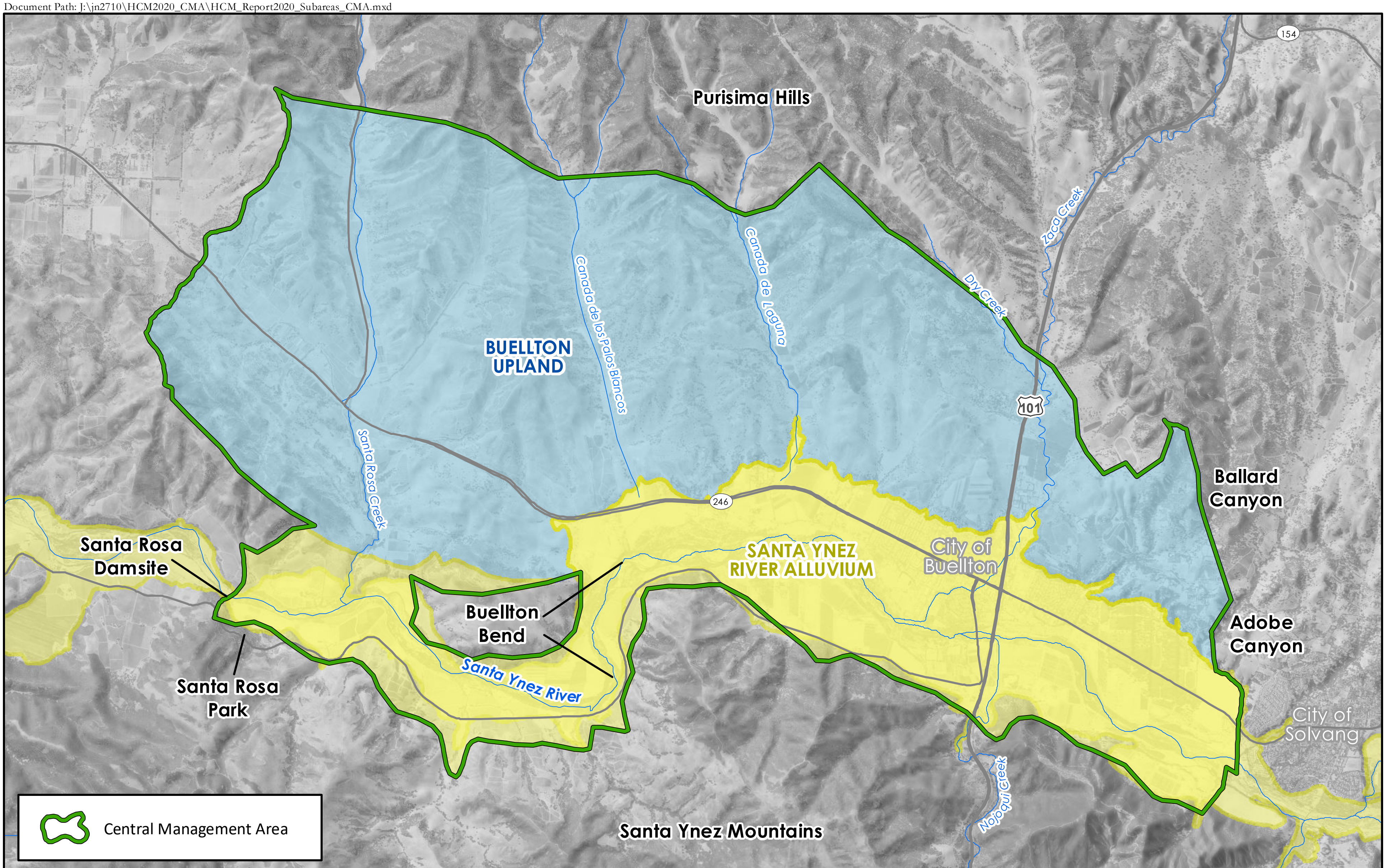

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SUBAREAS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
USGS Nationa l Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 1-3

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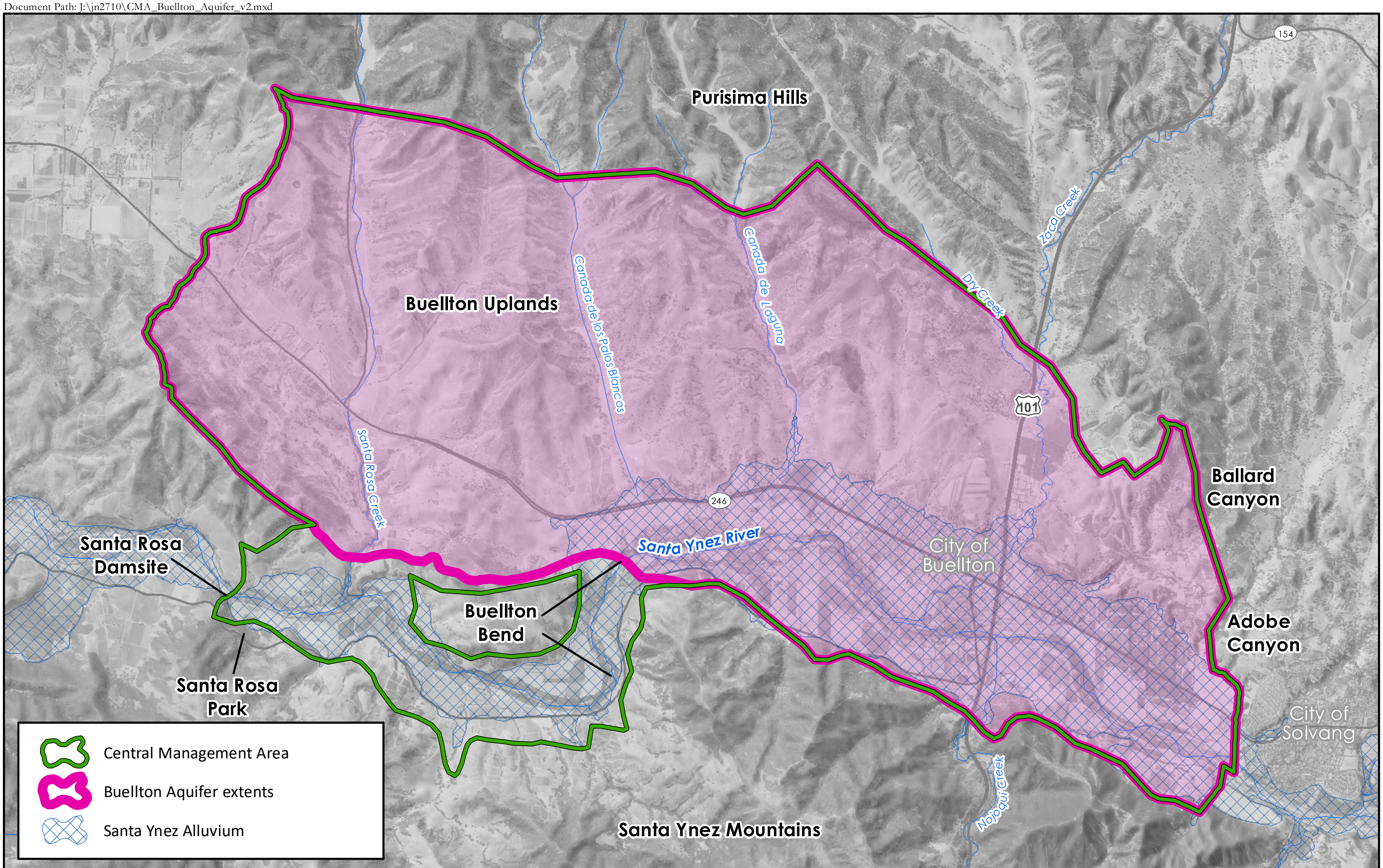

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EXTENTS OF THE BUELLTON AQUIFER
CENTRAL MANAGEMENT AREA

FIGURE 1-4

1.1 PURPOSE OF ANNUAL REPORT

The California legislature identified the following specific items to be included 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.)*

Portions of the SGMA regulations implementing the SGMA statue for Annual Reports are included as **Appendix 1-A**.

1.2 SUSTAINABILITY GOAL AND UNDESIRABLE RESULTS

The January 2022 CMA GSP identified the following sustainability goal for the Basin:

> "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 CMA GSA will maintain the sustainability of the Basin, and how the measures recommended in the GSP will achieve these objectives and desired conditions" (2022 CMA GSP, Section 3B.1 Sustainability Goal).

In accordance with SGMA[5] there are six indicators of sustainability that were considered as part of the GSP. The GSP described potential undesirable results associated with each indicator, minimum thresholds to avoid undesirable results, measurable objectives to maintain conditions, and interim milestones "to achieve the sustainability goal for the basin within 20 years of Plan implementation."[6]

The six sustainability indicators identified in the GSP are described and illustrated below.

1. Chronic lowering of groundwater levels
2. Reduction of groundwater storage
3. Seawater intrusion (not applicable to CMA)
4. Degraded water quality
5. Land subsidence
6. Depletion of interconnected surface water

1.3 NEW AND UPDATED PLANS, REPORTS, AND DATA OF NOTE DURING WATER YEAR 2021

Plans, reports, and data that were pertinent to the January 2022 GSP are developed, updated, and released by various agencies every year. Some agencies report on updated conditions in the SYRVGB as

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

6 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.

they evolve. Other agencies provide updated data and information in annual reports. The January 2022 CMA GSP included data and discussion of conditions in the SYRVGB generally through May 2021.

SYRVGB data and conditions for the first half of the water year[7] are compiled in the Santa Ynez River Water Conservation District's annual reports entitled "Engineering Investigation and Report upon Ground Water Conditions"[8] which are based on an annual period from July 1 to June 30.[9] A preliminary report is published in March,[10] and a final investigation, including spring conditions data collected through the end of March, is published at the end of April. The engineering investigation provides information for consideration by the SYRWCD's Board of Directors regarding overdraft, water production, and obligated water purchases. Other annual reports regarding water resources in the SYRVGB are published throughout the year. Additional annual reports include the Santa Barbara County Hydrology report[11] and the Annual Monitoring Summary for Biological Opinion. Other annual reporting is also provided in Consumer Confidence Reports which larger water systems (e.g., City of Buellton) publish to provide information on the quality of drinking water. Annual SGMA updates, including this First Annual Report, commence with the inclusion of data and information compiled in these various annual report updates, and address the additional required elements of the SGMA annual reporting.

Provided below is a list of relevant reports and plans that were released after the start of WY 2021 (October 1, 2020) which provide information for use in updating future GSPs.

November	Santa Barbara County Hydrology Report. Precipitation, Rivers/Streams, & Reservoirs Water-Year 2020. Santa Barbara County Water Resources Division, Flood Control District.
January	La Graciosa Thistle (*Cirsium scariosum var. loncholepis*). Draft Recovery Plan. U.S. Fish and Wildlife Service.
January	Management of the California State Water Project. Bulletin 132-2018: Covers Calendar Year 2017 Activities. California Department of Water Resources.

7 See the discussion regarding Water Year in the front matter.
8 CWC Section 75560 The district shall annually cause to be made an engineering investigation and report upon ground water conditions of the district.
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 75570 On or before the day of the regular meeting of the board in March of each year, the engineering investigation and report shall be delivered to the secretary in writing.
11 Santa Barbara County Hydrology reports use a September 1st -August 31st water year.

January	Environmental Thresholds and Guidelines Manual. Santa Barbara County. Planning and Development.
February	WY2020 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.
April	Forty-Third Annual Engineering and Survey Report on Water Supply Conditions of The Santa Ynez River Water Conservation District 2020-2021. Santa Ynez River Water Conservation District.
June	Polonio Pass Water Treatment Plant Water Quality Table. Reporting Period of January-December 2020. Central Coast Water Authority.
June	2020 Urban Water Management Plan. Final. City of Lompoc.
June	Central Coast Water Authority Urban Water Management Plan. 2020 Update. Central Coast Water Authority.
June	City of Buellton Annual Water Supply Report. June 2021. City of Buellton.
June	Consumer Confidence Report For 2020 Period. City Of Buellton Water System. City Of Buellton.
August	Geologic and Geophysical Maps of the Santa Maria and Part of the Point Conception 30'×60' Quadrangles, California. Scientific Investigations Map 3472. U.S. Geological Survey.
November	California's Groundwater Update 2020 (Bulletin 118). California Department of Water Resources

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CHAPTER 2: BASIN CONDITIONS

The California Code of Regulations (CCR) requires that GSP Annual Reports contain information on current and historical water year types, to present context for the changes in groundwater conditions over the water year of interest. The information presented and described in this chapter primarily updates the "Hydrologic Characteristics" subsection of the hydrogeologic conceptual model section of the January 2022 GSP through WY 2021. (2022 CMA GSP, 2b.2-2 Classification of Wet and Dry Years)

Table 2-1 summarizes the precipitation and the water year type for the recent years of WY 2015 through WY 2021.

Table 2-1
Annual Precipitation and Water Year Classification for CMA, WY2015 through WY2021

Water Year	Buellton Fire Station		Hydrologic Year Type Classification USGS Gage 11132500 (Salsipuedes Creek)	
	Precipitation (in/year)	% of Average [A]	Percentile Rank	Classification
2015	7.01	42%	0%	Critically Dry
2016	10.68	65%	3%	Critically Dry
2017	20.36	123%	73%	Above Normal
2018	7.92	48%	5%	Critically Dry
2019	19.22	116%	80%	Above Normal
2020	15.44	93%	33%	Dry
2021	8.56	52%	49%	Below Normal

Dry and critically dry years are shaded yellow; wet years are shaded blue; and normal, below normal, and above normal years are unshaded. Percentages and percentiles are calculated from the respective periods of record.
[A] Average calculated as Mean of period of record.
Notes: CMA = Central Management Area; USGS = U.S. Geological Survey; SWRCB = State Water Resources Control Board; in/year = inches per year.

2.1 PRECIPITATION

Precipitation within the CMA is largely driven by orthographic lift effects and portions of the CMA at lower elevations generally receive less direct precipitation. **Figure 2-1** shows the average precipitation within the CMA and adjacent watershed.[12] Direct annual average precipitation ranges from 16.6 inches per year in portions of Santa Rosa Creek up to 20.4 inches per year along the north side of the Santa Ynez River. The annual average direct precipitation for the subareas of the CMA is summarized in **Table 2-2** below.

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

CMA Subarea	Size (Acres) [A]	Average Annual Precipitation Per Subarea (Average 1991-2020) inches per year		
		Average	Average Annual Minimum	Average Annual Maximum
Buellton Upland	14,220	17.5	16.6	18.5
Santa Ynez River Alluvium	6,800	18.5	17.3	20.4

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

Precipitation within the CMA is measured at Buellton Fire Station. Total precipitation during WY 2021 was 8.56 inches. Data for WY 1955 to present (WY 2021) is presented in **Figure 2-2**. Figure 2-2 shows the annual precipitation and the cumulative departure from mean (CDM) for WY 1955 through WY 2021. The CDM trends provide a representation of wet and dry periods within the overall period of record.

12 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.

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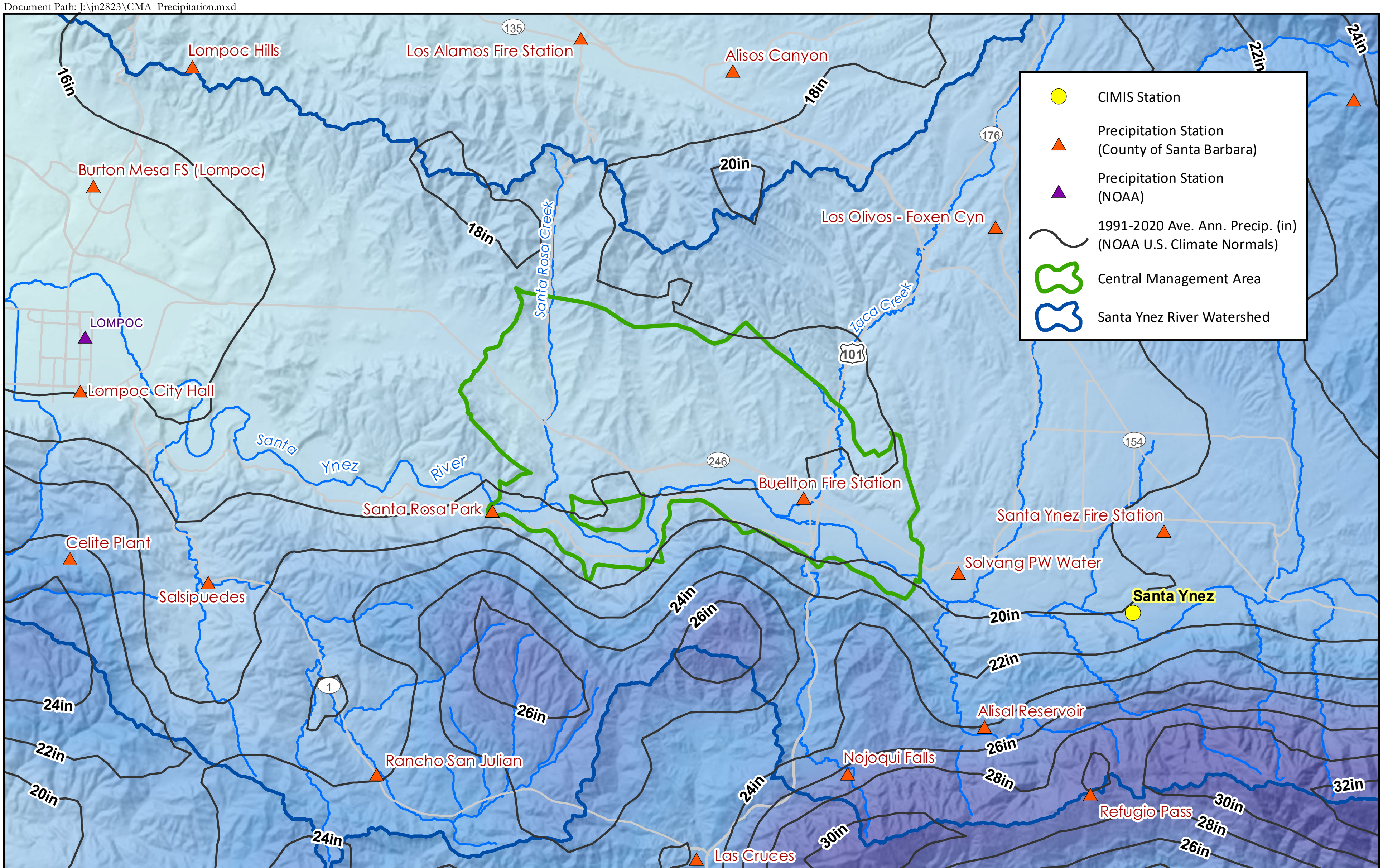

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PRECIPITATION STATIONS AND ISOHYETALS
1991-2020 CLIMATE NORMALS
CENTRAL MANAGEMENT AREA

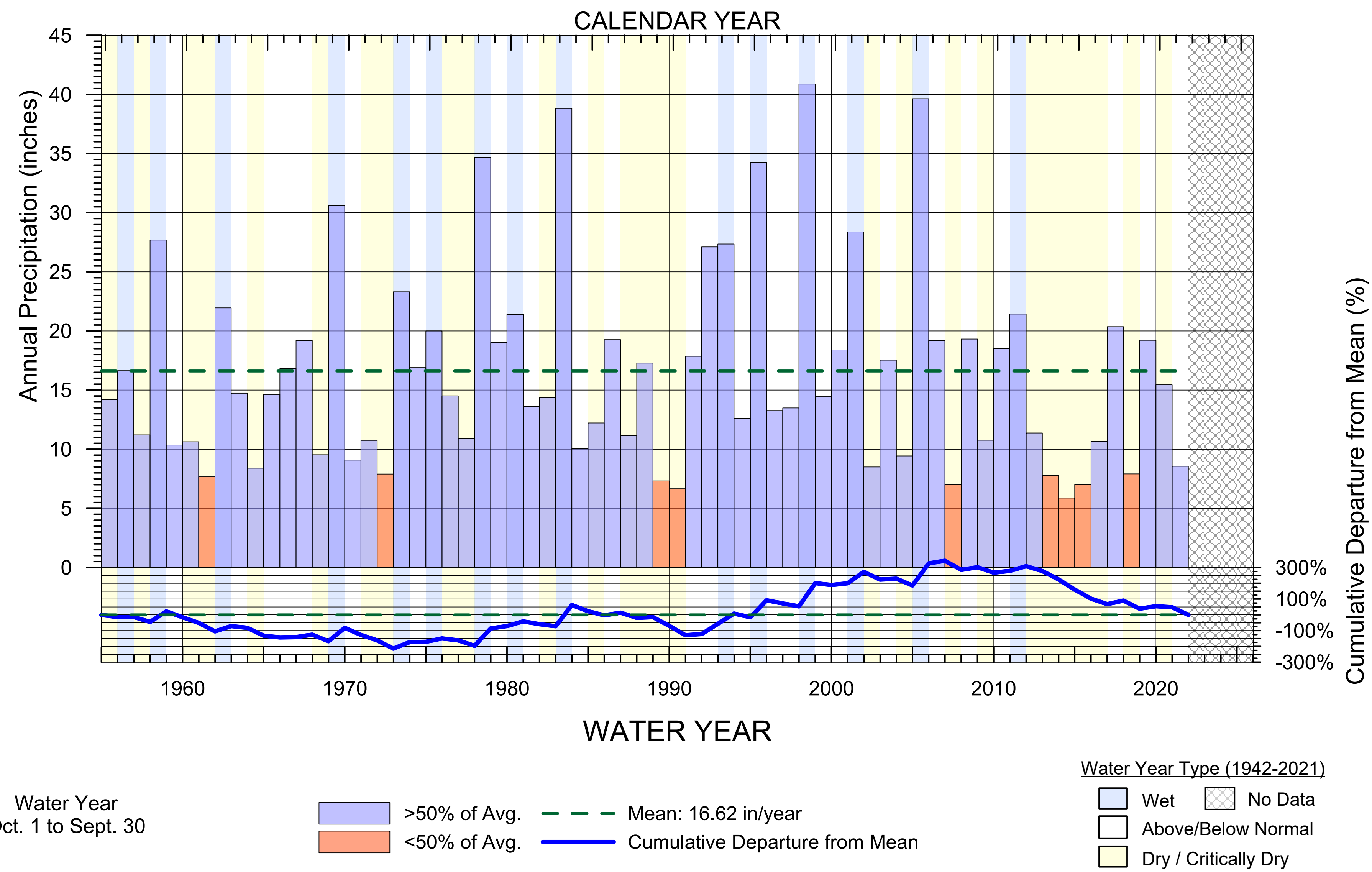
DRAFT

0 1.5 3 Miles

N

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

FIGURE 2-1



F:\DATA\2823\Analyses\2022-02 WY21 Precipitation CDM Graphs\Fig 2-02 CMA_Buellton_Fire_Station_Precip_CDM WY2021.grf 2/2/2022 M. McCammon

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BUELLTON FIRE STATION
PRECIPITATION AND
CUMULATIVE DEPARTURE FROM MEAN
WY 1955 - 2021

Source: Santa Barbara County (2022)
Preciptiation Gage #233

FIGURE 2-2

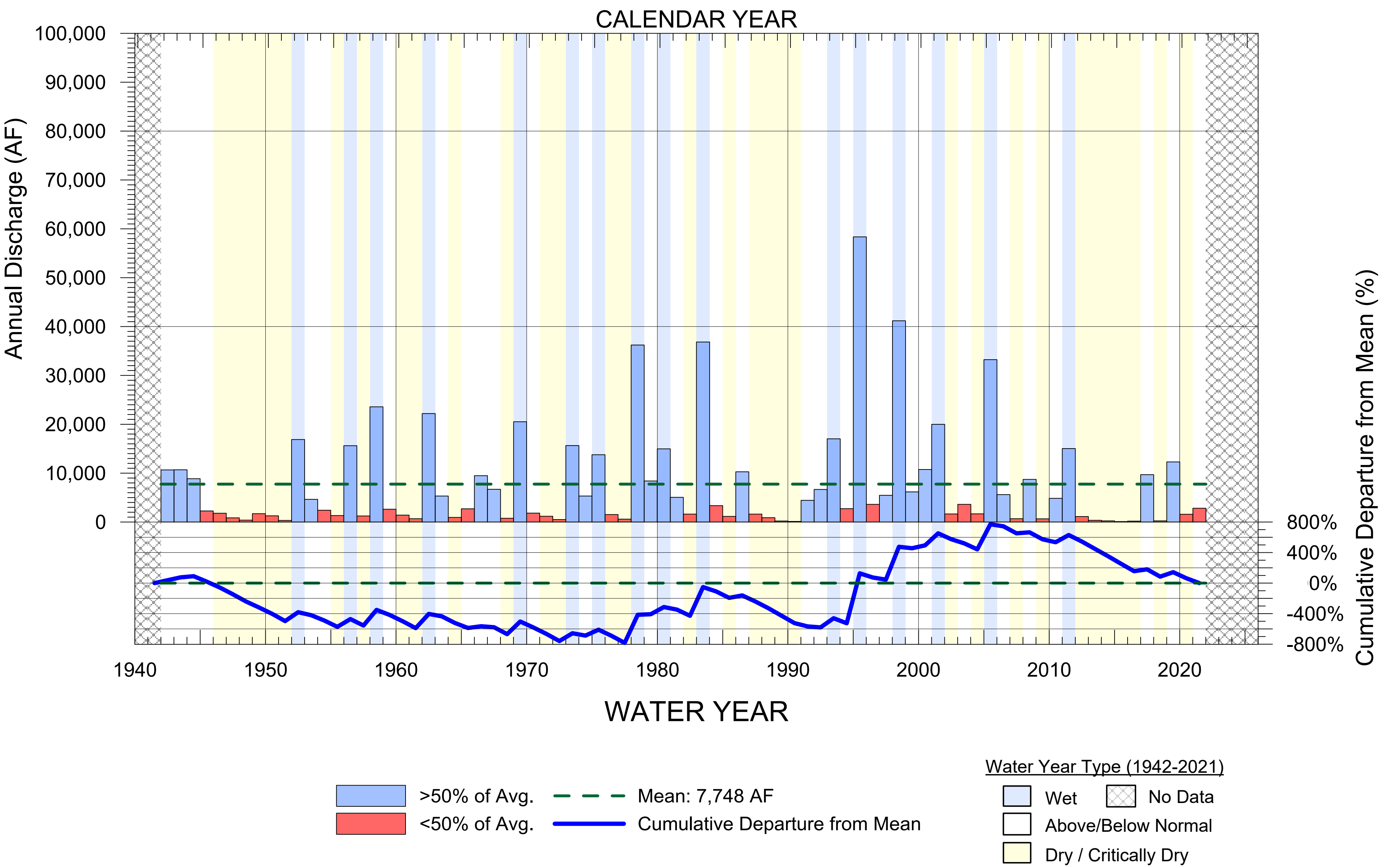
2.2 CLASSIFICATION OF 2021 WATER YEAR

The January 2022 GSP described how water year types are classified in the CMA using a surface water stream gage to characterize water year conditions and to account for carryover effects from previous years. Hydrologic year types are classified based on a relative ranking in the period of record for 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 water year types are calculated differently by the three management agencies within the Basin. For consistency, the CMA and WMA are currently using a method similar to the 2019 State of California Water Resources Control Board (SWRCB) Order WR 2019-0148 for the Cachuma Project which is based on surface flows. The EMA is using the SGMA Water Year Type Dataset method based on precipitation data (DWR, 2021). The water year types from the two methods exhibit a reasonably robust match, though during some years slight differences in water year type designation exist. Both methods were selected in coordination with the entire Basin and were chosen based on the management needs of each management area. Both methods are focused on the same Basin-wide sustainability goal.

To characterize all water years as either wet, above/below normal, or dry/critically dry as shown on **Figure 2-3**, the Salsipuedes Creek streamflow gage (U.S. Geological Survey [USGS] gage 11132500) was selected as a proxy to classify each water year. 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. The 80-year dataset for the Salsipuedes Creek stream gage spans 1942 through 2021 and represents unimpeded runoff due to the absence of upstream water diversions and storage reservoirs.

As shown in **Figure 2-4**, WY 2021 was a below normal year for the CMA. Conditions for recent years, WY 2015 through WY 2021 are summarized on Table 2-1. The basin is currently experiencing an historic drought. For the recent 10-year period WY 2012-2021, there were only two years, WYs 2017 and 2019, which were “Above Normal” or “Wet”, and Lake Cachuma has not spilled since WY 2011.



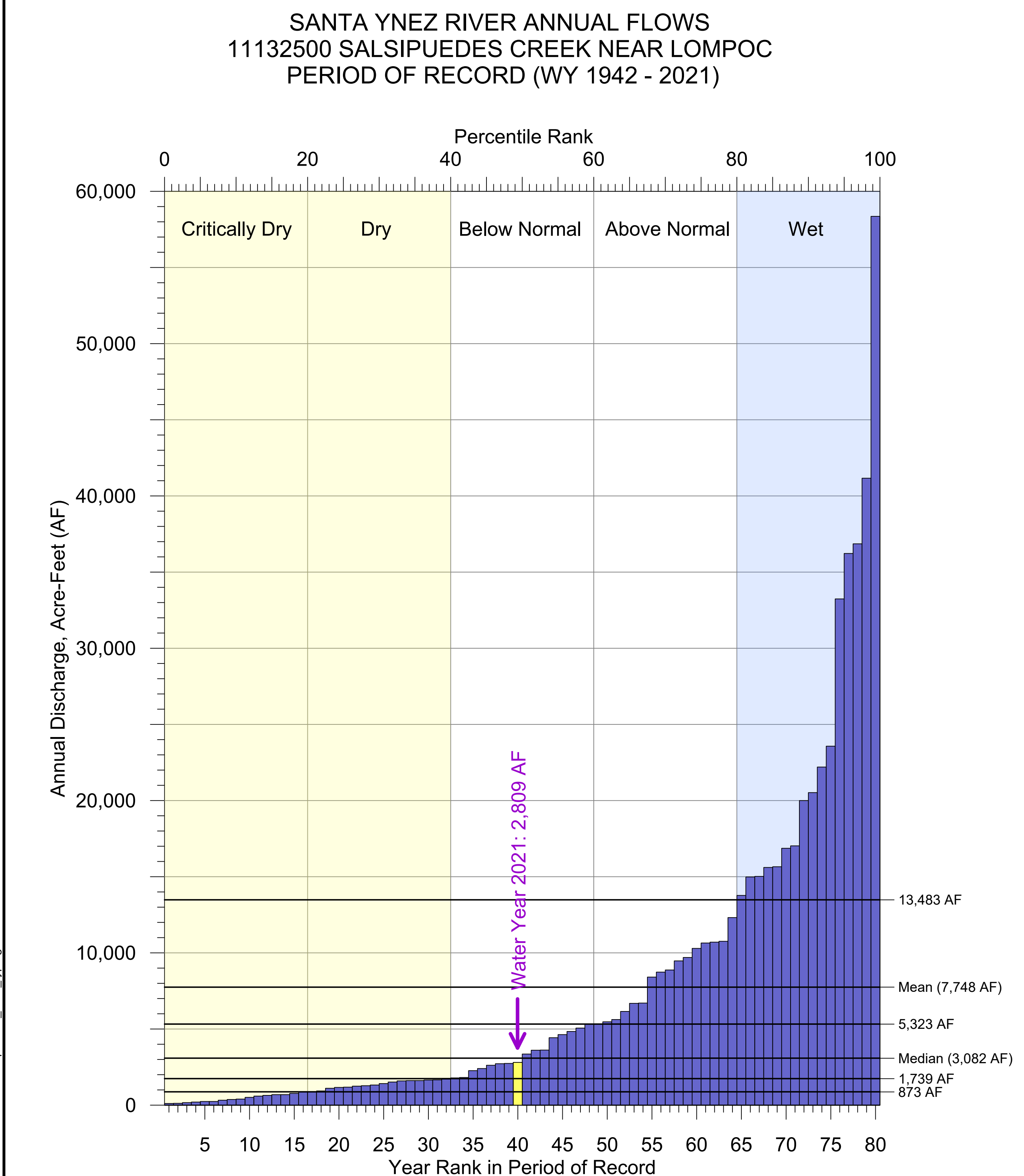
F:\DATA\2823\Analyses\2022-02 WY21 SW Flow Statistics\Salsipuedes\Salsipuedes_CDM.grf 1/31/2022 M. McCammon

STETSON ENGINEERS INC.

11132500 SALSIPUEDES CREEK NEAR LOMPOC
CUMULATIVE DEPARTURE FROM MEAN AND
PERIOD OF RECORD (WY 1942 - 2021)

Sources: USGS (2021) streamflow data

FIGURE 2-3



Data Source: USGS (2022) streamflow data

WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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F:\DATA\2823\Analyses\2022-02 WY21 SW Flow Statistics\Salsipuedes_Year_type.grf 1/31/2022 M. McCammon

CHAPTER 3: GROUNDWATER HYDROGRAPHS AND CONTOURS

The CCR requires that GSP Annual Reports contain "...*groundwater elevation data from monitoring wells identified in the monitoring network [which] shall be analyzed and displayed*."[13] The January 2022 GSP was being developed during WY 2021, and all recommended monitoring described in the January 2022 GSP has not yet been fully implemented because only two months separate the date that the 2022 GSP was submitted to DWR and the date this First Annual Report is required to be submitted.

Groundwater elevations measured in Basin wells vary as; a result of conditions described in Chapter 2 (Basin Conditions) and Chapter 4 (Water Use and Available Surface Water) of this First Annual Report. The following sections of this report (3.1 and 3.2) provide updated data and information for groundwater levels measured and recorded for WY 2021.

3.1 GROUNDWATER ELEVATION DATA AND HYDROGRAPHS

As described in the January 2022 GSP, groundwater level data has been collected in the CMA by several agencies. Groundwater elevation data for all wells that were measured and recorded by the various agencies was compiled for WY 2021 for the purpose of analyses and presentation in this First Annual Report. Fall groundwater elevation data, representing the seasonal low resulting from conditions in WY 2021, is collected following the end of the water year during the first month of WY 2022 (October).

13 23 CCR § 356.2(b)(1)

Groundwater level data were identified in the January 2022 GSP to assess the following three of SGMA indicators:


Chronic lowering of groundwater levels

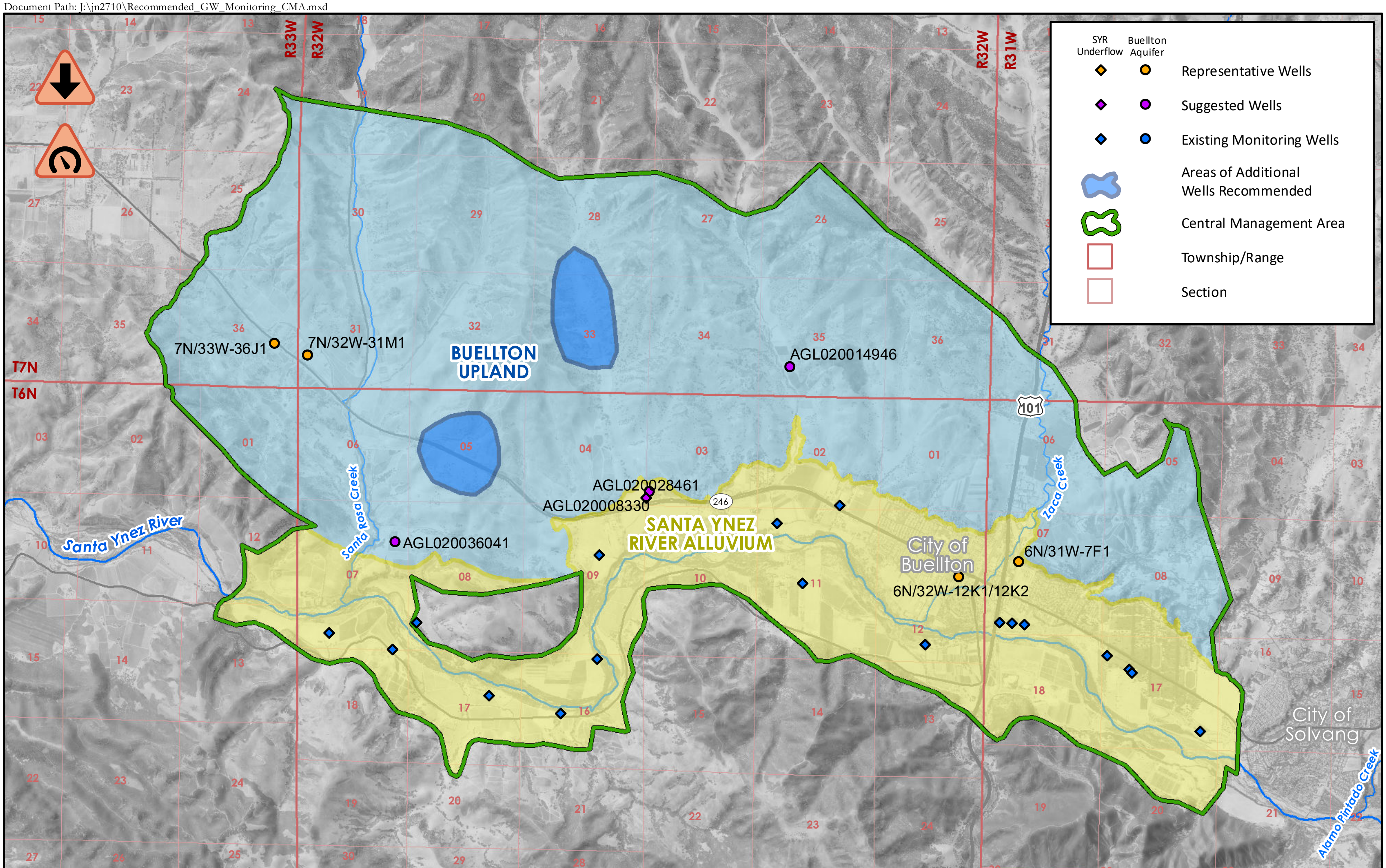

Reduction of groundwater storage (see Chapter 5:)


Depletion of interconnected surface water

The locations of groundwater monitoring network wells used to assess these indicators are shown on **Figure 3-1**. Due to the number of wells included in the monitoring, groundwater level hydrographs[14] are included as two appendices to this report: Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels are attached as **Appendix 3-A**. Groundwater Level Hydrographs for Assessing Surface Water Depletion are attached as **Appendix 3-B**.

14 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_CMA.mxd



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

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

FIGURE 3-1

3.2 GROUNDWATER ELEVATION CONTOUR MAPS

The CCR additionally requires that GSP Annual Reports contain "*...elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.*"[15] The information provided in this section of this First Annual Report updates the Groundwater Conditions section of the January 2022 GSP (2022 CMA GSP, 2b.1 Groundwater Elevation), to provide updated information for WY 2021.

3.2.1 Spring 2021 – Seasonal High Contours

Seasonal high groundwater elevations represented by Spring 2021 measurements are presented on **Figure 3-2**. This is an update from the Spring 2020 groundwater level contours which were presented as part of the January 2022 GSP. Groundwater level contours were primarily informed by spring water level measurements collected by the County of Santa Barbara, City of Buellton, and USBR. However past groundwater level contours and general groundwater flow conditions were also considered in developing updated groundwater level contours.

Groundwater contours were developed for the Buellton Aquifer, the principal aquifer of the CMA. Additionally, underflow water level contours are shown within the Santa Ynez River Alluvium, which are a part of the river underflow and not a principal aquifer of the CMA.

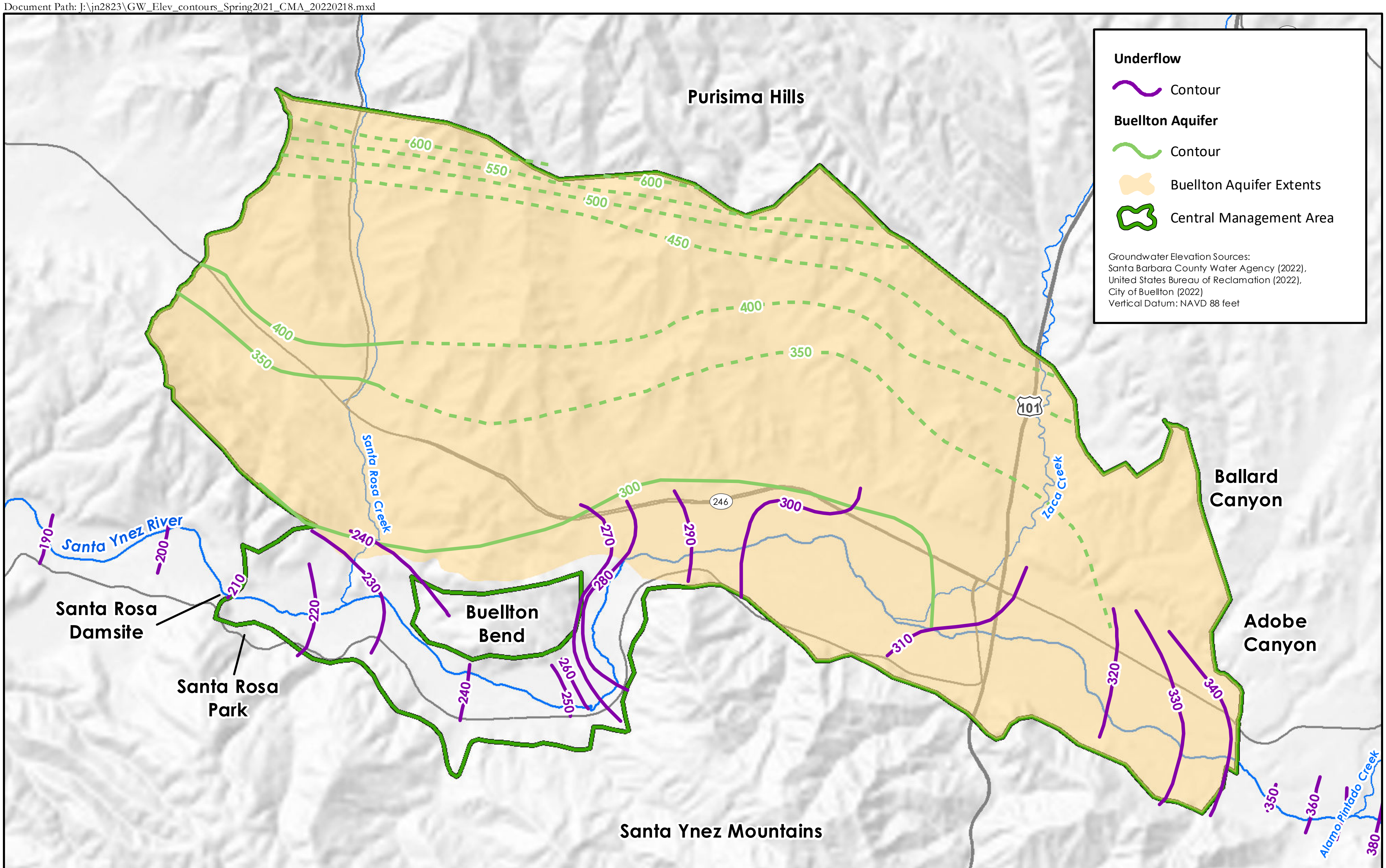
However due to limited data collection during 2021, much of the contours are based on previous contour maps, rather than observations at specific wells. These data gaps were identified in the GSP. Projects to address these data gaps are discussed in Chapter 6:.

3.2.2 Fall 2021 – Seasonal Low Contours

Seasonal low groundwater levels are represented by Fall 2021 groundwater elevations, and contours are shown on **Figure 3-3**. This data was mostly collected in October 2021 following the end of WY2021. The Fall 2021 groundwater elevations provide an update of seasonal low conditions from the Fall 2019 groundwater level contours which were presented as part of the January 2022 GSP.

15 23 CCR § 356.2(b)(1)(A)

Document Path: J:\jn2823\GW_Elev_contours_Spring2021_CMA_20220218.mxd



GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
SPRING 2021
CENTRAL MANAGEMENT AREA

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

DRAFT

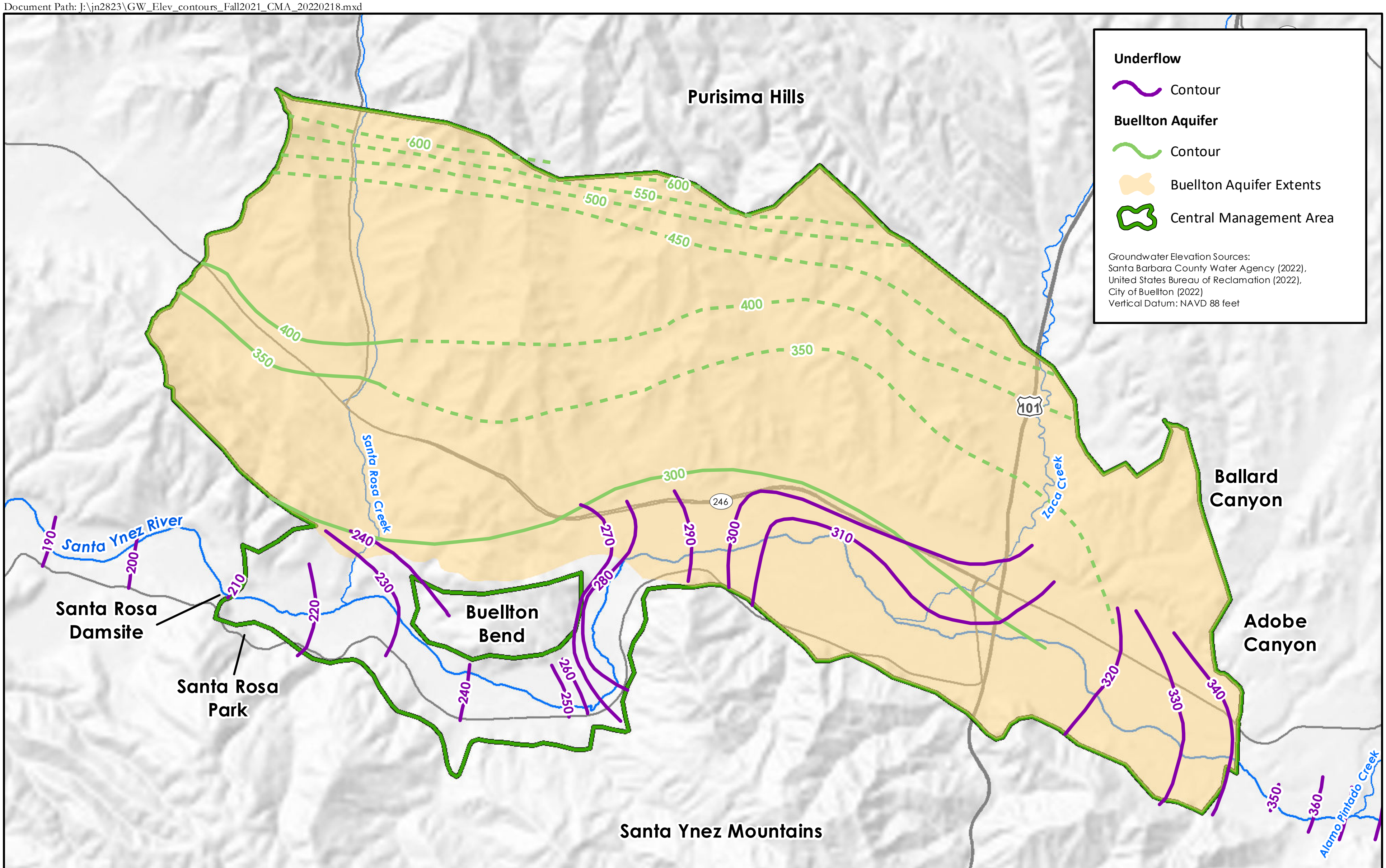
0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 3-2

Document Path: J:\jn2823\GW_Elev_contours_Fall2021_CMA_20220218.mxd



GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
FALL 2021
CENTRAL MANAGEMENT AREA

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

DRAFT

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 3-3

CHAPTER 4: WATER USE AND AVAILABLE SURFACE WATER

The CCR requires 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.*"[16] The information in this section of this First Annual Report updates the "Uses and Users of Groundwater in the Central Management Area" subsection of the hydrogeologic conceptual model section of the January 2022 GSP through WY 2021.

4.1 GROUNDWATER USE

Groundwater production within the CMA Buellton Aquifer is for agricultural, domestic, municipal, and industrial uses. There are no managed wetlands in the CMA. Outside of the municipal uses by the City of Buellton, most of the CMA is a mixture of rural areas with agriculture and some suburban development.

Groundwater production for the CMA is reported to the Santa Ynez River Water Conservation District (SYRWCD), presented in Annual Report (SYRWCD Annual Report), and includes groundwater production within the WMA and parts of the EMA (Stetson Engineers 2021). Based on the SYRWCD Annual Reports, for the historical period (1982 through 2018), the average annual use of groundwater in the SYRWCD was 71% "Agricultural Water,"[17] 3% "Special Irrigation Water,"[18] and 26% "Other Water." [19]

16 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.

17 Water first used on lands in the production of plant crops or livestock for market (CWC Section 75508).

18 Water used for irrigation purposes at parks, golf courses, schools, cemeteries, and publicly owned historical sites.

19 Water used for purposes not including agriculture or irrigation at parks, golf courses, schools, cemeteries, and publicly owned historical sites. Generally, refers to municipal, industrial, or domestic uses of pumped or produced water.

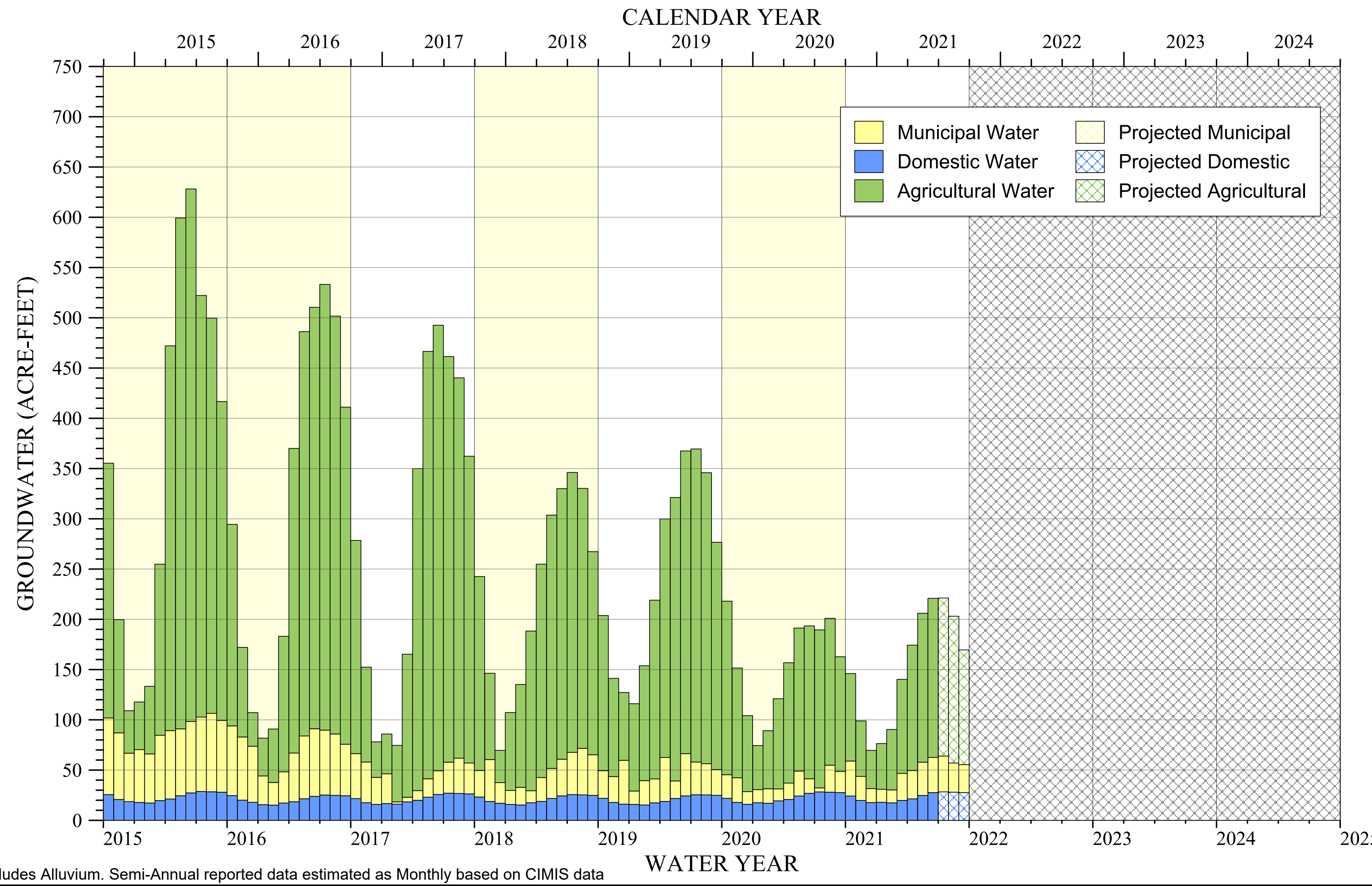
Semi-annual groundwater production data reported to the SYRWCD was converted to monthly data based on monthly evapotranspiration (ET) from CIMIS sites (see Figure 2-1 for locations) for the domestic and agricultural use. Municipal data provided by the City of Buellton was compiled into monthly data. Domestic and agricultural data for the fourth quarter (July-September) of WY 2021 was estimated using the data from the fourth quarter of the previous water year (WY2020). **Figure 4-1** shows the resulting total monthly groundwater use for the CMA Buellton Aquifer, and **Figure 4-2** shows the annual groundwater use for each water year.[20] **Figure 4-3** is a map showing the approximated locations and volume of groundwater pumping in the Buellton Aquifer during WY2021. **Table 4-1** summarizes the groundwater production for WY 2021.

Table 4-1
Summary CMA Groundwater Extraction for Water Year 2021

Water Use Sector	Buellton Aquifer	Method of Measurement	Estimated Accuracy
	Acre Feet		Acre Feet
Domestic	270	Self-Reported to SYWRCD may include estimates using crop usage, estimated for July-September using WY 2020 data	± 30 (~10%)
Agricultural	1,230	Self-Reported to SYWRCD may include estimates using crop usage, estimated for July-September using WY 2020 data	± 120 (~10%)
Municipal	310	City of Buellton Daily totalizer values	± 10 (~1%)
Total	1,810		± 160

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

20 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.



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

F:\DATA\2823\Analyses\2022-02 WY221 GW Pumping\Figures\Fig 4-01 Monthly_Water_Use_CMA.grf 2/25/2022 M. McCammon

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

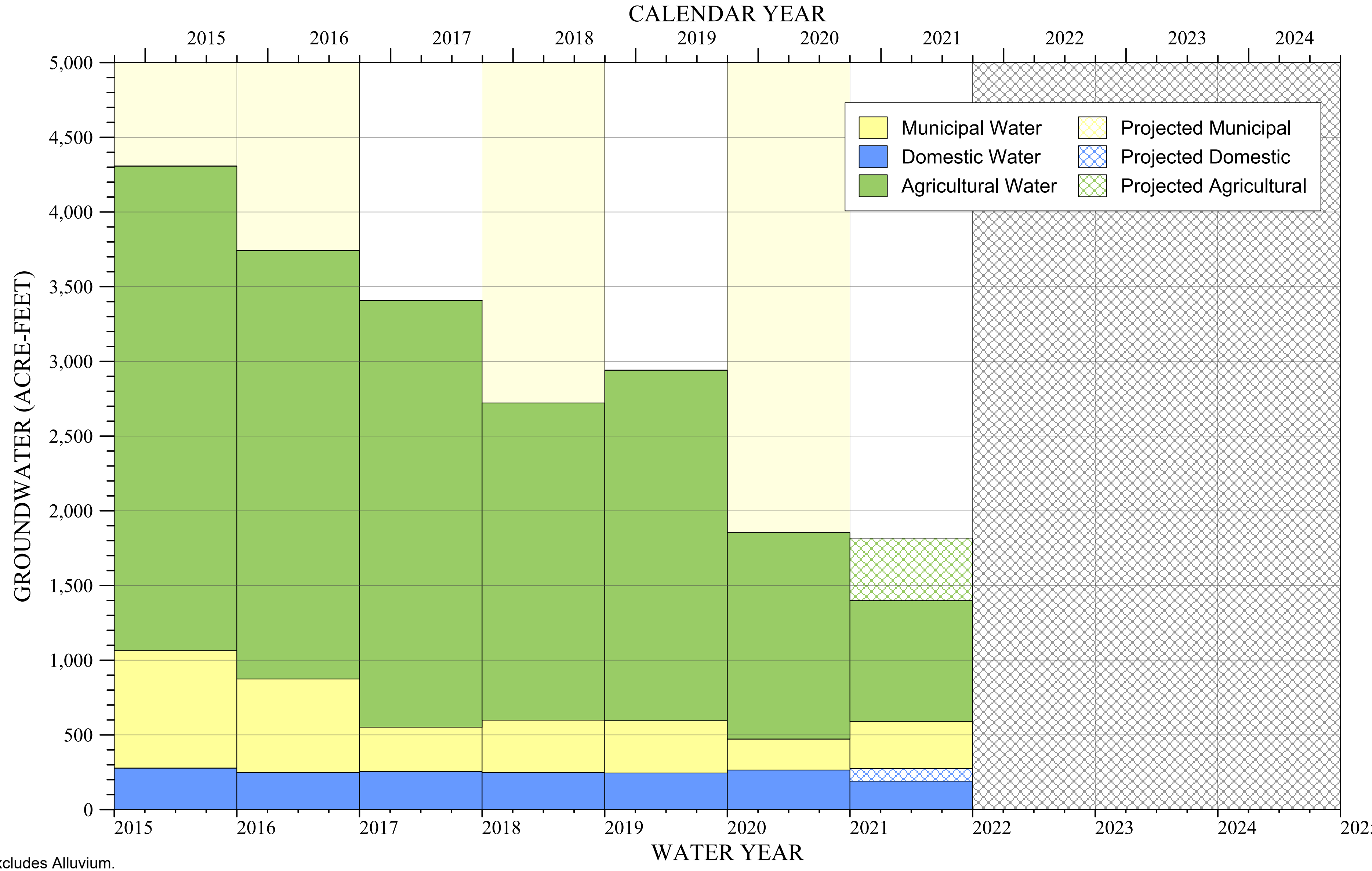
MONTHLY GROUNDWATER USE
BUELLTON AQUIFER

Water Year Type (1942-2021)

- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Source: Santa Ynez River Water Conservation District (2022), City of Buellton (2022)

FIGURE 4-1



Excludes Alluvium.

F:\DATA\2823\Analyses\2022-02 WY221 GW Pumping\Figures\Fig 4-02 Annual_Water_Use_CMA.grf 2/25/2022 M. McCammon

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

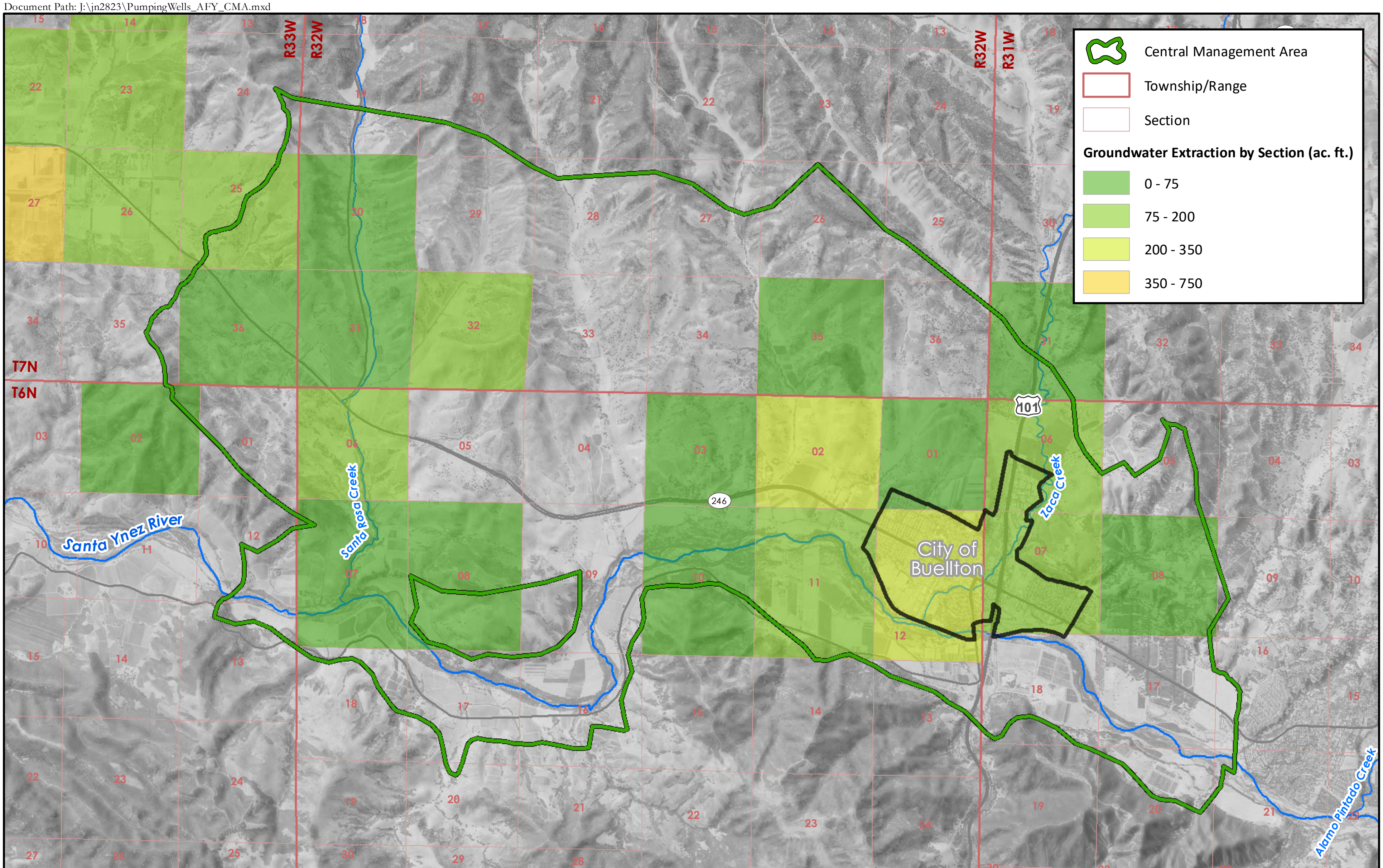
ANNUAL GROUNDWATER USE
BUELLTON AQUIFER

Water Year Type (1942-2021)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

Source: Santa Ynez River Water Conservation District (2022), City of Buellton (2022)

FIGURE 4-2

Document Path: J:\jn2823\PumpingWells_AFY_CMA.mxd



STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

LOCATION AND VOLUME OF GROUNDWATER EXTRACTION 2021

Source: Santa Ynez River Water Conservation District (2022)

DRAFT

0 0.5 1 Miles

N

FIGURE 4-3

4.2 SURFACE WATER USE

The CMA relies on two surface water source types: local and State Water Project (SWP) supplies. Local surface water use in the CMA includes river well diversions of the underflow of the Santa Ynez River upstream of the Lompoc Narrows (Section 4.2.1). The City of Buellton currently uses SWP deliveries (Section 4.2.2). Sources of surface water for groundwater recharge, including the Santa Ynez River at Solvang and wastewater return flows, are discussed in Section 4.2.3.

4.2.1 Surface Water Diversions from Santa Ynez River Underflow

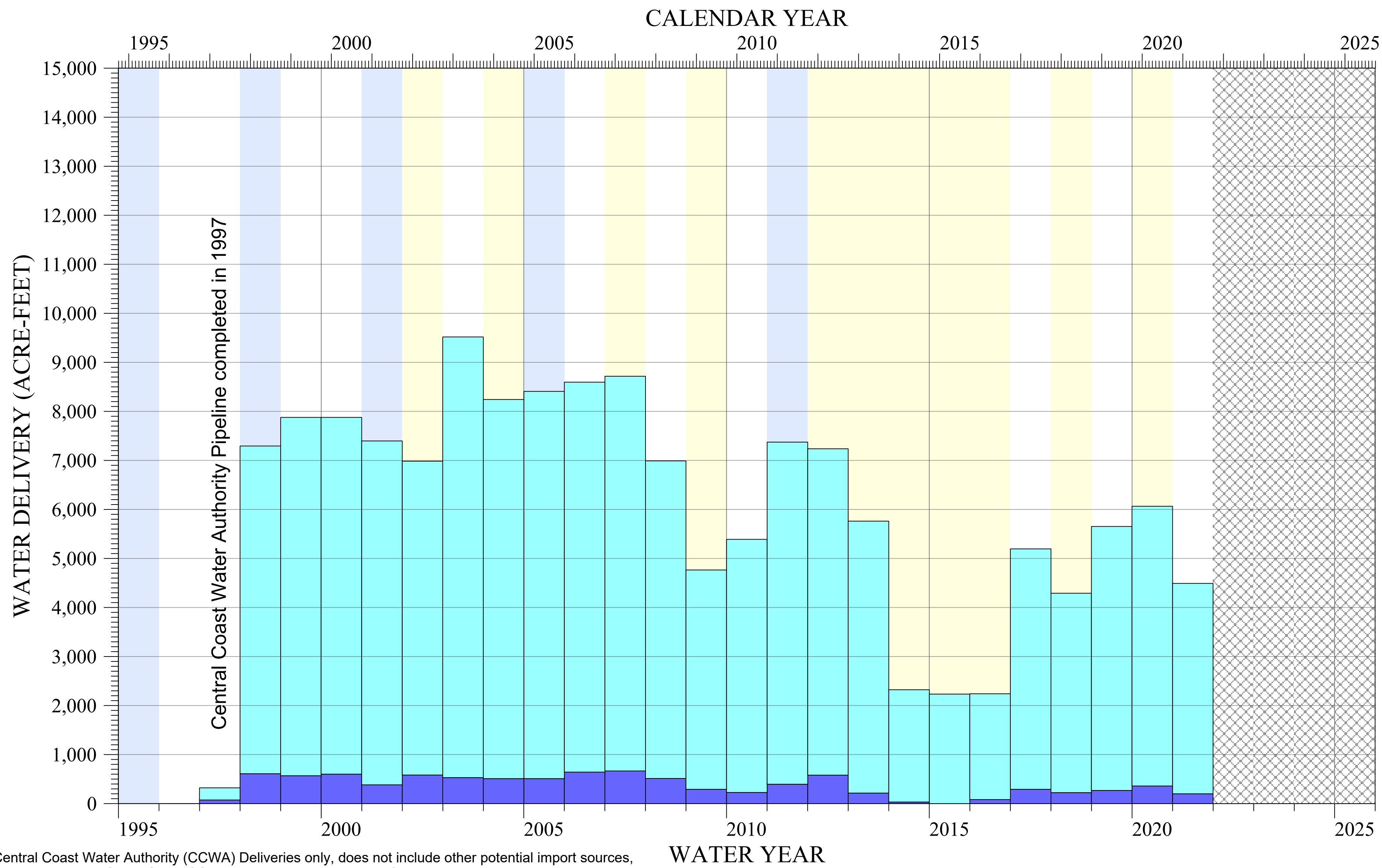
As discussed in the CMA GSP (Stetson, 2022), the underflow of the Santa Ynez River, upstream of the Lompoc Narrows, is managed by SWRCB pursuant to WR 2019-0148 and other orders and decisions. Therefore, the Santa Ynez River Alluvium is treated as part of the surface water in this annual report. Underflow extraction is reported to the SYRWCD and presented as Zone A pumping in Annual Reports (SYRWCD Annual Report) and includes surface water diversions via river wells (Stetson Engineers 2021). **Table 4-2** shows the total extraction of underflow via river wells upstream within the CMA for WY 2021.

Table 4-2
Summary CMA Surface Water Diversions for Water Year 2021

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre Feet		Acre Feet
Domestic	570	Self-Reported to SYWRCD	± 60 (~10%)
Agricultural	3,660	Self-Reported to SYWRCD may include estimates using crop usage, estimated for July-September using WY 2020 data	± 370 (~10%)
Municipal	750	City of Buellton Daily totalizer values	± 10 (~1%)
Total	4,980		± 440

4.2.2 Water Imports

Water is primarily imported to the City of Buellton in the CMA through the Coastal Branch Pipeline by Central Coast Water Authority (CCWA). The CCWA pipeline has delivered imported water from the SWP since 1997. SWP water is delivered at turnouts to specific water distribution systems within the Santa Ynez Valley and to Lake Cachuma for pass through deliveries to CCWA customers on the South Coast outside of the SYRVGB. Within the SYRVGB, the receiving entities of SWP are VSFB, the City of Buellton, the City of Solvang, and the Santa Ynez River Water Conservation District Improvement District No. 1. CCWA water can also be comingled with the water rights releases at Lake Cachuma based on the Cachuma Project Settlement Agreement. **Figure 4-4** shows the annual imports through the CCWA pipeline to the CMA and to the entire SYRVGB updated through the end of WY 2021. The City of Buellton's imports were 2,239 acre-feet into the CMA in WY 2021.



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

F:\DATA\2823\Analyses\2022-02 WY21 CCWA Water Imports\Fig 3-02 CCWA Imports CMA.grf 3/1/2022 M. McCammon

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

ANNUAL WATER IMPORTS
CENTRAL COAST WATER AUTHORITY

Water Year Type (1942-2021)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Santa Ynez Imports
- City of Buellton
- Non-CMA

Source: Central Coast Water Authority (2022)

FIGURE 4-4

4.3 SURFACE WATER AVAILABLE FOR GROUNDWATER RECHARGE

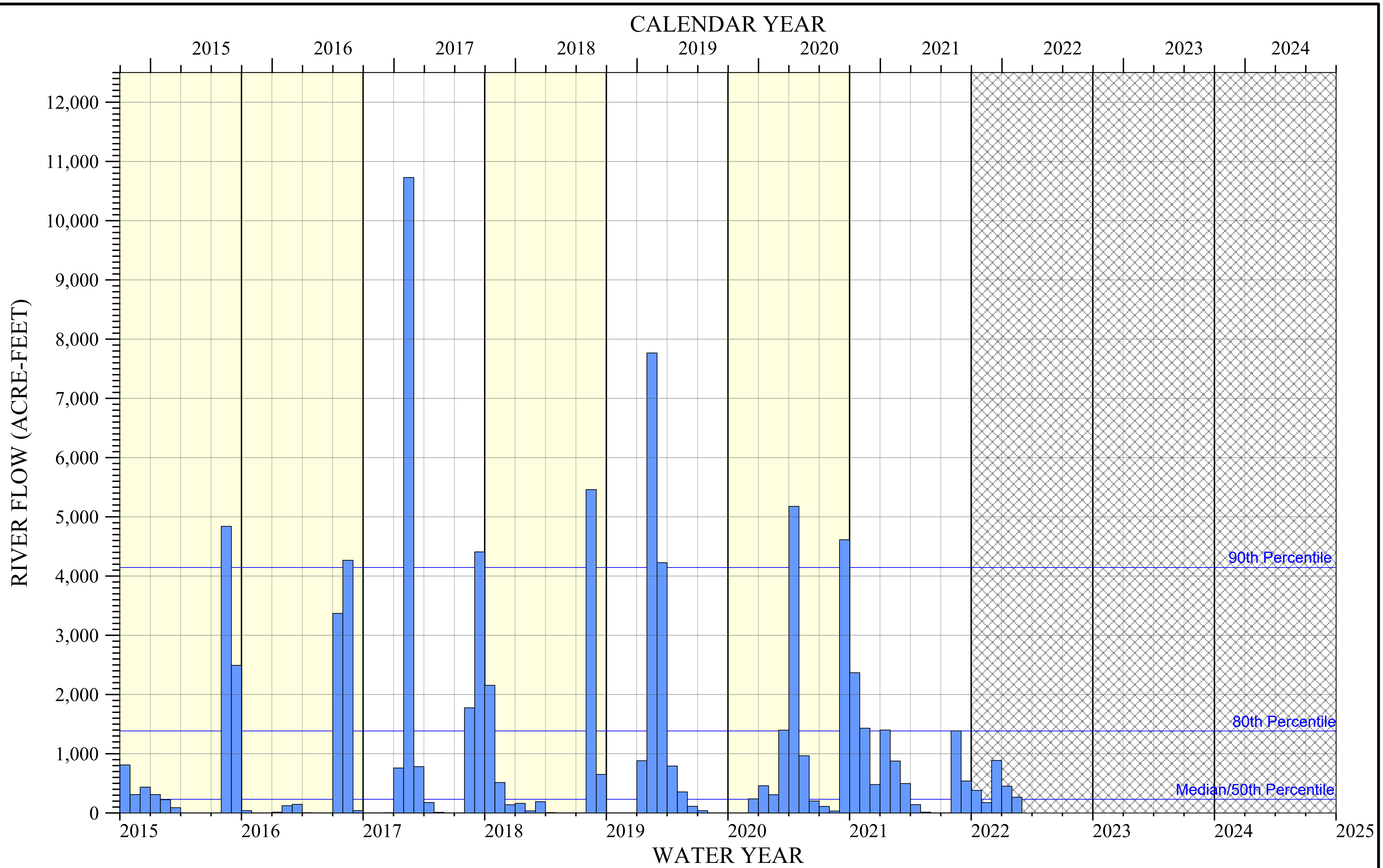
During WY 2021, there were no projects within the CMA for groundwater recharge or in-lieu use.[21] The Santa Ynez River and its underflow are within the jurisdiction of and regulated by the California State Water Resources Control Board (SWRCB) pursuant to Order of 1973 (WR 73-37), as amended in 1989 (WR 89-18) and most recently in 2019 (2019-0148).

Measurements at the Solvang stream gage represents more than 90% of all local surface water flows entering the CMA (Stetson, 2022). **Figure 4-5** shows flows of the Santa Ynez River at the USGS Streamflow gage 11128500 at Solvang, at the EMA-CMA boundary for WY2015 through present. River flows including Santa Ynez River underflow respond to releases from upstream reservoirs.

SWRCB regulates surface water and underflow for various beneficial purposes including steelhead trout (*Oncorhynchus mykiss*) population. During summer months, water is released from Lake Cachuma to meet downstream water rights and releases for endangered steelhead (*O. mykiss*) as specified in the SWRCB Order, the Cachuma Project Settlement Agreement, and the National Marine Fisheries Service Biological Opinion.[22]

[21] 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.

[22] Monitoring of steelhead (*Oncorhynchus mykiss*) population in the Santa Ynez is conducted by the Cachuma Operation and Maintenance Board (COMB) Fisheries Division. 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.



F:\DATA\2823\Analyses\2022-02 WY21 SW Flow Statistics\Fig 4-05 CMA Monthly_11128500 SANTA YNEZ R A SOLVANG CA.grf 3/3/2022 M. McCammon

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

MONTHLY SURFACE FLOW
SANTA YNEZ RIVER AT SOLVANG CALIFORNIA
USGS STREAMGAGE 11128500

Water Year Type (1942-2021)

Wet
No Data
Above/Below Normal
Dry / Critically Dry

Source: USGS NWIS (2022)

FIGURE 4-5

4.3.1 Treated Wastewater Sources

Wastewater treatment plants act as a point source of water flowing into the surface water system at locations where groundwater recharge occurs. Within the CMA, wastewater is collected by the City of Buellton and the City of Solvang[23]. Wastewater is conveyed to the treatment facilities before it is discharged as treated effluent to percolation ponds over the Santa Ynez River alluvium. Average daily secondary treated effluent from the City of Buellton and City of Solvang for recent years is provided in **Table 4-3** as wastewater plant influent flows.

Table 4-3
Wastewater Influent Volumes

Water Year	City of Buellton Plant Influent	City of Solvang Plant Influent
	Acre Feet per Year	Acre Feet per Year
2015	447	710
2016	470	705
2017	472	719
2018	522	696
2019	571	736
2020	503	690
2021	508	717

Source: City of Buellton (2021, 2022), City of Solvang (2021, 2022)

4.4 TOTAL WATER USE

Total water use in the CMA during WY 2021 is comprised of groundwater supplies, surface water diversions from the Santa River underflow, and SWP water imported supplies. See Chapters 4.1 and 4.2 above for additional detail on these supplies. **Table 4-4** shows the summary total water use by sector for water year 2021, and **Table 4-5** summarizes total water use for recent years WY2015-WY2021. Total water use in the CMA was 6,990 AF in WY 2021.

[23] Solvang Wastewater Treatment Plant is located within the City of Solvang outside of the CMA, but discharges its wastewater at the border of the CMA and EMA inside the CMA.

Table 4-4
Summary CMA Total Water Use by Sector for Water Year 2021

Water Use Sector	Total	Method of Measurement	Estimated Accuracy
	Acre Feet		Acre Feet
Domestic	840	Self-Reported to SYWRCD	± 80
Agricultural	4,890	Self-Reported to SYWRCD and estimates	± 490
Municipal	1,260	Daily totalizer values; Includes CCWA imports to City of Buellton	± 10
Total	6,990		± 580

Table 4-5
Summary CMA Total Water Use by Source for Water Years 2015-2021

Water Year	Total Groundwater (Buellton Aquifer)	Total Surface Water (River Underflow 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	4,310	4,420	0	8,730
2016	3,740	4,460	80	8,280
2017	3,410	4,900	290	8,600
2018	2,720	5,230	220	8,170
2019	2,940	4,940	270	8,150
2020	1,850	5,040	360	7,250
2021	1,810	4,980	200	6,990

CHAPTER 5: GROUNDWATER STORAGE

The CCR requires that GSP Annual Reports contain "Change in groundwater in storage."[24] As described in the progress and implementation chapter of this First Annual Report (Chapter 6), the January 2022 GSP was being developed during WY 2021, and was submitted to DWR on January 18, 2022. All recommended monitoring described in the January 2022 GSP has not yet been fully implemented as of start of WY 2021 (October 2020). Changes in groundwater storage are based on the changes in groundwater elevations described in the previous chapter (Chapter 3:).

Reduction of groundwater storage

5.1 CHANGE IN STORAGE METHODOLOGY

For this First Annual Report, and in compliance with the SGMA, the method for estimating change in groundwater storage needs to be presented on a map[25] and show annual and cumulative storage changes since 2015.[26] The Thiessen Polygon Method (Dunne and Leopold, 1978) was used to estimate annual groundwater storage change within the CMA based on observed Spring 2020 and Spring 2021 water levels at representative well locations. As described in the January 2022 CMA GSP (Section 3a.3 Recommended Monitoring Networks), wells were chosen as representative of water levels in the Buellton Aquifer based on their period of record and distributed location throughout the CMA. The Thiessen Polygon method provides a weighted average of changes in groundwater storage based on annual observed groundwater levels.

24 23 CCR § 356.2(b)(1)
25 23 CCR § 356.2(b)(5)(A) Change in groundwater in storage maps for each principal aquifer in the basin.
26 23 CCR § 356.2(b)(5)(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.

There are several approaches for estimating storage that were considered and rejected for the purposes of this First Annual Report, as summarized in **Table 5-1**. Three approaches for estimating change in groundwater storage are referenced in the January 2022 GSP (see column "GSP Location" in Table 5-1). Different approaches have different assumptions and inputs and result in slightly different estimates of change in storage in a particular year.

Table 5-1
Alternative Methods of Calculating Change of Groundwater in Storage Considered

Method Description	GSP Location	Required Inputs	Advantages	Issues for Use in SGMA Annual Report
District Annual Report Method	Hydrogeologic Conceptual Model, Groundwater Conditions (Section 2b.2)	Change In Groundwater Levels, USBR Storage Calculations	Rapid: March and April data, April Report Simple inputs Long term consistency	Cannot generate map easily.
Water Budget	Water Budget (Section 2c)	Inflow and Outflow Components	Integrates many data sets, less likely for one measurement to adversely affect results.	Cannot generate map. Inputs not available quickly More Complex
Calibrated MODFLOW Model	Appendix 2c-1	Inflow and Outflow Components, Spatially Distributed	Integrates many data sets, less likely for one measurement to adversely affect results.	Inputs not available quickly Most Complex
Change in Groundwater Contours	Not in GSP	Groundwater Contours	Contours already being developed for Chapter 3	Contours include more complex considerations. Requires GIS calculations every year.

The method used here is most directly comparable to the District Annual Report method produced in April of the Water Year but based on the updated monitoring network set forth in the GSP (2022 CMA GSP, Section 3a Monitoring Networks). Both the District Annual Report and this analysis assume a specific yield of 8%. The calculation is considered conservative for areas where the aquifer is confined locally and represents an upper limit to the storage change. Future SGMA annual reports may move to estimates using the Fall water levels at the end of the water year (September – October) as bi-annual groundwater level collection commences, as required by SGMA, to provide decision makers additional information about the status of the SYRVGB.

5.2 CHANGE IN GROUNDWATER IN STORAGE MAP

The CCR requires that GSP Annual Reports contain "Change in groundwater in storage maps for each principal aquifer in the basin."[27] As described above, a Thiessen polygon method was used to derive and map changes in groundwater storage within the CMA. Thiessen polygons[28] were formed by the existing representative monitoring wells for the Buellton Aquifer. Each polygon was developed using geographic information system (GIS) to calculate perpendicular bisectors[29] and areas. The change in groundwater storage for each polygon was calculated from the change in groundwater levels and the aquifer's specific yield (Sy) using the following equation:

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)

The color of the polygon shows the relative increase or decrease in groundwater storage per acre estimated for the polygon while the numbers listed on the map are the estimated overall volume change in acre-feet represented by the polygon area.

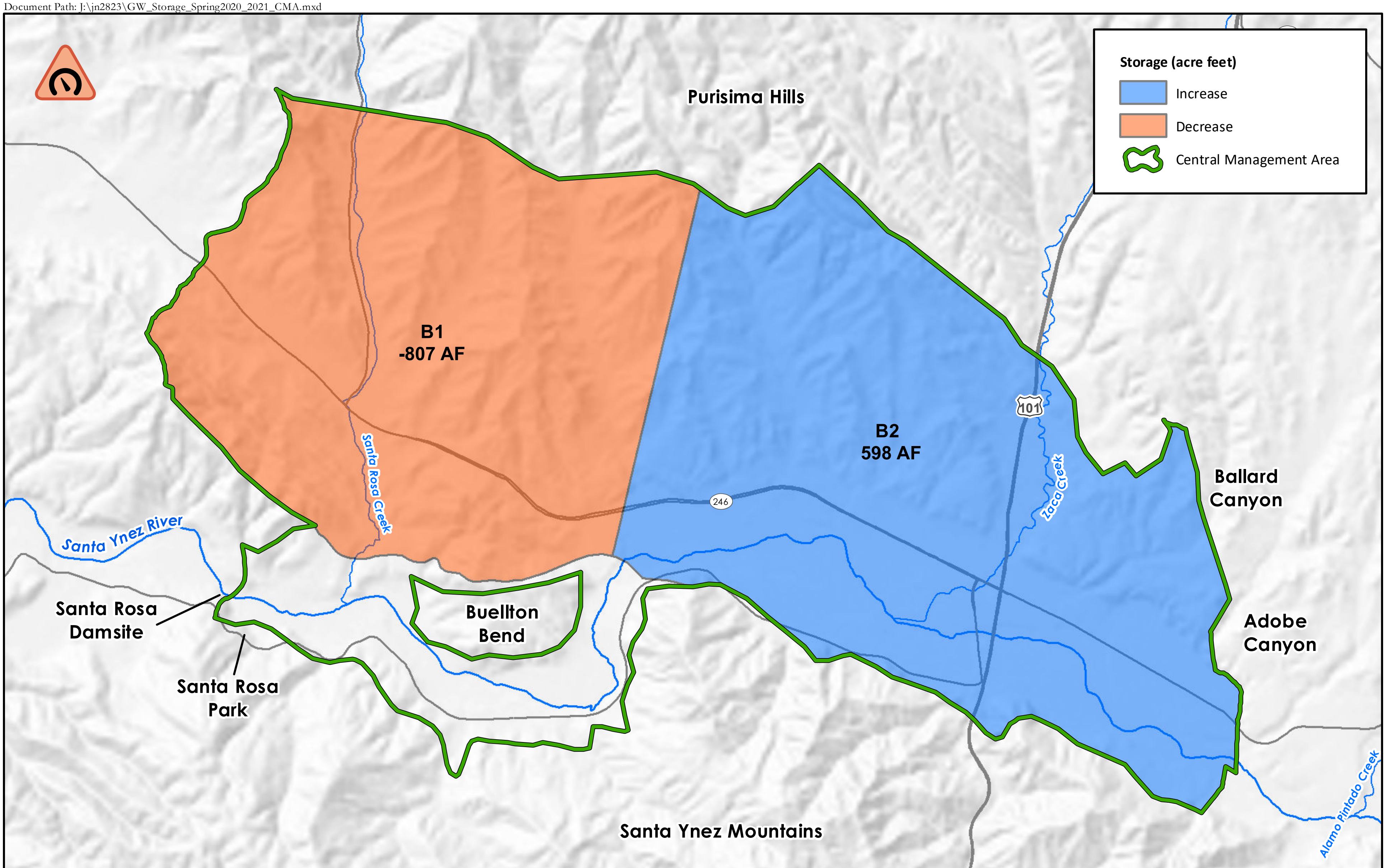
Figure 5-1 is a map which displays the Thiessen polygons that were generated and show change in groundwater in storage for the Buellton Aquifer for the period from Spring 2020 to Spring 2021 (capturing conditions as of the first half of WY2021). As shown on this map, the wells in the east showed a water level increase, which results in significant increase in storage, while in the west there was a water level decrease indicating reduced storage. The total change in groundwater storage for the Buellton Aquifer in the CMA was (-210) AF in WY 2021.

27 23 CCR § 356.2(b)(5)(A)

28 In mathematics this method of partitioning a plane is known as Voronoi diagrams or Dirichlet tessellation. The application to hydrology of this approach is where the term Thiessen polygons comes from.

29 The edges of the polygons are equidistant to two measuring points. Each edge is setup by first drawing a line connecting two adjacent points; locating the bisector, and then draw a second line perpendicular to the first intersecting at the bisector. This second line is the edge of the Thiessen-weighted average polygon. This is done between all points in the basin until the entire two-dimensional plane within the specified boundaries is subdivided into multiple polygons.

Document Path: J:\jn2823\GW_Storage_Spring2020_2021_CMA.mxd



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

STETSON ENGINEERS INC.

CHANGE IN GROUNDWATER IN STORAGE
SPRING 2020-SPRING 2021
BUELLTON AQUIFER
CENTRAL MANAGEMENT AREA

DRAFT

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 5-1

As described in Chapter 6:, the January 2022 CMA GSP submitted in the second quarter of WY2022 identified additional well locations in the Buellton Aquifer needed to improve groundwater monitoring coverage and reduce the overall sensitivity of calculations related to changes at a particular well. Chapter 6: further identifies the current planned timeline for adding additional wells for groundwater level monitoring which will be used to improve storage estimates. The Thiessen polygons will be updated after two years of data have been collected.

5.3 GROUNDWATER USE AND EFFECTS ON STORAGE

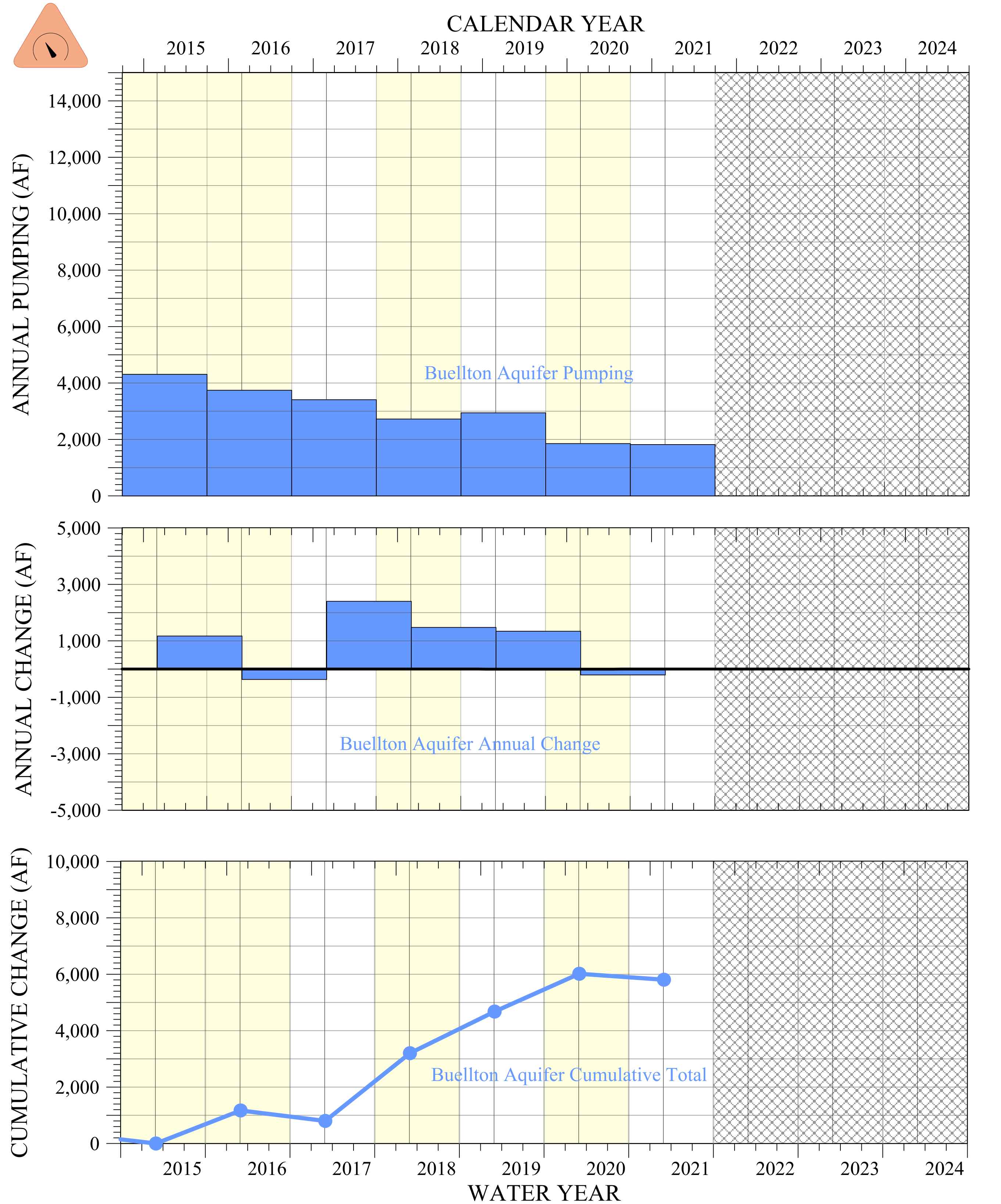
The CCR requires that GSP Annual Reports contain "*A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year*."[30]

The Water Year Type is classified in Chapter 2: of this First Annual Report using the same method as described in the January 2022 GSP. Updated groundwater use for WY 2021 is described in Chapter 4:. The method for calculating 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 present, based on this methodology.

Annual reported groundwater use for the CMA in the Buellton Aquifer is compared to cumulative groundwater storage loss on **Figure 5-2**. The Water Year classifications shown on this figure is consistent with the classification of water years shown on Figure 2-4.

The top of Figure 5-2 shows annual reported groundwater use for the CMA Buellton Aquifer. The middle of Figure 5-2 shows the annual change in storage, and the bottom of Figure 5-2 set shows the cumulative change starting in March 2015.

[30] 23 CCR § 356.2(b)(5)(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.



Annual Pumping Data Includes Projected Data for WY2021Q4

F:\DATA\2823\Analyses\2022-02 WY21 Storage\CMA 2-01_Dewatered_Storage_Comparison.2015.grf 3/4/2022 M. McCammon

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CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency

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

Water Year Type (1942-2021)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

CHAPTER 6: PROGRESS TOWARDS GSP IMPLEMENTATION AND SUSTAINABILITY

DWR has classified the SYRVGB as a medium-priority groundwater basin, and analyses conducted for the January 2022 GSP indicate that current Basin conditions are sustainable with no current undesirable results (defined as significant and unreasonable impacts to sustainability indicators). The CCR requires that GSP Annual Reports contain "A description of progress towards implementing the Plan, including [..] implementation of projects or management actions since the previous annual report."[31]

6.1 Sustainability Indicators

The CCR requires that GSP Annual Reports contain "A description of progress towards implementing the Plan, including achieving interim milestones."[32] Analyses conducted for the January 2022 GSP indicate that current Basin conditions are sustainable with no current undesirable results (defined as significant and unreasonable impacts to sustainability indicators). Annual assessment of the remaining three sustainability indicators is not required under the SGMA statute (Chapter 1:) and SGMA regulations (Appendix A-1). This chapter discusses groundwater levels, storage, and interconnected surface water in the context of minimum thresholds, measurable objectives, and interim milestones as well as the other three sustainability indicators not addressed earlier in the report.

Seawater intrusion (not applicable to CMA)

Degraded water quality

Land subsidence

31 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

32 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

The January 2022 GSP was being developed during WY 2021 and was adopted by the CMA on January 3, 2022, and submitted to DWR on January 18, 2022. All recommended monitoring described in the GSP, published during WY 2022, was not fully implemented as of the start of WY 2021 (October 1, 2020).

6.1.1 Chronic Lowering of Groundwater Levels

The chronic lowering of groundwater levels sustainability indicator is addressed earlier in Chapter 3: of this annual report. Regarding monitoring for undesirable results, the January 2022 GSP (3B.2 Undesirable Results) states:

> "Spring groundwater elevations that drop below the established groundwater elevation minimum thresholds in more than 50% of the representative monitoring wells for two consecutive, non-drought[33] years would correspond to an undesirable result associated with chronic lowering of groundwater elevations."

Similarly, for measurable objectives and interim milestones, the January 2022 GSP (3B.4 Measurable Objectives) states:

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

Due to the Basin conditions being sustainable with no current undesirable results, the interim milestones were set to measurable objectives.

For the four representative monitoring wells for water levels in the Buellton Aquifer, no wells (Appendix 3-A) are as of Spring of 2021, below the minimum thresholds. One wells in the Buellton Aquifer (6N/32W-12K2; Appendix 3-A) is, as of Spring 2021, above the measurable objectives and interim milestones.

[33] Two or more consecutive years that are classified as Dry or Critically Dry (Section 2b, GC) will be defined for this purpose 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.

6.1.2 Reduction of Groundwater in Storage

Data on reduction of groundwater in storage sustainability indicator is addressed in Chapter 5: of this report. In addition, progress towards sustainability for groundwater storage is tracked along with ground water levels as discussed in Section 6.1.1.

6.1.3 Water Quality

The January 2022 GSP, submitted on January 18, 2022, found "Groundwater quality in the CMA is currently suitable for agricultural, domestic, and municipal supply purposes" (2022 GSP, 3b.5-4). Annual assessment of water quality is not required under the SGMA statute (Chapter 1) and SGMA regulations (Appendix A-1). The CMA plans to provide an update on water quality starting with the WY 2022 report.

6.1.4 Seawater Intrusion

The CMA is an inland management area of the Basin and is greater than 20 Santa Ynez River miles above the Pacific Ocean. Therefore, seawater intrusion is not an applicable sustainability indicator for sustainable management of the CMA, and the CMA GSP did not set specific targets within the CMA. For the Santa Ynez River Valley Groundwater Basin as a whole, the seawater intrusion sustainability indicator is addressed by the WMA which includes a portion of the coast.

6.1.5 Land Subsidence

The January 2022 GSP found that land subsidence has not been historically observed in the CMA, existing water infrastructure have not been affected by land subsidence, and geologic properties of the aquifer indicate that land subsidence due to groundwater withdrawal in the CMA is unlikely. The land subsidence minimum threshold is a decline of six inches (half foot) from the 2015 land surface elevation resulting from groundwater extractions and that interferes with land uses or infrastructure.

The CMA GSP presented remote sending data from Interferometric Synthetic Aperture Radar (InSAR) for January 2015 through September 2019, and continuous global positioning system (CGPS) station BUEG near the city of Buellton and has been collecting horizontal and vertical displacement data since January

2015. Both InSAR and CGPS methods provide absolute changes in elevation and do not differentiate between groundwater extraction and other sources such as tectonic movement.

Using the InSAR data provided by DWR, several maps have been prepared the CMA. Vertical accuracy of InSAR data is around 0.71 inches[34] (Towill 2021). **Figure 6-1** is a map of the InSAR data showing the total change in elevation from January 2015 through October 2020, which represents the conditions at the beginning of Water Year 2021.[35]

The CGPS station BUEG is shown in **Figure 6-2**, which includes total vertical data and lateral movement. This data shows that the movement in the north direction, and the movement in the west direction is ten times larger than the total vertical movement. This lateral movement indicates active aseismic tectonic movement is occurring, as expected as the basin's geologic setting is within an active tectonic plate margin.

The CCWA pipeline is the largest water infrastructure in the CMA. Stress and damage to the pipeline is a potential negative outcome from land subsidence, as well as an indicator of land subsidence. CCWA was contacted for a statement about the presence or absence of observed negative impacts. CCWA clarified that they are unable to confirm any representations about potential presence or absence of land subsidence since they do not have a subsidence monitoring program (CCWA, 2022b).

6.1.6 Interconnected Surface Water and Groundwater Dependent Ecosystems

The SGMA sustainability indicator "depletion of interconnected surface water," which is related to the effects of groundwater on surface water flows, is addressed using the groundwater level hydrographs presented in Appendixes 3-A and 3-B. As stated in the 2022 CMA GSP (Section 3b.2-6), significant and undesirable results for interconnected surface water and groundwater dependent ecosystems are defined as groundwater elevations in the Santa Ynez River Alluvium that drop to 15 feet below channel thalweg elevations in two out of the three representative monitoring wells for two consecutive non-drought.[36]

34 Reported as 18 mm vertical accuracy at 95% confidence level in Towill (2021).
35 InSAR data is provided by DWR, and the data on conditions after the start of the water year is expected to be published during the second quarter which would be current or after this report.
36 2 or more consecutive years that are classified as Dry or Critically Dry (Section 2b) 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.

years. Similarly, the measurable objective and interim milestone (2022 GSP, Sections 3b.4-6 and 3b.5-6) established goals for the groundwater levels in the Santa Ynez River Alluvium underflow to rise to at least 5 feet below the channel thalweg elevation (Appendix 3b-D). For the three representative monitoring wells, no wells (Appendix 3-B), as of Spring of 2021, are below the minimum thresholds for depletion of interconnected surface water and groundwater dependent ecosystems. However, one well (6N/32W-13G2) appears to have anomalous data for WY 2021 compared with historical measurements, which will be investigated for next year's annual report (WY 2022). In terms of meeting measurable objectives and interim milestones, all three representative monitoring wells (Appendix 3-B) were above the groundwater elevations goal, equal to at least five feet below the channel thalweg of the Santa Ynez River.

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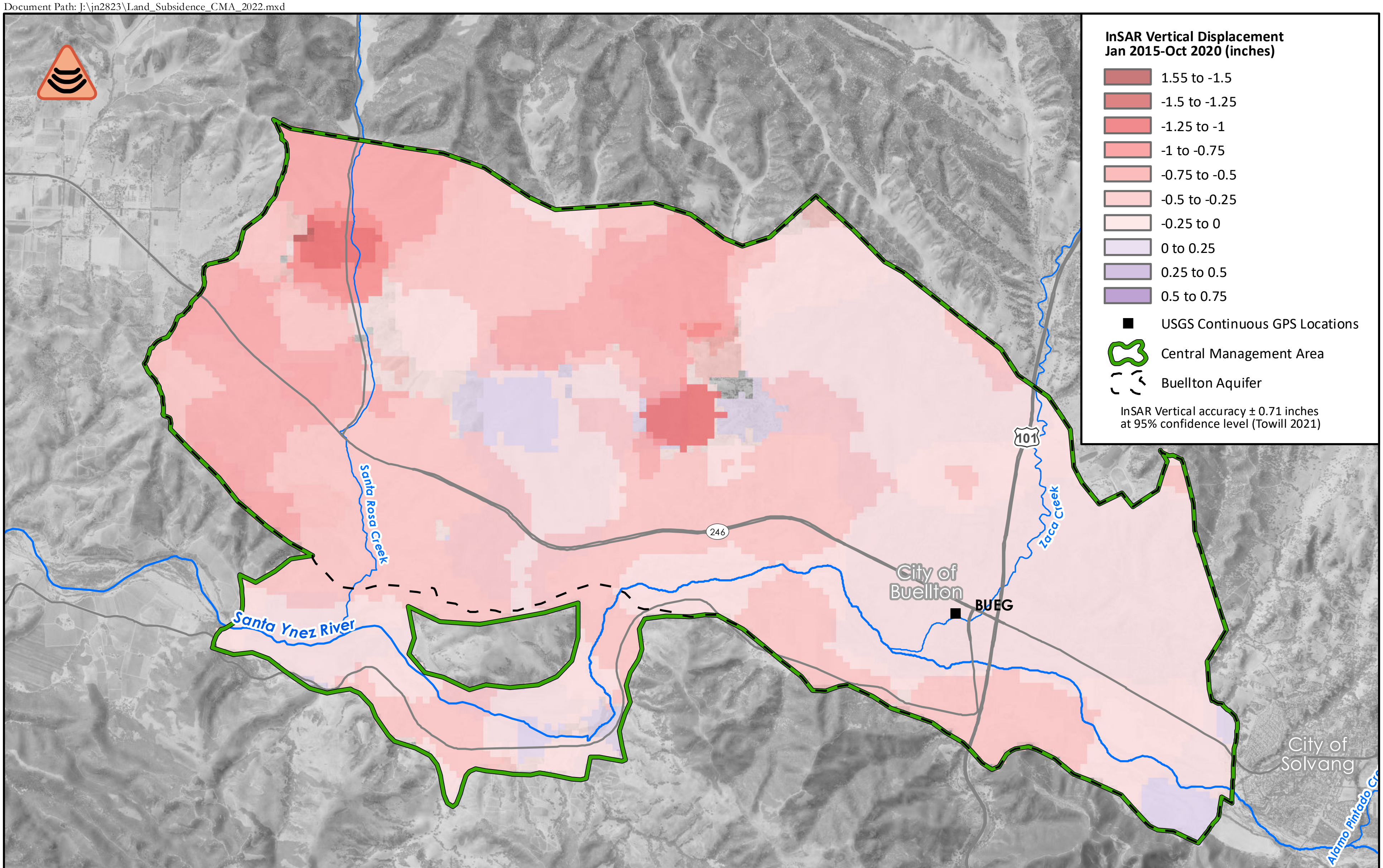


STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

LAND SUBSIDENCE
JANUARY 2015 TO OCTOBER 2020
INSAR DATA
WITHIN CENTRAL MANAGEMENT AREA

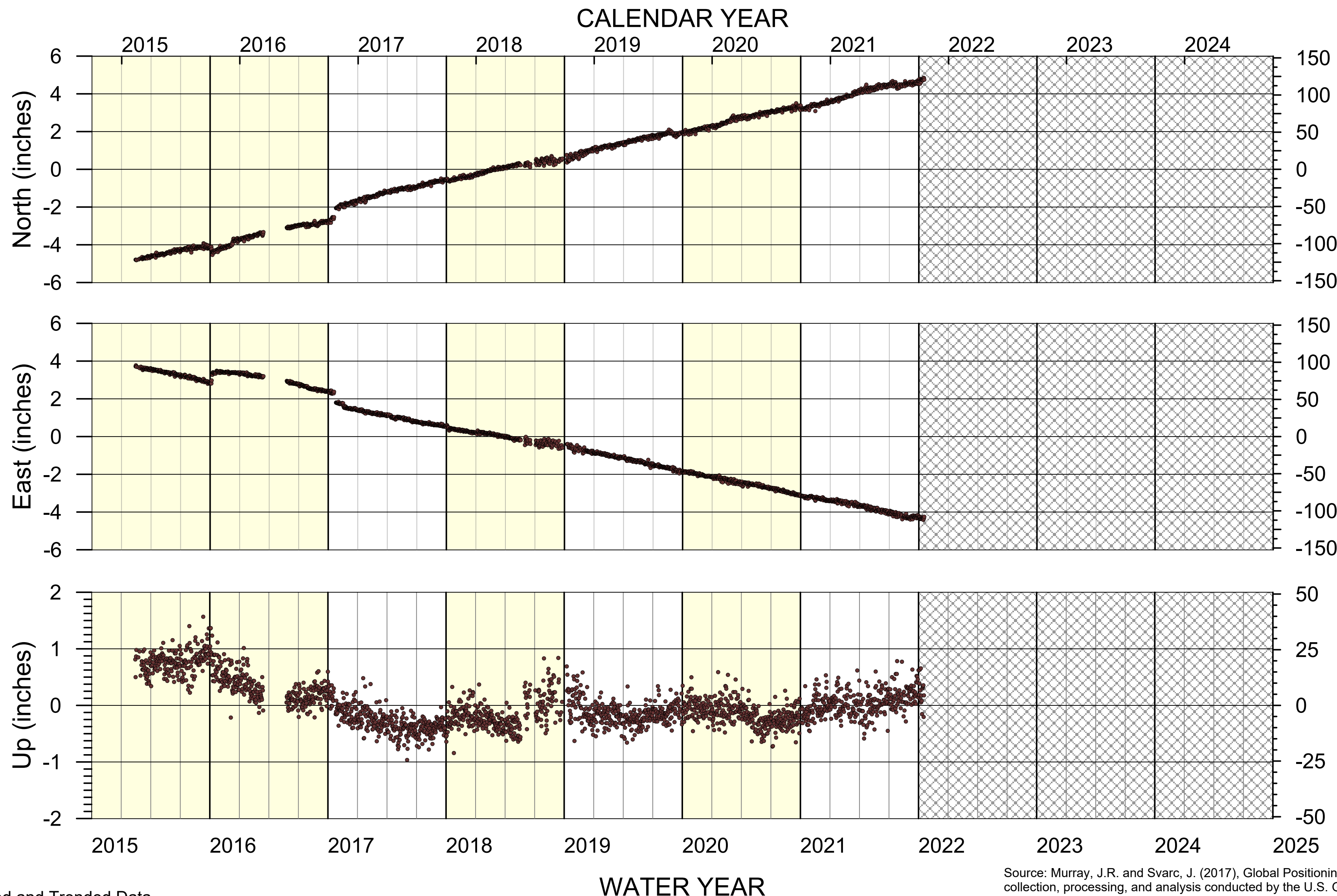
DRAFT

0 0.5 1 Miles

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

N

FIGURE 6-1



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 .

F:\DATA\2823\Analyses\2022-02 WY21 CGPS Land Subsidence\BUEG_data\Fig 6-03 CMA_CGPS WY2021.grf 2/25/2022 M. McCammon

STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

CONTINUOUS GLOBAL POSITIONING SYSTEM
BUEG STATION TRENDS
LAND SUBSIDENCE

Water Year Type (1942-2021)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

FIGURE 6-2

6.2 PLANNED FUTURE PROJECTS AND MANAGEMENT ACTIONS

The January 2022 CMA GSP, submitted to DWR on January 18, 2022, identified future projects to implement as part of the plan (**Table 6-1**) and project and management actions (**Table 6-2**) to improve sustainability of the basin. Completion is subject to funding approval from the CMA GSA committee.

Table 6-1
Summary of CMA GSP Implementation Projects and Approximate Completion Date

Project Category	Task	Occurrence	Completion
Completing Ongoing Field Investigations	Surveying Representative Wells	One Time	WY 2022
	SkyTEM Airborne Geophysics	One Time	WY 2022
Monitoring Network Gaps	Video Logging and Sounding Wells	One Time	WY 2023
	Add new GWL Monitoring	One Year	WY 2023
	Dedicated GWL Monitoring Wells (Outreach)	One Time	WY 2022
	SW Gage Installation (planning)	One Time	WY 2024
Projects and Management Actions	Water Conservation	Annual	WY 2023
	Groundwater Extraction Fee Study	5 Year	WY 2023
	Supplemental Imported Water Fund Reserve Options	One Time	WY 2022
	Feasibility Study for Bioswale Stormwater Retention	One Time	WY 2023
Improved Data Collection for Management	Well Registration Update	One Time	FY 2023-2024
	Well Metering Requirement	One Time	CY 2024
Data Management	Data Updates	Annual	Ongoing
Reporting and Plan Updates	SMGA WY Annual Reports	Annual	Ongoing
	SGMA Five Year Plan Assessment	5 Year	Ongoing

WQ = Water Quality, SW = Surface Water, WY = water year (October 1 – September 30), FY = fiscal year (July 1 – June 30), CY = calendar year (January 1 – December 31)

Table 6-2
Summary of Project and Management Actions in the CMA- Sustainability Benefits and Implementation Process

Timetable	Project and Management Action Title	Relevant Sustainability Indicators Affected: Groundwater Levels	Reduction in Storage	Water Quality	Land Subsidence	Interconnected Surface Water	Required Permits	Estimated Additional Water (AFY)	Estimated Benefit : Cost Ratio
Group 1- Initiated in first three years (see Table 4b.1-1)	Water Conservation	x	x	x	x	x	None	150-450	High
	Well Meters, Update Well Registration, and Groundwater Extraction Fees	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	150-450	High
	Supplemental Imported Water Program	x	x	x	x	x	Santa Barbara County, DWR, CEQA	500-1,000	Low to Medium
	Increased Stormwater Recharge	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	20-200	Low to Medium
Group 2 - Initiated if Early Warning Triggers	Water Rights Releases Request	x	x	x	x	x	None	0; minimal	High
	Supplemental Conditions on New Wells	x	x	x	x	x	None	20-200	High
Group 3 - Initiated if Minimum Thresholds Reached	Annual Pumping Allocation Plan	x	x	x	x	x	Proposition 26 / 218 or Local Ballot Initiative	300-900	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	Water Quality	Land Subsidence	Interconnected Surface Water			
Group 4 - Pending further decision by GSA to initiate	**Non-native Vegetation Removal**	x	x		x		Santa Barbara County, USACE, DWR, CDFW, CEQA, SWRCB	20-200	Low to Medium
	Agricultural Land Retirement/ Pumping Allowance	x	x	x	x	x	CEQA	300-900	Low to Medium
	Santa Rosa/ Zaca Creek Recharge Pond Project	x	x	x	x	x	Santa Barbara County, USACE, DWR, CDFW, CEQA	50-300	Low to Medium
	Recycled Water Project	x	x	x	x	x	Santa Barbara County, RWQCB, DWR, CEQA	300 - 500	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

6.2.1 Progress During Water Year 2021 (October 2020 – September 2021)

During WY 2021 the preparation of the GSP was still in progress. **Appendix 6-A** is the Executive Summary from the January 2022 GSP. Portions of the GSP development included public review and comment periods for all component sections of the GSP starting with the Hydrogeologic Conceptual Model on October 20, 2020, followed by Groundwater Conditions, and completion of all other sections, culminating in the release of the full Public Draft GSP for public comment on September 11, 2021.

Other actions taken by the GSA Groundwater Sustainability Agency Committee during WY 2021 included work on developing the Santa Ynez River Valley Groundwater Basin Coordination Agreement.

6.2.2 Progress To-Date Water Year 2022 (October 2021-February 2022)

On November 15, 2021, the CMA committee passed Resolution CMA-2021-002 adopting the Santa Ynez River Valley Groundwater Basin Coordination Agreement, with the EMA and WMA adopting similar resolutions in November and December 2021 respectively. The Coordination Agreement became effective January 1, 2022.

On October 26, 2021, the CMA received public comments on the Public Draft GSP. During the remainder of the first quarter of WY2022, the CMA reviewed and addressed additional comments received. In the second quarter of WY2022, the CMA Groundwater Sustainability Agency Committee adopted the CMA GSP (January 3, 2022) as Resolution CMA-2022-001, and the final report was submitted to DWR on January 18, 2022. On January 31, 2022, DWR posted the CMA GSP for 75-day agency public review period which closes on April 16, 2022.

In compliance with SGMA, the January 2022 GSP provides Basin management strategies that will culminate in managing the CMA within the sustainable yield and the absence of undesirable and unsustainable groundwater conditions in the CMA. The GSP recommends projects and management actions that are intended to achieve Basin sustainability while considering the unique geologic and hydrogeologic conditions of the CMA. Sustainable management criteria were established for measuring progress towards groundwater sustainability. The recommendations of the GSP will provide for long-term sustainable groundwater management in the CMA during the 20 years (through WY 2042) of GSP implementation.

CHAPTER 7: REFERENCES

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CHAPTER 8: APPENDICES

Chapter 1 – General Information

Appendix 1-A:

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

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

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

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.

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Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-A:

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

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APPENDIX 3-A: GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING CHRONIC DECLINE IN GROUNDWATER LEVELS

This appendix includes historical hydrographs (including from January 1, 2015 to current reporting year) of the representative wells for monitoring groundwater level decline, as well as the established sustainable management criteria of the measurable objective, early warning, and minimum threshold. All included wells are in the Buellton Aquifer, and the Appendix is organized into two sections based on location: Buellton Upland subarea and Santa Ynez River Alluvium Subarea.

Hydrographs showing the historical long term period of record were provided in the 2022 Groundwater Sustainability Plan (GSP). Copy of the GSP, water level data, and hydrographs are available at https://sywater.info.

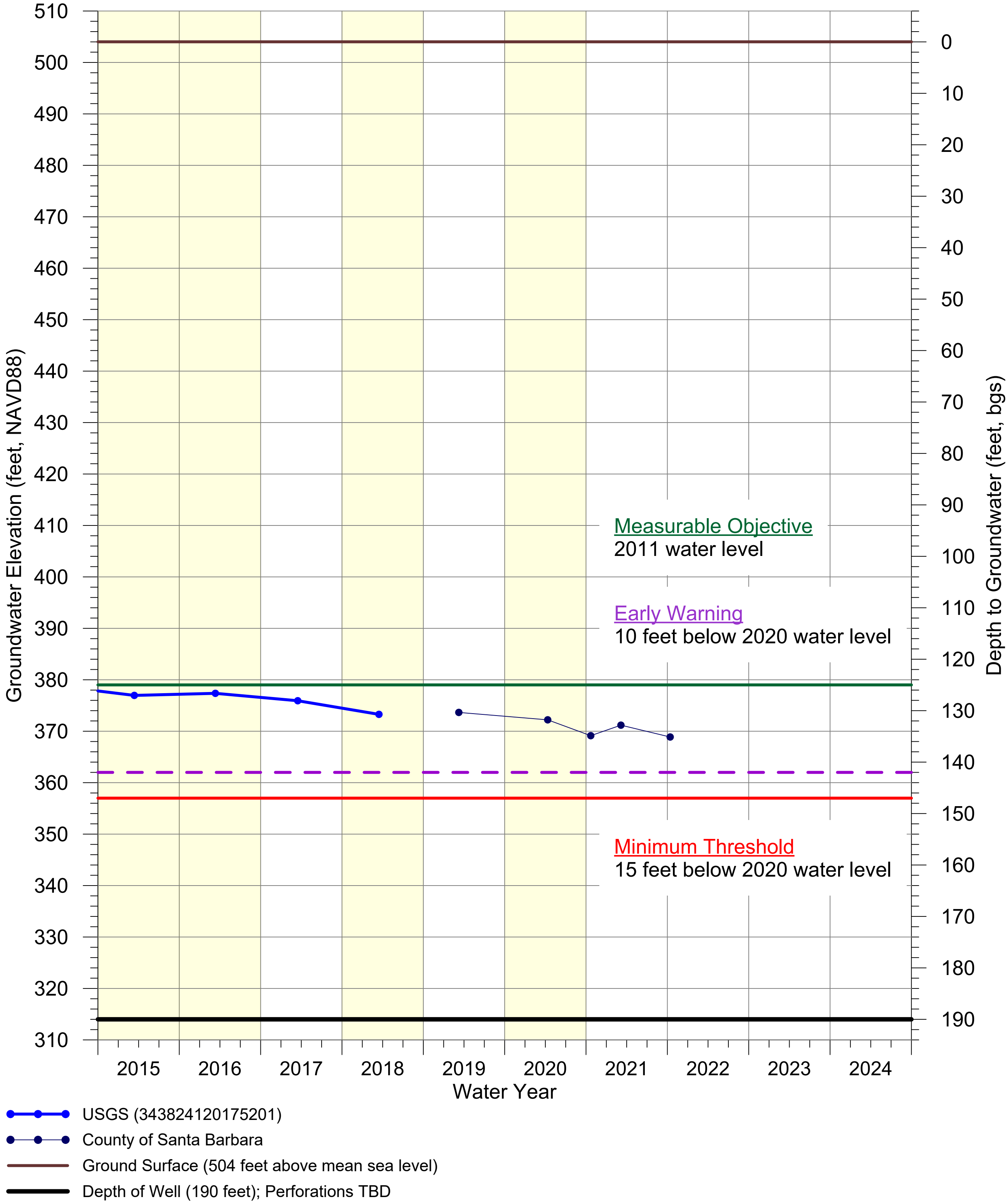
LIST OF ACRONYMS AND ABBREVIATIONS

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

FIGURE A1-01

CASGEM ID
25268
Voluntary

CMA Representative Monitoring Well
for Buellton Aquifer
(Buellton Upland Subarea)
7N/33W-36J1



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

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REPRESENTATIVE MONITORING WELL
Buellton Aquifer - Buellton Upland

Water Year Type (1942-2021)

- Wet
- Above/Below Normal
- Dry / Critically Dry

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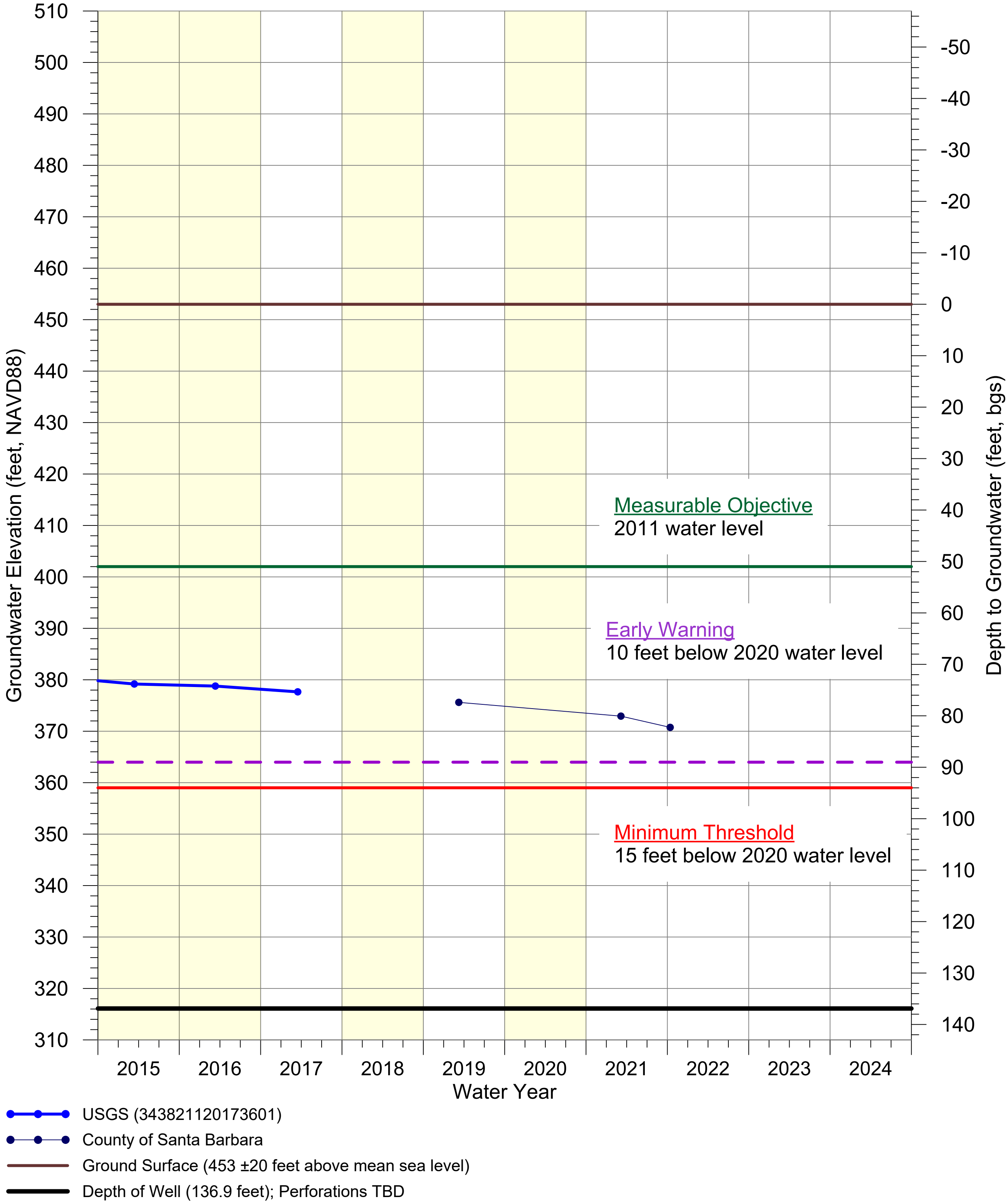
FIGURE A1-02

CASGEM ID
23681
Voluntary

**CMA Representative Monitoring Well
for Buellton Aquifer
(Buellton Upland Subarea)
7N/32W-31M1**



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STETSON ENGINEERS INC.

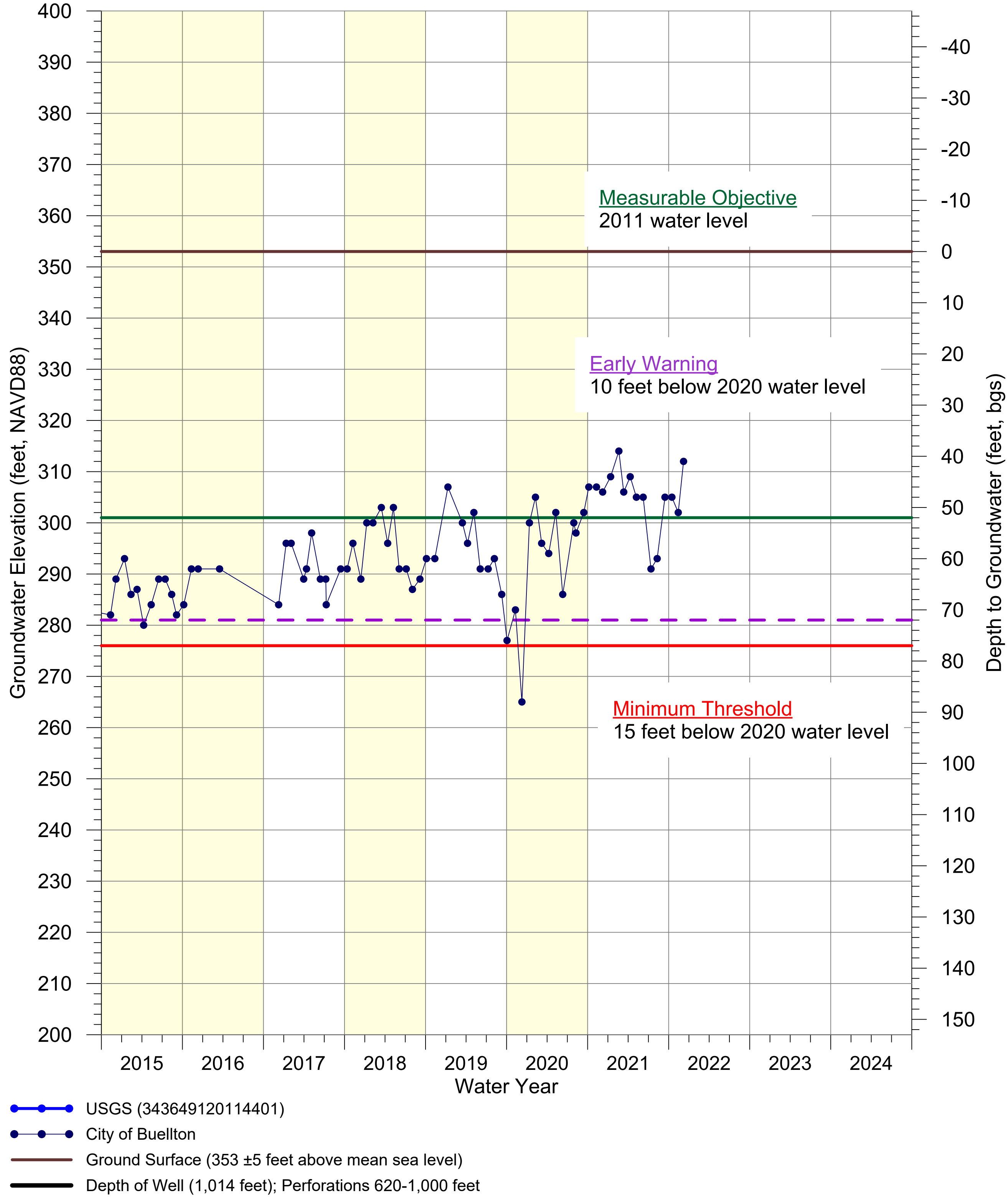
CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

**REPRESENTATIVE
MONITORING WELL
Buellton Aquifer - Buellton Upland**

Water Year Type (1942-2021)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE A2-01

CMA Representative Monitoring Well for Buellton Aquifer (Santa Ynez River Alluvium Subarea) 6N/32W-12K2



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STETSON ENGINEERS INC.

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

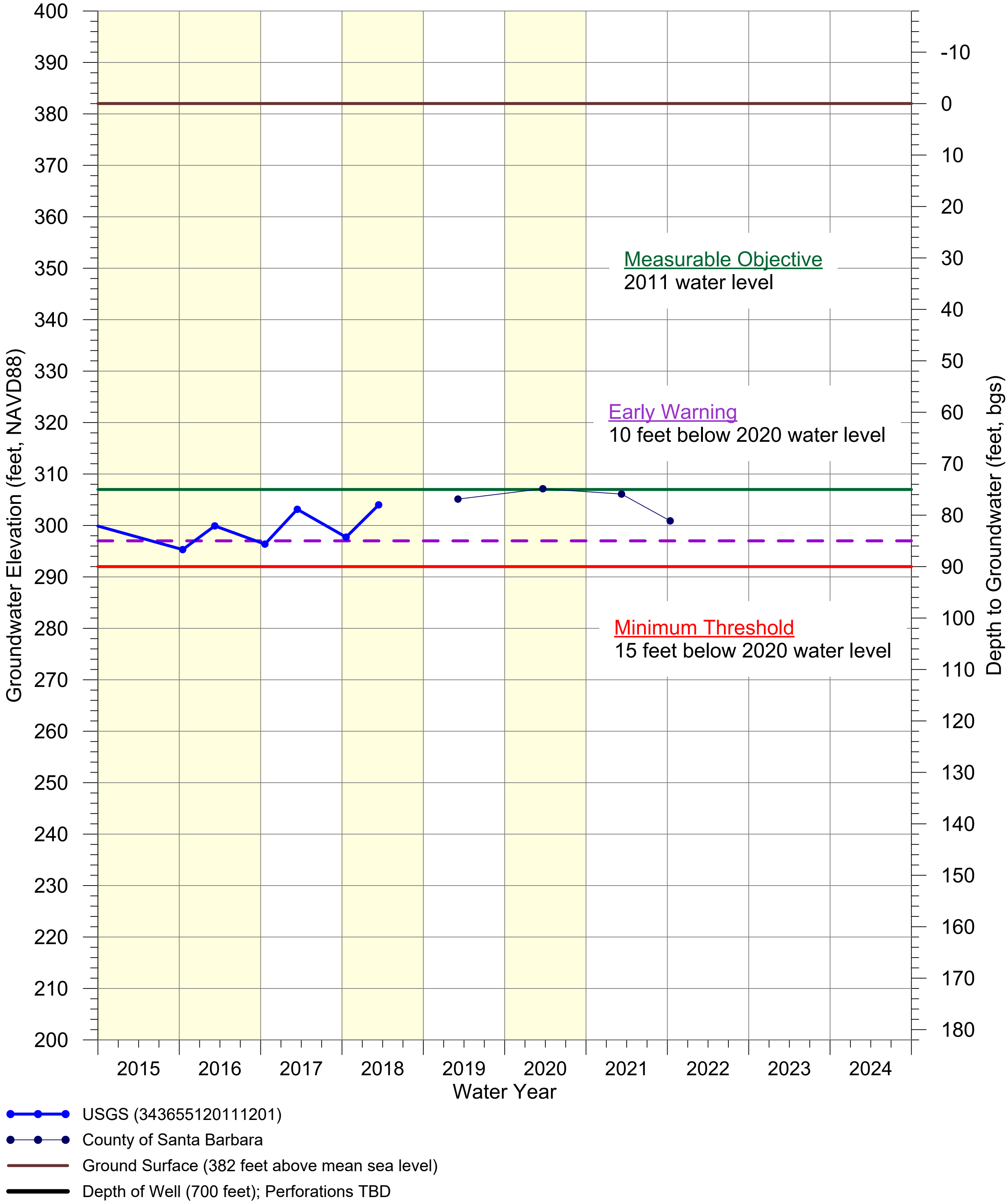
REPRESENTATIVE MONITORING WELL
Buellton Aquifer
Santa Ynez River Alluvium

Water Year Type (1942-2021)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE A2-02

CASGEM ID 49120 CASGEM

CMA Representative Monitoring Well for Buellton Aquifer (Santa Ynez River Alluvium Subarea) 6N/31W-7F1



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STETSON ENGINEERS INC.

CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL Buellton Aquifer Santa Ynez River Alluvium

Water Year Type (1942-2021)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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Chapter 3 – Groundwater Hydrographs and Contours

Appendix 3-B:

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

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APPENDIX 3-B:

GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING SURFACE WATER DEPLETION

This appendix includes historical hydrographs (including from January 1, 2015 to current reporting year) of the representative wells for monitoring potential surface water depletion as well as the established sustainable management criteria of the measurable objective, early warning, and minimum threshold.

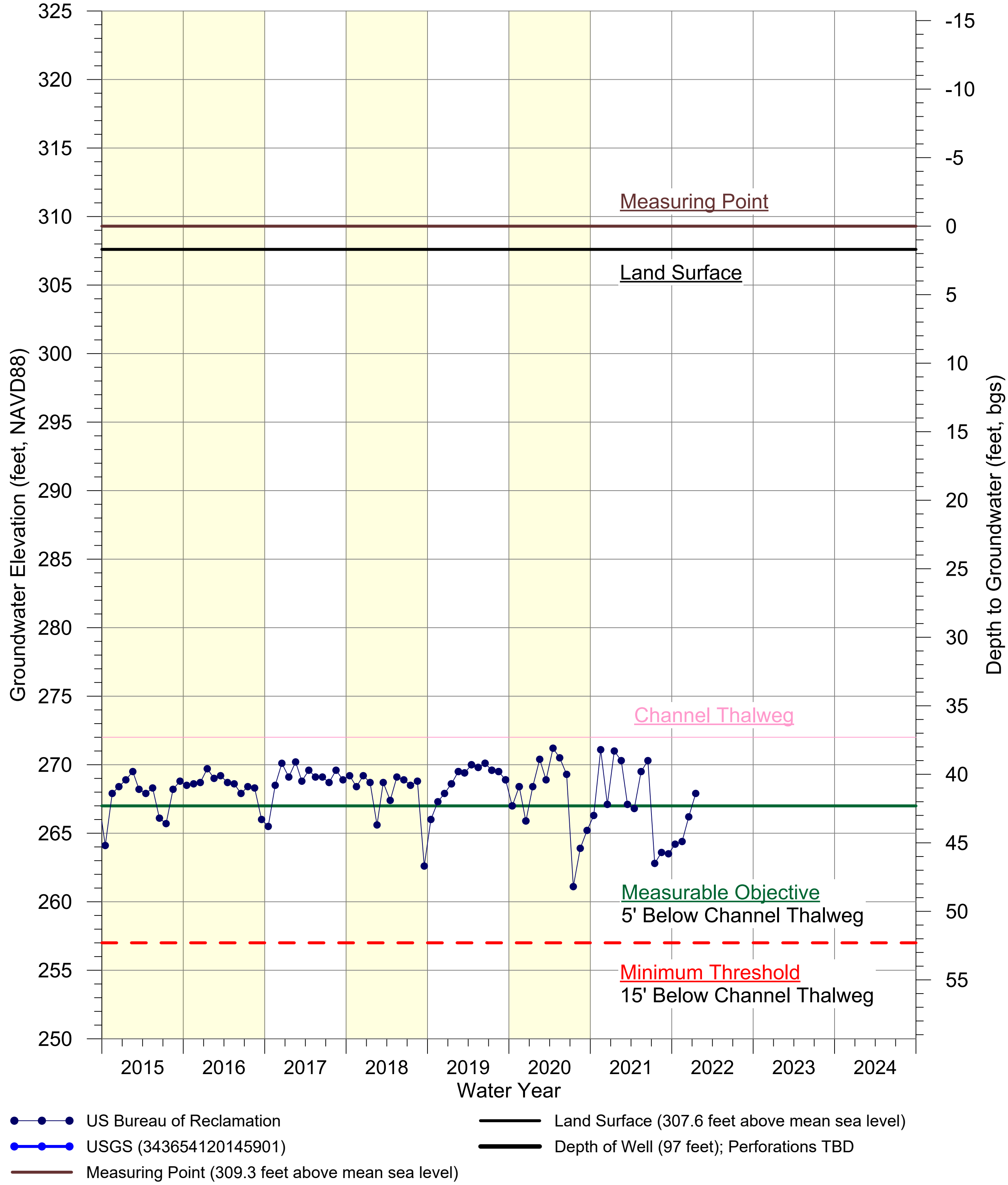
Hydrographs showing the historical long term period of record were provided in the 2022 Groundwater Sustainability Plan (GSP). Copy of the GSP, water level data, and hydrographs are available at https://sywater.info.

LIST OF ACRONYMS AND ABBREVIATIONS

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

FIGURE B-01

CMA Representative Monitoring Well for
Interconnected Surface Water and Groundwater Dependent Ecosystems
6N/32W-9G1



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CMA
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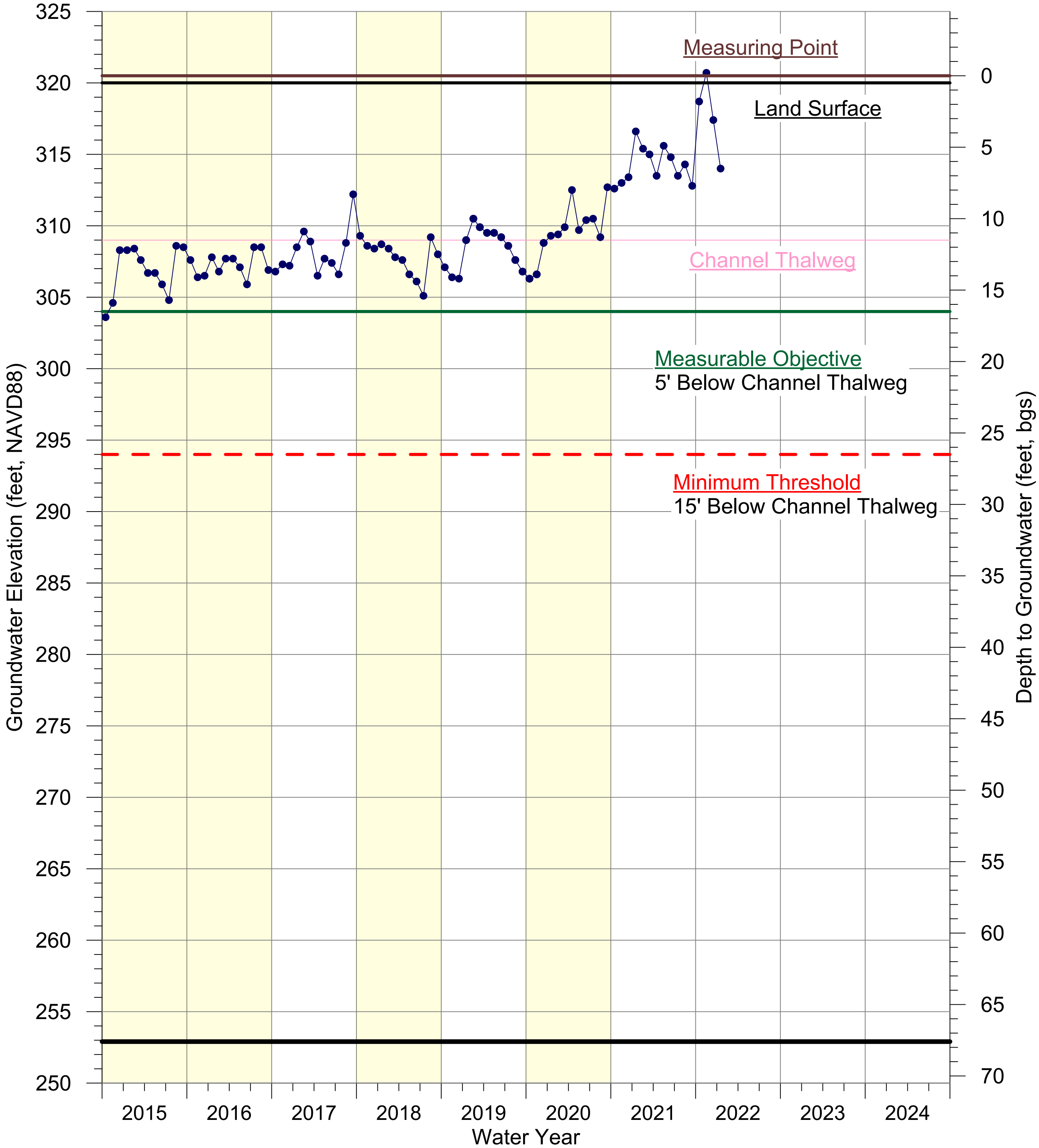
Central Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2021)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE B-02

CMA Representative Monitoring Well for
Interconnected Surface Water and Groundwater Dependent Ecosystems
6N/32W-13G2



US Bureau of Reclamation

Measuring Point (320.5 feet above mean sea level)

Land Surface (320.0 feet above mean sea level)

Depth of Well (67.6 feet); Perforations TBD

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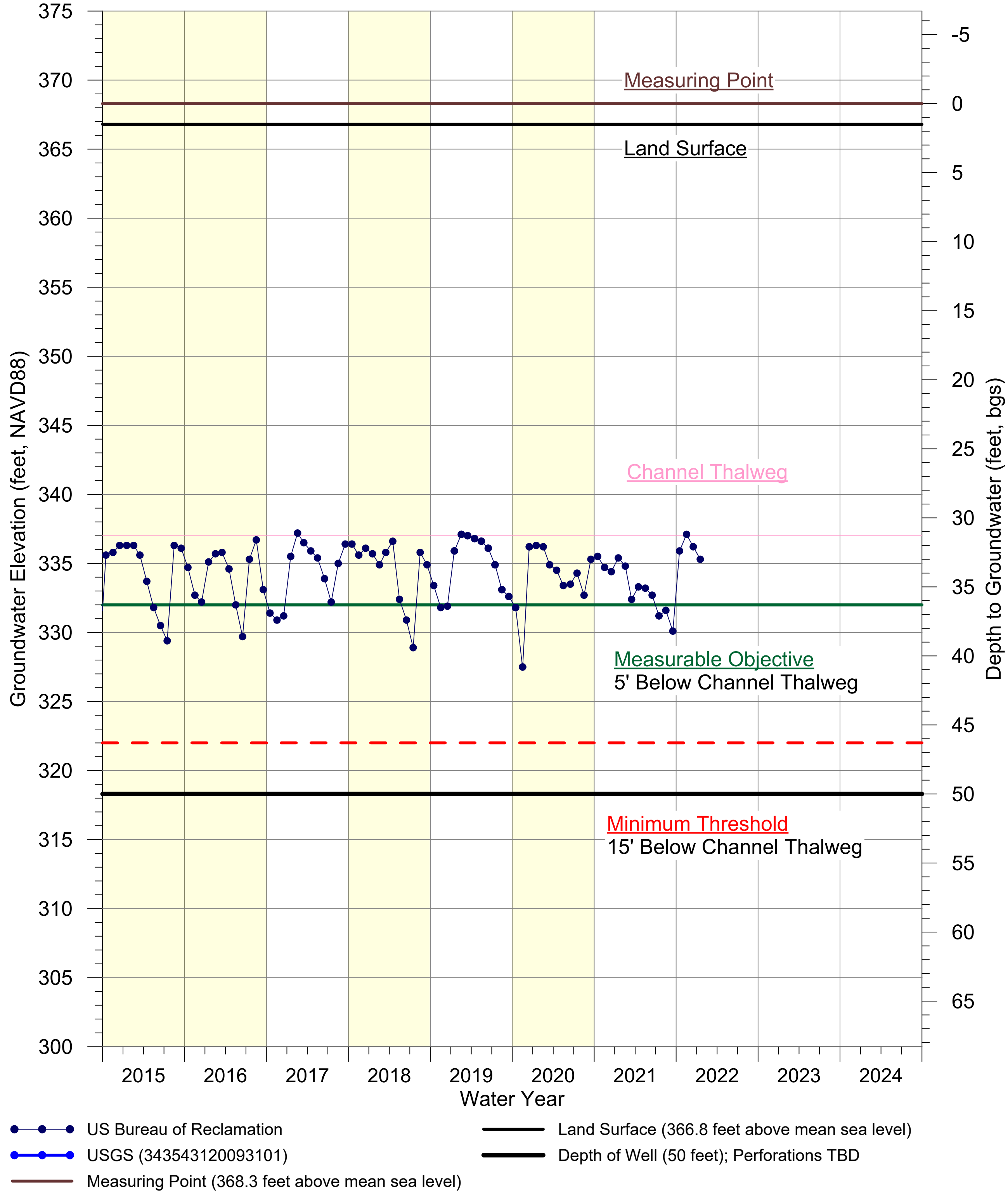
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2021)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE B-03

CMA Representative Monitoring Well for Interconnected Surface Water and Groundwater Dependent Ecosystems
6N/31W-17R1



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STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2021)

- Wet
- Above/Below Normal
- Dry / Critically Dry

Chapter 6 – Progress Towards GSP Implementation and Sustainability

Appendix 6-A:

Executive Summary from Groundwater Sustainability Plan.
Santa Ynez River Valley Groundwater Basin
Central Management Area
Dated January 18, 2022

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Groundwater Sustainability Plan

Executive Summary

CMA
Central Management Area

January 2022

Geosyntec consultants

STETSON ENGINEERS INC.

DUDEK

WATER RESOURCE PROFESSIONALS
SERVING CLIENTS SINCE 1957

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EXECUTIVE SUMMARY

ES ABSTRACT

This Groundwater Sustainability Plan (GSP) is prepared in accordance with the 2014 Sustainable Groundwater Management Act (SGMA) and covers the Central Management Area (CMA) of the Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB) located in coastal central California. There is one principal aquifer in the CMA: the Buellton Aquifer which covers the Buellton Upland and the older formations that lie under the Santa Ynez River alluvium near the City of Buellton. The Santa Ynez River is the primary surface water source within the Basin. The underflow of the Santa Ynez River is considered part of the river flow and is managed as surface water pursuant to the administrative authority and jurisdiction of the State Water Resources Control Board (SWRCB) over waters flowing in known and definite channels. The analyses conducted for this GSP indicate that current Basin conditions are sustainable and no undesirable results (defined as significant and unreasonable impacts to sustainability indicators) are occurring. Potential undesirable results have been identified and specific minimum thresholds have been developed to help ensure that undesirable results do not occur under future conditions. Potential project operations and management actions designed to maintain and improve groundwater conditions and sustainability have been identified and are described within this GSP.

ES CHAPTER 1: INTRODUCTION

ES Introduction, Agency, and Communication (GSP Sections 1a, 1b, 1c)

SGMA requires that the Basin develop one or more GSPs that outline how the Basin will achieve groundwater sustainability by 2042. Physical and political complexities within the Basin resulted in decisions by local public agencies to develop three GSPs under a coordination agreement to satisfy SGMA requirements for the entire Basin. The Western, Central, and Eastern Management Areas (WMA, CMA, and EMA) make up the Basin. This GSP is prepared to address the SGMA requirements for the CMA portion of the Basin.

The primary sustainability goal and purpose of these GSPs are to manage groundwater resources in the WMA, CMA, and EMA without causing undesirable results and facilitate long-term beneficial uses of groundwater within the Basin. Beneficial uses of groundwater in the Basin include municipal, domestic, and agricultural uses, in addition to riparian habitat that supports environmental ecosystems.

In 2016 and 2017, three local Groundwater Sustainability Agencies (GSA) were established for the Basin. Three GSA-eligible public entities ratified an agreement and formed the CMA GSA, with each of the public entities having a seat on the CMA GSA Committee. Two of the three member agencies, the City of Buellton and the Santa Ynez River Water Conservation District both have voting seats on the Committee, whereas the Santa Barbara County Water Agency has a non-voting seat.

During the development of this GSP the CMA GSA committee met regularly on SGMA matters. The GSA developed an Outreach and Engagement Plan to facilitate engagement with stakeholders. A volunteer public Citizens Advisory Group (CAG) was created with members representing a group of groundwater users to help solicit public feedback on GSP elements. Newsletters and press releases about the GSA and SGMA were created and distributed through numerous channels, including utility bills. All three management areas used a centralized website to aid with communications, tracking meetings, and receiving public comments.

ES Plan Area (GSP Section 1d)

The Basin is a coastal groundwater basin measuring approximately 317 square miles, located in Santa Barbara County, California. Each of the three management areas of the Basin is covered by a GSP; this GSP is for the CMA, which is approximately 32.8 square miles. The CMA itself is divided into two subareas based on hydrogeology and topography: the Buellton Upland which is relatively steep topography, and the Santa Ynez River Alluvium which consists of the relatively flat area cut by the historical movements of the Santa Ynez River. The Santa Ynez River Alluvium contains the Santa Ynez River, and the underflow of the River in that area is not groundwater as defined by SGMA and thus is not be managed by the CMA GSA, because such underflow constitutes subterranean water flowing in known and definite channels that is treated as surface water and subject to the jurisdiction of and regulation by SWRCB.

Approximately 95% of the CMA is privately held land. There is Federal Bureau of Land Management land, State California Wildlife Conservation Board land, as well as local cities, school districts, and other district properties.

The public water agencies in the CMA are the City of Buellton Water Department, and there are several small Mutual Water Companies (MWC) which supply water outside of the city. The Central Coast Water Authority (CCWA), a wholesale water agency, operates a water pipeline that passes through the CMA and conveys imported water from the State Water Project to the City of Buellton within the CMA.

Population data for communities within the CMA indicate that most people live near or within the City of Buellton or along the highway 246 corridor.

There are three General Plans, or equivalent plan areas, outlining land use in the CMA. The City of Buellton has a General Plan within its jurisdiction. The Santa Ynez Valley Community Plan is a specific General Plan from the County of Santa Barbara for the area around the city. The entire CMA is within the general plan area of the County of Santa Barbara.

ES 4 Additional GSP Elements (GSP Section 1e)

A data management system was implemented for this GSP in accordance with the SMGA. As part of its communications and public outreach, the CMA GSA prepared and distributed the Data Management Plan, a whitepaper describing the data management system. The DMS was then implemented.

ES CHAPTER 2: BASIN SETTING

ES Hydrogeologic Conceptual Model (GSP Section 2a)

A hydrogeologic conceptual model was developed and used to identify existing and projected groundwater conditions for the Basin. The hydrogeologic conceptual model presents the various conceptual components of the CMA's groundwater system, including the geologic setting; aquifer extents; physical properties, including water imports; and land use.

The geologic setting is related to the northward movement of the Pacific Plate relative to the North America Plate. Groundwater is found in younger geologic formations that have been uplifted and deformed into a large syncline fold. The Santa Ynez River has cut through and filled in the existing geology. Alluvium subareas are where the Santa Ynez River cut into underlying non-water bearing units causing a 'bedrock channel,' which limits groundwater flow. The definable bottom and lateral extents of the Basin were determined using the three-dimensional geologic model included in the hydrogeologic conceptual model. For groundwater management purposes one principal aquifer, the Buellton Aquifer, was defined as the principal formation in the Buellton Upland subarea, and the lower non-alluvial formation in the Santa Ynez River Alluvium (SYRA) subarea. The SYRA subarea consists of upper alluvial formations in a bedrock channel that convey the Santa Ynez River and the underflow of the river. Accordingly, the Santa Ynez River and its underflow are within the jurisdiction of and regulated by the SWRCB.

The topography of the CMA is varied with low hills with steep canyons in the north and a relatively flat plain towards the south around the Santa Ynez River. Rainfall is highly influenced by local topography. However, local slope and soil types influence runoff and the amount of potential recharge to the aquifers in any particular location.

Since 1997, the CCWA has delivered State Water Project water to the Basin through the 130 mile long Coastal Branch Pipeline that enters the Basin at Vandenberg Space Force Base and terminates at Lake Cachuma. State Project Water deliveries from the pipeline are received by the City of Buellton in the CMA. Other water from this pipeline is delivered to ID No.1, City of Solvang, and Lake Cachuma, east and upstream of the CMA. The Tecolote Tunnel conveys water from Lake Cachuma to the Santa Barbara County south coast including the cities of Santa Barbara, Goleta, Montecito, and Carpinteria. The Tecolote Tunnel was completed in 1955 and is the newest of three tunnels used for exporting Santa Ynez River water to the south coast of Santa Barbara County.

Groundwater within the CMA is primarily used for agriculture, which represents the largest proportion of land and water use within the Basin. Other uses of groundwater in the basin include municipal and light industrial, small domestic uses, and environmental uses, such as groundwater dependent ecosystems.

ES Groundwater Conditions (GSP Section 2b)

This GSP describes historical, existing, and projected groundwater conditions with regard to each of the six SGMA sustainability indicators including: the chronic lowering of groundwater levels, significant and unreasonable reduction of groundwater in storage, significant and unreasonable seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface water.

Groundwater elevation data was collected from wells throughout the CMA, in both the seasonal high (spring) and seasonal low (fall) conditions. Groundwater contours were developed by interpolating between monitoring wells. Groundwater levels were plotted over time (hydrographs) were developed to show the change in groundwater elevation at each location over time to evaluate groundwater levels and groundwater storage.

Groundwater storage over time was compared against the year type and groundwater pumping: year type was found to be a primary influence on groundwater storage. To support this analysis, a quantitate method using flow at the Salsipuedes Creek measured by the U.S. Geologic Survey (USGS) streamflow gage is described which identify the qualitative “dry” and “wet” years.

Location of known potential groundwater contamination sites were identified. The responsibility of remediating groundwater is not under the jurisdiction of the GSA but lies with other state and local agencies. Assessments to beneficial users in the basin and an assessment of recent (2015-2018) groundwater quality data were made for six constituents identified by the SWRCB. The goal of the GSP is to ensure than groundwater quality is not further degraded by groundwater pumping managed under this GSP. As an inland management area seawater intrusion was not applicable, but is addressed by the coastal WMA GSP.

Land subsidence was determined to be unlikely due to the geologic setting of the CMA, and the nature of the aquifer. Recent remote sensing data provided by Department of Water Resources (DWR) from 2015 – present show very little change in land surface elevation. Additionally, historical infrastructure records do not indicate land subsidence.

In the CMA, interconnected surface water for both the Santa Ynez River and its tributaries to the Buellton Aquifer is unlikely given that there is little perennial surface water in the CMA. The Santa Ynez River is separated from the Buellton Aquifer by bedrock west of the Buellton Bend. The extent that the Buellton Aquifer underlies the Santa Ynez River and alluvial underflow deposits east of the Buellton Bend is a data gap that will be addressed during the first year of GSP implementation (see Chapter 5). In connection with this data gap east of the Buellton Bend, the quantity and timing of flow from the Buellton Aquifer to the streamflow is also currently a data gap. Because the flow from the Buellton Aquifer would have to go through the underflow deposits before reaching the river, the potential effect of groundwater pumping on surface flow is expected to be minimal. With the improved mapping of contact between the two formations and additional surface water data collected, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits and Santa Ynez River surface flows. However, the surface water of the Santa Ynez River within the CMA is still primarily influenced by releases from Cachuma Reservoir and by diversions via shallow wells in the alluvial underflow deposits, both of which are administered by the SWRCB.

Groundwater Dependent Ecosystems (GDEs) in the CMA were assessed using an assumed rooting depth and the current depth to groundwater. A map of the GDEs in the CMA was developed. Potential GDEs along the CMA upland tributaries were greater than 30 feet above the groundwater table and were screened out of consideration for future groundwater management. The exception being an isolated area near the confluence of Santa Rosa Creek and the Santa Ynez River mainstem, where groundwater levels are estimated to be within 30-feet of the ground surface. This area will be surveyed to evaluate the potential for GDEs. Potential GDEs along the Santa Ynez River are not considered vulnerable due to historically stable water levels, based on a review of previous studies done in the area. The stability may in part be due to the management of the Santa Ynez River under SWRCB Order 2019-148.

ES Water Budgets (GSP Section 2c)

Water budgets are calculations of the flows of water in and out of the various components of the Basin's surface water and groundwater systems. The various components of the water budget are introduced in the hydrogeologic conceptual model. Three water budget periods were created: historical, current, and projected. Water flows in any particular year are highly dependent on the weather, and to a lesser extent, the antecedent conditions. The selection of hydrologic years for each of the three budget periods was coordinated with the other two management areas (WMA and EMA).

The period of 1982 through 2018 was selected as the historical period. Stream flow along Salsipuedes Creek were used as a proxy for water supply conditions in the Basin. Flows during this historical period are similar to the long-term monitoring at the same gage, indicating that the years are likely representative of the long-term period. The years from 2012 to 2018 were all relatively dry years, so the current period was started in 2011. To meet the 50-year planning horizon required by SGMA, the projected period is 2018 through 2072.

The length of the historical water budget in this GSP is 36 years, which exceeds the 10-year SGMA requirement. For surface water, the average inflows were 100,200 acre-feet per year (AFY) and ranged from 4,570 to 724,710 AFY, with most of this variability influenced by the Santa Ynez River flows. Surface water outflows were on average 100,070 AFY and ranged from 7,085 to 710,805 AFY. Groundwater is less variable, with inflows ranging between 1,990 to 6,570 AFY, and an average inflow of 3,550 AFY. The two primary drivers of variability in groundwater were percolation from surface water and recharge from precipitation. Groundwater outflows ranged from 1,450 to 5,590 AFY with an average of 3,540 AFY. Agricultural pumping was the largest influence on groundwater flow and had the greatest variation over the historical period. The average annual pumping total of 2,760 AFY (Table 2c.2-5) for the historical period (1982 through 2018, 37 years) resulted in zero net change in groundwater storage in the Buellton Aquifer, so this water budget analysis indicates that the sustainable perennial yield of the CMA is approximately 2,800 AFY.

For the current period (2011 through 2018), surface water average inflows were 32,040 acre-feet per year (AFY) and ranged from 9,130 to 141,660 AFY, with most of this variability influenced by the Santa Ynez River flows. Surface water outflows were on average 32,040 AFY and ranged from 11,100 to 140,540 AFY. Groundwater is less variable for the current period, with inflows ranging between 2,150 to 4,160 AFY, and an average inflow of 2,810 AFY. For groundwater, the two primary drivers of variability were percolation from surface water and recharge from precipitation. Groundwater outflows ranged from 3,000 to 5,290 AFY, and an average of 4,170 AFY. Agricultural pumping was the largest influence on groundwater flow and had the greatest variation over this current period.

The projected period water budget estimates population increases, projected precipitation and climate change factors. However, population of the Buellton area is expected to grow by up to 45% over the 20-year planning period (by 2042), but water use is expected to grow by only 15%. Within the 50 year planning period (by 2072) the total water usage is expected to increase by 20%. Groundwater demand is expected to increase from 3,015 AFY in 2018 to 3,198 AFY in 2042, and 3,328 AF in 2072. Projected water availability is expected to be relatively similar to historical conditions, which will likely result in a loss of groundwater storage, unless projects and management actions are undertaken to maintain sustainability.

ES Chapter 3: Monitoring Networks and Sustainable Management Criteria

ES Monitoring Networks (GSP Section 3a)

The Monitoring Networks section of the GSP summarizes the parameters that were monitored in the Basin and identifies representative sites for monitoring for five applicable SGMA sustainability indicators. Seawater intrusion is not directly applicable to the non-coastal CMA.

Federal, state, and local monitoring networks are responsible for groundwater monitoring in the CMA, are described in this GSP. Prior to 2019 the United States Geological Survey (USGS) conducted groundwater level monitoring in the CMA and the entire Basin. Starting in 2019 the groundwater level monitoring was taken over by the Santa Barbara County Water Agency. The City of Buellton also collects groundwater levels in its wells. Estimates for groundwater storage rely on using the same network data.

Groundwater quality is currently monitored by two programs in the CMA:

- Public water system monitoring of drinking water sources by water suppliers as reported to Safe Drinking Water Information System; and
- Monitoring by commercial agriculture as part of the Irrigated Lands Regulatory Program.

Land subsidence is monitored using monthly remote sensing satellite data, which covers the entire CMA. Additionally, there is a continuous GPS (CGPS) station in the CMA, and the Central Coast Water Authority, which operates the State Water Project pipeline, has remote access to operators that can be contacted in the event of subsidence. The remote sensing tracks elevation change, while CGPS tracks elevation and horizontal movement. If a decline in land surface elevation is observed, a follow-up analysis would need to be conducted to determine whether the cause was subsidence from groundwater depletion.

Finally, two U.S. Geological Survey stream gages measure and record surface water flows, each within one mile of the CMA east boundary that monitor surface water inflow into the CMA. The surface water outflow from the CMA is currently a data gap which will be addressed with spot flow measurements in the first year of implementation and correlation with an existing nearby gage with a long history of record. Monitoring of potential surface water depletion is performed by collecting water levels in the underflow alluvium near the Santa Ynez River in addition to the monitoring of groundwater levels in the Buellton Aquifer.

These existing monitoring networks were reviewed, and wells were selected from each based upon representativeness. Additionally, several areas were identified as locations where the network should be improved.

ES Sustainable Management Criteria (GSP Section 3b)

This section identifies the stainability goal of the Basin, conditions of undesirable results for each of the six SGMA sustainability indicators, Minimum Thresholds at the representative sites, and Measurable Objectives. These criteria are described below and summarized in **Table ES.1**.

Sustainability goals were identified as follows:

(1) Maintain long-term groundwater elevation at levels adequate to support existing and anticipated beneficial uses,

(2) Maintain a sufficient volume of groundwater in storage to ensure groundwater availability during periods of drought and recovery during wet climate conditions,

(3) Maintain water quality conditions to support ongoing beneficial use of groundwater for agricultural, municipal, domestic, and industrial and environmental uses.

For each of the five applicable SGMA sustainability indicators the potential undesirable result was identified. The potential undesirable result is determined, quantified based on the identification criteria, and the potential effects on beneficial users are described.

Undesirable results from chronic lowering of groundwater levels would result in beneficial well users' access to water being impaired. This impairment would require more energy to pump water and potential replacement of wells to access water. This undesirable result could occur if groundwater extractions exceed the sustainable yield over a period of years. Evaluation of this potential undesirable result will be based on direct measurements of groundwater levels.

Table ES.1
Sustainable Management Criteria Indicator Summary for the CMA

Sustainability Indicator	Minimum Threshold	Measurement	Measurable Objective	Undesirable Result
Chronic lowering of groundwater levels	Water level minimum thresholds for Representative Monitoring Wells (RMWs) screened in the Buellton Aquifer established 15 feet or more below the 2020 levels.	Groundwater elevations measured at 4 RMWs screened in the Buellton Aquifer.	Spring 2011 groundwater elevations.	Spring groundwater elevations that drop below the established groundwater elevation minimum thresholds in more than 50% of the RMWs for 2 consecutive non-drought years.
Reduction of groundwater in storage	Water level minimum thresholds for RMWs screened in the Buellton Aquifer established 15 feet or more below the 2020 levels.	Groundwater elevations are used a proxy for the total volume of groundwater in storage. Groundwater elevations will be measured at 4 RMWs screened in the Buellton Aquifer	Spring 2011 groundwater elevations.	Spring groundwater elevations that drop below the established groundwater elevation minimum thresholds in more than 50% of the RMWs for 2 consecutive non-drought years.
Seawater Intrusion	Not applicable: non-coastal management area	Not applicable.	Not applicable.	Not applicable.
Degraded Water Quality	For all constituents except Nitrate and Total Dissolved Solids (TDS), minimum threshold concentrations were established as the Water Quality Objectives by RWQCB. Nitrate minimum threshold concentration established at the drinking water Maximum Contaminate Level (MCL), and TDS is the drinking water Secondary Maximum Contaminate Level (SMCL).	Salt and nutrient concentrations measured at 7 RMWs.	For Nitrate and TDS: the MCL and SMCL. Other constituents: Median Groundwater Quality Objectives.	Minimum threshold exceedances for each constituent in more than 50% of the RMWs for 2 consecutive non-drought years.
Subsidence	A decline of six inches from 2015 land surface elevation resulting from groundwater extractions.	Review of publicly available land subsidence satellite data and continuous GPS data.	Land subsidence less than two inches compared to the 2015 InSAR data.	Land subsidence associated with groundwater production that exceeds half a foot from 2015 conditions.
Depletion of interconnected surface water	Water Elevations in underflow alluvium near the Santa Ynez River that drop 15 feet or more below the Santa Ynez River channel bottom.	Water elevations in underflow alluvium measured at three RMWs.	Water elevations in underflow alluvium equal to five feet below the elevation of the Santa Ynez River channel bottom.	Water elevations in underflow alluvium near the Santa Ynez River that drop 15 feet or more below the channel bottom in 2 of the 3 surface water depletion RMWs for 2 consecutive non-drought years. Key undesirable result is more surface water depletion due to groundwater extraction than prior to 2015.

RMW = Representative monitoring wells; RWQCB = Regional Water Quality Control Board; MCL =maximum contaminate level; SMCL = secondary maximum contaminate level; TDS = total dissolved solids; GPS = Global Positioning System; InSAR = Interferometric synthetic aperture radar; mg/L = milligrams per liter

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The potential undesirable result from chronic lowering of groundwater levels is less water available for beneficial users using existing infrastructure. This impairment would require more energy to pump water and potential replacement of wells to access water. This undesirable result could occur if groundwater extractions exceed the sustainable yield over a period of years. Evaluation of this potential undesirable result will be based on direct measurements of groundwater levels.

Groundwater storage is the volume of water that is stored in an aquifer. The potential undesirable result of a decline in groundwater storage is less water available for beneficial users, meaning that the water is physically not present to be extracted. As with groundwater levels, groundwater storage is related to pumping and other outflows exceeding the amount of water inflows into the groundwater basin over a period of years. Groundwater storage will be estimated using the groundwater elevation data to assess the volume of water involved.

In the CMA there is no direct potential undesirable result from seawater intrusion.

Potential undesirable results from degradation of water quality is impaired beneficial uses of the groundwater. To assess water quality, specific salts and nutrients are chosen for analysis. Specifically, concentrations of total dissolved solids, chloride, sulfate, boron, sodium, and nitrate.

Potential undesirable results due to land subsidence may include damage to surface infrastructure and collapsed pore space in the aquifers. Land-surface elevation changes are quantified by a remote sensing (satellite) system which uses interference patterns between radar returns to accurately calculate changes in elevation over a wide region.

The potential undesirable results related to depletions in interconnected surface water and groundwater dependent ecosystems occur when impacts are greater than impacts due to groundwater extraction prior to 2015. The Santa Ynez River and River alluvium are under the jurisdiction of the SWRCB. The SWRCB retains administrative authority over the surface flow and underflow of the Santa Ynez River, including wells that divert the underflow. Depletions in interconnected surface water are evaluated by assessing water levels in potential GDE areas.

With each of the six potential undesirable results described above, specific minimum thresholds were determined to protect against the potential undesirable results. For groundwater levels, minimum thresholds were based on well screen elevations and historical low groundwater levels. For groundwater storage, minimum thresholds are based on the number of wells that met the groundwater level criteria. Minimum thresholds for water quality are based on Water Quality Objectives from the SWRCB. The land subsidence minimum threshold six inches or less relative to the 2015 elevations. Minimum thresholds for interconnected surface water will be monitored by measured water level elevations in nearby wells at or above historical low water levels and within 15 feet of the elevation of the river channel bottom.

Quantifiable goals for the maintenance or improvement of the Basin were identified as the measurable objectives. Groundwater elevations pre-drought conditions (i.e., Spring 2011) were identified as the measurable objective for groundwater levels and storage. No decline in water quality relative to 2015 was set for water quality. Less than two inches of land subsidence since 2015 was set for land subsidence. Finally, to protect surface water, nearby groundwater levels no lower than 5 feet below the local river channel bottom was set as the measurable objective.

Impacts of setting these management criteria on neighboring groundwater basins is expected to be minimal as the CMA is not directly connected to neighboring groundwater basins.

ES Chapter 4: Projects and Management Actions (GSP Section 4)

Projects and Management actions (PMAs) will be implemented to maintain groundwater sustainability in the CMA. The PMAs are categorized into four groups based on when each PMA would be implemented. Group 1 PMAs would be initiated within the first year after GSP submittal. Group 1 Management Actions such as water conservation, pumping fees and the installation of well meters are anticipated to close any shortfalls in maintaining the sustainable yield identified in the water budget and maintain sustainability goals. Additional Group 1 PMAs will increase water supplies further such as increased recharge through stormwater capture and supplemental imported water projects.

If Group 1 PMAs fail to have the expected results, then further actions through the implementation of other PMA groups 2, 3, and 4 will be required. PMAs in Group 2 and 3 will be implemented when the early warning and Minimum Threshold triggers for the sustainability indicators are reached.

The CMA GSA is taking an adaptive management approach to CMA management over the planning horizon. Consequently, potential projects and management actions will continuously be considered and evaluated over the planning horizon to ensure that the most beneficial and economically feasible projects and management actions are implemented to achieve the sustainability goal in the CMA and Basin. Proposed projects and management actions may be modified, as necessary, if the intended project benefits are not realized in the intended timeframe.

ES Chapter 5: Plan Implementation (GSP Section 5)

This chapter describes actions to implement this GSP. Five implementation categories are described.

Implementation Group 1 is completion of work started during the drafting of this GSP. This is completion of data collection and survey work that commenced during the development of this GSP. This includes surveying all representative wells in the representative monitoring network. Additionally, data collected during the SkyTEM Airborne Geophysics aerial electromagnetic survey will be evaluated and used to update the existing geologic model, hydrogeologic conceptual model and numeric groundwater model.

Implementation Group 2 resolves data gaps in the monitoring network and the conceptual framework as identified in this GSP. This includes determining information about monitoring wells that currently have no well perforation information by video surveying and sounding, and working with landowners on adding voluntary wells to the water level and quality monitoring network. A new piezometer will also be needed to assess and monitor a potential GDE on Santa Rosa Creek. New surface water measurements will also be taken on the Santa Ynez River at the CMA/WMA boundary to better quantify the amount of surface flow leaving the CMA.

Implementation Group 3 implementation items are data collection actions to allow for improved management of the CMA. Efforts to improve data collection information on water use in the Basin will be done, including the collection of additional information from well owners. In addition, the GSA will require the installation of water meters on all wells (excluding *de minimis* domestic wells).

Implementation Group 4 and Implementation Group 5 is improved data management and SGMA updates. The former consists of update and utilized the data management system, the latter is completing SGMA annual reports (first due in 2022) and 5-year assessment and updates to the GSP (first due in 2027) will be done as required by SGMA.

Groundwater Sustainability Plan

Executive Summary

CMA

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

Geosyntec consultants

STETSON ENGINEERS INC.

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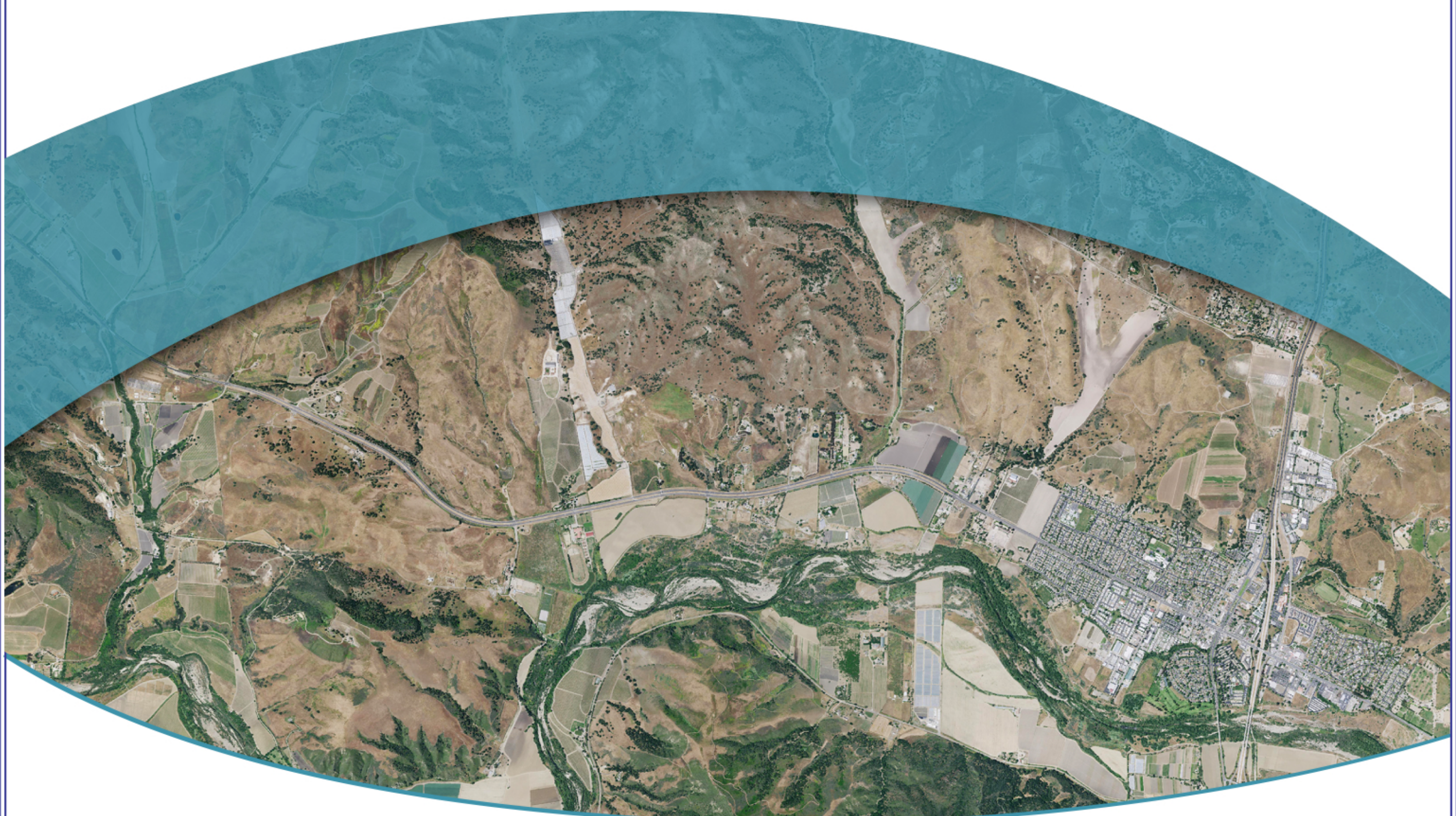
First Annual Report Water Year 2021

CMA

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



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