Groundwater Sustainability Plan for the Santa Ynez River Valley Groundwater Basin Bulletin 118 Basin No. 3-15 Central Management Area Groundwater Sustainability Agency

CMA

Central Management Area

January 2022

Geosyntec consultants

Stetson Engineers Inc.

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WATER RESOURCE PROFESSIONALS
SERVING CLIENTS SINCE 1957

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COVER PHOTOGRAPHS

Front Cover: Grapes and Flags, graphics produced as alternative logo for the Central Management Area and photo of Central Management Area Field taken October 22, 2019.

Back Cover: Photo of boundary of Western Management Area and Central Management Area taken October 22, 2019.

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SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

CENTRAL MANAGEMENT AREA

Groundwater Sustainability Plan

January 2022

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Central Management Area

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LIST OF ACRONYMS AND ABBREVIATIONS

3D	three-dimensional
AEM	Airborne Electromagnetic
AF	acre-feet
AFB	Air Force Base
AFY	acre-feet per year
AGR	Agriculture Supply
ANA	Above Narrows Account
Basin	Santa Ynez River Valley Groundwater Basin
BCM	Basin Characterization Model
BLM	Bureau of Land Management
BMP	Best Management Practices
CAG	Citizen Advisory Group
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CCRWQCB	Central Coast Regional Water Quality Control Board
CCTAG	Climate Change Technical Advisory Group
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CFS	cubic feet per second
CGPS	Continuous Global Positioning System
CIMIS	California Irrigation Management Information System
CMA	Central Management Area
COMB	Cachuma Operation and Maintenance Board
CRCD	Cachuma Resource Conservation District
CSOB	County of Santa Barbara
CSD	Community Services District
CTA	Conservation Technical Assistance
CWC	California Water Code

DAC	Disadvantaged Communities
DBID	Database Identification Number
DDW	Division of Drinking Water
DMS	Data Management System
DO	Dissolved Oxygen
DPS	Distinct Population Segment
DRINC	Drinking Water Information Clearinghouse
DWR	Department of Water Resources
EIR	Environmental Impact Report
EMA	Eastern Management Area
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ET	Evapotranspiration
FY	Fiscal Year (July 1 through June 30)
GAMA	Groundwater Ambient Monitoring Assessment
GC	Groundwater Conditions
GCM	Global Circulation Model
GDE	Groundwater Dependent Ecosystem
GPM	gallons per minute
GPS	Global Positioning System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWMP	Groundwater Management Plan
HCM	Hydrogeologic Conceptual Model
HUC	Hydrologic Unit Codes
ID No.1	Improvement District No. 1
ILRP	Irrigated Lands Regulatory Program
IND	Industrial Service Supply
InSAR	Interferometric Synthetic Aperture Radar
IRWM	Integrated Regional Water Management
LSYR	Lower Santa Ynez River

LUST	Leaking Underground Storage Tanks
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
mg/L	milligrams per liter
MOU	Memorandum of Understanding
MUN	Municipal and Domestic Supply
MWC	Mutual Water Company
NCCAG	Natural Communities Commonly Associated with Groundwater
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCE	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OEP	Outreach and Engagement Plan
OWTS	In-site Wastewater Treatment System
PCPD	per capita per day
PROC	Industrial Process Supply
RWQCB	Regional Water Quality Control Board
SBCAG	Santa Barbara County Association of Governments
SBCFCWCD	Santa Barbara County Flood Control and Water Conservation District
SBCWA	Santa Barbara County Water Agency
SDAC	Severely Disadvantaged Communities
SDWIS	Safe Drinking Water Information System
SFB	Space Force Base
SGMA	Sustainable Groundwater Management Act
SMCL	Secondary Maximum Contaminant Level
SSC	Species of Special Concern
SWGP	Stormwater Grant Program
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
TDS	Total Dissolved Solids
USBR	United State Bureau of Reclamation
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USP	United States Penitentiary
UWMA	Urban Water Management Act
UWMP	Urban Water Management Plan
VAFB	Vandenberg Air Force Base
VSFB	Vandenberg Space Force Base
WDR	Waste Discharge Requirement
WMA	Western Management Area
WQO	Water Quality Objective
WR	Water Rights Order
WY	Water Year (October 1 through September 30)
µg/L	micrograms per liter

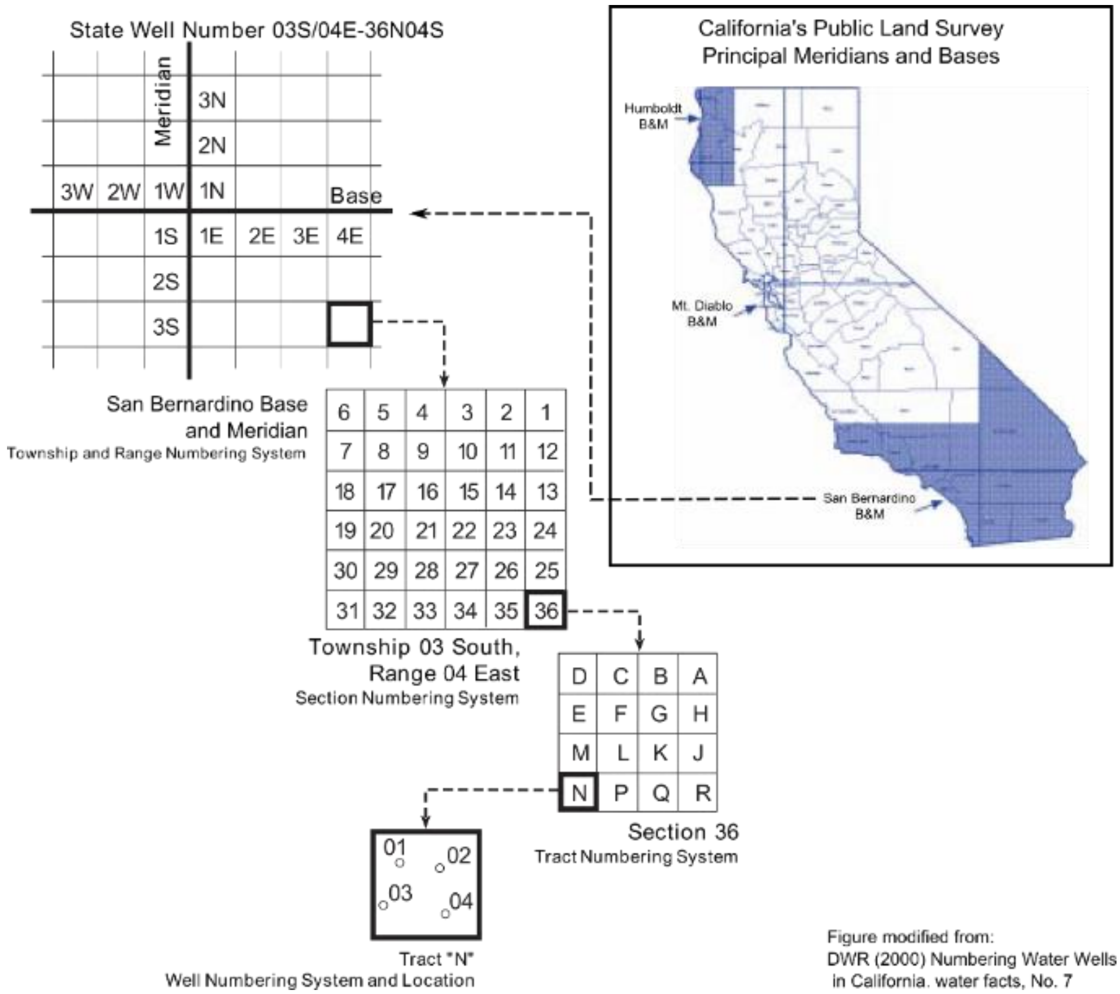
GEOLOGIC UNITS:

QG	Geologic Unit, River Channel Deposits
QAL	Geologic Unit, Younger Alluvium
QOS	Geologic Unit, Older Dune Sands
QOA	Geologic Unit, Terrace Deposits / Older Alluvium
QO	Geologic Unit, Orcutt Sand
QTP	Geologic Unit, Paso Robles Formation
TCA	Geologic Unit, Careaga Sand
TF	Geologic Unit, Foxen Formation
TSQ	Geologic Unit, Sisquoc Formation
TM	Geologic Unit, Monterey Formation

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 based on the public land grid, and includes the township, range, and section in which the well is located. Each section is further subdivided into sixteen 40-acre tracts, which are assigned a letter designation as shown below. All wells in Santa Ynez use the San Bernardino ("S") base line and meridian, so this letter is generally omitted. Lands not part of the Bureau of Land Management Cadastral survey, such as Mexican Land grants land map are interpolated from other sources. In maps and in texts monitoring wells by their section, tract, and well number, following the United States Geologic Survey (USGS) convention for abbreviation. If the township and range are otherwise made obvious, the well may be shortened further to section, track, and well numbers. Occasional exceptions to this naming scheme are made for wells drilled or used for other purposes.

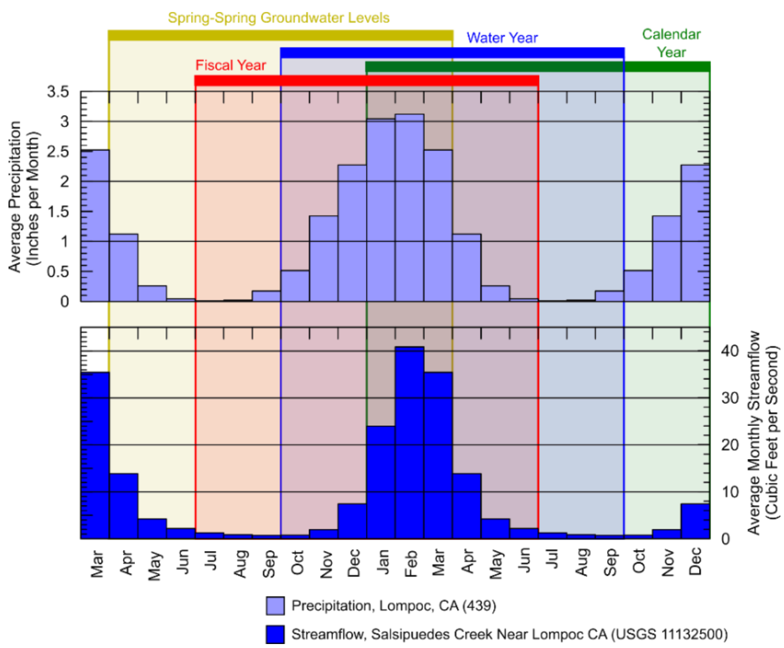
The USGS 15-digit well number based on degrees, minutes, and seconds of latitude (6 digits) and longitude (7 digits) and sequential number (2 digits) are also shown on wells that are part of the USGS databases. Finally, a 4-digit unique database identification number (DBID) is used in the database management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



California Department of Water Resources' Numbering System for Water Wells

WATER YEAR DESCRIPTION

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



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

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EXECUTIVE SUMMARY

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.

CHAPTER 1: INTRODUCTION AND PLAN AREA

SECTION 1A – INTRODUCTION

The Sustainable Groundwater Management Act (SGMA)[1], signed into statue on September 16, 2014, includes a structure and schedule to achieve sustainable groundwater management within 20 years. SGMA requires that groundwater basins identified by the California Department of Water Resources (DWR), as medium and high priority basins must achieve sustainability by January 31, 2042. To meet this goal, State law requires the creation and implementation of a Groundwater Sustainability Plan (GSP) for each basin. The Santa Ynez River Valley Groundwater Basin (SYRVGB), defined by DWR as Basin 3-15 (DWR 2016), is classified as a medium priority groundwater basin and requires submittal of a GSP by January 31, 2022

Local agencies recognized that the 317.4 square miles of the SYRVGB contains diverse physical and human geographies, resulting in the creation and coordination of three distinct management areas within the SYRVGB. The three distinct areas are defined as the Eastern, Central and Western Management Areas. This document is the GSP for the Central Management Area (CMA) portion of the SYRVGB (**Figure 1a.1-1**).

The CMA Groundwater Sustainability Agency (GSA) is responsible for preparing and implementing a GSP for the Central portion of the SYRVGB. Two additional GSPs are being prepared for the Western Management Area (WMA) and the Eastern Management Area (EMA). The three GSAs are being coordinated by the Santa Ynez River Water Conservation District.

The CMA GSA was formed by a Memorandum of Agreement (MOA) between the City of Buellton, the Santa Ynez River Water Conservation District and Santa Barbara County (**Figure 1a.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.

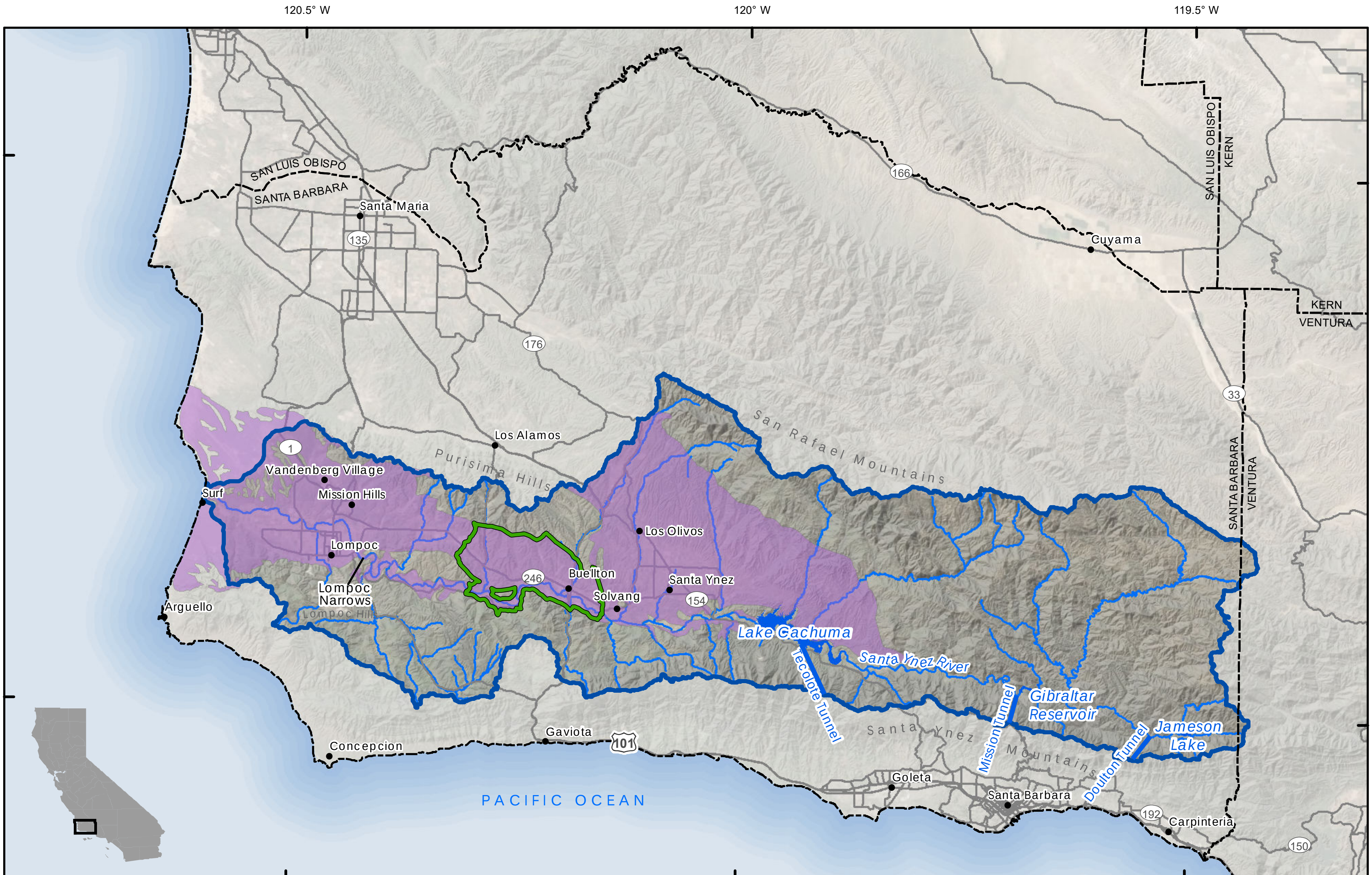
1 CWC Section 10720 et seq. and 23 CCR § 350 et seq.

The CMA encompasses approximately 33 square miles of the central portion of the Santa Ynez River Valley Groundwater Basin. The CMA has a complex geology and geography and is divided into two subareas: the Buellton Upland and the Santa Ynez River alluvium.

Table 1a.1-1 identifies the Management Areas of the Santa Ynez River Valley Groundwater Basin. Locations for each Management Area are shown in Figure 1a.1-2.

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

Management Area	Physical Description	Committee Member Agencies
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)
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)
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



Central Management Area

Santa Ynez River Watershed

Santa Ynez River Valley

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SANTA YNEZ RIVER WATERSHED AND SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

CENTRAL MANAGEMENT AREA

0 4 8 Miles

N

FIGURE 1a.1-1

Document Path: J:\jn2710\SYRwatershed_GW_basin_CMA_.mxd

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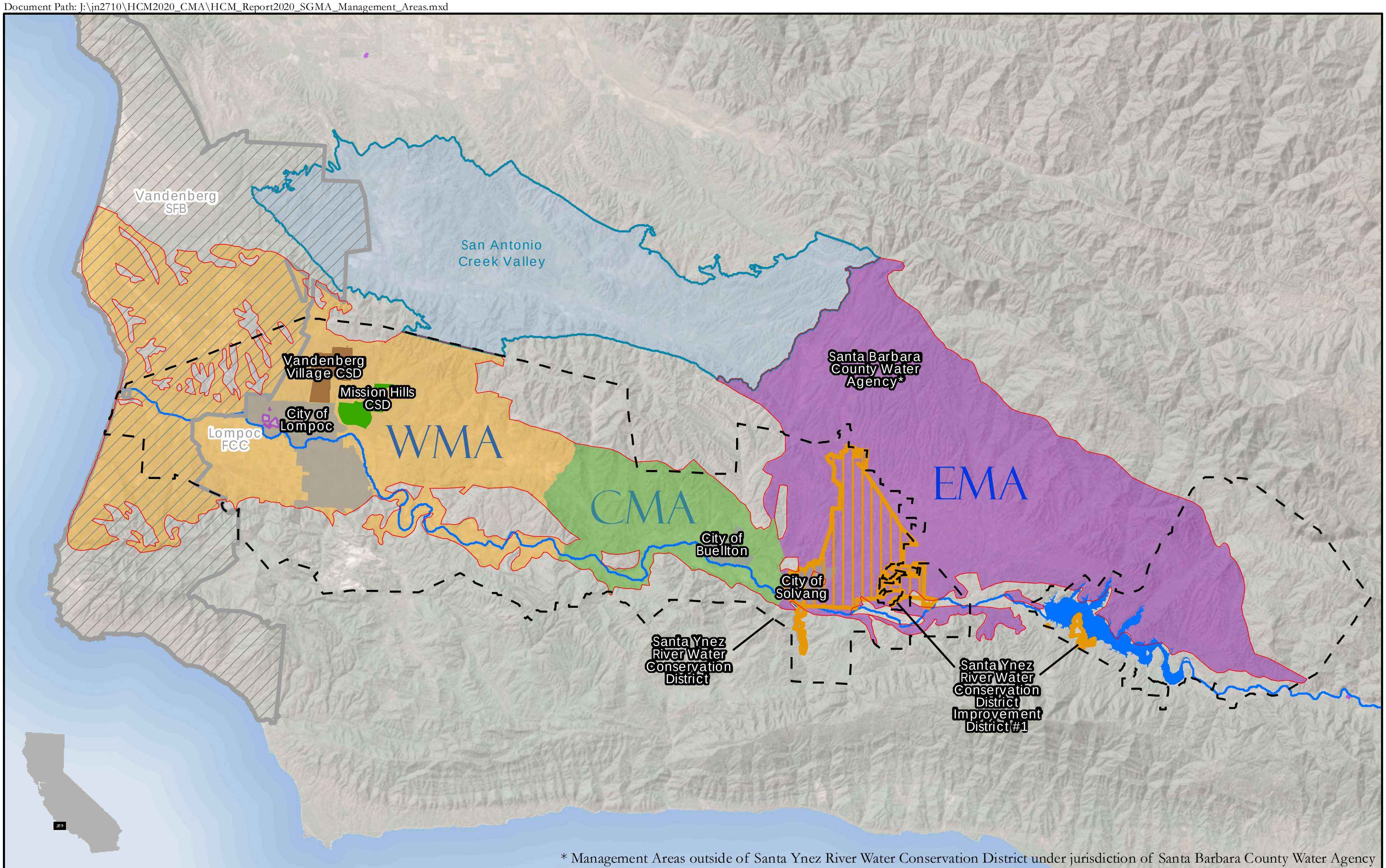
Document Path: J:\jn2710\HCM2020_CMA\HCM_Report2020_SGMA_Management_Areas.mxd



* Management Areas outside of Santa Ynez River Water Conservation District under jurisdiction of Santa Barbara County Water Agency

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Western Management Area (WMA)

Central Management Area (CMA)

Eastern Management Area (EMA)

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

(DWR BULLETIN 118 BASIN NO. 3-105)

AND SGMA MANAGEMENT AREA BOUNDARIES

0 2 4 Miles

N

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

FIGURE 1a.1-2

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1A.1 PURPOSE OF THE GROUNDWATER SUSTAINABILITY PLAN

The purpose of this GSP is to ensure that groundwater is managed sustainably within the groundwater basin. The GSP must also determine how the basin will achieve sustainable groundwater management within a 20-year period through monitoring and management actions.

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.

The California legislature identified the following specific goals that intended to be achieved as a result of the execution of the SGMA (California Water Code [CWC] Section 10710.2):

> In enacting this part, it is the intent of the Legislature to do all of the following:
>
> (a) To provide for the sustainable management of groundwater basins.
>
> (b) To enhance local management of groundwater consistent with rights to use or store groundwater and Section 2 of Article X of the California Constitution. It is the intent of the Legislature to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater.
>
> (c) To establish minimum standards for sustainable groundwater management.
>
> (d) To provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater.
>
> (e) To avoid or minimize subsidence.

(f) To improve data collection and understanding about groundwater.

(g) To increase groundwater storage and remove impediments to recharge.

(h) To manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner.

(i) To provide a more efficient and cost-effective groundwater adjudication process that protects water rights, ensures due process, prevents unnecessary delay, and furthers the objectives of this part.

1A.2 SUSTAINABLE MANAGEMENT INDICATORS

Sustainable conditions occur when undesirable results are mitigated, or are not occurring in the Basin. In accordance with SGMA[2] there are six potential undesirable results that must be considered. These potential undesirable results are listed below, and are discussed in detail in Section 3b of this GSP, which details Sustainable Management Criteria.

1. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon
2. Significant and unreasonable reduction of groundwater storage
3. Significant and unreasonable seawater intrusion
4. Significant and unreasonable degradation of water quality
5. Significant and unreasonable land subsidence
6. Depletion of interconnected surface water and groundwater that has significant and unreasonable adverse impacts on beneficial uses of the surface water.

This GSP is a tool developed by the GSA, within input from the public and a CMA Citizen Advisory Group (CAG), to support sustainable management of, and sustainable decision-making for, the CMA.

[2] CWC Section 10721 (x), 23 CCR § 354.28(c), 23 CCR § 354.34(c),

1A.3 GROUNDWATER SUSTAINABILITY PLAN ORGANIZATION

This GSP was developed in accordance with SGMA and the DWR-prepared Best Management Practices (BMP) and Guidance Documents. The GSP is organized as outlined below in **Table 1a.3-1**, following SGMA regulations.[3] Figures and tables are organized, labeled, and numbered accordingly.

3 23 CCR Division 2 Chapter 1.5 Subchapter 2 Article 5. Plan Contents

Table 1a.3-1
Organization of the Groundwater Sustainability Plan

Chapter	Section	Title	Short Description
ES	Executive Summary		Summarizes the contents of the report
1	Introduction and Plan Area		
	a	Introduction	Introduces Plan Purpose and Contents
	b	Administrative Information	Information about Agency and Governance
	c	Notices and Communication	Outreach and Engagement
	d	Plan Area	Extents and geography of the Management Area: Subareas, Water Agencies, Governments, Well Density, Regulatory Programs, Management Plans, Population, and Land Use Considerations
	e	Additional GSP Elements	Supplemental Plan Content
2	Basin Setting		
	a	Hydrogeologic Conceptual Model	Conceptual components of groundwater system: Geology, Aquifers, Inflows, Outflows
	b	Groundwater Conditions	Current and historical status of the Basin: Water Levels, Storage, Seawater Intrusion, Groundwater Quality, Land Subsidence, and Interconnected Surface Water
	c	Water Budget	Flow between components of the groundwater system: Historical, Current, and Projected
3	Monitoring Network and Sustainable Groundwater Management Criteria		
	a	Monitoring Network	Current and representative monitoring
	b	Sustainable Management Criteria	Sustainability goal, potential undesirable results, minimum thresholds, and measurable objectives
4	Project and Management Actions		Potential ways to improve sustainability as needed.
	a	Overview	Overview of all Projects and Management Actions.
	b	Planned	Group 1: Planned Project and Management Actions.
	c	Responsive	Group 2 & 3: Project and Management Actions planned to respond to Early Warning or Minimum Threshold conditions.
	d	Supplemental	Group 4: Additional Projects and Management Actions to implement as a fallback if results are not met.
5	Plan Implementation		
	a	Implementation Projects	Projects and actions to resolve data gaps and implement the GSP.
	b	Implementation Timeline	Timeline of implementation projects.
	c	Plan Funding	Funding opportunities.
6	References		Works cited and relied upon.
7	Appendices		Supporting documents and analysis and public comments.

SECTION 1B – ADMINISTRATIVE INFORMATION

1B.1 AGENCY BACKGROUND

The California Department of Water Resources (DWR) identified the SYRVGB as a medium priority basin (DWR 2020). As such the associated groundwater sustainability agency (GSA) must submit a GSP by January 31, 2022 to comply with the SGMA statute[4] and SGMA regulations[5]. Major organizational documents that supported the development of this GSP are shown in **Figure 1b.1-1**.

On May 23, 2016 SYRVGB public water agencies executed a Memorandum of Understanding (MOU) (Appendix 1b-A) which organized the SYRVGB according to three separate management areas, creating the CMA, WMA, and EMA. The Central Management Area Groundwater Sustainability Agency (CMA GSA) was formed after the "*Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Central Management Area in the Santa Ynez River Valley Groundwater Basin*" (MOA) dated January 11, 2017 (Appendix 1b-B).

To adopt the MOA, ratification occurred by all three CMA member agencies. On November 10, 2016, the Buellton City Council passed Resolution 16-26 wherein the City of Buellton resolved to become a member of the CMA GSA in cooperation with the other CMA member agencies. On December 6, 2016, the Board of Supervisors for Santa Barbara County, serving as Santa Barbara County Water Agency (SBCWA) Directors, passed Resolution 16-284 wherein the SBCWA resolved to become a member of the CMA GSA in cooperation with the other CMA member agencies. On January 11, 2017, the Board of Directors for the Santa Ynez River Water Conservation District (SYRWCD) passed Resolution 665 wherein the SYRWCD resolved to become a member of the CMA GSA in cooperation with the other CMA member agencies.

4 CWC Section 10720 et seq.
5 23 CCR § 350 et seq.

The three GSAs for the SYRVGB have coordinated to ensure consistency between the three GSPs prepared in the Basin. The GSPs are being prepared under a SGMA compliant coordination agreement[6] as specified in SGMA. The three SYRVGB GSAs have conferred on governance, starting with the MOU in 2016 followed by the "*Intra-Basin Administrative Agreement for Implementation of the SGMA in the Santa Ynez River Valley Groundwater Basin*" (Appendix 1b-C) dated February 26, 2020. The SYRVGB Coordination Agreement between the WMA, CMA, and EMA will be included as Appendix 1b-D.

1b.1-1 Organizational and Management Structure of the Central Management Agency

GSA Mailing Address

Central Management Area Groundwater Sustainability Agency
P.O. Box 719
Santa Ynez CA 93460

GSA Physical Address

Central Management Area Groundwater Sustainability Agency
3669 Sagunto St., Suite 101
Santa Ynez CA 93460

Plan Manager Contact Information

William J. Buelow, Water Resources Manager
Santa Ynez River Valley Groundwater Basin Central Management Area GSA
P.O. Box 719, 3669 Sagunto Street, Suite 108 | Santa Ynez, CA 93460
805-693-1156 | bbuelow@syrwcd.com

6 CWC Section 10721 (d) "Coordination agreement" means a legal agreement adopted between two or more groundwater sustainability agencies that provides the basis for coordinating multiple agencies or groundwater sustainability plans within a basin pursuant to this part

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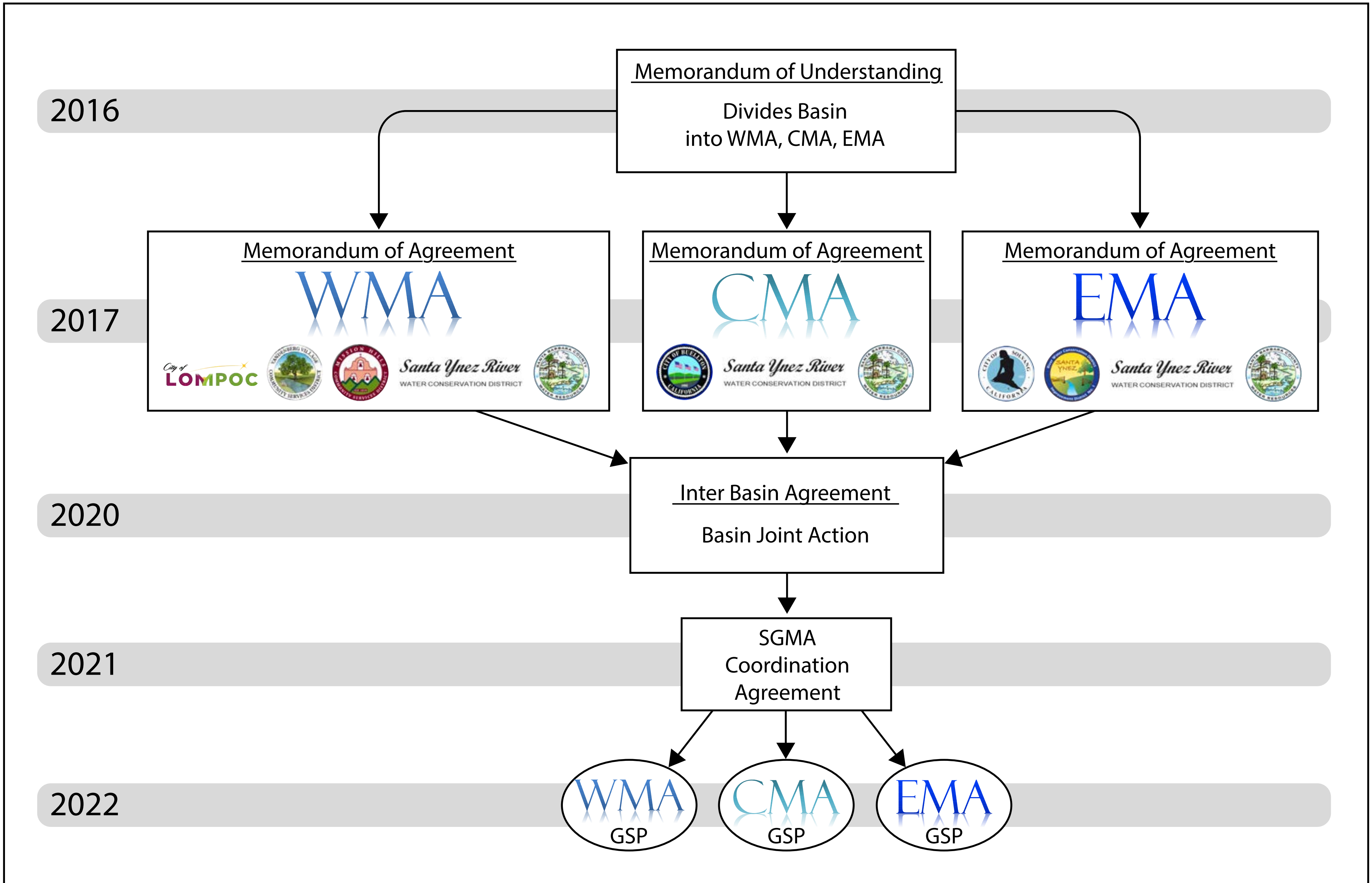

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SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
SGMA ORGANIZATIONAL DOCUMENTS

FIGURE 1b.1-1

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1b.1-2 Governance

Governance of the CMA GSA is described in the "*Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Central Management Area in the Santa Ynez River Valley Groundwater Basin*" (Appendix 1b-B). The CMA GSA is governed by a committee of representatives from each member agency. However, votes are weighted. There are two voting committee members representing the SYRWCD and City of Buellton, and one non-voting committee member representing the SBCWA. The SBCWA is represented by a person or persons as appointed by the Board of Supervisors for Santa Barbara County, serving as Water Agency Directors.

A quorum to transact business requires both voting member agencies are present. To pass any proposition or resolution, a unanimous vote of both member agencies is required.

1b.1-3 Legal Authority

As part of its creation, the authorizing resolutions for the GSA Committee granted it authority to have all powers that a GSA is authorized to exercise as provided by the SGMA, including developing a GSP consistent with the Act and DWR's regulations and imposing fees to fund GSA and GSP activities (Appendix 1b-B).

As the sole GSA for the CMA, the CMA GSA has the legal authority to manage groundwater within the CMA pursuant to SGMA. As such, SGMA grants the CMA GSA broad powers, including: the legal authority to: conduct investigations; adopt rules, regulations, ordinances and resolutions; require registration of groundwater extraction facilities and measurement of groundwater extractions by a water-measuring device satisfactory to the GSA; enter into written agreements and funding with private parties to assist in, or facilitate the implementation of, a GSP or any elements of the GSP; provide for the measurement of groundwater extractions; regulate groundwater extractions; impose fees on the extraction of groundwater and to fund the costs of groundwater management; and perform any act necessary or proper to carry out the purposes of SGMA.[7]

[7] CWC Sections 10725, 10725.2, 10725.4, 10725.6, 10725.8, 10726.2, 10726.4, 10726.5, 10730, 10730.2

In accordance with CWC Section 10720.5 (b) "*Nothing in this part, or in any groundwater management plan adopted pursuant to this, part determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights.*" Accordingly, this GSP does not determine or alter such surface water or groundwater rights.

1b.1-4 Implementation and Costs

As plans related to implementation of specific projects are developed, the public will be provided opportunity to review and provide comments to the CMA GSA committee.

Pursuant to CWC Section 10730, the CMA GSA is authorized to fund the costs of groundwater management by imposing fees on the extraction of groundwater or through a parcel tax or fee. The CMA GSA committee in coordination with the other two GSAs in the Basin, are evaluating the type of fee they will use to fund implementation and future project and management actions.

The CMA GSA is funded by a cost sharing agreement between the two voting CMA member agencies develop a GSP and perform related studies as approved by the CMA GSA Committee. The SBCWA, as a non-voting member, is not responsible for any other costs related to the CMA GSP development. All member agencies are responsible for their own costs to attend and participate in the CMA GSA committee.

Future implementation of the CMA GSP is described Chapter 5 of this GSP. **Table 1b.1-1** is a summary of potential implementation costs of this GSP. These costs are anticipated to be funded through fees created by the GSA, and or cost-sharing between agencies. There may be opportunities to obtain implementation grants from the State of California.

Table 1b.1-1
Summary Implementation Costs to Manage CMA Groundwater

Implementation Projects			
Task	Type	Completion	Additional Cost Estimates [A]
Surveying Representative Wells	One Time	WY 2023	\$2,000 - \$4,000
SkyTEM Airborne Geophysics	One Time	WY 2023	Already funded
Video Logging and Sounding Wells	One Time	WY 2023	\$7,500 - \$12,000
Add new GWL Monitoring	One Time	WY 2023	\$8,000 - \$12,000
SW Gage Installation (planning)	One Time	WY 2023	GSA Overhead [B] (\$10,000)
Well Registration Update	One Time	FY 2023-2024	GSA Overhead [B] (\$20,000)
Well Metering Requirement	One Time	CY 2023	GSA Overhead [B] (\$20,000 - \$40,000)
Data Updates	Annual	Ongoing	\$10,000 - \$15,000
SMGA WY Annual Reports	Annual	Ongoing	\$30,000 - \$50,000 [D]

[A] Estimates are in 2021 dollars. Costs are to the GSP, certain tasks include mandates for well owners.
[B] Estimated as primarily GSA staff time to administer program.
[C] CMA portions assuming continuing cost share with WMA.
[D] Estimate for first year, mature report likely starting with third annual report, estimated as \$20,000 per year.

Projects and management actions that would improve sustainability and resilience of the CMA groundwater are discussed in Chapter 4 of this GSP. Several projects to improve sustainability that are recommended under all basin conditions are summarized in **Table 1b.1-2**. These costs are anticipated to be funded through the GSA fees, agency cost sharing and potentially State grants.

Table 1b.1-2
Sustainability Project and Management Actions: General Management Summary Costs for CMA

Sustainability Project and Management Action			
Project and Management Action	Proposed Completion	Additional Cost Estimates [A]	Annual Implementation Costs [B]
Water Conservation Plan	WY 2023	\$50,000 - \$75,000	\$30,000 - \$40,000
Tired Groundwater Extraction Plan	WY 2023	\$100,000 - \$175,000	GSA Overhead [C] (\$40,000 - \$50,000)
Supplemental Imported Water Program	WY 2023	\$100,000 - \$120,000	Need Dependent
Buellton Upland Bioretention Bioswale Network Project (Design and Benefits Study)	WY 2022	\$25,000 - \$35,000	Design Dependent Install Costs

[A] All estimates are in 2021 dollars. Costs are to the GSP, certain items may include costs to other parties.
[B] Actual implementation costs will depend on results of particular suitability project and management action.
[C] Estimated as primarily GSA staff time to administer program.

1B.2 INTRA-BASIN COORDINATION BETWEEN MANAGEMENT AREAS

SGMA statute requires that multiple GSAs coordinate when developing GSPs in a single groundwater basin, such as in the Santa Ynez River Valley Groundwater Basin with the WMA, CMA, and EMA. The SGMA statue (CWC Section 10727.6) states:

> When Multiple Plans Cover a Basin. Groundwater sustainability agencies intending to develop and implement multiple groundwater sustainability plans [...] shall coordinate with other agencies preparing a groundwater sustainability plan within the basin to ensure that the plans utilize the same data and methodologies for the following assumptions in developing the plan:
>
> (a) Groundwater elevation data.
>
> (b) Groundwater extraction data.
>
> (c) Surface water supply.
>
> (d) Total water use.
>
> (e) Change in groundwater storage.
>
> (f) Water budget.
>
> (g) Sustainable yield.

During the GSP development process the CMA GSA and WMA GSA shared the same consultant team and document prepares to ensure that the two plans used the same data and methodologies. To coordinate with the EMA GSA, numerous meetings and conference calls were held between the two consultant teams to coordinate activities in each management area so that the requirements for intra-basin coordination were met. As of September 1, 2021, the CMA consultant team met with the EMA consultant team for over 40 meetings or conference calls during development of the technical elements of the GSP. Additionally, CMA consultant team regularly attended the EMA GSA committee meetings to receive public updates on EMA activity.

SECTION 1C – NOTES AND COMMUNICATION

This section addresses 23 CCR § 354.10 of the SMGA regulations, which relates to notification and communication of the CMA with other agencies and interested parties during the development of this GSP. This section documents the efforts made to inform, involve, and empower constituents as well as the broader public, while meeting the requirements of SGMA.

1C.1 COMMUNICATION

1c.1-1 Public Outreach and Engagement Plan

On July 29, 2019, the CMA GSA released the draft Outreach and Engagement Plan (OEP) with the goals of providing the framework to provide individual stakeholders, stakeholder organizations, and other interested parties an opportunity to be involved in the development and evaluation of this GSP and future actions of the GSA. After a 123-day public comment period, a draft final OEP released on February 24, 2020. The OEP, included as **Appendix 1c-A** of this GSP, describes the steps the CMA GSA has taken, and will continue to take, to encourage public involvement during the development and implementation phases of this GSP. The OEP includes a list of identified stakeholders as of 2020 and describes the methods the CMA GSA has used to identify additional stakeholders, solicit public involvement, and feedback, and consider stakeholder comments and concerns during the development of, and future implementation of, this GSP.

1c.1-2 Identified Stakeholders in the Plan Area

Stakeholder categories within the CMA Plan Area are summarized in **Table 1c.1-1**.

Table 1c.1-1
Stakeholder Categories in the CMA Plan Area

Category of Interest	Examples of Stakeholder Groups	Engagement Purpose
General Public	General public	Inform to improve public awareness of sustainable groundwater management
Land Use	County of Santa Barbara City of Buellton	Consult and involve to ensure land use policies are supporting GSP and vice-versa
Private Users/Agriculture	Domestic users Agricultural users	Inform and involve to avoid negative impact to these users. Collaborate to ensure sustainable management of groundwater
Urban/ Recreational Users	City of Buellton Small mutual water systems Golf courses	Collaborate to ensure sustainable management of groundwater
Environmental and Ecosystem	California Department of Fish and Wildlife National Marine Fisheries Service	Inform and involve to sustain a vital ecosystem
Economic Development	City of Buellton Mayor Holly Sierra County District 3 Supervisor Joan Hartmann State Assembly Member Steve Bennett State Senator Monique Limón	Inform and involve to support a stable economy
Human Right to Water	Domestic water users Disadvantaged communities	Inform and involve to provide safe and secure groundwater supplies to DACs
Integrated Water Management	Regional water management groups (IRWM regions)	Inform, involve, and collaborate to improve regional sustainability

Notes: DAC = disadvantaged community; IRWM = Integrated Regional Water Management. There are no Federally-Recognized Tribes within the CMA, however, the Santa Ynez Band of Chumash Mission Indians of the Santa Ynez Reservation is located in the EMA.

Disadvantaged communities (DAC) and severely disadvantaged communities (SDAC) are geographical areas where the median income is 80% or 60% respectively of statewide annual median household income.[8] Population demographics are discussed further in Section 1d.6-1 (Plan Area). No DACs or SDACs were identified within the CMA Plan Area, however, the City of Lompoc a Member Agency of the adjacent WMA management area is considered a DAC.

[8] The DAC and SDAC definitions do not take into account relative cost of living throughout the state.

There are no Federal or state recognized Native American tribal lands within the CMA. However, the Santa Ynez Band of Chumash Indians are located within the groundwater basin with a reservation located within the EMA.

1c.1-3 Decision Making Process

Decisions by the GSP are made by the Committee, which is made up of representatives of the public water agencies within the basin. Governance (Section 1b.1-2) describes the voting mechanics for the GSA which is based in part on the financial contribution of each agency. These public agencies are elected by constituents within the CMA.

When particular issues are identified, they are first directed to the technical consultant team for appraisal. Technical consultants then meet with the agency staff. Depending on the topic this may include review by legal staff. Recommendations are then presented to the Committee for consideration, or for further direction.

1c.2 Public Engagement

1c.2-1 Public Meetings and Public Meeting Notices

The Central Management Area Groundwater Sustainability Agency (CMA GSA) was formed by the City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency. 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. Meetings of the CMA GSA Committee are called, noticed, and conducted subject to the provisions of the Ralph M. Brown Act (Govt. Code sections 54950 et seq.).

Appendix 1c-B includes a list of public meetings that have been held to date for the CMA GSA as well as meetings of the CMA Citizens Advisory Group (described below). In accordance with Governor of California issued Executive Orders N-25-20 and N-29-20, which temporarily waived requirements in the Bagley-Keene Act and Brown Act, meetings were convened during the SARS-CoV-2 (COVID-19) pandemic via video teleconference and phone. The Governor of California issued Executive Orders N-33-20 and California State Department of Public Health Order of March 19, 2020 required a stay-at-home directive.

Additionally, Santa Barbara County Public Health, Health Officer Order No. 2020-12.5 prohibited all gatherings within the County. **Appendix 1c-C** includes the reference Proclamations, Executive Orders, Health Orders, and Health Officer Orders.

1c.2-2 Citizens Advisory Group

As part of public outreach and communication, the CMA GSA Committee created the Citizens Advisory Group (CAG) to provide the GSA focused public input from representatives of different categories of groundwater uses and users in the CMA.

CAG members are members of the public who volunteered to participate in reviewing sections of the Draft GSP and other materials produced by the CMA GSA. Members of the community were invited to apply to the CAG. An ad-hoc selection committee reviewed applicants and made a recommendation to the CMA GSA Committee. The CMA GSA Committee considered the recommendations and then appointed a slate of members to the CAG. The CAG membership reflects a diversity of interests and different types of groundwater uses and users in the CMA. As requested by the Committee, the CAG provides input to the GSA by reviewing sections of the GSP and other materials and providing comment for CMA GSA consideration. The CMA GSA member agency staff organized and facilitated the CAG meetings.

CMA CAG members reviewed the following documents:

- Outreach and Engagement Plan;
- Data Management Plan;
- Subsurface Three-Dimensional Geology Technical Memorandum;
- Hydrogeologic Conceptual Model;
- Groundwater Conditions;
- Numeric Groundwater Model;
- Water Budgets;
- Sustainability Management Criteria;
- Monitoring Network.

As with the CMA GSA committee meetings, CMA CAG meetings were convened during the SARS-CoV-2 pandemic via phone and video teleconference. Appendix 1c-A includes a list of meeting dates and topics for the CMA CAG. Appendix 1c-B includes the reference Proclamations, Executive Orders, Health Order, and Health Officer Orders.

1c.2-3 Newsletters and Press Releases

The three management areas of the Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB) coordinated in creating newsletters and press releases to notify the public about the development of the GSP throughout the SYRVGB. Copies of the newsletters and press releases created to date are included as **Appendix 1c-D**.

Newsletters are one-page documents about the SYRVGB, the CMA GSA, and CMA GSP developments. The newsletters were distributed in both English and Spanish. Translation services were provided by DWR's Written Translation Service. The newsletters were distributed in member agency utility bills, e-mailed to interested parties, and posted on the SGMA website for the Basin (below, Section 1c.1-4).

Press releases were also produced and sent to local media organizations about specific topics. As an example, one such press release reported on helicopter flights that were used as part of the Aerial Electromagnetic Method (AEM) survey in November 2020.

1c.2-4 Communication Website: SantaYnezWater.Org

The three management areas of the SYRVGB coordinated in creating a single website for communication and outreach located at: https://www.santaynezwater.org

This website is a centralized location where updates regarding SGMA activities across the basin are made available. It has been a tool to engage and inform the public and to allow for public involvement in developing the GSP.

Features of this website include a tool to enter physical addresses to identify a management area of interest and obtain additional information about each GSA. Members of the public can register as interested parties for one, or all of the SYRVGB management area GSAs (WMA, CMA or EMA), and receive emails regarding upcoming events such as GSA or CAG meetings or documents available for public review and comment.

The website also includes items related to noticing and archiving GSA activities including a calendar of GSA meetings, both past and present, upcoming events, and public comment periods, both past and present. Minutes and meeting packets from GSA meetings are made available through the website.

Additionally, the website provided opportunity for the public review process used in developing this GSP. Draft documents released to the public were posted to this website, which included a public comment tool to allow individuals to comment on a specific document, or part of documents or make a general comment.

Appendix 1c-E provides additional information about the SantaYnezWater.Org website.

1C.3 PUBLIC COMMENTS

In accordance with the SGMA regulations[9] the CMA GSA solicited public comments on this GSP as well as supporting draft documents. As described above, request for comments included outreach to specific identified stakeholder groups, running the CAG, newsletters released through multiple channels, press releases, and development and implementation of a communications website.

Written comments received by the CMA GSA are included as Appendix Public Review Comments, located as the last appendix. Public comments were considered throughout the development of the GSP. Comments on draft documents by stakeholder technical consultants identified additional supporting data that was included in this GSP. Comments by State and Federal wildlife agencies resulted in additional clarification about principal aquifer extents, additional discussion of SWRCB Order WR 2019-0148, limits to GSA authority[10] and expanded discussion of wildlife beneficial use including existing biological opinions and wildlife monitoring programs.

9 23 CCR § 354(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.
10 Including CWC Section 10720.5 (b)

1C.4 FUTURE PUBLIC ENGAGEMENT

The groundwater sustainability agency plans to put in place the plans described in this document, which are a result of successful consultation and collaboration with the public. Chapter 4 describes the Project and Management Actions which are the planned to maintain and improve groundwater conditions, and Chapter 5 describes ongoing field tasks which will resolve data gaps, improve monitoring of the basin, as well as plans to address reporting and update requirements. Public engagement and noticing[11] will be an important component of the successful completion of these future projects.

The expected process for notice to the public is planned to follow the methods during this GSP development. Multilingual newsletters sent in all water bills, distribution through the public agencies that are member agencies, as well as notice through the communications website.

[11] 23 CCR § 354.44(b)(1)(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

SECTION 1D – PLAN AREA

This Plan Area section addresses 23 CCR § 354.8 of the SMGA regulations. It reintroduces the geographic areas covered by the GSP, and addresses administrative, statutory, and policy issues, in addition to aspects of the built environment related to water supply and demand.

Section 1d.1, CMA Plan Area Location, reintroduces the overall extents of the Santa Ynez River Valley Groundwater Basin (Basin) and adjacent basins, the division of the Basin into three GSP management areas, coverage of the Basin by SGMA, the extents of the Central Management Area (CMA) within the Basin, and the subareas of the CMA.

Section 1d.2, Summary of Jurisdictional Areas and Other Features, describes agencies with land use jurisdiction and water agencies throughout the CMA.

Section 1d.3, Well Density, describes existing well density throughout the CMA.

Section 1d.4, Water Resources Monitoring and Management Programs, describes existing water resource monitoring and management plans within the CMA.

Section 1d.5, Regulatory Programs, describes existing regulatory programs that are applicable to the CMA.

Section 1d.6, Land Use Considerations, describes land use and projected population numbers, general plans, and other applicable planning efforts.

1D.1 CMA PLAN AREA LOCATION

This GSP for the Central Management Agency addresses the central of three management areas that cover the entire Santa Ynez River Valley Groundwater Basin through a coordination agreement.

1d.1-1 Santa Ynez River Valley Groundwater Basin and Adjacent Basins

Santa Ynez River Valley Groundwater Basin (Basin) is designated by the California Department of Water Resources (DWR) under CWC Section 12924 as one of California's 515 alluvial basins. The Basin (DWR Basin No. 3-015) is a coastal groundwater basin encompassing approximately 317.4 square miles (203,141.4 acres) in central Santa Barbara County (County). The Basin underlies the cities of Solvang, Buellton, and Lompoc, and the unincorporated communities of Santa Ynez, Ballard, Los Olivos, Mission Hills, and Vandenberg Village. The Basin is bounded by the Pacific Ocean on the west, the Purisima Hills and San Rafael Mountains on the north, the Santa Ynez Mountains on the south, and consolidated non-water-bearing rocks of Mesozoic[12] and Tertiary[13] age on the east (DWR 2004; Upson and Thomasson 1951). These consolidated rocks underlie the unconsolidated water-bearing deposits of Tertiary and Quaternary[14] age that comprise the Basin, and define the Basin's lower boundary (Upson and Thomasson 1951). To the north, the Basin boundary is coincident with the boundary of the approximately 105.4 square mile (67,473.7-acre) San Antonio Creek Valley Groundwater Basin (DWR Basin No. 3-014).

The Basin is one of several within Santa Barbara County. **Figure 1d.1-1** shows other groundwater basins adjacent to or near the Basin. North of and bordering the Basin is the San Antonio Creek Valley Groundwater Basin.[15] The Santa Maria River Valley Groundwater Basin[16] is directly adjacent to the north of the San Antonio Creek Valley Groundwater Basin. To the southeast, along the south coast of Santa Barbara County, is the Goleta Groundwater Basin,[17] separated from the Basin by the Santa Ynez Mountain range.

12 Geologic period from 252 million to 66 million years ago.
13 Geologic period from 66 million to 2.6 million years ago.
14 Geologic period from 2.6 million years ago to the present.
15 DWR Basin 3-14
16 DWR Basin 3-12
17 DWR Basin 3-16

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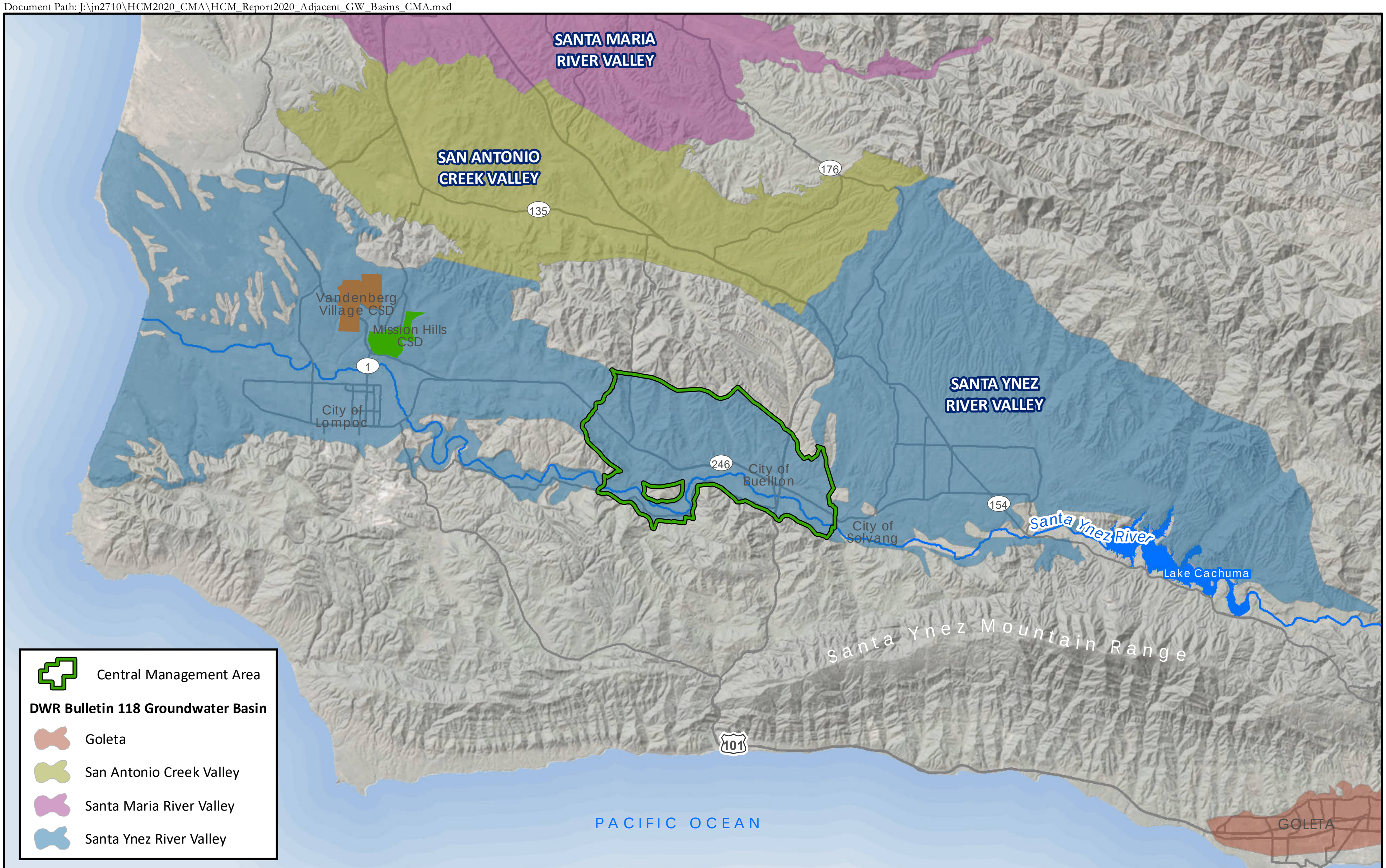

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CMA
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Central Management Area
Groundwater Sustainability Agency

ADJACENT AND NEIGHBORING GROUNDWATER BASINS
CENTRAL MANAGEMENT AREA

0 2 4 Miles

N

Sources:
ESRI World Imagery (2018 Maxar)
USGS National Elevation Dataset, 2002

FIGURE 1d.1-1

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The Santa Ynez River Valley and adjacent San Antonio Creek Valley groundwater basins are designated by the DWR as medium priority[18] basins (DWR 2020). The DWR basin prioritization process was completed in accordance with the requirements of the Sustainable Groundwater Management Act (SGMA) of 2014 and CWC Sections 10722.4 and 10933, based on eight components as outlined in the *Sustainable Groundwater Management Act 2019 Basin Prioritization Process and Results* (DWR 2020). Basins that received total priority points ranging from greater than 14 points to less than or equal to 21 points were designated as medium priority basins. The Santa Ynez River Valley Groundwater Basin received a total of 15 priority points, with component 3 (the number of public supply wells that draw from the basin) and component 6 (the degree to which persons overlying the basin rely on groundwater was their primary source of water) being the two components that received the highest number of priority points (DWR 2020).

Table 1d.1-1
Summary of the Santa Ynez River Valley Groundwater Basin, Adjacent Basins, and Contributing Watershed Area

Basin/Watershed Name	Area			DWR Designations		Previous Groundwater Management Plan	GSP Required per SGMA
	Acres	*Square Miles*	*Basin Number*	*Critically Overdrafted*	*Basin Priority*		
Santa Ynez River Valley Groundwater Basin	203,141.4	317.4	3-015	No	Medium	No	Yes
Adjacent Basin							
San Antonio Creek Valley Groundwater Basin	67,473.7	105.4	3-014	No	Medium	No	Yes
Primary Watershed Contributing to the Santa Ynez River Valley Groundwater Basin							
Santa Ynez River Watershed	574,059.0	897.0	Not applicable				

Source: DWR 2016a. California's Groundwater. Bulletin 118 Interim Update 2016
Notes: DWR = Department of Water Resources; GSP = Groundwater Sustainability Plan; SGMA = Sustainable Groundwater Management Act.

18 Basin prioritization classifies California's 515 basins and subbasins into priorities based on components identified in the California Water Code. The priority process consists of applying datasets and information in a consistent, statewide manner in accordance to the provisions in California Water Code, Section 10933(b). Further information on DWR's basin prioritization process can be found on the following website: https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization.

1d.1-2 SGMA Coverage of Basin

The Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB) is divided into three management areas based on hydrogeologic and jurisdictional boundaries, each governed by a Groundwater Sustainability Agency (GSA). The three management areas include the Western Management Area (WMA), Central Management Area (CMA), and Eastern Management Area (EMA). For the purpose of development and implementation of this GSP, the Plan Area is synonymous with the CMA of the Basin. Appendix 1d-A provides the rationale for the divisions of the three management areas.

The entire Santa Ynez River Valley Groundwater Basin is covered by one of the three groundwater sustainability plans prepared for the Basin. The extents of all three management areas were shown previously on Figure 1a.1-3 (Introduction). There are no adjudicated areas or parts of the Basin covered by a SGMA Alternative plan.[19]

1d.1-3 Plan Area: Central Management Area

The CMA boundary encompasses approximately 32.8 square miles (21,023.8 acres) of the center of the Basin (**Figure 1d.1-2**). The CMA GSA committee consists of the Santa Ynez River Water Conservation District (SYRWCD), City of Buellton, and County of Santa Barbara. The CMA is divided into two subareas[20] based on hydrogeologic and topographic characteristics: Buellton Upland, and Santa Ynez River Alluvium. **Figure 1d.1-3** shows the locations and extents of the subareas, and **Table 1d.1-2** lists the size of each subarea.

19 Alternative plans are described in 23 CCR Division 2 Chapter 1.5 Subchapter 2 Article 9. Alternatives

20 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 CMA. Extents were adjusted to cover the entire Bulletin 118 Interim Update 2016 (DWR 2016) basin boundary.

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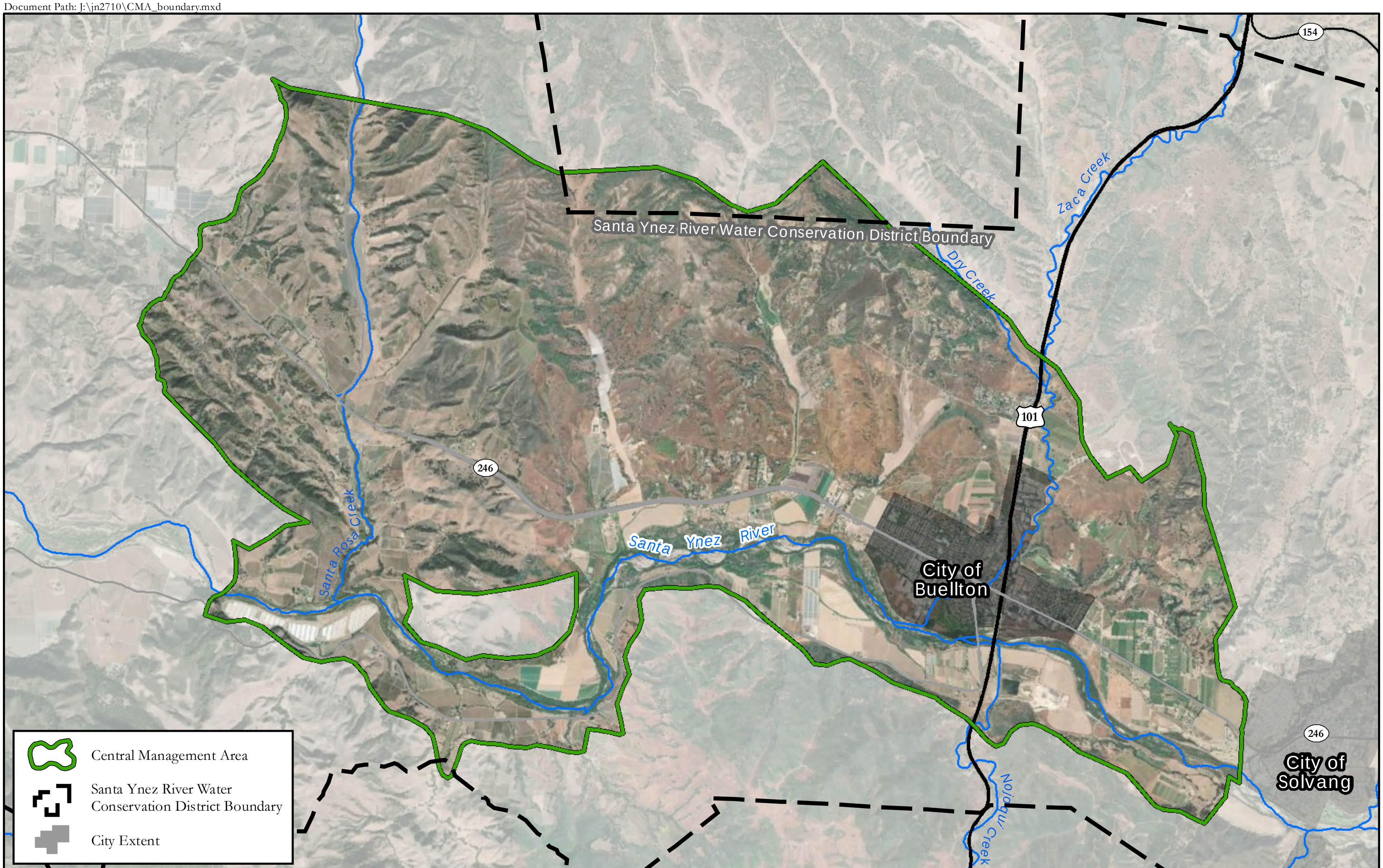

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CENTRAL MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 0.5 1 Miles

N

FIGURE 1d.1-2

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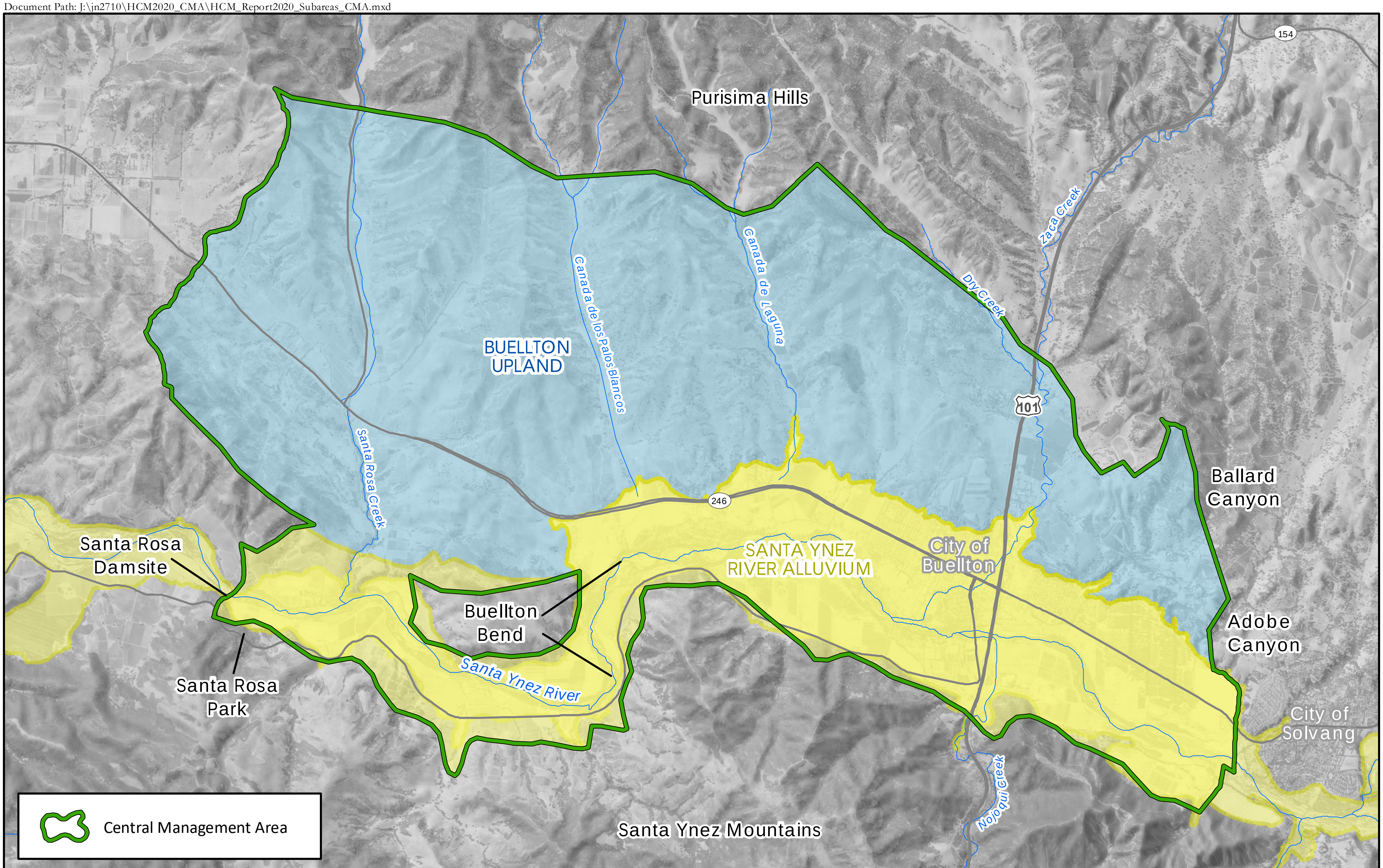

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Central Management Area
Groundwater Sustainability Agency

SUBAREAS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

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

N

FIGURE 1d.1-3

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Table 1d.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.

1d.1-3-1 Buellton Upland Subarea

The Buellton Upland subarea consists of the hilly portions of the CMA north of the Santa Ynez River. This subarea includes the watershed of Santa Rosa Creek, Cañada de la Laguna, and the lower portions of Zaca Creek and Ballard Canyon. The northern extent of the CMA Buellton Upland is bound by the Purisima Hills, and the southern extent terminates at the Santa Ynez River Alluvium subarea.

The Buellton Upland subarea consists of relatively rugged terrain. Agricultural uses occur primarily along the flat land in the valley bottoms. Although there are no cities or urbanized areas in the Buellton Upland, there are several municipal water systems. No wastewater treatment plants are in the Buellton Upland subarea.

1d.1-3-2 Santa Ynez River Alluvium Subarea

Directly south of the Buellton Upland is the Santa Ynez River Alluvium subarea, bordered by exposed bedrock of the Sisquoc Formation, Monterey Formation, and older consolidated Miocene Formations. The Santa Ynez River Alluvium subarea spans from the EMA boundary near the City of Solvang in the east, through a large near-ninety degree west to east bend in the Santa Ynez River west of the City of Buellton, called the “Buellton Bend,” to the CMA-WMA boundary near Santa Rosa Park in the west.

There are agricultural and urbanized areas in the CMA portion of the Santa Ynez River Alluvium subarea. The majority of the City of Buellton is located in this subarea.

Recharge of the alluvium is primarily received from the surface and underflow of the Santa Ynez River, tributary creek flow, seepage, and irrigation return flows. The Santa Ynez River and its underflow through the alluvial sediments are within the jurisdiction and regulated by the California State Water Resources Control Board (SWRCB). River flows including Santa Ynez River underflow responds to releases from upstream reservoirs. SWRCB regulates surface water and underflow for various beneficial purposes including steelhead trout (*Oncorhynchus mykiss*) population. **Appendix 1d-B** describes the extents of the Santa Ynez River underflow and explains why the underflow is not groundwater as defined by SGMA.

In the western Santa Ynez River Alluvium subarea (Section 2a.2) the alluvium is a known and definite channel, and all water in the alluvium is Santa Ynez River underflow. The water flowing through the alluvium, in known and definite channels,[21] is not considered groundwater as defined by SGMA, but, rather, is considered the same as surface water by the SWRCB and the extraction of such water is not subject to the SGMA.

In the eastern Santa Ynez River Alluvium subarea, east of the Buellton Bend, the Buellton aquifer (Section 2a.2) underlies part of the Santa Ynez River Alluvium subarea. Water in the Buellton aquifer is managed by SGMA, which discharges to the overlying Santa Ynez River alluvium which is under jurisdiction of the SWRCB.

[21] CWC Section 10721 (g) "Groundwater" means water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water that flows in known and definite channels. (emphasis added)

1D.2 SUMMARY OF JURISDICTIONAL AREAS AND OTHER FEATURES

1d.2-1 Land Use Jurisdictions within the CMA Plan Area

The CMA Plan Area consists of the City of Buellton (City) and private rural land under Santa Barbara County jurisdiction. The developed land uses in the Plan Area include in general residential, commercial, and agricultural. Approximately 5% of the Plan Area consists of the City and 95% consists of the private land (**Figure 1d.2-1**, Public Lands). **Figure 1d.2-2** identifies specific State and Federal Land indicating the California Wildlife Conservation Board has protected lands along Santa Rosa Creek, and the Federal lands are lands under the Bureau of Land Management (BLM), part of the U.S. Department of the Interior, run out of the BLM Bakersfield Field Office. The land uses in the Plan Area contributing watershed include primarily agricultural (e.g., vineyards, field crops, pasture) and open space (e.g., recreational). Table 1d.2-1 summarizes the land ownership and jurisdiction in the Plan Area.

Table 1d.2-1
Summary of Land Ownership in the CMA Plan Area

Ownership Type	Agency	Description	Acres / % of Total
Private	Private	Mixed land uses including primarily residential, commercial, and agricultural under Santa Barbara County jurisdiction	19,998.0 / 95%
City	City of Buellton	Mixed land uses including primarily residential and commercial	1,025.8 / 5%
		Grand Total	21,023.8 / 100%

Source: Geographic information system (GIS) analysis of jurisdictional boundaries.

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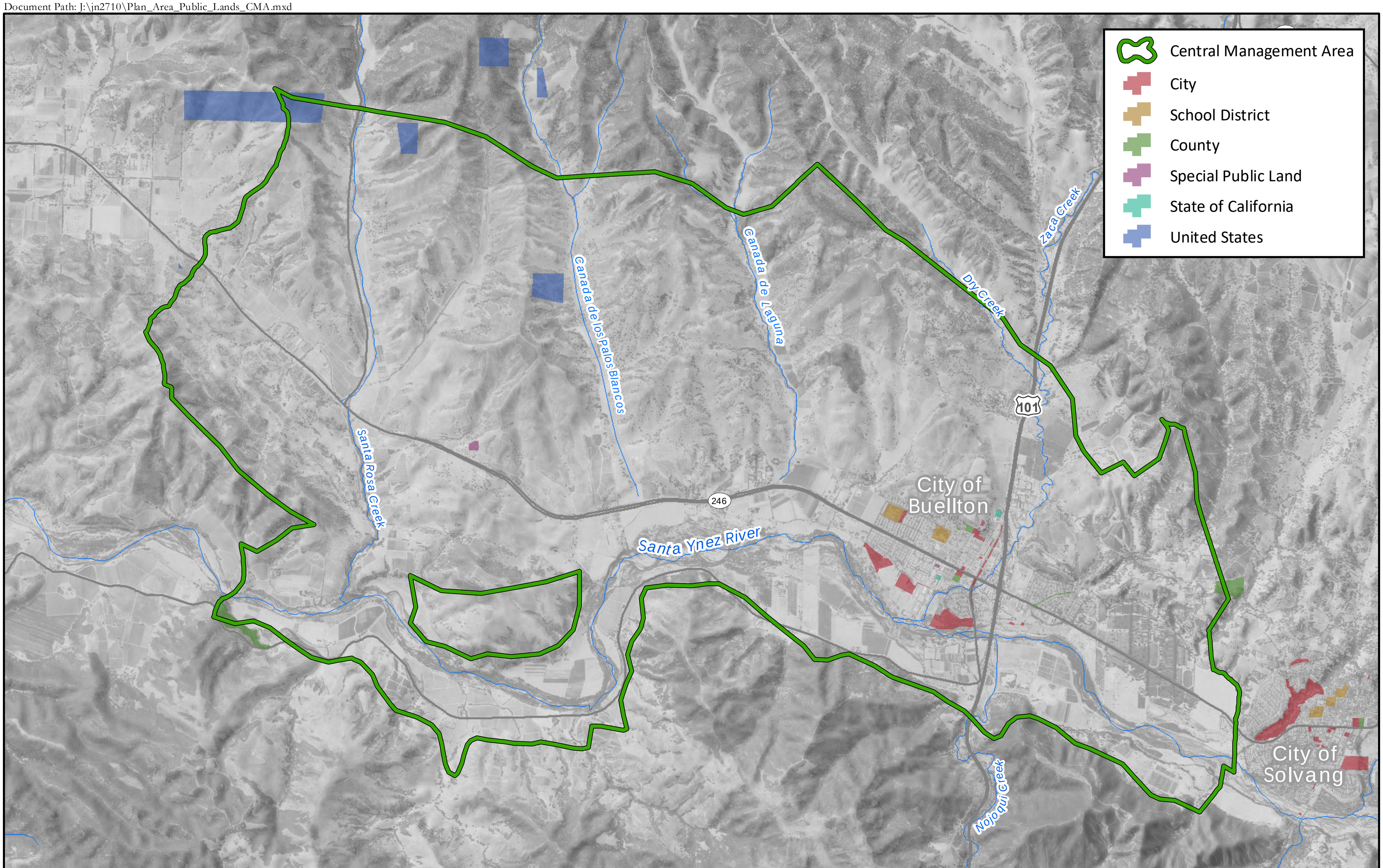

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CMA
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Central Management Area
Groundwater Sustainability Agency

PUBLIC LANDS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
Santa Barbara County (2019) Parcel Data

FIGURE 1d.2-1

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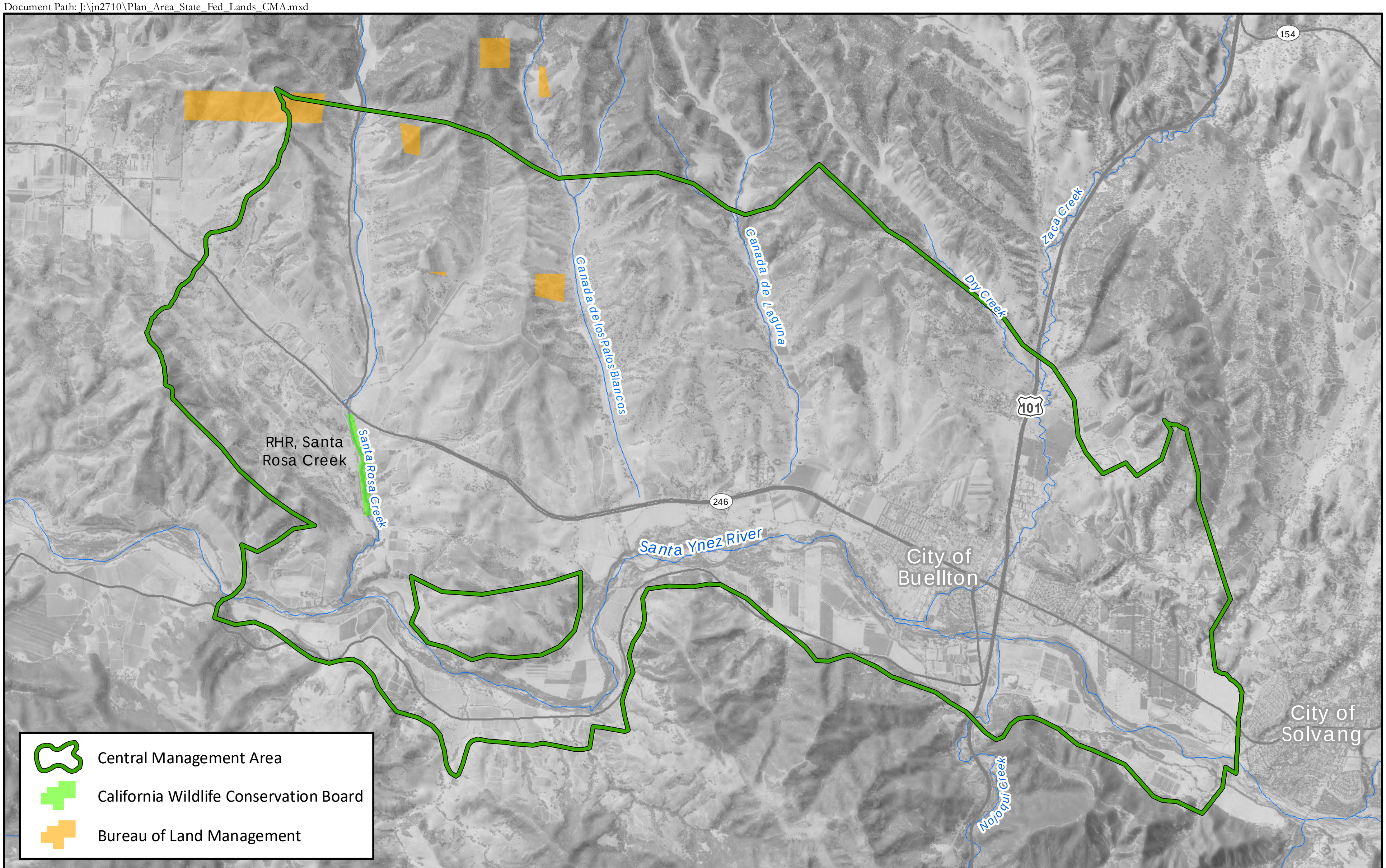

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CMA
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Central Management Area
Groundwater Sustainability Agency

STATE AND FEDERAL LANDS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
U.S. Geological Survey (USGS) Gap Analysis Project (GAP)
Protected Areas Database of the United States (PAD-US)
Version 2.1 Published 9/30/2020

FIGURE 1d.2-2

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1d.2-1-1 Santa Barbara County

The Department of Planning and Development has land use authority in the unincorporated Santa Barbara County parts of the CMA Plan Area. The Department of Planning and Development conducts policy development, planning, permitting, and inspection services through its divisions which include administration, building and safety division, development review, and long-range planning. Section 1d.6, Land Use Considerations, provides greater detail on land use, population, and general plan land use policies relevant to the GSP.

1d.2-1-2 City of Buellton

The City of Buellton Planning Department has land use authority within the City limits. The Planning Department conducts planning, economic development, and code enforcement. Section 1d.6, Land Use Considerations, provides greater detail on land use, population, and general plan land use policies relevant to the GSP.

1d.2-2 Water Agencies Relevant to the Plan

The retail water agencies serving the CMA Plan Area include the City of Buellton, Bobcat Springs Mutual Water Company (MWC), and Mesa Hills MWC. The wholesale water agency relevant to the Plan Area is the Central Coast Water Authority (CCWA), which delivers State Project Water (SWP) to the City of Buellton. Each water agency relevant to the Plan Area is described below. Water district boundaries and regional water infrastructure are shown on **Figure 1d.2-3**, Water Agencies and Infrastructure.

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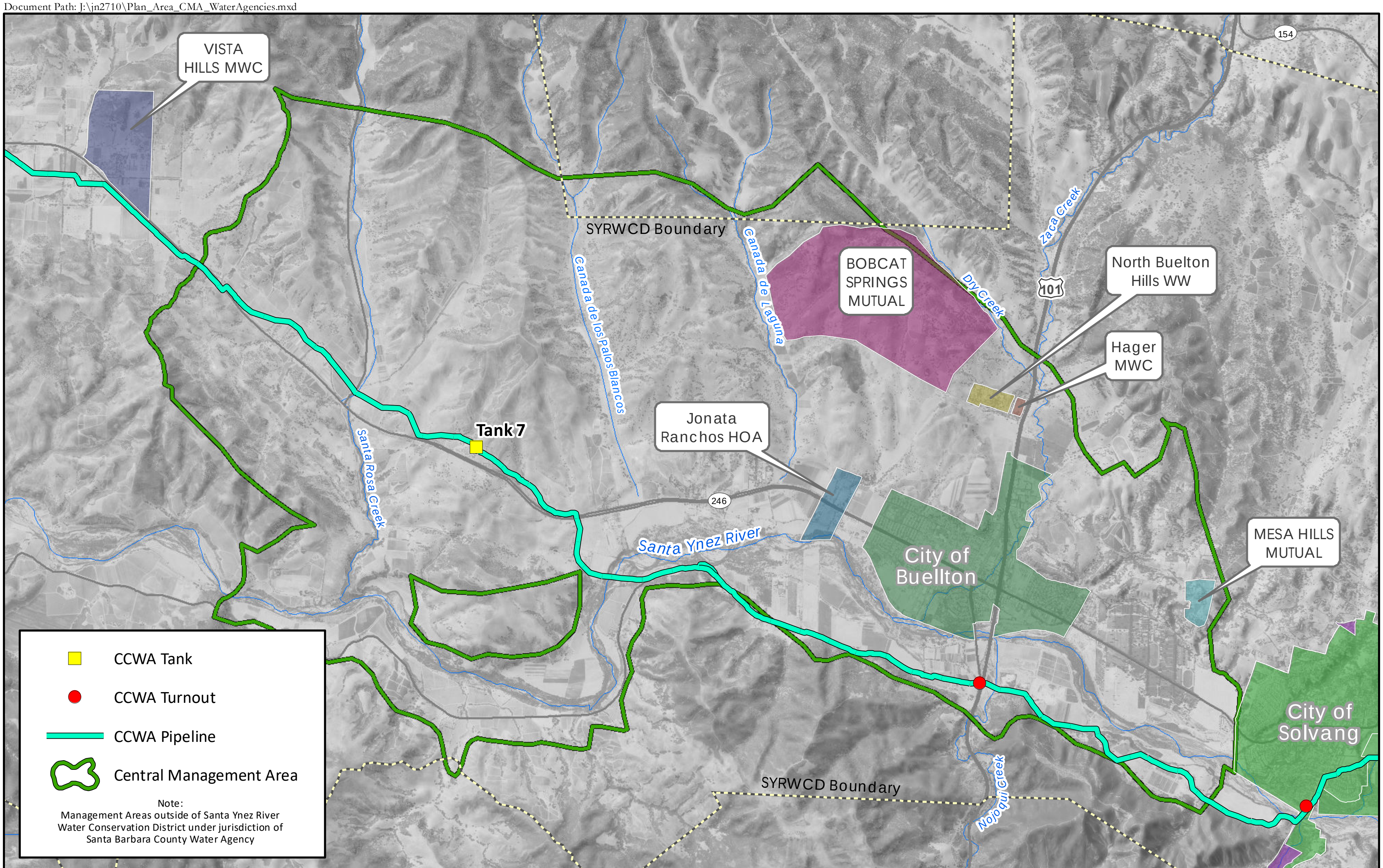

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CMA
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Central Management Area
Groundwater Sustainability Agency

WATER AGENCIES AND INFRASTRUCTURE
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Source:
Central Coast Water Authority (CCWA)

N

FIGURE 1d.2-3

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1d.2-2-1 City of Buellton

The City of Buellton (public water system 4210018) is the only city within the CMA. The City provides potable water service to 1,836 connections and to a population of 5,464 within the City limits (SWRCB 2021a). The City relies on groundwater and the SWP to satisfy customer demands (City of Buellton 2021; SWRCB 2021a). The City's potable water system consists of four municipal supply wells and two water treatment facilities (City of Buellton 2021). Three of the municipal wells are located in the Santa Ynez River Alluvium subarea and one is located in the Buellton Upland subarea. The City has two additional wells located in the Santa Ynez River Alluvium subarea that is used solely for irrigation purposes, including for the Zaca Creek Golf Course (City of Buellton 2021). In addition, the City owns and operates a wastewater treatment plant. Secondary treated effluent from the plant is discharged into infiltration basins for replenishment of the groundwater Basin. Approximately 478,000 gallons per day of secondary treated effluent was discharged into the infiltration basins in 2020 (City of Buellton 2021).

The City's permit to pump underflow from the Santa Ynez River Alluvium subarea is currently 1,385 acre-feet per year (AFY). In 2020, the City provided 1,214.0 acre-feet (AF) of water to its customers, 869.3 AF of which was groundwater (City of Buellton 2021). Approximately one-half of the potable water provided by the City is used for domestic purposes and the other half is used for commercial and industrial processes (City of Buellton 2021). The daily water use for 2020 was 198 gallons per capita per day (City of Buellton 2021). **Table 1d.2-2** summarizes the City of Buellton water use for three recent years.

Table 1d.2-2
City of Buellton Annual Water Use

Calendar Year	Population	Buellton Upland (AF)	Santa Ynez River (AF)	State Water Project (AF)	Total Water (AF)	Daily Per Capita Use (GPDPC)
2020	5,464	219.3	650.0	344.7	1,214.0	198
2019	5,453	314.3	564.6	296.0	1,174.8	192
2018	5,098	326.9	699.2	165.3	1,191.4	209

Source: City of Buellton (2021), City of Buellton (2020), City of Buellton (2019).
Notes: AF = Acre-Feet; GPDPC = gallons per day per capita.

Due to the number of connections, the City of Buellton is not considered an urban water supplier[22] or agricultural water supplier[23].

1d.2-2-2 Bobcat Springs Mutual Water Company

Bobcat Springs MWC (public water system 4200891) provides potable water service to 47 connections and a population of 120. Bobcat Springs MWC relies on groundwater from two extraction wells as the sole source of supply (SWRCB 2021a). Annual water use for the years 2014 through 2018 ranged between 92 to 107 acre-feet per year (DWR 2019b).

1d.2-2-3 Mesa Hills Mutual Water Company

Mesa Hills MWC (public water system 4200862) provides potable water service to 36 connections and a population of 54. Mesa Hills MWC relies on groundwater from two extraction wells as the sole source of supply (SWRCB 2021a). Annual water use for the years 2014 through 2018 ranged between 97 and 122 acre-feet per year (DWR 2019b).

1d.2-2-4 Jonata Homeowners Association

Jonata Homeowners Association (public water system 4200814) provides potable water service to 16 connections and a population of 45. Jonata Homeowners Association relies on groundwater from one extraction wells as the sole source of supply (SWRCB 2021a).

1d.2-2-5 North Buellton Hills Water Works

North Buellton Hills Water Company (public water system 4200809) provides potable water service to 8 connections and a population of 30. Reported to use a local public agency as the sole source of supply (SWRCB 2021a).

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22 Per CWC Section 10617, an urban water supplier means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly, to more than 3,000 customers or supplying more than 3,000 AFY of water.

23 Per CWC Section 10608.12(a), an agricultural water supplier means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water.

1d.2-2-6 Hager Mutual Water Company

Hager MWC (public water system 4200940) is a state small water system[24] with less than 15 service connections and a population of less than 25.

1d.2-2-7 Central Coast Water Authority

The Central Coast Water Authority (CCWA), public water system 4210030, is a wholesale supplier of urban water for thirteen (13) water agencies in Santa Barbara County (CCWA, 2021a). CCWA is a public entity organized under a joint exercise of powers agreement dated August 1, 1991, by the cities and special districts responsible for the creation and maintenance of water resources in portions of the North County, Santa Ynez Valley, and the South Coast areas of Santa Barbara County. The CCWA Board of Directors includes two SYRVGB GSA member agencies: City of Buellton has a 2.21% vote, and Santa Ynez River Water Conservation District Improvement District #1 (EMA GSA member agency) has a 7.64% vote (CCWA 2021a).

CCWA owns and operates a water treatment plant and pipeline that delivers water primarily from the State Water Project (SWP) to project participants in Santa Barbara and San Luis Obispo counties. The distribution system consists of an approximate 130-mile-long pipeline (Coastal Branch Pipeline), treated water tanks at the water treatment plant, three interim storage facilities, one energy dissipation facility, nine turnouts, four isolation valve facilities, a chloramines removal and water pumping facility, and the Lake Cachuma inlet monitoring facility (CCWA 2021b). Major reservoirs and pipelines are shown on Figure 1d.2-3, Water Agencies and Infrastructure. In 2020, CCWA delivered 12,175 acre-feet to its clients out of a possible 43,886 acre-feet of water (CCWA 2021a).

The City of Buellton's full allocation of SWP water is 636 AFY, which includes a 58 AFY drought buffer to enhance the reliability of SWP water during shortages (CCWA 2020). In fiscal year 2020/21, the City requested 399 AF of SWP water (CCWA 2020). The Hydrogeologic Conceptual Model (HCM) (Section 2a.3) includes time series graphs of CCWA imports to the Santa Ynez River basin and major water quality.

24 California Health and Safety Code Section 116275.

1d.2-2-8 Santa Ynez River Water Conservation District

The Santa Ynez River Water Conservation District (SYRWCD) was established by the Santa Barbara County Board of Supervisors in October of 1939 for the primary purpose "To protect water rights and conserve and augment the District's water supplies in an environmentally responsible manner for residential, agricultural and commercial uses." (SYRWCD 2021). The SYRWCD is a water conservation district organized under CWC Sections 74000-76501.

The SYRWCD encompasses approximately 180,000 acres of the Santa Ynez River watershed from Lake Cachuma to where the River discharges into the Pacific Ocean at Surf Beach (Stetson 2021). The SYRWCD receives its operating budget from ad valorem property taxes and charges levied on the production of groundwater from water-producing facilities within the SYRWCD boundary (Stetson 2021). The SYRWCD works with public agencies and landowners to maintain a balance of water resource allocations for all beneficial uses and users of water in the Basin. The SYRWCD does not serve potable water, including within the CMA.

1d.2-2-9 Santa Barbara County Water Agency

The Santa Barbara County Water Agency (SBCWA) is a special district that was established by the State Legislature in 1945 to control and conserve storm, flood, and other surface waters for beneficial use and to enter into contracts for water supply. As of February 1994, the SBCWA along with the Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) special district are organized under the Water Resources Division of the Public Works Department of the County of Santa Barbara. The SBCWA prepares investigations and reports on the County's water requirements, groundwater conditions, efficient use of water, and other water-supply-related technical studies, and manages a number of County-wide programs, including the Integrated Regional Water Management (IRWM) Program, the Regional Water Efficiency Program, and the winter cloud seeding program.

The Water Resources Division also administers the Cachuma Project and the Twitchell Dam Project contracts with Reclamation, holds the SWP water contract[25] with DWR, and participates in some of the County's GSAs.

1D.3 WELL DENSITY

The SYRWCD maintains a registry of all water-producing facilities within its jurisdiction. Property owners must register any new water-producing facility within 30 days or be guilty of a misdemeanor (CWC Section 75640). Table 1d.3-1 is a count of wells and the average density for each of the CMA subareas. **Figure 1d.3-1** shows the density distribution by square mile (section) for wells for agricultural use, **Figure 1d.3-2** shows the same for domestic wells, and **Figure 1d.3-3** shows the same for municipal wells.

Table 1d.3-1
Well Density by Water Use for CMA Subareas

CMA Subarea	Agriculture		Domestic		Municipal	
	Well Count	Average per Sq. Mile	Well Count	Average per Sq. Mile	Well Count	Average per Sq. Mile
Buellton Upland	48	2.16	55	2.48	-	-
Santa Ynez River Alluvium	82	7.74	66	6.23	4	0.38
Total	130	3.96	121	3.69	4	0.12

Source: Santa Ynez River Valley Water Conservation District
Subarea is strictly based on geographic extents in this table, not aquifers wells are drawing from. City of Buellton has 1 well pumping from the Buellton Aquifer and 3 wells pumping from the Santa Ynez River Alluvium.

25 SBCFCWCD holds the contact with DWR for delivery of State Water Project (SWP) water. DWR (2021). Management of the California State Water Project.

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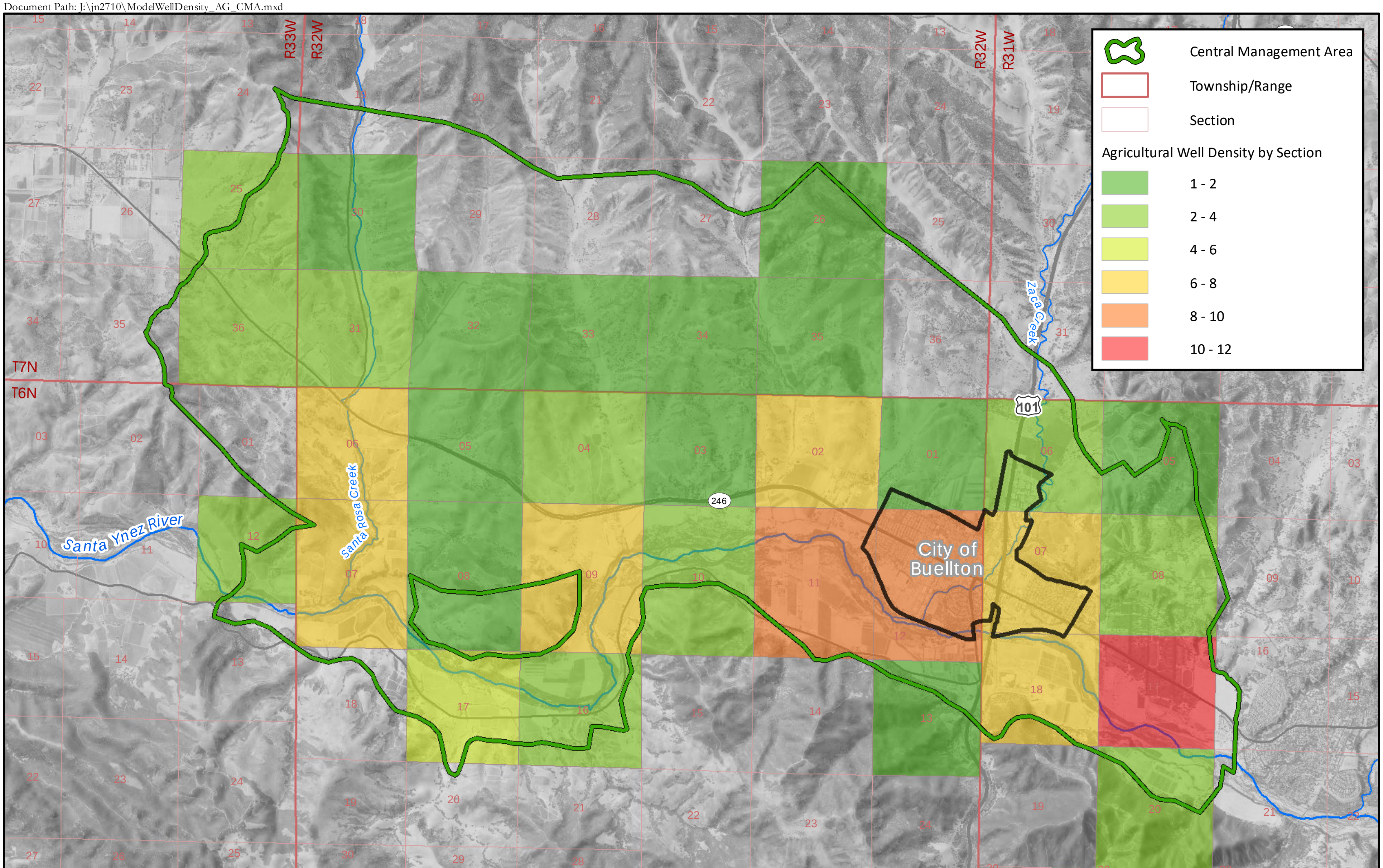

STETSON ENGINEERS INC.

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

REGISTERED PUMPING WELLS
AGRICULTURAL USE
DENSITY BY SECTION

Source: Santa Ynez River Water Conservation District (1980-2020)

0 0.5 1 Miles

N

FIGURE 1d.3-1

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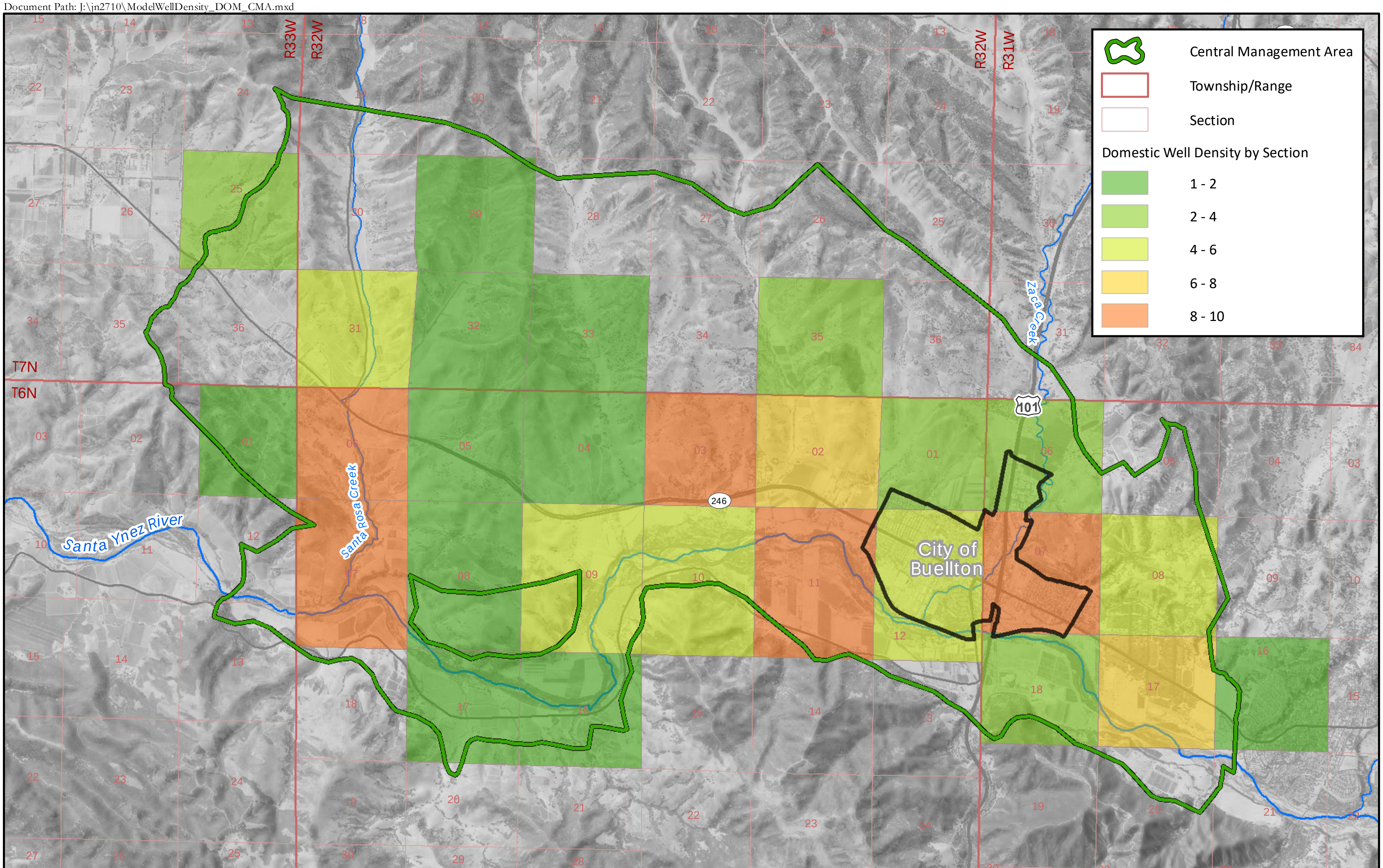

STETSON ENGINEERS INC.

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

REGISTERED PUMPING WELLS DOMESTIC USE

DENSITY BY SECTION

Source: Santa Ynez River Water Conservation District (1980-2020)

0 0.5 1 Miles

N

FIGURE 1d.3-2

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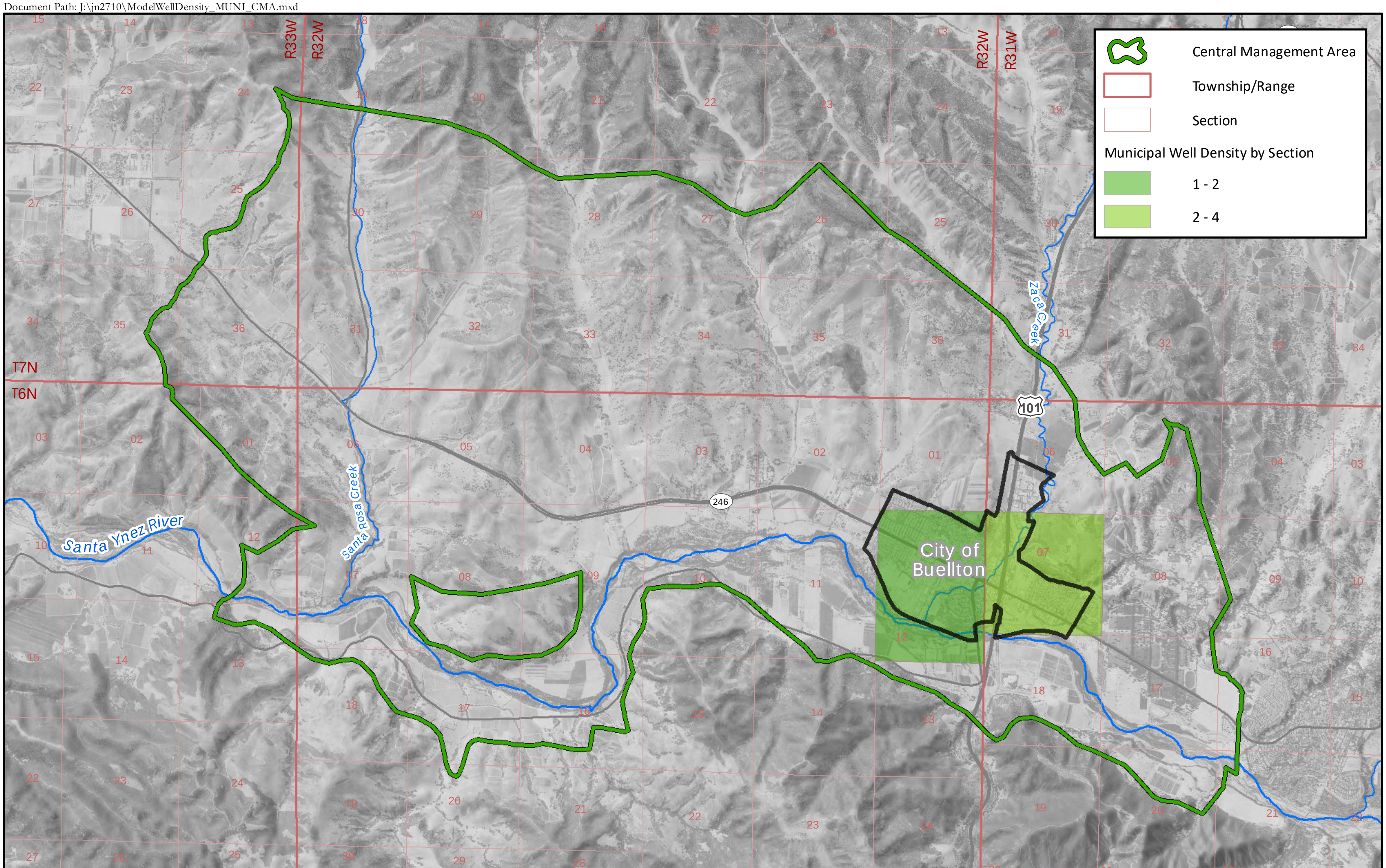

STETSON ENGINEERS INC.

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

REGISTERED PUMPING WELLS
MUNICIPAL USE
DENSITY BY SECTION

Source: Santa Ynez River Water Conservation District (1980-2020)

0 0.5 1
Miles

N

FIGURE 1d.3-3

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1D.4 WATER RESOURCES MONITORING AND MANAGEMENT PROGRAMS

1d.4-1 Water Resources Monitoring

Water resource monitoring including groundwater elevation monitoring, water quality, groundwater extraction, and stream flow and precipitation monitoring are introduced in this section. Additional information is provided in additional sections of this GSP, primarily the Groundwater Conditions (Section 2b) and the Monitoring Network (Section 3a) and Sustainable Management Criteria (Section 3b).

1d.4-1-1 Groundwater Elevation

Three groundwater elevation monitoring programs were identified in the CMA. Groundwater elevation or level data was used in the Groundwater Conditions (Section 2b), Monitoring Network (3a), and Sustainable Management Criteria (Section 3b).

Water level data is collected semi-annually by the SBCWA at several wells throughout the CMA. This program formerly was run by the United States Geologic Survey (USGS). The United States Bureau of Reclamation collects monthly groundwater levels for wells within the alluvium of the Santa Ynez River as part of information operations of the Lake Cachuma Reservoir. The City also collects groundwater levels for their own well network on a monthly basis.

1d.4-1-2 Groundwater Quality

Two sources of groundwater quality data were identified in the CMA. Groundwater quality data was used in the Groundwater Conditions (Section 2b), Monitoring Network (3a), and Sustainable Management Criteria (Section 3b).

The public water system within the CMA report water quality data for public water sources including wells to the Division of Drinking Water for compliance with the Safe Drinking Water Act. The data is collected by individual public water systems including the CMA GSA member agency, City of Buellton.

The Irrigated Lands Regulatory Program (ILRP) is a program of the State Water Resource Control Board that applies to commercial crop or pasture lands. Commercial farmers are required to submit the results of water quality testing in order to receive operating permits.

1d.4-1-3 Groundwater Extraction

Three sources of groundwater extraction data were identified for the CMA. Groundwater extraction data was used in developing the Water Budget (Section 2c) and the groundwater model.

The SYRWCD, in its role of managing and conserving groundwater as a Water Conservation District, collects reported production data for all wells within its jurisdiction on a semi-annual basis and assesses a groundwater charge based on reported production. Not all wells are metered and production may be estimated by water use factors that include crop type and acreage, household size, and livestock numbers.

The GSA member agency, City of Buellton, monitors the daily pumping volume by well.

An additional source of groundwater pumping information is DWR's Water Use and Efficiency Branch which conducts a yearly survey of public water agencies used in updating the California Water Plan[26] (DWR, 2019). These Public Water Systems Statistics Surveys generally provide monthly totals of water use by public water agency.

1d.4-1-4 Streamflow Monitoring

Streamflow monitoring is conducted by the USGS. Locations and volumes of current and historical monitoring are shown in the Groundwater Conditions (Figure 2b.6-1).

1d.4-1-5 Precipitation Monitoring

There are three identified sources of precipitation monitoring within the area of the CMA. Precipitation data is discussed in more detail in the Hydrogeologic Conceptual Model (Section 2a).

County of Santa Barbara operates a series of weather stations throughout Santa Barbara County including within the CMA. National Oceanic and Atmospheric Administration (NOAA) operates a single station at

26 Previous version of this were published as DWR Bulletin 160.

Lompoc. The California Irrigation Management Information System (CIMIS), part of DWR's Water Use and Efficiency Branch operates the "Lompoc" and "Santa Ynez" stations.

1d.4-2 Management Plans

1d.4-2-1 Central Coast Water Authority Urban Water Management Plan

Central Coast Water Authority (CCWA) water supply management is outlined in its 2020 Urban Water Management Plan (UWMP) (CCWA 2021). As a wholesale supplier of urban water, CCWA is required to prepare urban water management plans on a 5-year cycle.[27] Past CCWA UWMP were prepared in 2005, 2010, and 2016. CCWA supplies thirteen (13) water agencies in Santa Barbara County, and the CCWA UWMP follows this regional water supply perspective. UWMP describe existing and planned water supply sources, identify human and/or environmental threats to water reliability, outline how state-mandated water conservation targets will be met,[28] establish water shortage contingency plans, and assess whether their existing and future water supplies will be sufficient over a 20-year planning horizon. Projections of growth and land use in the service area along with drought scenarios are incorporated in the long-term water supply assessment.

1d.4-2-2 Buellton Uplands Groundwater Basin Management Plan

In 1992, the State Legislature provided an opportunity for local groundwater management with the passage of AB 3030, the Groundwater Management Act (CWC Section 10750 et. seq. Part 2.75). Many basins developed groundwater management plans (GWMPs) to provide planned and coordinated monitoring, operation, and administration of groundwater basins with the goal of long-term groundwater resource sustainability. The Groundwater Management Act was first introduced in 1992 as AB 3030, and has since been modified by SB 1938 in 2002 and AB 359 in 2011. These significant pieces of legislation establish, among other things, specific procedures on how GWMPs are to be developed and adopted by local agencies.

27 Per CWC 10617, an urban water supplier means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly, to more than 3,000 customers or supplying more than 3,000 AFY of water.

28 The Water Conservation Act of 2009 (SB X7-7) requires that the state reduce urban water consumption by 20% by the year 2020, as measured in gallons per capita per day.

The City of Buellton and SYRWCD started the GWMP process under AB 3030 in 1994 (SYRWCD and City of Buellton 1995). The GWMP was prepared for the Buellton Uplands which "includes the area north of the Santa Ynez River that extends eastward from the Santa Rita Uplands Basin to the east of the City of Buellton." The GWMP provided a review of current and projected groundwater conditions, defined an overall groundwater management goal and basin management objectives, described existing and an expanded monitoring program, and identified conservation actions (SYRWCD and City of Buellton 1995). As of January 1, 2015, new or updated GWMPs cannot be adopted in medium and high priority basins; therefore, the 1995 GWMP will be superseded by this GSP.

1d.4-2-3 Santa Barbara County Integrated Regional Water Management Plan

The Santa Barbara County Integrated Regional Water Management (IRWM) Program began in 2005 following the passage of Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002. Chapter 8 of Proposition 50 authorized the legislature to appropriate $500 million for IRWM planning, the intent of which was to encourage agencies to develop plans using regional water management strategies for water resources and to develop projects using these IRWM strategies to protect communities from drought, protect and improve water quality, and improve local water security by reducing dependence on imported water. The Santa Barbara County IRWM developed and then adopted its first IRWM plan in 2007, and under Proposition 50 received $25 million for 14 countywide projects. The County IRWM program developed and then adopted its first IRWM plan in 2007, and under Proposition 50 received $25 million for 14 countywide projects. The County IRWM Plan was updated under the Proposition 84 Guidelines in 2013, and received 5.7 million for 13 countywide projects.

Disadvantaged communities (DACs) in the CMA are discussed in Section 1d.6-1. In 2018, the region was awarded almost $900,000 in direct funds to DACs, and the region applied for further implementation funds (up to $6.3 million) in spring 2019.

In July 2019, another update to the IRWM Plan was prepared to ensure that the County remains eligible for funding under the Proposition 1 Guidelines (County of Santa Barbara 2019a). The Proposition 1 IRWM Grant Program provides funding for projects that help meet the long-term water needs of the state, including the need to decrease reliance on imported water sources, increase infrastructure resilience to the impacts of climate change, and locally manage and prioritize watershed resources and water infrastructure projects. This 2019 Update focused on improving the previous IRWM Plan and incorporating the outcome of the SGMA and the formation of groundwater sustainability agencies (County of Santa Barbara 2019a). The IRWM Plan region encompasses all of Santa Barbara County. IRWM grants are discussed in Section 5c as potential funding for GSP implementation and proposed project and management actions.

1d.4-2-4 Storm Water and Sewer System Management Plans

In 2005, the City of Buellton (City) created a Storm Water Management Program to ensure that water quality from stormwater and storm events does not act of a source of pollution to nearby water bodies (City of Buellton 2005). In 2018 the County produced a County-Wide Integrated Stormwater Resource Plan which identified and evaluated water quality priorities for each watershed based on waterbodies with current water quality regulatory actions and the pollutant generating activities in each watershed (Geosyntec 2018).

Additionally, the City also prepared a Sewer System Management Plan to properly manage, operate, and maintain all parts of the sanitary sewer system to reduce and prevent sanitary sewer overflows (City of Buellton 2020b).

1D.5 REGULATORY PROGRAMS

1d.5-1 Porter-Cologne Water Quality Control Act and Clean Water Act Permitting

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act; codified in CWC Section 13000 et seq.) is the primary state water quality control law for California. Whereas the federal Clean Water Act applies to all waters of the United States, the Porter-Cologne Act applies to waters of the state, which includes isolated wetlands and groundwater in addition to federal waters. The Porter-Cologne Act is implemented by the California State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). In addition to other regulatory responsibilities, the RWQCBs have the authority to conduct, order, and oversee investigation and cleanup where discharges or threatened discharges of waste to waters of the state could cause pollution or nuisance, including impacts to public health and the environment. The Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB) is located in the southern part of the Central Coast Region (RWQCB Region 3) and within the Santa Ynez Hydrologic Unit, based on the RWQCB Water Quality Control Plan for the Central Coastal Basin (Central Coast Basin Plan; RWQCB 2019). These statutes are relevant to the GSP in that they regulate the quality of point-source discharges (e.g., wastewater treatment plant effluent, industrial discharges, and on-site wastewater treatment systems (OWTSs) and non-point source discharges (e.g., stormwater runoff) to the underlying aquifer.

The Central Coast Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Central Coast Basin Plan (CWC Sections 13240–13247). The Porter-Cologne Act provides the RWQCBs with authority to include in their Basin Plans water discharge prohibitions applicable to particular conditions, areas, or types of waste. The Central Coast Basin Plan is continually being updated to include amendments related to implementation of total maximum daily loads, revisions of programs and policies within the RWQCB Central Coast Region, and changes to beneficial use designations and associated water quality objectives. The beneficial uses for groundwater are identified in the Central Coast Basin Plan as being suitable for agricultural water supply, municipal and domestic water supply, and industrial use (RWQCB 2019). Unlike beneficial uses of surface water (which vary based on individual surface water), the RWQCB designates the same beneficial uses for all DWR-designated groundwater basins throughout the Central Coast Region.

The Central Coast Basin Plan defines water quality objectives for groundwater generally (for taste, odors, and radioactivity) and for specific beneficial uses (i.e., municipal/domestic supply and agricultural supply). The water quality objectives for municipal/domestic supply are the same as primary drinking water standards (i.e., maximum contaminant levels) found in Title 22 of the California Code of Regulations. For agricultural uses of groundwater, the Central Coast Basin Plan provides water quality objectives consisting of maximum concentrations for various inorganic chemicals (including certain metals and nitrate) and guidelines for various physical and general mineral properties (Tables 3-1 and 3-2 in RWQCB 2019). The Central Coast Basin Plan defines additional objectives for select constituents specific to certain groundwater basins, including the SYRVGB (RWQCB 2019). Table 1d.5-1 provides the median groundwater objectives for the Basin as defined in the Central Coast Basin Plan.

Table 1d.5-1
Median Groundwater Objectives for the Santa Ynez River Valley Groundwater Basin

Sub-Area	TDS	Chloride	Sulfate	Boron	Sodium	Total Nitrogen
Santa Ynez	600	50	10	0.5	20	1
Santa Rita	1,500	150	700	0.5	100	1
Lompoc Plain	1,250	250	500	0.5	250	2
Lompoc Upland	600	150	100	0.5	100	2
Lompoc Terrace	750	210	100	0.3	130	1

Source: RWQCB 2019.
Notes: All values in milligrams per liter (mg/L); TDS = total dissolved solids. Extents and boundaries of Santa Rita and Santa Ynez sub-areas extents are not rigorously defined. Santa Ynez likely means Solvang and east (EMA). Santa Rita likely applies to the Santa Rita Upland (WMA) and Buellton Upland (CMA).

It should be noted that the Central Coast Basin Plan addresses inland waters, coastal waters (enclosed bays, estuaries, and coastal lagoons), and groundwater, whereas the Water Quality Control Plan for Ocean Waters of California (Ocean Plan; SWRCB 2019) establishes beneficial uses and water quality objectives for waters of the Pacific Ocean. Also, the Ocean Plan prescribes effluent quality requirements and management principles for waste discharges and specifies certain waste discharge prohibitions. The Ocean Plan also provides that the SWRCB shall designate Areas of Special Biological Significance and requires wastes to be discharged a sufficient distance from these areas to assure maintenance of natural water quality conditions (SWRCB 2019). The Vandenberg State Marine Reserve, established by the California Department of Fish and Wildlife in September 2007, is an approximately 32.9 square mile Marine Protected Area adjacent to the Basin that extends just beyond Rocky Point to the south, to near Purisima Point to the north, and up to approximately 3.75 miles offshore from the mean high tide line (CDFW 2016). The recreational and/or commercial take of all marine resources is prohibited within the Vandenberg State Marine Reserve. There are no Areas of Special Biological Significance, as identified by the SWRCB, in or adjacent to the Basin.

The Porter-Cologne Act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. CWC Section 13260(a) requires that any person discharging waste or proposing to discharge waste—other than to a community sewer system—that could affect the quality of the waters of the state file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface water (waters of the United States), a National Pollutant Discharge Elimination System (NPDES) permit is required, which is issued under both state and federal law. For other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (such as groundwater and isolated wetlands), Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. WDRs typically require many of the same best management practices (BMPs) and pollution control technologies as required by NPDES-derived permits.

The NPDES and WDR programs regulate construction, municipal, and industrial stormwater and non-stormwater discharges under the requirements of the Clean Water Act of 1972 and the Porter-Cologne Act, respectively. The construction and industrial stormwater programs are administered by the SWRCB, whereas individual WDRs, low-threat waivers, and other Basin-specific programs are administered by the Central Coast RWQCB. Programs and policies that have particular relevance to the Basin include the following:

1. **Stormwater General Permits** (Construction and Industrial General Permits). SWRCB and the Central Coast RWQCB administer a number of general permits that are intended to regulate activities that collectively represent similar threats to water quality across the state and thus can

appropriately be held to similar water quality standards and pollution prevention BMPs. Construction projects more than one-acre in size are regulated under the statewide Construction General Permit and are required to develop and implement a stormwater pollution prevention plan. Similarly, industrial sites are also required to develop a stormwater pollution prevention plan that identifies and implements BMPs necessary to address all actual and potential pollutants of concern. There are currently 16 entities within the Basin subject to an industrial stormwater pollution prevention plan based on a review of industrial storm water reports submitted to the SWRCB (SWRCB 2021b). Three (2) of the 16 entities are located in the CMA. These entities include Lucas and Lewellen Winery, HSS Recycling Center, and Mission Ready Mix (SWRCB 2021b).

2. **Irrigated Lands Regulatory Program**. Water discharges from agricultural operations include irrigation runoff, flows from tile drains, irrigation return flows, and stormwater runoff. These discharges can affect water quality by transporting pollutants, including pesticides, sediment, nutrients, salts (including selenium and boron), pathogens, and heavy metals, from cultivated fields into surface waters and/or groundwater. To prevent agricultural discharges from impairing the waters that receive these discharges, the Irrigated Lands Regulatory Program (ILRP) regulates discharges from irrigated agricultural lands. Regulation by ILRP is accomplished by issuing WDRs or conditional waivers of WDRs to growers. These orders contain conditions requiring water quality monitoring of receiving waters and corrective actions when impairments are found. Through a series of events related to the passage of SB 390 (Alpert), the ILRP originated in 2003. Initially, the ILRP was developed for the Central Valley RWQCB. As the Central Valley RWQCB ILRP progressed, a groundwater quality element was added to the filing requirement for agricultural lands that had previously been subjected to only surface water discharge concerns. To date, the different RWQCBs are in different stages of implementing the ILRP. The Central Coast RWQCB has a conditional waiver program for irrigated agricultural lands throughout the region, focusing on priority water quality issues such as pesticides and toxicity, nutrients, and sediments—especially nitrate impacts to drinking water sources. There are a number of enrollees to the program within the Basin (SWRCB 2021c).

3. **On-site Wastewater Treatment Systems Requirements**. Requirements for the siting, design, operation, maintenance, and management of on-site wastewater treatment systems (OWTS) are

specified in the SWRCB's OWTS Policy (SWRCB 2018). The OWTS policy sets forth a tiered implementation program with requirements based upon levels (tiers) of potential threat to water quality. The OWTS policy includes a conditional waiver for on-site systems that comply with the policy. Since 1991, on-site sewage disposal systems in the County have been regulated by the County Public Health Department, Environmental Health Services Division. Santa Barbara County regulations for on-site sewage disposal systems are contained in Article I, Chapter 18C of the County Code, which was most recently updated in 2015. These regulations set forth specific requirements related to (1) permitting and inspection of on-site systems; (2) septic tank design and construction; (3) drywell and disposal field requirements; and (4) servicing, inspection, reporting, and upgrade requirements. Standards pertaining to system sizing and construction are contained in the California (Uniform) Plumbing Code. Additional requirements for on-site sewage disposal systems in the County are adopted as part of community plans or as project-specific mitigation measures or conditions applied to development proposals lying within a designated "Special Problem Area" of the County. The Central Coast RWQCB approved the County's Local Agency Management Program, developed by Environmental Health Services with local stakeholders, on November 20, 2015, and it became fully effective January 1, 2016.

4. **Individual Waste Discharge Requirements**. Individual Waste Discharge Requirements (WDRs) are required for point source discharges to land not otherwise covered under a general permit program or conditional waiver. The purpose of individual WDRs is to define discharge prohibitions, effluent limitations, and other water quality criteria necessary to ensure discharges do not result in exceedances of Central Coast Basin Plan objectives for receiving waters, including groundwater. There are 74 individual active WDRs in the Basin, 21 of which are located within the CMA. Of the 21 active WDRs in the CMA, 19 are associated with private agricultural operations (e.g., vineyards) and two are issued to wastewater treatment facilities (SWRCB 2021c). The two wastewater treatment facilities are the City of Buellton Wastewater Treatment Plant (WDR Order No. 99-134) and Solvang Wastewater Treatment Plant (WDR Order No. R3-2007-0069) (SWRCB 2021c). These facilities are subject to a monitoring and reporting program which requires regular sampling of influent, effluent and receiving waters to verify that the facilities are meeting applicable water quality standards (e.g., the Ocean Plan). Required submittals under the WDR

permits include a variety of monitoring, inspection, and technical reports that are submitted monthly and annually to the Central Coast RWQCB, and requirements for reporting and rectifying emergency/unplanned discharges (e.g., sanitary sewer overflows).

Implementation of this CMA GSP would not affect the applicability or implementation of the regulatory programs discussed above. Continued implementation of Porter-Cologne Act and the Clean Water Act permitting would advance the GSP's sustainability goals related to water quality. The County requires new development and redevelopment projects proposed within the Basin to comply with NPDES permits, WDRs, and OWTS requirements as part of its permitting and approval process. These programs will continue to provide benefits to water quality by requiring both point and non-point discharges to comply with Central Coast Basin Plan water quality objectives and to be protective of Central Coast Basin Plan beneficial uses throughout SGMA's planning and implementation horizon. In addition, the application of stormwater permits means specific performance standards for capture and infiltration of stormwater runoff would be implemented where applicable, providing opportunities for enhanced recharge of the Basin.

1d.5-1-1 Beneficial Uses and Users

The beneficial uses for groundwater identified in the Central Coast Basin Plan include municipal and domestic supply (MUN), agricultural supply (AGR), industrial process supply (PROC), and industrial service supply (IND) (RWQCB 2019). The beneficial uses and users in the CMA Plan Area include, but are not limited to, the following: (1) holders of overlying groundwater rights; (2) municipal, domestic and agricultural well operators; (3) public water systems; (4) local land use planning agencies; (5) environmental users of groundwater; (6) surface water users; (7) federal government; (8) disadvantaged communities; and (9) entities listed in SGMA (CWC Section 10927) that are monitoring groundwater elevations in all or part of the CMA managed by the GSA. Of the beneficial uses and users listed, the municipal and agricultural sectors are the primary groundwater users in the CMA Plan Area. Private groundwater well owners who extract less than 2 AFY are considered de minimis users under SGMA.[29]

[29] CWC Section 10721(e) "De minimis extractor" means a person who extracts, for domestic purposes, two acre-feet or less per year.

1d.5-2 Groundwater Well Permitting

Statewide standards for the construction, repair, reconstruction, or destruction of wells are found in DWR Bulletin 74-81 and 74-90 (i.e., California Well Standards) (DWR 1981 and 1991). The California Well Standards include requirements to avoid sources of contamination or cross-contamination, proper sealing of the upper annular space (i.e., first 50 feet), disinfection of the well following construction work, use of appropriate casing material, and other requirements. In October 2017, Governor Brown signed SB 252, which became effective on January 1, 2018. SB 252 requires well permit applicants in critically overdrafted basins to include information about the proposed well, such as location, depth, and pumping capacity. The bill also requires the permitting agency to make the information easily accessible to the public and the GSAs. The CMA Basin is not designated as critically overdrafted (DWR 2016a).

Within unincorporated Santa Barbara County construction, modification, inactivation and destruction of water wells is subject to Chapter 34A of the Code of Ordinances, included as **Appendix 1d-C**. This defines additional local well construction requirements and permit procedure for the well itself. Depending on planned use and the zoned Land Use (Section 1d.6 and Figure 1d.6-1), an additional land use permit may be required under Chapter 35.

The City of Buellton is the only incorporated city within the CMA. Well permitting within the City of Buellton follows 8.20 of the Buellton Municipal Code included as **Appendix 1d-D**.

The Santa Barbara County Environmental Health Services issues groundwater well permits in the Basin. The Santa Barbara County Environmental Health Services notifies water agencies in the Basin of newly permitted wells in the Basin. Well owners within the boundaries of the Santa Ynez River Water Conservation District must register their new and existing wells regardless of whether the well is operational or not.

1d.5-3 Title 22 Drinking Water Program

The SWRCB Division of Drinking Water (DDW) regulates public water systems in the state to ensure the delivery of safe drinking water to the public. A public water system is defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. All six water companies in the CMA Plan Area are classified as public water systems (SWRCB 2021a). Private domestic wells, wells associated with drinking water systems with less than 15 residential service connections, industrial wells, and irrigation wells are not regulated by DDW. Single-parcel and multiple parcel/state small water systems are regulated by the County. DDW enforces the monitoring requirements established in Title 22 of the California Code of Regulations (CCR) for public water system wells, and all the data collected must be reported to DDW. Title 22 also designates the maximum contaminant levels (MCLs) for various waterborne contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters. Water quality compliance monitoring of all source water is required every 12 to 108 months (1 to 6 years) depending on the constituent. For example, nitrate as nitrogen shall be tested for every 12 months, whereas gross alpha (radiological) is required to be tested for every 108 months. Additionally, public water systems are required to submit annual consumer confidence reports that detail the water quality testing results. Similarly, the County enforces the monitoring requirement established in Title 22 for single-parcel and multiple-parcel/state small water systems. Small water systems are required to complete water source yield and quality testing as part of the permit application process, and water quality testing at regular defined intervals upon receipt of an approved permit.

1d.5-4 Water Supply Planning and Water Use Efficiency

Over the years, California has passed a series of Senate Bills (SB), including SB X7-7, SB 610, SB 221, SB 1262, and most recently SB 606, that together outline the regulatory framework for water conservation and water supply planning, and for considering issues of water availability in the environmental and permitting process for land use plans, projects, and subdivisions. These bills have been codified in the CWC Sections 10608–10609.42, which establish water use and demand reduction targets; Sections 10610–10657, which address UWMPs; and Sections 10910–10914, which address water supply assessments, and California Government Code Section 66473.7 (part of the Subdivision Map Act of 1893), which contains requirements related to written verifications (i.e., “will-serve” letters). Collectively, these laws, along with the California Environmental Quality Act (CEQA) of 1970, prompt cities, counties, special districts, and water suppliers to evaluate growth in a broader geographic and temporal context, by coordinating land use planning with water availability and sustainability. SB 1262, which became effective in 2017, made changes to existing law to integrate to some extent existing law governing written verifications and water supply assessments with the passage of SGMA. The sections of the California Water Code (CWC) addressing water supply now contain several provisions relating specifically to groundwater, which if used wholly or in part to supply a project or subdivision, triggers additional analytical steps that could expand the necessary scope of a CEQA document, water supply assessment, and/or written verification, as applicable. SB 1262 added language in the subdivision map act clarifying additional considerations when part or all of the water supply comes from groundwater, especially in adjudicated basins, basins in critical overdraft, and/or basins designated as high or medium priority pursuant to SGMA. In addition to incorporating information from UWMPs, water supply assessments may incorporate relevant information from GSPs prepared pursuant to SGMA.

AB 1668 and SB 606, passed in May 2018, would require the SWRCB, in coordination with DWR, to adopt long-term standards for the efficient use of water, as provided, and performance measures for commercial, industrial, and institutional water use on or before June 30, 2022. The bill, among other things, establishes a standard for indoor water use of 55 gallons per capita daily to be reached by 2025, 52.5 gallons per capita daily beginning in 2025, decreasing to 50 gallons per capita daily beginning in 2030, or as determined jointly by DWR and SWRCB in accordance with necessary studies and investigations. DWR will also adopt long-term standards for outdoor residential water use and outdoor irrigation in connection with commercial, industrial, and institutional water use. With the 20% by 2020 conservation goal pursued in the Water Conservation Act of 2009, these bills extend UWMP requirements, but will measure compliance with uniform standards based on the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently (rather than relative to a water district's baseline). The legislation has a variance process available to allow for exceptions in special circumstances approved by DWR. AB 1668 continues the requirements for urban water suppliers to submit UWMPs every 5 years (though in years ending in 6 and 1 instead of 0 and 5), and makes water suppliers ineligible for any water grant or loan if it does not submit a UWMP. The bills also add requirements for agricultural water management.

1d.5-5 Operational Flexibility and Conjunctive Management Considerations

Operational flexibility is a key consideration in integrated water resource management because it helps water purveyors adapt to known legal, operational, and environmental constraints and plan for an uncertain future, especially as it relates to drought resiliency and the effects of climate change. Operational flexibility can be measured over a given time horizon and/or geographic scale (e.g., water district service area) as the difference between available water supply and service area demand. Operational flexibility is maximized when a water purveyor has a large variety of sources in a water supply portfolio, when it has local control over such sources, and when such sources are connected to each other (e.g., conjunctively managed). On a general statewide scale, water purveyors are increasingly looking to minimize reliance on imported water supplies by promoting stormwater recharge, maximizing wastewater recycling, and sustainably developing local sources of water.

Water purveyors in the CMA Plan Area rely primarily on groundwater. The City of Buellton is the only water agency in the Plan Area that receives SWP water. Because of the significant reliance on groundwater, it is of utmost importance that local groundwater is sustainably managed. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, minimum thresholds and measurable objectives may be established for each sustainability indicator to avoid undesirable results and mitigate potential effects to beneficial uses and users of groundwater in the Basin.

"Conjunctive management or conjunctive use refers to the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various management objectives" (DWR 2016b). Conjunctive use is the coordination of surface and groundwater use, and envisioned projects within the CMA rely on the Santa Ynez River managed by the SRWCB in accordance with WR 73-37 and subsequent orders (SBCWA 1977). Conjunctive use[30] operations are a consideration of the SWRCB in managing the Santa Ynez River and consist releases from either or both of the two surface water right accounts (see Section 1d.5-6) and Fish Reserve Account (CCRB 2002). This program has the goals of flow-related improvements to the

30 23 CCR § 354.8 (e) A description of conjunctive use programs in the basin.

riparian zone including year-round rearing habitat for the endangered steelhead salmon (*O. mykiss*) (SYRTAC 2000).

1d.5-6 Water Rights Agreements and Environmental Regulations

State water rights and environmental regulations, to a large extent, control the operations of Cachuma Reservoir (Lake Cachuma), the flow in the Santa Ynez River below Bradbury Dam, and storage of water within the Santa Ynez Alluvial Subarea. Bradbury Dam, which impounds water on the Santa Ynez River forming Lake Cachuma, was constructed by the U.S. Bureau of Reclamation (Reclamation) in 1953 to provide a reliable water source for Cachuma Project Member Units including Santa Ynez River Water Conservation District Improvement District No. 1, Goleta Water District, the City of Santa Barbara, Montecito Water District, and Carpinteria Valley Water District. In addition, water from Lake Cachuma is released to satisfy downstream users on the lower Santa Ynez River with senior water rights to surface water and to recharge the Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB). Releases from Lake Cachuma are governed by two water accounts, the Above Narrows Account and Below Narrows Account, which accrue credits (acre-feet of water) that can be used to provide water to downstream users. Releases from the Above Narrows Account are made to benefit downstream water users between Bradbury Dam and the Lompoc Narrows. Releases from the Below Narrows Account are conveyed to the Narrows for the benefit of water users in the Lompoc Plain subarea (Stetson 2021).

Reclamation currently owns and operates Bradbury Dam in accordance with permits and water rights orders issued by the SWRCB. In 1958, water rights Permits 11308 and 11310 were issued to Reclamation to store water from the Santa Ynez River. The permits were later modified in years following through a series of hearings and revised orders (Orders WR 73-37 and WR 89-18) to address the volume and timing of water releases from Lake Cachuma to satisfy downstream water rights. In 1987, the California Sportfishing Protection Alliance filed a complaint with the SWRCB against Reclamation alleging Cachuma Project operations were adversely impacting federally listed endangered anadromous steelhead trout (*Oncorhynchus mykiss, O. mykiss*) in the lower Santa Ynez River. In response to the allegation and as required by SWRCB WR 94-5, Reclamation prepared, with direction from SWRCB as lead agency under CEQA, a draft Environmental Impact Report (EIR) that evaluated measures needed to protect the steelhead fishery. The National Marine Fisheries Service (NMFS) simultaneously completed a Biological

Opinion (NMFS 2000) pursuant to Section 7 of the Federal Endangered Species Act of 1973 for the Reclamation's operation and maintenance of Bradbury Dam. In 2011, the SWRCB released a final EIR (SWRCB 2011), and subsequently certified the final EIR. The SWRCB subsequently issued WR 2019-0148 based on the findings of the final EIR which requires Reclamation to provide higher flows in the lower Santa Ynez River during above normal and wet water years, and to provide flows equivalent to those required under the Biological Opinion in all other water year types. In addition, WR 2019-0148 requires Reclamation to study the feasibility of additional measures that may be necessary to restore the steelhead fishery to good condition, including fish passage around Bradbury Dam and habitat restoration in the upper Santa Ynez River and its tributaries where the majority of historical spawning and rearing habitat exist. WR 2019-0148 is the latest water rights order issued to Reclamation. Studies that may result in additional amendments to the original water rights permits are ongoing.

1D.6 LAND USE CONSIDERATIONS

The following section presents a review of population data and land use characteristics for the CMA Plan Area, including the various land use plans and their applicability to groundwater resource management. State law requires that all cities and counties adopt a comprehensive, long-term general plan that outlines physical development for the county or city. The general plan must cover a local jurisdiction's entire planning area so that it can adequately address the broad range of issues associated with the city or county's development. Ultimately, the general plan expresses the community's development goals and embodies public policy relative to the distribution of future public and private land uses. The general plan may be adopted as a single document or as a group of documents relating to subjects or geographic segments of the planning area.

Most of the planning documents relevant to the CMA Plan Area fall under the umbrella of the Santa Barbara County Comprehensive Plan (Comprehensive Plan), which is a "living document" made up of many parts that are periodically updated by the County's Department of Planning and Development. The core structure of the document is to have broad countywide land use policies that are refined in various community plans—the local setting, policy issues, and community concerns are taken into account through a public participation process. All elements of a general plan, whether mandatory or optional—including community plan principles, goals, objectives, policies, and plan proposals—must be internally consistent with each other and all elements have equal legal status (i.e., no element is legally subordinate to another).

The development and implementation of this GSP is relevant to several general plan and community plan elements because each contain policies and implementation actions that are intended to be protective of water resources. All applicable land use plans acknowledge the major constraints on growth that the lack of water availability presents. The County's general plans broadly encourage water conservation, and prohibit development, such as tentative map and subdivision approvals, unless the availability of water can be demonstrated. Several plan elements intersect, including the Conservation Element, the Environmental Resource Management Element, and the Groundwater Resources Element, and contain policies specifically aimed at water resources and groundwater sustainability.

In a few cases, identified below, the passage of SGMA and the adoption of this GSP may supersede some of the land use plan policies or underlying assumptions within them. Where this occurs, it is expected that future general plan and community plan updates, and/or updates to general plan theoretical buildout estimate, will consider the sustainability goals, sustainable management criteria, and the projects and management actions of this GSP, resulting in revisions to relevant land use plans elements.

1d.6-1 Land Use and Population

The primary developed land uses in the Plan Area consist of residential, commercial, and agricultural uses (**Figure 1d.6-1**, Land Use). Agricultural land is the single largest land use type comprising approximately 80% of the entire Plan Area. The predominant types of agriculture within the Plan Area include field crops, pasture, and vineyards. Table 1d.6-1 presents a summary of land uses in the Plan Area.

Table 1d.6-1
Summary of Land Use in the CMA Plan Area

Land Use	Number of Parcels	Area (Acres)	Percent of Total
Agricultural	190	16,694.1	79.4%
Commercial	178	200.7	1.0%
Highways and Streets[a]	8	606.3	2.9%
Industrial	57	113.9	0.5%
Institutional	5	16.4	0.1%
Multi-Family Residential	334	38.1	0.2%
Recreational	9	71.0	0.3%
Single-Family Residential	1,678	3,122.0	14.9%
Undefined[b]	35	8.9	<0.1%
Utilities/Rights-of-Way	34	30.8	0.1%
Vacant	56	121.7	0.6%
Total	2,584	21,023.8	100%

Source: Santa Barbara County 2019 parcel GIS data layer.
Notes:
a Includes road right-of-ways and areas not included in the parcel data layer.
b Consists of parcels where land use type has not been defined. Based on a review of aerial imagery, it appears these parcels are primarily residential and commercial.

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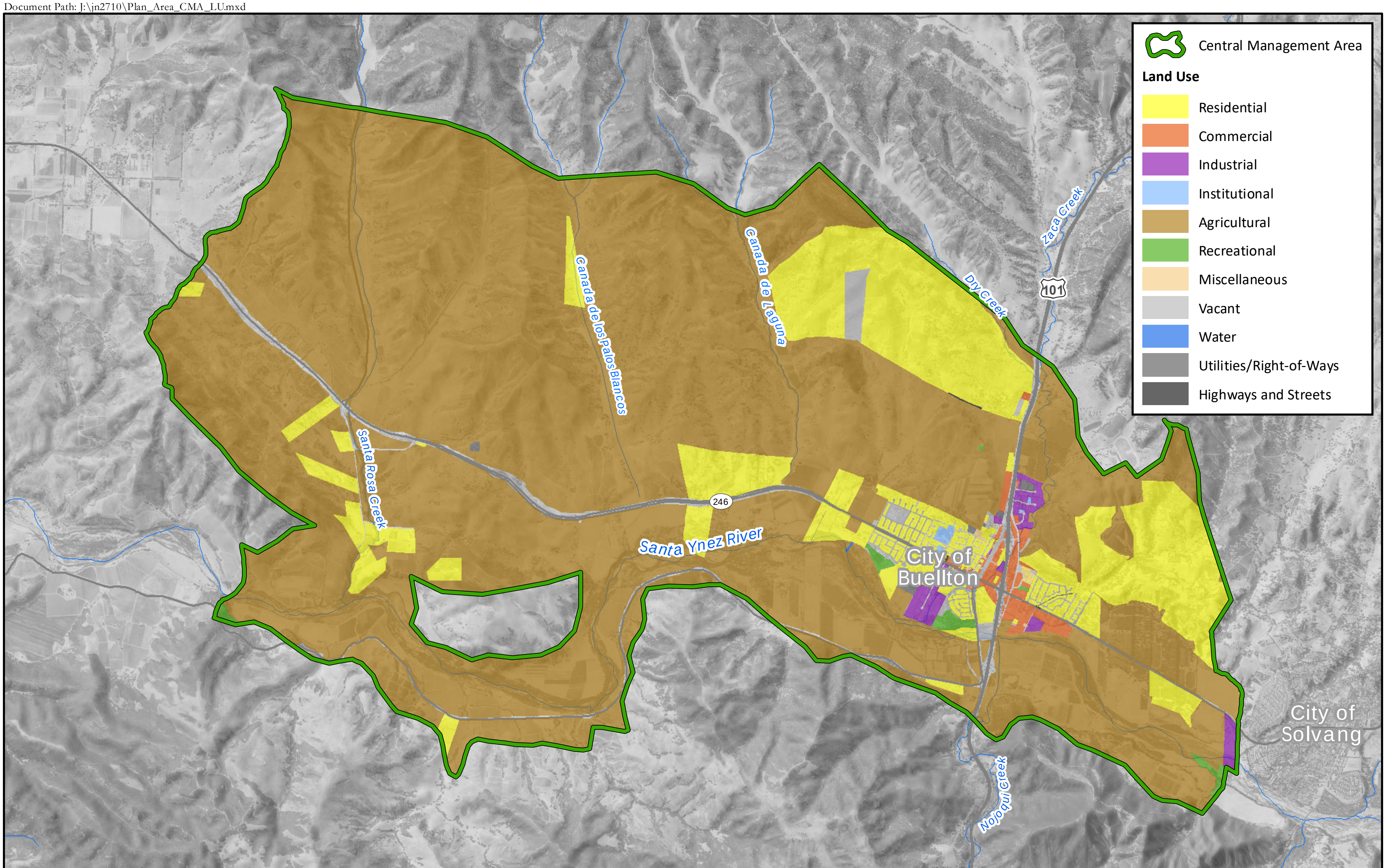

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CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

LAND USE
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
Santa Barbara County (2019)

FIGURE 1d.6-1

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There are several sources of population data for the Plan Area, most of which are derived from decennial census counts, which last occurred in 2010.[31] Sources of population information are as follows:

- **U.S. Census Bureau**: The U.S. Census Bureau conducts a census count every 10 years. Census data are gathered by tracts, blocks, and census-designated places. Census blocks were intersected with the CMA boundary to determine the population within the Plan Area for 2010. Census blocks that intersected the boundary of the CMA were area-weighted to determine the population that falls within the Plan Area.
- **City and County General Plans**: The City of Buellton (City) and the County of Santa Barbara (County) gather data on development, growth, and land use patterns, and make population estimates in conjunction with census data. The general plans relevant to the Plan Area were reviewed for historical and current population data.
- **Santa Barbara County Association of Governments**: Santa Barbara County Association of Governments (SBCAG) is a regional planning agency comprised of the County and eight incorporated cities within the County. The SBCAG produces demographics data and growth forecasts for the County which were reviewed and used to forecast population growth within the Plan Area.

On a countywide level, population growth is associated primarily with the growth of incorporated cities. Between 2000 and 2010, the cities of Buellton, Guadalupe, and Santa Maria experienced significant population increase upwards of 29% while population change within the unincorporated areas of the County was 0% (SBCAG 2012). In 2010, the total population of the County was 423,800. By 2040, the total population of the County is forecast to be 519,965, an increase of 96,165 or approximately 23% from 2010 (SBCAG 2012).

Based on U.S. Census Bureau data, the population of the Plan Area in 2010 was approximately 5,592. As shown in Table 1d.6-2, the population of the Plan Area is concentrated in the City of Buellton. The City of Buellton alone accounted for approximately 86% of the Plan Area population in 2010. Using the regional forecast growth rate for each 5-year period for 2010 to 2040, the population of the Plan Area is projected

31 Results from the 2020 census were unavailable at the time of writing this GSP.

to be approximately 6,861 by the year 2040 (Table 1d.6-2). **Figure 1d.6-2** shows the population density throughout the Plan Area.

Table 1d.6-2
Past, Current, and Projected Population for
Santa Barbara County, City of Buellton, and CMA Plan Area

Area	Population						
	2010	*2015*	*2020*	*2025*	*2030*	*2035*	*2040*
County	423,800	428,614	445,891	470,445	495,000	507,482	519,965
City of Buellton	4,811	4,866	5,062	5,341	5,619	5,761	5,903
Plan Area	5,592	5,656	5,883	6,207	6,531	6,696	6,861

Source: SBCAG 2012 and 2013; 2010 U.S. Census Bureau GIS data layer.
Notes: 2015 to 2040 population of City of Buellton and Plan Area estimated based on County growth forecast for same period.

As defined in California Health and Safety Code, Section 116275, disadvantaged communities (DAC) are Census geographies having less than 80% of the statewide annual median household income, and severely disadvantaged communities (SDAC) are Census geographies having less than 60% of the statewide annual median household income. Census Tracts are smaller relatively permanent statistical subdivisions that provide a stable set of geographic units for the presentation of statistical data representing smaller populations of between 1,200 and 8,000 people, with an optimum size of 4,000 people.[32] Based on 2018 DAC mapping at the Census Tract level (**Figure 1d.6-3**), there are no DACs or SDACs within the CMA Plan Area. **Table 1d.6-3** summarizes the DAC and SDAC land area and population.

32 Glossary. United States Census Bureau. https://www.census.gov/programs-surveys/geography/about/glossary.html#ti1142073952 Accessed 2021-11-18

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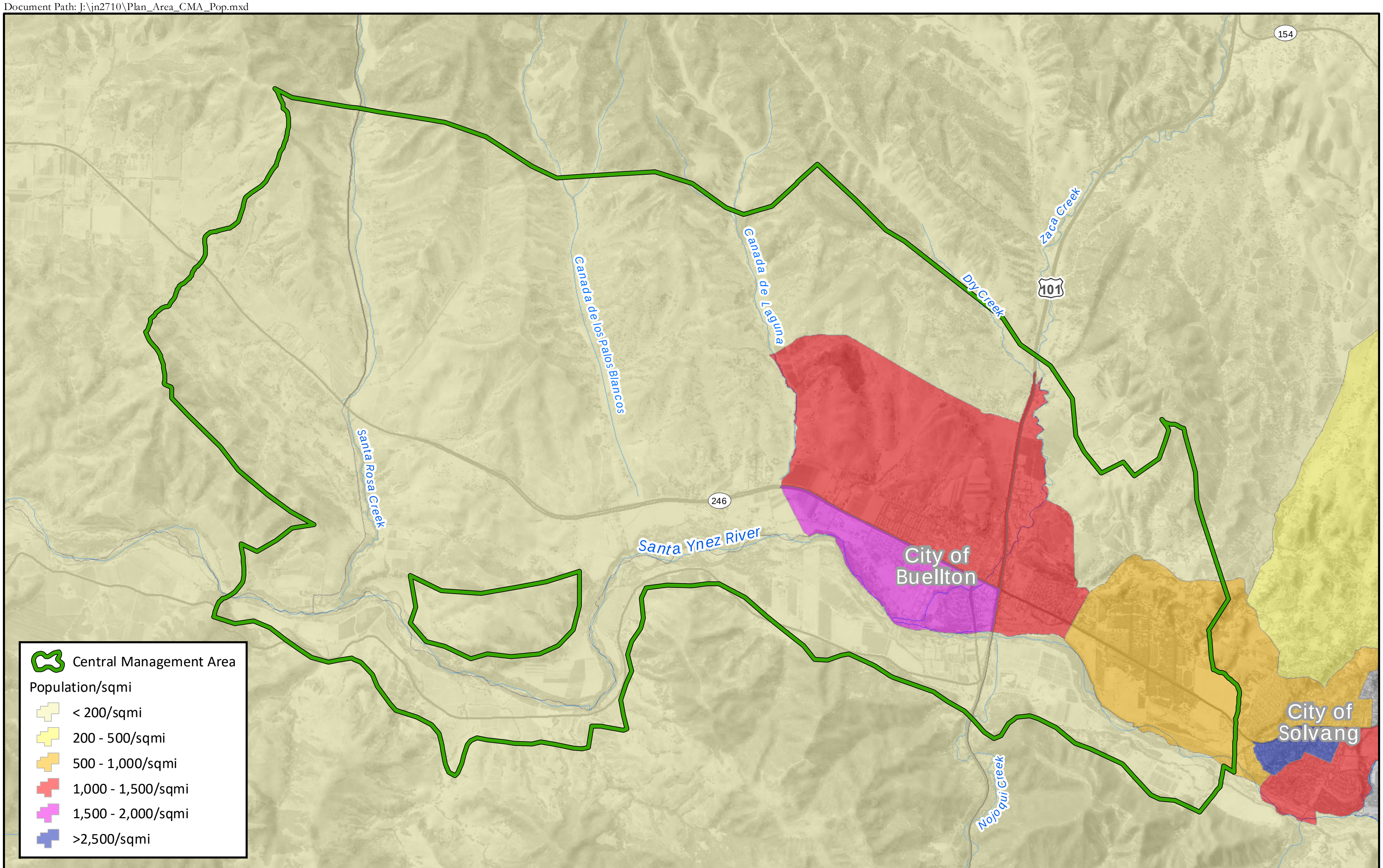

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POPULATION DENSITY
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
US Census 2018 (population adjusted from 2010)

FIGURE 1d.6-2

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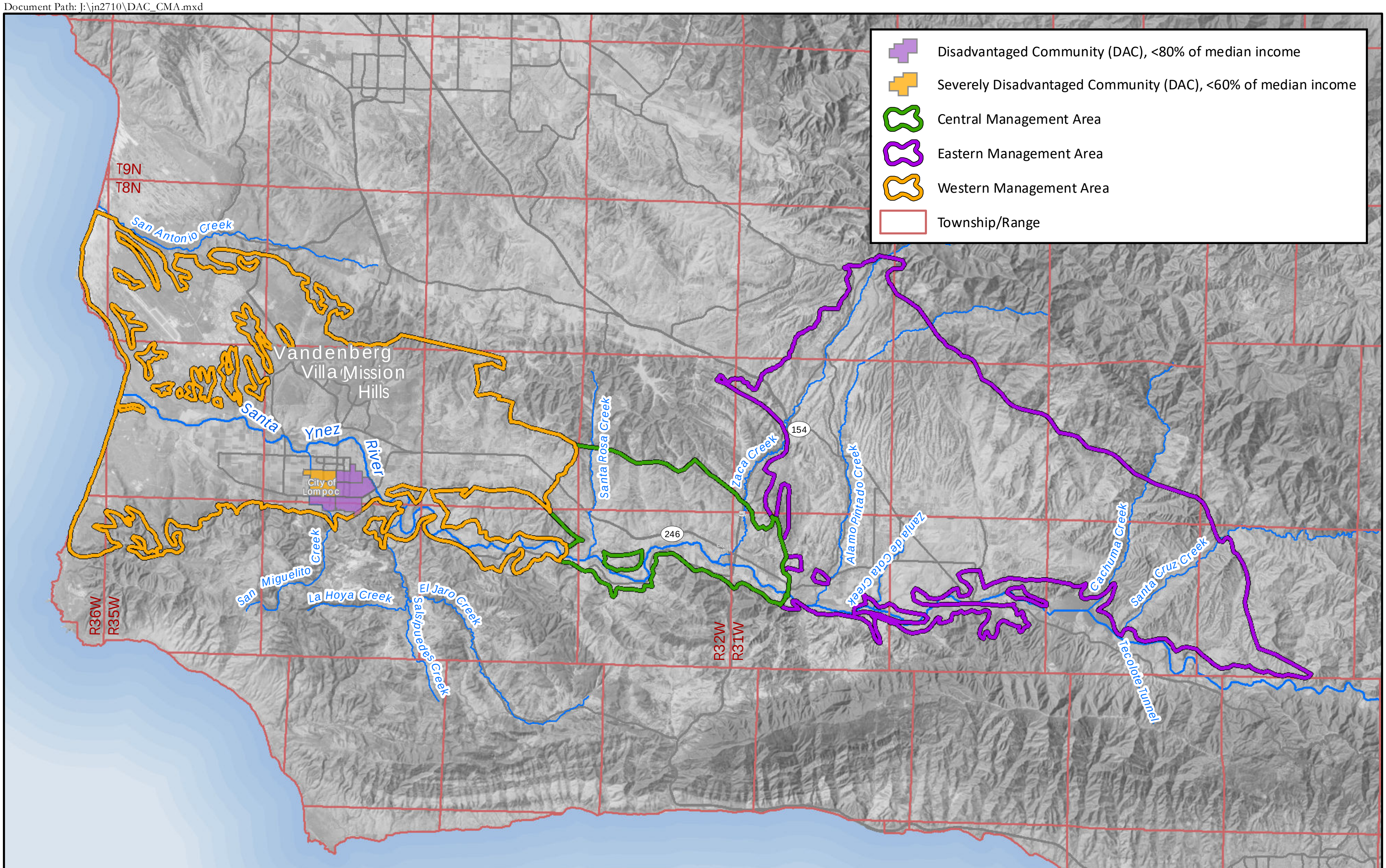

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CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

DISADVANTAGED COMMUNITIES WITHIN SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

BY CENSUS TRACT

0 2 4 Miles

Source:
DWR, 2018 Disadvantaged Communities
by 2010 Census Tract.

N

FIGURE 1d.6-3

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Table 1d.6-3
Disadvantaged Communities and Severely Disadvantaged Communities
Census Tract Level

CMA Subarea	Severely Disadvantaged Community (SDAC)		Disadvantaged Community (DAC)	
	Median annual income <60% of state: <$42,737 in 2018		Median annual income 60%-80% of state: $42,737 - $56,981 in 2018	
	Acres	Population	Acres	Population
Buellton Upland	0	0	0	0
SYR Alluvium	0	0	0	0
Total	0	0	0	0

Notes: DAC and SDAC based on median income in a census tract, not on an individual or household level.
Source: DWR 2021b, based on US Census Data for 2018

1d.6-2 General Plans

General plans are considered applicable to the GSP to the extent that they may change water demands within the Basin or affect the ability of the CMA GSA to achieve sustainable groundwater management over the planning and implementation horizon. The general plans applicable to the Plan Area include the Santa Barbara County Comprehensive Plan (Comprehensive Plan) and City of Buellton General Plan. These two general plans are described below and summarized in **Table 1d.6-4**. The areas covered by the General Plans are shown in **Figure 1d.6-4**.

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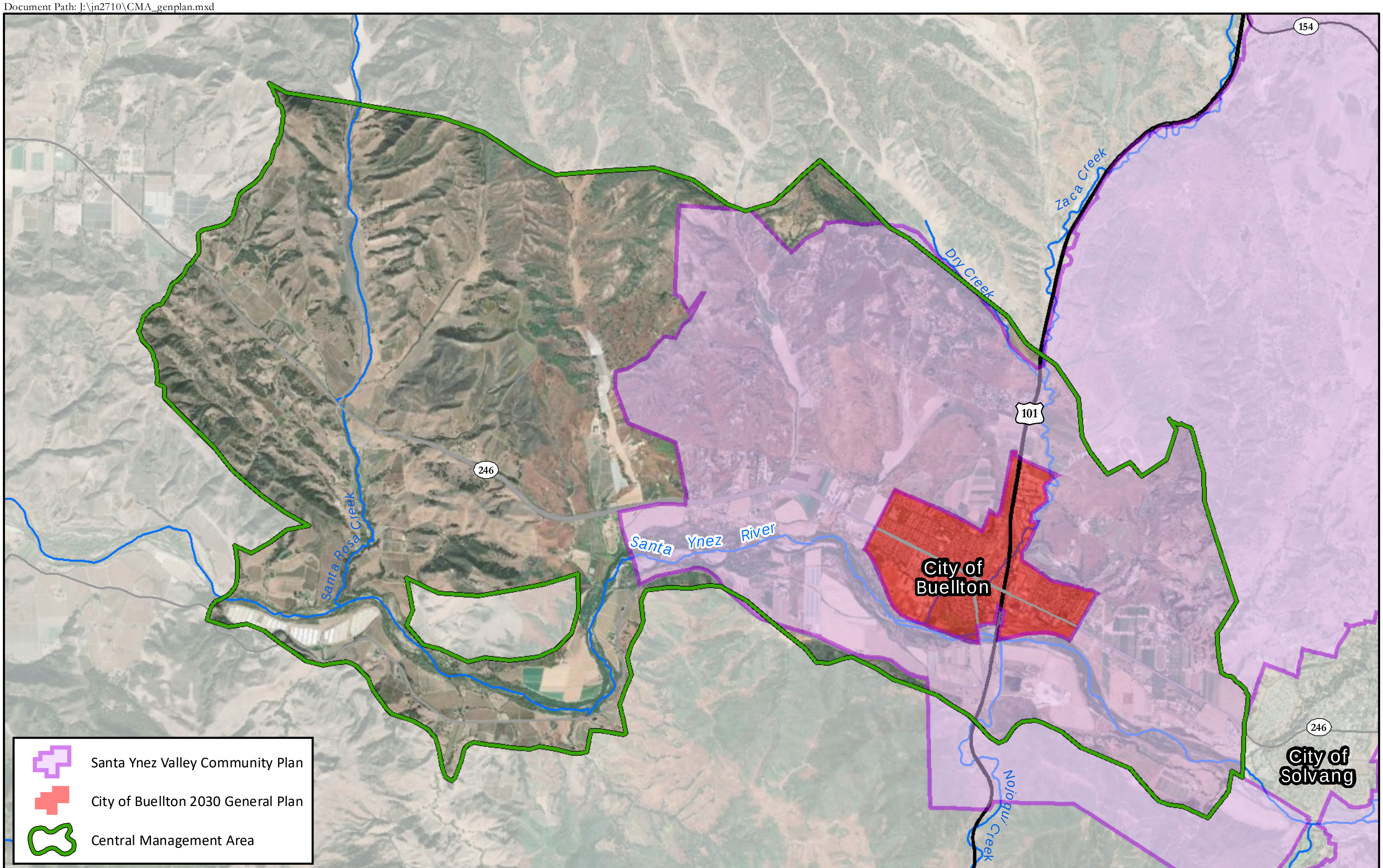

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Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

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

Note: Map contents located within the County of Santa Barbara General Plan area.

0 0.5 1 Miles

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FIGURE 1d.6-4

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Table 1d.6-4
Summary of General Plan Policies Relevant to Groundwater Sustainability in the CMA Plan Area

Element	Policy/Action No.	Quoted Description	GSP Consistency
Santa Barbara County Comprehensive Plan			
Conservation Element – Groundwater Resources Section	Goal 1: To ensure adequate quality and quantity of groundwater for present and future County residents, and to eliminate prolonged overdraft of any groundwater basins.		
	Policy 1.1	The County shall encourage and assist all of the County's water purveyors and other groundwater users in the conservation and management, on a perennial yield basis, of all groundwater resources.	Consistent.
	Action 1.1.1	The County shall encourage and, where feasible, financially assist in continued studies of new or supplemental water sources and the more efficient use of existing sources, for the purpose of avoiding, reducing, or eliminating prolonged overdraft. To ensure that such water is used to reduce overdraft (as opposed to supplying only new uses), the County shall encourage water purveyors to give first priority to offsetting existing demands met by overdrafting groundwater supplies.	Consistent.
	Action 1.1.2	The County will seek the voluntary cooperation with purveyors during the early planning of any supplemental water sources that the purveyors propose or plan to develop. The County will coordinate with the purveyor, to the extent allowed by the purveyor, to ensure that: (1) environmental constraints are fully incorporated into the location and design of such projects; and (2) mitigations are applied to the fullest extent feasible and consistent with County permit conditioning policies and practices to minimize the magnitude of significant impacts.	Consistent.
	Policy 1.2	The County shall encourage innovative and/or appropriate, voluntary water conservation activities for increasing the efficiency of agricultural water use within the County.	Consistent.
	Action 1.2.1	The County shall provide support to the Soil Conservation Service, the Resource Conservation District, and other appropriate agencies to continue the Irrigation Management Program and other such water conservation and management efforts.	Consistent.

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Action 1.2.2	The County shall support the expansion of existing efforts by the U.C. Cooperative Extension/Farm Advisor, in cooperation with the Agricultural Commissioner, Soil Conservation Service, Resource Conservation District, and other appropriate agencies, to develop and update a verifiable comprehensive database on agricultural water use and conservation effectiveness. Such efforts should include incentives for groundwater users to collect and provide more accurate data, as needed to permit the development of more precise determinations of consumptive groundwater use.	Consistent, but SGMA now provides additional regulatory authority and tools to collect groundwater data.
	Policy 1.3	The County shall act within its powers and financial abilities to promote and achieve the enhancement of groundwater basin yield.	Consistent. GSA now has additional authorities to do the same.
	Policy 1.3.1	Where feasible and consistent with the County's applicable Comprehensive Plan element(s), the County shall encourage and assist appropriate agencies in ongoing or future projects and programs which increase groundwater recharge and basin yield, as long as such projects and programs can be shown not to degrade groundwater quality. Such activities could include, but would not be limited to, cloud seeding, range management, dams, and spreading basins.	Consistent.
	Goal 2: To improve existing groundwater quality, where feasible, and to preclude further permanent or long-term degradation in groundwater quality.		
	Policy 2.1	Where feasible, in cooperation with local purveyors and other groundwater users, the County shall act to protect groundwater quality where quality is acceptable, improve quality where degraded, and discourage degradation of quality below acceptable levels.	Consistent.
	Action 2.1.1	In reviewing or preparing basin management plans under the Groundwater Management Act and other applicable law, the County shall consider both the quantity and quality of groundwater in affected basins. Pumpage that causes intrusion of poor quality water, if and where identified, should receive particular attention for improved management.	This policy should be updated to reflect SGMA, as it supersedes the Groundwater Management Act.
	Action 2.1.2	In basins or sub-basins with water quality problems, the County will encourage reduction of salt and other pollutant loading from all sources through cooperative, voluntary efforts and, where feasible, will take direct action in this regard.	Consistent. Note that while cooperative and voluntary efforts are preferred, SGMA gives GSA authority to mandate mitigation if sustainability criteria are threatened or exceeded.

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Policy 2.2	The County shall support the study of adverse groundwater quality effects which may be due to agricultural, domestic, environmental and industrial uses and practices.	Consistent.
	Action 2.2.1	The County shall cooperate in ongoing and future studies which determine the current and potential extent of agricultural, domestic, environmental and industrial pollutants in various County aquifers, and to ascertain better methods by which agriculturalists can prevent increasing pollutant loads in the future. Such studies should be coordinated with the basin planning and enforcement work done by the RWQCB and SWRCB, and should involve other appropriate agencies and groundwater users.	Consistent.
	Goal 3: To coordinate County land use planning decisions and water resources planning and supply availability.		
	Policy 3.1	The County shall support the efforts of the local water purveyors to adopt and implement groundwater management plans pursuant to the Groundwater Management Act and other applicable law.	These policies and actions should be updated to reflect SGMA, as it supersedes the Groundwater Management Act.
	Action 3.1.1.	The County shall encourage the preparers of groundwater management plans to consider environmental factors, including but not limited to the potential link between groundwater resources and riparian habitat.	
	Policy 3.2	The County shall conduct its land use planning and permitting activities in a manner which promotes and encourages the cooperative management of groundwater resources by local agencies and other affected parties, consistent with the Groundwater Management Act and other applicable law.	
	Action 3.2.1	The County Flood Control & Water Conservation District or the County Water Agency, as feasible and as requested by a local agency or agencies pursuant to the Groundwater Management Act, may assume responsibility in preparing a groundwater management plan pursuant to the Groundwater Management Act and other applicable law.	
	Policy 3.2	The County shall use groundwater management plans, as accepted by the Board of Supervisors, in its land use planning and permitting decisions and other relevant activities.	
	Action 3.3.1	The Board of Supervisors, in consultation with the County Planning Commission, shall accept a groundwater management plan which promotes and is consistent with the Goals of this Groundwater Resources Section of the Conservation Element. Such acceptance shall be rescinded where specific facts and circumstances indicate that a plan has been rendered inadequate to promote these Goals.	

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Action 3.3.2	The County shall conserve waters to the extent feasible through exercise of the County's discretionary land use planning and permitting decisions, and shall promote such conservation through related public and private actions.	
	Policy 3.4	The County's land use planning decisions shall be consistent with the ability of any affected water purveyor(s) to provide adequate services and resources to their existing customers, in coordination with any applicable groundwater management plan.	Consistent.
	Action 3.4.1	The County, in its planning activities, shall work cooperatively with local water purveyors, the County Water Agency, the County Flood Control and Water Conservation District, State and Federal agencies concerned with water resources, and private groups and individuals with particular interest and expertise related to water resources.	Consistent.
	Action 3.4.2	Santa Barbara County shall develop its land use plans and policies in a manner which takes into account all groundwater uses (e.g., domestic, agricultural, natural resources and habitats, etc.).	Consistent.
	Action 3.4.4	Santa Barbara County shall encourage and assist local water purveyors in developing adequate water supplies (groundwater, surface water, desalination, etc.) to serve their customers and communities consistent with the applicable general plan(s).	Consistent.
	Action 3.4.5	The County shall facilitate the efforts of purveyors to serve overlying landowners from the purveyor's system.	Consistent.
	Policy 3.5	In coordination with any applicable groundwater management plan(s), the County shall not allow, through its land use permitting decisions, any basin to become seriously overdrafted on a prolonged basis.	Consistent. Note that the Basin is not designated as critically overdrafted by DWR.
	Action 3.5.1	Based on input from the County Water Agency and P&D, the Board, in coordination with the responsible water purveyor(s), shall designate any basins within the county as "seriously overdrafted" if the following conditions are present: Prolonged overdraft which results or, in the reasonably foreseeable future (generally within ten years) would result, in measurable, unmitigated adverse environmental or economic impacts, either long-term or permanent. Such impacts include but are not limited to seawater intrusion, other substantial quality degradation, land surface subsidence, substantial effects on riparian or other environmentally sensitive habitats, or unreasonable interference with the beneficial use of a basin's resources. The County's fundamental policy shall be to prevent such overdraft conditions.	Consistent. These now constitute the main sustainability indicators under SGMA. Note that the Basin is not designated as critically overdrafted by DWR.

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Action 3.5.2	In seriously overdrafted basins, the County shall not approve discretionary development permits if such development requires new net extractions or increases in net extractions of groundwater, pending development and County acceptance of a basin management plan, consistent with the Groundwater Management Act or other applicable law, which adequately addresses the serious overdraft.	Consistent. Note that the Basin is not designated as critically overdrafted by DWR.
	Policy 3.6	The County shall not make land use decisions which would lead to the substantial overcommitment of any groundwater basin.	Consistent.
	Policy 3.6	New urban development shall maximize the use of effective and appropriate natural and engineered recharge measures within project design, as defined in design guidelines to be prepared by the Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) in cooperation with P&D.	Consistent.
	Action 3.6.1	In cooperation with the USGS and local water purveyors, the County should conduct or participate in a study to identify in more detail those areas where natural and enhanced recharge is occurring or may occur in each of the County's major groundwater basins and develop detailed design guidelines for ways to protect recharge areas from further degradation.	Consistent.
	Policy 3.8	Water-conserving plumbing, as well as water-conserving landscaping, shall be incorporated into all new development projects, where appropriate, effective, and consistent with applicable law.	Consistent.
	Action 3.8.1	The County shall continue to encourage and, where feasible, financially participate in water-saving landscape experiments and education programs, such as those conducted by the Water Agency's Regional Water Conservation Program.	Consistent.
	Action 3.8.2	The County shall continue to develop and refine uniform standards and guidelines for water conservation in new development projects, which shall recognize that different physical characteristics within various areas may require more than a single set of standards and guidelines. All cities within the County shall be encouraged to adopt similar standards and guidelines.	Consistent.
	Policy 3.9	The County shall support and encourage private and public efforts to maximize efficiency in the pre-existing consumptive M&I use of groundwater resources.	Consistent.
	Action 3.9.2	The County, in consultation with the cities, affected water purveyors, and other interested parties, shall promote the use of consistent "significance thresholds" by all appropriate agencies with regard to groundwater resource impact analysis.	Consistent.

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Action 3.9.3	The County shall continue to refine and update its “significance thresholds” as new data becomes available and as overdraft conditions persist, as specified in the County’s CEQA Guidelines. The County’s acceptance of duly prepared and adopted groundwater management plans also may necessitate the adjustment of appropriate groundwater thresholds.	Consistent. Note that the Basin is not designated as critically overdrafted by DWR, and sustainable management criteria of this GSP may necessitate updated significance thresholds.
	Goal 4: To maintain accurate and current information on groundwater conditions throughout the County.		
	Policy 4.1	The County shall act within its powers and financial abilities to collect, update, refine, and disseminate information on local groundwater conditions.	Consistent.
	Action 4.1.1	The County Water Agency shall continue to monitor water levels from existing monitoring wells and, in coordination with the U.C. Cooperative Extension/Farm Advisor, shall request, on a voluntary basis, private and public water purveyors and major private groundwater users, including agricultural users, to provide periodic records of groundwater production. Unless deemed unnecessary by the Water Agency's Board of Directors for any year, the Agency shall compile an annual report on the status of pumping amounts, water levels, overdraft conditions, and other relevant data, and shall submit this report to the Board of Supervisors for its acceptance and possible further action. The annual report to the Board shall include a review of the results of all groundwater quality monitoring conducted in the County.	Consistent. The GSA will have this responsibility. The GSA will send annual reports required by DWR to the County as well.
	Action 4.1.2	The County, in consultation with the cities, other counties, affected water purveyors, and other interested parties, shall promote the use of consistent standards by all appropriate agencies with regard to groundwater resources.	Consistent. Note that sustainability criteria for basins under management of a GSP will be specific to each basin.
	Action 4.1.3	The County recognizes the need for more accurate data on all groundwater basins within the County and shall continue to support relevant technical studies, as feasible.	Consistent.
	Action 4.1.4	The County should identify areas where natural resources and habitats depend upon groundwater, and where such resources and habitats have been adversely affected by groundwater overdraft.	Consistent.

Element	Policy/Action No.	Quoted Description	GSP Consistency
	Action 4.1.6	The service area boundaries of existing and planned private water companies shall be defined. These companies shall be requested to provide this information to P&D and the County Water Agency no later than 12/31/94 or, for subsequently organized companies, within six months of their final formation.	Consistent.
	Action 4.1.7	The County recommends that all public and private water companies, districts, and agencies, to the extent legally possible, maintain mutual aid agreements with adjacent districts or private water companies in case of water shortages. Any such agreements shall be noted by the County Water Agency in its annual report (see Action 4.1.1). Such agreements would be based on short-term or emergency needs or identified economic benefits to all parties.	Consistent.
	Action 4.1.8	All water districts and city water departments which have prepared a Water Conservation Plan (under the 1984 Urban Water Management Act) and/or other long-term water planning studies, shall be asked to submit a copy of such plan(s) to the County Water Agency and P&D for review and comment. P&D shall meet with these purveyors to discuss the population/land use projections and their current status.	Consistent.
	Action 4.1.9	The County Water Agency shall continue to work with local water purveyors and other appropriate entities to promote the efficient use of water by all users through education and incentive programs. Progress on such programs shall be reported by the County Water Agency in its annual report (see Action 4.1.1).	Consistent. GSP annual reports will be submitted to the County at the same time they are submitted to DWR.
	Action 4.1.10	The County shall continue to encourage and, where feasible, financially participate in USGS, DWR, SWRCB, and local water purveyors' studies of water quality in basins throughout the County.	Consistent.
	Action 4.1.11	The County shall continue to encourage and, where feasible, materially assist the seawater intrusion monitoring programs of the USGS, local water purveyors, and other appropriate agencies.	Consistent.
	Action 4.1.12	The County shall encourage and, where feasible, materially contribute to the refinement and updating of agricultural water use ("duty") factors by the Soil Conservation Service, the U.C. Cooperative Extension/Farm Advisor, or other appropriate entities.	Consistent.
	Action 4.1.13	The County shall encourage and, where feasible, materially contribute to the refinement of estimates of agricultural water return flows by the State Department of Water Resources, the U.C. Cooperative Extension/Farm Advisor, or other appropriate entities.	Consistent.

Element	Policy/Action No.	Quoted Description	GSP Consistency
City of Buellton General Plan			
Conservation/Open Space Element – Water Resources and Water Quality	Goal: Improve and maintain water quality of the region		
	Policy C/OS-1	Encourage efficient water use by existing and future development.	Consistent.
	Policy C/OS-2	Encourage implementation of Best Management Practices to eliminate/minimize the impacts of urban run-off and improve water quality.	Consistent.
Santa Ynez Valley Community Plan			
Public Facilities and Services – Wastewater	Goal WW-SYV: Ensure adequate wastewater treatment and disposal throughout the planning area.		
	Policy WW-SYV-1	Development and infrastructure shall achieve a high level of wastewater treatment, in order to best serve the public health and welfare.	Consistent.
	Policy WW-SYV-2	Pollution of surface and groundwater shall be avoided. Where contribution of potential pollutants of any kind is not prohibited and cannot be avoided, such contribution shall be minimized to the maximum extent practical.	Consistent.
Public Facilities and Services – Water	Goal WAT-SYV-1: Protect the quality of surface and ground waters from degradation; maintain adequate, safe water supplies; and protect groundwater basins from prolonged overdraft.		
	Policy WAT-SYV-1	Development in the Santa Ynez Valley Planning Area shall incorporate appropriate water efficient design, technology and landscaping.	Consistent.
	Action WAT-SYV-1.1	The County Water Agency shall work with the SYRWCD ID #1 to promote educational programs that encourage efficient water use.	Consistent.
	Policy WAT-SYV-2	Existing and future water supply and quality shall continue to be periodically evaluated with specific measures identified to maintain adequate supply levels and quality, if deemed necessary.	Consistent.
	Action WAT-SYV-2.1	The County will continue to work with local water purveyors to assess water demand under Plan buildout conditions and identify the necessary infrastructure improvements to serve that demand and/or identify new sources of water or improved treatment facilities that may be necessary to meet demand.	Consistent.
Resources and Constraints –	Goal BIO-SYV: The Biological Resources of the Santa Ynez Valley Community Plan Area are an Important Regional Asset that Should be Protected, Enhanced and Preserved.		

Element	Policy/Action No.	Quoted Description	GSP Consistency
Biological Resources	Policy BIO-SYV-5	Pollution of the Santa Ynez River, streams and drainage channels, underground water basins and areas adjacent to such waters shall be minimized.	Consistent.

Source: County of Santa Barbara 2009a, 2009b, 2010, 2019b; City of Buellton 2008.

Notes: GSP = Groundwater Sustainability Plan; SGMA = Sustainable Groundwater Management Act; GSA = Groundwater Sustainability Agency; Basin = Santa Ynez River Valley Groundwater Basin; RWQCB = Regional Water Quality Control Board; SWRCB = State Water Resources Control Board; P&D = Planning and Development Department; DWR = California Department of Water Resources; M&I = municipal and industrial; CEQA = California Environmental Quality Act; U.C. = University of California; USGS = U.S. Geological Survey; PRC = California Public Resources Code; CWSA = Certificate of Water Service Availability.

1d.6-2-1 Santa Barbara County Comprehensive Plan

The Santa Barbara County Comprehensive Plan (Comprehensive Plan) outlines land use and growth policies at the county-wide level, and has several elements particularly relevant to groundwater sustainability, including the following:

- **Conservation Element**. The Conservation Element describes and recommends policies and programs designed to protect water resources, agricultural resources, ecological systems, historical and archaeological sites, and mineral resources (County of Santa Barbara 2010).
- **Groundwater Resources Section**. The Groundwater Resources Section is a stand-alone section of the Conservation Element that provides a review of groundwater resource limitations throughout the County, and establishes groundwater resource policies for each of the groundwater basins in the County (County of Santa Barbara 2009).
- **Environmental Resources Section**. The Environmental Resource Management Element is a compendium of the Seismic Safety and Safety Element, the Conservation Element, and the Open Space Element and includes topics such as prime agricultural lands, slopes, biological resources, habitat areas, floodplain and floodways, and geologic hazards, among others (County of Santa Barbara 2009).
- **Community Plans**. The- Comprehensive Plan is supplemented by individual community plans that take into account the local setting, policy issues, and community concerns. There are no community plans applicable to the GSP Plan Area.

1d.6-2-2 City of Buellton General Plan

The City of Buellton (City) General Plan outlines the City's land use and growth policies, reflecting the community's long-term development goals. Many of the goals and policies included in the- City's General Plan supplement those contained in the Comprehensive Plan. The element of the City of Buellton General Plan with goals and policies that explicitly address water resources is the Conservation and Open Space element (City of Buellton 2008).

1d.6-2-3 Santa Barbara County Comprehensive Plan Elements

In the Groundwater Resources section of the Comprehensive Plan's Conservation Element, the County included several findings that generally remain accurate, although certain expectations, particularly with regard to the availability of State Water Project (SWP) water, may no longer be accurate. For example, at the time of preparation (1994), the County recognized that new supplemental water sources, such as SWP water and augmentation of local supplies, would be available and could serve to replenish groundwater basins or be used in lieu of groundwater. However, the availability of SWP water supplies varies with hydrologic cycles where during wet years, the SWP is generally able to deliver sufficient water to meet delivery requests. However, during extended dry periods, the SWP can deliver only a portion of requested deliveries (DWR 2020b, CCWA 2020). For example, the City has experienced periodic drought-related curtailments of water supply from the SWP in recent years requiring the City to rely more heavily on local groundwater supplies (City of Buellton 2021). Existing conditions therefore challenge the expectation contained in the Groundwater Resources section of the County's Comprehensive Plan (County of Santa Barbara 2009a). Furthermore, the land use plans describe groundwater-related actions as voluntary cooperative and collaborative efforts that are not mandated under the regulatory schemes that existed at the time. With the passage of SGMA, specific mandates now exist.

1d.6-2-4 Santa Ynez Valley Community Plan

The Santa Ynez Valley Community Plan (Community Plan) was developed in response to concerns regarding the changing character of the Santa Ynez Valley as a result of increased growth and land use change. The Community Plan supplements the County's Comprehensive Plan and provides a framework for planning future development in the region while maintaining the visions and objectives of the area's residents. The Community Plan covers approximately 72 square miles (46,933 acres) of the Santa Ynez Valley and encompasses the unincorporated townships of Santa Ynez, Ballard, and Los Olivos. The Community Plan does not apply to the incorporated cities of Buellton and Solvang. The predominant land use designation within the Community Plan area is agriculture, followed by residential and very limited commercial and industrial. The Community Plan sets development standards to maintain the rural character and scenic value of the Santa Ynez Valley including limiting subdivision of larger agriculture parcels into smaller parcels, requiring new development to be compatible with adjacent agricultural lands, and preserving existing land designated for agriculture, among others (County of Santa Barbara 2009b).

1d.6-3 Other Planning / Land Use Considerations

Implementation of existing land use plans are expected to not significantly change water demands within the basin or affect the ability of the CMA to achieve sustainable groundwater management over the planning and implementation horizon.[33] All discretionary projects proposed within the Basin are subject to compliance with CEQA. In 2019, the Governor's Office of Planning and Research released an update to the CEQA Guidelines that included a new requirement to analyze projects for their compliance with adopted GSPs. Specifically, the new applicable significance criteria include the following:

- Would the program or project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
- Would the program or project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Therefore, to the extent general plans allow growth that could have an impact on groundwater supply, such projects would be evaluated for their consistency with adopted GSPs and for whether they adversely impact the sustainable management of the Basin. Under CEQA, potentially significant impacts identified must be avoided or substantially minimized unless significant impacts are unavoidable, in which case the lead agency must adopt a statement of overriding considerations.

The County has long implemented its own CEQA significance thresholds based on heightened public concern and awareness for the scarcity of the County's groundwater resources. Under County guidelines, "safe yield" is defined as "the maximum amount of water which can be withdrawn from a basin (or aquifer) on an average annual basis without inducing a long-term progressive drop in water level" (County of Santa Barbara 2021). The Environmental Thresholds and Guidelines Manual prepared by the County (County of Santa Barbara 2021) outlines the appropriate use and application of various environmental

33 23 CCR § 354.8 (f) (2)

impact thresholds as they relate to groundwater resources. The County originally determined in 1992 that the safe yield of the Buellton Uplands Basin (roughly equivalent to what is now considered the Buellton Upland subarea) was 1,300 AFY, with pumping that put the Buellton Uplands Basin into overdraft with an estimated "remaining life of available storage" at the time to be 184.6 years (County of Santa Barbara 2021).

GSP Implementation is described in detail in Chapter 4 (Project and Management Actions) and Chapter 5 (Plan Implementation) which includes project and management actions if conditions become unsustainable. Existing land use plans have taken into account potential negative impacts on groundwater, meaning that implementation of SGMA will be generally consistent with the water supply assumptions of the relevant land use plans over the planning and implementation horizon.[34]

No specific land use plans outside the basin are known to affect the ability of the CMA to achieve sustainable groundwater management.[35] Outside land use plans and policy could change water demand by changing the profitability of particular agricultural crops resulting in changes in land and water use within the plan area. Outside land use plans could also negatively affect water supply by reduce availability of state water project and sources of water imports.

1d.6-4 Well Permitting Process Summary

The process for permitting new or replacement wells in the CMA,[36] is a result of adopted standards in local well ordinances (Section 1d.5-2) and land use (Figure 1d.6-1). Depending on the location within the CMA, the well must receive a drilling permit from the County of Santa Barbara (Appendix 1d-C) or the City of Buellton (Appendix 1d-D).

Depending on both the zoned location and the proposed use of the well, an additional land use permit may be required. **Table 1d.6-5** summarizes land use permit requirements by the proposed use of the well

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23 CCR § 354.8 (f) (3) A general description of how implementation of the Plan may affect the water supply assumptions of relevant land use plans over the planning and implementation horizon.

35 23 CCR § 354.8 (f) (5) To the extent known, the Agency may include information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management.

36 23 CCR § 354.8 (f) (4) summary of the process for permitting new or replacement wells in the basin, including adopted standards in local well ordinances, zoning codes, and policies contained in adopted land use plans.

in the unincorporated Santa Barbara County. Agricultural water wells, and water systems with a single connection are generally exempt; wells serving two to less than five connections require a land use permit; more than five connections require a Minor Conditional Use Permit; and commercial use requires a Conditional Use Permit. Land Use permits may also require Development Plan approval by the County.

Table 1d.6-5
Summary of Santa Barbara County Land Use Permit Requirements by Zone Type in Unincorporated CMA

Zone Type	Zone Symbol	Water Extraction	Water System			Water well
		Commercial	1 connection	2 to 4 connections	5 or more connections	Agricultural
Agricultural	AG-I	CUP	E	P	MCUP	E
	AG-II	CUP	E	P	MCUP	E
Residential	E-1	CUP	E	MCUP	MCUP	E
Commercial	C-3	CUP	E	P	MCUP	-
	CH	CUP	E	P	MCUP	E
Industrial	M-2	CUP	E	P	MCUP	E
Special Purpose Zones	REC	CUP	E	P	MCUP	E

Notes: - = not applicable; E = Allowed use, no permit required (Exempt); P = Permitted use, Land Use Permit required, Development Plan approval may also be required; MCUP = Minor Conditional Use Permit required; CUP = Conditional Use Permit required; CDP = Coastal Development Permit
Source: Derived from Santa Barbara County Land Use & Development Code, Update October 2021 which also includes descriptions of zone symbols.

After completion of the well the property owners must register with the Santa Ynez River Water Conservation District within 30 days or be guilty of a misdemeanor.[37] Additionally within 60 days from the date its construction, alteration, abandonment, or destruction is completed[38] the well completion report be filed with the Department of Water Resources, likewise a misdemeanor if not completed.[39]

As an owner of a water-producing facility, on a semi-annual basis, the property owner is required to file water production statements with the Santa Ynez River Water Conservation District until the well is officially abandoned or destruction is completed. In addition, wells that divert from the underflow (see Appendix 1d-B) have additional water production reporting requirements. Senate Bill 88 requires that all water right holders, including diversions from the Santa Ynez River underflow, who have previously diverted or intend to divert more than 10 acre-feet per year (riparian and pre-1914 claims), or are authorized to divert more than 10 acre-feet per year under a permit, license, or registration, to measure and report the water they divert to the SWRCB on an annual basis.

37 CWC Section 75640
38 CWC Section 13751
39 CWC Section 13754

SECTION 1E - ADDITIONAL GSP ELEMENTS

The SGMA statue[40] identifies plan additional elements that are not required, but addressed as determined by the CMA GSA[41]:

(a) Control of saline water intrusion.

(b) Wellhead protection areas and recharge areas.

(c) Migration of contaminated groundwater.

(d) A well abandonment and well destruction program.

(e) Replenishment of groundwater extractions.

(f) Activities implementing, opportunities for, and removing impediments to, conjunctive use or underground storage.

(g) Well construction policies.

(h) Measures addressing groundwater contamination cleanup, groundwater recharge, in-lieu use, diversions to storage, conservation, water recycling, conveyance, and extraction projects.

(i) Efficient water management practices, as defined in Section 10902, for the delivery of water and water conservation methods to improve the efficiency of water use.

(j) Efforts to develop relationships with state and federal regulatory agencies.

(k) Processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity.

(l) Impacts on groundwater dependent ecosystems.

Elements items (e), (f), (g), and (i) are addressed in detail in project and management actions (Chapter 4) to improve conditions within the basin. Items related to (l) "Impacts on groundwater dependent ecosystems" are addressed in Hydrogeologic Conceptual Model (Section 2a) and Groundwater Conditions (Section 2b).

The Data Management System (DMS) is not included in the Plan Contents[42] article of the SGMA regulations and so is included below.

40 CWC Section 10727.4. Additional Plan Elements

41 23 CCR § 352.8 (g) description of any of the additional Plan elements included in Water Code Section 10727.4 that the Agency determines to be appropriate

42 23 CCR Division 2 Chapter 1.5 Subchapter 2 Article 5. Plan Contents

1E.1 DATA MANAGEMENT SYSTEM

A Data Management System (DMS) was developed as a central source for groundwater data, providing up-to-date technical information regarding Basin conditions. Collecting and centralizing data are steps towards meeting the goals of protecting water rights and ensuring local agencies continue to manage groundwater while minimizing state intervention. In addition to meeting these intentions, SGMA specifically requires the use of a DMS.[43]

The WMA and CMA developed a joint DMS and reserved the following domain name for access:

https://sywater.info

1e.1-1 Data Management Plan

In February 2020, the GSA prepared a Data Management Plan (DMP) to provide a complete description of the planned DMS. The DMP, provided as **Appendix 1e-A**, provides discussion of the general architecture of the DMS, including aspects of the software to be used and strategies for incorporation of various types of data. The DMS uses open-source software for most of the architecture components. The plan identifies how all data types will be handled in the DMS.

The DMP discusses the expected sources of relevant data (Federal, State, County, Local, Municipal) and how they were collected for inclusion into the DMS. There is an identification of a tiered scheme for data collection and verification efforts, in order to focus efforts on higher impact data.

The DMP also includes a general description of the web interface, access to the data stored within the system, and outlines a process for exporting and importing various datasets into the system. The DMP provides other details with regards to various administration concerns, and security steps taken to protect the system.

43 23 CCR § 352.6 Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin."

1e.1-2 Implementation

In May 2020, the GSA released a technical memorandum (Appendix 1e-B) summarizing data compilation collected and entered into the DMS during the general data collection phase of the project, and additional features that had been developed. Data collection was undertaken throughout the GSP development. Section 2b (Groundwater Conditions), Section 3a (Monitoring Networks), and Section 3b (Sustainable Management Criteria) of the GSP describe and provide interpretations the data contained in the DMS.

Planned updates and maintenance of the DMS are described in Chapter 5 (Plan Implementation).

CHAPTER 2: BASIN SETTING

The Basin Setting for this CMA GSP is described in terms of the following three topics. The details of each topic and how each relates to the Basin Setting are presented in subsequent sections of the Chapter 2.

Section 2a. Hydrogeologic Conceptual Model

The Hydrogeologic Conceptual Model characterizes the CMA extent and management area, subareas, topography, geology, principal groundwater aquifers, primary sources of water and water uses, and the users of groundwater.

Section 2b. Groundwater Conditions

The Groundwater Conditions Section of this CMA GSP presents the available data that was evaluated, provides an assessment of current CMA groundwater conditions as observed in the period 2015 through 2020, and describes historical conditions using available data from the period 1924 through 2020.

Section 2c. Water Budget

The Water Budget Section of this CMA GSP quantifies groundwater flows into and out of the CMA, including natural conditions (precipitation, groundwater flow, etc.) and human-made conditions (reservoir releases, groundwater pumping, etc.).

SECTION 2A – HYDROGEOLOGIC CONCEPTUAL MODEL

The Hydrogeologic Conceptual Model (HCM) is required to "characterize[s] the physical components and interaction of the surface water and groundwater systems in the basin."[44] Documentation for the HCM provides a written description of the general physical characteristics of the Basin, specifically within the CMA, as related to regional hydrology, land use, and geology and geologic structures, lateral and vertical basin structure (or aquifer) limits, introduction of groundwater quality, and definition of principal aquifers and aquitards. Description of these items in the HCM provides context for subsequent sections and chapters of the GSP.

This HCM contains the following sections:

Section 2a.1, Central Management Area and Adjacent Geology, provides an introduction and overview of the geology of the CMA. This includes a description of the regional geologic structural setting, relevant geologic units, surface geologic mapping, and major structural features. A three-dimensional geologic model was developed for the Basin. Cross sections developed from this model are provided.

Section 2a.2, Principal Aquifers and Aquitards, provides a discussion of geologic units corresponding to aquifers, including the three-dimensional groundwater basin boundaries (lateral and basal boundaries). This section also summarizes the physical characteristics of the aquifers in each subarea.

Section 2a.3, Hydrologic Characteristics, describes physical surface conditions that interact with the groundwater. This section includes topography, soil map, and watershed extent, a description of surface water components, including rivers and tributaries, and large anthropogenic alterations to the water environment, including imports, exports, and treated wastewater discharge.

[44] 23 CCR § 354.14(a) Each Plan shall include a descriptive hydrogeologic conceptual model of the basin based on technical studies and qualified maps that characterizes the physical components and interaction of the surface water and groundwater systems in the basin.

Section 2a.4, Uses and Users of Groundwater in the Central Management Area, discusses the primary use of groundwater in each of the CMA subareas, including a summary of where groundwater pumping occurs, agricultural lands, and groundwater-dependent ecosystems.

Section 2a.5, Data Gaps and Uncertainty, addresses the data gaps at the time of this GSP, and uncertainty with respect to certain components of the HCM.

2A.1 CENTRAL MANAGEMENT AREA AND ADJACENT GEOLOGY

This section of the CMA GSP provides an overview of the regional geology and defining structures within the CMA that control the lateral and vertical extent of groundwater presence, storage, and flow. Much of this section draws from the Draft Technical Memorandum on Regional Geology and 3D Geologic Model for the Santa Ynez River Valley Groundwater Basin, by Geosyntec (2020), which is included as **Appendix 2a-A**. **Appendix 2a-A** also describes the development of a three-dimensional geologic model based on data collected and analyzed as part of this GSP and references historical reports and studies.

The Basin is located on the Pacific Plate within the Transverse Range geomorphic province of California, which is characterized by east/west-striking, complexly folded and faulted bedrock formations. The Basin is in an irregular structural depression between two mountain ranges and two ranges of hills. Primary structural features of the Basin include large anticline/syncline pairs. These large folds are evident in the rocks and deposits in the valley floor between the folded and faulted Santa Ynez Mountains to the south and the folded and faulted San Rafael Mountains to the north (Upson and Thomasson 1951).

2a.1-1 Mapped Surface Geology

The surface geology of the CMA and the near vicinity has geological formations that consist of the younger water-bearing units and older non-water bearing formations that constitute the CMA portion of the groundwater basin (see **Figure 2a.1-1**) (**Appendix 2a-A**). The extents of the surface geology are based on the Los Alamos, Santa Rosa Hills, Zaca Creek, and Solvang United States Geological Survey (USGS) Quadrangle Maps.[45] Additional local faults were added to Figure 2a.1-1 based on a Quaternary map compilation by USGS (USGS 2020).

45 Dibblee conducted field mapping for the following USGS 7.5-minute geologic quadrangles that cover the CMA: Los Alamos, Santa Rosa Hills, Zaca Creek, and Solvang Quadrangle.

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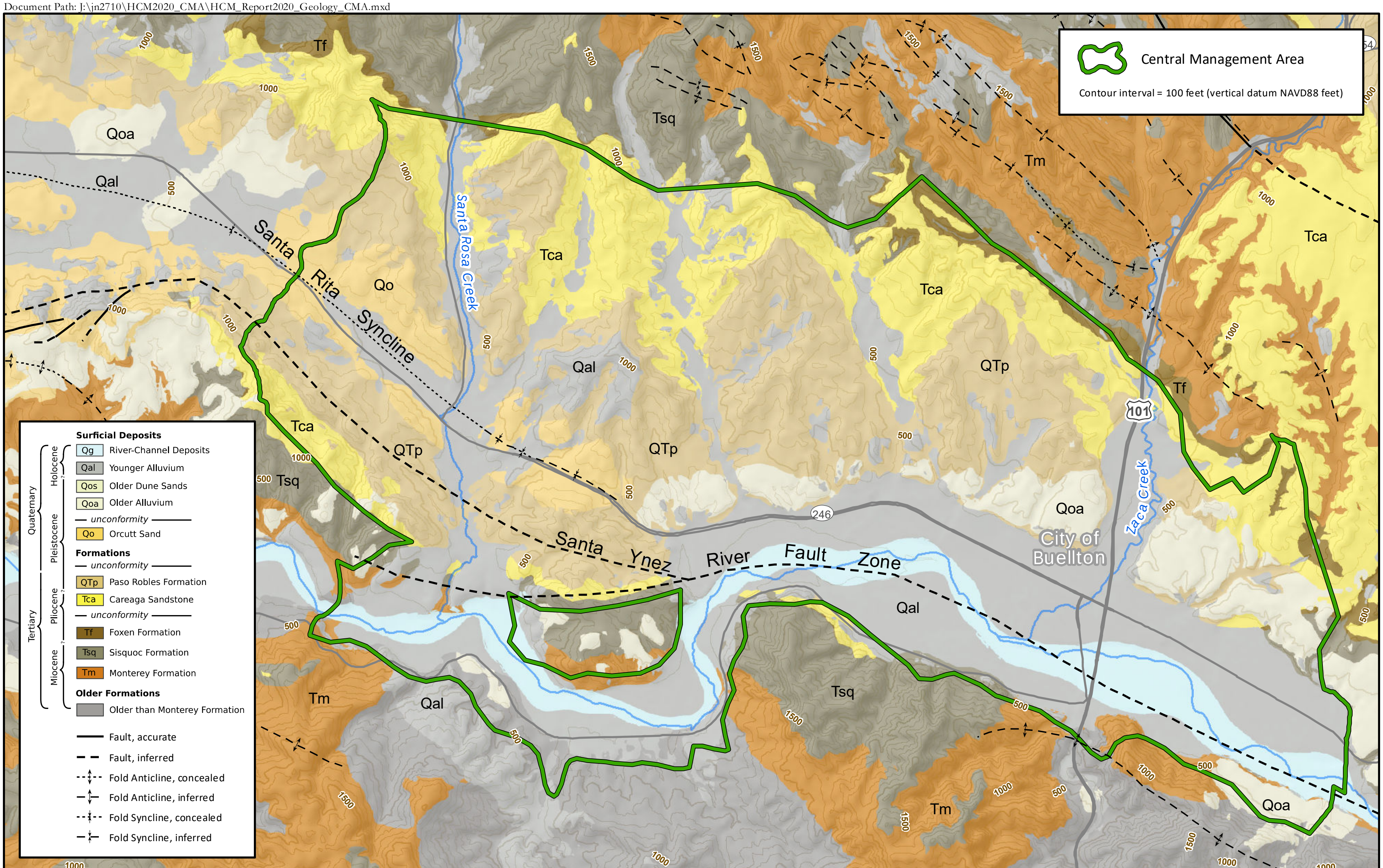

SURFACE GEOLOGY
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
Geosyntec, 2020; Dibblee, 1993; USGS, 2020
USGS National Elevation Dataset, 2002

STETSON ENGINEERS INC.
Geosyntec consultants

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

FIGURE 2a.1-1

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2a.1-1-1 Surface Geologic Units

Descriptions of the surficial geologic units that are shown in Figure 2a.1-1, in agreement with publicly available literature and as shown in the three-dimensional geological model and stratigraphic column (Appendix 2a-A), are provided in the following subsections. The geologic unit descriptions are provided from the surface units (youngest) to deeper underlying units (oldest), as shown in Figure 2a.1-1. Detailed descriptions for the geologic units, as excerpted from Appendix 2a-A (Geosyntec 2020) are provided below:

Younger Units

River Channel Deposits (Qg)

The River Channel Deposits (Qg) occurs within the modern-day Santa Ynez River channel and consists of fine-to-coarse sand, gravels, and thin discontinuous lenses of clay and silt (Bright et al. 1992; Miller 1976; Upson and Thomasson 1951; Wilson 1959). The grain size typically decreases along the river's reach, fining toward the ocean (Upson and Thomasson 1951). The Qg unit thickness ranges from 30 feet to 40 feet, with observations of localized deposits up to 70 feet in thickness 6 miles west of the City of Buellton along the Santa Ynez River; however, these deposits are largely indistinguishable from the underlying alluvium (Upson and Thomasson 1951). The Qg in the geologic model is interpreted using the Dibblee geologic map and from borehole data, and is generally thought to be hydraulically connected to the Qal, described below.

Alluvium (Qal)

The Quaternary Alluvium (Qal) is composed of a coarse sand upper member and a fine sand lower member, which have been previously described by others (Dibblee 1950; Upson and Thomasson 1951; Wilson 1959; Miller 1976; Bright et al. 1992). For the purposes of the geologic model, these units are not differentiated, and the alluvium was modeled as a single lithologic unit. Qal is composed of unconsolidated, normally graded gravel and medium-to-very coarse sand that grades upward into fine to coarse sand with rare gravels, then fines vertically upward into fine sand, silt, and clay (Upson and Thomasson 1951; Wilson 1959; Miller 1976; Bright et al. 1992; Fugro Consultants 2007). The thickness of

Qal varies from approximately 30 to 90 feet in the Buellton Santa Ynez River subarea (Upson and Wilson 1951) to approximately 170 feet to 200 feet in the Lompoc Plain (Dibblee 1950; Upson and Thomasson 1951; Evenson and Miller 1963; Miller 1976; Bright et al. 1992). In sloped areas and drainages, the thickness of Qal varies from less than 10 feet to 50 feet (Fugro Consultants 2007). Qal is the principal source of groundwater in the Lompoc Plain in the WMA (Dibblee 1950; Upson and Thomasson 1951; Evenson and Miller 1963; Miller 1976; Berenbrock 1988; Bright et al. 1992).

Terrace Deposits / Older Alluvium (Qoa)

The Quaternary Terrace Deposits and Older Alluvium (Qoa) typically consists of unconsolidated to poorly consolidated sands and gravels with common silt and clay zones (Dibblee 1950; Upson and Thomasson 1951; Miller 1976; Berenbrock 1988; Bright et al. 1992). Qoa thickness varies from 0 to 50 feet (Bright et al. 1992), up to 150 feet (Upson and Thomasson 1951; Miller 1976; Berenbrock 1988). Qoa underlies alluvium (Qal) in most of the southern Lompoc Plain, and caps hilltops, benches, and upland areas of the Santa Ynez River and major tributaries (Upson and Thomasson 1951; Miller 1976; Berenbrock 1988; Bright et al. 1992).

Orcutt Sand (Qo)

The Quaternary Orcutt Sand (Qo) consists of unconsolidated, well-sorted, coarse to medium sand and clayey sand with scattered pebbles and gravel stringers (Upson and Thomasson 1951; Bright et al. 1992). The top of the formation is locally indurated in Lompoc Valley and Burton Mesa by iron oxides, and the basal portion contains well-rounded pebbles of quartzite, igneous rocks, and Monterey chert and shale (Dibblee 1950). Qo thickness varies from 0 to 300 feet (Upson and Thomasson 1951; Evenson and Miller 1963; Bright et al. 1992).

Paso Robles Formation (QTp)

The geologic unit, Quaternary-Tertiary Paso Robles Formation (QTp) consists of poorly consolidated to unconsolidated poorly sorted gravels, sands, silts, and clays (Dibblee 1950; Upson and Thomasson 1951; Wilson 1959; Miller 1976; Berenbrock 1988; Bright et al. 1992; Yates 2010). QTp varies in thickness from 2,800 feet in the Santa Ynez Upland subarea (Upson and Thomasson 1951) to 700 feet in Santa Rita Valley in the WMA (Dibblee 1950; Miller 1976), and thins westward where it pinches out in the eastern Lompoc Plain, also in the WMA (Dibblee 1950; Upson and Thomasson 1951; Miller 1976).

QTp yields water to wells throughout the study area (Upson and Thomasson 1951; Miller 1976; Berenbrock 1988; Bright et al.1992) and is the principal water-bearing unit in the Basin near Lake Cachuma and in the Santa Ynez Upland in the EMA (Yates 2010).

Careaga Sand (Tca)

The geologic unit, Tertiary Careaga Sand (Tca) yields water and consists of massive, fine to coarse sand with lenses of gravels and fossil shells (Dibblee 1950; Woodring and Bramlette 1950; Upson and Thomasson 1951; Wilson 1959; Evenson and Miller 1963; Miller 1976). Clay and silt beds are characteristically absent, and the uniformity in grain size and presence of seashells distinguish it from the overlying QTp (Dibblee 1950; Upson and Thomasson 1951). Tca is often differentiated into the upper coarse sand Graciosa Member (Tcag) and the lower, fine sand Cebada Member (Tcac), which have been described in literature (Dibblee 1950; Woodring and Bramlette 1950; Upson and Thomasson 1951; Evenson and Miller 1963; Miller 1976; Berenbrock 1988; Bright et al. 1992). Tca thickness can vary from 450 feet to 1,000 feet (Upson and Thomasson 1951) but is typically observed from 500-foot to 800-foot thickness in the Lompoc area, surrounding Lompoc Hills, and in the Buellton area (Dibblee 1950; Evenson and Miller 1963; Miller 1976). The Careaga Sand Formation has been previously identified as an important aquifer within the Santa Ynez River Valley Groundwater Basin (Hoffman 2018).

Older Units

Tertiary-Mesozoic Rocks are consolidated non-water-bearing units, all of marine origin. They consist of the near-shore marine Foxen (Tf), Sisquoc (Tsq), and Monterey (Tm) Formations. The Foxen Formation consists of light gray or tan massive claystone, siltstone, and/or mudstone (Dibblee 1950; Woodring and Bramlette 1950; Upson and Thomasson 1951). The Sisquoc Formation is massive to very thin-bedded, white diatomite and diatomaceous mudstones, with basal massive fine sands (Dibblee 1950; Woodring and Bramlette 1950; Upson and Thomasson 1951). The Monterey Formation, primarily known for its vast oil reserves, consists of variably bedded siliceous shale, diatomaceous mudstone, porcelaneous shale, chert, phosphatic shale, silty shale, limestone, and a basal clay altered tuff (Dibblee 1950; Woodring and Bramlette 1950; Upson and Thomasson 1951).

2a.1-2 Key Geologic Structures within the Central Management Area

Several geologic fault and fold structures are shown on the geologic map of the CMA and the immediate vicinity (Figure 2a.1-1). The existence and orientation of these geologic structures are related to regional movement, generally due to north/south compression. The locations and existence of these features are based on two sources: maps produced by Dibblee (Dibblee 1950, Dibblee 2009a, Dibblee 2009b, Dibblee 2009c, Dibblee 2009d) and a Quaternary map compilation by U.S. Geological Survey (USGS 2020).

2a.1-2-1 Synclines and Anticlines in the Central Management Area

The Santa Rita Syncline is an east-west trending fold trending from the CMA to the WMA. The eastern end of the mapped syncline is in the Buellton Upland subarea of the CMA (Figure 2a.1-1). Just north of the Buellton Bend, the syncline extends southeast underneath the Santa Ynez River alluvium. The syncline extends westward through the Santa Rita subarea to the Lompoc Upland subarea in the WMA. The fold axis runs more or less southeast to northwest in the CMA. The water-bearing units in this syncline fold form the Buellton Aquifer, which, in the CMA, extends underneath a portion of the Santa Ynez River Alluvium east of the Buellton Bend. The axis of the syncline is buried under Qal and Orcutt Sand for most of the extent, therefore the location of the fold's axis is approximate.

The Purisima Anticline is an anticline fold that runs along the top of the Purisima Hills, with the eastern-most extents terminating in the vicinity of Santa Rosa Creek. East of the Purisima Anticline are smaller anticline and syncline folds that make up the Purisima Hills to the north and northeast of the CMA.

2a.1-2-2 Faults in the Central Management Area

With the exception of the Santa Ynez River Fault described below, geologic faults with potential to impede groundwater recharge, storage, or flow are not currently identified in the CMA. Additional geophysical airborne electromagnetic data collected within the CMA, in conjunction with potential input received from water users and the public, may be used to update current understanding of faults that may affect the water environment within the CMA.

The location of the Santa Ynez River Fault is shown in Figure 2a.1-1, consistent with the recent USGS Quaternary fault-and-fold map. The trace of the fault was mapped by the USGS with limited accuracy (USGS 2020). The fault is estimated to trend northwest in the Santa Ynez River Alluvium from the eastern boundary with the EMA to the Buellton Bend (Figure 2a.1-1), at which point the fault continues northwest along the southern boundary of the Buellton Upland, paralleling the Santa Rita Syncline. The fault may correspond to the base of the Careaga Sand on the southern side of the Santa Rita Syncline.

2a.1-3 Subsurface Geologic Modeling

The three-dimensional shape of the geology at depth is a result of tectonic forces. A detailed subsurface three-dimensional model of the geologic units and structures for the CMA and immediate vicinity is provided in **Appendix 2a-A**. The geologic modeling effort included compiling new data, comprehensively collecting recent well completion reports, interpreting driller's logs and assigning the logged lithologies to principal geologic units.[46] Geologic maps and interpretations of the subsurface from past reports were also incorporated into the model. The resulting three-dimensional model is a compilation of all these sources, and represents the best available three-dimensional understanding of the CMA's geology and hydrogeology.

2a.1-3-1 Geologic Cross Sections

The locations of four geologic cross sections in the CMA[47] exported from the three-dimensional geological model are shown in **Figure 2a.1-2**. Details of the four cross-sectional views are shown in **Figures 2a.1-3a** through **2a.1-3c**. The locations of the cross sections represent the structure and shape of the geologic units that underlie the CMA. A description of the geology shown in each cross section is provided in **Appendix 2a-A**. The next section discusses these same cross sections in terms of the aquifers in the CMA.

46 The geologic units included in the geological model, map, cross sections, and discussion are interpreted from well drilling logs.

47 Cross section C-C' is located 0.7 miles from CMA-WMA boundary in the WMA and is representative of the geology at the boundary between the CMA Buellton Upland subarea and the WMA Santa Rita Upland subarea.

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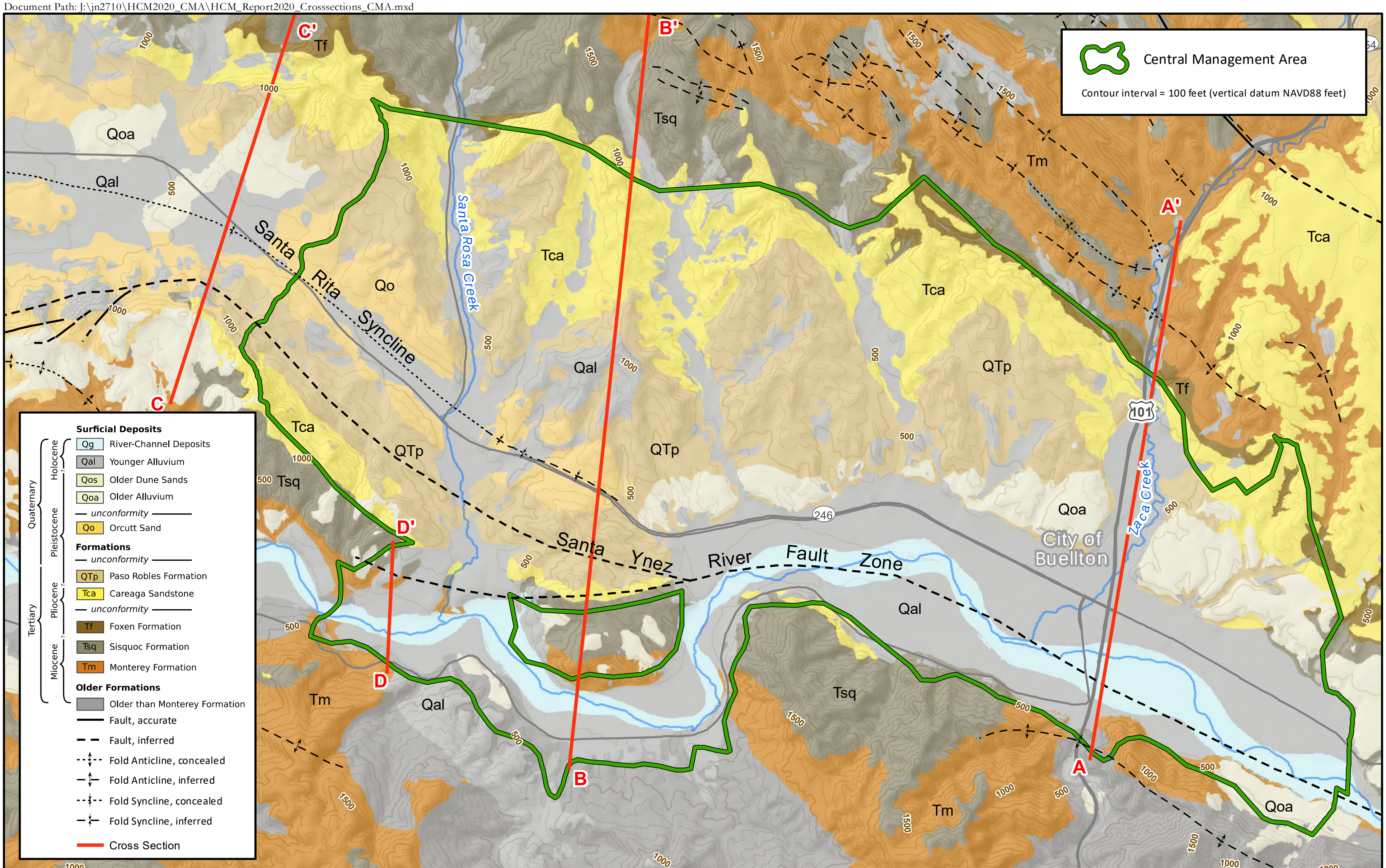

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GEOLOGIC CROSS SECTIONS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
Geosyntec, 2020; Dibblee, 1993; USGS, 2020
USGS National Elevation Dataset, 2002

FIGURE 2a.1-2

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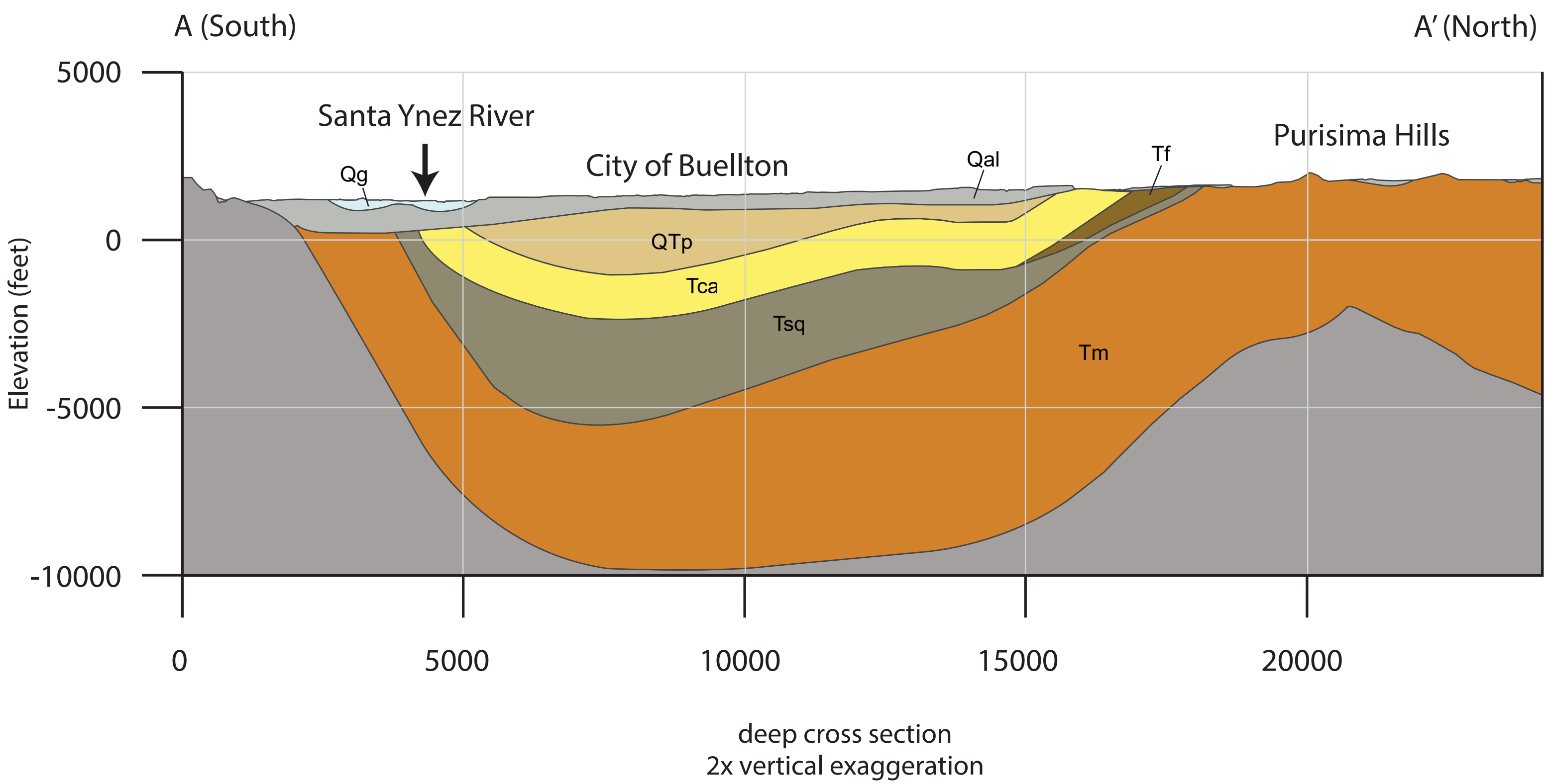

Model Geology

- River-Channel Deposits (Qg)
- Younger Alluvium (Qal)
- Older Dune Sands (Qos)
- Older Alluvium (Qoa)
- Orcutt Sand (Qo)
- Paso Robles Formation (QTp)
- Careaga Sandstone (Tca)
- Foxen Formation (Tf)
- Sisquoc Formation (Tsq)
- Monterey Formation (Tm)
- Tertiary - Older than Monterey

Cross sections based on 3D geologic model Geosyntec (2020).

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CENTRAL MANAGEMENT AREA GEOLOGIC CROSS SECTION A-A'

FIGURE 2a.1-3a

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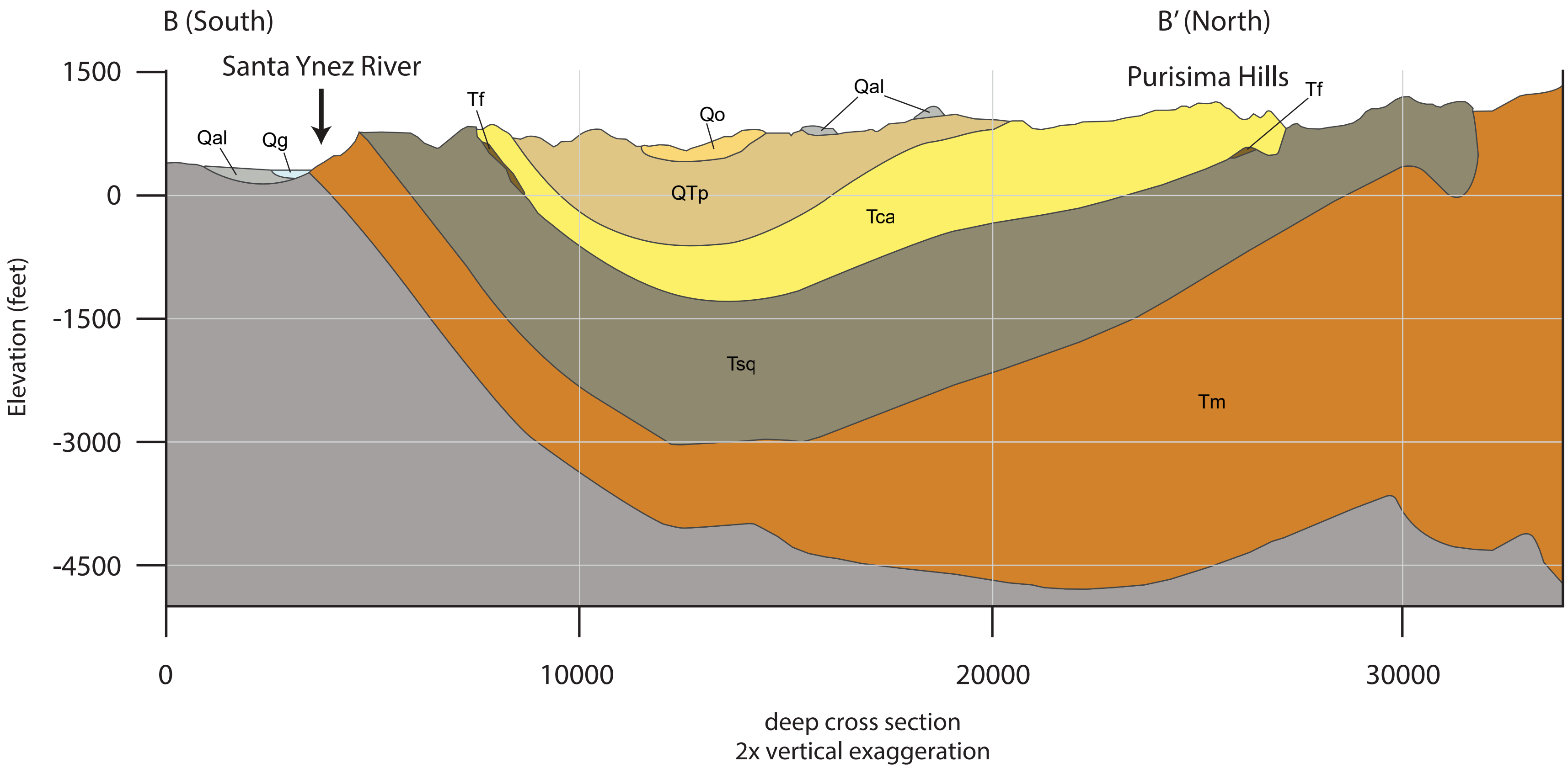

Model Geology

- River-Channel Deposits (Qg)
- Younger Alluvium (Qal)
- Older Dune Sands (Qos)
- Older Alluvium (Qoa)
- Orcutt Sand (Qo)
- Paso Robles Formation (QTp)
- Careaga Sandstone (Tca)
- Foxen Formation (Tf)
- Sisquoc Formation (Tsq)
- Monterey Formation (Tm)
- Tertiary - Older than Monterey

Cross sections based on 3D geologic model Geosyntec (2020).

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CENTRAL MANAGEMENT AREA GEOLOGIC CROSS SECTION B-B'

FIGURE 2a.1-3b

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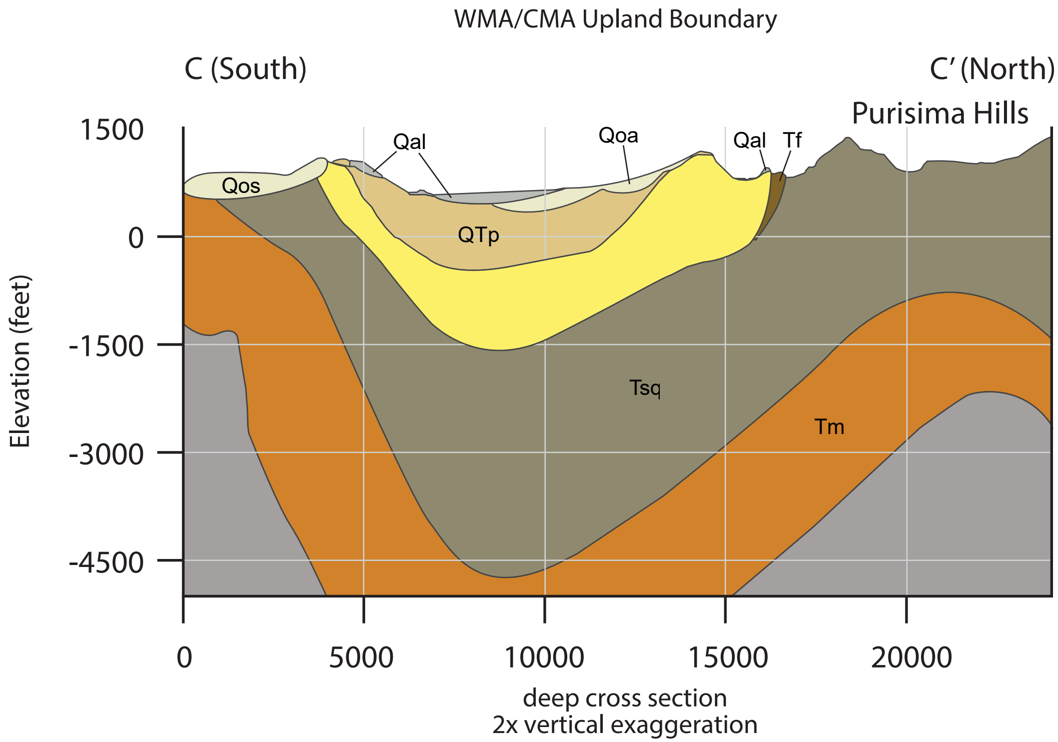

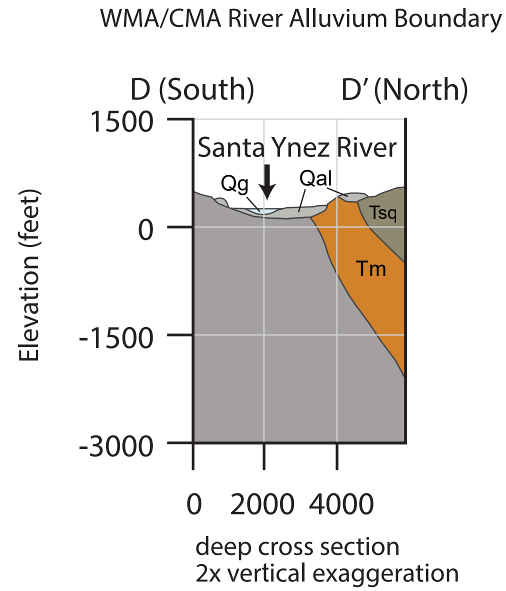

Model Geology

- River-Channel Deposits (Qg)
- Younger Alluvium (Qal)
- Older Dune Sands (Qos)
- Older Alluvium (Qoa)
- Orcutt Sand (Qo)
- Paso Robles Formation (QTp)
- Careaga Sandstone (Tca)
- Foxen Formation (Tf)
- Sisquoc Formation (Tsq)
- Monterey Formation (Tm)
- Tertiary - Older than Monterey

Cross sections based on 3D geologic model Geosyntec (2020).

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CENTRAL MANAGEMENT AREA GEOLOGIC CROSS SECTIONS C-C' AND D-D'

FIGURE 2a.1-3c

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2A.2 PRINCIPAL AQUIFERS AND AQUITARDS

Principal aquifers refer to aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. The CMA is characterized by a single principal aquifer, the “Buellton Aquifer” shown in **Figure 2a.2-1.** Non-water bearing geologic formations and perched groundwater systems are not subject to SMGA and are not principal aquifers. The underflow of the Santa Ynez River flowing through the Santa Ynez River alluvium is managed by SWRCB pursuant to WR 2019-0148 and other orders and decisions, and is also not a principal aquifer. Appendix 1d-B is a technical memorandum that discusses in more detail the hydrogeological basis for characterization of water within the Santa Ynez River alluvium above the Lompoc Narrows as underflow or a subterranean stream, which occurs in a known and definite channel, which is not groundwater as defined by SGMA and is not subject to SGMA jurisdiction.

This section describes the principal groundwater aquifer (Buellton Aquifer) within the CMA as correlated to the principal geologic units. Definition of these geologic units and principal aquifer properties is important in terms of groundwater presence, storage, and flow. These properties are also essential during development of the water budget, and evaluation of current groundwater characteristics and conditions, and for the numerical groundwater model employed to quantify groundwater flow in the Basin under historical, current, and projected future conditions. In agreement with the geologic model prepared for the Basin, the lateral and vertical extents of the Buellton Aquifer, including the definable base of the Basin, are presented and discussed in this section.

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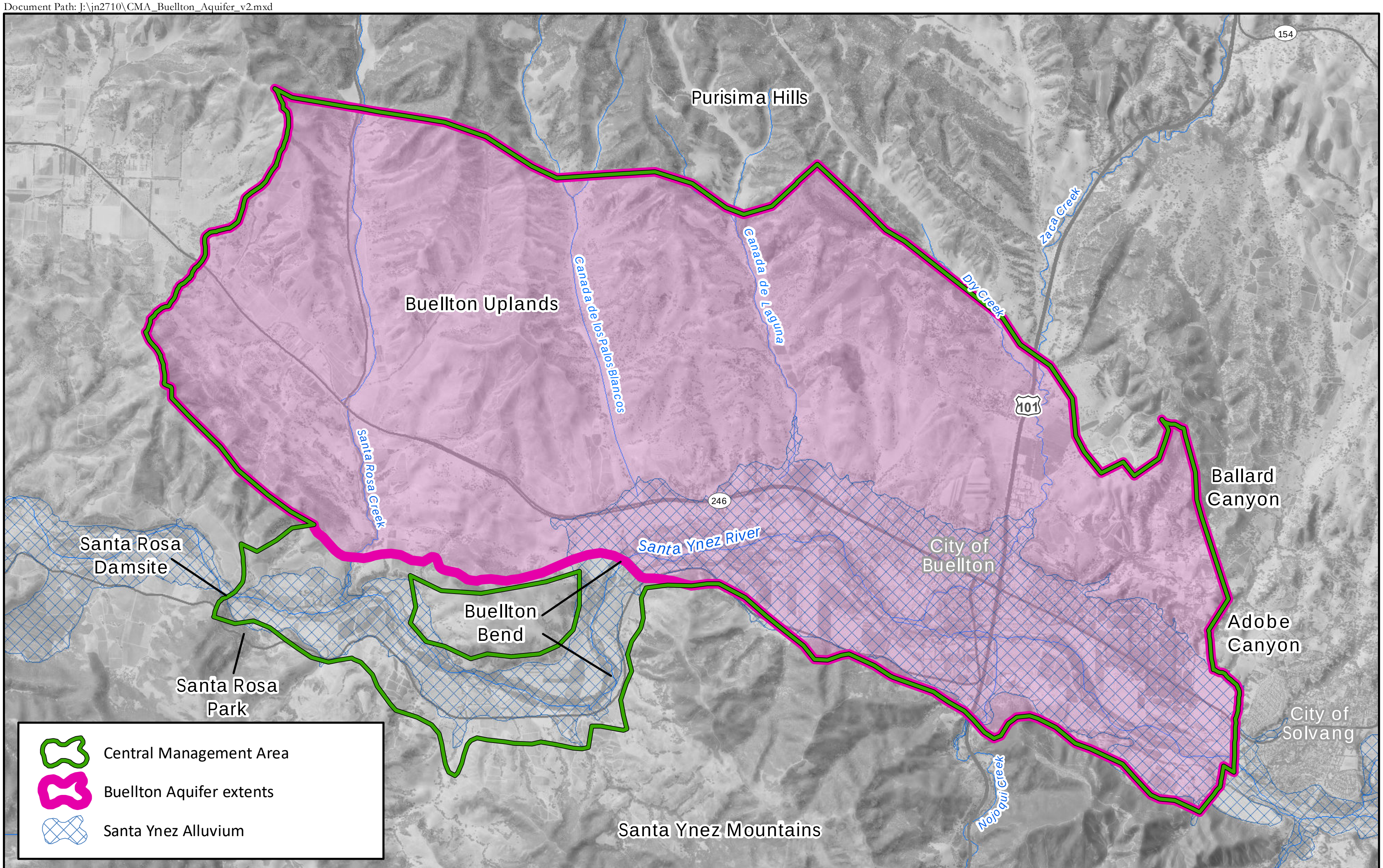

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EXTENTS OF THE BUELLTON AQUIFER
CENTRAL MANAGEMENT AREA

FIGURE 2a.2-1

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2a.2-1 Central Management Area Buellton Aquifer Basin Extent and Thickness

Geologic units are categorized in terms of aquifer properties into two broad categories: (1) water-bearing units composed of "unconsolidated" sedimentary deposits; and (2) non-water-bearing units composed of "consolidated" sedimentary deposits and crystalline rocks. The "unconsolidated" deposits allow water to infiltrate into them, be stored within them, and flow through them. The "consolidated" deposits impede groundwater infiltration, storage, and flow.

The unconsolidated, water-bearing sediments are those with sufficient permeability and storage potential to store and convey groundwater. Less-consolidated materials allow for greater permeability of water. In terms of the defined geologic units of the Buellton Aquifer, the unconsolidated sediment applies to the Careaga Sand and Paso Robles formations.

Non-water-bearing units are consolidated sediments or rock that have low porosity, low hydraulic conductivity, or a combination of the two. Low porosity means there is little space to contain groundwater. Low hydraulic conductivity means groundwater does pass through or move quickly. Consolidation such as cementation and compaction of sedimentary units reduces both porosity and hydraulic conductivity. Crystalline units in the area include igneous and metamorphic rocks, which are also significantly older and have no porosity, which is characteristic of their original extrusion. However, crystalline formations may have fractures resulting in localized instances of increased porosity and hydraulic conductivity, which may be suitable for limited use, such as domestic water supply, but they are considered non-water-bearing. In terms of the defined geologic units for the CMA, this means the Foxen Formation, Sisquoc Formation, Monterey Formation, and the older formations (Hamlin 1985).

2a.2-1-1 Central Management Area Definable Bottom of the Basin

The boundary between water-bearing and non-water-bearing geologic units form the "definable bottom of the basin"[48] and "lateral basin boundaries,"[49] as defined by the Sustainable Groundwater Management Act. Regarding the lateral basin boundaries, the current DWR Bulletin 118 Basin boundary[50] is very close

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48 23 CCR § 354.14(b)(3) The definable bottom of the basin.
49 23 CCR § 354.14(b)(2) Lateral basin boundaries, including major geologic features that significantly affect groundwater flow.
50 SGMA Portal – Basin Boundary Modification Request System. Department of Water Resources. Website. https://sgma.water.ca.gov/basinmod/ Accessed 2021-09-02.

to the geologic contact between consolidated deposits (Foxen, Sisquoc, Monterey, and the older formations) and unconsolidated deposits (formations younger than or equal to Careaga) shown in **Figure 2a.2-2**. However, there are some minor differences with the geology mapped by Dibblee (Figure 2a.2-2) and the current CMA boundary. For example, the island of non-water bearing consolidated deposits near Buellton Bend is mapped by Dibblee to extend about 1,000 feet south of the current CMA boundary. However, throughout most of the area, the current CMA boundary lies within a couple hundred feet of the surface geology mapped by Dibblee (Figure 2a.1-1).

Based on the three-dimensional geological model (Geosyntec 2020), the *definable bottom of the Basin* was mapped using the contact between the consolidated deposits (Foxen, Sisquoc, Monterey, and the older Formations) and unconsolidated deposits (formations younger than or equal to Careaga) as the base elevation. The Basin bottom elevation has been contoured and is shown on Figure 2a.2-2.

The lateral Basin boundaries are also shown in Figure 2a.2-2 as approximated by the CMA Basin Boundary, where the basin bottom intersects the land surface and is analogous to the hard bottom and side that contains an aquifer. As shown in Figures 2a.2-1 and 2a.2-2, the boundary of the Buellton Aquifer coincides with Buellton Upland boundary for the reach from the Buellton Bend and westward. However, east of the Buellton Bend (Figure 2a.2-1) the Buellton Aquifer extends beneath the Santa Ynez River Alluvium and underflow deposits (Figures 2a.2-1 and 2a.2-2). Figure 2a.2-2 indicates two elevation low points of the Buellton Aquifer in the middle of the synclinal structure. One low spot is located just to the west of Santa Rosa Creek, and another low spot is located west of Highway 101 in the City of Buellton (Figure 2a.2-2). This figure will be updated with the recent SkyTEM Airborne Geophysics aerial electromagnetic survey in 2022.

The combined thickness of the Basin unconsolidated deposits is shown in **Figure 2a.2-3**. This is the maximum depth of a groundwater well in an aquifer throughout the Basin. The thickness of the Buellton Aquifer ranges from less than 100 feet along the border of the synclinal structure to over 2,000 feet along the approximate axis of the Santa Rita Syncline in the Buellton Upland. The saturated thickness of the aquifer at any particular time, or volume of water, is dependent on current groundwater elevations.

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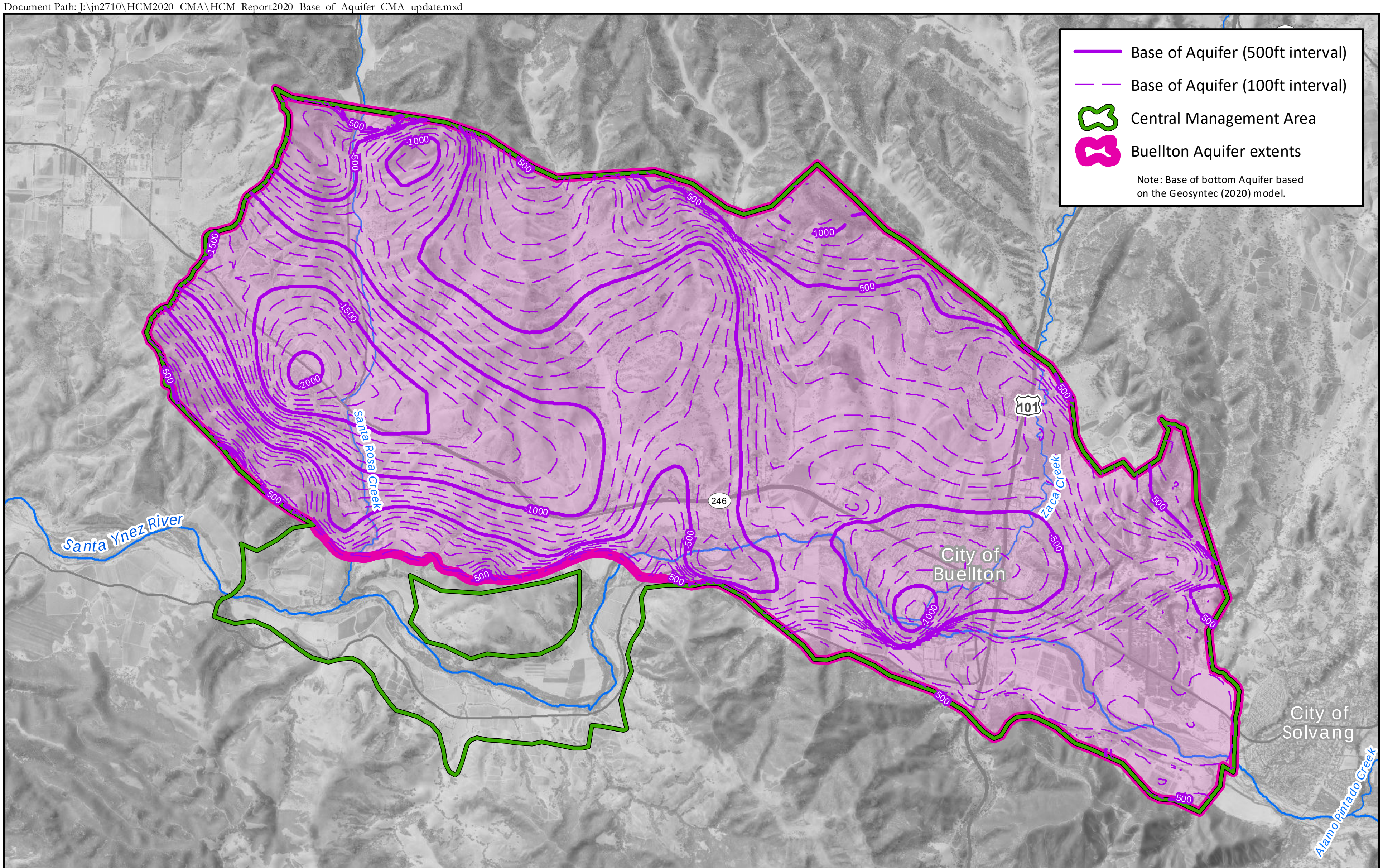

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BOTTOM OF THE BASIN SUBSURFACE ELEVATION CONTOUR

WITHIN CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)
Geosyntec (2020)

FIGURE 2a.2-2

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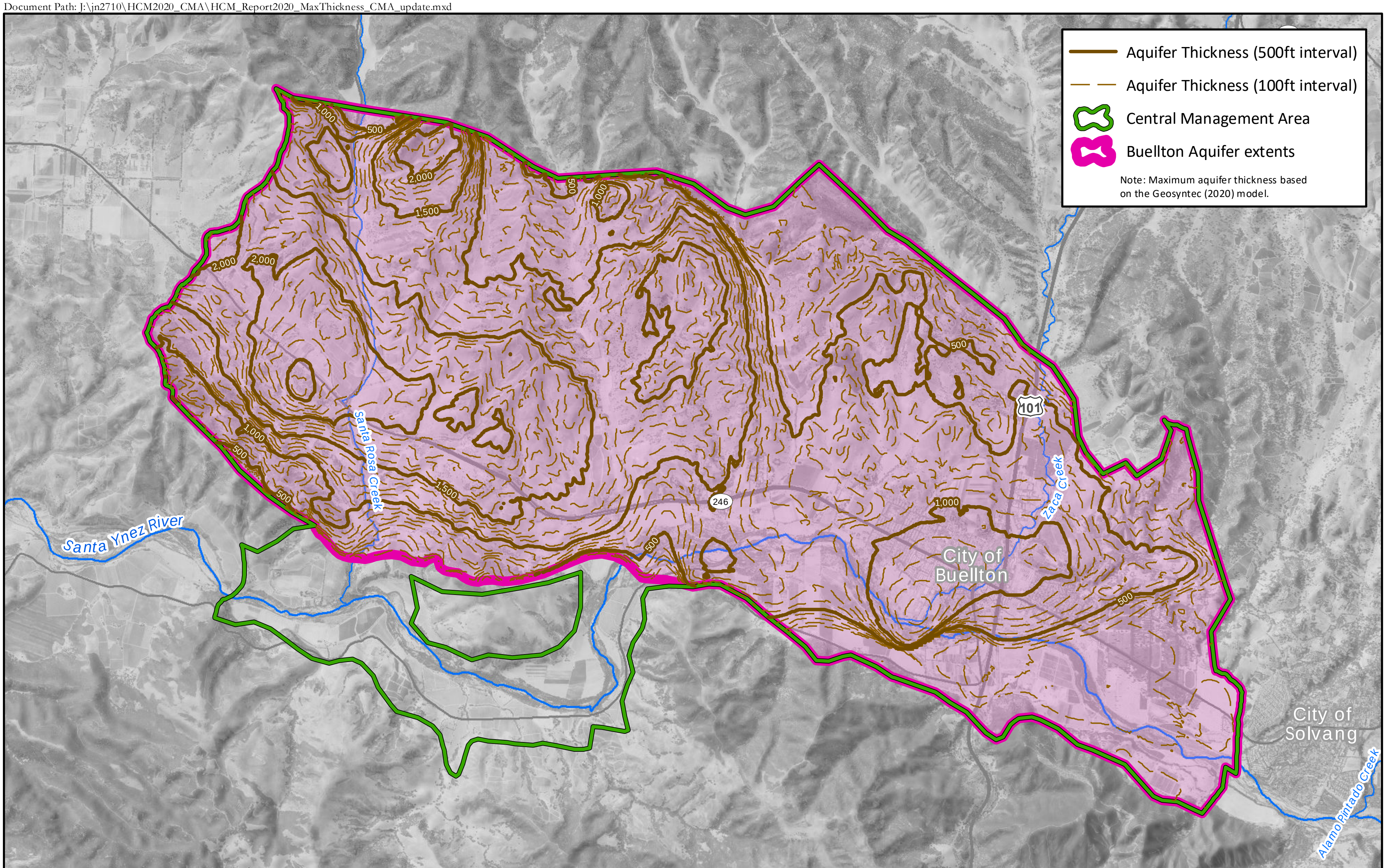

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MAXIMUM THICKNESS OF THE BASIN
WITHIN CENTRAL MANAGEMENT AREA

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)
Geosyntec (2020)

FIGURE 2a.2-3

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2a.2-2 Principal Aquifers and Description for Central Management Area Subareas

The two subareas of the CMA correlates with the surface extents of management zones used by the Santa Ynez River Water Conservation District (**Figure 2a.2-4**, based on Stetson 2021). Zone A represents the Santa Ynez River Alluvium, which is considered part of the surface water flow and not a principal aquifer under SGMA. Zone D represents the Buellton Upland and Buellton Aquifer, the principal aquifer of the CMA. Zone D within the vicinity of the City of Buellton extends below Zone A, which is the similar to the Buellton Aquifer shown under the Santa Ynez Alluvium in Figures 2a.2-1 (extents), 2a.2-2 (base elevation), and 2a.2-3 (maximum aquifer thickness).

2a.2-2-1 Buellton Aquifer

The Buellton Aquifer consists of the Paso Robles and Careaga Formations which are found in the axis of the Santa Rita Syncline. The syncline terminates under the Santa Ynez River Alluvium in the eastern part of the CMA. The Paso Robles and Careaga Formations are older and more consolidated than the alluvial formations.

The Paso Robles Formation, is composed of sand, silt, and clay of non-marine origin and overlies the older marine Careaga Formation. The Paso Robles Formation contains a large proportion of fine-grained material and is composed chiefly of discontinuous, lenticular, and poorly assorted alluvial-fan deposits (Upson and Thomasson 1951). The lower part of the Paso Robles Formation is finer-grained than the upper part. Wells completed in the Paso Robles Formation yield from 200 to 1,000 gallons per minute (gpm) (Hamlin 1985; Upson and Thomasson 1951). The Paso Robles formation and has a similar permeability as the Orcutt Sand (Upson and Thomasson 1951), approximately 5 feet per day. In the upland deposits, the Paso Robles Formation is often completely unsaturated (Bright et al. 1992).

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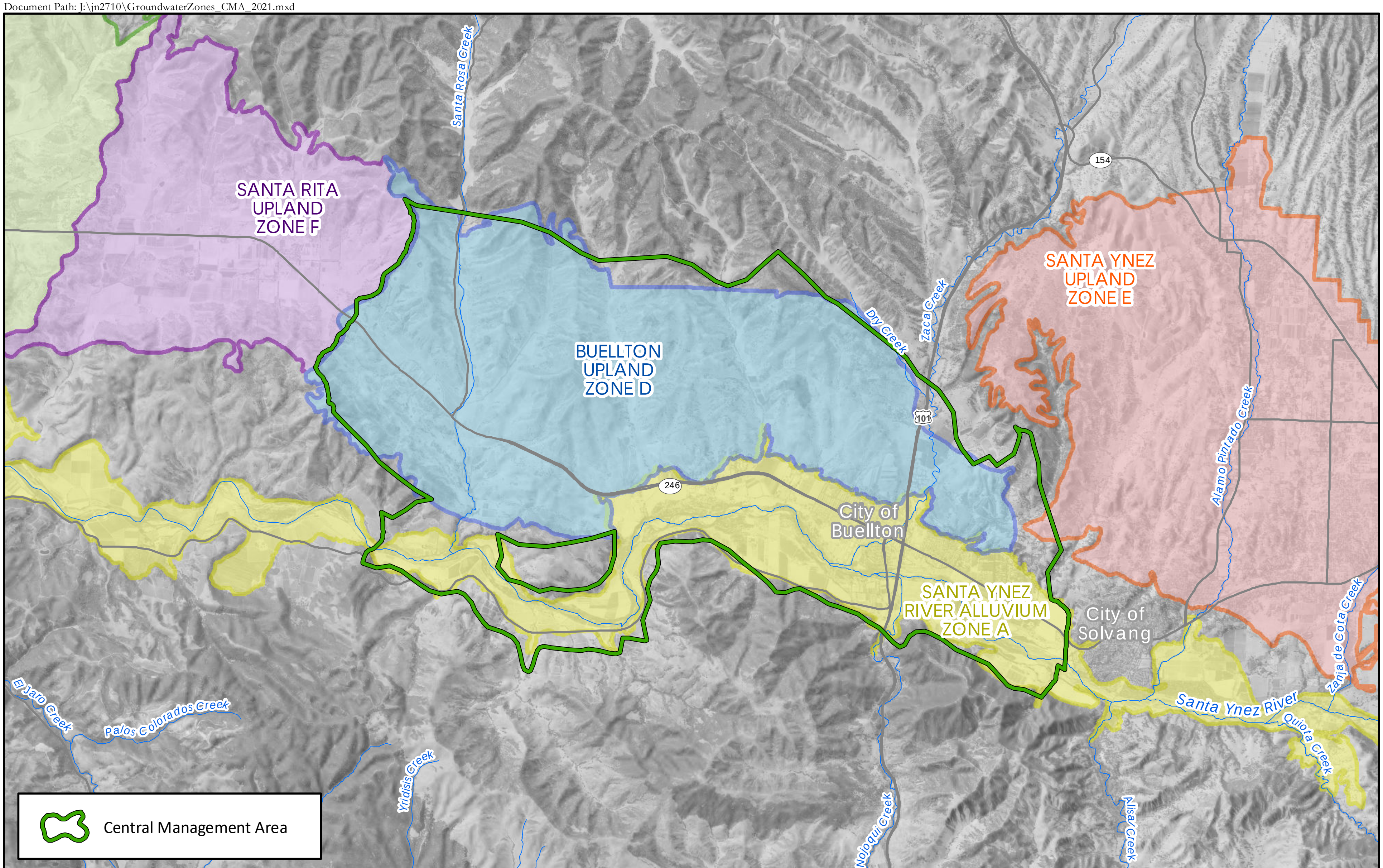

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SANTA YNEZ RIVER
WATER CONSERVATION DISTRICT
GROUNDWATER ZONES
AND THE CENTRAL MANAGEMENT AREA

0 0.75 1.5
Miles

N

Sources:
NAIP Imagery (2018)
Note: Zone D extends under Zone A (see Figure 2a.2-1).

FIGURE 2a.2-4

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The Careaga Formation has two sub-members including the upper Graciosa Member with medium to coarse sand, and the lower Cebada Member with typically finer sand. The Graciosa Member is the main producer of groundwater in the Buellton Aquifer (Bright et al. 1992). Permeabilities in the Graciosa Member range from 0.1 to 100 feet per day (Upson and Thomasson 1951; Wilson 1959; Bright et al. 1992, 1997), with an average permeability of approximately 9.4 feet per day[51] (Hamlin 1985; LaFreniere and French 1968). Hydraulic conductivity of the Cebada Member ranges from 0.1 to 3 feet per day beneath the Lompoc Plain (Bright et al. 1992). The specific yield of the Careaga Formation ranges from 10-30%, and a 10% specific yield was utilized in the Buellton Upland Groundwater Management Plan (Santa Ynez River Water Conservation District and City of Buellton, 1995).

Buellton Aquifer in the Santa Ynez River Alluvium Subarea

From the CMA/EMA boundary to the Buellton Bend, the Buellton Aquifer lies underneath the Santa Ynez River Alluvium (Upson and Thomasson 1951; Wilson 1959; Geosyntec 2020 Figure 2a.1-3a and **Figure 2a.2-5**). The similarities between the Lower Aquifer in the WMA and Buellton Aquifer in the CMA are noted by Upson and Thomasson (1951, pg. 52):

> Thus, only near Buellton and in the Lompoc subarea, where it crosses the two ends of the Santa Rita syncline that is, for only about 18 miles of its entire course, is the Santa Ynez River in direct contact with the major bodies of water-bearing deposits (*Lower (Buellton) Aquifer*) in its valley. (Parenthesis added)

Because the majority of wells in the SYRA subarea are shallow, a precise understanding of the Buellton Aquifer underneath the Santa Ynez River is undetermined. The 3D Geologic model (Geosyntec 2020) is able to model the geologic structure of this area using the existing well logs and bedding angles of the syncline. Additional geophysical AEM data collected within the CMA will be able to fill in more details and validate the geologic structure and hydrogeologic modeling of the Buellton Aquifer in the SYRA subarea.

51 Unit conversion from 70 (gal/d)/ft^2 in Hamlin (1985).

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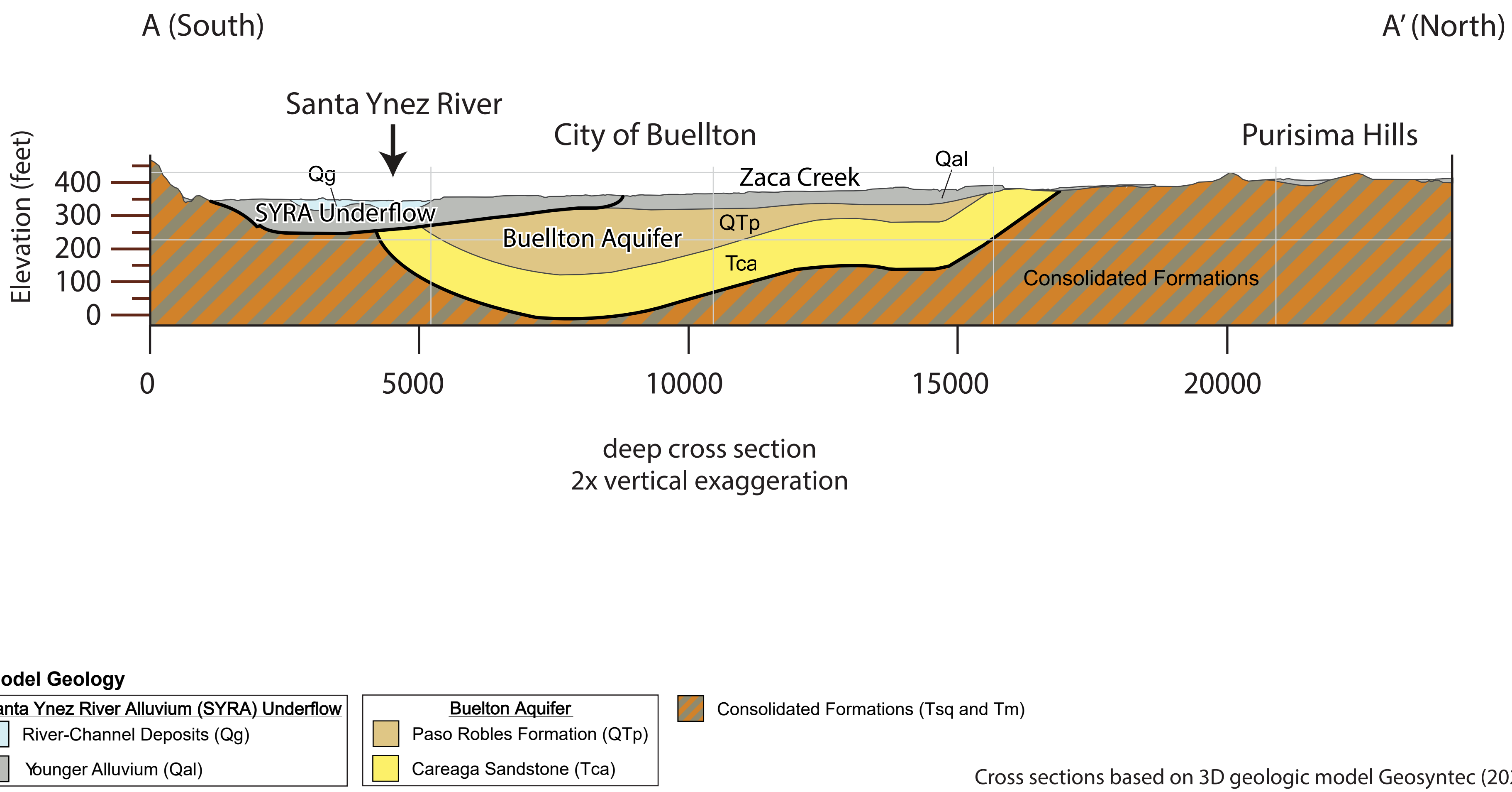

Cross sections based on 3D geologic model Geosyntec (2020).

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CENTRAL MANAGEMENT AREA AQUIFER CROSS SECTION A-A'

FIGURE 2a.2-5

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Buellton Aquifer in the Buellton Upland Subarea

Excluding the agricultural areas of Santa Rosa Creek drainage, the Buellton Upland is relatively rugged and has not been extensively developed, and consequently, few wells have been drilled in the Buellton Upland, and fewer deeper wells have been drilled into the Careaga and Paso Robles formations. The lack of well and water level information over time has led to a data gap about details and changes in groundwater movement in the Buellton Upland, especially in the Careaga and Paso Robles formations. All water bearing geologic units in the Buellton Upland are grouped into the Buellton Aquifer.

Geologic cross sections A-A', B-B', and C-C' (Figures 2a.1-3a through 2a.1-3c) show the Santa Rita Syncline and the Buellton Aquifer (the Paso Robles and Careaga Formations) through the Buellton Upland from east to west. The deposits of the Paso Robles and Careaga Formations are on a steeper slope on the south side of the syncline compared with the north side flanking the Purisima Hills (Figures 2a.1-3a through 2a.1-3c). Except for the area from the CMA/EMA boundary to the Buellton Bend, the Buellton Aquifer is separated from the Santa Ynez River and subterranean alluvial deposits, by non-water bearing deposits of Sisquoc and Monterey Shale Formations (Figures 2a.1-3b and 2a.1-3c).

The groundwater movement of the Buellton Aquifer in the Buellton Upland generally follows the surface topography flowing from north to south, from the Purisima Hills towards the Santa Ynez River (Hamlin 1985). A conceptual diagram showing this water flow is **Figure 2a.2-6**. Section 2a.3 describes controls on inflows into the groundwater system, and Section 2a.4 describes uses and outflows of water out of the groundwater system including seeps and springs along the CMA southern boundary.

A recommendation was made in 1995 as part of the Buellton Upland Groundwater Management Program (Santa Ynez River Water Conservation District and City of Buellton, 1995) to develop a more extensive groundwater water level database for the Buellton Upland. So far, this update to the monitoring program in the Buellton Upland has not occurred but can be planned for as part of this SGMA effort.

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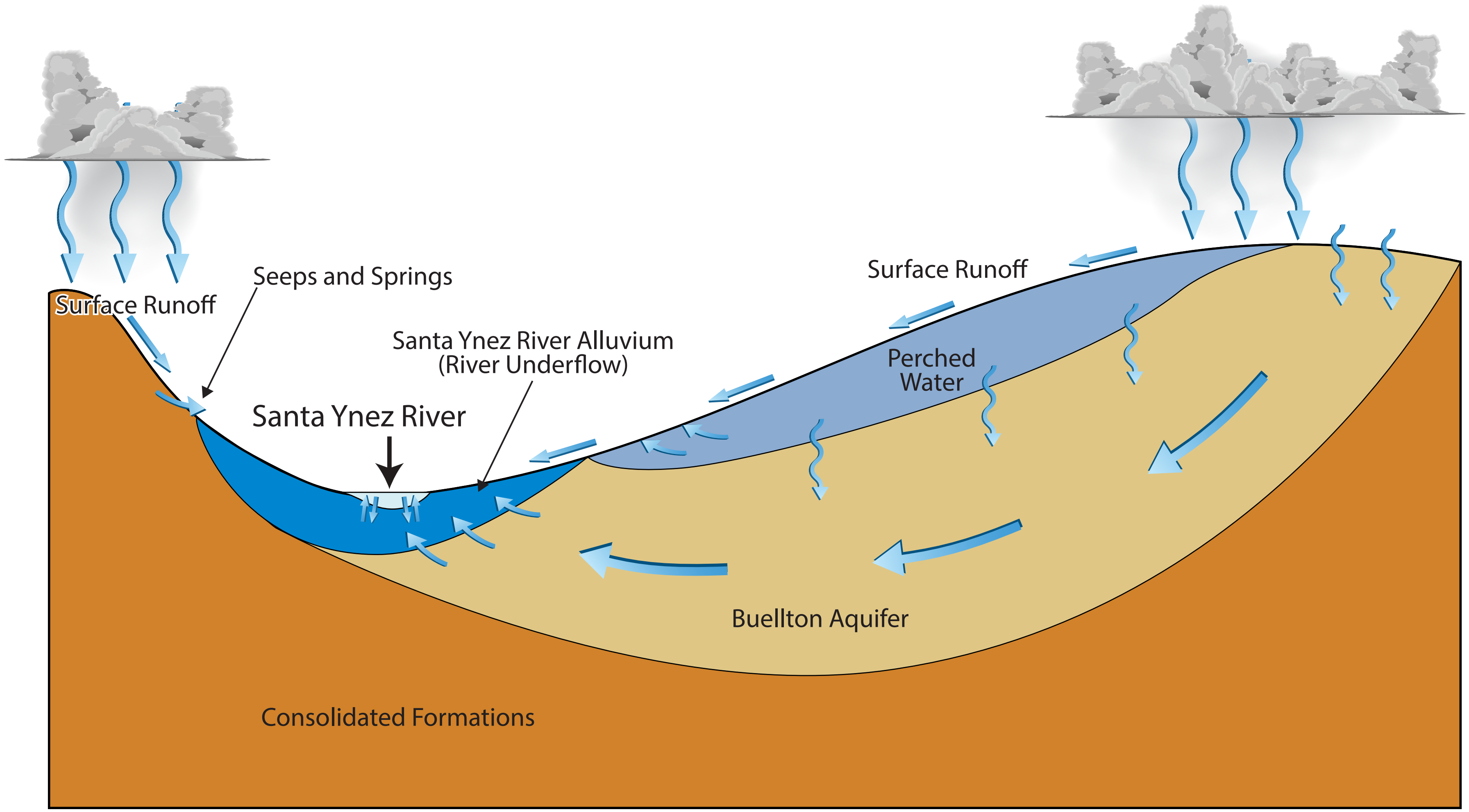

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Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

GROUNDWATER FLOW CONCEPT
CENTRAL MANAGEMENT AREA

FIGURE 2a.2-6

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This Buellton Aquifer is described in the Buellton Upland Groundwater Basin Management Plan (Santa Ynez River Water Conservation District and City of Buellton, 1995) as having “many confined and unconfined water bearing zones within the overall basin”, which probably relates to the heterogeneity of the deposits of the Buellton Aquifer in the CMA and lenses of coarser deposits within both the Paso Robles and Careaga Formations.

2a.2-3 Summary of the Aquifer Properties

In the Santa Ynez River Alluvium, managed by SWRCB under WR 2019-0148, the permeability, or hydraulic conductivity, of the alluvial deposits varies widely upon location and depth. The permeability of the river gravel deposits along the Santa Ynez River ranges from 100 to 700 feet per day (Upson and Thomasson 1951). Compared to the Santa Ynez River alluvium upstream of Solvang in the EMA, which has 15% or less clay deposits in the Santa Ynez River Alluvium, the Buellton area has clay deposits that compose as much as 43% of the drilling log materials (Wilson 1959). The specific yield of the Santa Ynez River gravel deposits along the Santa Ynez River is estimated as high as 30 percent (Bright et al. 1997). However, in the Buellton area the specific yield is estimated at 17 to 18 percent (Wilson 1959).

In the Buellton Aquifer in the CMA, the permeability and storage coefficients of the Paso Robles and Careaga Formations are relatively much less than the Santa Ynez River Alluvial deposits. Hydraulic conductivity of the Graciosa Member of the Careaga Formation (upper Careaga) ranges from about 5 feet per day to 90 feet per day (Bright et al. 1992). Hydraulic conductivity of the Cebada Member of the Careaga Formation (lower Careaga) ranges from 0.1 to 3 feet per day (Bright et al. 1992). The Paso Robles Formation has a similar range of hydraulic conductivity as the Careaga. However, the Paso Robles formation in the Buellton Upland is predominantly clayey and probably yields and transmits water very slowly (Upson and Thomasson 1951). The storage coefficients for the Buellton Aquifer have been estimated to range from 0.04 to 0.08 percent (Bright et al. 1997). The specific yield for unconfined portions of the Buellton Aquifer have been estimated from 10-30%, and the Buellton Upland Workgroup concluded that a 10% specific yield was appropriate for the Buellton Aquifer (Santa Ynez River Water Conservation District and City of Buellton, 1995).

The wells in the CMA with available aquifer pump tests were analyzed. The data are from well completion reports from DWR, County of Santa Barbara Department of Environmental Health Services[52], and local water agencies. Most data is from the County of Santa Barbara because the County requires a pump test for wells that are permitted as a single parcel and as multiple-parcel water systems, State small water systems[53], and Public Water Systems with less than 200 service connections.[54] Most of the tests are of short duration and only include one observation of drawdown. Specific capacity data was analyzed for 31 pump tests in the Santa Ynez River Alluvium with well depths of less 220 feet. Similarly, specific capacity data was analyzed for 41 pump tests in the Buellton Aquifer with well depths greater than 220 feet.

Using the available pump-test data, the median yield, specific capacity, and hydraulic conductivity were calculated for each aquifer. The hydraulic conductivities were estimated using the methodology from Driscoll (Driscoll, 1986). The median yield of the pump tests was estimated to be 650 and 500 gallons per minute (gpm) for the Santa Ynez River Alluvium and Buellton Aquifer, respectively. The median specific capacity of 53 and 7 gpm per foot of drawdown was estimated for the Santa Ynez River Alluvium and Santa Ynez River Aquifer, respectively. The median hydraulic conductivities of 400 and 10 feet per day (ft/day) were calculated for the Santa Ynez River Alluvium and Buellton Aquifer in the CMA, respectively.

2a.2-3-1 Estimated Groundwater Age

Mapping done by Lawrence Livermore National Laboratory used tritium (^{3}H) helium (^{3}He) to estimate groundwater age (**Figure 2a.2-7**). This is an estimate of when the water last was in the atmosphere (Visser et al. 2014). This indicates the oldest groundwater is in the northwest Buellton Upland at 40 to 50 years old. The underflow in the eastern Santa Ynez River Alluvium is shown as having a younger age of 30–40 years. The east Santa Ynez River Alluvium is shown as having a younger age of 30 to 40 years. This likely represents conditions in the Buellton Aquifer, as the Santa Ynez River Alluvium is much younger being underflow of the Santa Ynez River.

52 Acting as Local Primacy Agency (LPA) under Health and Safety Code 116325 et seq.

53 Health and Safety Code Section 116275 (n) “State small water system” means a system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year

54 Health and Safety Code Section 116330 (a) [..] This delegation shall not include the regulation of community water systems serving 200 or more service connections. [..]

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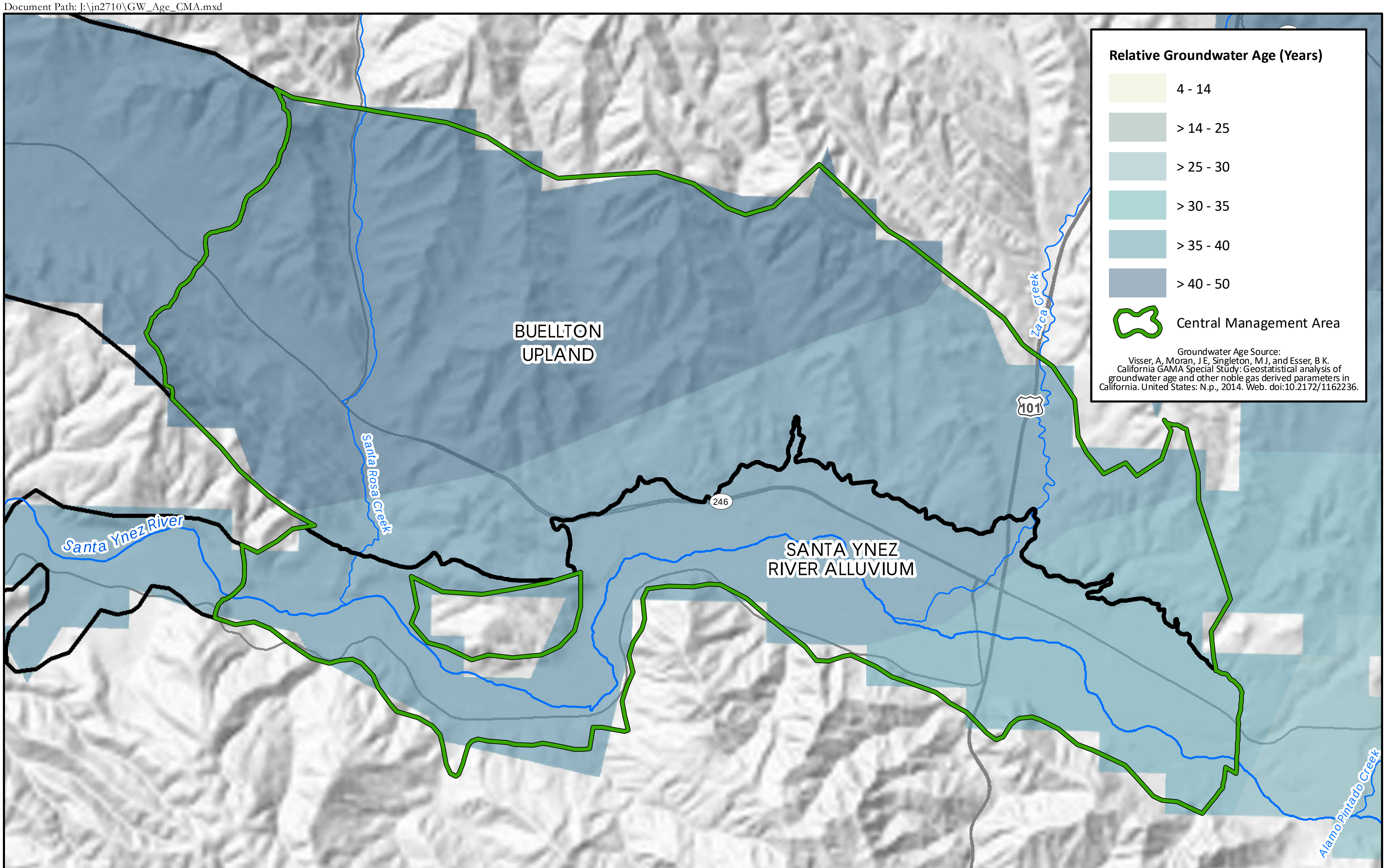

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RELATIVE GROUNDWATER AGE
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002

FIGURE 2a.2-7

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Groundwater age is related to the relative amount of water that is recharged: younger water indicates higher recharge. In terms of water quality, younger water high vulnerability to groundwater contamination from the surface, but quicker recovery from contamination. The water budget (Section 2c) uses a modeling method to estimate flows, unlike this trace isotope method.

2a.2-3-2 Water Quality in the Central Management Area

Water-quality problems most frequently encountered in the CMA pertain to high salinity and hardness (City of Buellton 2021b; RWQCB 2019). The salinity measured as Total Dissolved Solids (TDS) concentration of the groundwater in the City of Buellton at 828 milligrams per liter (mg/L) in wells exceeds the recommended limit[55] of 500 mg/L, but is less than half the concentrations found elsewhere in the Basin, such as the Lompoc Plain of the WMA. In the Santa Ynez River Alluvium in the CMA, the TDS concentration of groundwater in the ranges from 630 to 2,000 mg/L (Hamlin 1985). Groundwater salinity in the Santa Ynez River Alluvium increases from east to west as the underflow travels over the non-water bearing Monterey Shale (Hamlin 1985). Conversely, in the Buellton Aquifer in the CMA, the TDS concentration of groundwater is typically less than 500 mg/L (Hamlin 1985).

Collected samples from the Santa Ynez River Alluvium in the CMA show water quality concentrations exceeding maximum or secondary contaminant levels for drinking water and impairment for irrigation, including the parameters of arsenic, iron, manganese, nitrate, and sulfate, as provided in California's Groundwater Ambient Monitoring Assessment (GAMA) program (Haas et al. 2019). The Buellton Aquifer in the Buellton Upland is generally of better water quality than the Santa Ynez River Alluvium along the Santa Ynez River. However, samples for some wells in the Buellton Aquifer have water quality concentrations exceeding maximum or secondary contaminant levels for drinking water and impairment for irrigation, including the parameters of arsenic, manganese, and nitrate as provided in California's Groundwater Ambient Monitoring Assessment (GAMA) program (Haas et al. 2019).

55 Secondary Maximum Contaminant Level. Non-mandatory reference water quality standard set by Federal Environmental Protection Agency.

The current status of the CMA groundwater quality is discussed in detail in Groundwater Conditions (Section 2b). Monitoring Network (Section 3a) discusses current and future monitoring, and Sustainable Management Criteria (Section 3b) identifies specific monitoring targets as well as time series graphs.

2A.3 HYDROLOGIC CHARACTERISTICS

Hydrologic characteristics of the CMA related to groundwater recharge, including aerial precipitation recharge, mountain-front recharge, and streamflow infiltration, are presented in this section. Additional details for these topics are discussed in Water Budget (Section 2c) which also quantifies the hydrologic inflows and outflows of the CMA.

2a.3-1 Topography

The topography of the CMA is a major factor on the movement of surface water and groundwater and magnitude of precipitation and groundwater recharge. Groundwater movement in the CMA follows the surface topography. The CMA boundary, topography, and various geographic features within or adjacent to the area are shown in **Figure 2a.3-1**. Ground-surface elevations in the CMA vary from the Santa Ynez River, at approximately 220 feet above sea level[56] near Santa Rosa Park, to the surrounding hills, which can exceed more than 1,175 feet. The mouth of Santa Rosa Creek is at approximately 240 feet, the City of Buellton is at approximately 320 to 520 feet, and the Bobcat Springs Mutual Water Company is at elevations of over 1,120 feet.

The terrain south of the Santa Ynez River rises relatively steeply to the Santa Ynez Mountains between the Santa Ynez River valley and the south coast of Santa Barbara County. North of the river the land is the hilly southern extents of the Purisima Hills, which include the Redrock Mountain peak at 1,973 feet. The Santa Rita Hills, are located west of the CMA in between the upland and the Santa Ynez River and have a peak of over 1,280 feet.

56 In accordance with 23 CCR § 351 (v), elevations are in North American Vertical Datum of 1988 (NAVD88).

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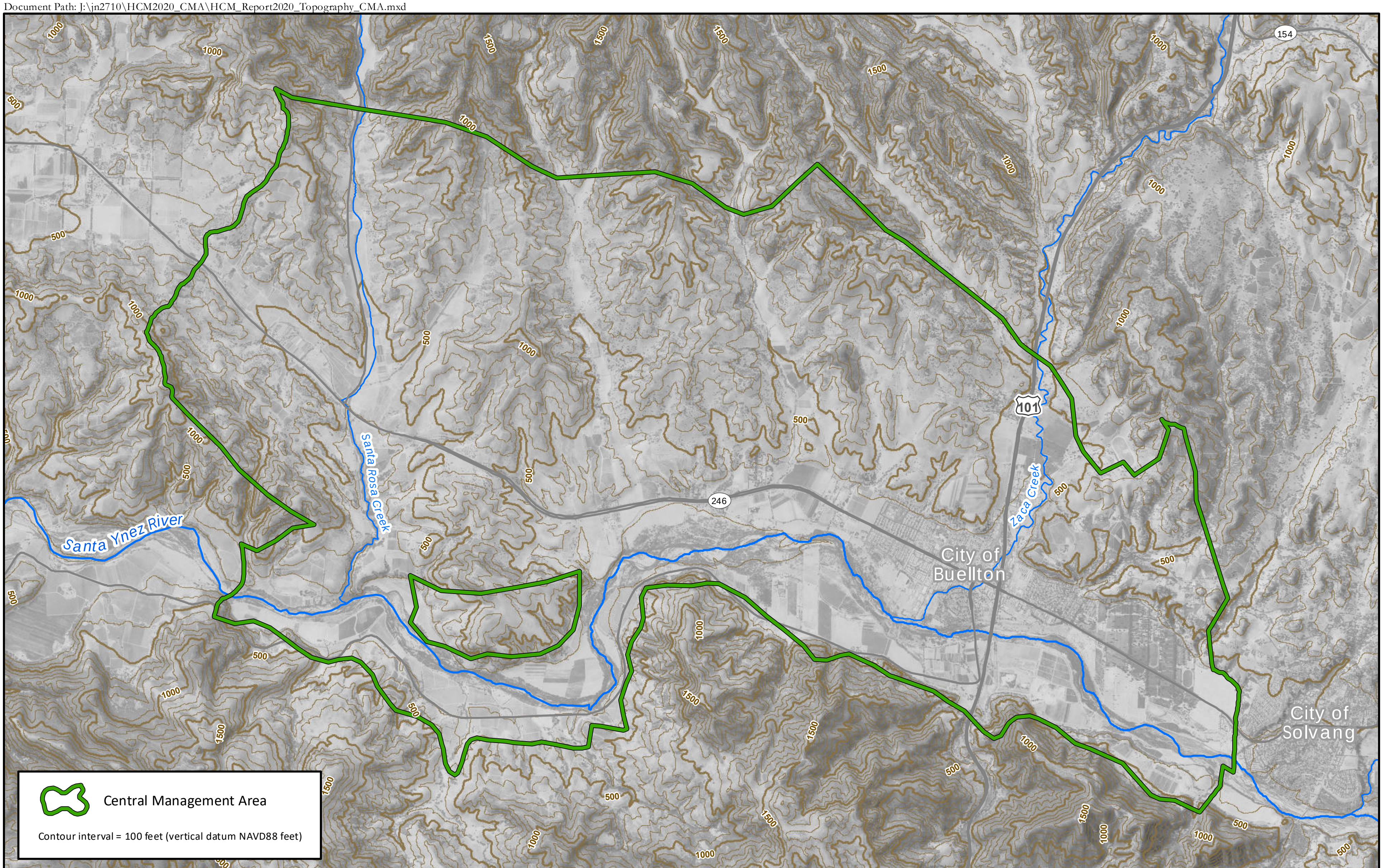

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Groundwater Sustainability Agency

TOPOGRAPHY
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

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

FIGURE 2a.3-1

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2a.3-2 Precipitation

Precipitation within the CMA is in largely driven by orthographic lift effects, and portions of the CMA at lower elevations portions generally receive less direct precipitation. **Figure 2a.3-2** shows the average precipitation within the CMA and adjacent watersheds (watershed extents discussed below in Section 2a.3-4). Direct annual average precipitation within the basin ranges from 16 inches per year in portions of Santa Rosa Creek up to 20 inches per year along the north side of the Santa Ynez River. CMA subareas annual average direct precipitation are summarized in the following table (**Table 2a.3-1**), and more detail breakdowns are found in the Water Budget (Section 2c). The watershed south of the Santa Ynez River (which flows towards the CMA) ranges from 18 up to 27 inches per year.

Table 2a.3-1
Summary of Average Annual Precipitation by CMA Subarea

CMA Subarea	Average Annual Precipitation (Average 1981-2010)
Buellton Upland	16 – 20 in/year
SYR Alluvium	17 – 21 in/year

Source: Derived from PRISM Climate Group (2014), Average Annual Precipitation 1981-2010.

Precipitation gages for the CMA and adjacent areas are also shown on **Figure 2a.3-2**. Within the CMA precipitation is measured at the Buellton Fire Station. Data for Water Year 1955-present (2021) is presented in **Figure 2a.3-3**. Shown in Figure 2a.3-3 is the annual precipitation and the cumulative departure from mean (CDM) for this data. CDM trends shows how relatively wet or dry a series of years are to the period of record. The Water Budget (Section 2c) additionally discusses precipitation and future projections.

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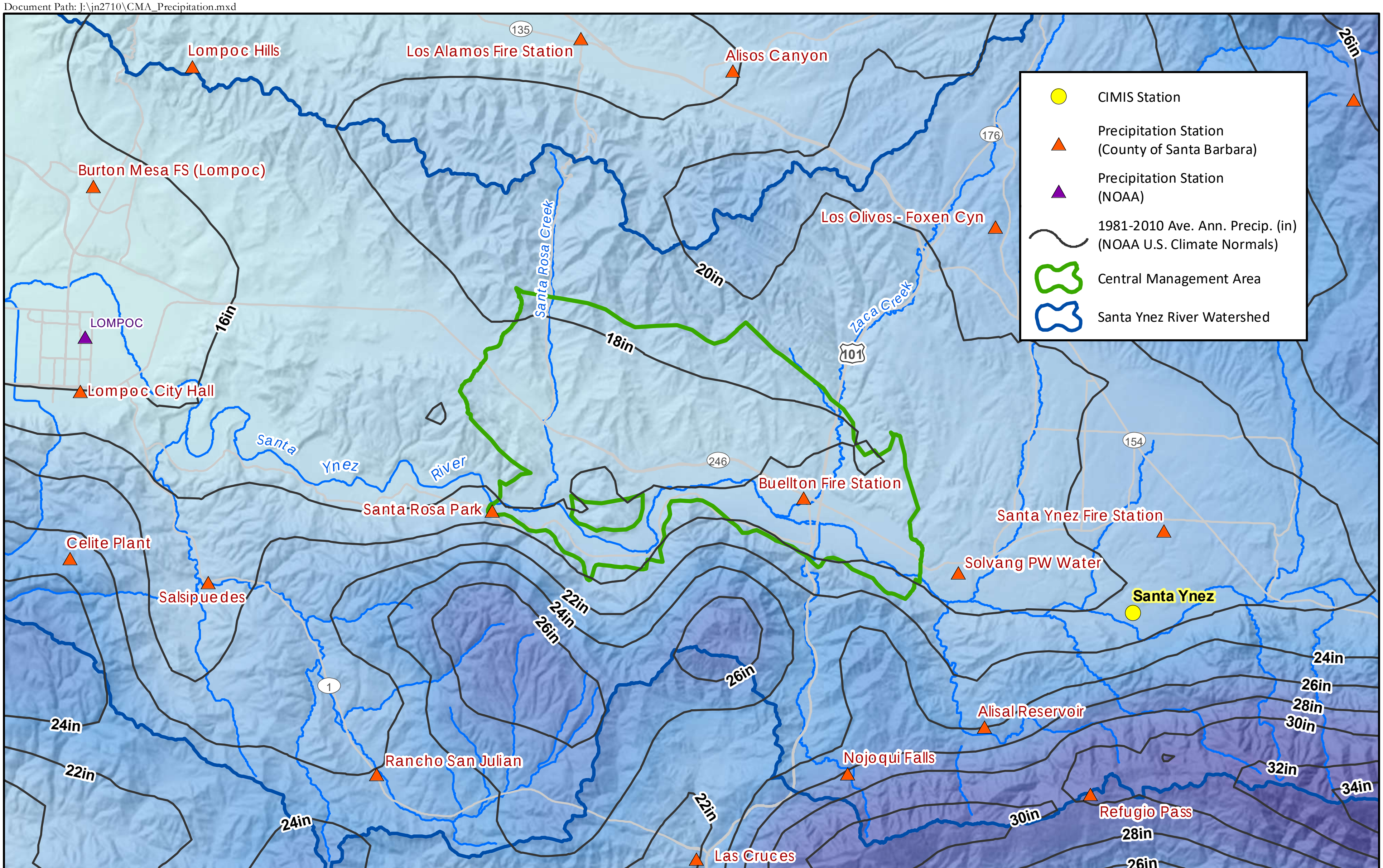

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PRECIPITATION STATIONS AND ISOHYETALS
CENTRAL MANAGEMENT AREA

0 1.5 3 Miles

N

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

FIGURE 2a.3-2

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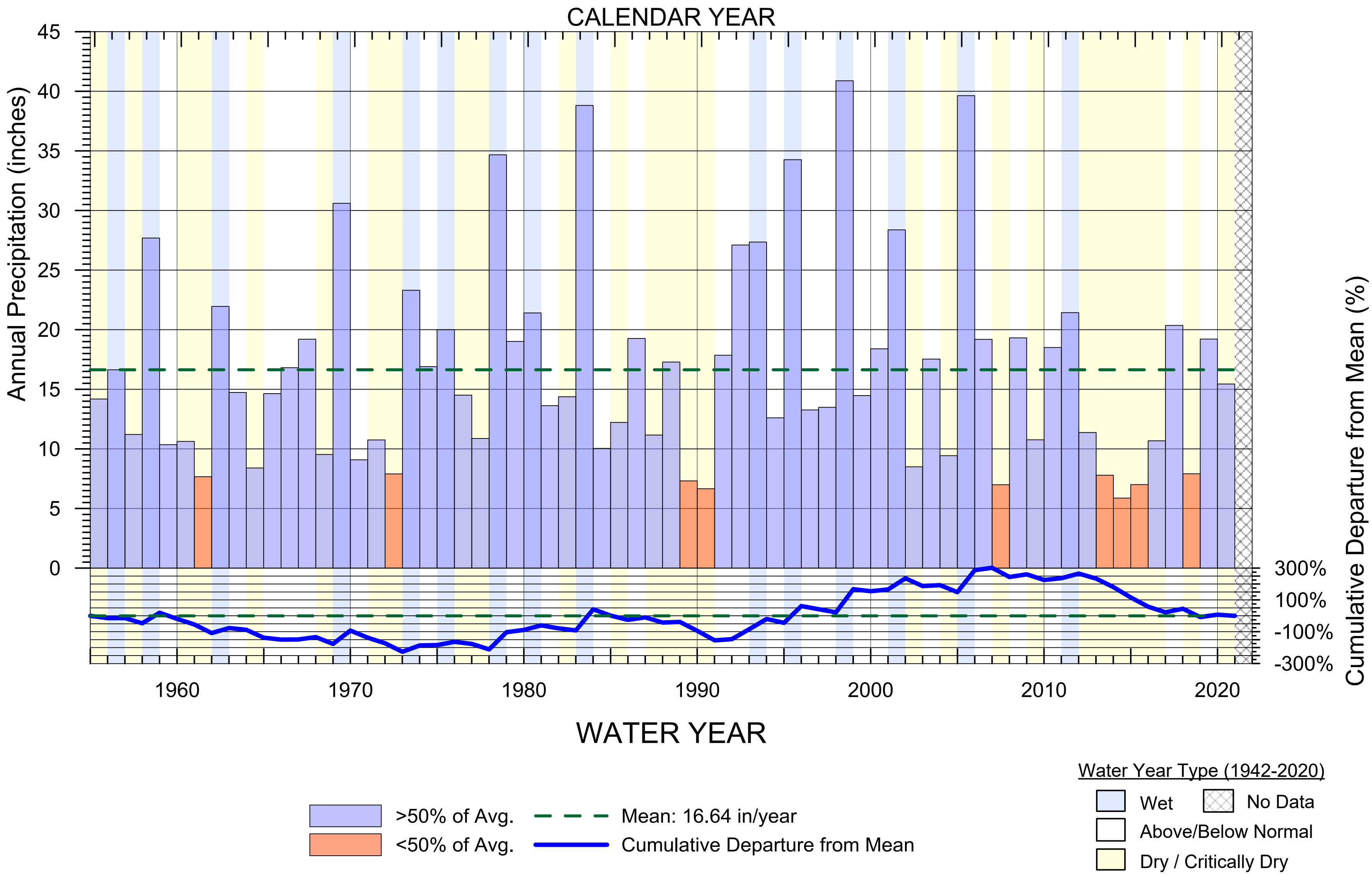

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BUELLTON FIRE STATION
PRECIPITATION AND
CUMULATIVE DEPARTURE FROM MEAN
WY 1955 - 2020

Source: Santa Barbara County (2021)
Preciptiation Gage #233

FIGURE 2a.3-3

I:\DATA\2710\Analyses\2021-04 Precipitation CDM Graphs\Fig 2a.3-3 CMA_Buellton_Fire_Station_Precip_CDM 2021.grf 6/30/2021 M. McCammon

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2a.3-3 Soils and Infiltration

Precipitation and other supplemental water from agricultural sources can infiltrate to become groundwater, evaporate into the atmosphere, or run off to become surface water. Annual average precipitation within the CMA ranges from 16 inches per year in portions of Santa Rosa Creek up to 20 inches per year along the north side of the Santa Ynez River (Prism Climate Group 2014). Soil properties and slope are important controls on infiltration and runoff as well as indicate the potential for specific agricultural use. The soil characteristics of the CMA in terms of their potential infiltration rates are shown in **Figure 2a.3-4**.

Soils are the combination of minerals, organic matter, living organisms, gas, and water that are located at land surface. Their total composition and elevation greatly affect their infiltration rate and contribution to groundwater recharge in addition to the types of unconsolidated or consolidated sediments underlying them.

2a.3-3-1 Natural Recharge Areas

Recharge in the CMA ranges from high to very slow as shown on **Figure 2a.3-5**. Areas with high recharge are dominant in the Buellton Upland west of Highway 101 to Santa Rosa Creek on the southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Sand Formation in the Buellton Upland and to the river gravels along the Santa Ynez River.

Areas of slow or very slow recharge include areas west of the City of Buellton north and south of Highway 246 and areas east of Zaca Creek and north of Highway 246 near Ballard Canyon. These areas correspond to older alluvial deposits in the lower drainage of the tributaries in the Buellton Upland.

Recharge through seepage and percolation from the Santa Ynez River to the Santa Ynez River Alluvium is also a major source of recharge in the CMA (Upson and Thomasson 1951). Releases from Lake Cachuma for the "Above Narrows Account," described below in the Section 2a.3-4-2, Rivers and Streams, is for recharging the river alluvium in this subarea.

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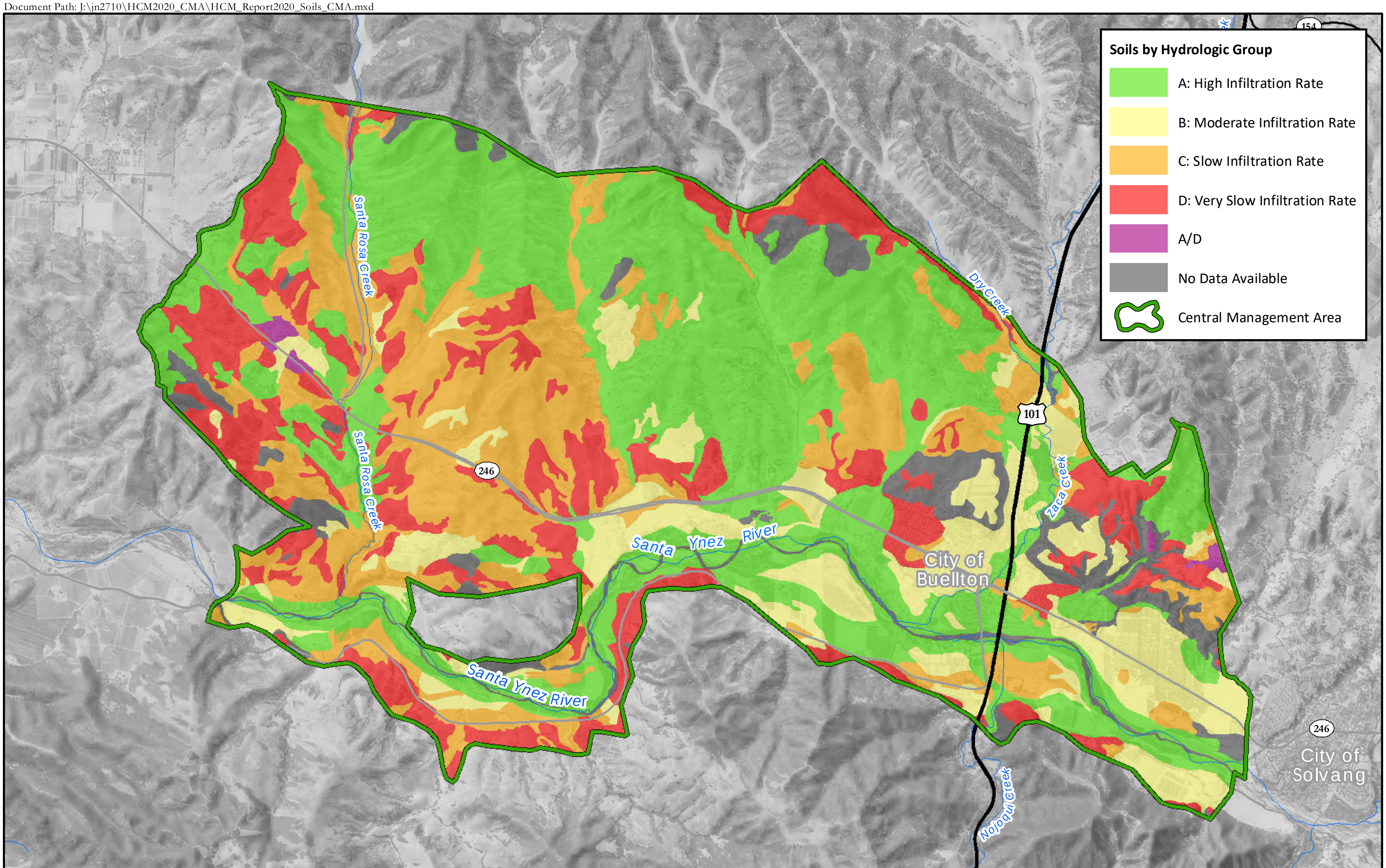

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SOIL CHARACTERISTICS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Source:
SSURGO Soil Survey Geographic Database,
National Resources Conservation Service.

N

FIGURE 2a.3-4

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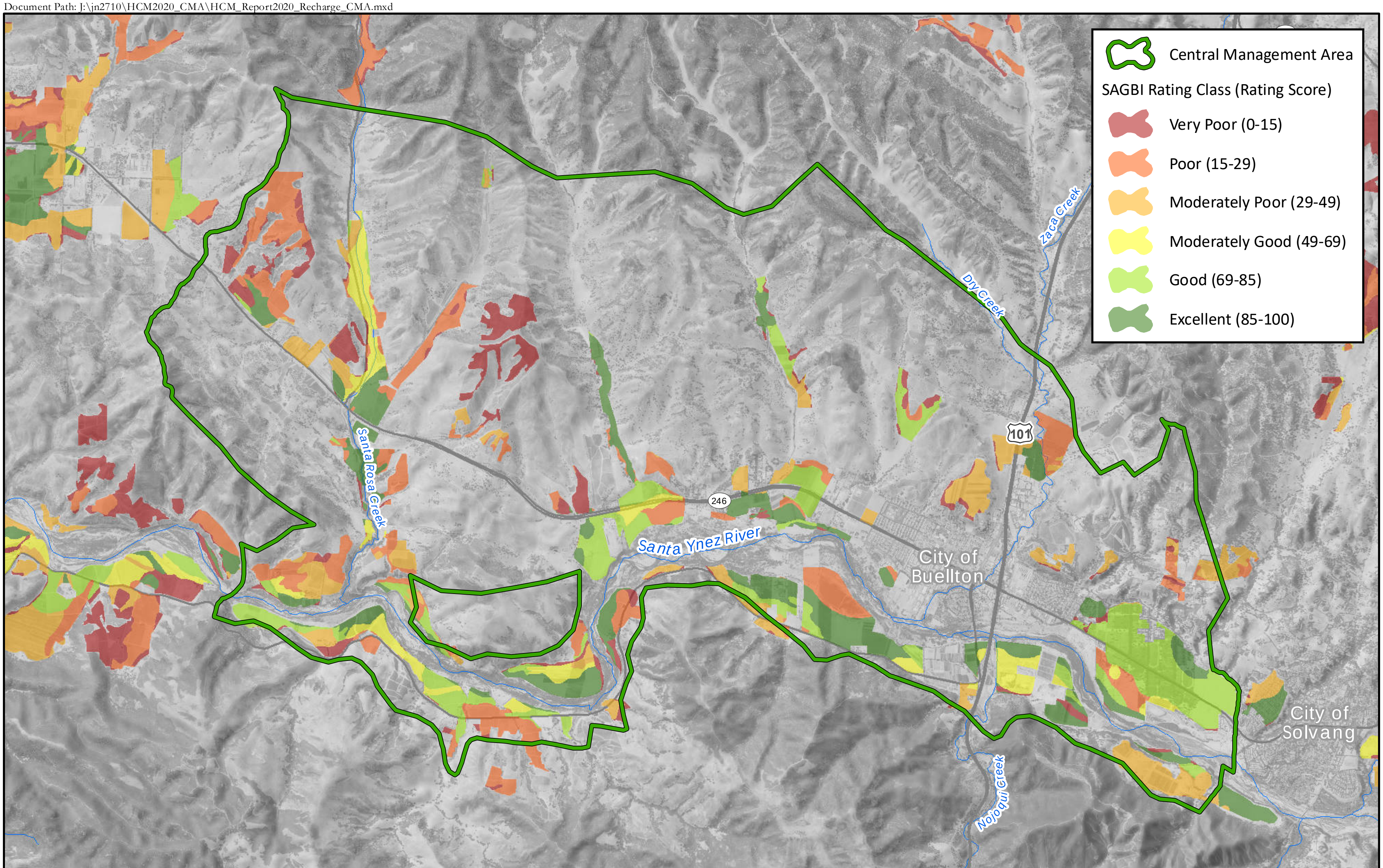

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POTENTIAL GROUNDWATER RECHARGE AREAS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
Soil Agricultural Groundwater Banking Index (SAGBI) - UCDavis, 2020

FIGURE 2a.3-5

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The Water Budget (Section 2c), uses the estimates of total recharge from the USGS Basin Characterization Model (BCM). This USGS model used monthly climate data including precipitation and soils information to estimate the volume of groundwater recharge.

2a.3-3-2 Potential Groundwater Recharge Areas

In addition to natural recharge, DWR recommends including in the Groundwater Sustainability Plan the Soil Agricultural Groundwater Banking Index (SAGBI) map (**Figure 2a.3-5**), which is a classification of the suitability of agricultural land for use in groundwater banking conducted by UC Davis (DWR 2016). Groundwater banking means using artificial recharge to store water in the aquifer for later withdrawal through pumping.

The SAGBI ratings are only available for agricultural land, and are based on a combination score using the following five factors to ensure that an artificial recharge project would be successful, including limited adverse impact on existing crops (O'Geen et al. 2015):

1. Deep percolation
2. Root zone residence time
3. Topography
4. Chemical limitations
5. Soil surface condition

Potential groundwater banking projects will be described in further detail when projects and management actions are developed for the CMA. Potential areas for artificial recharge have been identified along the Santa Ynez River, Zaca Creek, and Santa Rosa Creek, identified as "excellent" as shown on **Figure 2a.3-5.**

2a.3-4 Runoff and Surface Flows

The CMA aquifers are recharged by rainfall in the watershed and infiltration of surface flows in the Santa Ynez River and tributaries. These flows are supplemented by water-rights releases into the Santa Ynez River from Bradbury Dam at Lake Cachuma.

2a.3-4-1 Santa Ynez River Watershed

The CMA is located wholly within the Santa Ynez River watershed (**Figure 2a.3-6**).[57] Smaller local watersheds are shown in **Figure 2a.3-7,** including Zaca Creek and Santa Rosa Creek north of the Santa Ynez River. Nojoqui Creek is located south of the Santa Ynez River and is outside of the CMA. However, it is an important source of recharge to the Santa Ynez River. The larger Santa Ynez River watershed is a catchment area for the Santa Ynez River, which is a major source of recharge in the CMA within Santa Ynez River Alluvium.

Precipitation, water imports, and other water sources in the Santa Ynez River watershed outside of the CMA interact with the CMA through several routes:

- As runoff to surface water streams and rivers, which flows as surface water and underflow into the CMA. Examples are waters of the Santa Ynez River, Zaca Creek, Santa Rosa Creek, and Nojoqui Creek. A portion of this surface flow in the tributaries can infiltrate the unsaturated zone to recharge the Buellton Aquifer.

- As mountain front groundwater recharge, which is the subsurface inflow of groundwater to lowland aquifers from adjacent mountains. This likely occurs along the north of the CMA to the Buellton Upland subarea into the Buellton Aquifer, as well as south of the CMA to the Santa Ynez River Alluvium.

- As groundwater flow between management areas. Based on the ground water elevation gradient and thickness of saturated deposits between the EMA and CMA, groundwater will flow into the CMA at the upstream boundary.

57 Santa Ynez, Hydrologic Unit 18060010: 573,819 Acres

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Central Management Area

Santa Ynez River Watershed

SANTA YNEZ RIVER WATERSHED AND SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

CENTRAL MANAGEMENT AREA

0 4 8 Miles

N

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FIGURE 2a.3-6

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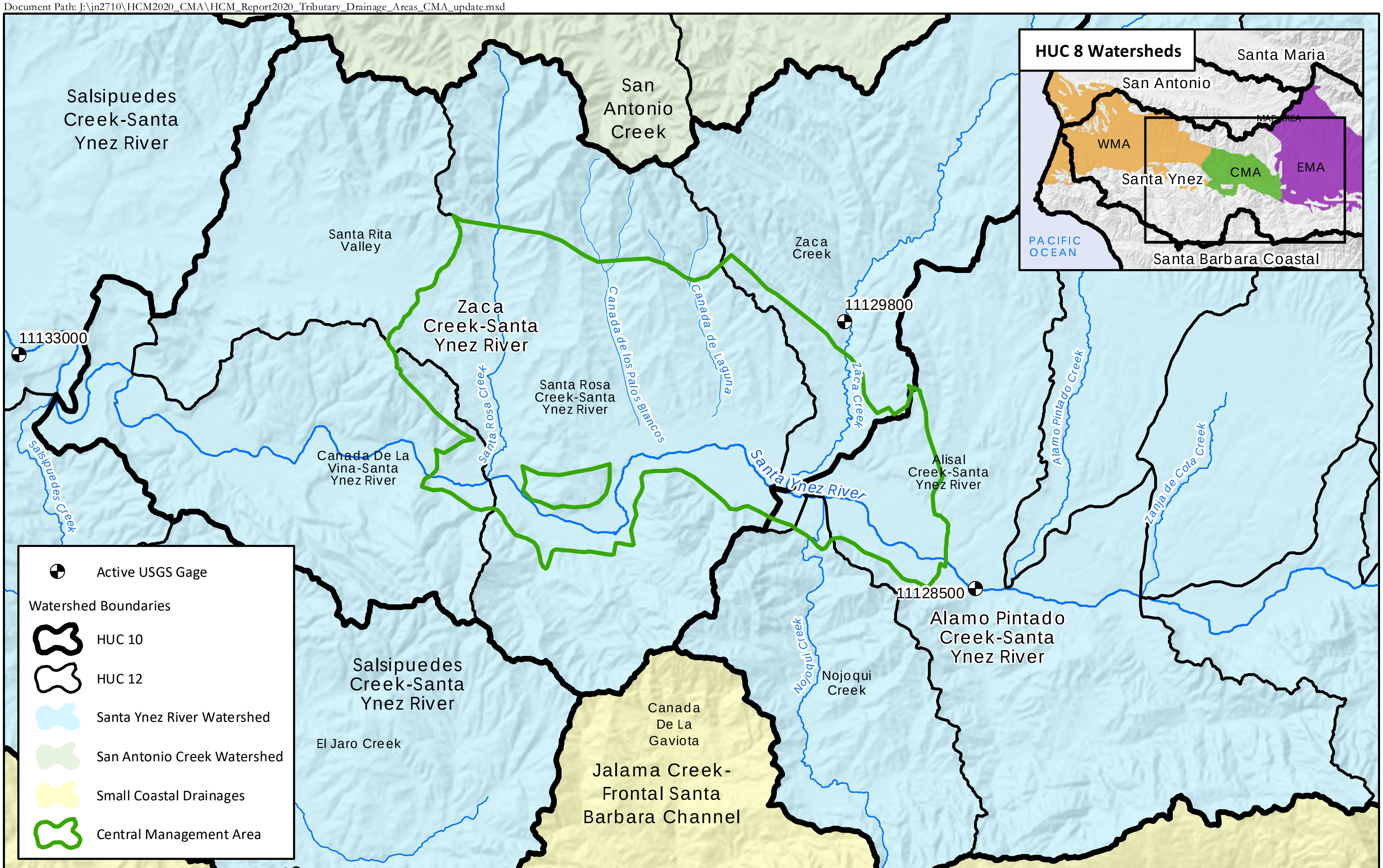

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TRIBUTARY DRAINAGE AREAS
CENTRAL MANAGEMENT AREA

Sources:
USGS National Elevation Dataset, 2002
National Hydrography Dataset

FIGURE 2a.3-7

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2a.3-4-2 Santa Ynez River and Tributaries

The Santa Ynez River flows west over approximately 90 miles from its headwaters in the Santa Ynez and San Rafael Mountains to the Pacific Ocean, draining approximately 900 square miles. The Santa Ynez River headwaters originate in the Santa Ynez and San Rafael Mountains at an elevation of about 4,000 feet near the eastern boundary of Santa Barbara County, with average annual precipitation of up to 49 inches per year (PRISM Climate Group 2014). The Santa Ynez River has three dammed reservoirs upstream of the EMA, CMA, and WMA: Jameson Reservoir is the farthest upstream, then Gibraltar Reservoir, and finally Cachuma Reservoir (Lake Cachuma) (Figure 2a.3-6). Although reservoir releases do flow into the Santa Ynez River, the reservoirs are also managed to divert water out of the Santa Ynez River watershed via a system of tunnels through the Santa Ynez Mountains for use by the cities located on the Santa Barbara County south coast (i.e., Goleta , Santa Barbara, Montecito, and Carpinteria).

Downstream of Bradbury Dam, the dam that forms Lake Cachuma, the Santa Ynez River continues flowing west, with the River underflow entering a bedrock-confined channel in the western CMA. The flow of the river is primarily intermittent throughout the Basin, carrying mainly flood flows from tributary watershed land downstream of Bradbury Dam, and occasional spills and releases of water from Lake Cachuma. During summer months, water is released from Lake Cachuma to meet downstream water rights. Historical flows of the Santa Ynez River at Solvang near where it enters the CMA are shown on **Figure 2a.3-8**. 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 Orders, the Cachuma Project Settlement Agreement, and the National Marine Fisheries Service Biological Opinion (see Section 1d.5).

There are three main tributaries in the CMA that flow into the Santa Ynez River in the CMA. These include Zaca Creek, Nojoqui Creek, and Santa Rosa Creek. Zaca Creek has a 40-square-mile watershed and is located north of the Santa Ynez River. The Zaca Creek watershed drains approximately 27 square miles before leaving the EMA, crossing non-water-bearing geology, and then into the watershed of the CMA. Historical flows of the Zaca Creek near where it enters the CMA are shown on Figure 2a.3-8.

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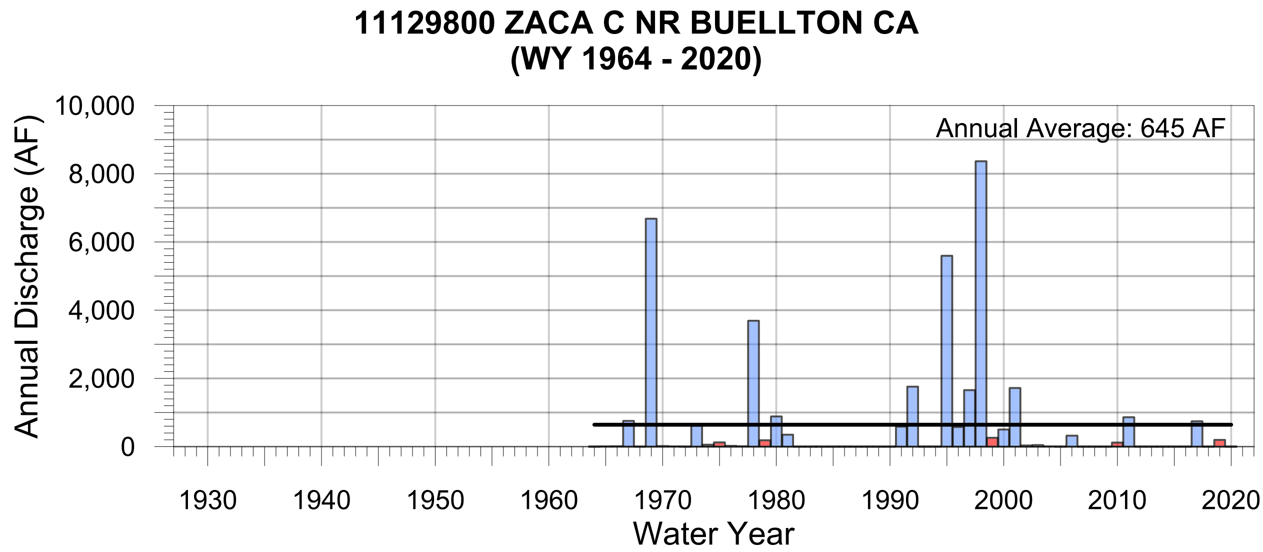

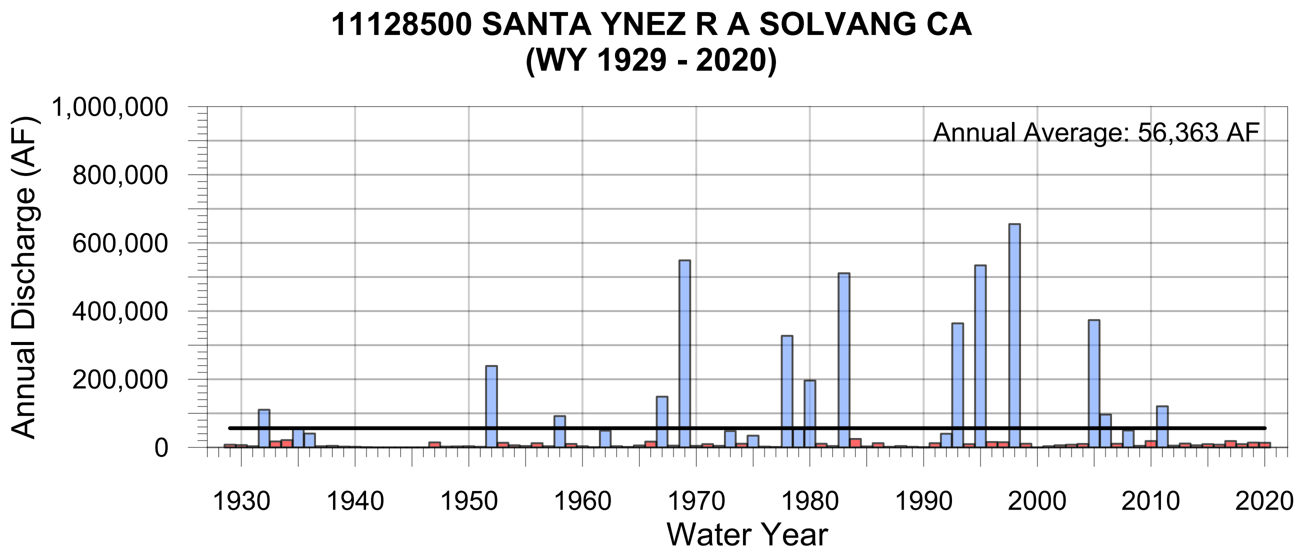

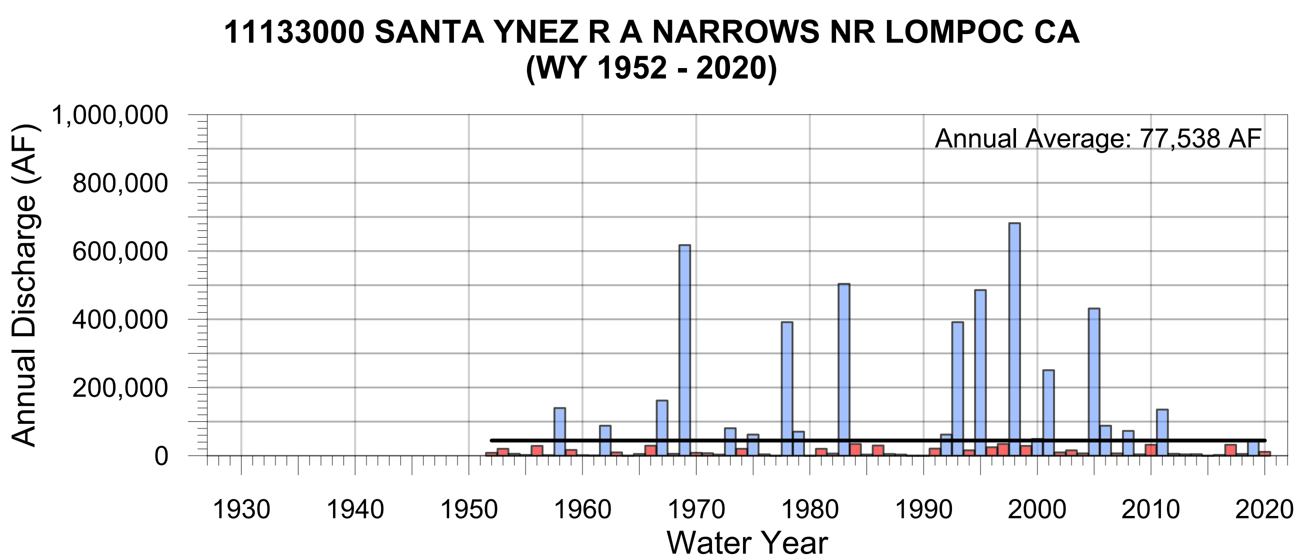

I:\DATA\2564\Data\Surface Water Hydrology\USGS Streamflow\Fig 09 Annual_Flow_AR_River_v20161026.grf M. McCammon

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ANNUAL FLOWS
SANTA YNEZ RIVER

Dry Years (less than 50% of Avg.)
>50% of Avg.
Annual Average

Data Source: USGS (2020) streamflow data

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Nojoqui Creek has a 16.4-square-mile watershed and is located south of the Santa Ynez River. The Nojoqui watershed extends from the Santa Ynez River southward along the northern slope of the Santa Ynez Mountains. Most of the approximately 16 square miles of Nojoqui watershed is outside of the CMA boundary.

Santa Rosa Creek drains an approximately 16.5-square-mile watershed and is located north of the Santa Ynez River, originating from the southern slope of the Purisima Hills. Approximately 6.3 square miles of the watershed is located outside of the CMA.

There are several smaller tributaries in the CMA including Adobe Canyon and Ballard Canyon located east of Zaca Creek, and Cañada De La Laguna and Cañada De Los Palos Blancos between Zaca Creek and Santa Rosa Creek.

2a.3-4-2-1 Downstream Water Rights Releases

A portion of the CMA aquifer is recharged by downstream water rights releases from Lake Cachuma as ordered by the Santa Ynez River Water Conservation District (SYRWCD) pursuant to the requirements of then applicable SWRCB orders. Water rights releases for users downstream of Lake Cachuma are set forth in the State Water Resources Control Board Order of 1973 (WR 73-37), as amended in 1989 (WR 89-18) and most recently in 2019 (2019-0148). These releases are based on the establishment of two accounts and accrual of credits (storing water) in Lake Cachuma for the Above and Below Lompoc Narrows areas. Flow at the Lompoc Narrows is measured the USGS gage 11133000 shown on Figure 2a.3-7, and Figure 2a.3-8 shows historical annual flows of the Santa Ynez River at the Lompoc Narrows. The SYRWCD designates the riparian flow subarea as Zone A, as shown in **Figure 2a.2-4** in the CMA. During downstream water rights releases, water infiltrates and recharges the alluvium in Zone A.

2a.3-4-3 Water Imports

In the CMA, water is imported to City of Buellton through the Coastal Branch Pipeline by Central Coast Water Authority (CCWA). Since 1997 this pipeline has delivered water from the State Water Project (SWP). The pipeline delivers water at turnouts to specific water distribution systems and to Lake Cachuma. Within the Basin, the receiving entities of SWP are Vandenberg Space Force Base, City of Buellton, City of Solvang, and Santa Ynez River Water Conservation District Improvement District No. 1 (ID No. 1). A map of the SYRVGB water import system is shown in **Figure 2a.3-9**. **Figure 2a.3-10** shows the annual imports through the CCWA pipeline to the CMA and to the entire SYRVGB. **Table 2a.3-2** summarizes major water chemistry in the CCWA pipeline, water quality is discussed in groundwater conditions (Section 2b.3).

Table 2a.3-2
Imported CCWA Water Quality in mg/L at Polonio Pass Water Treatment Facilities

Calendar Year	Total Dissolved Solids (TDS)	Chloride (Cl)	Sulfate (SO_4)	Sodium (Na)	Nitrate as Nitrogen (NO_3 as N)
2020	280	70 (0 – 120)	63	56	-
2019	260	59 (13 - 146)	46	58	-
2018	220	81 (39 -140)	55	40	ND (<0.4)
2017	165 (77 – 394)	39 (8 -145)	30	24	-
2016	346 (194 – 442)	97 (41 – 138)	100	87	ND (<0.4)
2015	437 (349 – 708)	122 (80 – 205)	97	84	ND (<0.4)

Source: CCWA 2021. Ranges in parentheses indicate the measured range.
ND = non-detected, parenthesis is detection limit; - = not reported

Within the CMA, the only importer of water is the City of Buellton. The City of Buellton receives water from the Central Coast Water Authority pipeline at the turnout, as shown in Figure 2a.3-9.

Wastewater return flows sourced from these imports to the City of Buellton is collected as part of the City of Buellton's sewer system and conveyed to the Buellton Wastewater Treatment Plant before discharge (Dudek 2019). In addition, imported water also enters the CMA via wastewater effluent return flows from CCWA delivered upstream to the City of Solvang and ID No. 1 and via mixing of SWP water with water rights releases at Bradbury Dam.

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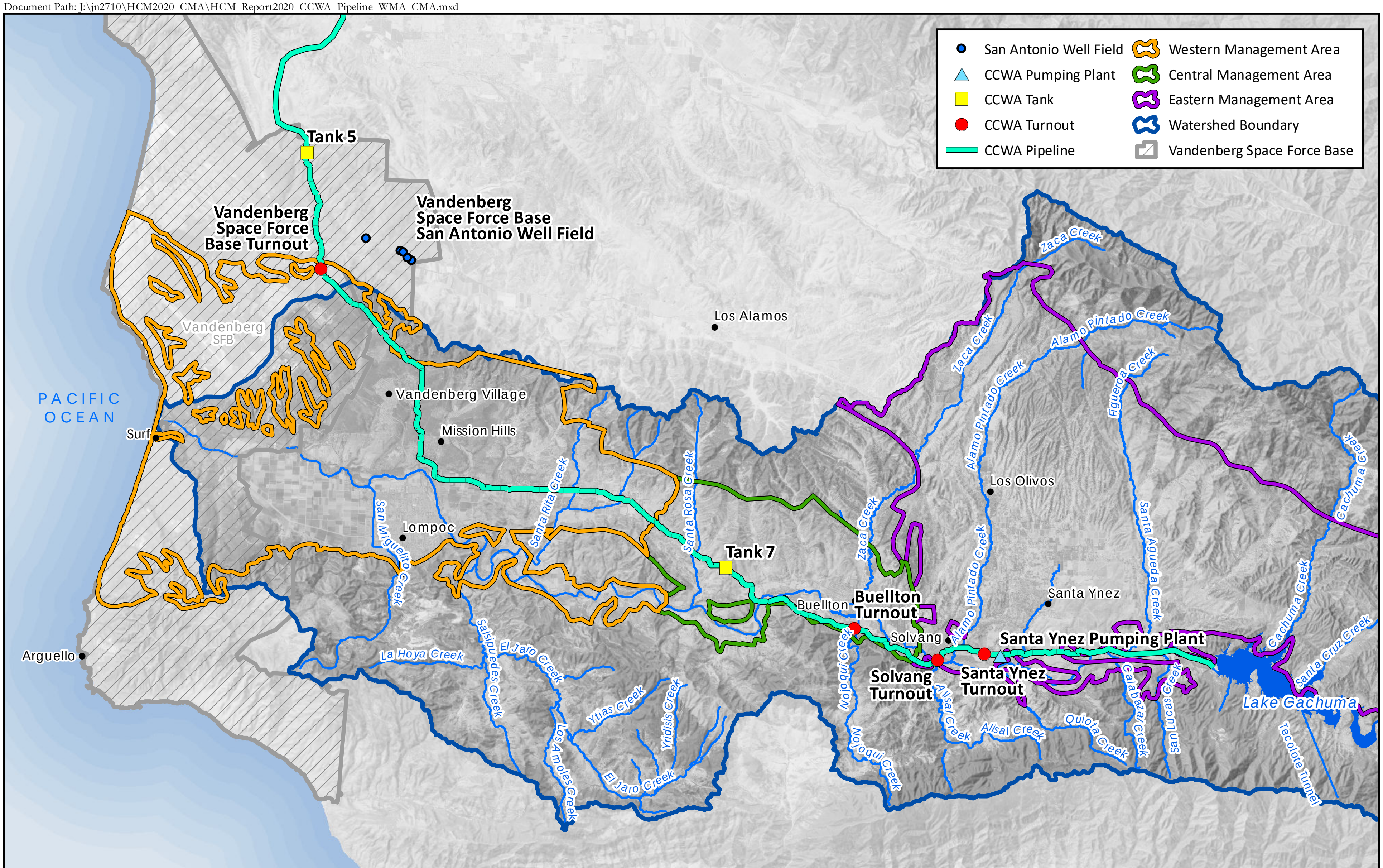

STETSON ENGINEERS INC.

WATER IMPORTS
CCWA PIPELINE AND SAN ANTONIO WELLS
WESTERN AND CENTRAL MANAGEMENT AREAS

0 2 4 Miles

Source:
Central Coast Water Authority (CCWA)

N

FIGURE 2a.3-9

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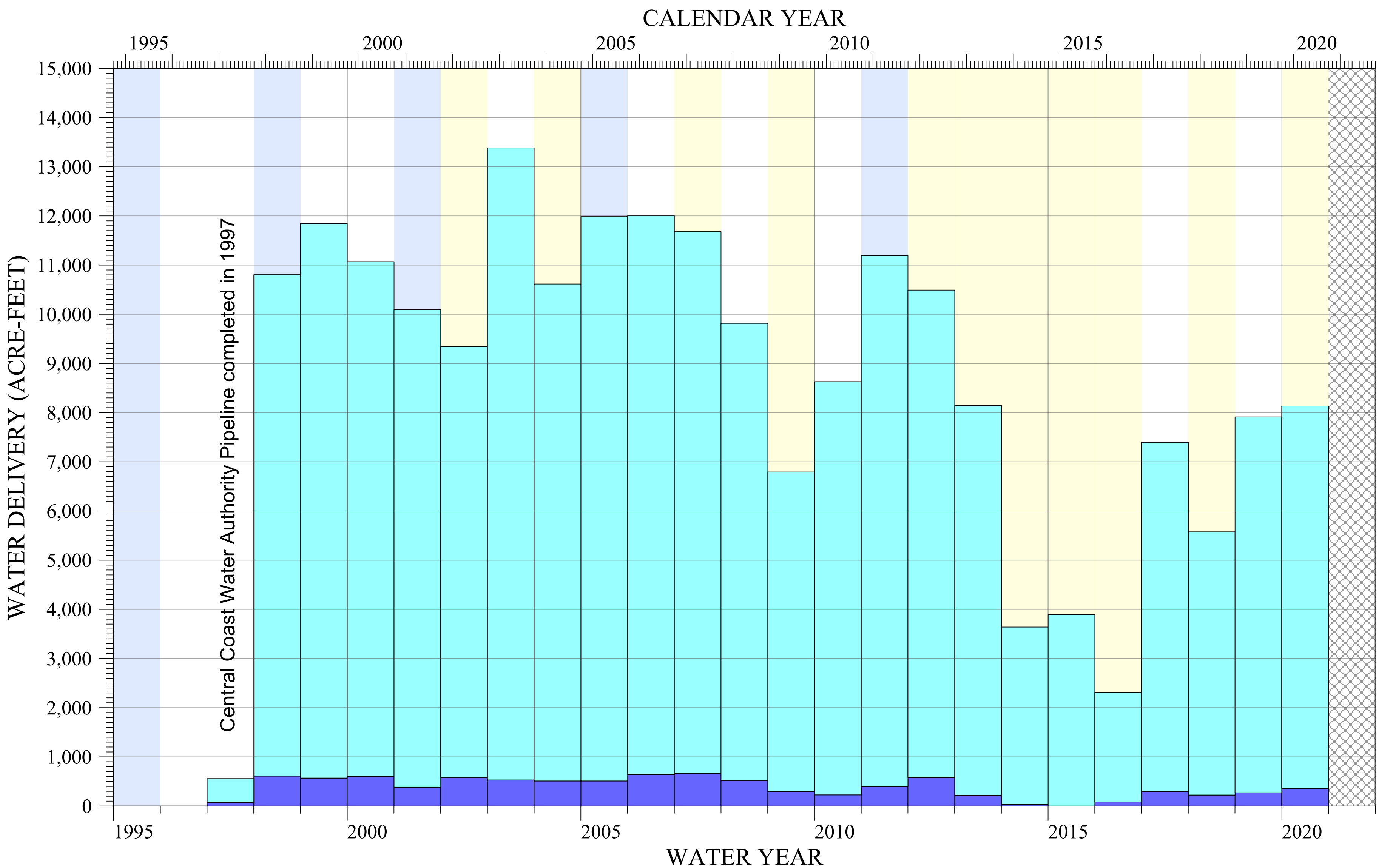

CCWA Deliveries only, does not include VSFB pumping from San Antonio Well Field.

Source: Central Coast Water Authority (2021)

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

ANNUAL WATER IMPORTS
CENTRAL COAST WATER AUTHORITY

Water Year Type (1942-2020)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

Santa Ynez Imports
City of Buellton
Non-CMA

FIGURE 2a.3-10

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2a.3-4-4 Treated Wastewater Sources

Wastewater treatment plants in the CMA act as a point source of groundwater recharge to the underlying river alluvium.

Within the CMA, wastewater is collected by the City of Buellton and the City of Solvang[58]. Wastewater is conveyed to the treatment facilities listed in **Table 2a.3-3** before it is discharged as treated effluent (Dudek 2019). Locations of the CMA wastewater treatment plants and sewer collection areas are shown in **Figure 2a.3-11**.

Table 2a.3-3
Wastewater Treatment Facilities

	Design Capacity (AFD)	Permitted Capacity (AFD)	Permitted Secondary (AFD)	Permitted Tertiary (AFD)	Current Disposal Method (Permit)	Level of Treatment	Recycled Water Uses
Buellton WWTP	2.0	4.0	4.0	0	Percolation ponds (WDR)	Secondary	Groundwater recharge
Solvang WWTP[18]	3.1	4.6	4.6	0	Percolation ponds (WDR)	Secondary	Groundwater recharge

Source: CCWA 2011, page 48. Values converted from million gallons per day.
ADF = acre-feet per day; WWTP = Wastewater Treatment Plant; WDR = waste discharge requirement

58 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.

Average daily secondary treated effluent from the City of Buellton for recent years is provided in **Table 2a.3-4** as flows into infiltration basins (City of Buellton 2021).

Table 2a.3-4
City of Buellton Secondary Treated Effluent Wastewater Volumes

Calendar Year	Population	Average Secondary Treated Effluent	
		Gallons Per Day	Acre Feet per Year
2020	5,464	478,000	535
2019	5,453	507,000	569
2018	5,098	480,000	538

Source: City of Buellton (2021), City of Buellton (2020), City of Buellton (2019).

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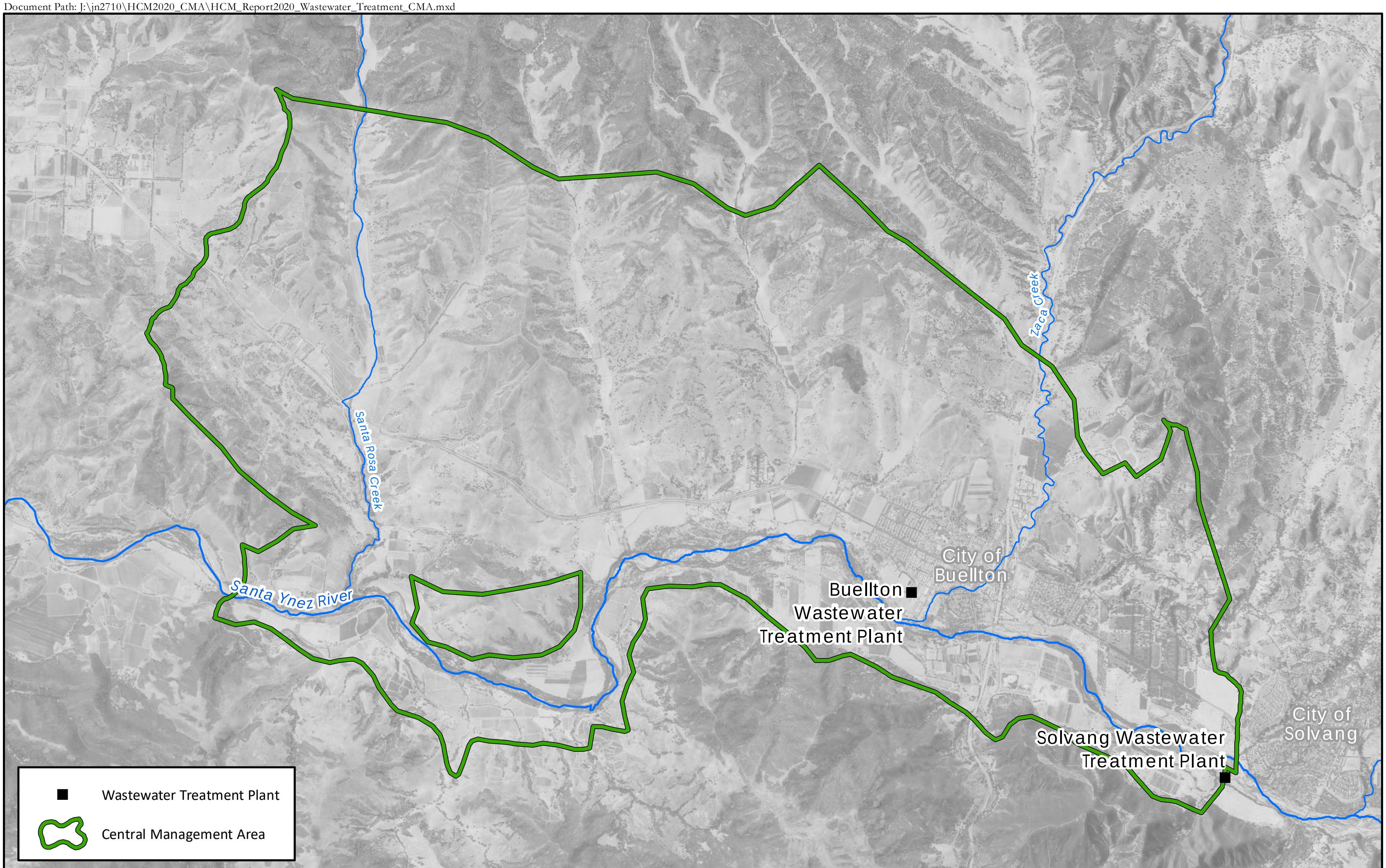

STETSON ENGINEERS INC.

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

WASTEWATER TREATMENT PLANTS
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2a.3-11

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2A.4 USES AND USERS OF GROUNDWATER IN THE CENTRAL MANAGEMENT AREA

This section discusses the primary uses of groundwater in the CMA and presents a summary of locations where groundwater pumping occurs. In addition, this section describes water use on agricultural lands, and discusses water use by phreatophytes.

2a.4-1 Primary Uses of Groundwater

Groundwater production within the CMA is primarily used for agricultural uses, with some domestic, municipal, and industrial use. There are no managed wetlands in the CMA. Outside of the population center of the City of Buellton, most of the CMA is a mixture of rural areas with agriculture and some suburban development. Groundwater production reported by SYRWCD Annual Report (SYRWCD Annual Report) includes the CMA, WMA, and parts of the EMA (Stetson Engineers 2021). The SYRWCD reports on average for the historical period (1982 through 2018) that the use of groundwater in the SYRWCD was 71% Agricultural Water[59], 3% Special Irrigation Water[60], and 26% Other Water.[61] **Figure 2a.4-1** presents groundwater use over this period for the CMA Buellton Upland, after it was split into a unique zone as described below. The Plan Area (Section 1d.3) included maps showing the well density for these water use types.

2a.4-1-1 Santa Ynez River Alluvium Subarea

The CMA Santa Ynez River Alluvium subarea comprises a portion of the SYRWCD Annual Report's Zone A, which extends through all of the Santa Ynez River Alluvium in the EMA, CMA, and WMA (Stetson Engineers 2021). For this larger Zone A area, overall annual average water production has ranged from 8,178 acre-feet per year (AFY) in fiscal year (FY)[62] 1979–1980 to 15,571 AFY in FY 2014–2015.

59 Water first used on lands in the production of plant crops or livestock for market (CA WAT § 75508).
60 Water used for irrigation purposes at parks, golf courses, schools, cemeteries, and publicly owned historical sites.
61 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.
62 Santa Ynez River Water Conservation District's fiscal year is July 1 through June 30.

Agricultural pumping and the majority of the City of Buellton pumping is from the CMA Santa Ynez River Alluvium within this Santa Ynez River Alluvium subarea. In this zone, Agricultural Water has ranged from 6,363 to 12,677 AFY, Special Irrigation Water has ranged up to 1,059 AFY, and Other Water has ranged from 1,355 to 2,806 AFY.

Wells in this subarea that produce water from the Buellton Aquifer are part of SYRWCD Annual Report Zone D, the Buellton Upland, described in the following section.

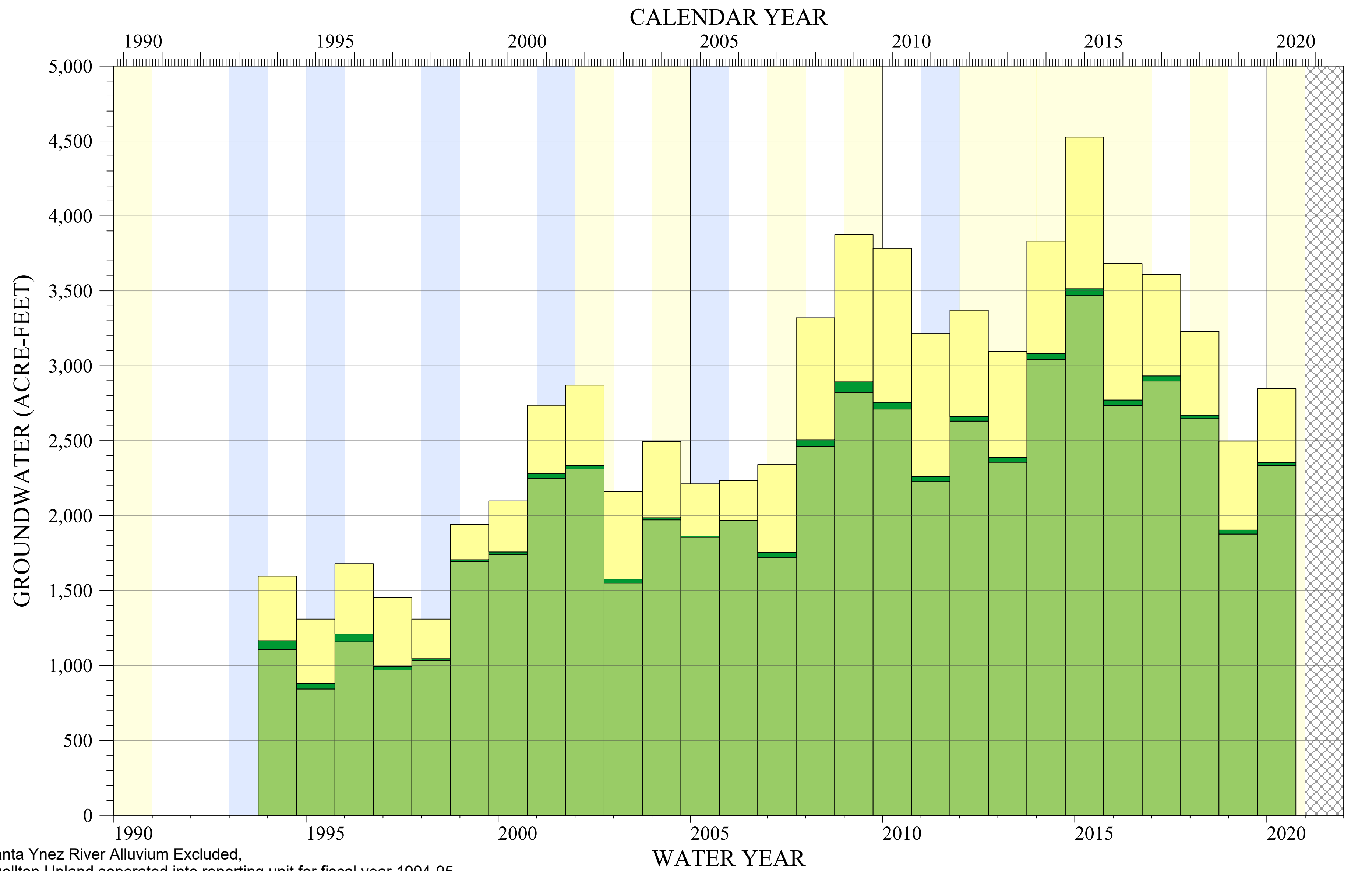
2a.4-1-2 Buellton Upland Subarea

The Buellton Upland subarea and portions of the CMA Buellton Aquifer (Paso Robles and Careaga Formations) in the Santa Ynez River Alluvium subarea form the SYRWCD Annual Report's Zone D. Prior to FY 1993–1994, this was part of the SYRWCD Zone C. Annual average water production has ranged from 1,309 AFY in FY 1994–1995 to 4,526 AFY in FY 2014–2015.

Agricultural pumping and the City of Buellton pumping occurs from the CMA Buellton Aquifer (Zone D). For this zone, Agricultural Water has ranged from 843 AFY to 3,468 AFY, Special Irrigation water (parks, golf courses, schools, cemeteries, and publicly owned historical sites) has ranged up to 69 AFY, and Other Water (domestic, municipal, and industrial) has ranged from 236 to 1,026 AFY.

2a.4-2 Agricultural Lands

In the CMA, a majority of agricultural lands are located in the lower-lying portions of the CMA with a majority being in the Santa Ynez River Alluvium subarea, as well as in Santa Rosa Creek of the Buellton Upland (**Table 2a.4-1**). County of Santa Barbara classification of parcels by land use was presented as Figure 1d.6-1 (Plan Area). The distribution of crops within the CMA for a representative year, 2016, based on the California LandIQ database, is shown in **Figure 2a.4-2**.



Santa Ynez River Alluvium Excluded,
Buellton Upland seperated into reporting unit for fiscal year 1994-95

GROUNDWATER USE
DISTRICT ZONE D

Other Water
Special Irrigation Water
Agricultural Water

Water Year Type (1942-2020)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

STETSON ENGINEERS INC.

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

Source: Stetson (2021) Forty-Third Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2020-2021

FIGURE 2a.4-1

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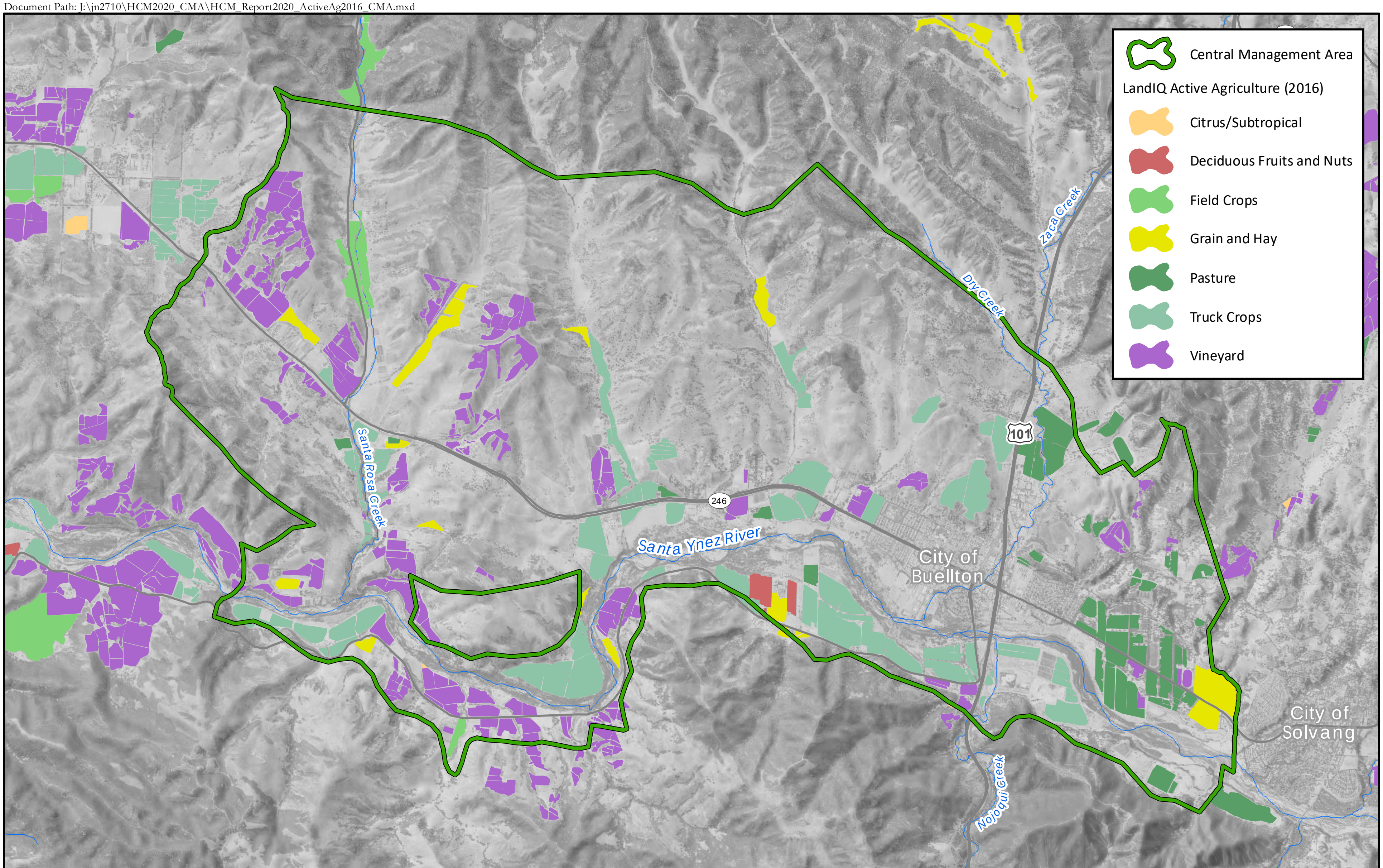

STETSON ENGINEERS INC.

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

ACTIVE AGRICULTURAL AREA 2016
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
California Department of Water Resources, LandIQ 2016

FIGURE 2a.4-2

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Table 2a.4-1
Summary of CMA Land Use for Agriculture

CMA Subarea	Agricultural Class [A]							Total Acres [B]	Agricultural Use (% total)
	Truck Crops (acres)	Vineyard (acres)	Pasture (acres)	Grain and Hay (acres)	Field Crops (acres)	Deciduous Fruits / Nuts (acres)	Citrus / Subtropical (acres)		
Buellton Upland	340	670	160	120	80	0	0	1,370	9.70%
SYR Alluvium	860	440	300	150	10	40	0	1,810	26.60%
Total	1,200	1,110	460	270	90	40	0	3,180	15.40%

[A] Source of agriculture land use is from the 2016 LandIQ database. "Idle" lands not included.
[B] All numbers rounded to nearest 10 acres after summing.

Planted crops have changed over the years according to the United States Department of Agriculture (USDA) (USDA 2020). Major crops include grapes, strawberries, dry beans, walnuts, and vineyards. According to the USDA, since at least 2012, grapes are the most common crop in both the Buellton Upland and Santa Ynez River Alluvium subareas (USDA 2020).

Table 2a.4-2 presents statistics of agricultural land use for historical 1984/1986 and two recent years (2016 and 2018). This shows that total amount of agricultural land use in the CMA has decreased, however it has increased slightly in the Buellton Upland. Location of active agriculture has shifted somewhat with 52% of the lands irrigated in 1984/1986 irrigated in 2018. By comparison 89% of the active agricultural lands in 2016 were active in 2018.

Table 2a.4-2
CMA Agriculture Land Use for 1984/1986, 2016, and 2018

CMA Subarea	Agricultural Land (acres)			Continuation of Land Use (1984/86 Baseline)			
				Irrigated in 2016		Irrigated in 2018	
	1984/1986	2016	2018	Acres	Percent	Acres	Percent
Buellton Upland	1,270	1,370	1,380	550	43%	550	43%
SYR Alluvium	2,510	1,810	1,720	1,420	57%	1,420	57%
Total	3,780	3,180	3,100	1,970	52%	1,970	52%

Acreage rounded to nearest 10 acres. "Idle" lands not included.
Subarea is based on geographic extents in this table
Sources: FMMP 2016 shapefile; 2016 LandIQ database, 2018 LandIQ Database

Crop types affect the amount of water in demand and the timing of water use. Additionally, crops have varying tolerances for degraded water quality, and may require extra water to flush salts from soils. Finally, certain crops, such as leafy vegetables, are associated with fertilizer practices that result in high-nitrate return flows.

2a.4-2-1 Emerging Agricultural Crops: Cannabis Cultivation

The newest regulated crop type in the CMA is cannabis.[63] In June 2016 Senate Bill No. 837 established that the SWRCB has regulatory power to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not lead to a negative impact on water quality, aquatic habitat, riparian habitat, wetlands, and spring. Santa Ynez River Valley is not identified as a Cannabis Priority Watershed with a high concentration of cannabis cultivation. SWRCB policy (SWRCB 2019b) limits diversions to a maximum of 10 gpm from surface water or subterranean streams without a water right, and requires metering and retention of daily diversion records for a minimum of five years.

In June 2017, Senate Bill No. 94 generally legalized cannabis and established a regulatory system and licensing to control the cultivation, processing, manufacturing, distribution, testing, and sale of cannabis. On July 13, 2021 California established a Department of Cannabis Control to consolidate state regulation. Regulations around protected regional appellations of origin to protect CMA agriculture are being established.

Local and county regulations also apply to cannabis cultivation. City of Buellton generally prohibits commercial cannabis facilities including cultivation within the City limits.[64] In February and May 2018, Santa Barbara County adopted a series of ordinances that regulate commercial cannabis operations within the County's unincorporated area. Lands outside of public lands and areas of local jurisdiction (City of Buellton) are zoned Agriculture-II Zone[65] which requires Land Use Permits from the County.

63 As defined in California Business and Professions Code Section 26001, parts of the plant *Cannabis sativa Linnaeus*, *Cannabis indica*, or *Cannabis ruderalis*.

64 Buellton Municipal Code Chapter 19.20.

65 Agriculture-II Zone. Commercial Cannabis Regulations. County of Santa Barbara. Web site. http://cannabis.countyofsb.org/zone/agriculture-ii.sbc Accessed 2021-08-26.

Table 2a.4-3 summarizes the status of current applications by parcel within the CMA to the County of Santa Barbara for cannabis Land Use Permits. All cannabis applications in the CMA are for parcels that in 2016 were used for agriculture. This indicates primarily a change of crop type, rather than an expansion of agriculture land use. As of August 2021, within the CMA permits for cannabis agriculture have been issued for four parcels, and were closed with no permit issued for 13 parcels as of August 2021.

Table 2a.4-3
CMA Cannabis Cultivation Land Use Permits as of August 2021

CMA Subarea	Permits Issued	Application In Review			Total Applications
		Approved	Processing	Closed	
Buellton Upland	1	3	7	2	13
SYR Alluvium	3	4	7	11	25
Total	4	7	14	13	38

County of Santa Barbara Commercial Cannabis Application status as of 2021-08-30.
Subarea is based on geographic extents in this table

2a.4-3 Industrial Use

The Plan Area (Section 1d) shows the land classification, population, and service areas for water suppliers within the CMA, as well as the distribution of municipal and domestic water supply wells.

As discussed in Section 2a.1, the Purisima Anticline north of the CMA, contains two oil and gas production fields: Barham Ranch and Los Alamos. **Figure 2a.4-3** shows the location of wells drilled for the purpose of oil and gas exploration. Currently the oil and gas industry uses little water from the CMA. However enhanced oil recovery technologies which may be applied in the future can use significant amounts of fresh water that may be used from the CMA.

2a.4-4 Water Export

Water is exported from the Santa Ynez River watershed from three reservoirs on the Santa Ynez River upstream of the CMA (Jameson Reservoir, Gibraltar Reservoir, and Cachuma Reservoir [Lake Cachuma]) through a series of tunnels that supply cities located on the Santa Barbara County south coast. No groundwater or surface water exports occur within the boundaries of the CMA.

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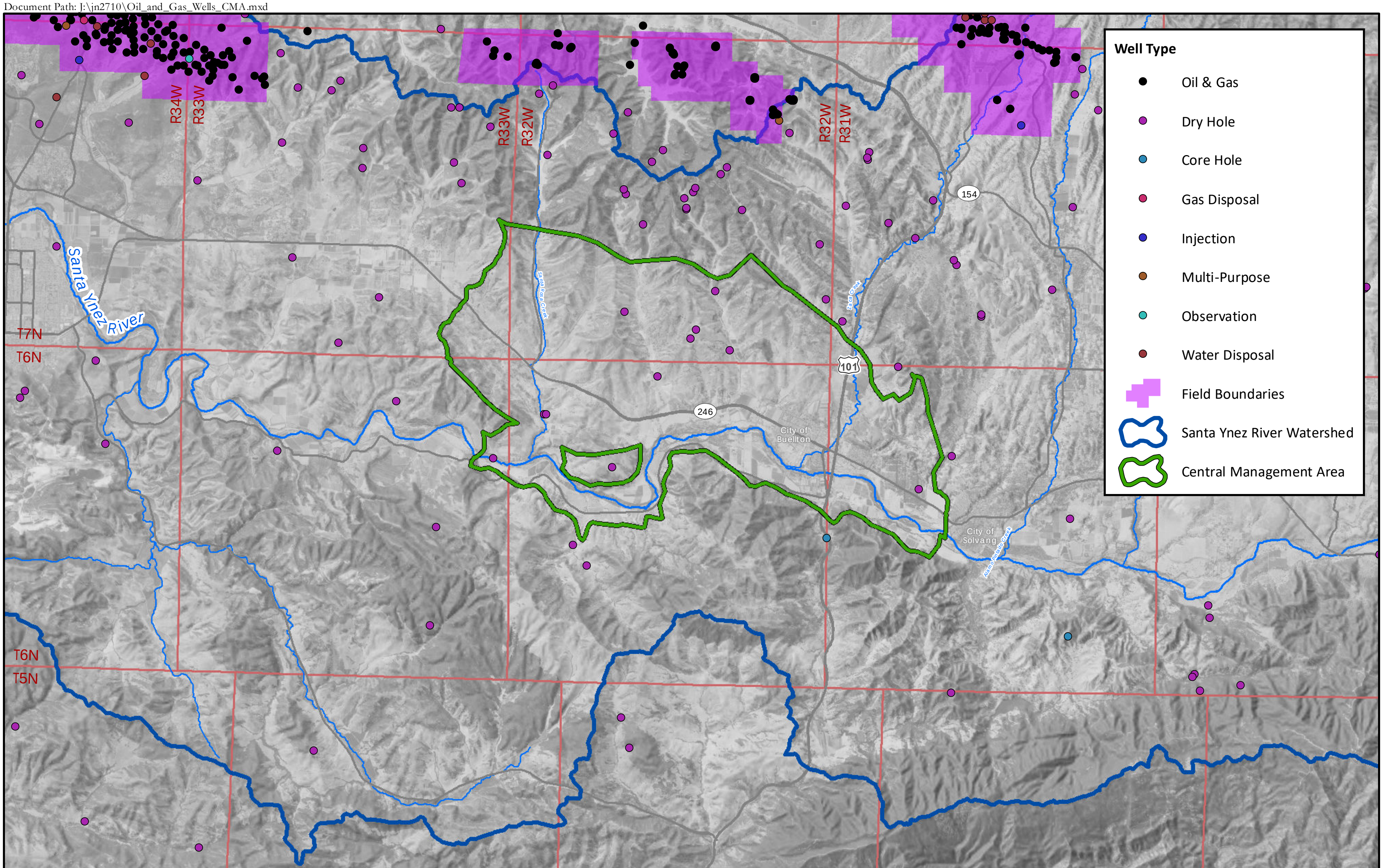

STETSON ENGINEERS INC.

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

OIL AND GAS WELL LOCATIONS

0 1 2 Miles

N

Source: California Department of Conservation, Geologic Energy Management Division (2021)

FIGURE 2a.4-3

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2a.4-5 Potential Groundwater Dependent Ecosystems

DWR recommends (DWR 2016) classification of potential groundwater-dependent ecosystems (GDEs)[66] as (1) wetland features commonly associated with the surface expression of groundwater under natural, unmodified conditions, and (2) vegetation types commonly associated with the sub-surface presence of groundwater (phreatophytes) (**Figure 2a.4-4**). The source of this Natural Communities dataset is a working group consisting of DWR, the California Department of Fish and Wildlife, and The Nature Conservancy[67] (DWR 2018, Klausmeyer et al. 2018).

Phreatophytes are plants that depend on, and obtain, groundwater that lies within reach of their roots. These include plants grown within the riparian zone of a river, and some agricultural crops, such as alfalfa. Portions of the Santa Ynez River Alluvium subarea and low-lying portions of the Buellton Upland subarea are likely supportive of phreatophyte growth (Figure 2a.4-4). Historical estimates of phreatophytes water use indicate up to 4,000 AFY is used in the CMA along the Santa Ynez River (Upson and Thomasson 1951).

The vegetation most likely not connected to groundwater is located high in the watershed and occurs in a canyon to the west of Santa Rosa Creek and along Dry Creek in the northeast corner of the CMA (Figure 2a.4-4). Because these areas are high in the watershed, perched groundwater conditions may exist in these areas. Perched groundwater has been documented in the WMA in association with Orcutt Sand deposits (Miller 1976; Arcadis 2016). In the CMA, Orcutt sand is typically found in the western half of the Buellton Upland (Figure 2a.1-1), and shallow groundwater system could exist on top of clay layers within multiple lenses. Along Dry Creek in the northeastern portion of the CMA, Dibblee has mapped the non-water bearing Sisquoc Formation (Figure 2a.1-1) as the clay layer associated with this perched groundwater. Non-water bearing geologic formations and perched groundwater systems are not subject to SGMA.

66 CWC Section 10727.4 Additional Plan Elements: "where appropriate […] (l) Impacts on groundwater dependent ecosystems."

67 501(c) non-profit environmental conservation organization based out of Washington, DC.

The Natural Communities dataset shown in Figure 2a.4-4 of consists of vegetation communities shown on **Figure 2a.4-5**. Biological surveys have not been completed during the preparation of this GSP. The potential vegetation and wetland GDEs within the CMA are summarized in in **Table 2a.4-4** and **2a.4-5**. The mapped area corresponding to each vegetation community type and the dominant species is summarized in Table 2a.4-4, and wetland areas are summarized in Table 2a.4-5.

Table 2a.4-4
Natural Communities Dataset
Mapped Extent of Vegetation Communities in the CMA

CMA Subarea	**Coast Live Oak**	**Valley Oak**	**Riparian Mixed Hardwood**	**Riversidean Alluvial Scrub**	**Willow**	**Willow (Shrub)**	**Total**
	Quercus agrifolia	*Quercus lobata*	-	-	*Salix spp.*	*Salix spp.*	
Buellton Upland	346.7	90.8	27.4	-	-	-	464.9
SYR Alluvium	61.4	-	889.0	-	-	11.2	961.6
Total	408.1	90.8	916.4	-	-	11.2	1426.5

Source: DWR and The Nature Conservancy (2018)

Table 2a.4-5
Natural Communities Dataset
Mapped Extent of Wetlands in the CMA

CMA Subarea	**Palustrine**		**Riverine**			**Seep or Spring**	**Total**
	Seasonally Flooded	*Seasonally Saturated*	*Seasonally Flooded*	*Semipermanently Flooded*	*Permanently Flooded*		
Buellton Upland	0	0	0	0.6	0	0	0.6
SYR Alluvium	19.9	0.9	0	5.1	0	0.2	26.1
Total	19.9	0.9	0	5.7	0	0.2	26.7

Seasonally flooded includes "fresh tidal" lands. Other subclassifications include description of vegetation.
Source: DWR and The Nature Conservancy (2018)
Notes: The Natural Communities wetlands and vegetation layers in part overlap. Therefore, the total potential GDE acreage in the CMA is less than the sum of the potential wetland GDE and the potential vegetation type GDE acres.

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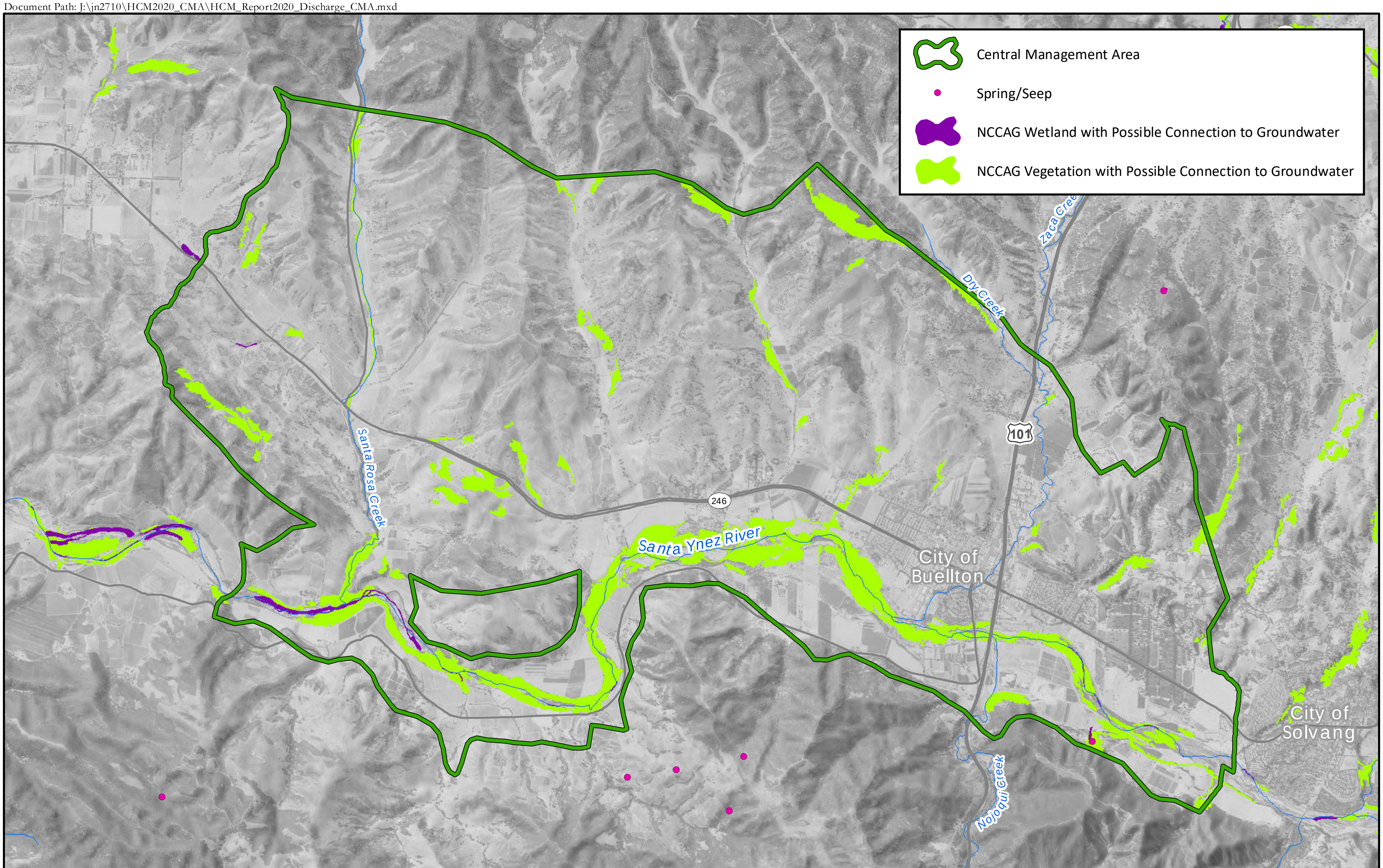

STETSON ENGINEERS INC.

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

POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS AND GROUNDWATER DISCHARGE AREAS

CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
The Natural Communities Commonly Associated with Groundwater (NCCAG) Wetland dataset.

FIGURE 2a.4-4

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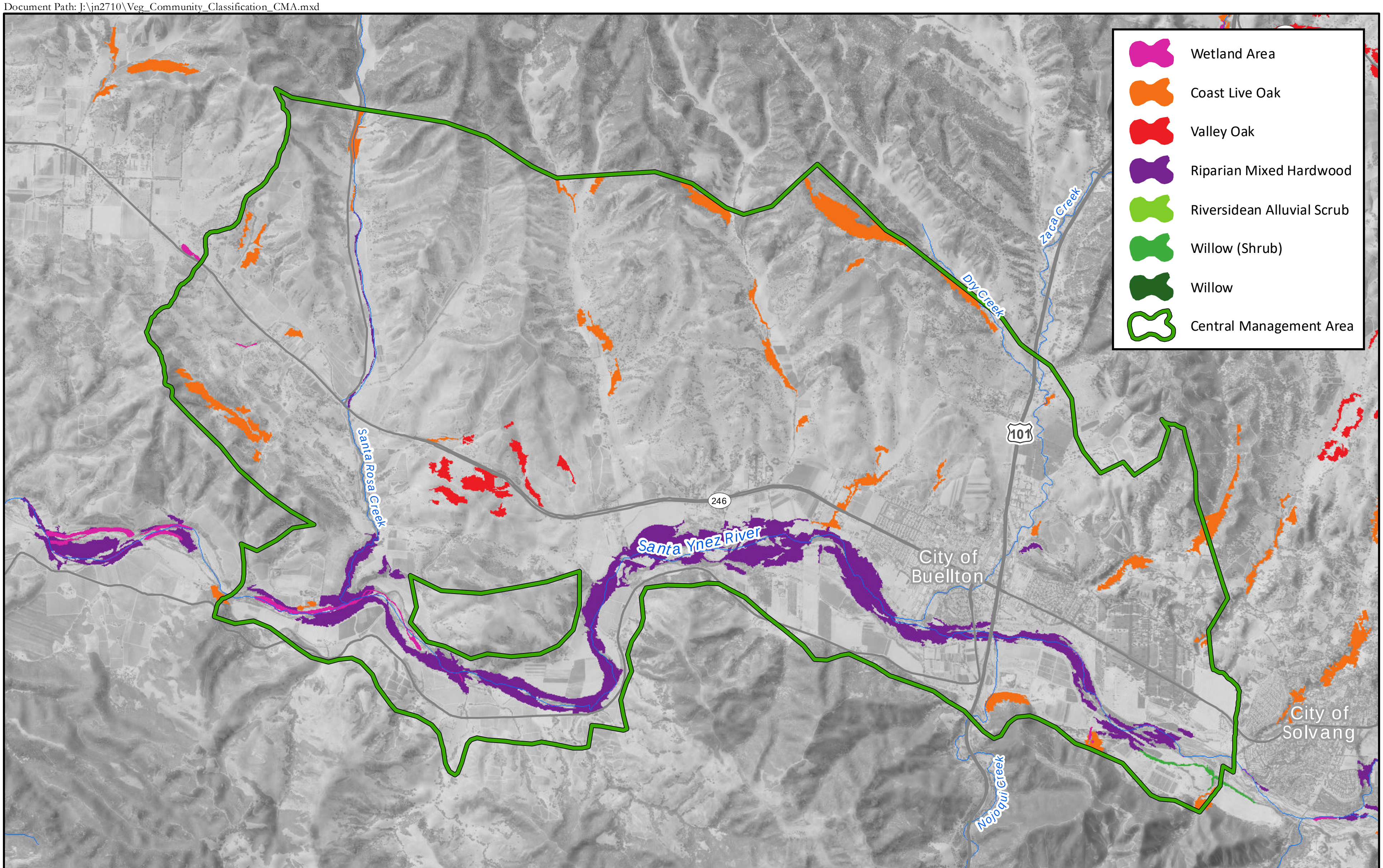

STETSON ENGINEERS INC.

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

VEGETATION COMMUNITY CLASSIFICATION
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Source:
The Natural Communities Commonly Associated with Groundwater (NCCAG) Wetland dataset.

FIGURE 2a.4-5

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2a.4-5-1 Discharge and Springs Areas

Habitat classification and active springs and seeps within and adjacent to the Basin are shown in Figure 2a.4-4. Only one active spring and seep has been identified in the CMA on the south side of the Santa Ynez River just east of Nojoqui Creek (Figure 2a.4-4). The quantity of water discharging from this spring near Nojoqui Creek is currently unknown but contributes to the surface flow in the reach and not to the Buellton Aquifer.

Underflow in the CMA discharges to the Santa Ynez River when the water elevation in the underflow deposits is higher than the stream channel thalweg. Underflow discharge to the river will occur during wet winter and spring months, but during the summer and dry winter months, the streamflow loses water to the underflow of the Santa Ynez River alluvium subarea.

2a.4-6 Wildlife Habitat

Wildlife habitat is a beneficial use of water, primarily through surface water flows of the Santa Ynez River. The controlling plan for Santa Ynez River flows, SWRCB Order WR 2019-0148 on the Cachuma Project on the Santa Ynez River (SWRCB 2019), included a Biological Assessment and Environmental Impact Report. Special species that are potentially located within the CMA are summarized in this section. However, species may have water demands and environmental needs outside of the principal aquifer in this Plan. All six SGMA sustainability indicators protect wildlife, with depletion of interconnected surface water being the SGMA indicator most closely associated with most wildlife.

The U.S. Fish and Wildlife Service (USFWS) has identified wildlife habitat areas within the CMA which support threatened or endangered species. These habitats are indirectly supported by water and land use. **Figure 2a.4-6** shows the locations of these habitat areas. **Table 2a.4-6**, below, lists the species involved.

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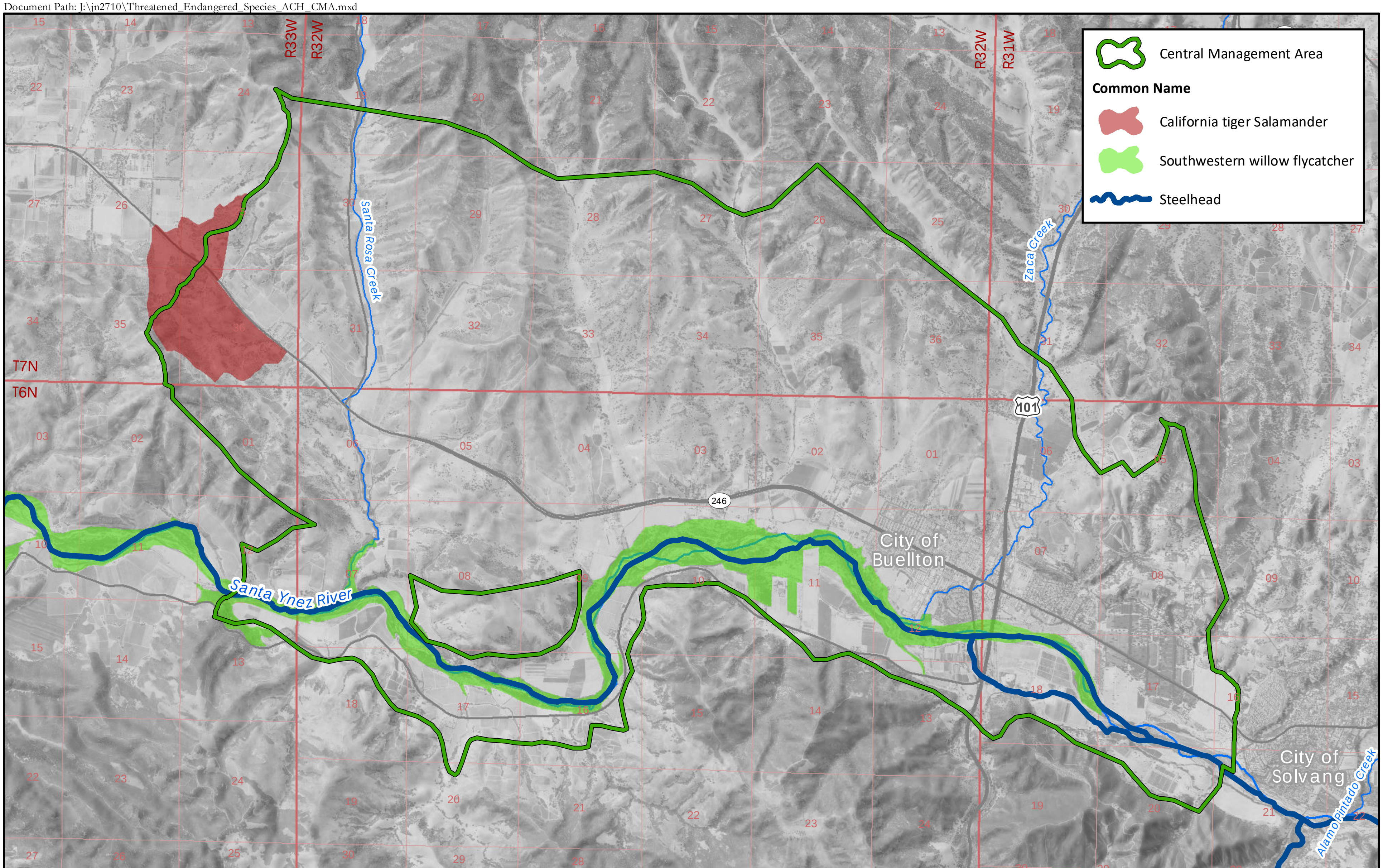

CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

THREATENED & ENDANGERED SPECIES ACTIVE CRITICAL HABITAT

Source: U.S. Fish and Wildlife Service (2021), NMFS (2005)

FIGURE 2a.4-6

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Table 2a.4-6
U.S. Fish and Wildlife Service Identified
Threatened and Endangered Species with Habitat within the CMA

Common Name	Scientific Name
California tiger salamander	*Ambystoma californiense*
Southwestern willow flycatcher	*Empidonax traillii extimus*

Source: U.S. Fish and Wildlife Service (2021)

Neither of the animal species are directly reliant on groundwater. The California tiger salamander has no known reliance on groundwater, and the Southwestern willow flycatcher is indirectly reliant on groundwater as it has reliance on riparian vegetation (Rohde et al. 2019). The California tiger salamander Santa Rita metapopulation centers on two ponds located along highway 246 at the CMA-WMA boundary and extends eastward in the Buellton Upland (U.S. Fish and Wildlife Service 2016). The Southwestern willow flycatcher is a migrant bird that spends the winter in locations such as southern Mexico, Central America, and probably South America, and has breeding range that covers southwestern United States from California to Texas (U.S. Fish and Wildlife Service 2002a).

California species of special concern (SSC) that are potentially within the CMA are the Southern Western Pond Turtle (*Emys marmorata pallida*), and the Two-striped Garter Snake (*Thamnophis hammondii*) (CDFW 2021). The Southern Western Pond Turtleis water dependent (Rhode et al. 2019) and is near endemic and has been found within the Santa Ynez River watershed (Spinks and Shaffer 2005; CDFW 2016) in perennial stretches of the river and elsewhere likely during streamflow events. Two-striped Garter Snake is among the most aquatic of the garter snakes and is often found in or near permanent and intermittent freshwater streams, creeks, and pools, with a range that historically has included the Santa Ynez River watershed although current presence is less certain (CDFW 2016).

The California Red-legged Frog (*Rana draytonii*) is common in the upper watershed of the Santa Ynez River. However, in the lower Santa Ynez River including the CMA these are rare. Deep pools with dense marginal vegetation are rare and introduced aquatic predators are abundant and diverse (U.S. Fish and Wildlife Service 2002b).

2a.4-6-1 Santa Ynez River

Stream flows and underflow of the Santa Ynez River (Appendix 1d-B) are managed by California State Water Resources Control Board (SWRCB) under WR 2019-0148 as surface water (Section 1d.5, Plan Area).[68] The 2019 Central Coast Basin Plan identified beneficial uses of the Santa Ynez River that supported wildlife habitats including Warm Fresh Water Habitat (WARM), Cold Fresh Water Habitat (COLD), Commercial and Sport Fishing (COMM), and Spawning, Reproduction, and/or Early Development (SPWN).

Steelhead in the Santa Ynez River is part of the Monte Arido Highlands Biogeographic Population Group, which is part of the Southern California[69] Distinct Population Segment (DPS) of steelhead which is considered endangered (NMFS 2012). With 94% of the estuarian habitat remaining, the Santa Ynez River has the highest percentage of historical estuarian habitat in this DPS. Groundwater extraction and agricultural development affecting SWRCB managed stream flows of the Santa Ynez River were ranked as threats to steelhead (Table 9-2 in NMFS 2012).

Arroyo chub (*Gila orcutti*) is a California species of concern, introduced to the Santa Ynez River in the 1930s that is native to other southern California river systems. In a 1993 survey these were still present in shallow pools (SWRCB 2019).

In accordance with the SWRCB and National Marine Fisheries Service (NMFS), the Lower Santa Ynez River (LSYR) is monitored by the Cachuma Operation and Maintenance Board (COMB) for Southern California steelhead/rainbow trout (*O. mykiss*) and supporting habitat conditions (COMB 2021). The Lower Santa Ynez River Fish Management Plan (ENTRIX 2000) identified ten native fish species in the Santa Ynez River: four freshwater and six in the estuary. In addition to volume and surface flow conditions, fish are sensitive to water temperature and dissolved oxygen (DO), both of which are supported by shade from riparian vegetation.

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

69 This area primarily consists of the highly urbanized coastal counties of Los Angeles, Orange, and San Diego southeast of Point Conception. Steelhead is Threatened in the adjacent South-Central California Coast which includes San Luis Obispo and Monterey counties also located north of Point Conception is generally more similar in terms of land use to the Santa Ynez River Valley.

2A.5 DATA GAPS AND UNCERTAINTY

Overall, there are many existing ground water studies and data for the CMA, however, the following data gaps are currently identified for the CMA Hydrogeologic Conceptual Model: Geologic Model of the Buellton Aquifer in the Santa Ynez River Subarea and water level data in the Buellton Upland subarea.

The Santa Ynez River from the boundary between the EMA and CMA to where the river enters the Buellton Bend is the only section of the Santa Ynez River alluvium upstream of the Lompoc Narrows that is not underlain completely by non-water bearing bedrock. This section includes an extension of the Santa Rita syncline, and Buellton Aquifer deposits typically associated with upland deposits, Paso Robles and Careaga Sand, occur beneath the Santa Ynez River alluvial deposits. The 3D Geologic model (Geosyntec 2020) provides a model of the geologic structure of this area using the existing well logs and bedding angles of the syncline. Because most wells in the Santa Ynez River alluvium are shallow (<120 feet), additional geophysical AEM data collected within the CMA will be able to fill in more details and validate the geologic structure of the Buellton Aquifer in this area. Results of the geophysical AEM data study are planned to become available in the first year of implementation of the plan in 2022.

2a.5-1 Geologic Model of the Buellton Aquifer in the Buellton Upland Subarea

Both the Paso Robles and Careaga Formations (Buellton Aquifer) have discontinuous lenses of permeable coarse deposits (Upson and Thomasson 1951). An exact mapping of these discontinuous lenses and the boundary between the coarser Careaga Graciosa Member (upper unit) and less permeable Careaga Cebada Member is identified as a potential data gap. Excluding the agricultural areas of Santa Rosa Creek drainage, the Buellton Upland is relatively rugged and the Buellton Aquifer has not been extensively developed, and consequently, few wells have been drilled in the Buellton Upland. The AEM geophysics study is expected to provide detailed information that will provide additional certainty to the current hydrogeologic conceptual model in the Buellton Upland.

2a.5-2 Connection between the Buellton Aquifer in the Buellton Upland and Surrounding Area

More water level data needs to be obtained to document the hydraulic gradient between the Buellton Upland and Santa Rita subarea to the west; between the Buellton Upland and Santa Ynez River Alluvium to the south, and between the Buellton Upland and the Santa Ynez Upland to the east. The current ground water level monitoring by the County of Santa Barbara in the CMA includes only 7 wells that are monitored annually for water levels, including 2 wells to represent the Buellton Upland and 5 wells representing the Santa Ynez River Alluvium. More wells are recommended to be added to the Buellton Upland groundwater monitoring network. This recommendation was also made in 1995 as part of the Buellton Upland Groundwater Management Program (Santa Ynez River Water Conservation District and City of Buellton, 1995).

SECTION 2B – GROUNDWATER CONDITIONS

This section describes groundwater conditions within the Central Management Area (CMA). The Sustainable Groundwater Management Act (SGMA) requires the Groundwater Sustainability Plan include "a description of current and historical groundwater conditions in the basin"[70] This Groundwater Conditions section presents the available data evaluated, provides an assessment of current CMA groundwater conditions as observed in the period 2015-2020, and describes historical conditions using available data from the period 1924 through 2020.

In accordance with SGMA, there are six Sustainable Management Criteria (see also Section 3b) which indicate if conditions are sustainable in the basin.[71] The indicator criteria for sustainability are summarized as:

1. Chronic lowering of groundwater levels
2. Reduction of groundwater storage
3. Seawater intrusion
4. Degraded water quality
5. Land subsidence
6. Depletion of interconnected surface water

70 23 CCR § 354.16. Groundwater Conditions
71 CWC Section 10721 (x), 23 CCR § 354.28(c), 23 CCR § 354.34(c),

The remainder of this section presents results from the review and evaluation of available data for the CMA. The SMC thresholds in Section 3b determine when effects are considered “significant and unreasonable.”

This section is organized as follows.

- *Section 2b.1. Groundwater Elevation.* This section evaluates the first of the six sustainability indicators, chronic lowering of groundwater levels, and can provide a framework to evaluate some or all of the remaining sustainability indicators. This section includes groundwater elevation data and hydrographs, groundwater flow directions and maps, lateral and vertical groundwater gradients, regional groundwater pumping patterns, and changes in groundwater elevations over time.

- *Section 2b.2. Groundwater Storage.* This section evaluates the second sustainability indicator, reduction of groundwater storage. It includes data on changes in groundwater storage data over the available period of record (roughly 1980–2020).

- *Section 2b.3. Water Quality.* This section addresses, degraded groundwater quality. Beneficial uses are described, and suitability of water quality for each is discussed. Areas of known groundwater contamination and existing contaminant plumes are documented. Water Quality conditions for recent water years 2015-2018 were evaluated using published water quality objectives for groundwater.

- *Section 2b.4. Seawater Intrusion.* The CMA is an inland management area of the Basin and is not directly connected to the Pacific Ocean and therefore, seawater intrusion is not an applicable sustainability indicator for establishing sustainable management criteria for the CMA.

- *Section 2b.5. Land Subsidence.* This section addresses the rate and extent of land subsidence. The section includes available data related to current and historical ground surface elevations, potential for subsidence, and summarizes historical extent, cumulative total, and annual rate of detected land subsidence within the CMA.

- *Section 2b.6. Interconnected Surface Water and Groundwater Dependent Ecosystems.* This section addresses depletion of interconnected surface water. It identifies potential interconnected surface waters, evaluates potential depletions of those waters, and describes the general relationships between surface water, groundwater, and depletions to potential Groundwater Dependent Ecosystems within the CMA.

2B.1 GROUNDWATER ELEVATION

This section addresses the first of the six sustainability indicators, chronic lowering of groundwater levels. Groundwater elevation data, lateral and vertical groundwater gradients, inferred groundwater flow directions, maps showing lines of equal groundwater elevations (contours), regional groundwater pumping patterns, and graphical changes in groundwater elevations over time (hydrographs) are described and evaluated in the following subsections. These descriptions include both historical seasonal and longer-term trends, and documentation of current conditions in the CMA. This section also provides a framework for data presentation and reporting on the five remaining sustainability indicators.

2b.1-1 Groundwater Elevation Data

Groundwater data were made available by the CMA Groundwater Sustainability Agency (GSA) member agencies. The data are collected by the agencies to monitor and manage their respective groundwater jurisdictions. Data provided by the CMA GSA member agencies include groundwater well names and/or identifying labels, groundwater well locations, static groundwater elevation data, and groundwater pumping or production data. Four sources of groundwater elevation data made available for this evaluation are summarized in **Table 2b.1-1**.

The groundwater elevation data were previously incorporated into the Data Management System as described in the Data Management Plan (Section 1e.1). The Data Management System was utilized to evaluate these data and prepare groundwater elevation hydrographs for the principal groundwater aquifers within the CMA based on well depth, well-casing perforated intervals, geologic conditions, and measured water level responses to recharge and pumping.

Table 2b.1-1
CMA Groundwater Elevation Data Sources

Type	Summary	Description
Monthly	City of Buellton	Static groundwater level elevation measurements provided by the City of Buellton.
Monthly	United States Bureau of Reclamation (USBR)	Groundwater level data reported in the USBR Cachuma project monthly reports. The vertical datum of the source data was converted from National Geodetic Vertical Datum of 1929 (NGVD29) to North American Vertical Datum of 1988 (NAVD88).[A]
Semiannual	United States Geological Survey (USGS) National Water Information System (NWIS)	Groundwater level data available from the USGS NWIS (entire Santa Ynez Valley).
Semiannual	County of Santa Barbara	Groundwater level data collected by the County of Santa Barbara.

Note: [A] 23 CCR § 352.4 requires that groundwater elevations be reported in NAVD88. Vertical datum is the zero-elevation from which all other elevations are referenced. In the Basin, depending on location, the difference between NGVD29 and NAVD88 is approximately 2.5–2.6 feet.

2b.1-2 Groundwater Elevation Contour Maps

In accordance with the Sustainable Groundwater Management Act (SGMA), "groundwater elevation contour maps depicting the groundwater table or potentiometric surface associated with the current seasonal high and seasonal low for each principal aquifer within the basin"[72] are to be prepared for the CMA. Contours were developed for those portions of the CMA having sufficient number and distribution of groundwater wells. Groundwater elevation contour maps for seasonal high (spring 2020) and seasonal low (fall 2019) conditions within the CMA are included as **Figures 2b.1-1** and **2b.1-2**. Elevations shown in Figure 2b.1-1 and Figure 2b.1-2 are in feet based on the North American Vertical Datum of 1988 computed by the National Geodetic Survey.

As described above in the Hydrogeologic Conceptual Model (Section 2b.2), the CMA has one principal aquifer, the Buellton Aquifer. There is additional water in the underflow of the Santa Ynez River, but that is not a principal aquifer under SGMA.

[72] 23 CCR § 354.1(a)(1).

- Buellton Aquifer consists of Careaga Sandstone and the Paso Robles Formation in a broad syncline structure that extends underneath the Santa Ynez River Alluvium subarea. Also includes all of the formations in the Buellton Upland subarea.
- Santa Ynez River Alluvium underflow consists primarily of older and younger alluvial deposits and river gravels of the Santa Ynez River. Managed as surface water by SWRCB, and so not a principal groundwater aquifer under SGMA.

Unfortunately, there is not enough groundwater level data for the Buellton Aquifer to create contour maps, so groundwater level data is identified as a data gap in the HCM for the CMA. The underflow elevation contours along the Santa Ynez River do have enough data and are shown on these figures. As described in the HCM (Section 2a.3), the Buellton Upland subarea topography is relatively rugged terrain. As a result of this there are few wells drilled, and even fewer that participate in the current monitoring program. Groundwater elevation contours were developed for areas adjacent with active groundwater monitoring.

2b1-2-1 Seasonal High and Seasonal Low Groundwater Elevation Contour Maps

<u>Seasonal High – Spring 2020</u>

Seasonal high groundwater elevations represented by Spring 2020 measurements are presented on Figure 2b.1-1. Shown on this map are the locations of wells with groundwater monitoring data, color-coded to identify wells with screened intervals within the Santa Ynez River Alluvium underflow deposits and wells screened within the Buellton Aquifer.

Santa Ynez River Alluvium seasonal high water elevations in the underflow deposits were available at wells located across the Santa Ynez River Alluvium subarea. The elevation data were used to calculate gradient and flow direction inferred from the contours. In the Santa Ynez River Alluvium, underflow and groundwater generally flows from east to west, in alignment with the Santa Ynez River channel. Groundwater flow in the Buellton Upland generally flows north to south from higher elevation to lower elevation.

The spring 2020 data was insufficient to create a Buellton Aquifer contour map for the CMA. Previous studies (Upson and Thomasson, 195l) have suggested that the Buellton Aquifer (referred to in Upson and

Thomasson as the 'Lower Aquifer') beneath the Santa Ynez River Alluvium may be at a slightly higher hydraulic head than the Santa Ynez River Alluvium, indicating an upward vertical gradient from the Buellton Aquifer to the Santa Ynez River Alluvium. The gradient may fluctuate from year to year or season to season.

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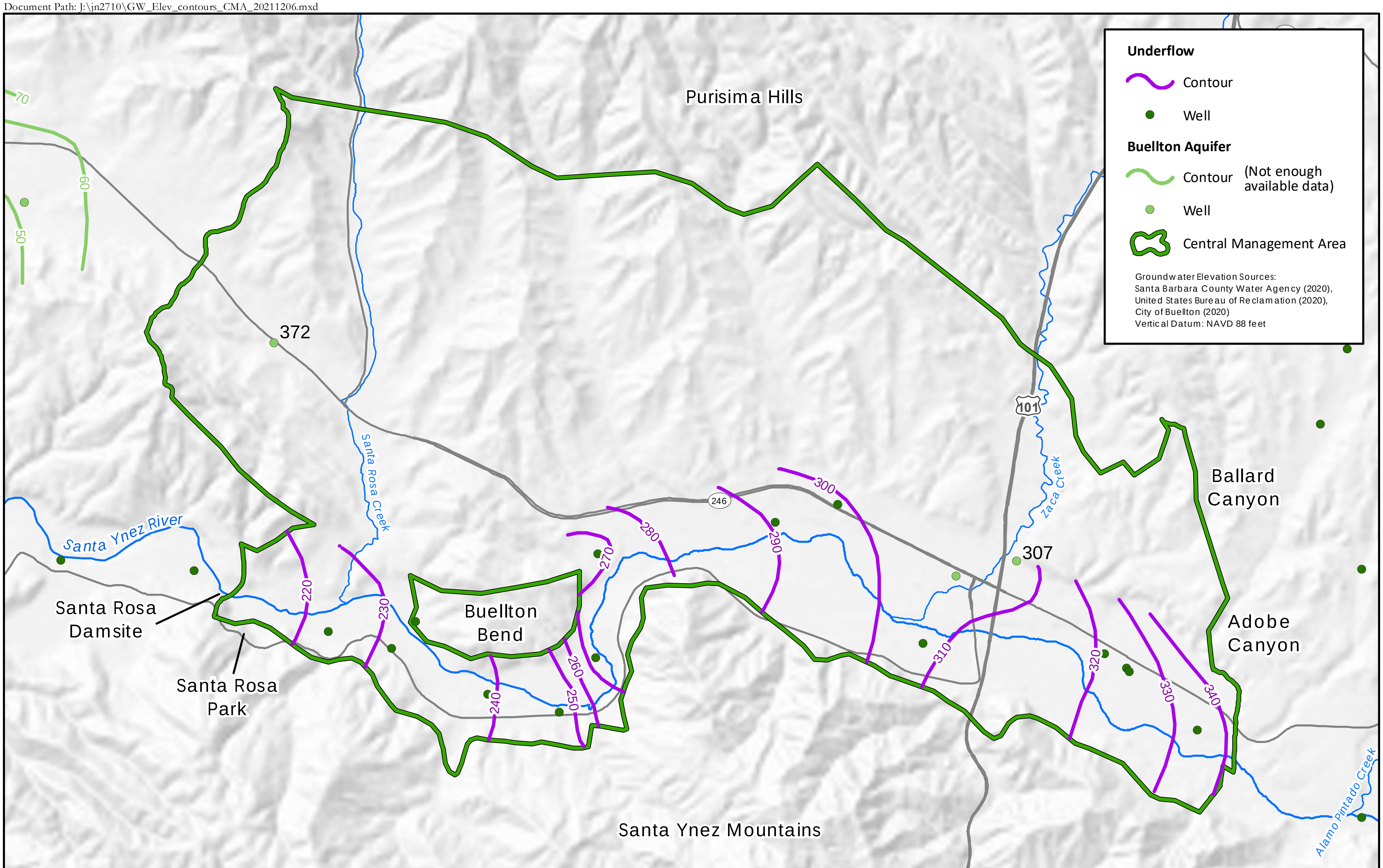

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Central Management Area
Groundwater Sustainability Agency

GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL HIGH
SPRING 2020
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2b.1-1

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Seasonal Low – Fall 2019

Seasonal low groundwater levels are represented by Fall 2019 groundwater elevations, and contours based on available data from wells located across the Santa Ynez River Alluvium and Buellton Upland are shown on Figure 2b.1-2. Fall 2019 Santa Ynez River Alluvium underflow and Buellton Aquifer groundwater elevation data are slightly lower in elevation with respect to the Spring 2020 seasonal high. However, horizontal flow directions and vertical gradients are consistent with the Spring 2020 conditions described above.

2b.1-2-2 Evaluation of Seasonal High and Low

As expected, seasonal low Santa Ynez River Alluvium underflow water elevations measured in Fall 2019 are generally lower than those measured in Spring 2020. Seasonal differences in water levels in the CMA for both the Santa Ynez River Alluvium and Buellton Aquifers can range from 1 to 10 feet depending upon the particular well.

2b.1-3 Groundwater Hydrographs

SGMA requires preparation of "hydrographs depicting long term groundwater elevations, historical highs and lows, and hydraulic gradients between principal aquifers."[73] Hydrographs using data from select CMA wells are shown on **Figure 2b.1-3**. Hydrographs were also prepared for other wells located within the CMA but are not shown on Figure 2b.1-3 because of their relatively short period lengths or limited value to assess CMA groundwater because of their locations. Additional groundwater level hydrographs are shown in Appendix 3b-A in the context of sustainable management criteria (Section 3b).

The wells shown on Figure 2b.1-3 were utilized to prepare representative hydrographs for the CMA subareas. The colors of hydrograph data points correspond to their data source noted in the figures and described in Section 2b.1-1, "Groundwater Elevation Data." The hydrographs show the measured groundwater elevation on the left y-axis (vertical axis) and the corresponding depth to groundwater on the right y-axis. Grid lines depicting Calendar Year are provided at the top x-axis (horizontal axis) and the bottom x-axis shows the Water Year which spans October through September, annually. Vertical columns

73 23 CCR § 354.1(a)(2).

for the water year are colored to represent water year index based on precipitation (wet, dry/critically dry, or above/below normal).

The following subsections discuss the hydrograph data presented in Figures 2b.1-4AB through 2b.1-5AD. In general, the hydrograph data show visible but slight increases in groundwater elevations during the relatively wet 1990-2000 period and decreases in groundwater elevations during the relatively dry 2005-2020 period.

2b.1-3-1 Buellton Upland

The Buellton Upland subarea consists of local alluvium, Paso Robles Formation and Careaga Sand Formation which make up the Buellton Aquifer. Groundwater hydrographs for wells located in the Santa Rosa Creek drainage (Figure 2b.1-3) are presented below.

Well 7N/32W-31M1 (Figure 2b.1-4A) represents conditions in the Buellton Aquifer. Measurements represent the seasonal high, so seasonal variation is not defined. Long-term trends indicate groundwater levels increased from 1970 through about 1985, decreased to about 1991, increased to about 2002, and have gone down since then. During the early period of the 2012-2018 drought, water levels declined by 24 feet in one year.

Well 7N/33W-36J1 (Figure 2b.1-4B) represents conditions in the Buellton Aquifer. Measurements represent the seasonal high, so seasonal variation is not defined. Long-term trends indicate groundwater levels declined from the 1940s through 1970, increased from 1970 through about 1985, decreased to about 1991, increased to about 2002, and have declined slightly since then. During the 2012-2018 drought, water levels declined by 11 feet over the course of seven years.

Wells along Santa Rosa Creek indicate that groundwater levels can be higher in the localized areas by as much as 30 to 40 feet during the years 1975 through 2012, likely indicating perched groundwater conditions in this reach.

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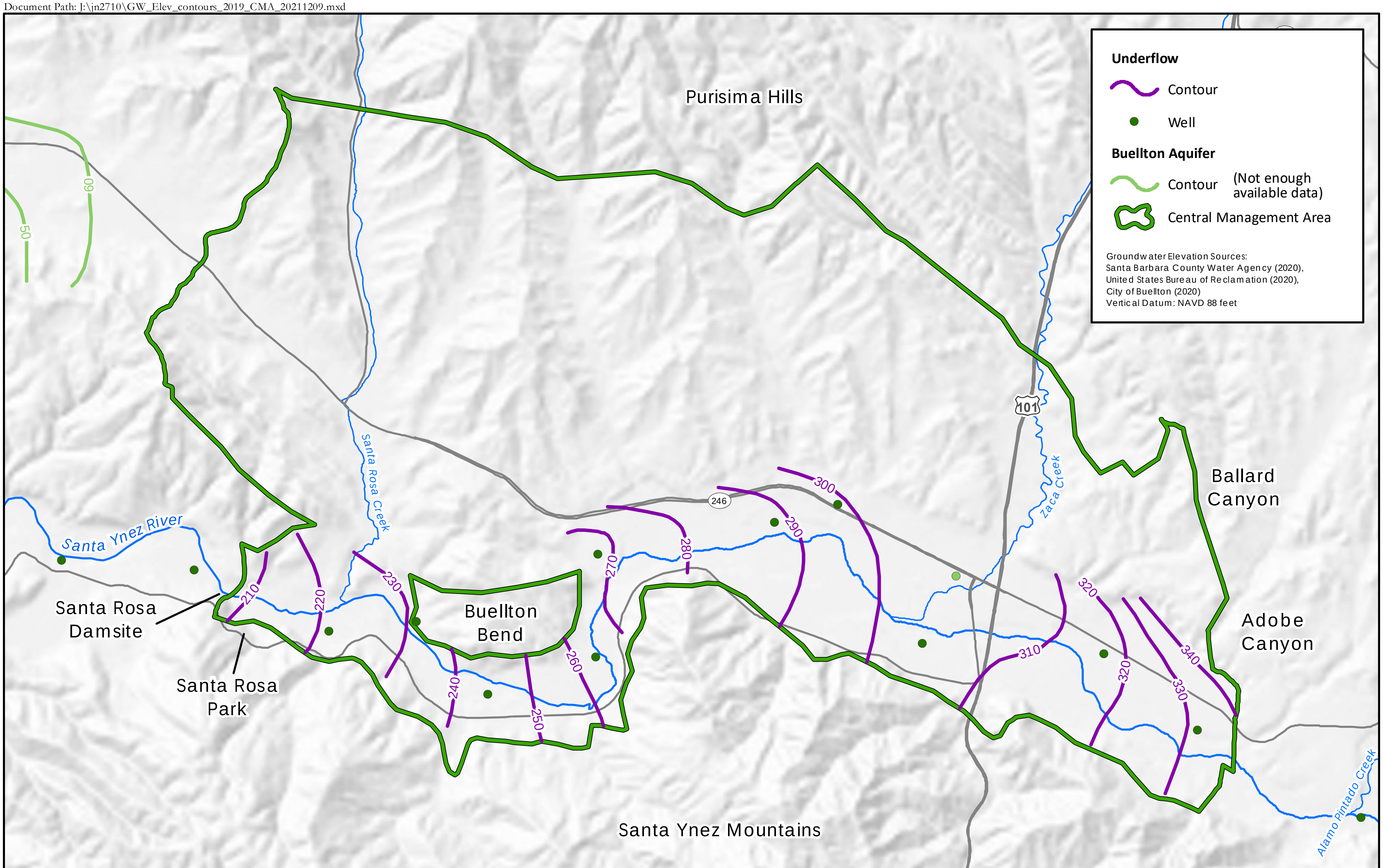

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GROUNDWATER AND UNDERFLOW ELEVATION CONTOURS
SEASONAL LOW
FALL 2019
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2b.1-2

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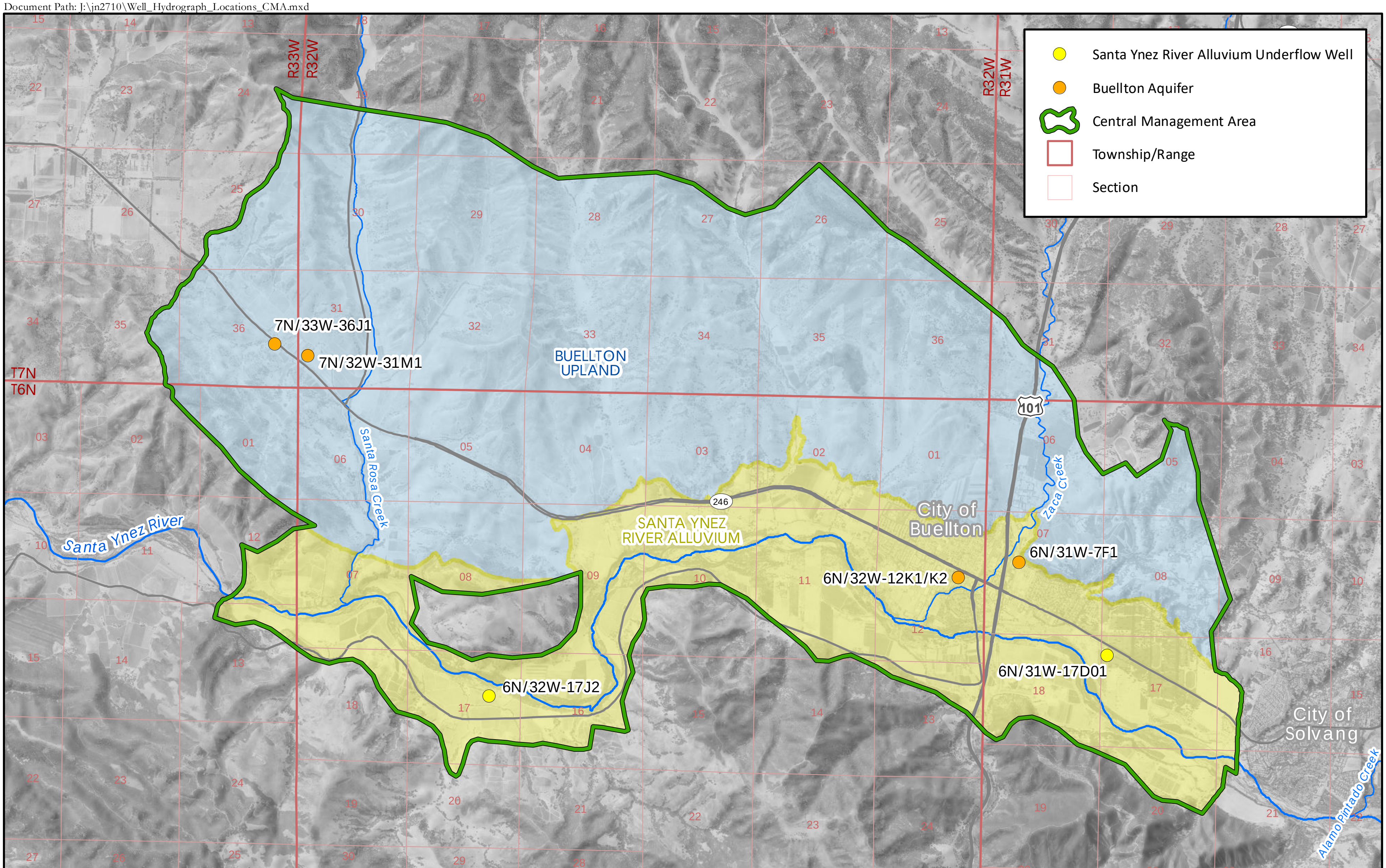

WELL HYDROGRAPH LOCATIONS
WITHIN CENTRAL MANAGEMENT AREA

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Central Management Area
Groundwater Sustainability Agency

0 0.5 1 Miles

N

FIGURE 2b.1-3

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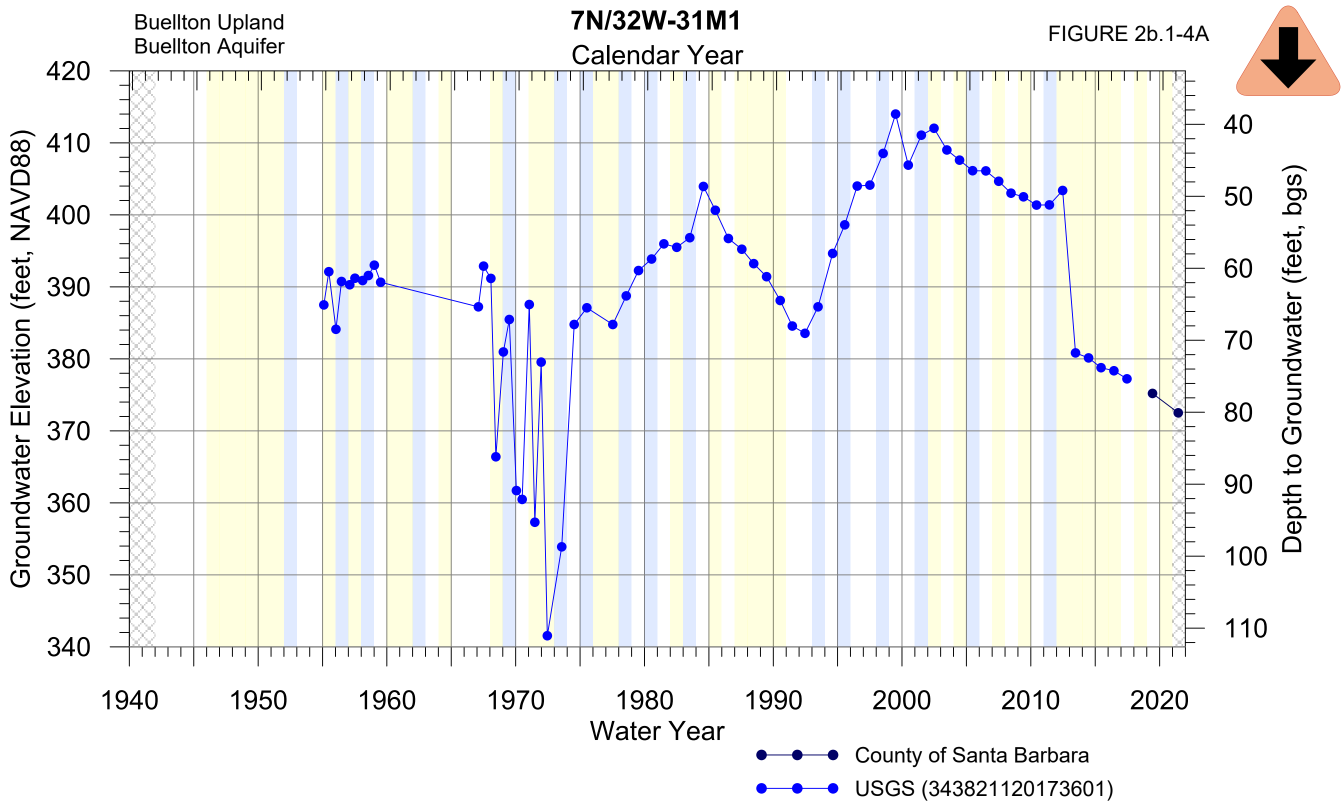

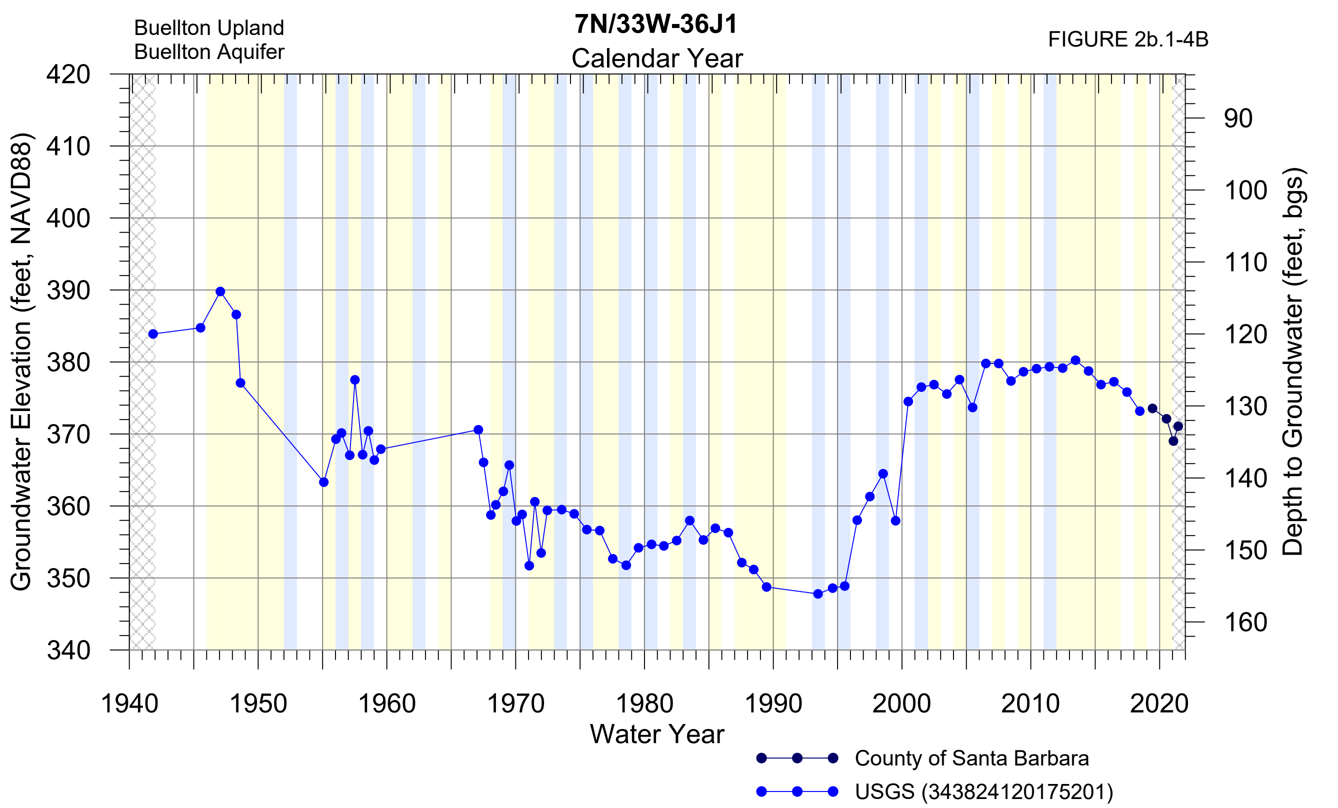

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CMA
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Central Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
BUELLTON UPLAND

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

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2b.1-3-2 Santa Ynez River Alluvium

As discussed in the HCM, the Santa Ynez River Alluvium is considered part of the underflow of the river, which is regulated by the SWRCB. Because underflow is considered surface water, the Santa Ynez River Alluvial deposits upstream of the Lompoc Narrows would not be classified as a principal aquifer or managed by a GSP under SGMA (Appendix 1d-B). The hydrograph for wells screened within this underflow of the Santa Ynez River, well 6N/32W-17J2 (Figure 2b.1-5A) and 6N/31W-17D1 (Figure 2b.1-5B), indicates water level elevations are relatively stable to slightly declining, following periods of prolonged drought in the late 1990s and late 2010s. Long-term trends are relatively flat, likely as a result of recharge from the Santa Ynez River. The stability of the water levels is indicative of that the river stage effectively controls the ground-water level (Upson and Thompson, 1951). Seasonal variations up to 4 feet are typically observed annually. These seasonal and longer-term trends are determined primarily by managed releases from Cachuma Reservoir and extractions of the subsurface water from wells in the river alluvium.

As discussed in the HCM, the Buellton Aquifer exists near the City of Buellton as part of the Santa Rita syncline in the reach from the EMA/CMA boundary to the Buellton Bend. Well 6N/32W-12K1/2 (Figure 2b.1-5C) and Well 6N/31W-7F1 (Figure 2b.1-5D) are deep wells perforated in the Careaga formation that represents long-term conditions of the Buellton Aquifer. Well 6N/32W-12K1/2 (Figure 2b.1-5C) indicates seasonal variations up to 10 feet are typically observed annually. Water levels in both wells declined 6 to 9 feet during the period 1985-1992. Water levels then increased by 8 to 12 feet from the mid-1990s to the mid-2000s. After 2005 and 2006, water levels declined by 26 to 27 feet by year 2016. This period has the largest water level decline that has been observed historically in the CMA. However, water levels have since increased by 12 to 17 feet during the period 2017 to 2020, and water levels in Well 6N/32W-12K1/2 have now recovered to 1982 water level conditions (Figure 2b.1-5C).

Wells in the Buellton Aquifer beneath the Santa Ynez River Alluvium and the Buellton Aquifer in the Buellton Upland near the City of Buellton indicate that groundwater level elevations are typically very similar. However, during droughts water levels in the less permeable Buellton Aquifer tend to drop quicker and have lower water levels than the Santa Ynez River Alluvium, which are sustained by water rights releases from Cachuma Reservoir and recharge from the Santa Ynez River.

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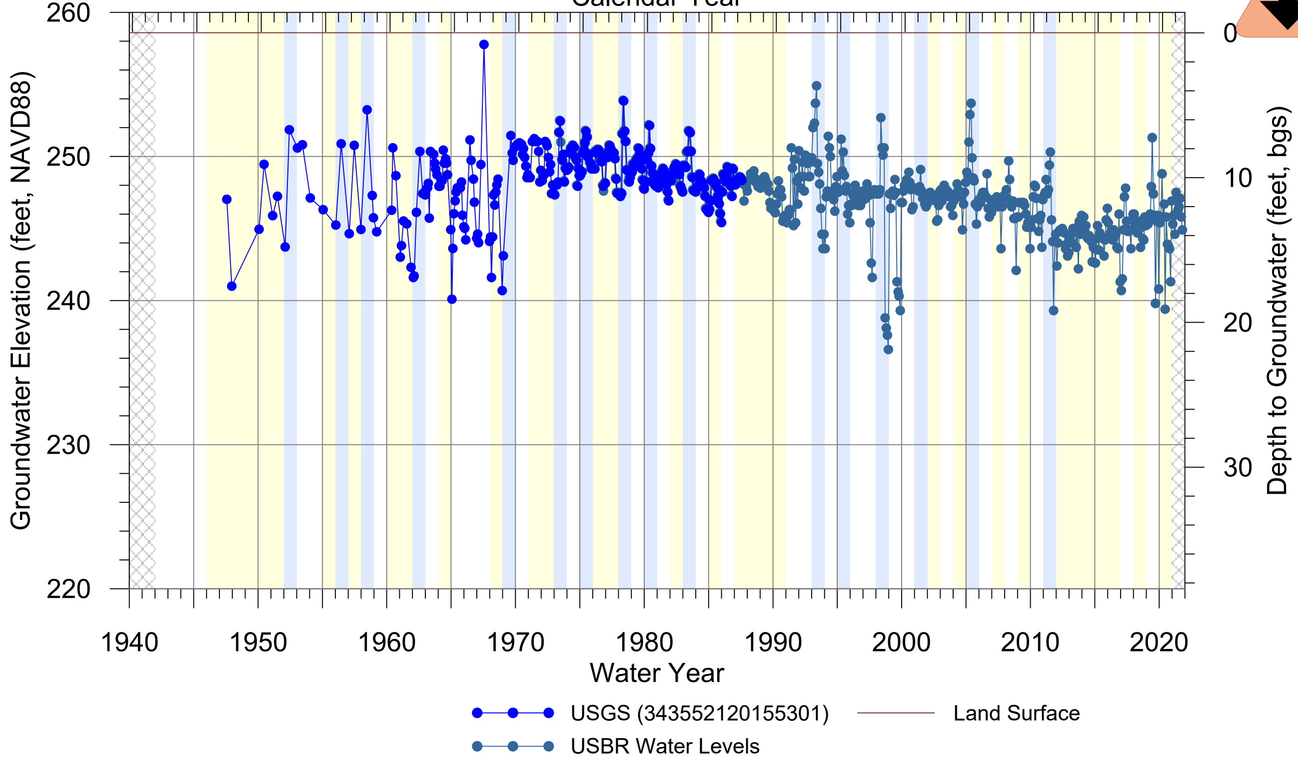
FIGURE 2b.1-5AB

Santa Ynez River Alluvium
SYRA Underflow

USBR Node 12 [6N/32W-17J2]

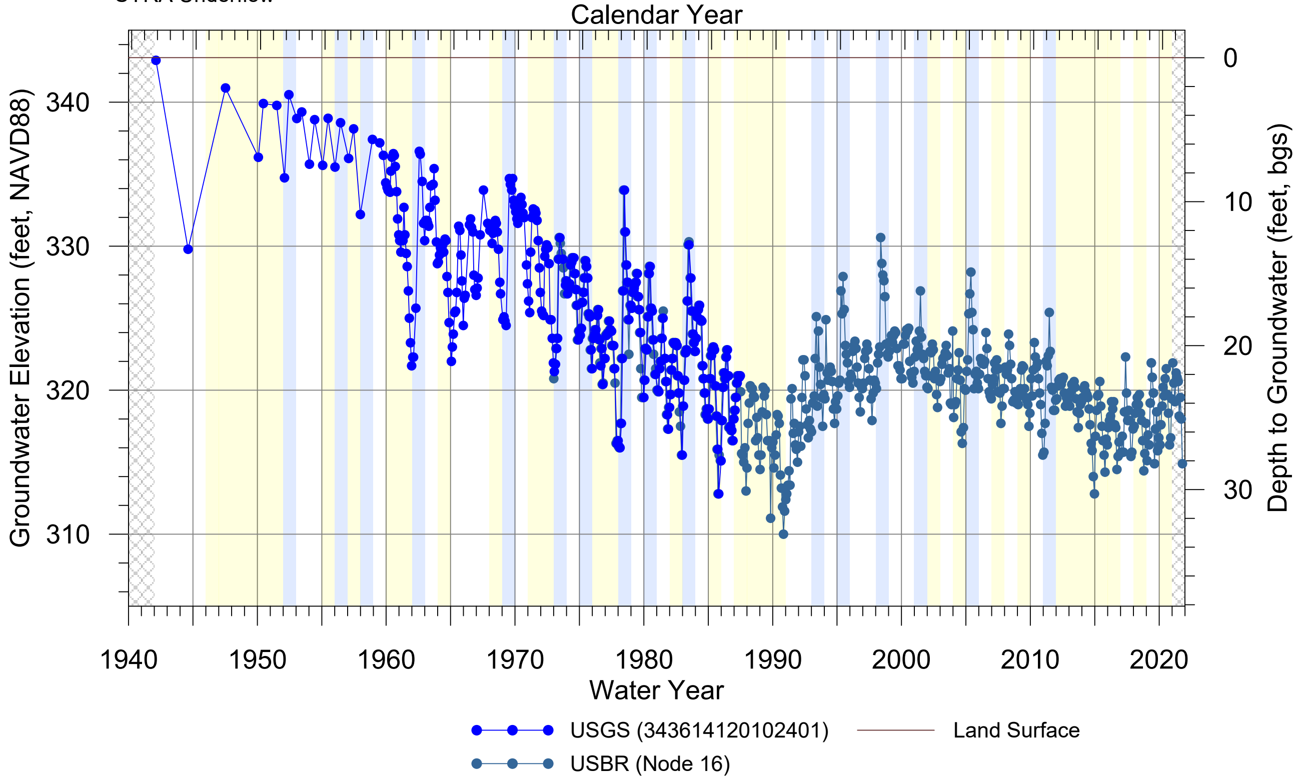
FIGURE 2b.1-5A



Santa Ynez River Alluvium
SYRA Underflow

USBR Node 16 [6N/31W-17D1]

FIGURE 2b.1-5B



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Central Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA YNEZ RIVER ALLUVIUM

Water Year Type (1942-2020)

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

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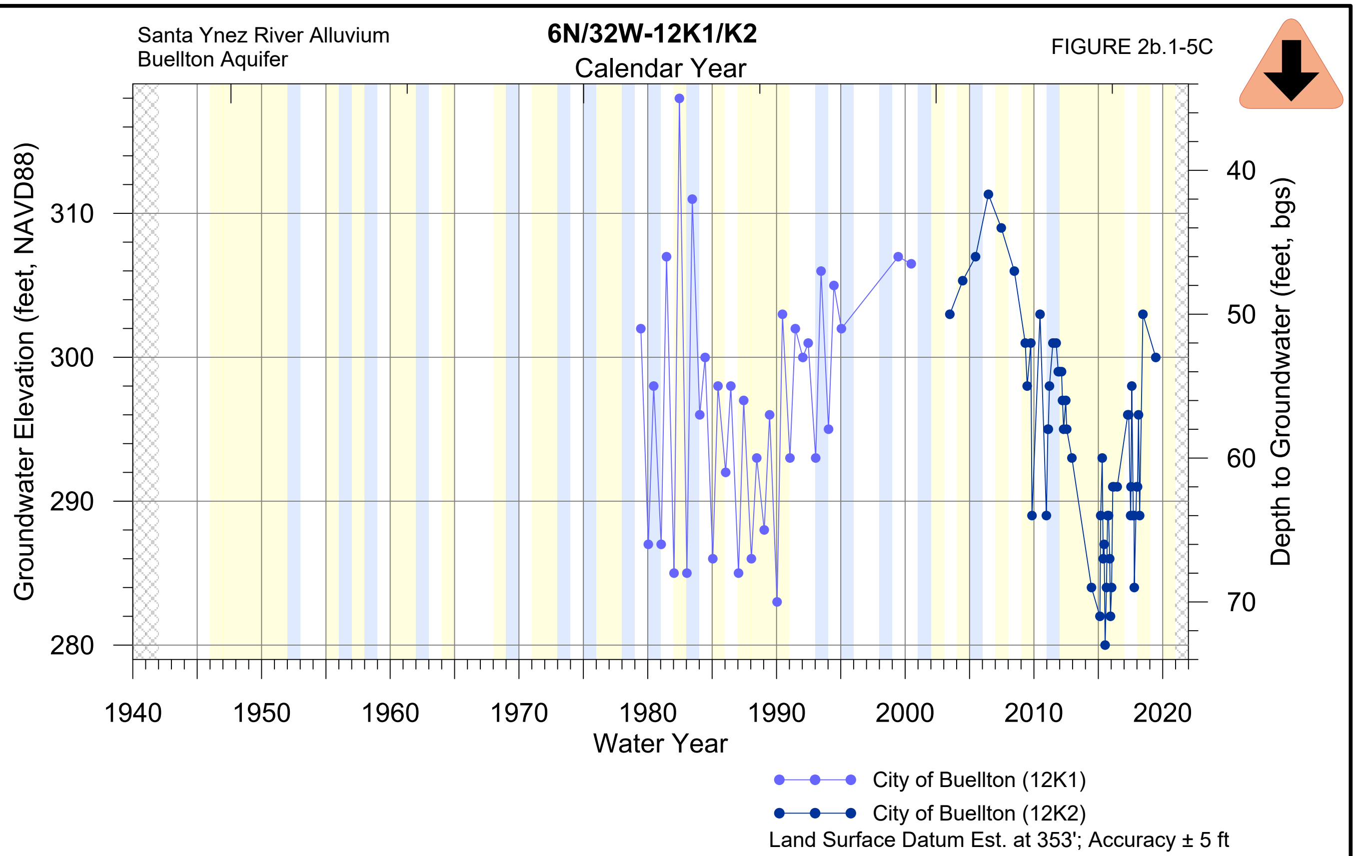

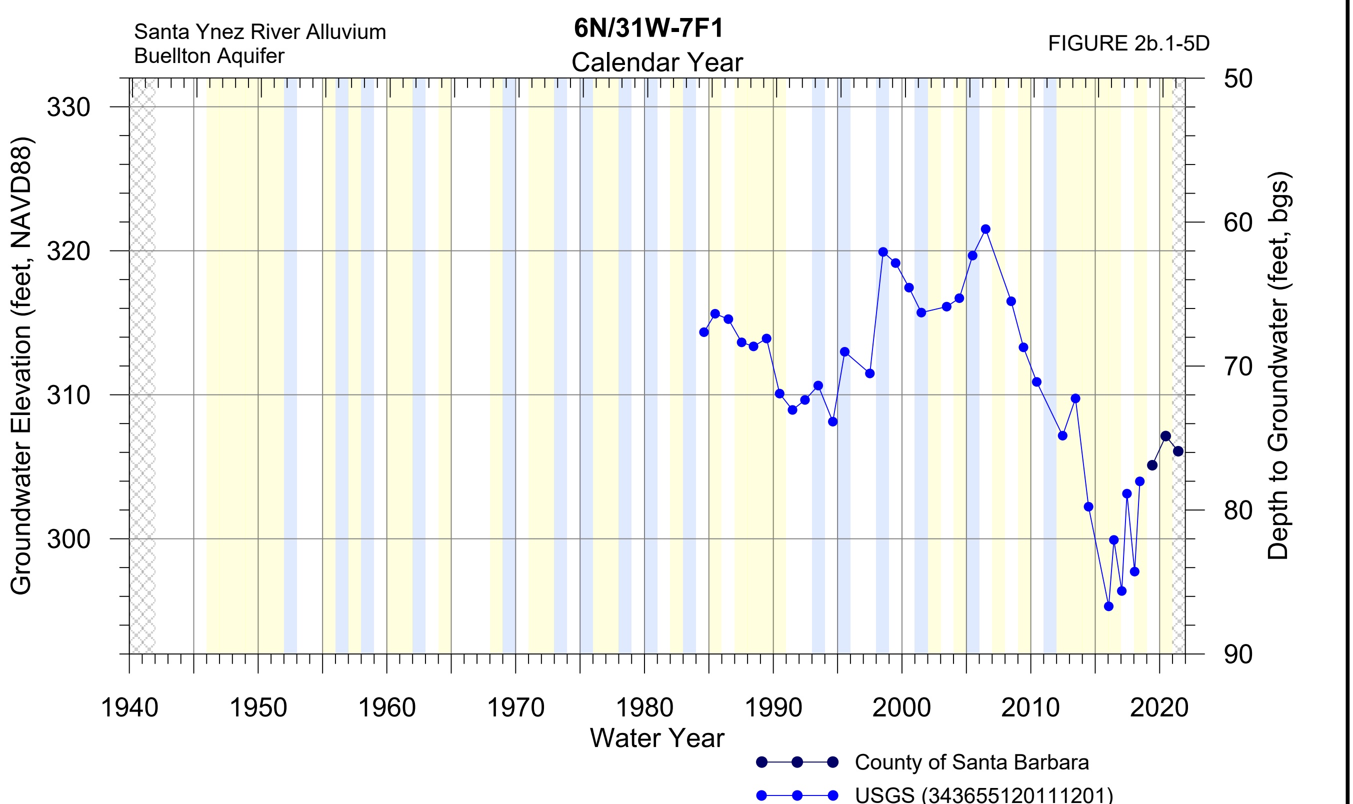

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Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA YNEZ RIVER ALLUVIUM

Water Year Type (1942-2020)

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

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2B.2 GROUNDWATER STORAGE

This section addresses the second sustainability indicator, reduction of groundwater storage. In the CMA, the change in groundwater storage in the Basin was evaluated in this section with respect to baseline conditions established in 1982, using data reported annually by the SYRWCD (Stetson, 2020). Groundwater storage data for the CMA is evaluated and the cumulative changes in groundwater storage over time are discussed below. In accordance with SGMA, the section also includes "a graph depicting estimates of the change in groundwater in storage, based on data, demonstrating the annual and cumulative change in the volume of groundwater in storage between seasonal high groundwater conditions, including the annual groundwater use and water year type."[74] Graphs were created for the CMA subareas that show changes to groundwater in storage since the established baseline (1982) and are included as **Figure 2b.2-1**. Groundwater storage under future scenarios will be analyzed and refined with the groundwater budget and groundwater model being developed for the GSP.

2b.2-1 Cumulative Change in Groundwater Storage

Accumulated change of groundwater in storage for the CMA is shown on Figure 2b.2-1 in acre-feet (AF). This annual and cumulative change in the volume of groundwater in storage is from the annual groundwater reports produced by the SYRWCD (Stetson 2021). For the historical period (1982 through 2018), the data indicate a net increase of groundwater storage in the CMA of about 900 AF. This increase equals 24 acre-feet of change per year on average and is very close to no net change over the 38-year period.

74 23 CCR § 354.16(b).

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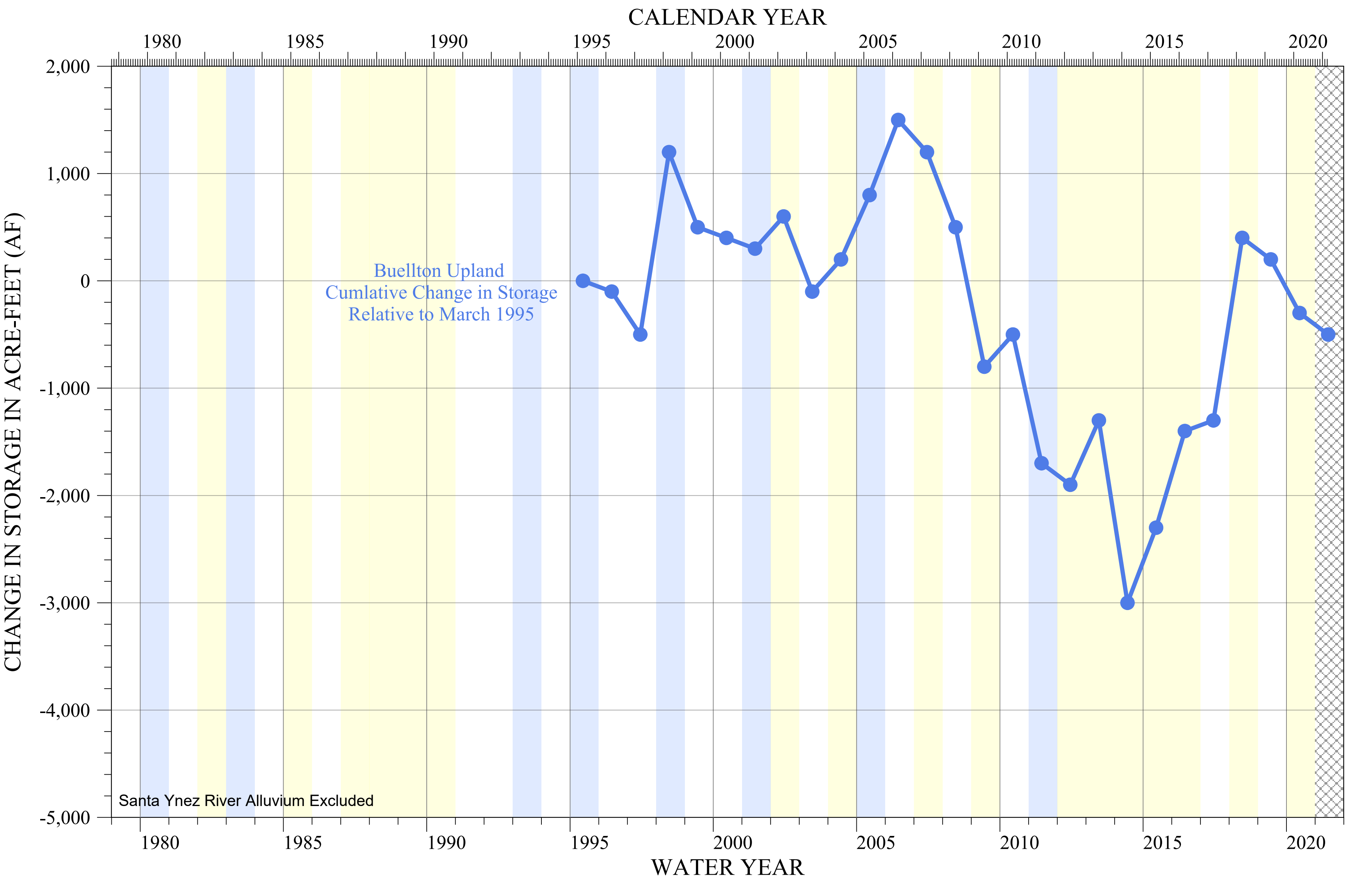

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CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency

CUMULATIVE CHANGE IN GROUNDWATER STORAGE RELATIVE TO MARCH 1995

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Sources: Stetson (2021) Forty-Third Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2020-2021
USBR Cachuma Project Reports

FIGURE 2b.2-1

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The annual reporting of changes in groundwater storage (Stetson 2021) is based on changes in groundwater levels in representative monitoring wells. For the Santa Ynez River Alluvium underflow, the United States Bureau of Reclamation (USBR), in connection with SWRCB Order No. 2019-0148, determines on a monthly basis the quantity of dewatered storage in the underflow of the Santa Ynez River. The SYRWCD uses a similar methodology with representative monitoring wells to estimate the changes in groundwater storage for the Buellton Aquifer in the Buellton Upland (Stetson 2021).

2b.2-2 Classification of Wet and Dry Years

The HCM (Section 2a) introduced water flow elements, including precipitation over time at Buellton Fire Station (Figure 2a.3-3). The four wettest water years (water-year defined as October through September, annually) based on precipitation in the period of record at Buellton Fire Station (Water Year 1955-2020)[75] are WY 1995 (34.26 inches), WY 1983 (39.03 inches), WY 2005 (39.57 inches), and WY 1998 (41.56 inches. The four driest water years in the period of record based on precipitation correspond to WY 2015 (6.94 inches), WY 1989 (6.79 inches), WY 2007 (6.30 inches), and WY 2014 (5.87 inches). However, precipitation does not fully account for carryover effects from previous years, so a surface water stream gage was used to characterize conditions.

To characterize all water years as either wet, above/below normal, or dry/critically dry as shown on **Figure 2b.2-2**, the Salsipuedes Creek streamflow gage (U.S. Geological Survey [USGS] gage 11132500) was selected as a proxy to classify each water year. The Salsipuedes Creek streamflow gage represents a 47.1-square-mile[76] drainage area with long period of record in the Lower Santa Ynez River watershed. The 79-year dataset for the gage spans 1942 through 2020 and represents unimpeded runoff due to the absence of upstream water diversion and storage.

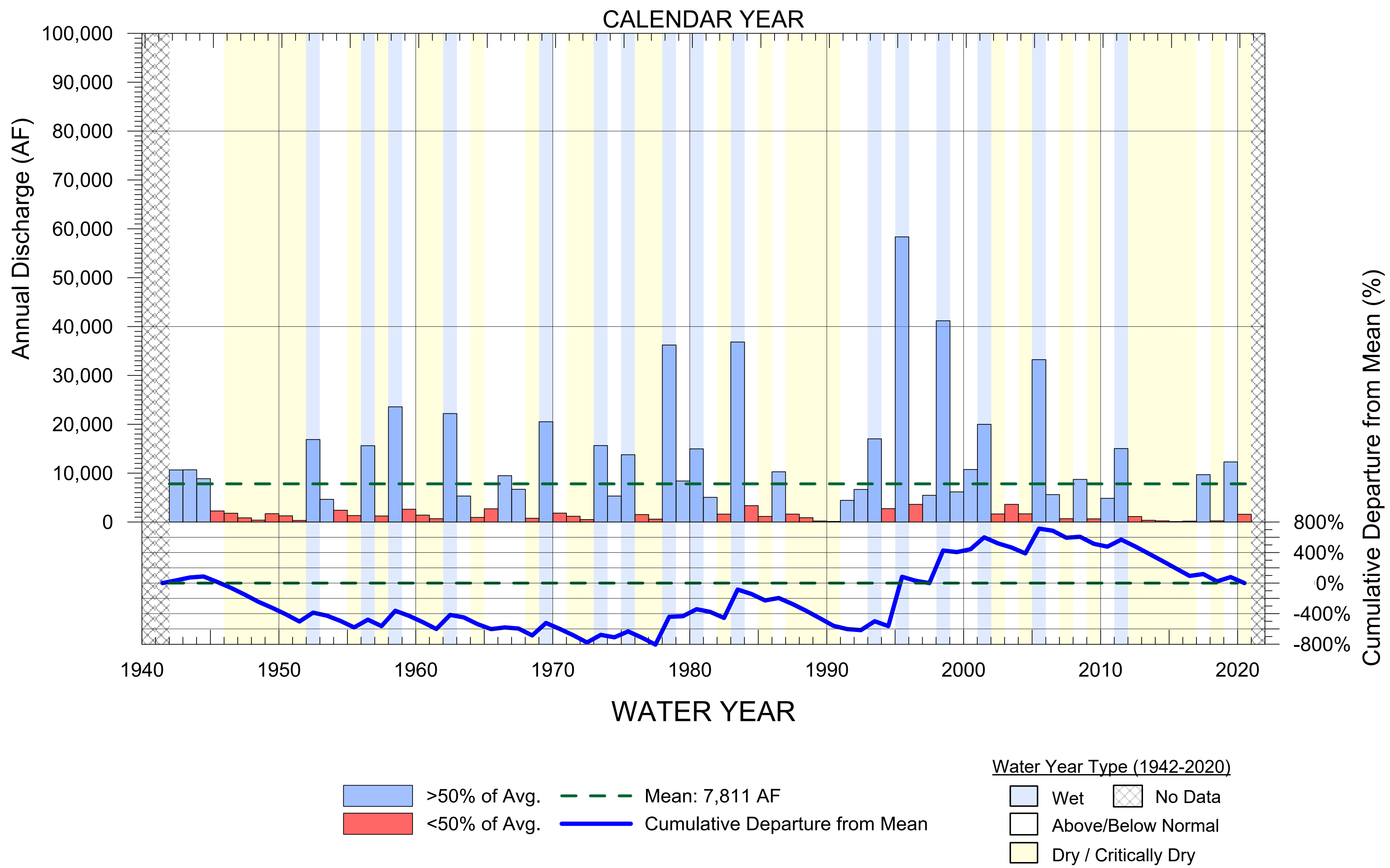
75 Buellton Fire Station, Gauge 233, Santa Barbara County Flood Control & Water Conservation District.
76 USGS NWIS (2020) USGS 11132500 SALSIPUEDES C NR LOMPOC CA

Discharge in acre-feet per year (AFY) for Salsipuedes Creek gage is shown on **Figure 2b.2-3** for the period of record. The data are presented as a power law distribution, meaning the highest recorded flows in acre-feet have occurred in a minority of the total years recorded. Classification into a water year type followed the State Water Resources Control Board Order WR 2019-0148 methodology. Years were classified based on the rank in the period of record in one of five categories: “critically dry” (bottom 20 percentile), “dry” (20th to 40th percentile), “below normal (40th to 60th percentile), “above normal” (60th to 80th percentile), and “wet” (80th to 100th percentile).

Using the robust dataset from the Salsipuedes Creek gage (Figure 2b.2-2) the period of record was classified as wet, above/below normal, or dry/critically dry. The cumulative departure from mean graph at the bottom indicates that the period 1995 through 2006 was relatively wet, while the period 2012 through 2018 has been relatively dry.

2b.2-3 Groundwater Use and Effects on Storage

Total annual reported groundwater use for the Buellton Upland is compared to cumulative groundwater storage loss on **Figure 2b.2-4**. Water use was introduced in the HCM (Section 2a.4 and Figure 2a.4-1). The groundwater uses totaled on Figure 2b.2-4 show that groundwater use in the Buellton Upland gradually increased from 1995 through 2007. Groundwater use increased in the period 2008 through 2015. Following 2015 through 2019 (current), groundwater use has declined. Cumulative groundwater storage loss indicates that effects of both hydrologic periods and groundwater use. For example, before the dry period of 2012 through 2018, the groundwater storage decreased with increased groundwater use. Conversely, during the wet period 1995 through 2016 and after above-normal water year 2017, groundwater storage increased.



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11132500 SALSIPUEDES CREEK NEAR LOMPOC
CUMULATIVE DEPARTURE FROM MEAN AND
PERIOD OF RECORD (WY 1942 - 2020)

Sources: USGS (2020) streamflow data

FIGURE 2b.2-2

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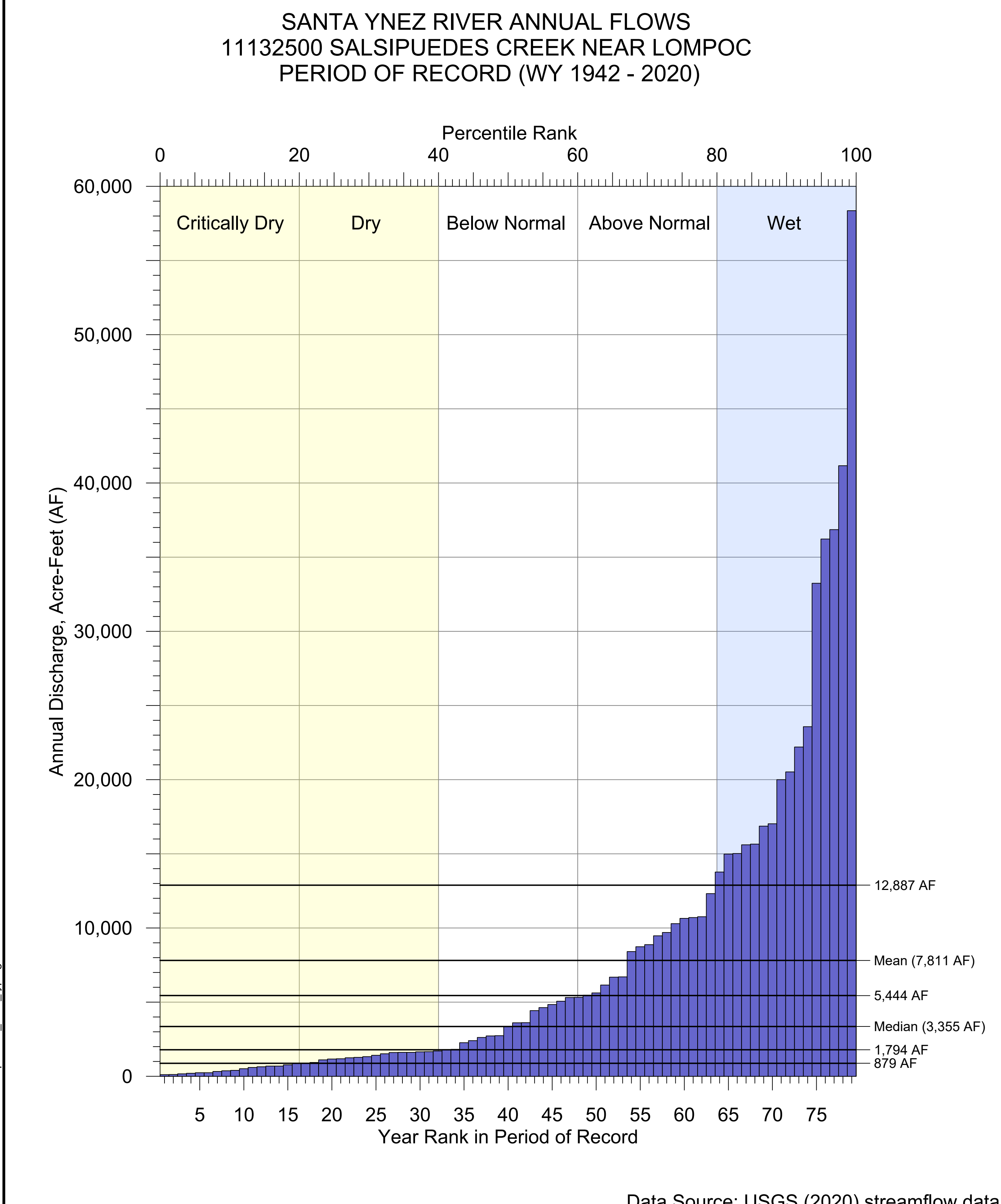

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WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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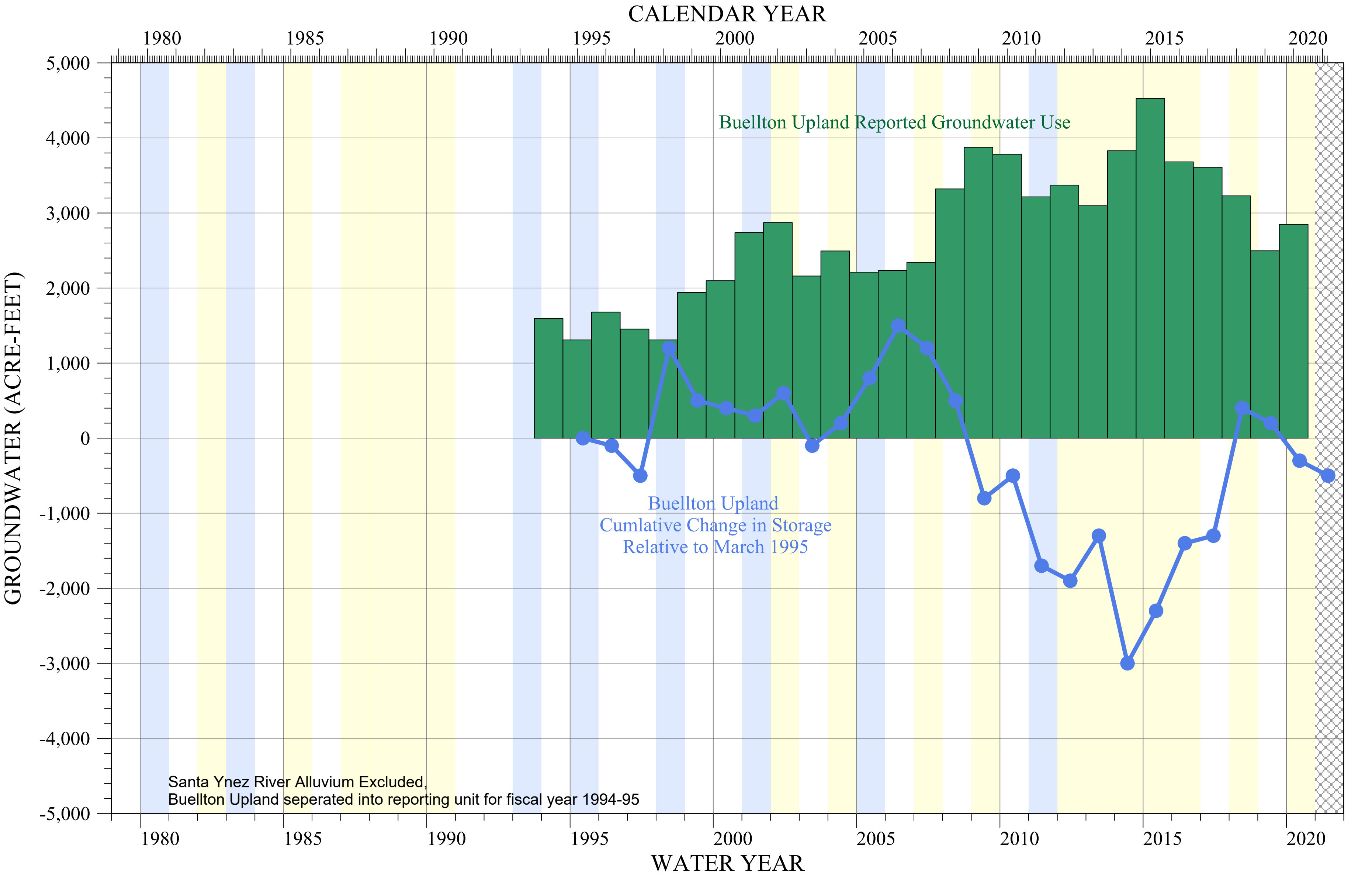

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CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

CHANGE IN STORAGE AND USE

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Sources: Stetson (2021) Forty-Third Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2020-2021

FIGURE 2b.2-4

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2B.3 WATER QUALITY

In accordance with SGMA, "Groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes"[77] are described in this section. Water quality objectives vary depending on the beneficial use and users of groundwater being evaluated. To determine existing or future potential water quality issues within the CMA, the beneficial uses of groundwater must first be established.

This section is divided as follows:

- Section 2b.3-1, Beneficial Uses. This subsection describes the various beneficial uses for groundwater within the Basin and provides context for water quality objectives for those beneficial uses.
- Section 2b.3-2, Suitability for Beneficial Use, includes discussion of major beneficial uses.
- Section 2b.3-3, Groundwater Contamination Sites and Plumes. This section describes the known existing groundwater contaminant sites and plumes that are currently managed by other State of California regulatory bodies responsible for protecting groundwater quality and quantity.
- Section 2b.3-4, Current Groundwater Quality, includes data for selected major diffuse or natural constituents for the period water year 2015 through 2018.

2b.3-1 Beneficial Uses

The Central Coast Basin Water Quality Control Plan herein referred to as the 2019 Central Coast Basin Plan (RWQCB 2019), which includes the SYRVGB, identifies 18 beneficial uses of surface and groundwater in the SYRVGB below Cachuma Reservoir (RWQCB 2019 Table 2-1), which are briefly listed and described below. Beneficial uses were previously introduced in the Plan Area (Section 1d.5).

77 23 CCR § 354.16 (d)

The following four beneficial categories apply to both groundwater and surface water in the CMA.

- Municipal and Domestic Supply (MUN). Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- Agricultural Supply (AGR). Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
- Industrial Process Supply (PROC). Uses of water for industrial activities that depend primarily on water quality (e.g., waters used for manufacturing, food processing, etc.).
- Industrial Service Supply (IND). Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

For surface water, the 2019 Central Coast Basin Plan has identified an additional 14 beneficial uses in the SYRVGB below the Cachuma Reservoir [78]. The importance of groundwater quality on these beneficial uses depends on the discharge of groundwater to surface water which is described further in Section 6.

2b.3-1-1 Median Groundwater Quality Objectives

The 2019 Central Coast Basin Plan includes median groundwater objectives for several major water quality constituents specifically for portions of the CMA. These are shown in **Table 2b.3-1** along with the secondary maximum contaminant levels (SMCL), a national federal drinking water standard for guidance regarding water for potential public supply. These "objectives are intended to serve as a water quality baseline for evaluating water quality management in the basin" (RWQCB 2019) and represent an average value in each subarea.

78 See "Table 2-1. Identified Uses of Inland Surface Waters (continued)", page 20, 2019 Basin Plan (RWQCB 2019).

Table 2b.3-1
Median Groundwater Objectives in MG/L
for the Central Management Area

Basin/Subarea	Salinity as Total Dissolved Solids (TDS)	Chloride (Cl)	Sulfate (SO_4^{2-})	Boron (B)	Sodium (Na)	Total Nitrogen (N)
Buellton Upland	1,500	150	700	0.5	100	1
Santa Ynez River Alluvium	1,500	150	700	0.5	100	1
SMCL	*500*	*250*	*250*	-	-	-

Note: The 2019 Central Coast Basin Plan values shown are for "Santa Rita" subarea, which also includes the Santa Rita Upland.

2b.3-2 Suitability for Beneficial Use

Groundwater quality in the CMA is suitable for potable and agricultural uses. Key water quality parameters in the CMA in relation to the primary beneficial uses and primary users are summarized below.

2b.3-2-1 Municipal Supply

Municipal supply is the best documented water quality in the CMA, as all public water systems of significant size are required to collect and report water quality to the State Water Resources Control Board (SWRCB) as part of the Safe Drinking Water Information System (SDWIS). Because the major public water systems, like the City of Buellton, treat the groundwater in the CMA, the majority of the water quality issues are constituents likely related to the distribution system and do not indicate general groundwater quality impairing this beneficial use. The exception is elevated levels of arsenic in water samples collected by the Bobcat Springs Mutual Water Company, located in the Buellton Upland, and reported to the SWRCB in 2009.

2b.3-2-2 Agricultural Supply

Agricultural beneficial use is the primary beneficial use in the CMA. Different crops have different sensitivities to water quality constituents, and water quality is one of many considerations in terms of crop selection. Section 2a.4 of the HCM identified major crops in the CMA as including wine grapes, dry beans, and walnuts. These include crops that are sensitive to high total dissolved solids (TDS), chloride, and boron. Agricultural water is generally untreated before use. However, poor water quality (high TDS) often can be mitigated by increased water application (increased leaching fraction).

Historical water quality in the CMA was reviewed relative to the 2019 Central Coast Basin Plan general water quality objectives for agricultural water use. Constituents with historical measurements exceeding objectives for agriculture through large areas of the CMA were boron, fluoride, and manganese. Boron was detected in samples above the irrigation reference value of 0.75 milligrams per liter (mg/L) in wells throughout the Santa Ynez River Alluvium, and in one sample collected in the Buellton Upland along Santa Rosa Creek. Fluoride was detected in a sample above the recommended 2.0 mg/L livestock reference value and above the 1.0 mg/L irrigation reference value in several samples collected in the CMA, one along Santa Rosa Creek in the Buellton Upland, and in several samples collected downstream of the Buellton Bend in the Santa Ynez River Alluvium. Manganese was detected in collected samples above the 0.2 mg/L irrigation recommendation value in several wells in the Santa Ynez River Alluvium.

2b.3-2-3 Domestic Supply

Impaired beneficial use for domestic supply was reviewed using the SWRCB Needs Analysis GAMA Tool. This tool identifies the location of domestic wells by section and indicates if groundwater is adversely affected by nitrate, arsenic, hexavalent chromium, perchlorate, 1,2,3-trichloropropane, and uranium. Unlike municipal supply, domestic supply is less likely to involve water treatment so groundwater quality is more likely to have a direct negative impact on this beneficial use. Domestic suppliers are not required to take and submit water quality samples.

In the CMA, levels of nitrate in collected samples exceeded recommended values in both the Buellton Upland along Santa Rosa creek, and the Santa Ynez River Alluvium downstream of the City of Buellton to the Buellton Bend. Detected levels of arsenic only occurred in sections in the eastern Buellton Upland, and portions of the Santa Ynez River Alluvium just east of the City of Buellton at concentrations below action levels. Concentrations of hexavalent chromium, perchlorate, 1,2,3-trichloropropane, and uranium in collected samples from the CMA were below action levels.

2B.3-3 GROUNDWATER CONTAMINATION SITES AND PLUMES

Publicly available databases maintained by various State of California regulatory agencies, including the State Water Resources Control Board GeoTracker GAMA site[79], and the California Department of Toxic Substances Control EnviroStor site[80] were reviewed and evaluated. In accordance with SGMA,[81] the available data were used to identify sites that could potentially affect groundwater quality within the CMA.

Identification of existing groundwater contamination sites are mapped on **Figure 2b.3-1** and the historical extents of contaminant plumes in groundwater are mapped on **Figure 2b.3-2**. These sites are regulated and under the oversight authority of their respective State of California agencies responsible for ensuring the contamination is mitigated in-place and directing appropriate actions to protect groundwater quantity and quality. SGMA requires[82] that sustainable groundwater management not influence plume migration and negatively influence groundwater quality. Hence, discussion of these sites is for information purposes, and all management, monitoring, compliance, and reporting activities related to these sites remain under their respective State of California agencies.

79 GeoTracker. State Water Resources Control Board. Web Application. https://geotracker.waterboards.ca.gov/ Accessed 2021-08-21.

80 EnviroStor. Department of Toxic Substances Control. Web Application. https://www.envirostor.dtsc.ca.gov/public/ Accessed 2021-08-20.

81 23 CCR § 354.16 (d) [..] including a description and map of the location of known groundwater contamination sites and plumes.

82 CWC Section 10721 (x)(4) […] including the migration of contaminant plumes that impair water supplies.

A summary of the identified sites within the CMA is provided in **Table 2b.3-2.** Contamination sites within the City of Buellton are located along Highway 246 and Avenue of the Flags and are likely related to leaking underground storage tanks (LUST) sites (Figure 2b.3-2).[83] Contamination at Ballard Canyon Road at the CMA/EMA boundary appears to be related to heavy metals[84]. Although these sites have multiple contaminants of concern, they are currently considered compliant with applicable regulatory orders and the contaminants are being effectively monitored and managed in place or remediated to reduce future potential to impair groundwater quality.

Table 2b.3-2
Count of Potential Point Sources of Groundwater Contamination
Shown on Figure 2b.3-1 by CMA Subarea

Basin/Subarea	SWRCB Cleanup Program		LUST Cleanup		Military Cleanup		DTSC Cleanup		Total	
	Open	Total	Open	Total	Open	Total	Open	Total	Open	Total
Buellton Upland	0	1	0	2	0	0	0	0	0	3
Santa Ynez River Alluvium	1	4	1	21	0	0	0	0	2	25
Total	1	5	1	23	0	0	0	0	2	28

Note: LUST = leaking underground storage tank; DTSC = Department of Toxic Substances Control.

83 Groundwater contamination associated with these locations includes benzene, methyl-tert-butyl ether, tert-butyl alcohol, tetrachloroethene, xylenes (total), ethylbenzene, naphthalene, toluene, and 1,2 dichloroethane.

84 Elevated concentrations of antimony, cadmium, selenium, thallium, arsenic, and manganese have been found at this location, as well as vinyl chloride, cis-1,2 dichloroethylene, and di phthalate (2-ethylhexyl).

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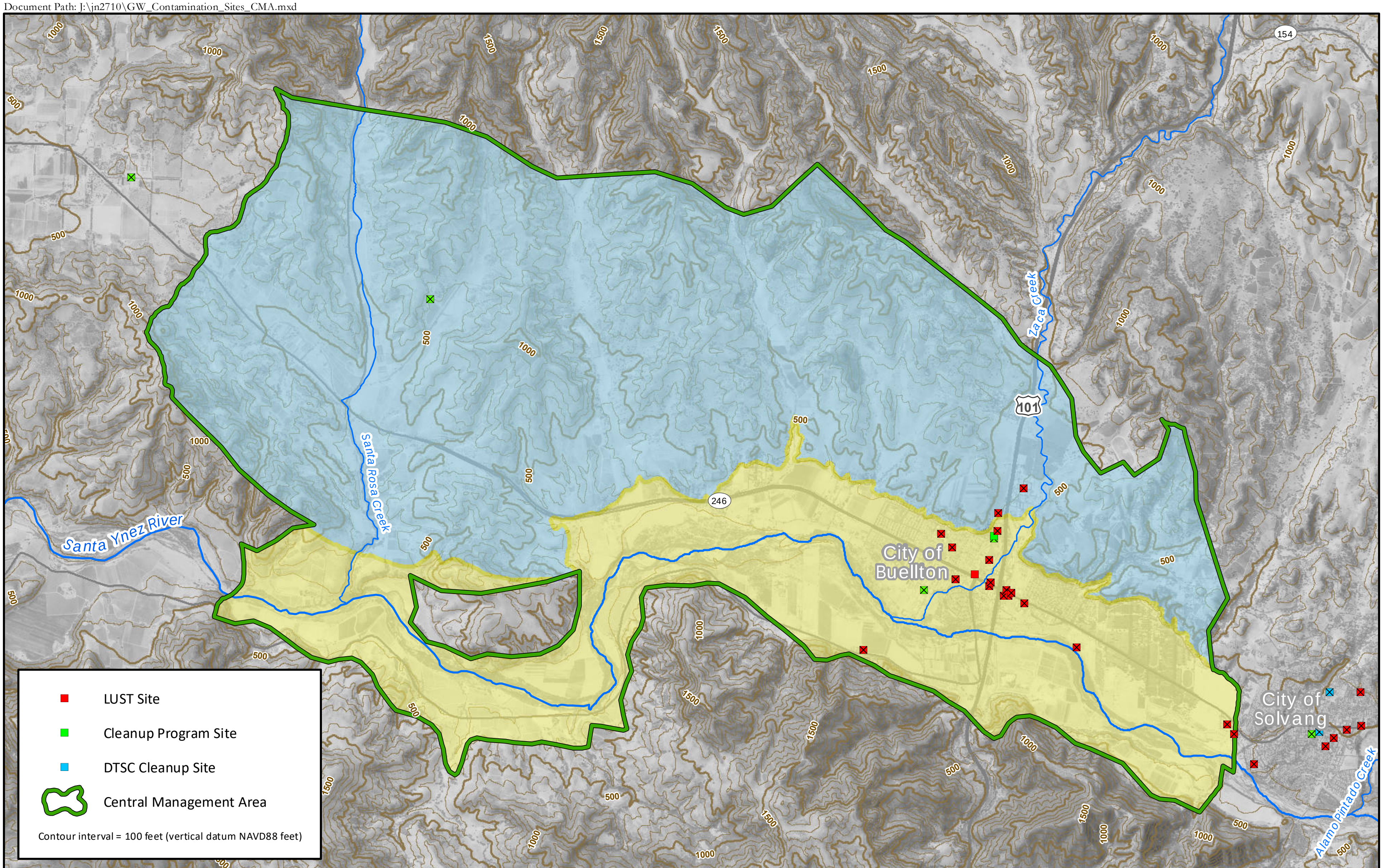

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Groundwater Sustainability Agency

LOCATION OF POTENTIAL POINT SOURCES OF GROUNDWATER CONTAMINANTS
CENTRAL MANAGEMENT AREA

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002
NAIP (2018)

FIGURE 2b.3-1

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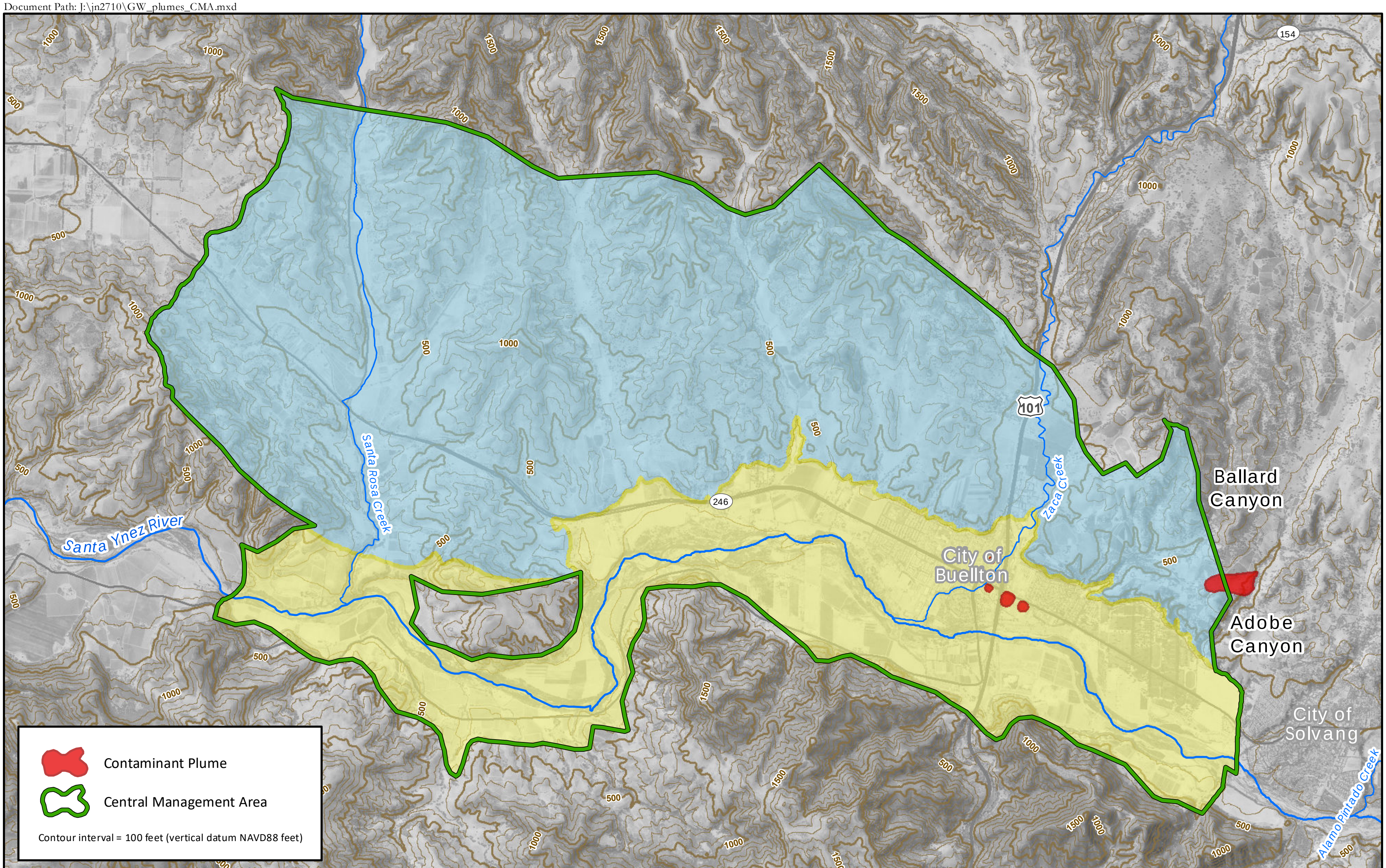

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GROUNDWATER CONTAMINATE PLUMES
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002
NAIP (2018)

N

FIGURE 2b.3-2

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2b.3-4 Current Groundwater Quality (2015-2018)

The distribution and concentration of selected naturally occurring or diffuse groundwater constituents are discussed in the following subsections. The constituents in this section correspond to the same constituents used for the 2019 Central Coast Basin Plan groundwater quality objectives (Table 3-1). Averages for the recent 4-year period of water years 2015 through 2018 are shown. Water quality data was primarily evaluated from three primary data compilation sources:

- Water Quality Portal, a cooperative service from USGS, the U.S. Environmental Protection Agency, and the National Water Quality Monitoring Council, which in addition to these federal sources includes some state, tribal, and local data. This is the primary source for USGS water quality data. Water quality data collected by the Santa Barbara County Water Agency is submitted to the USGS and included here.

- Safe Drinking Water Information System, which is a compilation service from SWRCB that compiles mandated water quality reports from California public water systems. Public water systems include the CMA member agency the City of Buellton.

- Irrigated Lands Regulatory Program (ILRP), an SWRCB program that tracks discharges from irrigated agricultural lands. Participants submit water quality sampling results for selected constituents. The IRLP is made available through the Safe Drinking Water Information System GeoTracker GAMA website.

The Data Management System, described in the Data Management Plan, was configured to automatically update the database with data from these three sources of water quality data. The sections below provide a snapshot of current groundwater conditions in the CMA, based on the best available data from January 1, 2015, through 2018. The spatial distribution of water quality is assessed using maps, and average concentrations are compared to the 2019 Central Coast Basin Plan water quality objectives and summarized in tables.

2b.3-4-1 Salinity (Total Dissolved Solids)

Salinity, as measured by total dissolved solids (TDS), is the dry mass of constituents dissolved in a given volume of water. There are two measurements of salinity: TDS, which is a measurement of the total mass of the mineral constituents dissolved in the water, and electrical conductivity, which is a measurement of the conductivity of the solution of water and dissolved minerals.

The Secondary Maximum Contaminant Level (SMCL) includes a recommended standard of 500 mg/L, an upper limit of 1,000 mg/L, and a short-term limit of 1,500 mg/L (SWRCB 2017). The 2019 Central Coast Basin Plan for irrigation does not provide a TDS guidance for salinity. Crops in the CMA sensitive to salinity are beans, and strawberries (Hanson 2006).

Average concentrations of TDS in groundwater samples collected during water years 2015 through 2018 for 108 measurements at 34 wells in the CMA are shown on **Figure 2b.3-3**. A summary of the data is provided in **Table 2b.3-3.** As shown in **Table 2b.3-3**, the average constituent concentrations in samples collected in the CMA were below the 2019 Central Coast Basin Plan Water Quality Objective (WQO). Concentrations of chloride were lower in the Buellton Upland compared to the Santa Ynez River Alluvium. The highest salinity was measured in samples collected in the western portions of the Santa Ynez River Alluvium (Figure 2b.3-3).

Table 2b.3-3
Summary of Salinity as Total Dissolved Solids (TDS)
in the CMA during Water Years 2015–2018

Subarea	TDS Average (mg/L)	TDS Minimum (mg/L)	TDS Maximum (mg/L)	TDS WQO (mg/L)	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	379	180	640	1,500	7	0
SYR Alluvium	1,042	460	1,770	1,500	26	1

2b.3-4-2 Chloride

Chloride (Cl^-) is a mineral anion and a major water quality constituent in natural systems. Chloride is characteristically retained in solution through most of the processes that tend to separate out other ions

(Hem 1985). The circulation of chloride ions in the hydrologic cycle is largely through physical processes. For example, chloride is a chemical indicator commonly used to evaluate seawater intrusion, as high chloride concentrations are characteristic of seawater, and it remains dissolved in solution in most surface water conditions (see Section 4, Seawater Intrusion).

For general municipal and domestic beneficial uses the SMCL is a recommended standard of 250 mg/L, an upper limit of 500 mg/L, and a short-term limit of 600 mg/L. For agricultural beneficial use, the 2019 Central Coast Basin Plan indicates chloride levels that exceed 106 mg/L cause increasing problems for crop irrigation. Crops grown in the CMA sensitive to chloride in irrigation water include strawberries (tolerance of 100–180 mg/L) (Hanson et al. 2006).

Average concentrations of chloride in samples collected during water years 2015–2018 for 105 measurements at 34 wells are shown on **Figure 2b.3-4**, and a summary of the data is provided in **Table 2b.3-4**. The average concentration in samples from almost all wells were below the 2019 Central Coast Basin Plan WQO.

Table 2b.3-4
Summary of Chloride (CL) Concentrations in the CMA during Water Years 2015–2018

Subarea	Cl^- Average (mg/L)	Cl^- Minimum (mg/L)	Cl^- Maximum (mg/L)	Cl^- WQO (mg/L)	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	58	31	95	150	7	0
SYR Alluvium	100	2	210	150	26	1

2b.3-4-3 Sulfate

Sulfate (SO_4^{2-}) is a naturally occurring anion and a major water quality constituent. The SMCL includes a recommended standard of 250 mg/L, an upper limit of 500 mg/L, and a short-term limit of 600 mg/L. The 2019 Central Coast Basin Plan does not indicate a specific sulfate guideline for irrigation water.

Average sulfate groundwater concentrations during water years 2015 through 2018 for 108 measurements at 34 wells in the CMA are shown on **Figure 2b.3-5**, and a summary of the data is provided in **Table 2b.3-6**. Average concentrations in sampled wells were below the 2019 Central Coast Basin Plan WQO. Concentrations of sulfate in collected samples were lowest in the Buellton Upland and higher in the Santa Ynez River Alluvium.

Table 2b.3-5
Summary of Sulfate Concentrations
in the CMA during Water Years 2015–2018

Subarea	SO_4^{2-} Average (mg/L)	SO_4^{2-} Minimum (mg/L)	SO_4^{2-} Maximum (mg/L)	SO_4^{2-} WQO (mg/L)	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	77	14	220	700	7	0
SYR Alluvium	34	1	763	700	27	0

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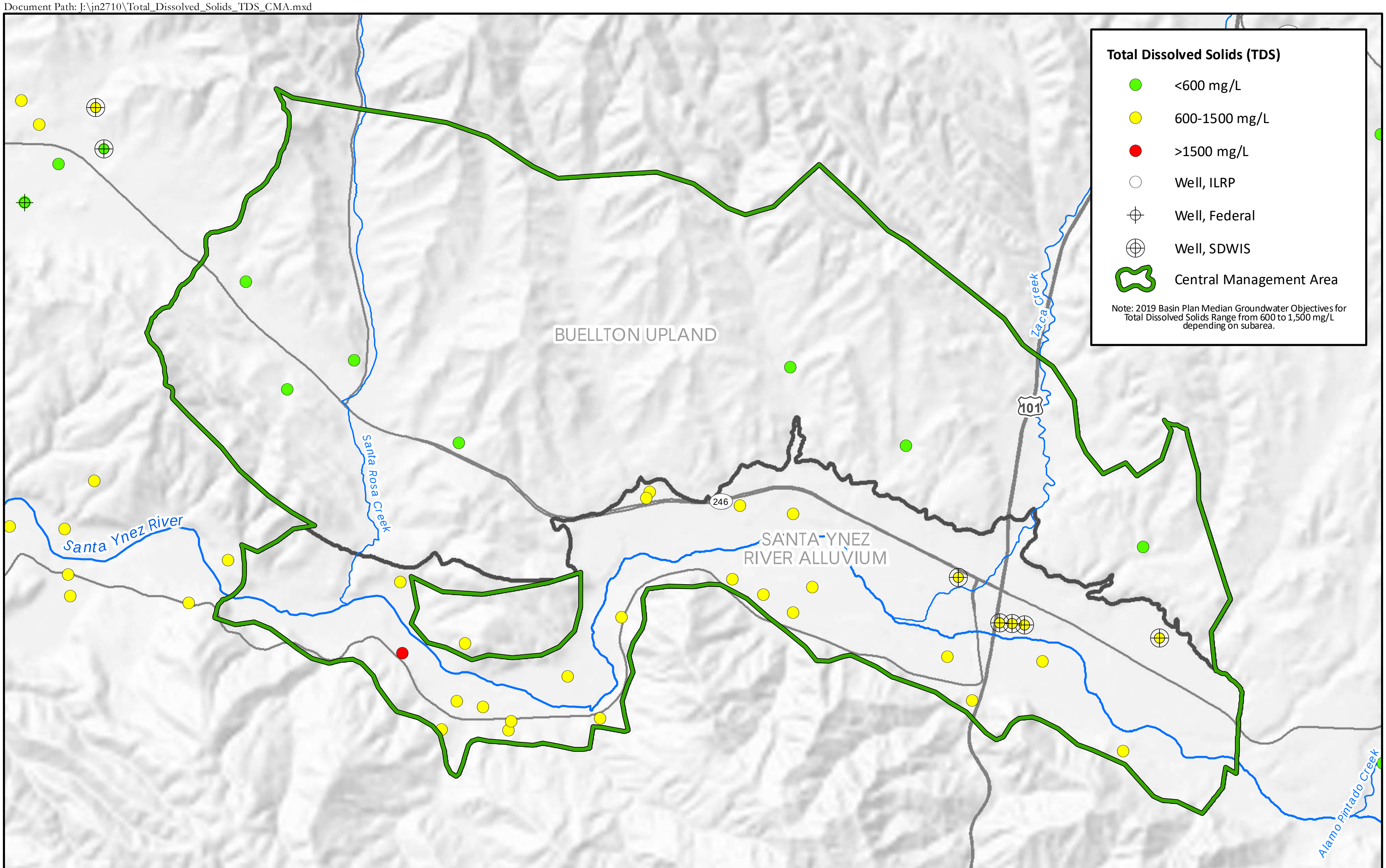

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SALINITY - TOTAL DISSOLVED SOLIDS
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-3

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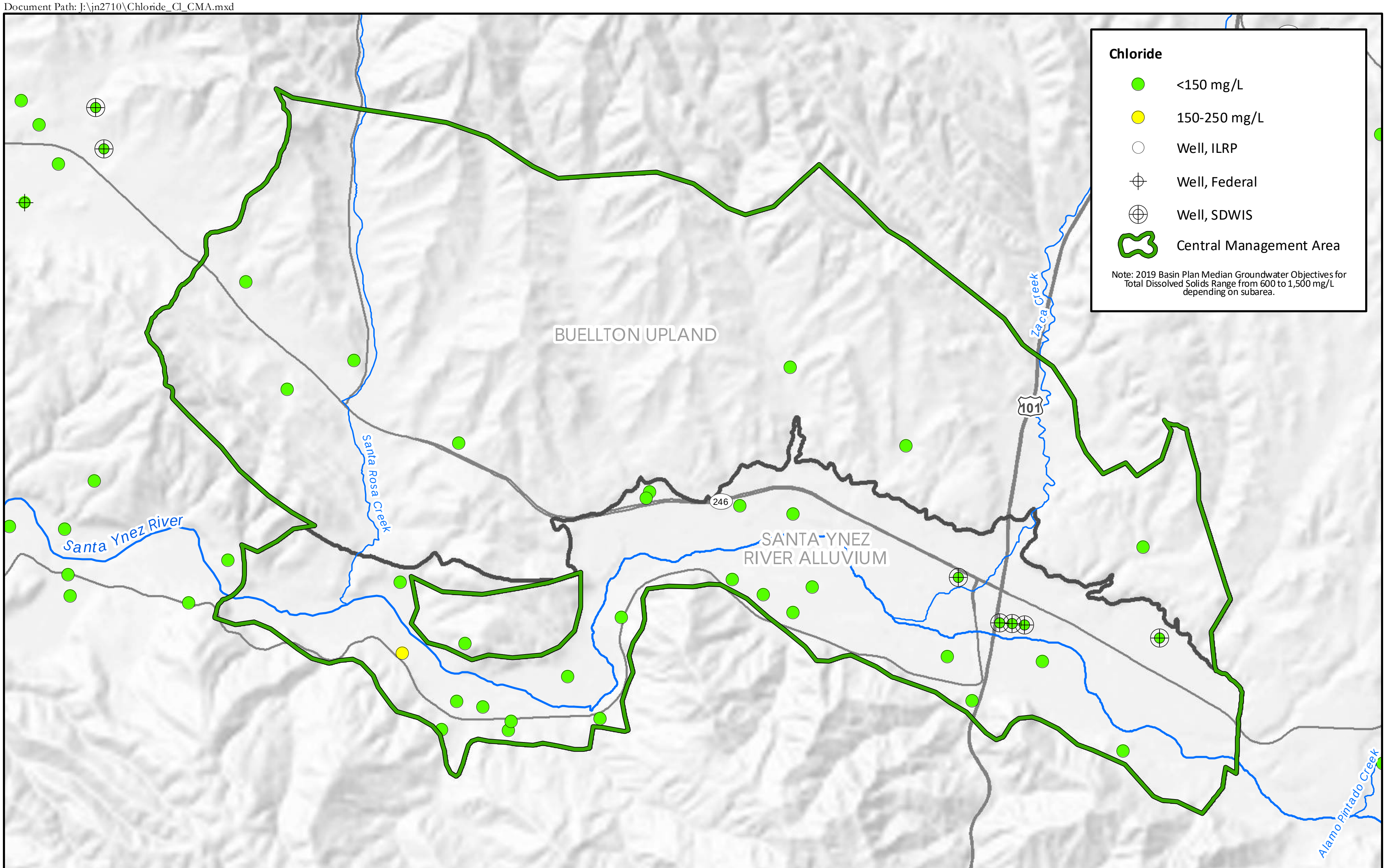

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Groundwater Sustainability Agency

CHLORIDE (CL)
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-4

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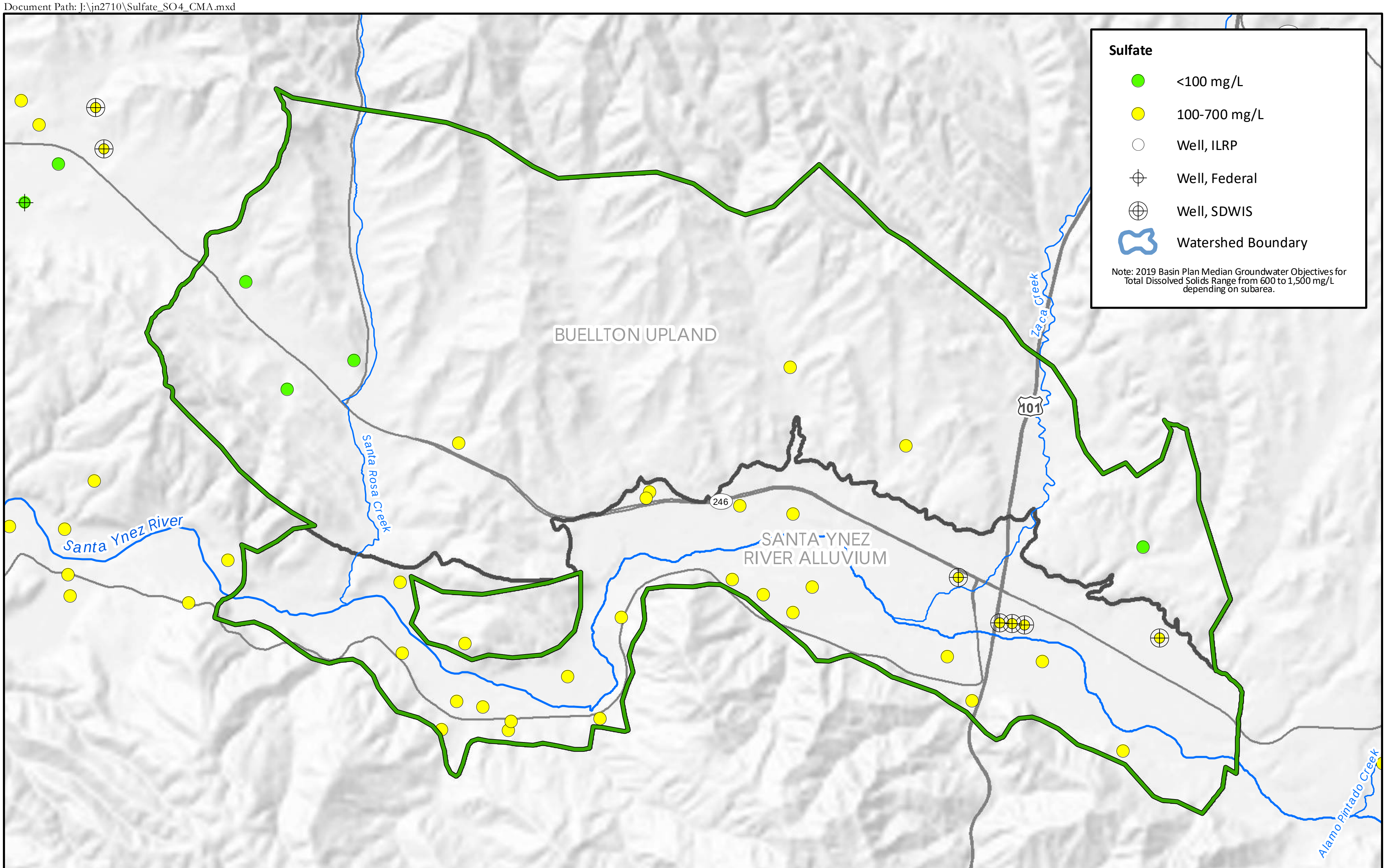

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CMA

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

SULFATE (SO4)
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-5

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2b.3-4-4 Boron

Boron (B) is a trace water quality constituent, and plants have specific tolerance limits for boron concentrations in irrigation water. The 2019 Central Coast Basin Plan's general guidance regarding boron toxicity from irrigation water increases from 500 to 2,000 micrograms per liter (µg/L). Crops in the CMA considered sensitive to boron are beans (750–1,000 µg/L), grapes (500–750 µg/L), strawberries (750–1,000 µg/L), and walnuts (500–750 µg/L) (Hanson et al. 2006). Concentrations above 10,000 µg/L may be toxic to fish.

Concentrations of boron detected in groundwater samples during water years 2015 through 2018 in the CMA are shown on **Figure 2b.3-6**, and a summary of the data is provided in **Table 2b.3-6**. Concentrations of boron in groundwater samples collected during other periods are below 500 µg/L objective in the Buellton Upland, and concentrations of boron in half the samples collected in Santa Ynez River Alluvium exceeded the 500 µg/L objective.

Table 2b.3-6
Summary of Boron Concentrations
in the CMA during Water Years 2015–2018

Subarea	B Average **(µg/L)**	B Minimum **(µg/L)**	B Maximum **(µg/L)**	B WQO **(µg/L)**	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	-	-	-	500	0	0
SYR Alluvium	475	470	480	500	1	0

Note: Non-Detect (ND) Values are Treated as Zero in Calculations.

2b.3-4-5 Sodium

Sodium (Na^{+}) is a mineral cation and a major water quality constituent in natural systems. The 2019 Central Coast Basin Plan indicates the primary concern for sodium in irrigation water is the sodium absorption ratio (SAR). The sodium absorption ratio is the relative concentration of sodium to calcium and magnesium and is managed to maintain soil permeability.

Average concentrations of sodium collected in 105 samples from 33 locations in the CMA during water years 2015 through 2018 are shown on **Figure 2b.3-7**, and a summary of the data is provided in **Table**

2b.3-7. The average concentrations in most wells were below the 2019 Central Coast Basin Plan WQO. Sodium concentrations were generally lower in the Buellton Upland. The highest concentrations were in samples from wells located in the Santa Ynez River Alluvium.

Table 2b.3-7
Summary of Sodium Concentrations
in the CMA during Water Years 2015–2018

Subarea	Na^+ Average (mg/L)	Na^+ Minimum (mg/L)	Na^+ Maximum (mg/L)	Na^+ WQO (mg/L)	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	41	27	69	100	7	0
SYR Alluvium	103	16	399	100	17	9

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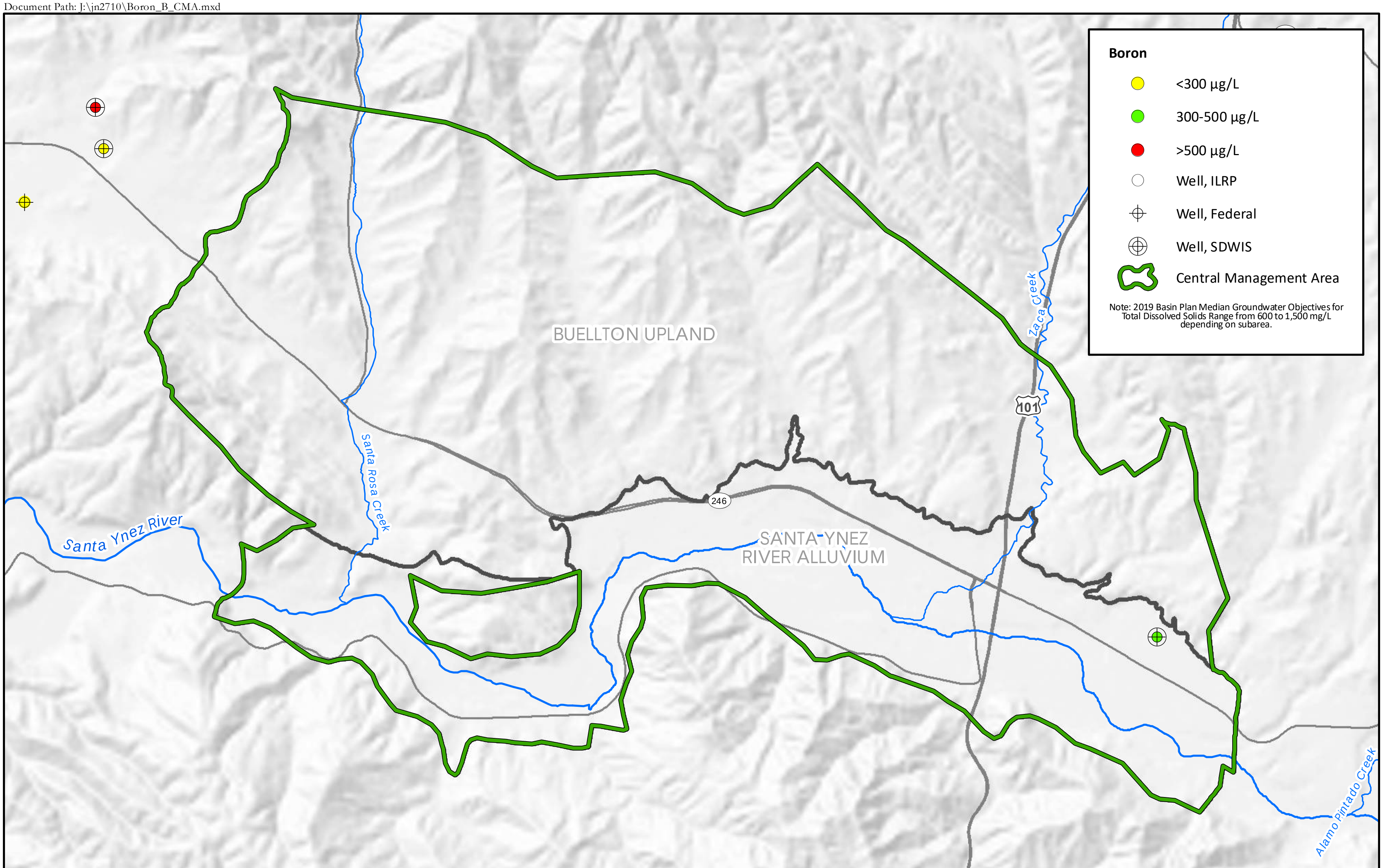

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BORON (B)
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-6

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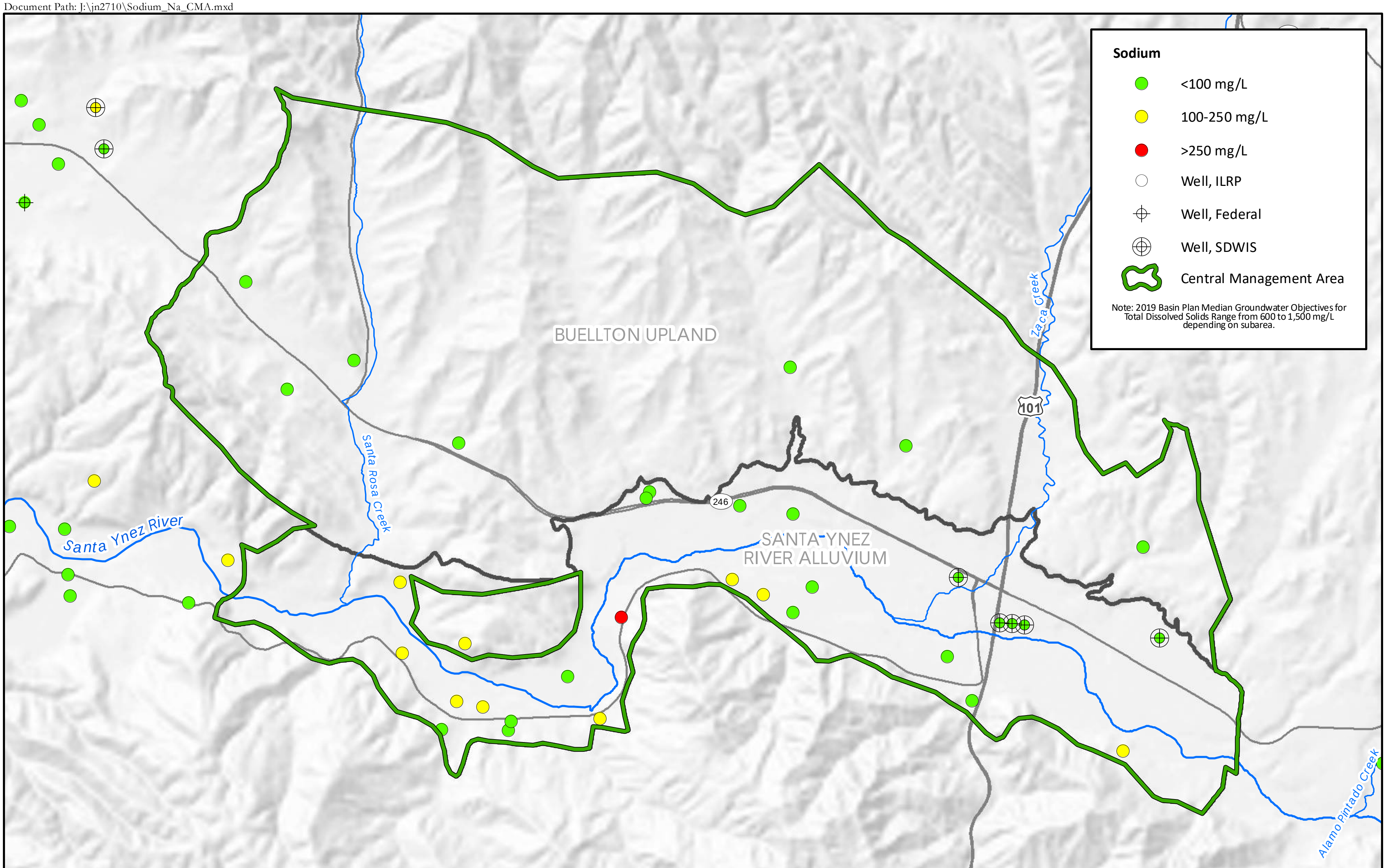

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SODIUM (NA)
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-7

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2b.3-4-6 Nitrate

Nitrogen is the primary atmospheric gas, however its presence in water is related to the breakdown of organic waste. Total nitrogen in groundwater is the sum of organic nitrogen and the three inorganic forms: nitrate (NO_3^-), nitrite (NO_2^-), and ammonia (NH_3). These forms are ubiquitous in nature and come from fixation by microbes in soil and water and by lightning. Sources for high concentrations in water sources include fertilizers, animal and human waste streams, and explosives. Nitrogen and phosphorus are key for life and are found in many fertilizers.

The maximum contaminant limit (MCL) and public health goal is 10 mg/L for combined nitrate plus nitrite as nitrogen (Banks et al. 2018). The 2019 Central Coast Basin Plan indicates increasing problems for irrigation of sensitive crops if nitrate as nitrogen is between 5 and 30 mg/L, and problems for livestock watering if nitrate plus nitrite as nitrogen exceeds 100 mg/L.

Nitrate concentrations are reported either as nitrate (the full mass of the nitrate anion), or as nitrogen (the mass of the nitrogen). For this study all values have been converted to nitrate as nitrogen. The best available data and coverage for nitrogen within the CMA for recent years is from ILRP, which measures and reports combined nitrate-nitrite values. In the CMA, measurements of nitrate concentrations are significantly greater than nitrite, so combined nitrate-nitrite are approximately equal to nitrate alone.

Average concentrations of nitrate in 126 groundwater samples collected at 34 locations during water years 2015 through 2018 are shown on **Figure 2b.3-8**, and a summary of the data is provided in **Table 2b.3-8**. High nitrate concentrations are found throughout the CMA. The lowest concentrations of nitrate are measured in samples from wells located in the Santa Ynez River Alluvium.

Table 2b.3-8
Summary of Nitrate as Nitrogen
in the CMA during Water Years 2015–2018

Subarea	NO_3 as N Average (mg/L)	NO_3 as N Minimum (mg/L)	NO_3 as N Maximum (mg/L)	NO_3-NO_2 as N WQO (mg/L)	Wells Below WQO (count)	Wells Above WQO (count)
Buellton Upland	3.489	0.100	34.200	1	3	10
SYR Alluvium	5.781	ND	239.000	1	15	17

2b.3-4-7 Historical Trends

Historical water quality trends in the CMA have been analyzed with available historical data from 1980 to present in California's Groundwater Ambient Monitoring Assessment (GAMA) program (Haas et al. 2019). Mixed trends were noted in the CMA for the identified constituents in the 2019 Central Coast Basin Plan (TDS, sulfate, and nitrate) and no trends for additional constituents (arsenic, hexavalent chromium, iron and manganese)[85]. The mixed nature of these trends is most likely to various natural and manmade sources (Haas et al. 2019).

These baseline water quality data are provided as a snapshot of current conditions. The responsibility of regulating water quality lies with other existing agencies and programs, and a goal of the CMA GSP will be to not significantly and unreasonably influence existing (background) water quality conditions. Future monitoring is discussed in the Monitoring Network (Section 3a) and protective targets are discussed in Sustainable Management Criteria (Section 3b). Hence, future groundwater management actions implemented by the CMA will not interfere with other agencies objectives or responsibility to manage, maintain, or improve water quality.

85 Figures 20-26 (Haas et al. 2019)

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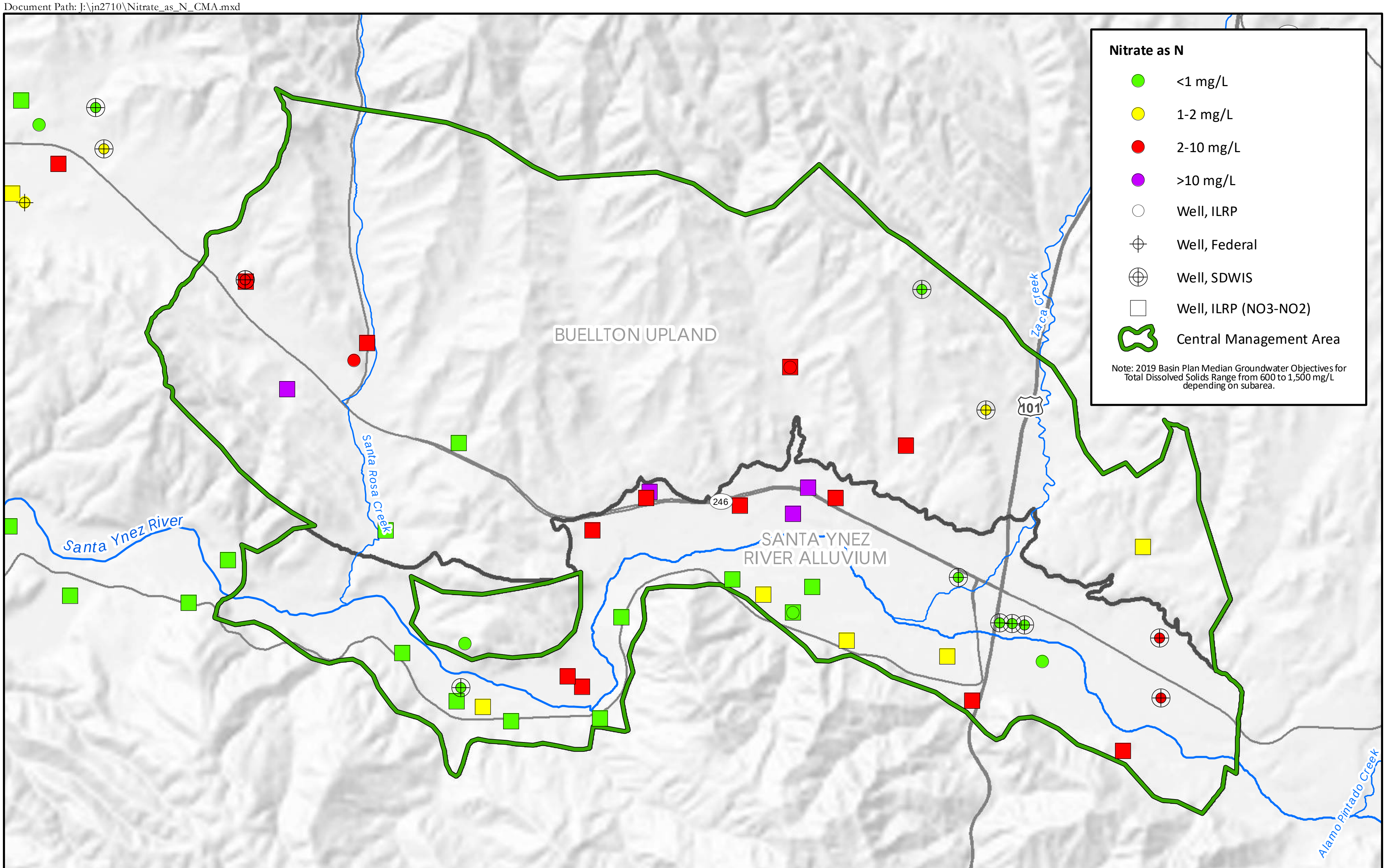

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NITRATE AS NITROGEN (NO3 AS N)
AVERAGE WY 2015 - 2018
CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources: Federal Water Quality Database (2020), Safe Drinking Water Information System (2020), Irrigated Lands Regulatory Program (2020), USGS National Elevation Dataset, 2002

FIGURE 2b.3-8

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2B.4 SEAWATER INTRUSION

The CMA is an inland management area of the Basin and is not directly connected to the Pacific Ocean and therefore, seawater intrusion is not an applicable sustainability indicator for establishing sustainable management criteria for the CMA.

2B.5 LAND SUBSIDENCE

The fifth sustainability indicator, land subsidence, is evaluated within the CMA in this section. SGMA requires evaluation of the "extent, cumulative total, and annual rate of land subsidence, including maps depicting total subsidence,"[86] with the overall goal of avoiding the undesirable result of "significant and unreasonable land subsidence that substantially interferes with surface land uses" as a result of changing groundwater conditions throughout the Basin.[87] Land subsidence is not an issue of concern in the CMA as discussed in more detail below. The USGS land subsidence map of California does not include any portion of the SYRVGB.[88]

Land subsidence may result from tectonic forces or the extraction of oil, gas and water. Land subsidence resulting from groundwater use and aquifer deformation (the action or process of changing in shape or distorting, especially through the application of pressure) may be of two kinds: elastic or inelastic.

Elastic deformation occurs from the compression and expansion of sediments due to pore pressure changes that occur with fluctuations in groundwater elevations (Borchers and Carpenter 2014). Therefore, elastic deformation may be cyclical in nature corresponding to seasonal groundwater recharge or groundwater discharge or extraction. Elastic deformation does not result in permanent loss of pore space or land subsidence.

Inelastic deformation may result in irreversible land subsidence and is commonly related to groundwater discharge or extraction from fine-grained sediments within clay or silt aquitards (Borchers and Carpenter 2014). Permanent land subsidence related to groundwater withdrawal generally occurs in an aquifer when groundwater elevations and changes in groundwater storage consistently decrease falling below historical seasonal and longer-term ranges. The resulting combination of increased pressure from the weight of the overlying sediments (overburden stress) and reduction in hydraulic pressure within the

86 23 CCR § 354.16(e). The extent, cumulative total, and annual rate of land subsidence, including maps depicting total subsidence, utilizing data available from the Department, as specified in Section 353.2, or the best available information.

87 CWC Section 10721(x)(5). Significant and unreasonable land subsidence that substantially interferes with surface land uses.

88 USGS, Areas of Land Subsidence Web Application. https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html. Accessed 2021-07-08.

aquifer (pore pressure) essentially squeezes the water out of the compressible clay beds within the aquifer system. This type of deformation is irreversible and represents a permanent loss in aquifer storage.

2b.5-1 Geologic Setting

The HCM (Section 2a) introduces the geologic setting, units, and extents, which are discussed relative to their potential influence on land subsidence. Generally, fine-grained sediments are susceptible to inelastic deformation. Inelastic compaction of coarse-grained sediment is usually negligible (Borchers and Carpenter 2014). The principal aquifers of the CMA and WMA are primarily coarser material and not subject to a significant risk of land subsidence. Previous studies of well logs in the regional aquifers in the Basin indicate 40 to 70 percent coarse grained material in the Santa Ynez River Alluvium deposits (HCI 1997).

2b.5-1-1 Tectonic Movement

Tectonic movement is a potential source for land surface elevation changes within the CMA. The Basin is within the Transverse Range geomorphic province of California, a tectonically active region of California. Rapid uplift is occurring in places within the Transverse Range, such as in the Santa Ynez Mountains, where uplift is estimated at approximately 2 millimeters per year (Hammond et al. 2018). Likewise, in tectonically active areas where uplift is occurring, subsidence may also be observed in response to fault motion. However, this type of subsidence is not influenced by groundwater use or water resource management actions in the CMA.

2b.5-2 Historical Records

There is little or no documentation of physical evidence of subsidence such as well casing failure, infrastructure disruption, or earth fissures within the CMA. The risk of future significant impacts is low because long-term groundwater levels have been mostly static.

The Caltrans (District 5), Department of Water Resources (DWR), and Santa Ynez River Water Conservation District have not observed or reported infrastructure failures due to land subsidence within the Basin for the past 100 years (Appendix 2b-A, Dudek, 2020). Staff from the City of Solvang Public Works

Department are not aware of any land subsidence issues throughout the Santa Ynez Valley (M. van der Linden, personal communication, August 12, 2020; Appendix 2b-A, Dudek, 2020). John Brady of the Central Coast Water Authority (CCWA) engineering department reported that since the 27-mile long CCWA pipeline (see Figure 2a.3-9, HCM) was built in 1990 there have been no triggers of the isolation valves and, in his opinion, there has been no groundwater related land subsidence in the area (Appendix 2b-A Dudek, 2020).

2b.5-3 Remote Sensing Data

Remote sensing data from Interferometric Synthetic Aperture Radar (InSAR) for January 2015 through September 2019 is available from DWR. Over this time period, land surface elevation changes have ranged from an estimated increase of 0.5 inch to a decrease of 0.5 inch (**Figure 2b.5-1**), although vertical accuracy of InSAR data is around 0.61 inches (Towill, 2020). The elevation changes mapped in Figure 2b.5-1 indicate that about a third of the area in the CMA actually increased in elevation. The area that increased in elevation includes the area around the City of Buellton and along the Santa Ynez River, which are the areas with the most groundwater pumping, which is further evidence that land subsidence is currently not a problem in the CMA. Appendix 2b-A includes detailed maps of the remote sensing dataset.

2b.5-4 Continuous Global Positioning System Data

USGS continuous global positioning system (CGPS) station (BUEG) was installed near the city of Buellton and has been collecting horizontal and vertical displacement data since January 2015 as shown on Figure **2b.5-2**. This indicates very little vertical change over this time, with the biggest changes (of approximately 20 mm, or 0.78 inches) due to manual updates.

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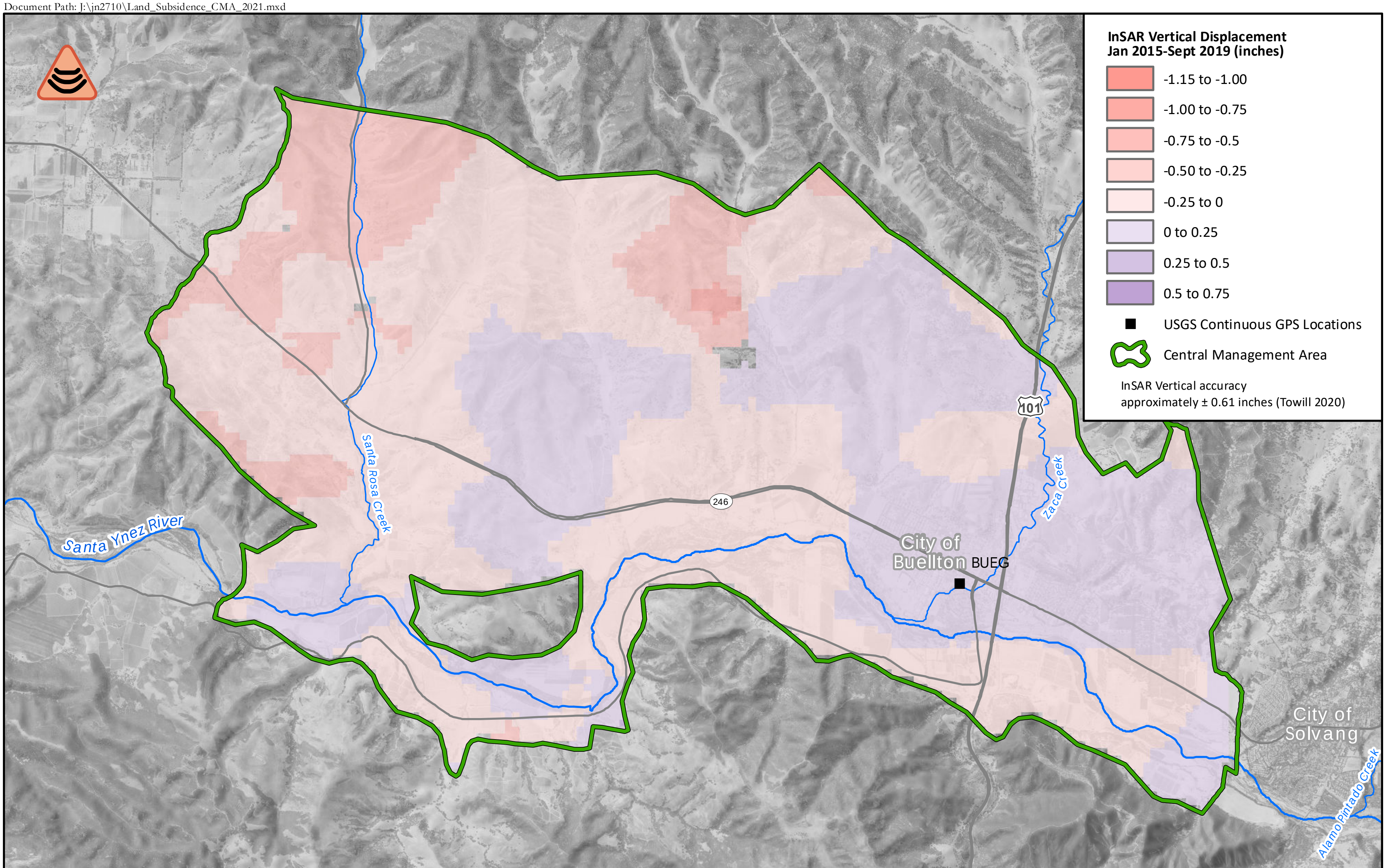

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LAND SUBSIDENCE
JANUARY 2015 TO SEPTEMBER 2019
INSAR DATA
WITHIN CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)
Dudek (2020), DWR (2020)

FIGURE 2b.5-1

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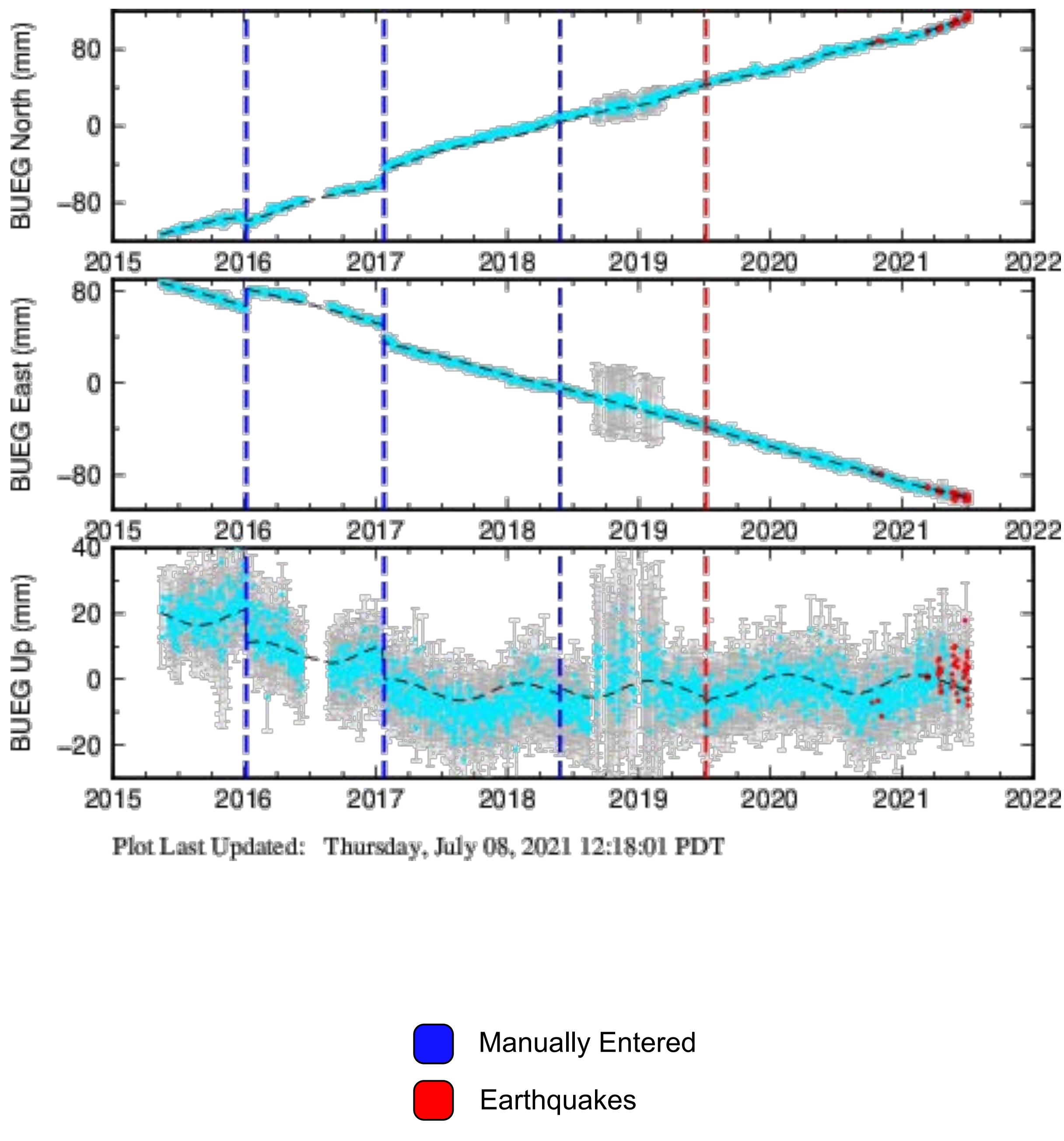

Source: Murray, J.R. and Svarc, J. (2017), Global Positioning System data collection,processing, and analysis conducted by the U.S. Geological Survey Earthquake Hazards Program, Seismol. Res. Lett., doi:10.1785/0220160204.

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CONTINUOUS GLOBAL POSITIONING SYSTEM
BUEG STATION TRENDS

I:\DATA\2710\Analyses\2021-07 CGPS Land Subsidence

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2B.6 INTERCONNECTED SURFACE WATER AND GROUNDWATER DEPENDENT ECOSYSTEMS

The sixth sustainability indicator, depletion of interconnected surface water, is addressed in this section. The various beneficial uses of surface water and groundwater are presented in Section 2a.4 and 2b.3 and include various natural environments that rely on surface water and groundwater.

In accordance with SGMA, "interconnected surface water" is defined as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted."[89] In this section, surface waters within the CMA that potentially meet this definition are identified. In addition, SGMA regulations require Groundwater Dependent Ecosystems (GDEs) be identified[90] as part of the description of groundwater conditions. GDEs are ecological communities or species that depend on groundwater emerging from aquifers or rely on groundwater occurring near the ground surface. Hence, GDEs are considered and discussed below because they could be influenced by chronic lowering of groundwater levels (second sustainability indicator) and depletions of interconnected surface water.

2b.6-1 Current Surface Water Conditions

In the CMA, the Santa Ynez River is gaged at several locations (**Figure 2b.6-1**) which shows river flows through the CMA have a strong seasonal pattern (**Figure 2b.6-2**). Currently there are no active USGS stream gages within the CMA boundaries, however there are three active USGS stream gages located up and downstream from the CMA (Figure 2b.6-1). The USGS Solvang Gage (ID No. 11128500) measures the flow of Santa Ynez River entering the CMA. **Table 2b.6-1** indicates that the gaged flows into the CMA entirely ceased during 13 of the past 20 years.

89 23 CCR § 351 (o) "Interconnected surface water" refers to surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.

90 23 CCR § 354.16 (g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.

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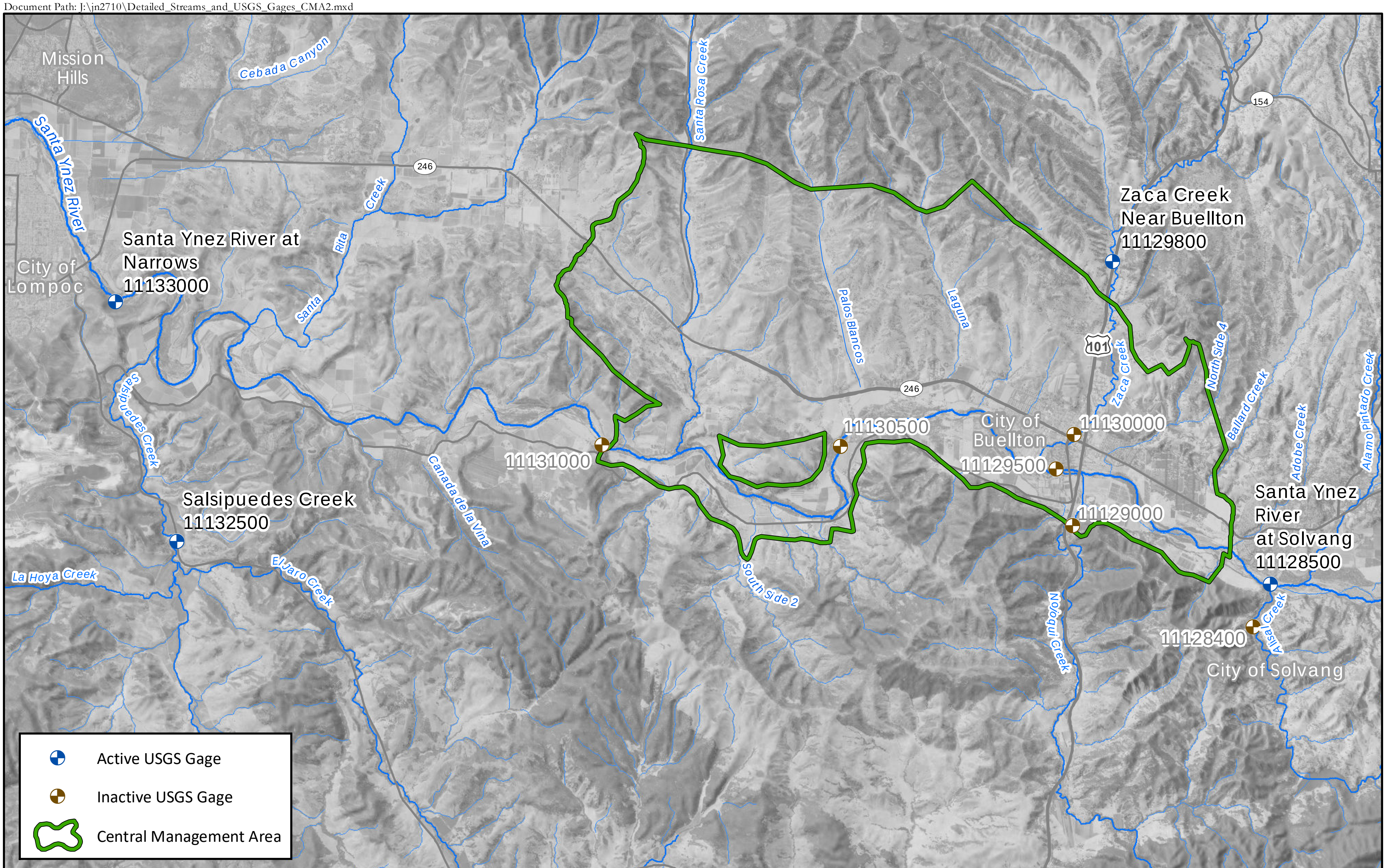

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DETAILED STREAMS AND USGS GAGES
CENTRAL MANAGEMENT AREA

0 0.75 1.5 Miles

Source: USGS Gages 2011

N

FIGURE 2b.6-1

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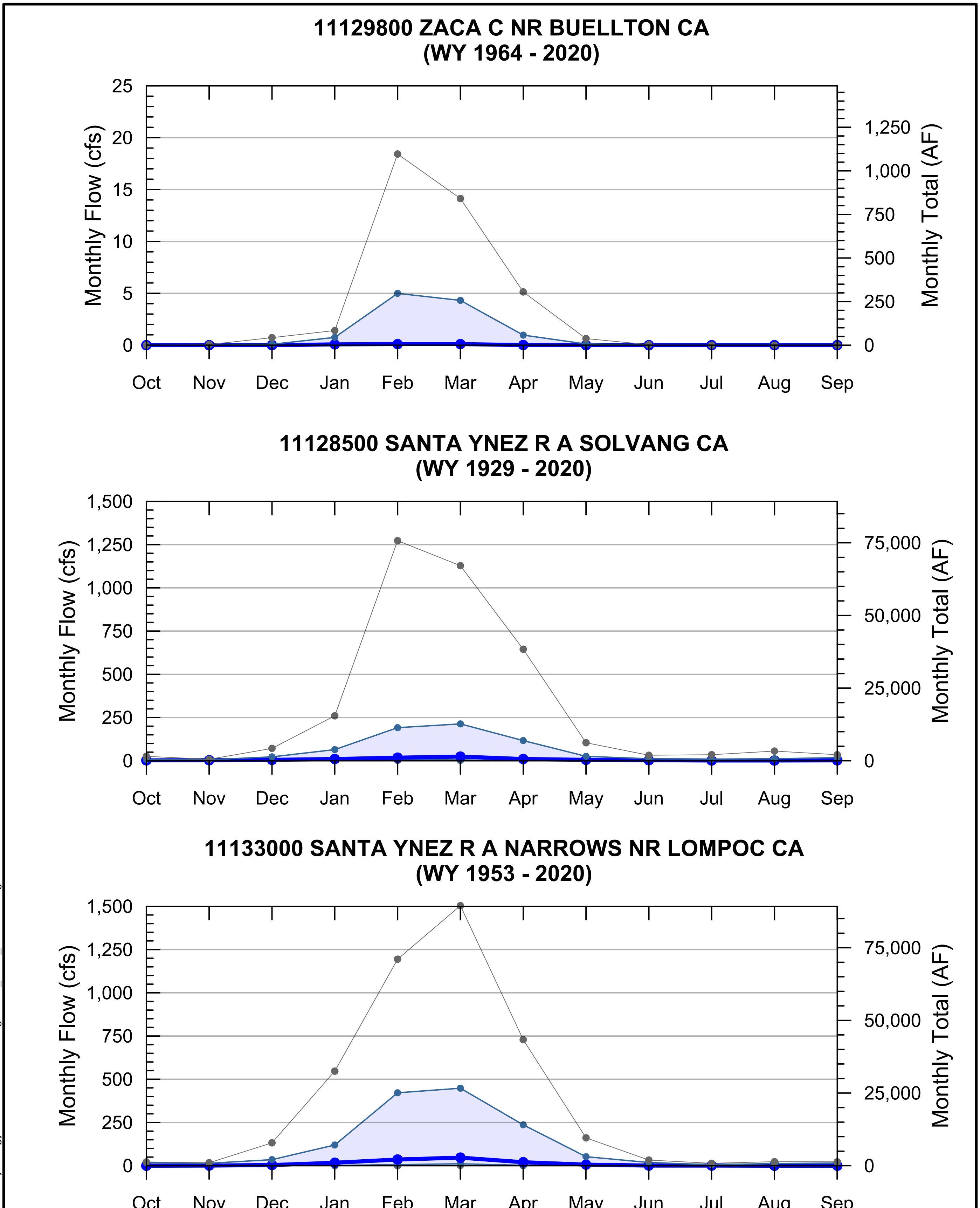
FIGURE 2b.6-2



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MONTHLY FLOW STATISTICS
SANTA YNEZ RIVER

Data Source: USGS (2020) streamflow data

I:\DATA\2564\Data\Surface Water Hydrology\USGS Streamflow\Fig 05 AR_River_v20161026.grf M. McCammon

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Santa Ynez River flows in the CMA are substantially influenced by upstream dam and reservoir operations. Surface flows will exist during water rights releases as described in the HCM (Section 2a.3-4-2-1). Water rights releases are typically made during the months of July through October when flows at Buellton would otherwise not exist. In addition, during above-normal and wet year types, flow targets ranging from 5 to 48 cubic feet per second (cfs) are to be maintained at the Solvang gage for endangered steelhead (*O. mykiss*) by the U. S. Bureau of Reclamation pursuant to SWRCB WR 2019-0148 (see HCM Section 2a.5).

Table 2b.6-1
Annual Minimum Gaged Flows of the Santa Ynez River in the CMA

Water Year	Minimum Flow at Solvang (USGS Gage 11128500) cubic-feet/second	Minimum Flow at Lompoc Narrows (USGS Gage 11133000) cubic-feet/second	Spill from Cachuma Reservoir acre-feet/year	Hydrologic Year Type [A]
2001	3.2	1.3	112,313	Wet
2002	0	0	0	Dry
2003	0	0	0	Below Normal
2004	0	0	0	Dry
2005	3.07	1.5	260,078	Wet
2006	2.7	0.5	62,869	Above Normal
2007	0	0	0	Critical
2008	0.67	0	22,994	Above Normal
2009	1.02	0	0	Dry
2010	0	0	0	Below Normal
2011	4.71	1.8	85,755	Wet
2012	1.3	0	0	Dry
2013	0	0	0	Critical
2014	0	0	0	Critical
2015	0	0	0	Critical
2016	0	0	0	Dry
2017	0	0	0	Above Normal
2018	0	0	0	Dry
2019	0	0	0	Above Normal
2020	0	0	0	Below Normal

Note: [A] Based on Hydrologic Year Type Classification in SWRCB Order 2019-0148, based on Lake Cachuma inflow, which also correspond to the classification using Salsipuedes Creek gage. Water Year 2010 is classified Below Normal in the lower watershed (Salsipuedes Creek gage) and Above Normal in the upper watershed (Lake Cachuma inflow).

Cachuma Inflow acre-feet/year (afy)	Classification

<4,550 afy	Critical
4,551 - 15,366 afy	Dry
15,367 - 33,707 afy	Below Normal
33,708 - 117,842 afy	Above Normal
>117,842 afy	Wet

2b.6-2 Interconnected Surface Water for the Santa Ynez River

The Santa Ynez River Alluvium lays unconformably on or beside either the non-water bearing sediments of the consolidated Monterey Shale and Sisquoc Formations or the low permeability Careaga Formation. 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 (Section 2a.5-1). Because the underflow of the Santa Ynez River is considered part of the surface water flowing in a known and definite channel and not groundwater as defined by SGMA (Appendix 1d-B), there is no interconnected surface water in the CMA. As illustrated in **Figure 2b.6-3**, the degree that surface water is interconnected to groundwater is unknown east of the Buellton bend because the extents of the underflow deposits, which may inhibit the connection, is unknown. The extent of the Buellton Aquifer underneath the underflow deposits east of the Buellton Bend, and the quantity and timing of water flowing from the Buellton Aquifer to the underflow deposits of the Santa Ynez River and indirectly to the surface flow is a data gap. The potential effect of groundwater pumping on surface flow relative to pre-2015 conditions is expected to be minimal because the flow from the Buellton Aquifer must flow through the underflow deposits before reaching the river which is regulated by the SWRCB. Data gaps, including the extent of the Buellton Aquifer underneath the underflow deposits and the potential depletion of surface flow due to pumping in the Buellton Aquifer, are being addressed in the Chapter 3 Monitoring and Chapter 5 Implementation. Results of the geophysical AEM data study are planned to become available in the first year of implementation of the plan in 2022. This AEM study will be used to better define the geologic structure in this area east of Buellton Bend. Also, as part of implementation, additional streamflow data will be collected to update the HCM.

The Santa Ynez River surface water and underflows are within the jurisdiction and regulated by the SWRCB for the reach of the Santa Ynez River in the CMA and will not be managed under SGMA by the CMA GSA.

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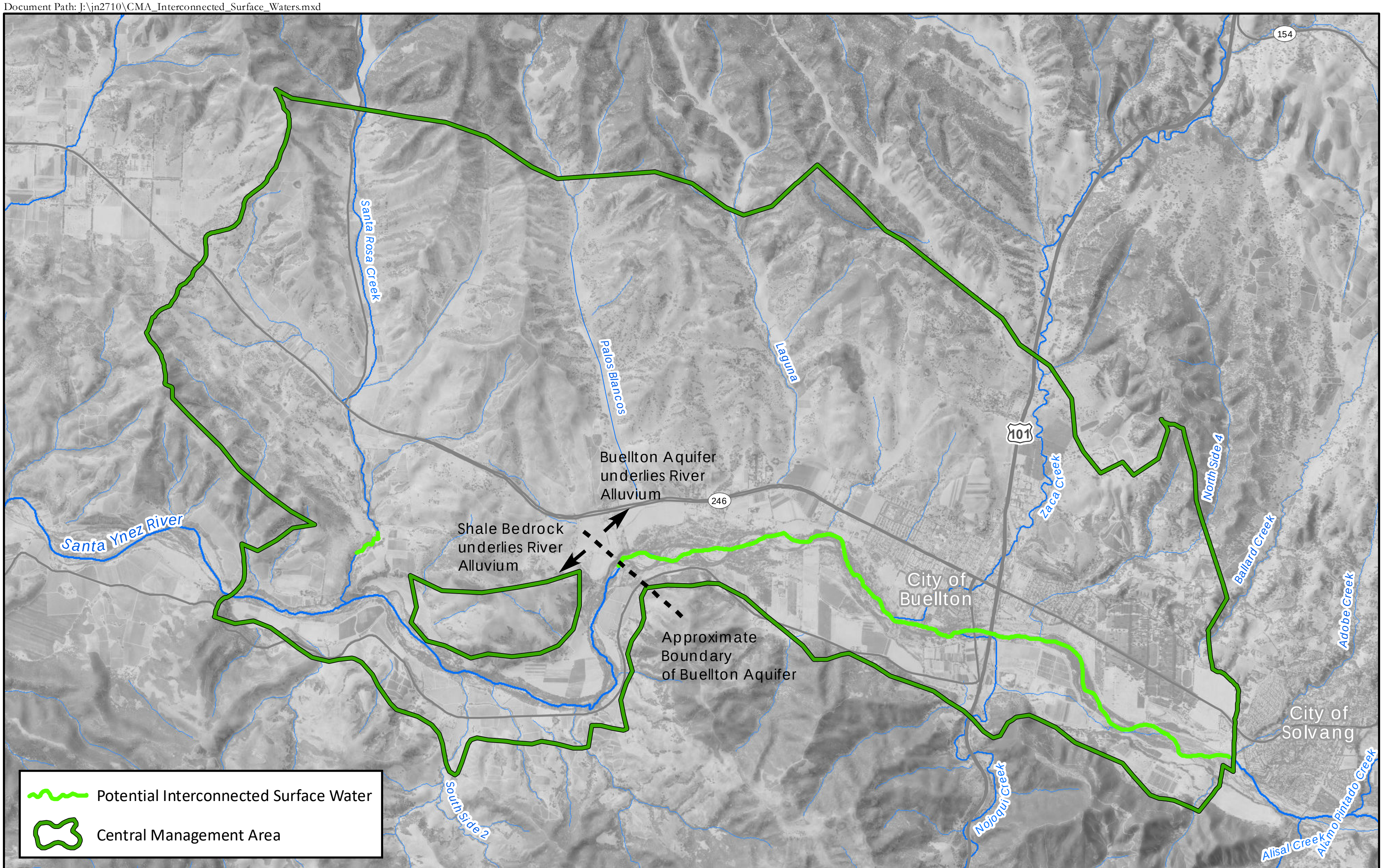

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INTERCONNECTED SURFACE WATERS
IN THE CENTRAL MANAGEMENT AREA

FIGURE 2b.6-3

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Diversions from the Santa Ynez River Alluvium are subject to SWRCB regulation which considers it the same as surface water diversions. As described in the HCM (Section 2a), the Santa Ynez River Alluvium is recharged from the surface water of the river.

2b.6-3 Interconnected Surface Water for Tributaries to the Santa Ynez River

All tributaries within the CMA (Figure 2b.6-1) are ephemeral. As shown on Figure 2b.6-2, Zaca Creek, the largest CMA tributary, has no measurable flow during half of the period of record. Most flow occurs in wet and above normal years between February to March, with no flow between June to November. This indicates these tributaries are "completely depleted"[91] during part of the year and do not meet the SGMA definition for interconnected surface water. As shown in the HCM (HCM Figure 2a.5-2) there are no identified springs associated with these tributaries.

Interconnected surface water may be present in one area of the CMA near the confluence of Santa Rosa Creek and the Santa Ynez River as shown on Figure 2b.6-3. GDEs are mapped on the distal end of Santa Rosa Creek. The lack of well and stream gage data at this location limits the GSA ability to evaluate the groundwater-surface-water connection and the associated GDEs in this area. This data gap is being addressed in the Chapter 3 Monitoring and Chapter 5 Implementation. Additional water level data will be collected from existing wells, and new piezometers may be drilled to evaluate the groundwater-surface water connection in this area.

2b.6-4 Groundwater Dependent Ecosystems in the Central Management Area

SGMA statute identifies addressing GDEs as a potential additional plan element.[92] SGMA defines GDEs as "ecological communities of species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface."[93]In some settings, groundwater can be critical to

[91] 23 CCR § 351 (o)

[92] CWC Section 10727.4 Additional Plan Elements: "where appropriate […] (l) Impacts on groundwater dependent ecosystems."

[93] 23 CCR § 351 (m) "Groundwater dependent ecosystem" refers to ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface.

sustaining springs, wetlands, and perennial flow (baseflow) in streams, as well as to sustaining vegetation such as phreatophytes that directly tap groundwater through their root systems.

Mapping of California Department of Water Resources' Natural Communities Commonly Associated with Groundwater dataset indicates most potentially sensitive ecological habitats within the CMA are located along the Santa Ynez River. As described in the HCM (Section 2a), these habitats are dependent on underflow of the Santa Ynez River (HCM Figure 2a.4-4) and not substantively on groundwater from the Buellton Basin. The recent SWRCB Order WR 2019-0148 states (pg. 2):

> The Santa Ynez River provides habitat for the Southern California Distinct Population Segment (DPS) of steelhead trout (*Oncorhynchus mykiss*) (steelhead), which is listed as an endangered species under the federal Endangered Species Act (ESA). (16 U.S.C. §§ 1531-1544.) The Cachuma Project has adversely affected the steelhead fishery by blocking access to the majority of suitable spawning and rearing habitat upstream, and by modifying flows in the mainstem of the lower Santa Ynez River (mainstem) below Bradbury Dam to the point that the survival of the species is uncertain. (E.g., NOAA-12, p. 6.) Currently, Reclamation operates and maintains Bradbury Dam on the Santa Ynez River in accordance with a Biological Opinion issued by the National Marine Fisheries Service (NMFS) on September 11, 2000 (2000 Biological Opinion) pursuant to section 7 of the federal ESA. (16 U.S.C. § 1536.)

SWRCB Order WR 2019-0148 requires additional releases from Cachuma Reservoir beyond the 2000 Biological Opinion (NMFS 2000) to protect steelhead (*O. mykiss*). In addition to the endangered steelhead trout species, riparian habitat along the lower Santa Ynez River also supports a great diversity of aquatic non-fish and terrestrial wildlife species (SWRCB 2019).

Historical impacts to GDEs along the Santa Ynez River were evaluated as part of the SWRCB Cachuma Project Water Rights hearings (Jones and Stokes 2000). The SWRCB Final Environmental Impact Report (SWRCB 2011) summarized the findings as follows:

> Jones & Stokes (2000) observed that, even in dry years, groundwater levels in the basin remained less than 10 feet below the channel thalweg along most of the river and remained at relatively constant depths below the ground surface on the banks of the river. The groundwater has been maintained at depths suitable to support mature phreatophytic plants (such as willows and cottonwoods), in combination with winter flows.

Jones & Stokes (2000) concluded that the operations of the Cachuma Project since 1973 have not altered groundwater conditions in a manner that adversely affects riparian vegetation.

Based on this study by Jones and Stokes (2000), habitats along the Santa Ynez River are not currently considered vulnerable due to pumping in the Santa Ynez River Alluvium, due in part to water rights releases under the SWRCB Order WR 2019-0148 for the Cachuma Project and the resulting stable groundwater levels. Moreover, as explained above, the Alluvium's underflow is not considered groundwater as defined by SGMA.

Potential GDEs have been mapped by the California Department of Water Resources, the California Department of Fish and Wildlife, and The Nature Conservancy along the tributaries of the CMA (Figure 2a.4-4, HCM), including the ephemeral tributaries in the Buellton Upland north of the Santa Ynez River, including Dry Creek, Santa Rosa Creek, Cañada de Palos Blancos, and Cañada de Laguna Creek, and Zaca Creek. These were assessed into three categories based on the relationship to the aquifer (**Figure 2b.6-4**). If depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems (Rohde et al. 2018), the potential GDE was identified as unlikely to be affected by groundwater management (Category C on Figure 2b.6-4). Riparian areas of the Santa Ynez River were identified as being within the jurisdiction of and regulated by the SWRCB as part of Santa Ynez River surface and underflow (Category B on Figure 2b.6-4). The remaining area consists of GDEs likely related to groundwater levels (Category A on Figure 2b.6-4). The only Category A GDE is located on the distal end of Santa Rosa Creek, near the confluence with the Santa Ynez River (Figure 2b.6-4). The lack of well data or a stream gage at this location limits the GSA ability to evaluate current conditions related to the groundwater-surface-water connection and the associated GDEs in this area. This data gap will be addressed during plan implementation. In addition, part of the Category B GDEs that overlies the Buellton Aquifer (east of Buellton Bend) may have some influence from the Buellton Aquifer water levels (807 acres, Table 2b.6-2). This area can also be grouped with the Category A to form the potential GDEs. **Table 2b.6-2** below summarizes the land areas involved.

Table 2b.6-2
Potential CMA Groundwater Dependent Ecosystem Categorization.

Category	Description	Acres	Percentage
A	Potential GDE Associated with a Principal Aquifer	11	0.6%
B	Riparian vegetation not subject to SGMA	1223	70.5%
C	Unlikely to be Affected by Groundwater Management	501	28.9%
Potential GDE	Category B over Buellton Aquifer	807	46.5%
Total		1,735	100%

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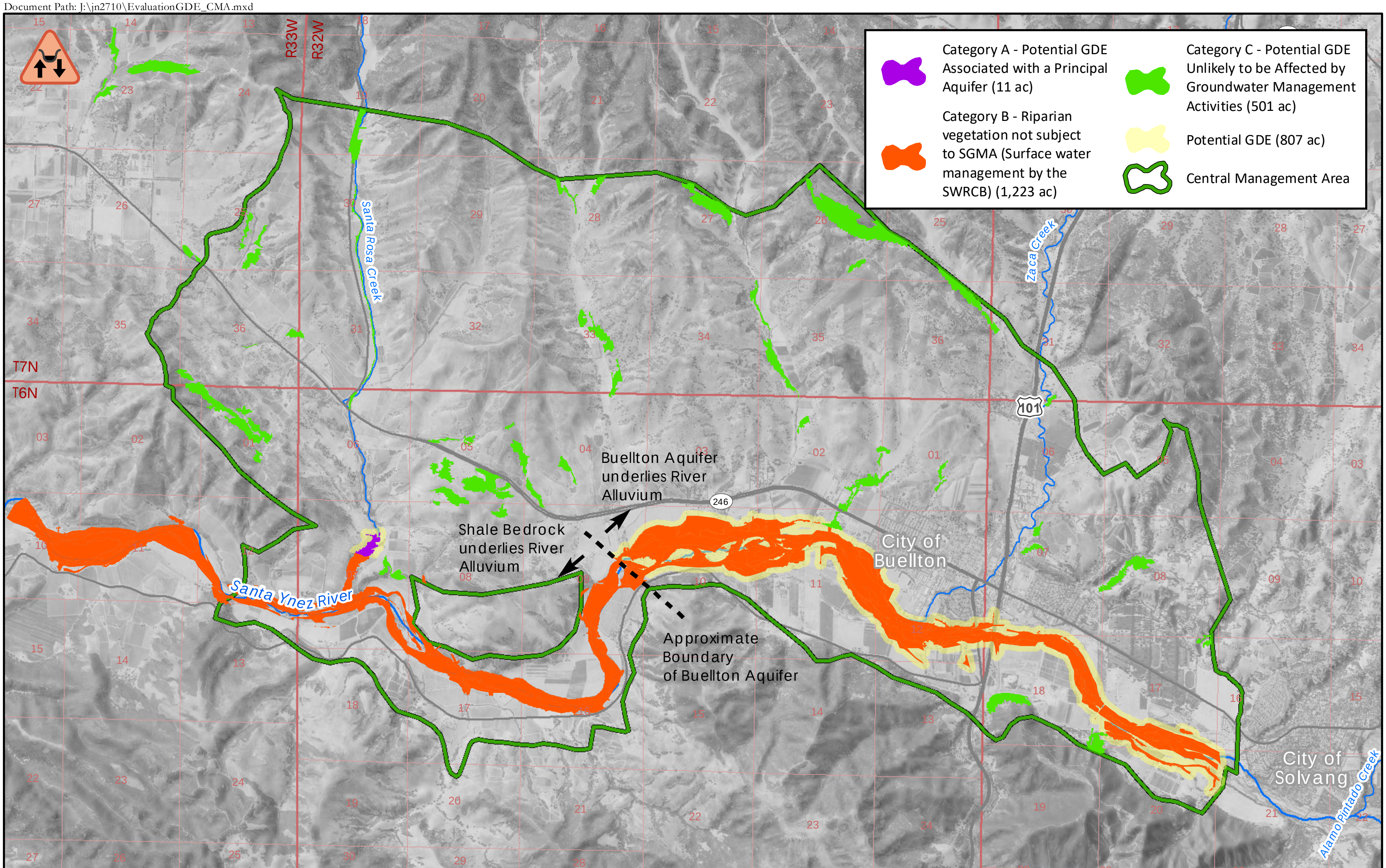

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EVALUATION OF GROUNDWATER DEPENDENT ECOSYSTEMS

FIGURE 2b.6-4

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SECTION 2C – WATER BUDGET

The Sustainable Groundwater Management Act (SGMA) requires that a Groundwater Sustainability Plan (GSP) include: "a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored."[94] This section describes the water budget within the Central Management Area (CMA) of the Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB).

A water budget is an accounting tool that quantifies inflows (sources) and outflows (sinks) occurring within a groundwater basin (or specified management area) using the following equation:

Inflows – Outflows = Change in Storage

The water budget is a key component of overall understanding of the Basin and contributes to developing the following GSP elements:

- Identifying data gaps
- Evaluating monitoring requirements
- Evaluating potential projects and management actions
- Estimating the sustainable yield
- Evaluating undesirable results (negative impacts)
- Informing water management decision making

Annual water budget components for the historical period (1982 through 2018) were assembled, compiled, and summarized. Total inflow and outflow components are presented in the water budgets for the historical data period (1982 through 2018), "current conditions" (2011 through 2018), and "projected conditions" (2018 through 2072). These data are evaluated to identify potential long-term trends in groundwater basin supply and demand and estimates of inflows and outflows and groundwater storage

94 23 CCR § 354.18.

changes. The results support interpretation of trends in measured water levels in wells, and a preliminary estimate of sustainable yield based on the perennial or safe yield.

Perennial yield, also referred to as safe yield, is defined as a long-term average annual amount of water which can be withdrawn from a basin under specified operating conditions without inducing a long-term progressive drop in water levels (Stetson 1992). The estimated perennial yield for the base period is calculated as follows:

Perennial Yield = Average Annual Pumping + Average Annual Change in Storage

Perennial yield can also be defined as pumping but that does not impact the physical or chemical integrity of the groundwater, but as used here relates only to the chronic lowering of groundwater levels for a base period in which precipitation approximates long-term average precipitation.[95]

Sustainable yield is defined in SGMA as “the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus that can be withdrawn annually from a groundwater supply without causing an undesirable result.”[96] An undesirable result[97] is defined as significant and unreasonable effects on one or more of the following six sustainability indicators:

1. Chronic lowering of groundwater levels
2. Reduction of groundwater storage
3. Seawater intrusion
4. Degraded water quality
5. Land subsidence
6. Depletion of interconnected surface water

95 The focus on long-term lowering of groundwater levels is also the focus of DWR’s definition of overdraft in Bulletin 118 Update 2003 (DWR 2003): “Condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions. Overdraft can be characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years.”

96 CWC Section 10721 (w) “Sustainable yield” means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.

97 CWC Section 10721 (x)

2C.1 WATER BUDGET ELEMENTS

This section provides a summary of the data sources used for development of the water budget. A conceptual diagram showing the components of the surface water and groundwater systems in the CMA is provided in **Figure 2c.1-1**. Water supply and water use within the CMA as well as groundwater conditions are dependent upon precipitation. Precipitation, either directly or as streamflow infiltration, recharges the groundwater supplies of the CMA. This Water Budget quantifies groundwater flows into and out of the CMA, including natural conditions (runoff and recharge from precipitation, groundwater flow, riparian evapotranspiration) and human-made conditions (dam releases, groundwater pumping, and return flows).

2c.1-1 Water Year Type Classification

Groundwater Conditions Section 2b.2-2 (“Classification of Wet and Dry Years”) describes how water year types are classified in the CMA. For consistency, the hydrologic year type for the CMA is based on the methodology similar to the recent State of California Water Resources Control Board (SWRCB) Order WR 2019-0148 (SWRCB 2019). Years are classified based on the rank in the period of record in 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). **Table 2c.1-1** compares the water year classification of the CMA and SWRCB Order WR 2019-0148 to the annual precipitation at Buellton Fire Station for the historical period (1982 through 2018).[98] Consistency between different stations throughout the Basin is indicated in **Table 2c.1-1**, except the CMA and SWRCB hydrologic year type based on surface water inflow reflects antecedent soil moisture conditions. For example, the annual precipitation in year 1997 was 81% of average at the Buellton Fire Station. However, because the precipitation occurred during a wet climatic trend following wet years 1993 and 1995, the water year is classified with above normal runoff and recharge conditions.

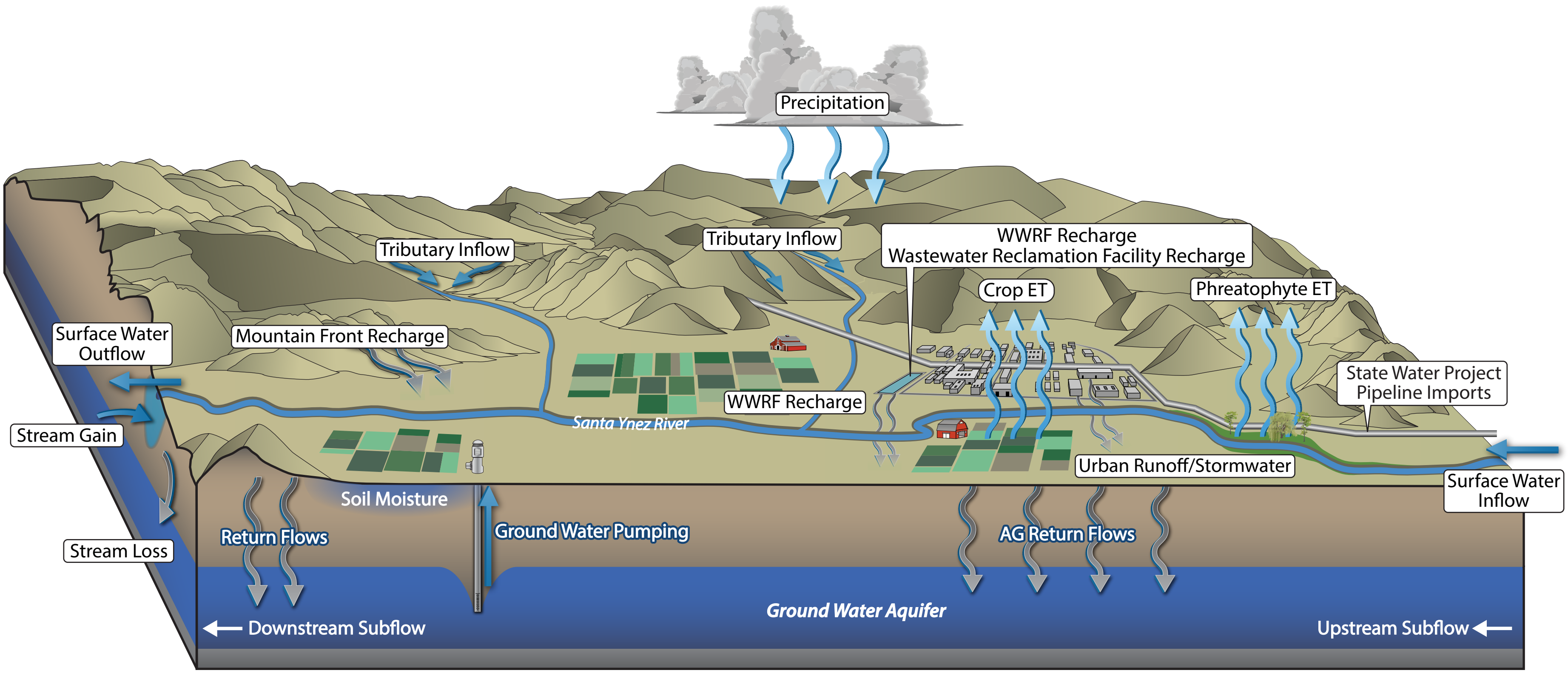
98 Buellton Fire Station, Precipitation Gauge 233, Santa Barbara County Flood Control & Water Conservation District. Water Years 1955–2020. Period of record average is 16.6 inches per year.

2c.1-2 Water Budget Analysis Time Periods (Historical, Current, and Projected)

The historical water budget period, or base period, is selected to be water years 1982 through 2018 (37 years; see **Figure 2c.1-2**). Water years start on October 1 of the previous year and run through September 30th of the current year.[99] This 37-year time period is in accordance with SGMA by being longer than 10 years and includes the "most recently available information."[100] This period includes two major historical droughts (1985 through 1991 and, 2012 through 2018) and represents a balanced period. For example, the average precipitation at the Buellton Fire Station is 16.6 inches per year for the period of 1955 through 2020 and 17.0 inches for the historical period (1982 through 2018), a difference of only 2%. Furthermore, this 37-year period also includes when the Santa Ynez River Water Conservation District (SYRWCD) began collecting self-reported groundwater pumping data in the Basin. This base period was also coordinated

[99] Per SGMA regulations, all years refer to water years; start in October 1st of the previous year through September 30th of the current year.

[100] 23 CCR § 354.18(c).



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Central Management Area
Groundwater Sustainability Agency

HYDROGEOLOGICAL CONCEPTUAL MODEL
CENTRAL MANAGEMENT AREA
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

FIGURE 2c.1-1

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Table 2c.1-1
Annual Precipitation and Water Year Classification for CMA

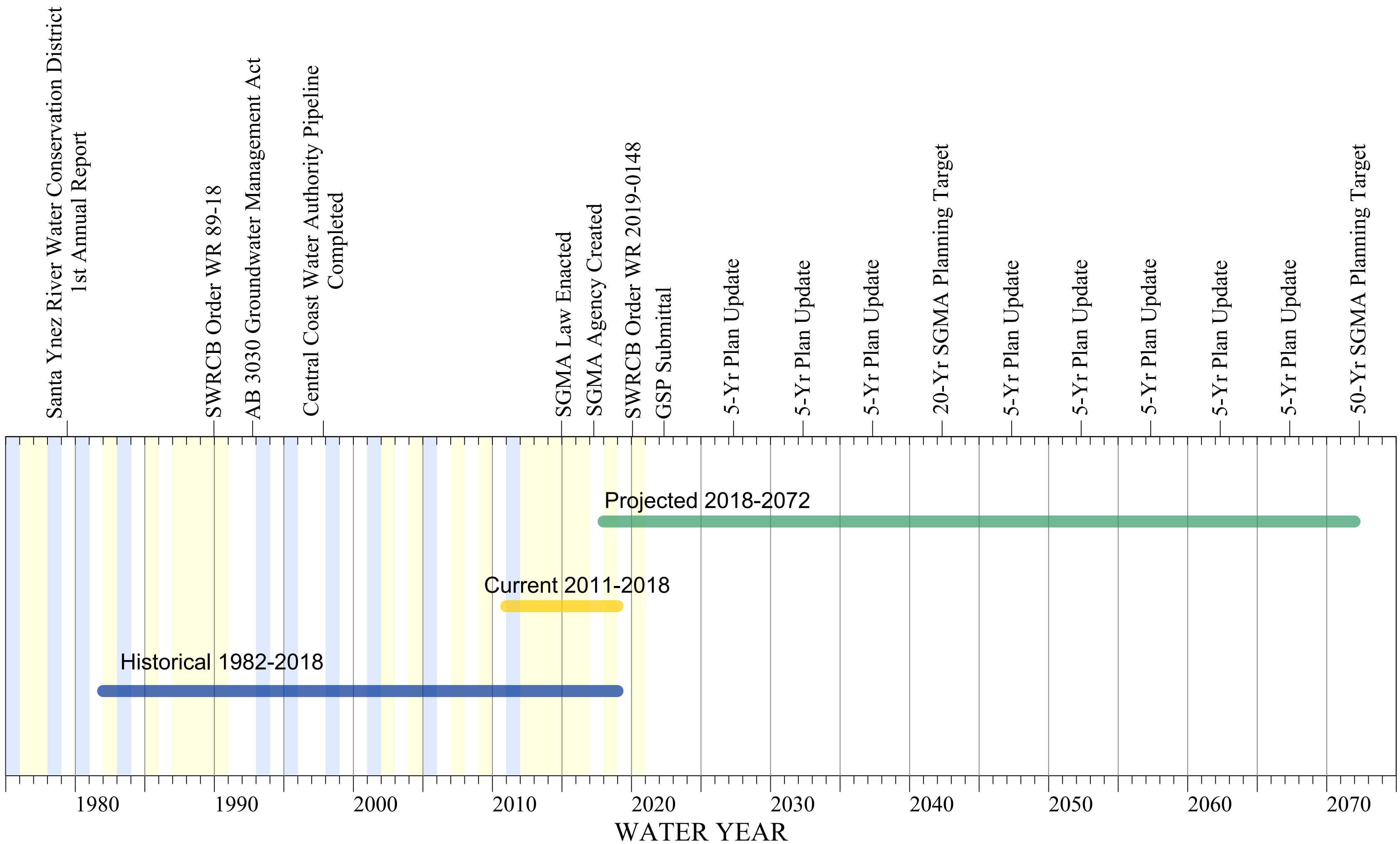
			Hydrologic Year Type Classification [A]		
	Buellton Fire Station		CMA	Upper Santa Ynez River	
Water Year	Precipitation (in/year)	% of Average [B]	USGS Gage 11132500 (Salsipuedes Creek)	SWRCB WRO 2019-0148	Climatic Trends[C]
1982	14.4	86%	Dry	Below normal	Wet
1983	38.8	233%	Wet	Wet	Wet
1984	10.0	60%	Below normal	Above normal	Dry
1985	12.2	74%	Dry	Dry	Dry
1986	19.3	116%	Above normal	Above normal	Dry
1987	11.2	67%	Dry	Critically Dry	Dry
1988	17.3	104%	Dry	Dry	Dry
1989	7.3	44%	Critically Dry	Critically Dry	Dry
1990	6.7	40%	Critically Dry	Critically Dry	Dry
1991	17.9	107%	Below normal	Above normal	Dry
1992	27.1	163%	Above normal	Wet	Wet
1993	27.4	165%	Wet	Wet	Wet
1994	12.6	76%	Below normal	Below normal	Wet
1995	34.3	206%	Wet	Wet	Wet
1996	13.3	80%	Below normal	Below normal	Wet
1997	13.5	81%	Above normal	Above normal	Wet
1998	40.9	246%	Wet	Wet	Wet
1999	14.5	87%	Above normal	Below normal	Normal
2000	18.4	111%	Above normal	Above normal	Normal
2001	28.4	171%	Wet	Wet	Normal
2002	8.5	51%	Dry	Dry	Normal
2003	17.5	105%	Below normal	Below normal	Normal
2004	9.4	57%	Dry	Dry	Normal
2005	39.6	238%	Wet	Wet	Normal
2006	19.2	115%	Above normal	Above normal	Normal
2007	7.0	42%	Critically Dry	Critically Dry	Normal
2008	19.3	116%	Above normal	Above normal	Normal

			Hydrologic Year Type Classification [A]		
	Buellton Fire Station		CMA	Upper Santa Ynez River	
Water Year	Precipitation (in/year)	% of Average [B]	USGS Gage 11132500 (Salsipuedes Creek)	SWRCB WRO 2019-0148	Climatic Trends[C]
2009	10.8	65%	Critical	Dry	Normal
2010	18.5	111%	Below normal	Above normal	Normal
2011	21.4	129%	Wet	Wet	Normal
2012	11.4	68%	Dry	Dry	Dry
2013	7.8	47%	Critically Dry	Critically Dry	Dry
2014	5.9	35%	Critically Dry	Critically Dry	Dry
2015	7.0	42%	Critically Dry	Critically Dry	Dry
2016	10.7	64%	Critically Dry	Dry	Dry
2017	20.4	122%	Above normal	Above normal	Normal
2018	7.9	48%	Critically Dry	Dry	Normal

[A] Dry and critically dry years are shaded yellow; wet years are shaded blue; and normal, below normal, and above normal years are unshaded. Notes: CMA = Central Management Area; USGS = U.S. Geological Survey; SWRCB = State Water Resources Control Board; WRO = Water Resources Order; in/year = inches per year.

[B] Average for period of record (1955–2020) is 16.6 inches per year.

[C] GSI 2021.



I:\DATA\2710\Analyses\2021-07 Time Periods\Fig 2a.1-2 Water Budget Timelines CMA.grf 7/3/2021 M. McCammon

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HISTORICAL, CURRENT, AND PROJECTED WATER BUDGET PERIODS

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.1-2

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with the two other management agencies (WMA and EMA) in the Basin. The historical water budget is presented below in Section 2c.2.

Water years 2011 through 2018, an eight-year subset of the historical data record, was used to represent current conditions. The period has "the most recent hydrology, water supply, water demand, and land use information,"[101] including data from January 1, 2015 to current conditions. This period is very dry, which is why 2011, a wet year, is included in this data set to provide some balance. The average annual precipitation for the 8-year period is 11.6 inches per year (70% of average). The current water budget is presented in Section 2c.3-2.

The projected water budget for the period of 2018 through 2072 extends 50 years past the 2022 submittal of this Groundwater Sustainability Plan (GSP), for a total of 55 years. The projected water budget is presented in Section 4.

2c.1-3 Surface Water and the Santa Ynez River Alluvium

In addition to groundwater inflows and outflows, GSP regulations state that the "total surface water entering and leaving a basin by water source type" must also be accounted for.[102] This will include the Santa Ynez River, tributaries, and State Water Project (SWP) imports. In addition, as discussed in the HCM (Section 2a.2), the Santa Ynez River Alluvium is part of the underflow of the river, which is regulated by SWRCB (Appendix 1d-B). Because underflow is considered surface water and not groundwater, the Santa Ynez River Alluvium would not be classified as a principal aquifer or managed by a GSP under SGMA. Therefore, the Santa Ynez River Alluvium is considered part of the underflow of the Santa Ynez River and is treated as part of the surface water in the historical, current, and projected water budgets.

101 23 CCR § 354.18(c)(1). Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, water demand, and land use information.

102 23 CCR § 354.18(b).

2C.2 WATER BUDGET DATA SOURCES

The historical and current water budgets were developed using various publicly available data. The projected water budget was developed using the SGMA guidance, further described below. **Table 2c.2-1** presents a summary of the data sources employed for developing the historical and current water budgets and a description of each data set's qualitative data rating. Data that is measured is usually rated at a high quality, and data that is estimated is rated as from low to medium depending upon the data source of the estimate. Each of these data sets is described in further detail in the following sections.

Table 2c.2 1
Water Budget Data Sources

Water Budget Component	Data Source(s)	Comment(s)	Qualitative Data Rating
Surface Water Inflow Components			
Santa Ynez River Inflow	USGS	Solvang Gage	Gaged – High
Tributary Inflow	Correlation with gaged data	Methods described in text	Calibrated Model – Medium
Imported: SWP	Central Coast Water Authority	—	Metered – High
Groundwater/Underflow Inflow Components			
Deep Percolation of Precipitation: Overlying and Mountain Front Recharge	USGS BCM Recharge	BCM calibrated to Basin precipitation station data	Calibrated Model – Medium
Streamflow Percolation	Santa Ynez RiverWare Model, USGS BCM	Collaborative Modeling effort: Stetson and GSI	Calibrated Model – Medium
Subsurface inflow	Darcian flux calculation	Collaborative Modeling effort: Stetson and GSI	Estimated – Medium
Irrigation Return Flows	Land use surveys, self-reported pumping data	Basinwide Collaborative Estimation: Stetson and GSI	Estimated – Low
Percolation of Treated Wastewater	City of Solvang and City of Buellton	Received from cities	Metered – High
Percolation from Septic Systems	SYRWCD self-reported data, Santa Barbara County Water Agency return estimates	Methods described in text	Estimated – Low

Surface Water Outflow Components			
Santa Ynez River Outflow	USGS	Methods described in text	Calibrated Model – Low/Medium
Streamflow Percolation	Santa Ynez RiverWare Model, USGS BCM	Collaborative modeling effort: Stetson and GSI	Calibrated Model – Low/Medium
Riparian Evapotranspiration	Aerial photography, NCCAG/NWI data sets, CIMIS weather station	Methods described in text	Estimated – Low/Medium
Groundwater/Underflow Outflow Components			
Agricultural Irrigation Pumping	Land use surveys, self-reported pumping data	Methods described in text	Estimated – Medium/Low
Municipal Pumping	City of Buellton self-reported pumping data	Methods described in text	High/Medium
Rural Domestic/Small Public Water Systems Pumping	SYRWCD self-reported data, DRINC	Methods described in text	Estimated – Medium/Low
Riparian Evapotranspiration	Aerial photography, NCCAG/NWI datasets, CIMIS weather station	Methods described in text	Estimated – Medium/Low
Subsurface Outflow	Darcian flux calculations, groundwater model	Methods described in text	Estimated – Medium

Notes: USGS = U.S. Geological Survey; SWP = State Water Project; BCM = Basin Characterization Model; Stetson = Stetson Engineers; GSI = GSI Water Solutions, Inc.; SYRWCD = Santa Ynez River Water Conservation District; NCCAG = The Natural Communities Commonly Associated with Groundwater (NCCAG) Wetland dataset; NWI = National Wetlands Inventory; CIMIS = California Irrigation Management Information System; DRI.NC = Drinking Water Information Clearinghouse.

A numerical groundwater model (Appendix 2c-A) was constructed to support and verify the water budgets for the Groundwater Sustainability Plans for the WMA and CMA. The model was developed as an analysis and planning tool for the sustainable management of groundwater resources within the basin.

The areal extents of the WMA/CMA Model (Figure 1 in Appendix 2c-A) cover about 110 square miles (72,000 acres) from east of Buellton (upstream) to the Pacific Ocean (downstream). Seven groundwater subareas (Figure 2 in Appendix 2c-A) are represented within the model: CMA Santa Ynez River alluvium, CMA Buellton Upland, WMA Santa Ynez River alluvium, WMA Santa Rita Upland, WMA Lompoc Plain, WMA Lompoc Upland, and WMA Lompoc Terrace). Please see Appendix 2c-A for more information presented in a Technical Memorandum that documents the construction and calibration of the

WMA/CMA Modflow Groundwater Model. The model currently illustrates a good fit of the simulated groundwater levels to the observed data, which helps to verify the water budget estimates (Appendix 2c-A). A recalibration of the numeric groundwater model will be done after two implementation projects are completed including: integration of AEM survey data into the HCM (Section 2A.5 Hydrogeologic Model Data Gaps and Uncertainty), and the collection of additional streamflow measurements to correlate the outflow from the CMA to an existing nearby gage (Section 3a.4-2 Plans to Fill Identified CMA Data Gaps in Monitoring Network).

2c.2-1 Sources of Surface Water Inflows

2c.2-1-1 Santa Ynez River

Surface water inflows include both local and imported water entering the CMA. As discussed in Section 1.3, all of the inflow into the Santa Ynez River Alluvium is considered as part of the surface water inflow.[103] The Santa Ynez River Alluvium includes fluxes that are associated with groundwater data sources (e.g., pumping from underflow, recharge from precipitation), but in Sections 2c.2, 2c.3, and 2c.4, all Santa Ynez River Alluvium fluxes will be accounted for as part of the total surface water in the water budget.

The U.S. Geological Survey (USGS) Solvang gage (USGS ID 11128500) measures the flow of Santa Ynez River water entering the CMA. Figure 2a.3-7 (HCM) shows the location of the gage, Figure 2a.3-8 (HCM) shows annual flow totals, and Figure 2b.6-2 (GC) shows average monthly flows. Santa Ynez River flows in the CMA are substantially influenced by upstream dam and reservoir operations. Downstream releases and spillway flows from Lake Cachuma are controlled and monitored by the U.S. Bureau of Reclamation at Bradbury Dam. Flows at the Solvang gage are the outflow from the Basin’s Eastern Management Area (EMA).

[103] The Santa Ynez River Alluvium subarea corresponds to Zone A in the SYRWCD management and annual reports (Figure 2a.2-4, HCM). This alluvium is included as part of the Above Narrows area in the SWRCB Order WR 2019-0148 (SWRCB 2019).

2c.2-1-2 Tributaries

Watershed drainage areas and average precipitation for Santa Ynez River tributaries to the Santa Ynez River within the CMA are summarized in **Table 2c.2-2**. Figure 2a.3-2 (HCM) shows the aerial distribution of precipitation in the CMA watershed. In general, the tributaries to the south of the Santa Ynez River receive more precipitation and are on steeper slopes compared with the tributaries to the north of the Santa Ynez River.

Table 2c.2 2
Tributary Creeks of the CMA

	Drainage Area (mi^2)	Average Annual Precipitation (in/year)[A]
North of the Santa Ynez River		
Adobe Canyon Creek	2.5	19.2
Ballard Canyon Creek	5.1	19.4
Zaca Creek	36.6	20.7
Cañada de Laguna	4.1	18.7
Cañada de los Palos Blancos	5.2	18.4
Santa Rosa Creek	8.3	18.6
Unnamed Tributaries	6.0	18.4
South of the Santa Ynez River		
Nojoqui Creek	15.9	25.1
Unnamed Tributaries	9.5	23.4
Salsipuedes Creek USGS Gage	47.10	23.0

Notes: CMA = Central Management Area. [A] PRISM 2014.

Tributary flow was estimated using stream gage data (if available) and correlation with nearby stream gage data. Zaca Creek has a USGS gage (USGS ID 11129800; Figure 2b.6-1, Groundwater Conditions) upstream of the CMA inflow boundary with data available for water years 1990–1992, 1995–2004, and 2006–present. For years with missing data, the USGS gage on nearby Alamo Pintado Creek, in the EMA, was used to estimate flows by regression analysis (Stetson 2008). The tributary in the Lower Santa Ynez River with the longest period of record is Salsipuedes Creek (USGS ID 11132500), located in the WMA.

Flows in ungaged areas are estimated based on the Salsipuedes Creek gage prorated by drainage area and average annual precipitation, as shown in Table 2c.2-2.

2c.2-1-3 State Water Project Imports

Imported SWP water deliveries were provided by the Central Coast Water Authority for August 1997 through present. These volumes include imported SWP water to the City of Buellton in the CMA. Prior to the completion of the Coastal Branch Pipeline in 1997, no water was imported into the Basin (HCM Figure 2a.3-10).

2c.2-2 Sources of Groundwater Inflows

The data sources used for the groundwater budget inflow terms are described below.

2c.2-2-1 Recharge from Precipitation

Precipitation that infiltrates into the soil zone and eventually recharges the regional groundwater table can be broken into two components: overlying recharge and mountain front recharge (also referred to as mountain block recharge). Overlying recharge occurs on the land surface that directly overlies the principal aquifer. Mountain front recharge occurs from flow from the adjacent bedrock or the older consolidated formations that are not part of the basin. Both types of recharge relate to the amount of precipitation in the drainage basin that infiltrates into the soil and drains to the groundwater aquifer. As is typical of a Mediterranean climate, the CMA experiences many months in the summer and fall with no precipitation. The area also goes through periodic dry cycles, with as many as seven consecutive years with below normal precipitation.

Recharge to groundwater from deep percolation of precipitation was determined using the USGS Basin Characterization Model (BCM) for California (Flint and Flint 2017). BCM uses a soil budget based on monthly climate data and soils information to estimate the recharge, as shown on **Figure 2c.2-1**.

The BCM data are provided statewide on roughly 20-acre cells (**Figure 2c.2-2**). This BCM recharge data set is the same data set being used in the EMA (GSI 2020) and WMA. As described in GSI 2020, the BCM recharge data set has been adjusted based on comparison to monthly precipitation records at weather stations across the entire Basin. A correction was applied to the BCM values for each monthly timestep such that the adjusted BCM data exactly matched all recorded weather station monthly precipitation values. These monthly adjustments were also applied to the BCM-generated recharge data sets. The timing of overlying recharge was modified from the BCM output. The BCM recharge output was very concentrated in wet years, but local well hydrographs indicate a more attenuated recharge flux across many years. The average annual recharge from the BCM was utilized and disaggregated based on percentage of rainfall at Buellton for any particular year compared to the average rainfall for the historical period (1982 through 2018).

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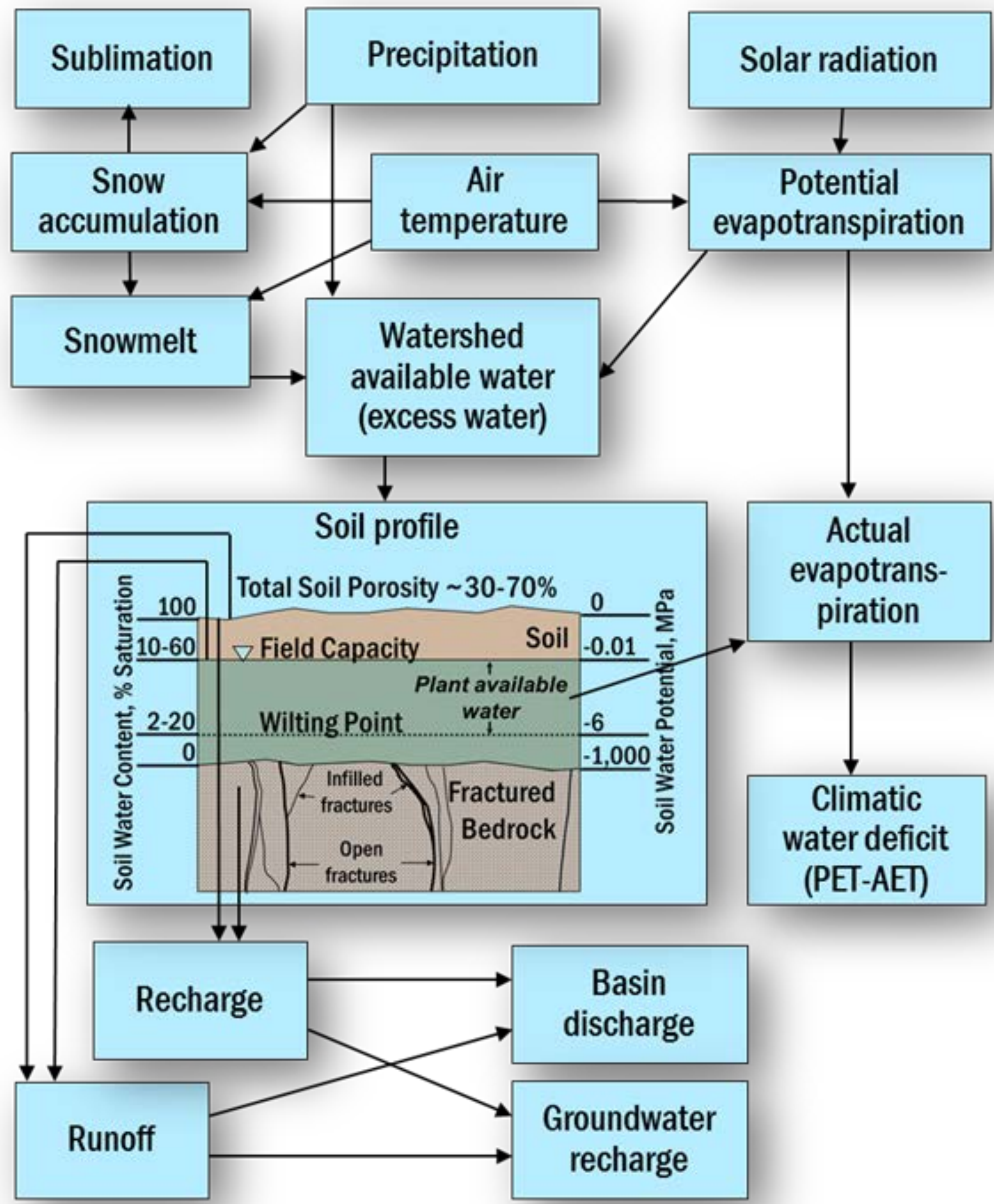

Source: Thorne, et al (2012).

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BASIN CHARACTERIZATION MODEL
WATER COMPONENTS

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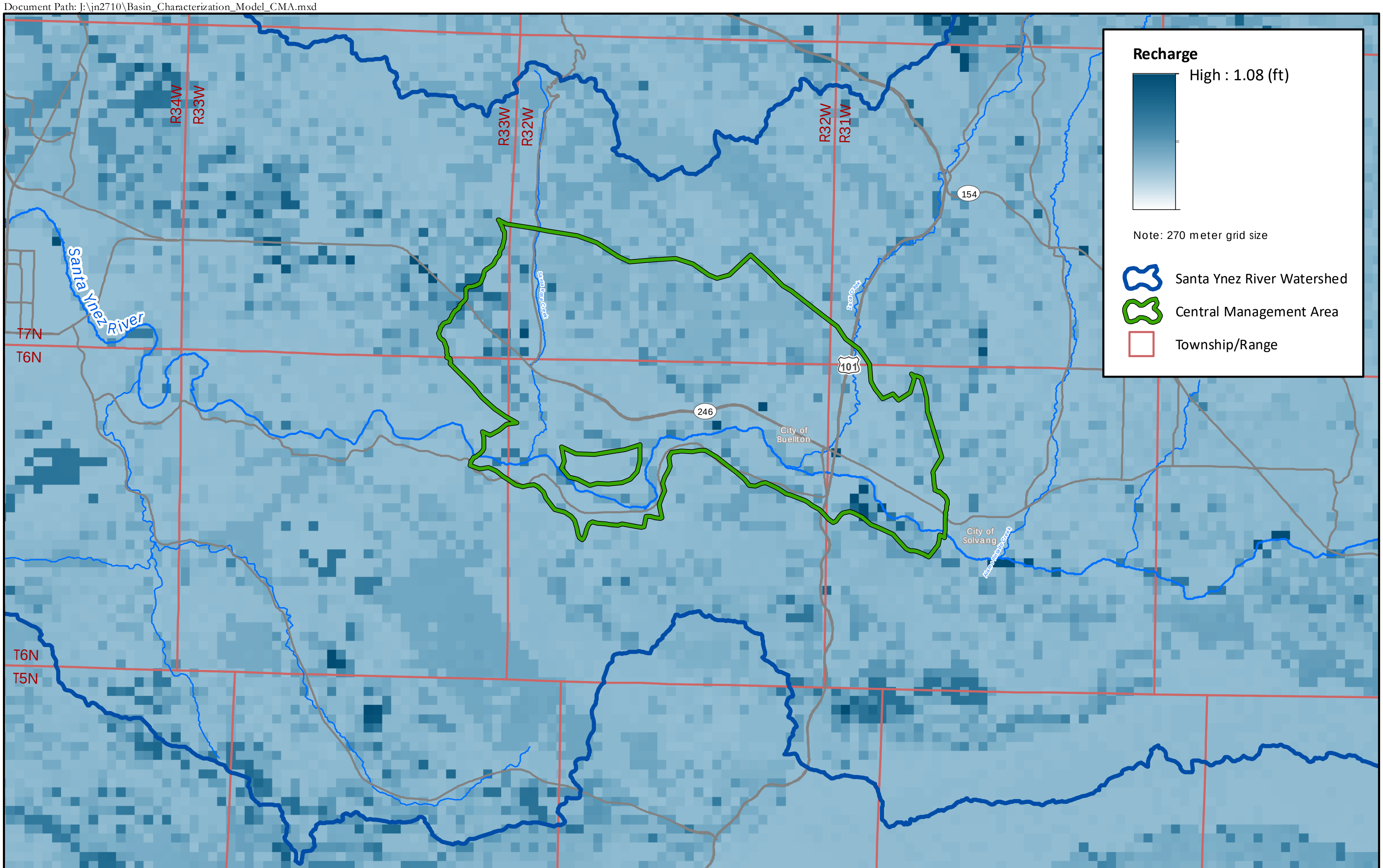

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BASIN CHARACTERIZATION MODEL (BCM) RECHARGE

0 1 2 Miles

Source:
Flint, L.E., and A.L. Flint. 2017

N

FIGURE 2c.2-2

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The BCM does not route flows downstream. For areas outside the Basin and not within the major tributaries (i.e., Nojoqui, Zaca, and Santa Rosa Creeks), mountain front recharge areas are estimated based on the Salsipuedes Creek gage prorated by drainage area and average annual precipitation.

2c.2-2-2 Percolation of Streamflow to Groundwater

Streamflow percolation, or the deep percolation of surface water to groundwater through the Santa Ynez River streambed, was estimated using the calibrated Santa Ynez River RiverWare flow model (Stetson 2008) for percolation in the Santa Ynez River Alluvium subarea.[104] Percolation occurring in the tributary channels in the Buellton Upland was estimated using the studies from the Buellton Upland Groundwater Management Plan (SYRWCD 1995).

2c.2-2-3 Subsurface Inflow from Adjacent Aquifers

Subsurface flow is estimated using Darcy's Law for two areas into the CMA, along the Santa Ynez River and in the Buellton Upland. Darcy's law is an equation that quantifies the flow of fluid through a porous medium (groundwater geologic materials like sand and gravel). The flow rate calculated by the law depends on three main variables, including the permeability of the medium, the cross-sectional area of the medium through which the fluid flows, and gradient (change in elevation) that is present over a given distance as shown in the equation below:

$$\mathbf{Q = K * I * A}$$

where

Q = flow in ft^3/sec (cfs)
K = hydraulic conductivity in ft/sec
I = hydraulic gradient in ft/ft
A = cross-sectional area in ft^2

104 The California Central Valley Groundwater-Surface Water Simulation Model (C2VSIM) and the Integrated Water Flow Model (IWFM), as provided by 23 CCR § 354.18 (f), are most applicable for the Central Valley. The existing calibrated Santa Ynez River RiverWare flow model was chosen for the CMA for surface water flows.

The subsurface flow at the CMA/EMA boundary is estimated at 1,800 acre-feet per year (AFY) along the Santa Ynez River. This estimate was coordinated with the water budget of the EMA and includes the underflow in the Santa Ynez River gravels and alluvium.

The Buellton Upland subarea (CMA) is separated from the Santa Ynez Upland subarea (EMA) by older non-water bearing deposits. Groundwater is likely discharged from the Santa Ynez Upland through creeks draining the upland and shallow deposits of the aquifer material between bedrocks outcrops. The subsurface flow at the CMA/EMA boundary in the Buellton Upland is estimated at 85 AFY, which has also been coordinated with the water budget of the EMA.

2c.2-2-4 Irrigation Return Flows

Irrigation return flow is the excess water from water applied to crops that percolates below the root zone and returns back to the groundwater aquifer. Irrigation return flow is related to the irrigation efficiency. The portion of applied water that is utilized to satisfy crop demand for water (evapotranspiration [ET]) is equivalent to the irrigation efficiency, expressed as a percentage. The remaining percentage of applied water is equivalent to the irrigation return flow. For example, if the irrigation efficiency is 60%, then 60% of the applied water would be used by the crops and 40% could be assumed as return flows. Irrigation return flows can either recharge the groundwater or leave the field as surface water in drains or tail water and discharge to a nearby creek or river. It is assumed that most of the irrigation return flow percolates to groundwater within the CMA. Similar to basin wide assumptions in other parts of the Basin (Yates 2010), an irrigation efficiency of 80% is assumed for all crops except vineyards, which are assumed to be irrigated using drip at an efficiency of 95%. The total inefficiency of 20% for all crops except vineyards and 5% for vineyards is assumed to recharge the groundwater. The urban landscape irrigation efficiency is assumed to be 70% but only 15% is assumed to return to groundwater based on historical estimates (Stetson 1992). Irrigation return flow volumes have been calculated using these efficiencies multiplied by the calculated annual volumes of irrigation water applied to each crop type, based on self-reported pumping data and assumed crop-specific water duty factors.

Based on self-reported pumping and parcel coverage, this analysis assumes 5% of the agricultural water pumped from the Santa Ynez River Alluvium is applied to lands in the Buellton Upland where the irrigation return flows would be inflow to the Buellton Upland groundwater. Of this 5% pumped from the River and applied to the Buellton Upland, 10% is assumed as return flow to the Buellton Aquifer in the Buellton Upland. For the City of Buellton, all of the return flows from urban irrigation are assumed to return to the Santa Ynez River Alluvium based on the City boundary and the wide alluvial boundary in this reach.

2c.2-2-5 Percolation of Treated Wastewater

There are two wastewater treatment plants within the CMA (Figure 2a.3-4, HCM Section). The City of Solvang and a portion of the township of Santa Ynez, west of Highway 154, are connected to sewer service. Wastewater flows are collected by the City of Solvang and the Santa Ynez Community Services District and are transmitted to the Solvang wastewater treatment plant, which is within the CMA near the boundary with the EMA. The treated wastewater is held in percolation ponds that subsequently recharge the Santa Ynez River alluvium and become underflow.

Similarly, City of Buellton has a wastewater treatment plant downstream of the confluence of Zaca Creek and the Santa Ynez River. The treated wastewater is held in percolation ponds that subsequently recharge the Santa Ynez River alluvium and become underflow. The measured treated wastewater quantities were obtained from the City of Solvang and City of Buellton, respectively, for the historical period (1982 through 2018).

2c.2-2-6 Percolation from Septic Systems

Outside of the sewer service areas within the CMA, domestic wastewater is discharged to septic systems. Return flows from the septic systems recharge the groundwater. The recharge from septic systems is calculated using estimates from previous SYRWCD and County studies (Stetson 1992). These previous analyses assumed that 40% of domestic water is used indoors and that 87% of this water will return to the groundwater. After accounting for the 60% for urban irrigation (outdoor water use) with 15% return flow, the total return flow from domestic/rural residential pumping for both indoor and outdoor use is estimated at 44%.

2c.2-3 Sources of Surface Water Outflows

The data sources used for the surface water budget outflow terms are described below.

2c.2-3-1 Santa Ynez River Outflow

Santa Ynez River surface water outflows were calculated as the sum of the Santa Ynez River inflows plus tributary inflows minus streamflow infiltration to groundwater. Each of these terms are described in the sections above.

2c.2-3-2 Percolation of Streamflow to Groundwater

The calculation of streamflow percolation to groundwater is discussed in Section 2c.2-2-2.

2c.2-4 Sources of Groundwater Outflows

The data sources used for the groundwater budget outflow terms are described below.

2c.2-4-1 Agricultural Irrigation Pumping

The largest source of water for irrigating crops in the CMA is pumped groundwater. The entire CMA is within the boundaries of the SYRWCD. Groundwater pumpers located within the SYRWCD boundaries are required to self-report their estimated pumping volumes to SYRWCD for each 6-month period. These estimates are based on multiple methods, including application of water duty factors specified in SYRWCD's Groundwater Production Information and Instructions pamphlet (SYRWCD 2010); metered pumping records; and metered electricity records. The groundwater users specify which type of water they are using (agricultural, special irrigation [parks, schools, and golf courses], or other [municipal and industrial]). This reported pumping was checked against available land use surveys in 1985, 2014, and 2016 from sources provided by the California Department of Water Resources (DWR).[105] For example, in 2016 a total of 2,730 acre-feet (AF) was reported to the SYRWCD for agricultural pumping from the Buellton Upland. DWR identified 1,373 acres of irrigated land in the Buellton Upland in 2016, which would total 2,747 AF using an average crop duty of 2.0 AF per acre. Monthly irrigation pumping was disaggregated from the biannual (6-month) totals using monthly multipliers based on historical average

105 LandIQ delineated the data for years 2014 and 2016 from imagery provided by the National Agriculture Imagery Program. The data are derived from a combination of remote sensing, agronomic analysis, and ground verification. The data set provides information for resource planning and assessments across multiple agencies throughout the state and serves as a consistent base layer for a broad array of potential users and multiple end-uses.

monthly irrigation, precipitation, temperature and monthly crop water demands (HCI 1997). Pumpage for rural domestic and small public water systems are reported to SYRWCD as derived from the Santa Ynez River Alluvium (surface water) or the Lower Aquifer (Paso Robles Formation and Careaga Formation).[106]

2c.2-4-2 Municipal Pumping

Municipal pumping includes all pumping for municipal, industrial, and domestic use that occurs within the City of Buellton, including water used for urban landscape irrigation. The measured monthly pumping quantities were obtained from the City of Buellton for the historical period (1982 through 2018). This pumping by the City combines the two categories reported to the SYRWCD: "other" water, which includes municipal, industrial, small public water systems, and domestic use, and "special irrigation" water, which refers to urban landscape irrigation. These municipal pumping volumes are reported by SYRWCD in the annual reports. Pumpage for municipal pumping is derived from the Santa Ynez River Alluvium (surface water) and the Lower Aquifer (Paso Robles and Careaga Sand formations).

2c.2-4-3 Rural Domestic and Small Public Water Systems Pumping

Besides the City of Buellton, the "other" water reported in the SYRWCD annual reports includes all other domestic uses, including rural domestic and small public water systems in the CMA. The biannual pumping quantities of rural domestic and small public water systems were disaggregated using the City of Buellton monthly average pumping distribution. Groundwater pumping for rural domestic and small public water systems are reported to SYRWCD as derived from the Santa Ynez River Alluvium (surface water) or the Lower Aquifer (Paso Robles and Careaga Sand formations).

2c.2-3-4 Riparian Vegetation Evapotranspiration

Riparian evapotranspiration was calculated using three sources to determine acreages of riparian vegetation types occurring within the CMA:

106 In the CMA, pumping is reported to the SYRWCD for the Santa Ynez River Alluvium (Zone A) or the Buellton Lower Aquifer (Zone D). Again, for the purposes of SGMA, pumpage from the Santa Ynez River Alluvium is considered a surface water diversion and is not subject to management by SMGA or the GSAs.

- The Natural Communities Commonly Associated with Groundwater (NCCAG) Wetland data set.[107]
- The National Wetlands Inventory (NWI) dataset.[108]
- An analysis of color-infrared aerial photos from 2012 (NAIP 2012) that was completed for this study by Stetson Engineers.

Color-infrared aerial photography captures a band of near infrared in addition to bands for visible light (red, green, and blue). Near infrared is a range of electromagnetic waves that are longer than the human eye can see and is widely used for interpretation of natural resources. The spectrum is effectively blueshifted (near infrared as red, red as green, and green as blue) which creates a 'pseudocolor' image. In this pseudocolor image very intense reds indicate dense, vigorously growing vegetation. Dense vegetation is commonly associated with riparian evapotranspiration related to groundwater use. The infrared aerial photos were the primary method of detecting vegetation along the Santa Ynez River. In the upland areas, the combination of the NCCAG and NWI data sets were relied on. Surface geology and topography data were used to avoid acreage on hillsides, which would be above the regional water table.

The riparian acreage analysis is multiplied by a monthly riparian water duty based on a weather station operated by the California Irrigation Management Information System (CIMIS). The station closest to the CMA is the Santa Ynez station (HCM Figure 2a.3-2). CIMIS has daily evaporation data for the station located near the township of Santa Ynez since November 1986. **Table 2c.2-3** shows the monthly average CIMIS data. The riparian water duty factor used is 4.2 feet per year, which is similar to the 4.5 and 3.7 feet per year rates used in the EMA and WMA, respectively.

107 Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Web Application. https://gis.water.ca.gov/app/NCDatasetViewer/ Accessed 2021-08-10

108 National Wetlands Inventory (NWI). Website. https://www.fws.gov/wetlands/Data/Data-Download.html Accessed 2021-08-10.

Table 2c.2-3
CIMIS Monthly Average Reference Evapotranspiration (2010 through 2019)

Month	Reference Evapotranspiration (inches)
January	1.9
February	2.4
March	3.9
April	5.1
May	6.0
June	.6.4
July	6.6
August	6.1
September	4.9
October	3.7
November	2.3
December	1.7
Total inches/year	51.0
Total feet/year	4.2

Note: CIMIS = California Irrigation Management Information System.

2c.2-4-5 Subsurface Outflows

Underflow occurs at the southwestern corner of the CMA along the border with WMA. Because of the constriction by the bedrock north and south of the river, this site was previously chosen for the proposed Santa Rosa Dam on the Santa Ynez River, which was never built. The magnitude of the underflow has been calculated using Darcy's law, with estimated values for hydraulic conductivity, the average hydraulic gradient, and outflow plane cross-sectional area (based on saturated thickness estimates). This estimate was made in coordination with the downstream WMA and verified with results from the numerical groundwater model.

Subsurface outflow from the Buellton Upland groundwater occurs along the southern boundary with the Santa Ynez River Alluvium subarea. Based on the length of this contact and low permeability of the Paso Robles and Careaga Formations, the subflow was estimated using Darcy's law. The flows estimate was verified with results from the numerical groundwater model.

The amount of subflow between the Santa Rita Upland (WMA) and Buellton Upland (CMA) is unknown. The USGS (Hamlin 1985) estimated groundwater flow following the surface topography (e.g., south along Santa Rosa Creek) with no subflow estimated between Santa Rosa Creek and Santa Rita Creek. Locally there are anecdotes about groundwater levels being higher within the Santa Rosa Creek drainage compared to the Santa Rita Creek drainage, which indicates that there might be some structural impediment to flow near the surface divide between the two upland subareas. Results from the AEM geophysics study currently being compiled for the project area is expected to provide additional data. Currently no subflow is assumed in the upland area.

2C.3 HISTORICAL WATER BUDGET

SGMA regulations require that the historical surface water and groundwater budget be based on at least the most recent 10 years of data.[109] The period of 1982 through 2018 was selected as the period for the historical water budget (also referred to as the historical base period) because it represents average conditions with several different dry and wet periods.

Estimates of the surface water and groundwater inflows and outflows, and changes in storage for the historical base period, are summarized in this section.

2c.3-1 Historical Surface Water Component

SGMA regulations require that the water budget include the total annual volume of surface water entering and leaving the basin.[110] The surface water component of the water budget quantifies important sources of surface water and evaluates their historical and future reliability.

The CMA relies on two surface water source types identified in DWR's Best Management Practices (DWR 2016): local supplies and State Water Project (SWP).

2c.3-1-1 Inflows: Local Surface Water (Santa Ynez River and Tributaries) and Imported Surface Water

Local surface water supplies include surface water flows that enter the CMA from precipitation runoff within the watershed and Santa Ynez River inflow to the CMA, regulated by SWRCB as outflows from Lake Cachuma. In addition, as discussed in the HCM (Section 2a.2), the Santa Ynez River Alluvium is part of the underflow of the river, which is regulated by SWRCB.

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109 23 CCR § 354.18 (c)(2)(B) A quantitative assessment of the historical water budget, starting with the most recently available information and extending back a minimum of 10 years, or as is sufficient to calibrate and reduce the uncertainty of the tools and methods used to estimate and project future water budget information and future aquifer response to proposed sustainable groundwater management practices over the planning and implementation horizon.

110 23 CCR § 354.18 (a) Each Plan shall include a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored. Water budget information shall be reported in tabular and graphical form.

Imported surface water through the SWP became available after completion of the Coastal Branch pipeline in 1997. The City of Buellton has an SWP allocation of 578 AFY and a drought buffer of 58 AFY.

Table 2c.3-1 summarizes the average, minimum, and maximum inflow from surface water from all sources. The estimated average annual total inflow over the historical base period is approximately 100,200 AFY. The large difference between the minimum and maximum inflows reflects the climatic variability between dry and wet years. The largest components of this average local inflow are releases from Bradbury Dam and flow in the Santa Ynez River upstream of the CMA, which represent about 86% of the average annual surface inflow. Inflow from the Buellton Upland and the Santa Ynez Mountains contributes 9% of the total surface water inflow. The remaining surface flow components make up 5% of the total surface water inflow (Table 2c.2-1).

The annual average, minimum, and maximum volumes of imported local surface water during the historical base period (1982 through 2018) are presented Table 2c.3-1. The average value of 230 AFY does not represent the typical SWP imports by the City of Buellton because deliveries did not start until 1997. The average amount of SWP imports for the shorter time period of 1998–2018 was approximately 400 AFY. The imported water supply provides approximately zero to 2% of the total volume of surface water that enters the CMA.

Table 2c.3-1
Annual Surface Water Inflow, Historical Period (1982 through 2018)

Surface Water Inflow Component	Average	Minimum	Maximum[1]
	(Acre-Feet per Year)		
Santa Ynez River Inflow from EMA	85,720	630	655,470
Santa Ynez River Tributary Inflow	9,060	70	61,820
Imported SWP	230	0	670
Santa Ynez River Alluvium Subarea (Surface Water Underflow)			
Subsurface inflow[A]	2,490	1,970	2,920
Recharge from Precipitation (Overlying and Mountain Front)	880	530	1,490
Recharge from Agricultural Return Flows to Underflow	480	340	710
Recharge from Municipal Return Flows to Underflow[B]	1,240	1,000	1,460
Recharge from Domestic Return Flows to Underflow	100	30	170
TOTAL	100,200	4,570	724,710

[A] Includes underflow from the Santa Ynez River Alluvium in the EMA and subflow from the Buellton Upland.

[B] Includes percolation return flow from both City of Buellton and City of Solvang wastewater treatment plants.

2c.3-1-2 Surface Water Outflows

The estimated annual average total surface water outflow leaving the CMA as flow in the Santa Ynez River, within the Santa Ynez River Alluvium Upper Aquifer, and percolation into Lower Aquifer over the historical base period is summarized in **Table 2c.3-2**. Similar to inflows, the Santa Ynez River surface outflow represents the majority (91%) off the average annual surface flow out of the CMA.

Table 2c.3-2
Annual Surface Water Outflow, Historical Period (1982 through 2018)

Surface Water Outflow Component	Average	Minimum	Maximum[1]
	(Acre-Feet per Year)		
Santa Ynez River Outflow to WMA	91,320	40	699,280
Net Channel Percolation to Groundwater[A]	360	10	1,470
Santa Ynez River Alluvium Subarea (Surface Water Underflow)			
Santa Ynez River Underflow Out	800	800	800
River well pumping – Agriculture[B]	2,720	1,920	3,690
River well pumping – Municipal[B]	470	80	1,020
River well pumping – Domestic[B]	225	70	380
Riparian Vegetation Evapotranspiration	4,165	4,165	4,165
TOTAL	100,070	7,085	710,805

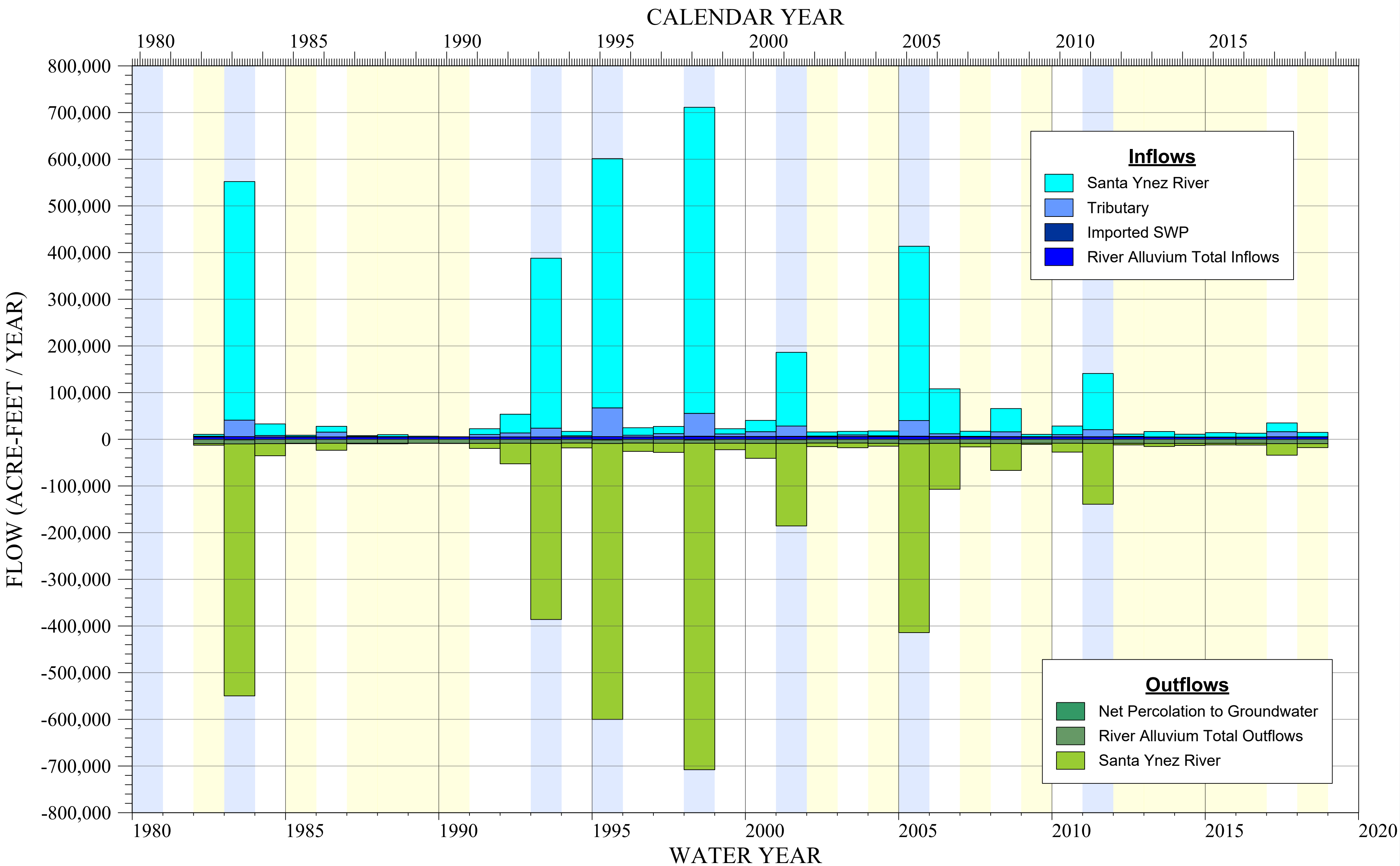
[A] Does not include percolation to Santa Ynez River Alluvium, which is part of the surface water component.

[B] River well pumping occurs from wells in the Santa Ynez River Alluvium. The wells pump from the underflow of the Santa Ynez River and are administered by the SWRCB as a surface water diversion.

2c.3-1-3 Summary

As indicated in Tables 2c.3-1 and 2c.3-2, the average surface flow in and out averaged 100,200 AFY and 100,070 AFY, respectively, for the historical period (1982 through 2018). The surface water inflow exceeded outflow by 130 AFY.

The surface water budget for the historical period in the CMA is presented on **Figure 2c.3-1** and **Table 2c.3-3**. The inflows and outflows for the Santa Ynez River Alluvium shown in Tables 2c.3-1 and 2c.3-2 are totaled in Figure 2c.3-1 and Table 2c.3-3. The figure shows how flashy the hydrologic system is, with ten wet years showing orders of magnitude more flux of surface water than the other, drier, years. In these wet years, surface water inflows and outflows are extremely large in response to precipitation, compared with the drier years.



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STETSON ENGINEERS INC.

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

HISTORICAL SURFACE WATER COMPONENTS 1982-2018

Water Year Type (1942-2020)

Wet
No Data
Above/Below Normal
Dry / Critically Dry

FIGURE 2c.3-1

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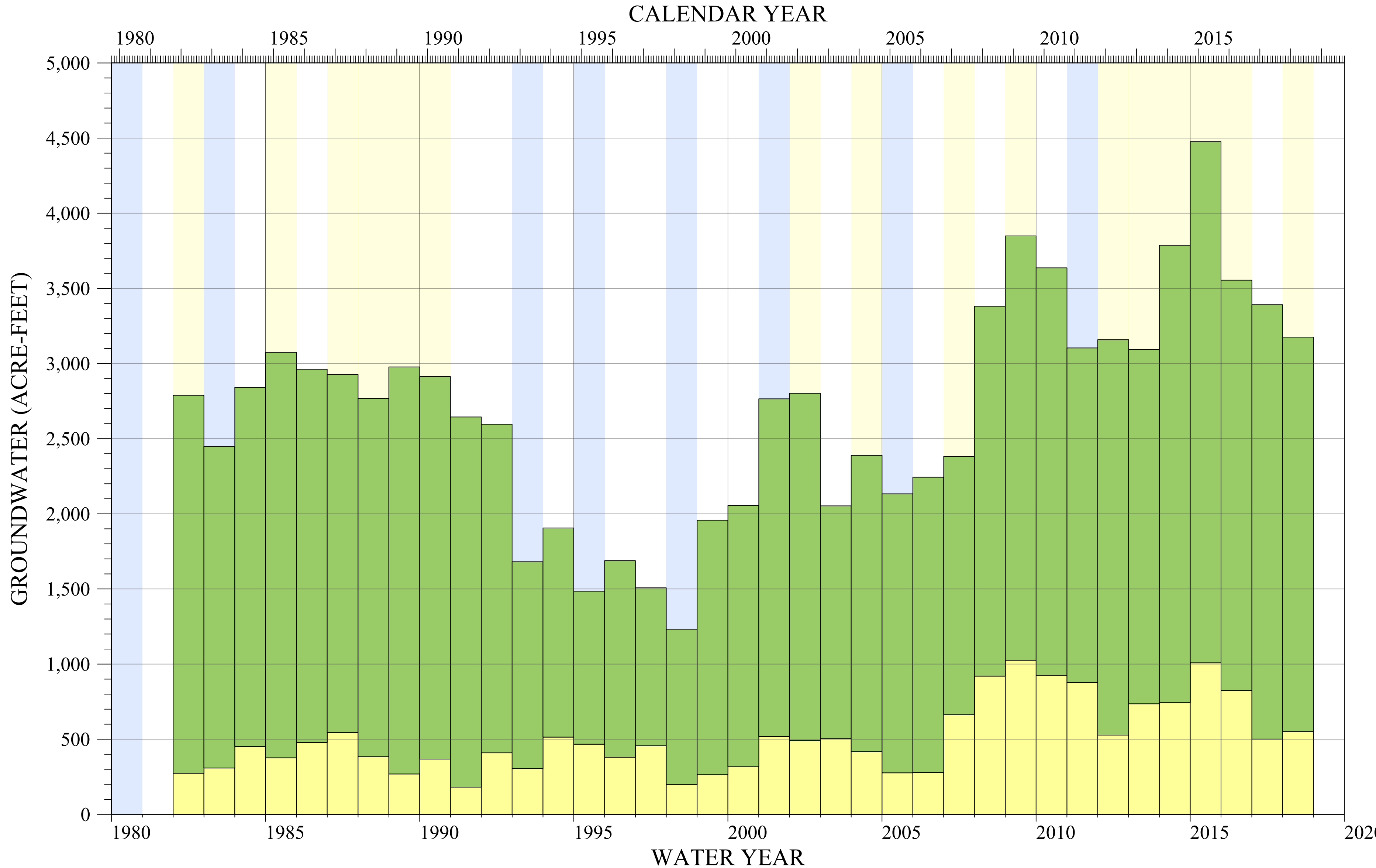

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STETSON ENGINEERS INC.

CMA

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

GROUNDWATER PUMPING BY SECTOR
WY1982-2018

Agricultural
Municipal/Domestic

Water Year Type (1942-2020)

Wet
No Data
Above/Below Normal
Dry / Critically Dry

FIGURE 2c.3-2

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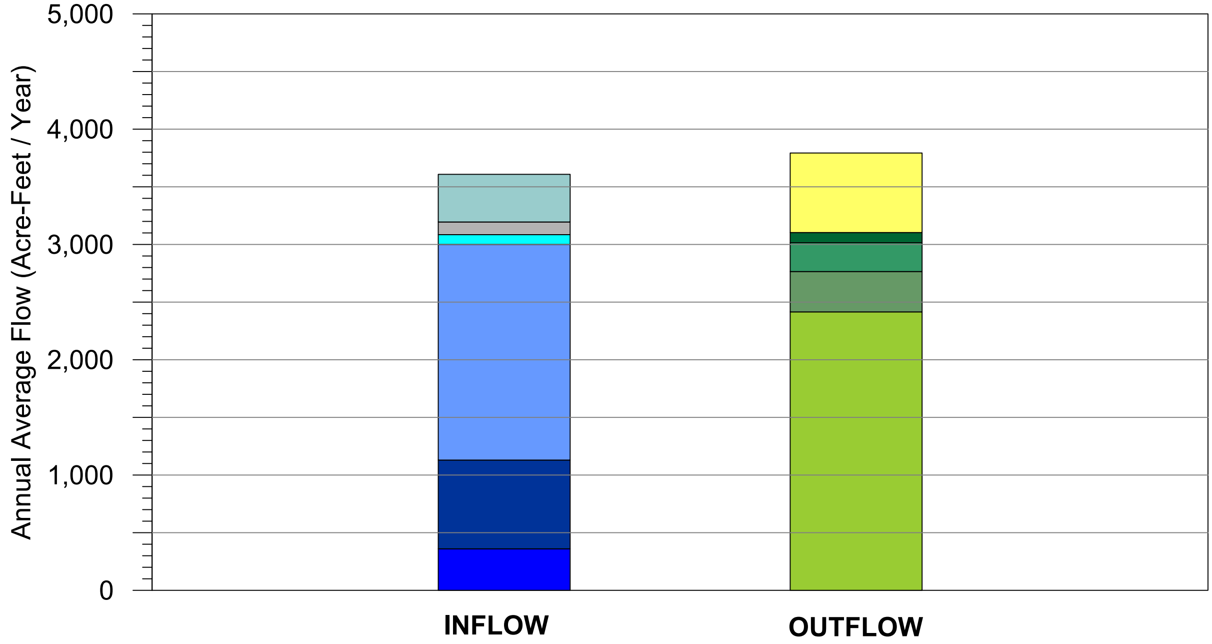
FIGURE 2c.3-3A



INFLOW

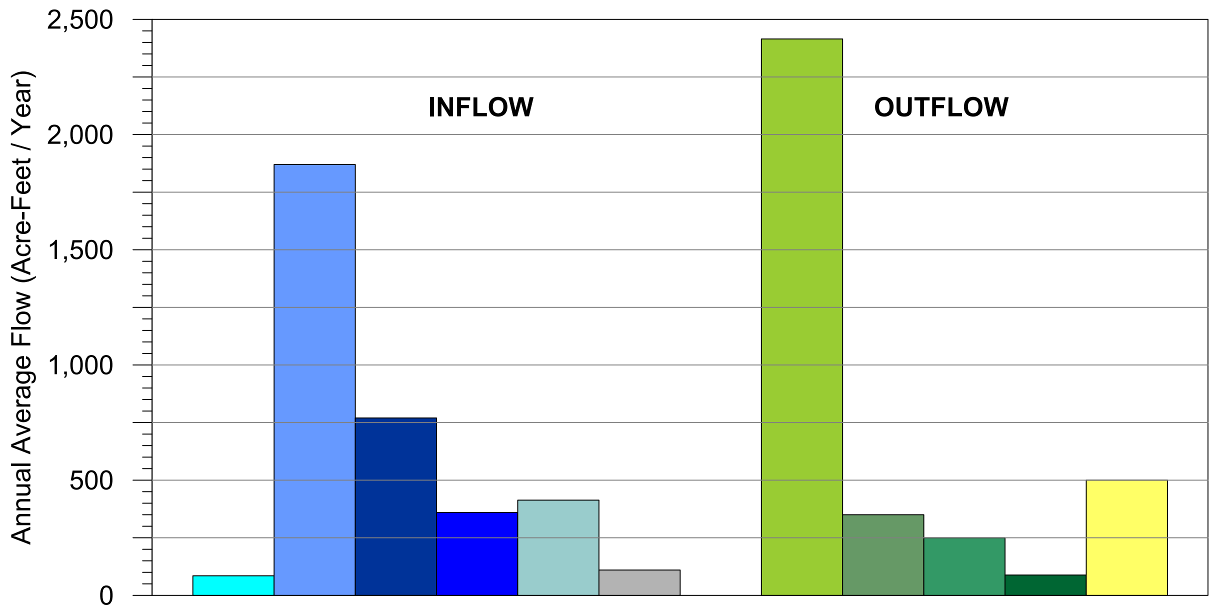
- Agricultural Return Flows
- Urban Return Flows
- Subflow In
- Precipitation Recharge-Overlying
- Mountain Front Recharge
- Net Stream Percolation

OUTFLOW

- Subflow Out
- Phreatophytes
- Domestic Pumping
- Municipal Pumping
- Agriculture Pumping

KEY GROUNDWATER COMPONENTS

FIGURE 2c.3-3B



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STETSON ENGINEERS INC.

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

AVERAGE GROUNDWATER BUDGET VOLUMES HISTORICAL WY1982-2018

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Table 2c.3-3
Annual Surface Water Components, Historical Period (1982 through 2018), AFY

		Inflows					Outflows				
Water Year	Hydrologic Year Type	Santa Ynez River	Tributary	Imported SWP	River Alluvium Total Inflows	Total Inflows	Santa Ynez River	Net Percolation to Groundwater	River Alluvium Total Outflows	Total Outflows	Inflow - Outflow
1982	Dry	3,916	1,403	0	5,125	10,445	3,402	161	9,239	12,801	-2,357
1983	Wet	511,215	35,305	0	5,721	552,242	539,648	1,137	8,890	549,675	2,566
1984	Below normal	24,859	2,955	0	5,236	33,049	26,082	262	9,126	35,470	-2,421
1985	Dry	2,677	937	0	5,129	8,742	562	139	8,656	9,358	-615
1986	Above normal	12,297	10,412	0	5,034	27,742	14,906	451	8,144	23,501	4,241
1987	Dry	1,853	1,374	0	4,735	7,961	1,392	124	8,228	9,743	-1,782
1988	Dry	4,119	720	0	4,995	9,834	1,320	114	8,209	9,643	191
1989	Critically Dry	1,758	155	0	4,765	6,677	109	34	8,568	8,712	-2,035
1990	Critically Dry	629	84	0	4,702	5,416	39	12	8,771	8,821	-3,406
1991	Below normal	12,361	5,477	0	4,816	22,654	11,091	227	8,429	19,747	2,907
1992	Above normal	40,134	8,366	0	5,085	53,585	43,968	446	8,039	52,453	1,132
1993	Wet	364,086	18,499	0	5,258	387,844	377,397	757	7,857	386,011	1,833
1994	Below normal	9,390	2,468	0	5,193	17,050	10,416	203	7,806	18,425	-1,375
1995	Wet	533,933	61,822	0	5,641	601,396	590,940	1,470	7,670	600,081	1,315
1996	Below normal	15,892	3,624	0	5,206	24,722	17,646	292	7,900	25,838	-1,116
1997	Above normal	15,294	6,532	74	5,584	27,484	19,711	424	8,042	28,176	-692
1998	Wet	655,470	49,154	609	5,905	711,137	699,276	1,361	7,199	707,836	3,301
1999	Above normal	10,953	5,491	569	5,522	22,535	14,156	408	7,914	22,478	57
2000	Above normal	24,183	9,991	602	5,579	40,356	32,004	488	8,170	40,662	-306
2001	Wet	157,890	22,082	384	5,825	186,181	176,979	771	7,867	185,617	564
2002	Dry	8,544	1,222	584	5,234	15,584	7,722	164	7,841	15,727	-143
2003	Below normal	7,711	3,344	530	5,409	16,994	9,747	270	7,970	17,987	-993
2004	Dry	10,147	1,484	511	5,521	17,663	6,017	121	8,674	14,812	2,851
2005	Wet	373,556	33,659	511	5,984	413,710	404,441	1,046	8,583	414,069	-359
2006	Above normal	96,498	5,477	641	5,528	108,144	98,411	364	8,332	107,108	1,036
2007	Critically Dry	10,885	469	665	5,173	17,192	7,714	65	8,632	16,411	781
2008	Above normal	49,596	10,337	513	5,238	65,684	57,782	451	8,497	66,730	-1,046
2009	Critically Dry	4,753	481	293	4,908	10,435	2,362	71	8,345	10,779	-344
2010	Below normal	18,594	4,572	226	5,091	28,483	18,906	259	8,246	27,411	1,071
2011	Wet	120,436	15,004	394	5,008	140,841	130,640	629	7,994	139,264	1,577
2012	Dry	4,862	763	582	5,003	11,210	3,107	118	8,734	11,959	-748
2013	Critically Dry	11,520	250	216	4,591	16,577	6,378	35	8,923	15,335	1,242
2014	Critically Dry	6,118	165	32	4,632	10,947	4,433	23	8,974	13,429	-2,483
2015	Critically Dry	9,518	73	0	4,633	14,224	3,370	10	8,719	12,099	2,125
2016	Critically Dry	8,006	116	82	4,638	12,842	3,823	16	8,649	12,488	354
2017	Above normal	18,652	10,820	293	5,255	35,020	24,538	410	9,026	33,974	1,046
2018	Critically Dry	9,315	162	224	5,035	14,735	8,527	22	9,239	17,788	-3,053
	Average 1982 - 2018	85,720	9,060	230	5,190	100,200	91,320	360	8,380	100,070	130

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2c.3-2 Historical Groundwater Budget

The historical groundwater budget (1982 through 2018) includes a summary of the estimated groundwater inflows and, groundwater outflows, followed by the change of groundwater in storage and discussion about the sustainable yield of the CMA.

2c.3-2-1 Groundwater Inflows

Groundwater inflow components include subsurface inflow, deep percolation of direct precipitation and mountain front recharge, streamflow percolation, and return flows from agricultural irrigation and, municipal, and domestic water uses. The annual groundwater inflows during the historical base period are summarized in **Table 2c.3-4**. During the historical base period, an average of 3,550 AFY of total groundwater inflow occurred. During this time, the groundwater inflow ranged from 1,990 AFY to 6,570 AFY, due to differences in rainfall in dry and wet years. The largest groundwater inflow component was recharge from precipitation overlying the Buellton Upland, which accounts for approximately 53% of the total annual average inflow.

Table 2c.3-4
Annual Groundwater Inflow, Historical Period (1982 through 2018)

Groundwater Inflow Component	Average	Minimum	Maximum[1]
	(Acre-Feet per Year)		
Subflow	90	90	90
Recharge from Precipitation – Overlying	1,870	890	3,560
Recharge from Precipitation – Mountain Front	770	770	770
Net Channel Percolation from Surface Water	360	10	1,470
Agricultural Return Flows	380	210	530
Municipal/Domestic Return Flows	80	20	150
TOTAL	3,550	1,990	6,570

2c.3-2-2 Groundwater Outflows

Groundwater outflow components include total groundwater pumping from all water use sectors, subsurface flow out of the Buellton Upland, and phreatophyte (riparian vegetation) evapotranspiration. The estimated annual groundwater outflows for the historical base period are summarized in **Table 2c.3-5**

Table 2c.3-5
Annual Groundwater Outflow, Historical Period (1982 through 2018)

Groundwater Outflow Component	Average	Minimum	Maximum[1]
	(Acre-Feet per Year)		
Pumping – Agriculture	2,220	1,070	3,240
Pumping – Municipal	370	80	790
Pumping – Domestic	170	40	350
Total Pumping	2,760	1,190	4,380
Riparian Vegetation Evapotranspiration	90	90	90
Subflow	690	170	1,120
TOTAL	3,540	1,450	5,590

Groundwater pumping was the largest groundwater outflow component, totaling 78% of the total groundwater outflow. The estimated annual groundwater pumping by water use sector for the historical base period is summarized in Table 2c.3-5 and on Figure 2c.3-2. Agricultural and municipal pumping were the largest components of groundwater pumping, accounting for approximately 63% (agricultural) and 10% (municipal) of total pumping over the historical base period. As indicated on Figure 2c.3-2, pumping fluctuated over time but increased overall during the historical base period. From 1998 to 2018, total pumping increased from 1,500 to 3,000 AFY. Domestic and small mutual water companies accounted for 5% of total pumping during the historical base period.

2c.3-2-3 Summary and Change in Storage

Annual changes in groundwater in storage were calculated for each year of the historical base period of 1982 through 2018 (37 years). A summary of the average annual inflows and outflows within the groundwater for the CMA for the historical base period are presented graphically on **Figure 2c.3-3AB**. Figure 2c.3-3AB shows the magnitude of the average annual flow for each individual water budget component. Recharge from precipitation and agricultural pumping are the two largest fluxes for inflow and outflow, respectively. The results of the water budget during the historical period show that the CMA has same amount of total inflow as total outflow. As shown on Figure 2c.3-3A, the average total inflow of approximately 3,500 AFY is the same as the average total outflow of approximately 3,500 AFY. The variability of the average inflow and outflow components are presented for each year of the historical period on **Figure 2c.3-4**, which presents groundwater inflow components above the zero line and outflow components below the zero line. The annual variation on Figure 2c.3-4 shows that the amount of recharge will fluctuate widely depending on precipitation (also shown in Table2c.3-4). Figure 2c.3-4 also shows the increase in groundwater pumping in the Buellton Upland (also shown in Figure 2c.3-2). These data are also presented in **Table 2c.3-6**.

As shown on **Figure 2c.3-5**, the cumulative change of groundwater in storage during each year and during the overall historical base period indicates no net change in storage.

There was zero accumulated water supply deficiency over the entire 37-year period, which is equal to an average surplus/deficit of zero AFY. The cumulative change in storage increased in the wet period from 1993 through 2006 for a net surplus, but then decreased from 2007 to 2018, for a net change of zero for the entire period.

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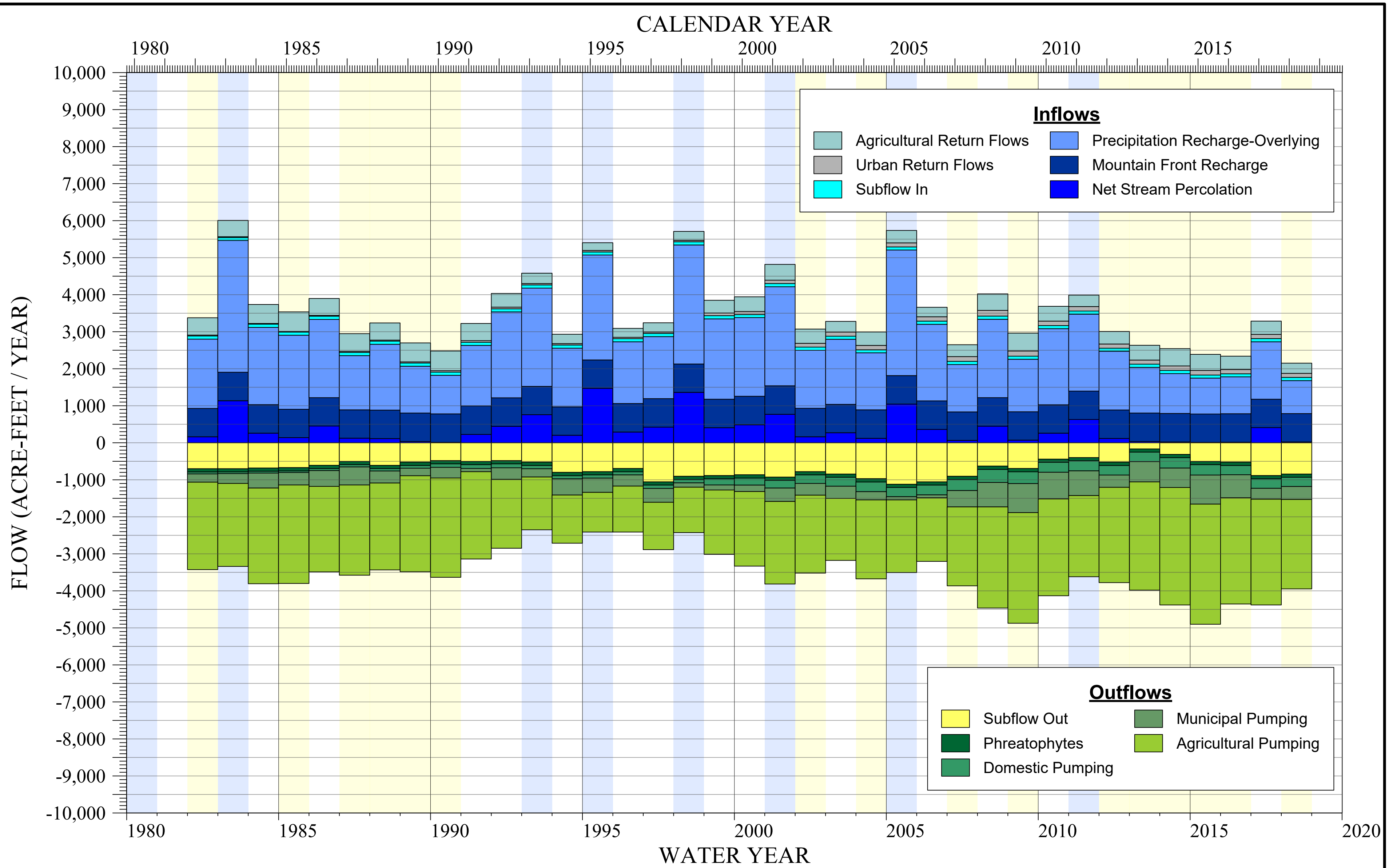

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HISTORICAL GROUNDWATER COMPONENTS 1982-2018

Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.3-4

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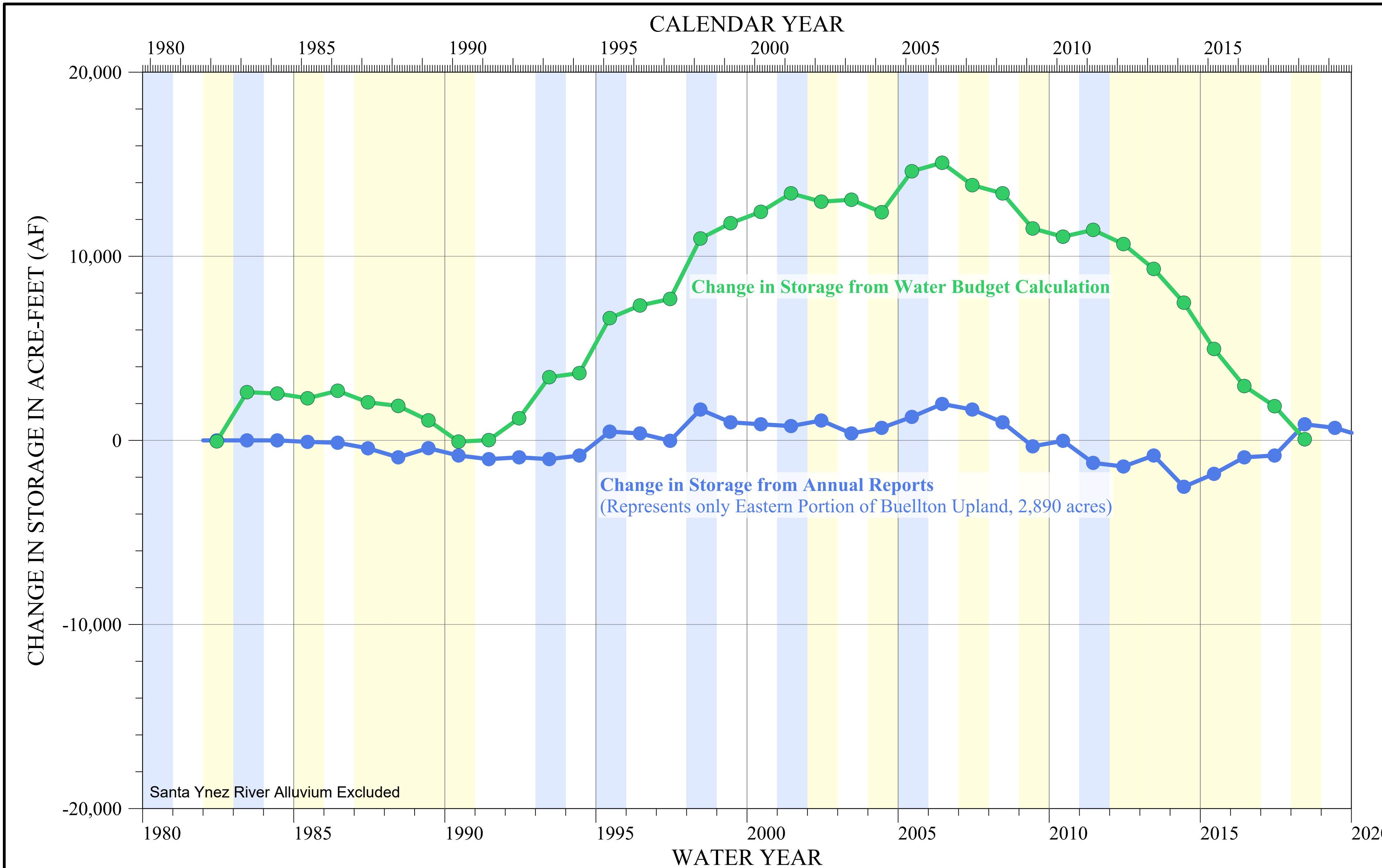

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CUMULATIVE CHANGE IN GROUNDWATER STORAGE 1982 to 2018

Sources: Stetson (2021) Forty-Third Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2020-2021; Water Budget Study for GSP

FIGURE 2c.3-5

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\CMA\Figures\Fig 2c.2-6 Cumulative WB CMA.grf 7/6/2021 M. McCammon

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The cumulative change in storage based on the water budget components is different in magnitude than the cumulative change in storage in SYRWCD's annual reports (Figure 2b.2-1 and Figure 2b.2-4, Groundwater Conditions) because the annual report data is based on the eastern portion of the Buellton Upland, which represents only about 20% of the entire Buellton Upland groundwater basin. However, the trends shown in both analyses are the same in that there is a zero change in the cumulative groundwater storage over the 37-year period. The cumulative change in storage estimated from the water budget also matches measured groundwater level trends, including rises during wet periods and declines during dry periods (Table 2c.3-6). The average annual groundwater storage increase or decline during the historical base period—or the difference between outflow and inflow to the CMA—is approximately zero AFY.

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Table 2c.3-6
Annual Groundwater Inflows, Outflow, and Change in Storage, Historical Period (1982 through 2018), AFY

		Inflows						Outflows						
Water Year	Hydrologic Year Type	Subflow In	Precipitation Recharge-Overlying	Mountain Front Recharge	Net Stream Percolation	Agricultural Return Flows	Urban Return Flows	Agricultural Pumping	Municipal Pumping	Domestic Pumping	Phreatophytes	Subflow Out	Change in Storage	Cumulative Change in Storage
1982	Dry	85	1,873	768	161	466	23	2,364	221	53	88	700	-51	-51
1983	Wet	85	3,557	768	1,137	442	19	2,240	266	44	88	700	2,670	2,619
1984	Below normal	85	2,088	768	262	510	21	2,582	405	48	88	683	-72	2,547
1985	Dry	85	1,998	768	139	527	19	2,659	335	43	88	673	-264	2,283
1986	Above normal	85	2,115	768	451	457	23	2,308	426	53	88	609	414	2,697
1987	Dry	85	1,463	768	124	482	26	2,438	487	60	88	504	-628	2,068
1988	Dry	85	1,779	768	114	464	28	2,347	326	63	88	610	-197	1,871
1989	Critically Dry	85	1,267	768	34	512	32	2,590	205	72	88	526	-783	1,089
1990	Critically Dry	85	1,044	768	12	531	40	2,683	288	91	88	483	-1,155	-66
1991	Below normal	85	1,634	768	227	465	44	2,357	90	100	88	504	84	18
1992	Above normal	85	2,321	768	446	367	45	1,859	315	103	88	483	1,184	1,201
1993	Wet	85	2,654	768	757	280	39	1,427	223	89	88	526	2,230	3,431
1994	Below normal	85	1,584	768	203	255	37	1,302	436	84	88	801	220	3,651
1995	Wet	85	2,834	768	1,470	208	39	1,068	385	88	88	780	2,993	6,645
1996	Below normal	85	1,668	768	292	242	38	1,241	301	86	88	695	681	7,326
1997	Above normal	85	1,677	768	424	250	39	1,280	374	88	88	1,056	356	7,682
1998	Wet	85	3,216	768	1,361	241	39	1,226	115	89	88	907	3,285	10,967
1999	Above normal	85	2,171	768	408	342	72	1,739	138	165	88	886	831	11,798
2000	Above normal	85	2,124	768	488	396	85	2,014	173	192	88	865	613	12,412
2001	Wet	85	2,676	768	771	429	91	2,232	362	206	88	928	1,004	13,415
2002	Dry	85	1,568	768	164	388	101	2,104	318	230	88	780	-446	12,969
2003	Below normal	85	1,757	768	270	291	107	1,676	325	243	88	844	102	13,071
2004	Dry	85	1,540	768	121	365	114	2,130	226	260	88	971	-682	12,390
2005	Wet	85	3,394	768	1,046	334	109	1,960	89	248	88	1,119	2,231	14,620
2006	Above normal	85	2,069	768	364	259	116	1,717	79	264	88	1,056	457	15,077
2007	Critically Dry	85	1,281	768	65	321	129	2,133	442	294	88	907	-1,215	13,862
2008	Above normal	85	2,119	768	451	444	154	2,729	663	351	88	632	-441	13,421
2009	Critically Dry	85	1,417	768	71	483	139	2,988	788	317	88	695	-1,913	11,507
2010	Below normal	85	2,056	768	259	403	118	2,617	718	268	88	441	-444	11,063
2011	Wet	85	2,075	768	629	310	120	2,194	667	272	88	399	367	11,430
2012	Dry	85	1,585	768	118	338	113	2,573	331	258	88	526	-768	10,663
2013	Critically Dry	85	1,236	768	35	397	112	2,925	546	255	88	165	-1,347	9,315
2014	Critically Dry	85	1,077	768	23	467	123	3,173	527	279	88	314	-1,839	7,476
2015	Critically Dry	85	968	768	10	437	122	3,244	786	278	88	504	-2,510	4,966
2016	Critically Dry	85	997	768	16	365	110	2,868	625	249	88	526	-2,016	2,950
2017	Above normal	85	1,552	768	410	360	112	2,856	296	255	88	886	-1,095	1,855
2018	Critically Dry	85	890	768	22	276	109	2,415	350	249	88	844	-1,796	60
Average 1982 - 2018		90	1,870	770	360	380	80	2,220	370	170	90	690	0	

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2c.3-3 Sustainable Perennial Yield Estimate of the Basin

The water budget for the CMA during the base period indicates that total groundwater outflow was the same as the total inflow on average for the historical period years (1982 through 2018, 37 years). This indicates that there is not a net deficit occurring, which indicates that most likely a state of overdraft does not currently exist in the CMA.

Perennial yield is a long-term average annual amount of water which can be withdrawn from a basin under specified operating conditions (i.e., legal, economic, environmental, and management parameters) without inducing a long-term progressive drop in water levels. The estimated perennial yield for the base period is calculated as follows:

Perennial Yield = Average Annual Pumping + Average Annual Change in Storage

The average annual pumping total of 2,760 AFY (Table 2c.3-5) 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 perennial yield of the basin is approximately 2,800 AFY. It should be recognized that the definitions of safe/perennial/sustainable yield and overdraft reflect conditions of water supply and use over a long-term period. The historical period (1982 through 2018) is representative of long-term average conditions.

While safe yield is difficult to estimate due to the inherent uncertainties in the estimates of recharge and discharge, this independent analysis corroborates the safe yield estimate in the SYRWCD annual reports of 2,800 AFY and the range of perennial yields in the Buellton Uplands Groundwater Management Plan (Santa Ynez Water Conservation District and City of Buellton 1995) of 2,650 to 2,900 AFY. This estimate of sustainable perennial yield will be refined and revisited through the implementation phase of the SGMA process as more water level data becomes available in the CMA.

The sustainable yield of 2,800 AFY does not include any imported water. All of the return flows from Central Coast Water Authority water imported by the City of Buellton are assumed to return to the Santa Ynez River Alluvium. This yield estimated also does not include any potential conjunctive use programs to store river water in the Buellton Aquifer.

When relating the perennial yield estimate of 2,800 AFY and the concept of sustainable yields, an evaluation of undesirable results must be performed. The undesirable results as defined in SGMA covers a broader range of criteria than the lowering of water levels and groundwater storage addressed by perennial yield, and also includes degraded groundwater quality, seawater intrusion, land subsidence, and depletion of interconnected surface water and groundwater dependent ecosystems.

2c.3-4 Reliability of Historical Surface Water Supplies

The long-term reliability of the surface water from the local sources, including Bradbury Dam outflows and tributary runoff from the Buellton Upland, is subject to climatic variability and is affected by exports out of the Santa Ynez River watershed to the Santa Barbara County south coast. The most recent drought, from 2012 through 2018, was very severe. The variability of the surface water flow from local and imported sources is summarized in Section 2c.3-1-1 and Table2c.3-1.

The City of Buellton has a State Water Project (SWP) allocation of 578 AFY and a drought buffer of 58 AFY. This SWP supply is not as reliable as the local groundwater supplies in the CMA. The average import amount for the period of 1998 through 2018 was approximately 400 AFY. During the dry "current period" of 2011 through 2018, the City was only able to import approximately 230 AFY, which is a 44% reduction. However, overall, imported water represents only a small fraction of the total water deliveries in the CMA (less than 6%).

2C.4 CURRENT WATER BUDGET

SGMA regulations require that a current water budget be developed based on the "most recent hydrology, water supply, water demand, and land use information."[111] For the GSP, the period selected to represent current conditions is water years 2011 through 2018. This period is a subset of the historical base period (1982 through 2018) described in Section 2c.3.

The current water budget period is dominated by a drought period when annual precipitation averaged about 70% of the historical average. As a result, the current water budget period represents drought conditions and is not representative of long-term, balanced conditions needed for sustainability planning purposes. The current water budget is used to project the future baseline and is based on current water demands and land use information.

Estimates of the surface water and groundwater inflow and outflow, and changes in storage for the current water budget period, are provided in this section.

2c.4-1 Current Surface Water Component

Similar to the historical surface water inflow and outflow component, the current surface water component includes two surface water source types: State Water Project (SWP) and local supplies.

2c.4-1-1 Inflows: Local and Imported

Local surface water supplies include surface water flows that enter the CMA from precipitation runoff within the watershed and Santa Ynez River inflow to the CMA, regulated by SWRCB as outflows from Lake Cachuma. In addition, as discussed in the HCM (Section 2a.3), the Santa Ynez River Alluvium is part of the underflow of the Santa Ynez River, which is regulated by SWRCB. Imported surface water through the SWP became available after completion of the Coastal Branch pipeline in 1997. The City of Buellton has an SWP allocation of 578 AFY and a drought buffer of 58 AFY.

111 23 CCR § 354.18(c)(1)

Table 2c.4-1 summarizes the average, minimum, and maximum inflow from surface water for all sources. The estimated average annual total inflow over the current period is approximately 32,040 AFY. The largest components of this average local inflow are releases from Bradbury Dam and flow in the Santa Ynez River upstream of the CMA, which represents about 74% of the average annual surface inflow for this period. Inflow from the Buellton Upland and the Santa Ynez Mountains contributes 11% of the total surface water inflow.

Table 2c.4-1
Annual Surface Water Inflow, Current Period (2011 through2018)

Surface Water Inflow Component	Average	Minimum	Maximum [A]
	(Acre-Feet per Year)		
Santa Ynez River Inflow from EMA	23,550	4,860	120,440
Santa Ynez River Tributary Inflow	3,420	70	15,000
Imported State Water Project	230	0	580
Santa Ynez River Alluvium Subarea (Surface Water Underflow)			
Subflow [A]	2,320	1,970	2,690
Recharge from Precipitation (Overlying and Mountain Front)	670	530	950
Recharge from Agricultural Return Flows to Underflow	480	420	500
Recharge from Municipal Return Flows to Underflow [B]	1,220	1,130	1,330
Recharge from Domestic Return Flows to Underflow	150	150	170
TOTAL	32,040	9,130	141,660

[A] Includes underflow from the Santa Ynez River Alluvium in the EMA and subflow from the Buellton Upland.

[B] Includes percolation return flow from both City of Buellton and City of Solvang wastewater treatment plants.

2c.4-1-2 Surface Water Outflows

The estimated annual surface water outflows in the CMA over the current water budget period is summarized in **Table 2c.4-2**.

Table 2c.4-2
Annual Surface Water Outflow, Current Period (2011 through 2018)

Surface Water Outflow Component	Average	Minimum	Maximum [A]
	(Acre-Feet per Year)		
Santa Ynez River Outflow to WMA	23,100	3,110	130,640
Net Channel Percolation to Groundwater[1]	160	10	630
Santa Ynez River Alluvium Subarea (Surface Water Underflow)			
Santa River Underflow Out	800	800	800
River Well Pumping – Agriculture	3,040	2,580	3,220
River Well Pumping – Municipal	420	100	700
River Well Pumping – Domestic	350	330	380
Riparian Vegetation Evapotranspiration	4,170	4,170	4,170
TOTAL	32,040	11,100	140,540

[A] Does not include percolation to Santa Ynez River Alluvium, which is part of the surface water component.

2c.4-1-3 Summary

During this current period (2011 through 2018), precipitation was well below average, which resulted in very little surface water flow. The current period (2011 through 2018) had 32% of the total surface flows in the historical period (1982 through 2018). The imported water supplies were still a minor component of the overall surface water inflows, 0.2% in the historical period (1982 through 2018) and 0.7% in the current period (2011 through 2018).

2c.4-2 Current Groundwater Budget

The current water budget includes a summary of the estimated groundwater inflows, groundwater outflows, and change in groundwater in storage.

2c.4-2-1 Groundwater Inflows

Groundwater inflow components include subsurface inflow, deep percolation of direct precipitation and mountain front recharge, streamflow percolation, and return flows from agricultural irrigation and, municipal, and domestic water uses. The annual groundwater inflows during the current period are summarized in **Table 2c.4-3**. During the current period, an average of 2,810 AFY of total groundwater inflow occurred. During this time, the groundwater inflow ranged from 2,150 AFY to 4,160 AFY, due to differences in rainfall in dry and wet years. The largest groundwater inflow component was recharge from precipitation overlying the Buellton Upland, which accounts for approximately 46% of the total annual average inflow. The current period (2011 through 2018) had 79% of the total groundwater inflows in the historical period (1982 through 2018).

Table 2c.4-3
Annual Groundwater Inflow, Current Period (2011 through 2018)

Groundwater Inflow Component	Average	Minimum	Maximum [A]
	(Acre-Feet per Year)		
Subflow	90	90	90
Recharge from Precipitation – Overlying	1,300	890	2,080
Recharge from Precipitation – Mountain Front	770	770	770
Net Channel Percolation from Surface Water	160	10	630
Agricultural Return Flows	370	280	470
Municipal/Domestic Return Flows	120	110	120
TOTAL	2,810	2,150	4,160

[A] Does not include percolation to Santa Ynez River Alluvium, which is part of the surface water component.

2c.4-2-2 Groundwater Outflows

Groundwater outflow components include total groundwater pumping from all water use sectors, subsurface flow out of the Buellton Upland, and phreatophyte (riparian vegetation) evapotranspiration. The estimated annual groundwater outflows for the current period are summarized in **Table 2c.4-4**.

Table 2c.4-4
Annual Groundwater Outflow, Current Period (2011 through 2018)

Groundwater Outflow Component	Average	Minimum	Maximum
	(Acre-Feet per Year)		
Pumping – Agriculture	2,780	2,190	3,240
Pumping – Municipal	520	300	790
Pumping – Domestic	260	250	280
Riparian Vegetation Evapotranspiration	90	90	90
Subflow	520	170	890
TOTAL	4,170	3,000	5,290

For the current water budget period, estimated total groundwater outflows ranged from 3,000 to 5,290 AFY, with an average outflow of 4,170 AFY. This is 118% more than the total average groundwater outflows estimated for the historical base period (3,540 AFY average).

Total average annual groundwater pumping in the current period was 3,560 AFY, an increase of 29% compared with the historical baseline period, which was 2,760 AFY. Agricultural, municipal, and domestic sectors accounted for 78%, 15%, and 7% of total pumping, respectively, during the current period.

2c.4-2-3 Summary and Change in Storage

Average groundwater inflows and outflows for the current water budget period are presented on **Figure 2c.4-1A. Figure 2c.4-1B** shows the magnitude of the average annual flow for each individual water budget component during the current period. Precipitation from recharge and agricultural pumping are two largest fluxes for inflow and outflow, respectively. More details regarding the data for each year in the current period (2011 through 2018) are presented in Table 2c.3-6.

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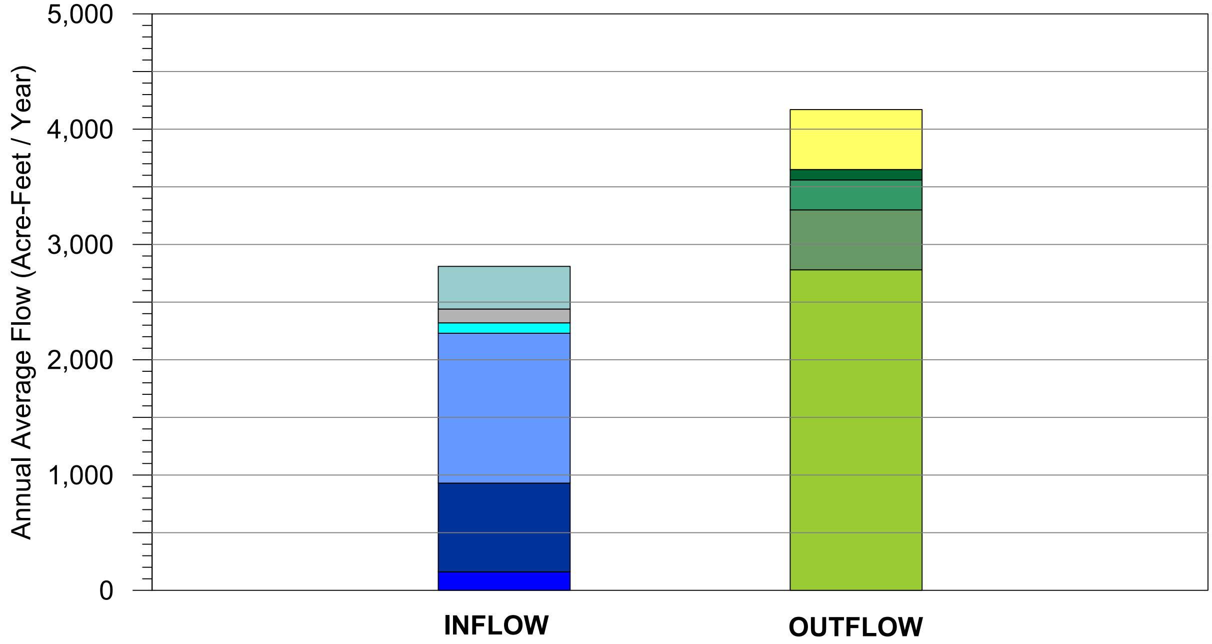
FIGURE 2c.4-1AB



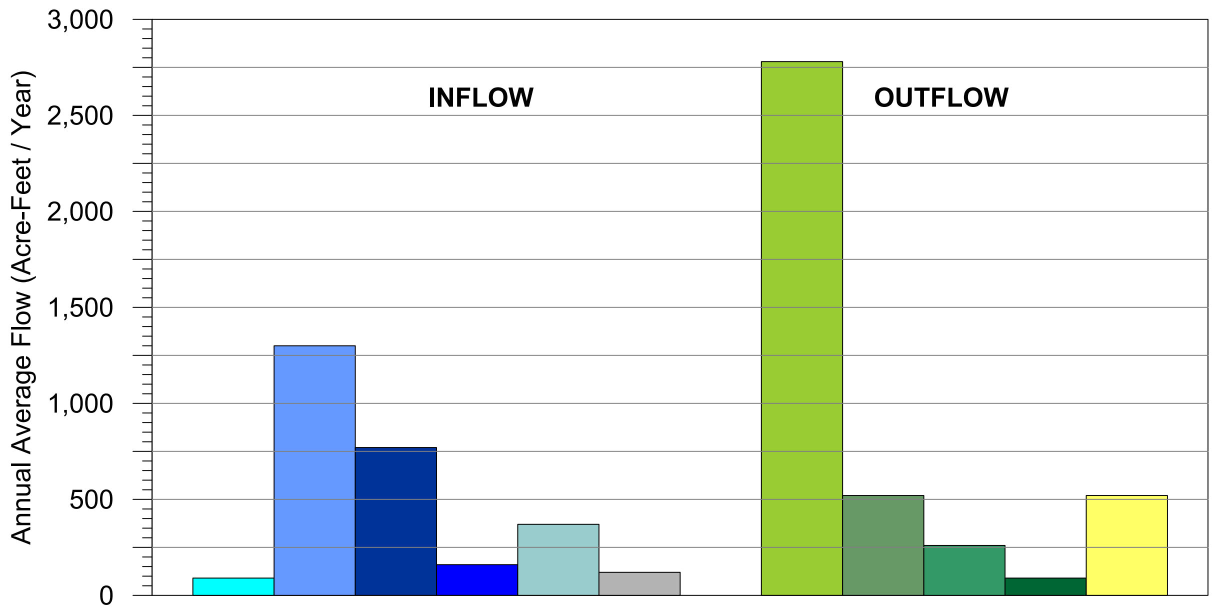
INFLOW

Agricultural Return Flows	Precipitation Recharge-Overlying
Urban Return Flows	Mountain Front Recharge
Subflow In	Net Stream Percolation

OUTFLOW

Subflow Out	Municipal Pumping
Phreatophytes	Agriculture Pumping
Domestic Pumping	

KEY GROUNDWATER COMPONENTS



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AVERAGE
GROUNDWATER BUDGET VOLUMES
CURRENT WY2011-2018

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The current groundwater budget is directly influenced by the drought conditions from 2012 to 2018, which is one of the driest periods on historical record in the Santa Ynez River Valley. The results of the water budget during the current period show that the CMA experienced more total outflow than inflow. As shown on Figure 2c.4-1A, the average total inflow of 2,810 AFY is 1,360 AFY less than the average total outflow of 4,170 AFY. During the current period, the amount of percolation of direct precipitation was diminished and at the same time, total groundwater pumping increased. During the current water budget period (2011 through 2018), an estimated net decline of groundwater in storage of approximately 10,880 AF occurred (Figure 2c.3-5). The annual average groundwater storage decline during the current water budget period (2011 through 2018) was approximately 1,360 AFY.

The short-term depletion of groundwater in storage indicates that the total groundwater outflows exceeded the total inflows during the current period. As summarized in Table 2c.4-4, total groundwater pumping averaged approximately 3,560 AFY during the current period. Due to the drought conditions and short period analyzed (8 years), the current water budget period is not appropriate for long-term sustainability planning.

2C.5 PROJECTED WATER BUDGET

SGMA regulations require the following regarding projected water budgets:

> "3. Projected water budgets shall be used to estimate future baseline conditions of supply, demand, and aquifer response to Plan implementation, and to identify the uncertainties of these projected water budget components."
>
> "(A) Projected hydrology shall utilize 50 years of historical precipitation, evapotranspiration, and streamflow information as the baseline condition for estimating future hydrology…"
>
> "(B) Projected water demand shall utilize the most recent land use, evapotranspiration, and crop coefficient information as the baseline condition for estimating future water demand…"
>
> "(C) Projected surface water supply shall utilize the most recent water supply information as the baseline condition for estimating future surface water supply. The projected surface water supply shall also be applied as the baseline condition used to evaluate future scenarios of surface water supply availability and reliability as a function of the historical surface water supply identified in Section 354.18(c)(2)(A), and the projected changes in local land use planning, population growth, and climate." [112]

2c.5-1 Projected Estimation Methodology

The future water budget in the CMA was estimated utilizing estimated future population forecasts and future factors prescribed by DWR for future hydrology projection of climatic conditions through 2030 and 2072. The effects of climate change were evaluated using DWR-provided climate change factors. This section describes the estimated components of the future water budget that includes land use, water demand, and climate change.

The 2030 and 2070 precipitation and ET climate change factors are available on 6-kilometer resolution grids. The climate data sets have been routed to the subbasins defined by 8-digit Hydrologic Unit Codes

112 23 CCR § 354.18 (c)(3)

(HUCs), and the resulting downscaled hydrologic time series are available on the DWR SGMA Data Viewer.[113] Precipitation and ET data used in this analysis were downloaded from the DWR SGMA Data Viewer for climate grid cells covering the CMA within HUC 18060010, which is the HUC for the Santa Ynez River. These change factors are available monthly from 1915 to 2011 for the Santa Ynez River watershed. The monthly change factors for the Santa Ynez River watershed were applied to the historical hydrology for the CMA. Mean monthly and annual values were then computed from the subbasin time series to show projected patterns of change under 2030 and 2070 conditions.

2c.5-1-1 Projected Hydrology and Surface Water Supply

DWR has provided SGMA Climate Change Data and published a guidance document, "Guidance for Climate Change Data Use for Groundwater Sustainability Plan Development" (DWR 2018), as the primary source for developing the future water budget.

A common approach to forecast the new water resources balance under climate change conditions in the future is the use of global circulation model (GCM) outputs, downscaled to local geographic scales. There are more than 30 GCMs, each with different ways of representing aspects of the climate system. DWR's Climate Change Technical Advisory Group (CCTAG) has identified the most applicable and appropriate GCMs for water resource planning and analysis in California. Key future climate projection scenarios identified by DWR are summarized in **Table 2c.5-1**.

Table 2c.5-1
Summary of Climate Scenarios

Year	Type	Scenario Name	Description
2030	Average	Central Tendency	Central tendency of the ensemble of 10 GCM and two RCPs (high and middle emissions scenarios).
2070	Average	Central Tendency	Central tendency of the ensemble of 10 GCM and two RCPs (high and middle emissions scenarios).
2070	Extreme	Drier/Extreme Warming (2070DEW)	Single GCM, HadGEM2-EM model for RCP 8.5 (high emissions scenario)
2070	Extreme	Wetter/Moderate Warming (2070WMW)	Single GCM, CNRM-CM5 model for RCP 4.5 (middle emissions scenario)

Source: DWR (2018) Guidance for Climate Change Data Use for Groundwater Sustainability Plan Development
GCM = general circulation models, RCP = representative concentration pathway

[113] SGMA Data Viewer. Web resource. https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer Accessed 2021-02-15.

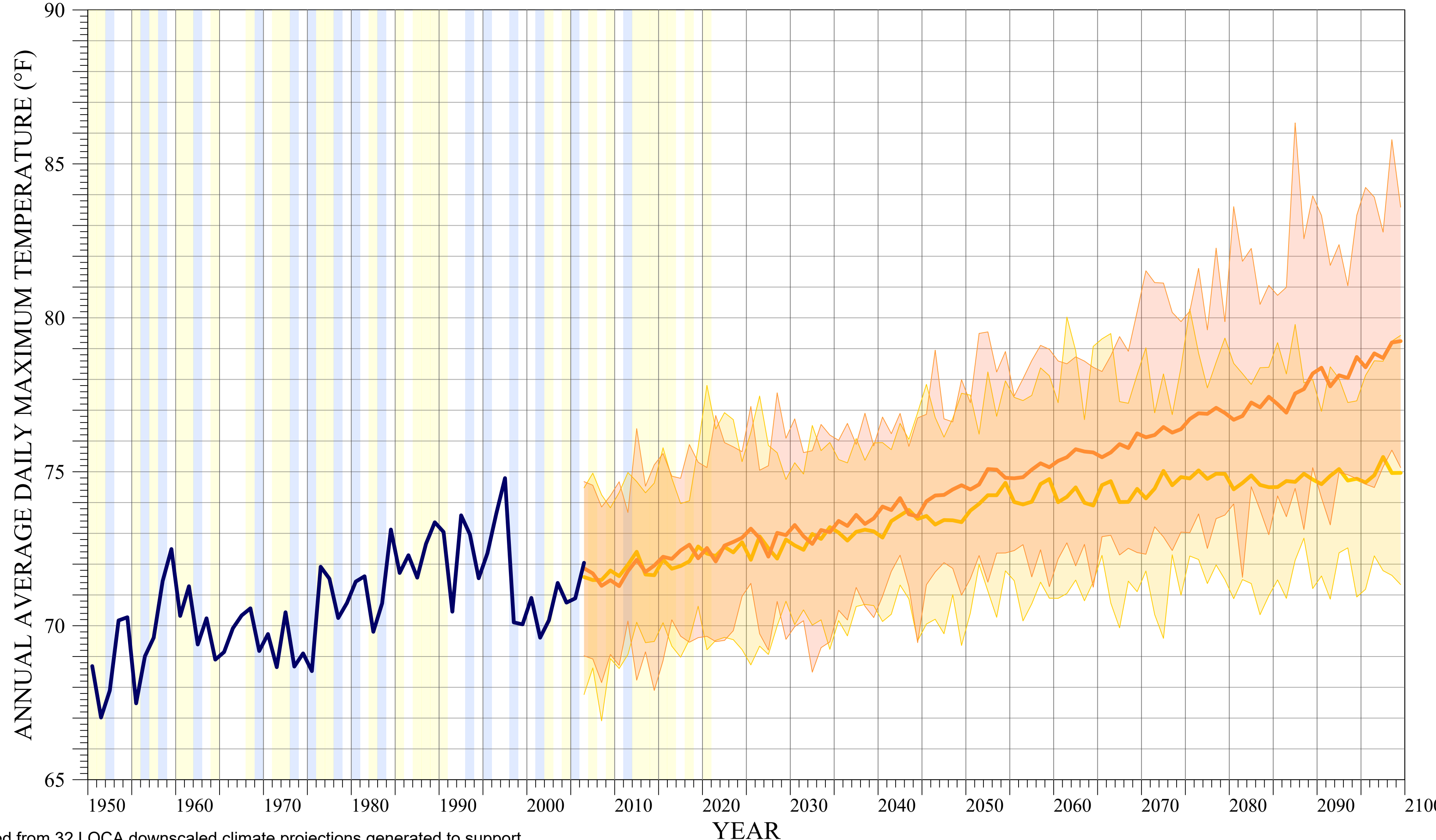
The Central Tendency scenarios are based on an average of 20 GCMs to project change in precipitation and evapotranspiration around 2030 and 2070 and used for projecting future conditions for the water budget. The Central Tendency scenarios were developed using an ensemble of climate models such that the entire probability distribution at the monthly scale was transformed to reflect the mean of the 20 climate projections[114] (DWR 2018). The DWR data set also includes two additional simulation results for extreme climate scenarios under 2070 conditions: Drier/Extreme Warming (2070DEW) and Wetter/Moderate Warming (2070WMW). Use of the extreme scenarios in GSPs is optional. Due to the concentration of greenhouse gases in the atmosphere, temperatures under the Central Tendency are estimated to rise by 3° to 7° Fahrenheit between 2020 and 2070 as shown in **Figure 2c.5-1** showing the range of the GCMs forecasted maximum daily temperatures for Buellton.[115] Generally, change factors under the Central Tendency scenario have a seasonal pattern with wetter conditions in the winter months, and drier during the spring and fall months when compared to historical conditions. Within the Basin, streamflow is projected to increase slightly by 0.5% in 2030 and 3.8% in 2070.

Crops require more water to sustain growth in a warmer climate, and this increased water requirement is characterized in climate models using the rate of ET. Under 2030 conditions, the CMA is projected to experience average annual ET increases of 3.8% relative to the baseline period. Under 2070 conditions, annual ET is projected to increase by 8.3% relative to the baseline period.

The seasonal timing of precipitation in the CMA is projected to change. Sharp decreases are projected early fall and late spring precipitation accompanied by increases in winter and early summer precipitation. The CMA is projected to experience minimal changes in total annual precipitation. No changes for annual precipitation are projected under 2030 conditions relative to the baseline period. Under 2070 conditions, small decreases in annual precipitation are projected by 3%.

114 10 GCMs selected are combined with two emission scenarios for a total of twenty scenarios utilized. The two emissions scenarios include a “middle” scenario (RCP 4.5) with emissions peaking around 2040 and a “business as usual” scenario with emission peaking around 2080 (RCP 8.5).

115 Local Climate Change Snapshot. Web Resource https://cal-adapt.org/tools/local-climate-change-snapshot/ Accessed 2021-02-15.



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Derived from 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment.

Source: California Energy Commission (2021) [https://Cal-Adapt.org]

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ANNUAL AVERAGE MAXIMUM TEMPERATURE AT BUELLTON
CLIMATE PROJECTIONS

Climate Change Scenario
- High Emissions (RCP 8.5) Average
- Medium Emissions (RCP 4.5) Average
- Historical Observations

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.5-1

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2c.5-1-2 Projected Water Demand for CMA

Based upon the historical and current water budget, the total water demands within the CMA were estimated for the future period extending for 20 years through the implementation period (2022-2042) and further through 50 years into the future, through 2072.

The average annual pumping for agricultural irrigation in 2018 was 2,415 AFY. For this analysis of projected water demand, no changes in future irrigated acres and type of crops are assumed. However, based on the climate change Central Tendency scenario, described above, irrigation demands will increase by 3.8% by 2030 and 8.3% by 2070. Using these same increases in crop water demand, future projection of agricultural demand in the Buellton Upland will increase to 2,507 AFY in 2042 and 2,615 AFY in 2072.

Future Municipal and Industrial (M&I) and rural domestic demands were estimated based on demand to satisfy the non-agricultural demand for the City of Buellton, small mutual water companies, and rural domestic users. The Santa Barbara County Association of Governments Regional Growth Forecasts estimate large increases in population for the Buellton area (SBCAG 2012). For example, the population of the City of Buellton (City) is forecasted to increase to 7,400 by the year 2040, which represents a 45% increase from the current population of 5,100 in 2020. However, current water use demand by the City has been relatively steady compared with population increases. For example, the population of the City grew by about 6% between 2010 and 2020, but the water use by the City was about the same.

This analysis assumes an increase in water use by the City of 15% by 2042, which is about a third of the SBCAG population projected percentage increase but more in-line with the 2010 to 2020 population trend. Assuming build-out conditions would be approached after 2040, an increase in water use by the City of only 20% by 2072 compared with 2018 levels is assumed for this analysis. Based on 2018 pumping from the Buellton Upland of 350 AFY, future projection of the City demand from the Buellton Upland will increase to 403 AFY in 2042 and 420 AFY in 2072. These same percentage increases are also assumed for the rural domestic water users who pump from the Buellton Upland. Based on 2018 pumping from the Buellton Upland of 250 AFY for domestic use, future projection of the rural domestic demand from the Buellton Upland will increase to 288 AFY in 2042 and 293 AFY in 2072.

The total demand from the CMA Buellton Upland groundwater during 2018 and projected values for 2042 and 2072 are presented on **Table 2c.5-2**. By 2042, at the end of the GSP implementation period, total demand in the CMA may increase by 6% relative to 2018 to 3,198 AFY, and further by a total of 10% by 2072 to 3,328 AFY due to a combination of increased temperatures due to climate change and increases in population. Using the same increase in demands for each sector, the surface water demands in the Santa Ynez River Alluvium subarea are similarly projected to increase by 7% in 2042 and 11% in 2072, as shown in Table 2c.5-2.

Table 2c.5-2
Projected Water Demand for CMA

	2018 Demand	Estimated 2042 Demand	Estimated 2072 Demand
	(Acre-Feet per Year)		
Groundwater Demand			
Pumping – Agriculture	2,415	2,507	2,615
Pumping – Municipal	350	403	420
Pumping – Domestic	250	288	293
TOTAL Groundwater Demand	3,015	3,198	3,328
Santa Ynez River Alluvium Subarea Surface Water Demand			
River well pumping – Agriculture	3,223	3,345	3,491
River well pumping – Municipal and SWP Imports	897	1,033	1,076
River well pumping – Domestic	376	434	441
TOTAL Surface Water Demand	4,497	4,812	5,008
TOTAL	7,512	8,010	8,336

2c.5-2 Projected Water Supply

The water demands in Table 2c.5-2 will be supplied from the same historical sources of groundwater in the Buellton Upland and surface water in the Santa Ynez River Alluvium subarea. Based on current planning from the Central Coast Water Authority and DWR's 2019 Delivery Capability Report (DWR 2020), a 58% delivery allocation for SWP to the CMA for the projected future period has been assumed. Based on the City's current SWP allocation of 578 AFY and a drought buffer of 58 AFY, the total imports to meet future demands is assumed at 432 AFY. The remaining demand for surface water supplies by the City (601 and 644 AFY, respectively for 2042 and 2072) is assumed to come from river well pumping similar to historical conditions.

The source for surface water supplies, the Santa Ynez River, is projected to continue to be a reliable source of water for the Santa Ynez River Alluvium subarea due to Cachuma Reservoir operations located about 11 miles upstream of the CMA. The ability to store water in Cachuma Reservoir will help attenuate the effects of the flashier runoff forecasted to occur under the Central Tendency scenario. Downstream water rights releases and releases for endangered steelhead (*O. mykiss*) from Bradbury Dam pursuant to WR 2019-0148 are assumed to be able to mitigate impacts downstream caused by climate change. Detailed climate change studies and impacts to the operations of Cachuma Reservoir are currently not available. However, releases from Cachuma Reservoir did sustain Santa Ynez River underflow during the recent critical drought of 2012-2018 and is expected to provide similar mitigation during future droughts. However, if climate change does not continue under the Central Tendency scenario but rather is more like the Drier/Extreme Warming Climate scenario, then the water supply for the entire region will be affected and re-evaluated.

The source for groundwater supplies in the Buellton Upland is primarily recharge from precipitation which will be affected by climate change to an uncertain degree. Because recharge is the resultant after three key processes including precipitation, runoff, and evapotranspiration, which among themselves have associated uncertainty, the combined uncertainty is compounded. Under the Central Tendency scenario in the CMA, no changes for annual precipitation are projected under 2030 conditions relative to the baseline period (1982 through 2018), and under 2070 conditions, small decreases in annual precipitation are projected by 3%. Recharge from precipitation to the Buellton Upland groundwater aquifer is assumed to be affected by climate change by these same percentages of zero percent by 2042 and 3% reduction by 2072. Recharge from streamflow infiltration is assumed to be similar to the projected increases in runoff by 0.5% in 2042 and 3.8% increase by 2072. The net effect of decreased recharge and increased runoff by these small percentages is that the current estimate of the perennial yield of 2,800 AFY for the Buellton Upland is assumed to be roughly the same for this analysis under climate change conditions.

2c.5-3 Summary of Projected Water Budget

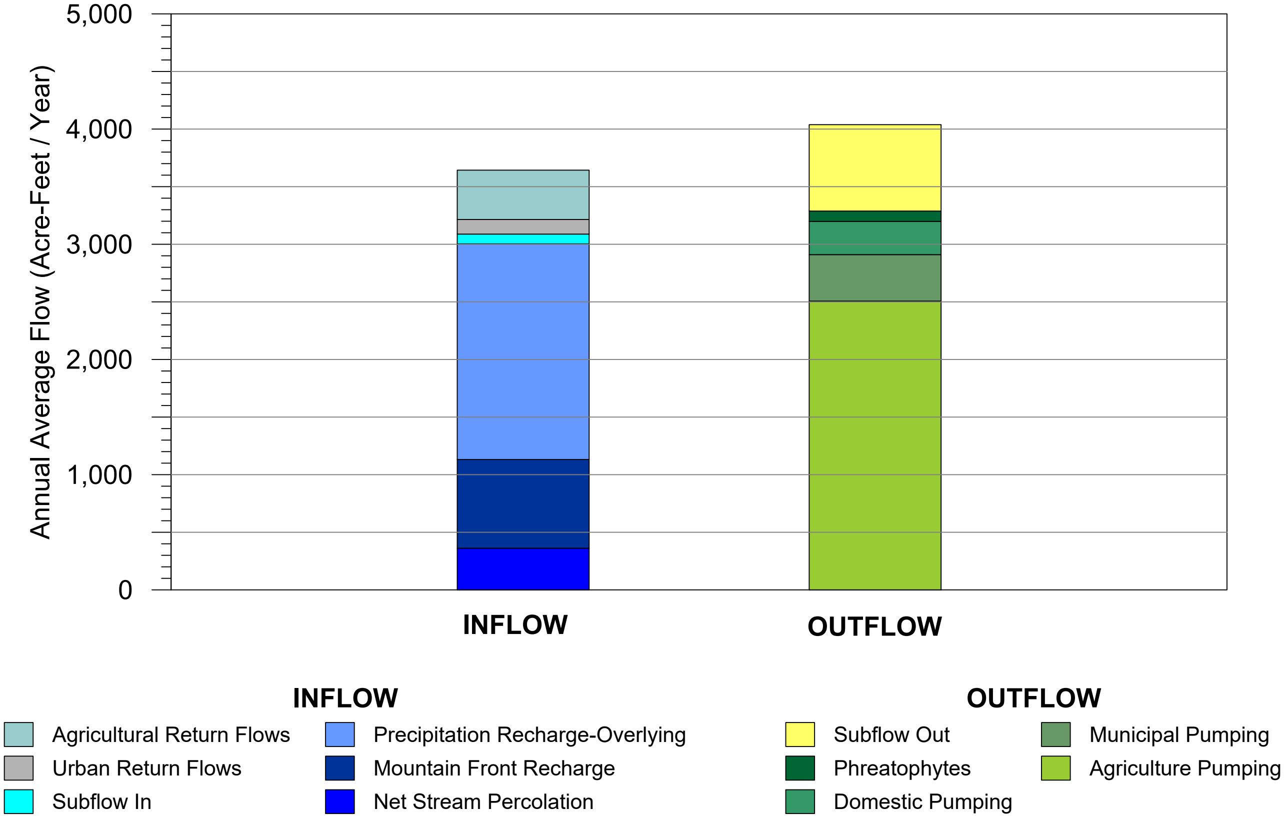
Groundwater supplies are projected to be about the same under projected future conditions, while overall demand is projected to increase up to 11% by 2072 to 4,223 AFY resulting from a combination of increased temperatures due to climate change and increases in local population. **Table 2c.5-3** summarizes the projected total groundwater budget and average change in storage in the future.

Average groundwater inflows and outflows for the projected future water budget period are presented on **Figure 2c.5-2AB** for years 2042 and 2072, respectively. The results of the water budget during the future period show that the CMA has more total outflow than inflow. As shown on Figure 2c.5-2A, in the year 2042 the average total inflow of 3,644 AFY is 395 AFY less than the average total outflow of 4,039 AFY. Similarly, as shown on Figure 2c.5-2B, in the year 2072 the average total inflow of 3,596 AFY is about 600 AFY less than the average total outflow of 4,223 AFY. The next steps in the GSP process will be to discuss the potential undesirable results from potential future losses of approximately 400 to 600 AFY in groundwater storage in the Buellton Upland and developing a monitoring system for the CMA.

FIGURE 2c.5-2AB

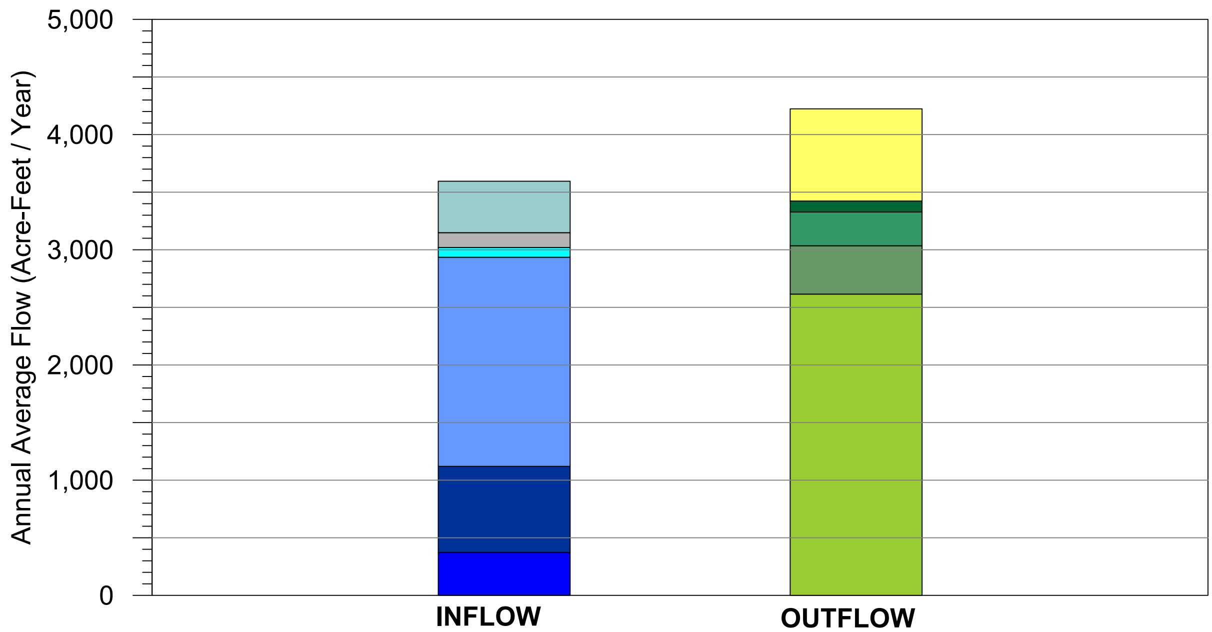
20-YEAR BUDGET, FUTURE 2042

FIGURE 2c.5-2A



50-YEAR BUDGET, FUTURE 2072

FIGURE 2c.5-2B



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AVERAGE GROUNDWATER BUDGET VOLUMES FUTURE PROJECTIONS

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Table 2c.5-3
Projected Groundwater Budget for CMA

	Baseline Hydrology and 2018 Demands	Estimated 2042 Hydrology and Demands	Estimated 2072 Hydrology and Demands
Subflow	85	85	85
Recharge from Precipitation- Aerial (Overlying)	1,870	1,871	1,814
Recharge from Precipitation- Mountain Front	770	770	747
Net Channel Percolation from Surface Water	360	362	374
Agricultural Return Flows	413	429	447
Municipal/ Domestic Return Flows	110	127	129
TOTAL Inflows	3,610	3,644	3,596
Pumping – Agriculture	2,415	2,507	2,615
Pumping – Municipal	350	403	420
Pumping – Domestic	250	288	293
Riparian Vegetation Evapotranspiration	88	91	95
Subflow to Santa Ynez River Alluvium	690	750	800
TOTAL Outflows	3,793	4,039	4,223
TOTAL Inflows - Outflows	-183	-395	-627

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CHAPTER 3: MONITORING NETWORKS AND SUSTAINABLE MANAGEMENT CRITERIA

The chapter consist of the following two related sections which describe the monitoring of the basin.

Section 3a. Monitoring Networks

The section summarizes the monitoring done in the CMA, as well as identifies representative sites for monitoring for each of the six SGMA sustainability indicators.

Section 3b. Sustainable Management Criteria

This section discusses the Sustainable Management Criteria (SMC). It identifies the stainability goal of the CMA, conditions of undesirable results for each of the six SGMA sustainability indicators, Minimum Thresholds at the representative sites, and Measurable Objectives.

SECTION 3A – MONITORING NETWORKS

This section of the GSP describes the existing monitoring networks within the CMA that are currently used to collect groundwater levels and water quality data and the recommended CMA monitoring networks that will be used to monitor the monitor five of the applicable sustainability indicators in accordance with SGMA and the SMCs described above. The remaining sustainability indicator, seawater intrusion, does not apply to the CMA, as presented in the Section 2a and Section 2b (Hydrogeologic Conceptual Model (HCM) and Groundwater Conditions (GC)) due to the inland location of the CMA from the ocean (greater than 20 river-miles). The recommended CMA monitoring networks were developed to support GSA decision making to achieve groundwater sustainability goals and objectives outlined in Section 3b.1.

Existing monitoring networks within the CMA for groundwater levels and water quality are described, and the wells from those existing networks that are part of the *California Statewide Groundwater Elevation Monitoring* (CASGEM) and the *Groundwater Ambient Monitoring and Assessment Program* (GAMA) are identified. Using the existing groundwater level and water quality monitoring networks within the CMA, recommended CMA monitoring networks were developed, and a subset of those wells were selected for representative monitoring.

Data gaps identified in Chapter 2 and discussed as part of the SMCs in Section 3b, were considered during development of the recommended CMA monitoring networks. Those data gaps are described, followed by a brief description of how they will be addressed. Detailed approaches to address the identified data gaps are included in Plan Implementation (Chapter 5).

3a.1 Monitoring Networks Objectives

The objectives of the CMA monitoring networks are to identify and select representative monitoring wells to collect data to support monitoring of groundwater conditions and detection of potential undesirable results, and to achieve sustainability goals. As stated in the SGMA regulations[116], the monitoring networks will support:

- Demonstrate progress toward achieving measurable objectives described in the GSP;
- Monitor impacts to the beneficial uses or users of groundwater;
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds; and
- Quantify annual changes in water budget components.

The recommended monitoring network presented herein for the CMA GSA, is intended to monitor for the five applicable sustainability indicators[117] and their associated undesirable results, listed 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

116 23 CCR § 354.34(b)
117 23 CCR § 354.26. Undesirable Results

As described in Section 2a (HCM) and Section 2b (GC), seawater intrusion is not applicable in the CMA and an associated monitoring network was not developed.

3a.1-1 CMA Basin Conditions

The CMA Basin Setting is described in detail in Chapter 2, (Hydrogeologic Conceptual Model (HCM), Groundwater Conditions (GC), and Water Budget) of this GSP. A summary of CMA conditions that were considered during the development of the monitoring networks are described below, including hydrogeologic conditions, land uses and historical groundwater conditions.

The CMA covers an area of 21,020 acres, split between two subareas: the Santa Ynez River Alluvium (SYRA) and the Buellton Upland. The SYRA comprises an area of approximately 6,800 acres of mostly flat land adjacent to the Santa Ynez River. The Buellton Upland comprises approximately 14,220 acres of rugged hills located north of the Santa Ynez River, underlain by the Buellton Aquifer.

The principal aquifer within the CMA is the Buellton Aquifer. The Buellton Aquifer, as described in the 3D Geologic Model and HCM, is comprised of relatively coarse-grained sedimentary rocks identified as the Paso Robles Formation, and the Careaga Sandstone. Locally, these two geologic formations are compressed into a wide synclinal fold. The Buellton Aquifer varies in spatial distribution and vertical thickness within the CMA and hydraulic conductivity within the principal aquifer ranges from 1 to 10 feet per day, with an average thickness of 1,325 feet in the Buellton Upland, and 825 feet in areas that underlie the Santa Ynez River Alluvium subarea.

Water is also observed in the Santa Ynez River channel, alluvium, and adjacent terrace deposits (alluvium), herein referred to as the SYRA. Water in the SYRA underflow is within the jurisdiction of and regulated by the SWRCB as part of the Santa Ynez River streamflow the same as surface water pursuant to various SWRCB orders and decisions dating back to at least 1973 (Appendix 1d-B). In accordance with WR 73-37, 89-18, 2019-0148 and the SGMA, the water in the SYRA underflow is not considered a principal aquifer of the CMA. Although the SYRA underflow is not considered groundwater as defined by SGMA or a principal aquifer within the CMA, SYRA wells are considered in the CMA monitoring network to collect data to support sustainable groundwater management decision making by the CMA GSA, and to evaluate sustainable management criteria.

The primary groundwater users within the CMA are agricultural (80% of the volume of groundwater pumped) and municipal and domestic use (20% of the volume of groundwater pumped).[118] The aerial extent of agricultural users within the CMA are shown on HCM Figure 2a.4-2. Agriculture land uses comprise approximately 3,180 acres (15%) of the CMA; approximately 1,380 acres (10%) of which are located in the Buellton Upland subarea; and approximately 6,800 acres (27%) are located in the SYRA subarea.

118 Five-year averages for Fiscal Year (FY) 2015-16 through FY2019-20 for Santa Ynez River Water Conservation District Zone D corresponding to the Buellton Aquifer. Source is Stetson (2021) Forty-Third Annual Engineering and Survey Report on Water Supply Conditions of the Santa Ynez River Water Conservation District 2020-2021.

3A.2 EXISTING MONITORING NETWORKS

Groundwater level and water quality networks are actively monitored within the CMA and these data are used to evaluate changes in groundwater levels, calculate estimates of groundwater in storage, assess changes in groundwater quality and understand surface water conditions. The details of those existing monitoring networks are presented below. Additionally, the existing networks were evaluated and used to develop the recommended CMA monitoring networks to support GSA decision making to sustainably manage groundwater in accordance with established sustainable management criteria (SMC), within the CMA. The following subsections summarize the existing monitoring networks for the period of 2015 through 2021.

3a.2-1 Groundwater Levels

The County of Santa Barbara (COSB)[119] , the United States Bureau of Reclamation (USBR), the City of Buellton (City) currently collect groundwater elevation data (groundwater levels) from their respective monitoring networks within the CMA. The monitored wells are shown in aerial view on **Figure 3a.2-1** and summarized below in **Table 3a.2-1**.

Table 3a.2-1
Summary of Existing Groundwater Elevation Monitoring Network Wells
Spring 2015 through Spring 2021

Monitoring Network	Monitoring Frequency	Buellton Aquifer	SYRA Underflow	Total
COSB (formerly USGS)[120]	Semi-annual / annual	3	5	8
USBR	Monthly	0	10	10
City of Buellton	Monthly	1	3	4
	Totals:	4	18	22

119 Groundwater levels are collected by the Santa Barbara County Water Agency which is one of five divisions of the Santa Barbara County Public Works Department, which in turn is one of several departments under the County of Santa Barbara.
120 Prior to 2019, the COSB monitoring network data was collected by the United States Geological Survey (USGS).

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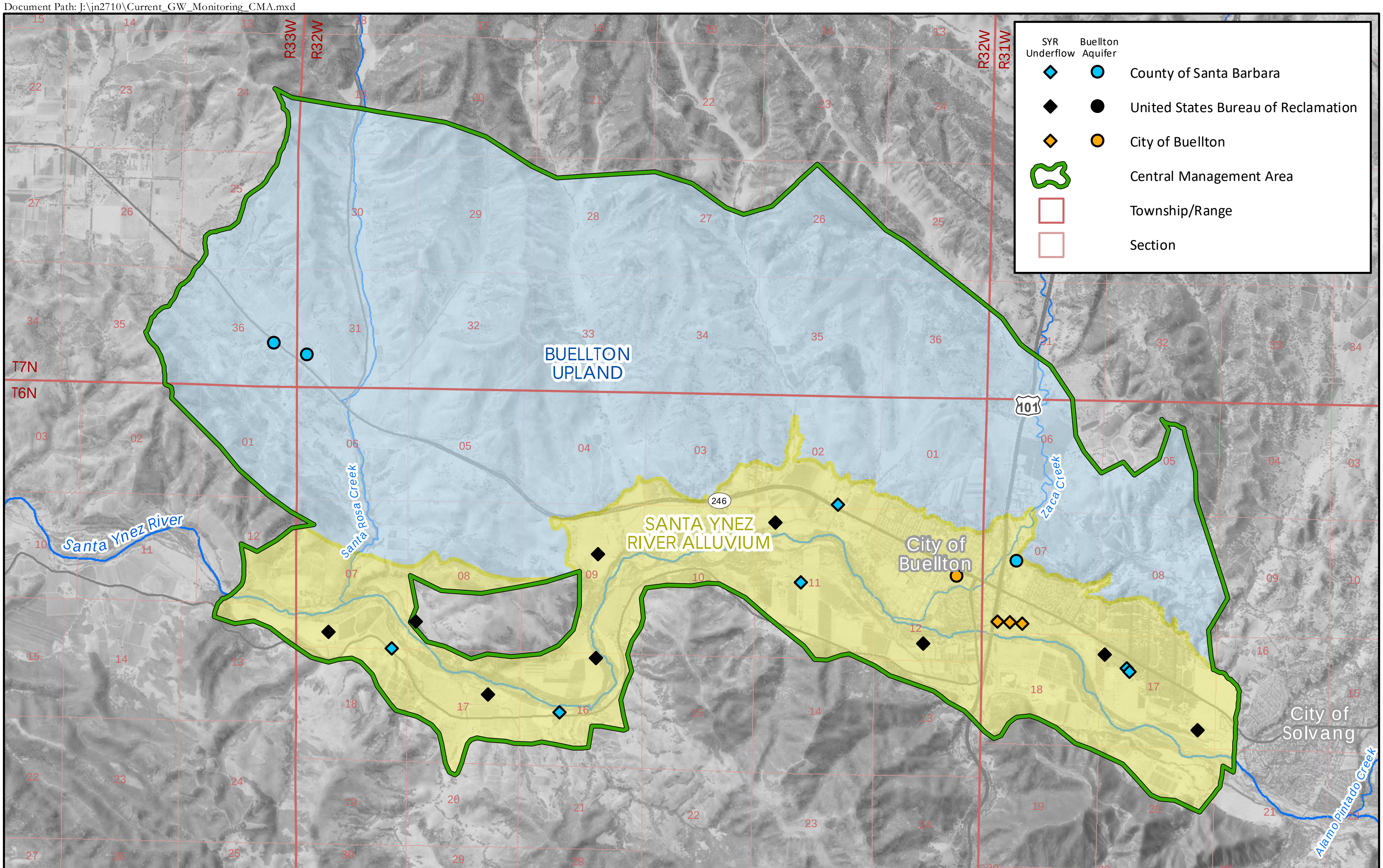

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CURRENT GROUNDWATER LEVEL MONITORING PROGRAMS

0 0.5 1 Miles

N

Note:
Wells shown were monitored 2015-2021.

FIGURE 3a.2-1

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Of the wells monitored within the CMA for groundwater levels, as summarized above in **Table 3a.2-1**, data collected from some of them are also submitted to the CASGEM program. The CASGEM wells are summarized below in **Table 3a.2-2**, including the principal aquifer their data represent, their assigned State identification (ID) number, their USGS ID, CASGEM ID and CASGEM type (mandatory or voluntary monitoring).

Table 3a.2-2
List of CMA CASGEM Wells (10 wells)
Spring 2015-Spring 2021

Principal Aquifer	State ID	CASGEM Well ID	Voluntary Monitoring	Master Site ID	USGS Well ID
SYRA Underflow	6N/32W-11L4	49137	Voluntary	346120N1202200W001	343644120131101
SYRA Underflow	6N/32W-16P3	38300	Voluntary	345955N1202570W001	343544120151801
SYRA Underflow	6N/32W-18H1	24991	Voluntary	346036N1202812W001	343613120164501
Buellton Aquifer	7N/32W-31M1	23681	Voluntary	346392N1202953W001	343821120173601
Buellton Aquifer	7N/33W-36J1	23895	Voluntary	346400N1202998W001	343824120175201
SYRA Underflow	6N/31W-17F1	38798	Voluntary	346025N1201720W001	343609120101201
SYRA Underflow	6N/31W-17F3	49121	Voluntary	346020N1201690W001	343608120101001
Buellton Aquifer	6N/31W-7F1	49120	CASGEM	346150N1201870W001	343655120111201
SYRA Underflow	6N/32W-2Q1	49119	Voluntary	346220N1202140W001	343719120124901
Buellton Aquifer	6N/32W-12K2	--	--	-	343649120114401

Additional historical groundwater elevation data exists for wells not included in the existing groundwater monitoring network, i.e. for wells that may have been monitored in the past but are no longer part of the current monitoring network[121]. Available data from those wells have been incorporated into the Data Management System (DMS), as described in Section 1e[122]. Additionally, detailed summaries and analysis of available historical groundwater elevation data are included in Section 2b.1 discussions of CMA groundwater condition.

121 Wells may be removed from monitoring programs over time due to land development, change in ownership or access, well destruction, well redundancy, lack of well completion or screen interval information, or other applicable criteria.
122 The DMS and the associated Data Management Plan (DMP) describe available CMA data and resources considered.

3a.2-2 Groundwater Storage

The existing groundwater level monitoring network (described above) and the collected data are used to estimate annual changes to groundwater in storage within the Santa Ynez River Water Conservation District (SYRWCD). The estimated changes to groundwater in storage are included in the SYRWCD annual reports, which are available for public access at the Buellton, Lompoc, and Solvang Public Libraries and on the SYRWCD website (SYRWCD.com). Groundwater in storage estimates utilize the data collected from the groundwater level monitoring network shown on **Figure 3a.2-1** and is summarized in Table 3a.2-1 and Table 3a.2-2.

3a.2-3 Groundwater Quality

Groundwater quality refers to the measurement of naturally occurring and anthropogenically influenced chemical compounds in groundwater. These compounds have the potential to adversely affect groundwater chemistry (groundwater quality). As described in Chapter 2, the groundwater quality in the Buellton Aquifer is generally of better quality than the groundwater quality in the SYRA which is present at shallower depths (closer to the ground surface).

Groundwater quality data is currently collected from wells within the CMA as part of Public Water System Reporting and the California Irrigated Lands Reporting Program (ILRP). Some of the data collected from these wells are also reported to the GAMA Program. The CMA wells included in these programs and monitored for groundwater quality are shown on **Figure 3a.2-2** and summarized below in Table 3a.2-3.[123]

[123] Sites are included if there were at least one or more Total Dissolved Solids measurements during the period 2015-2021. ILRP are grouped by reporting site.

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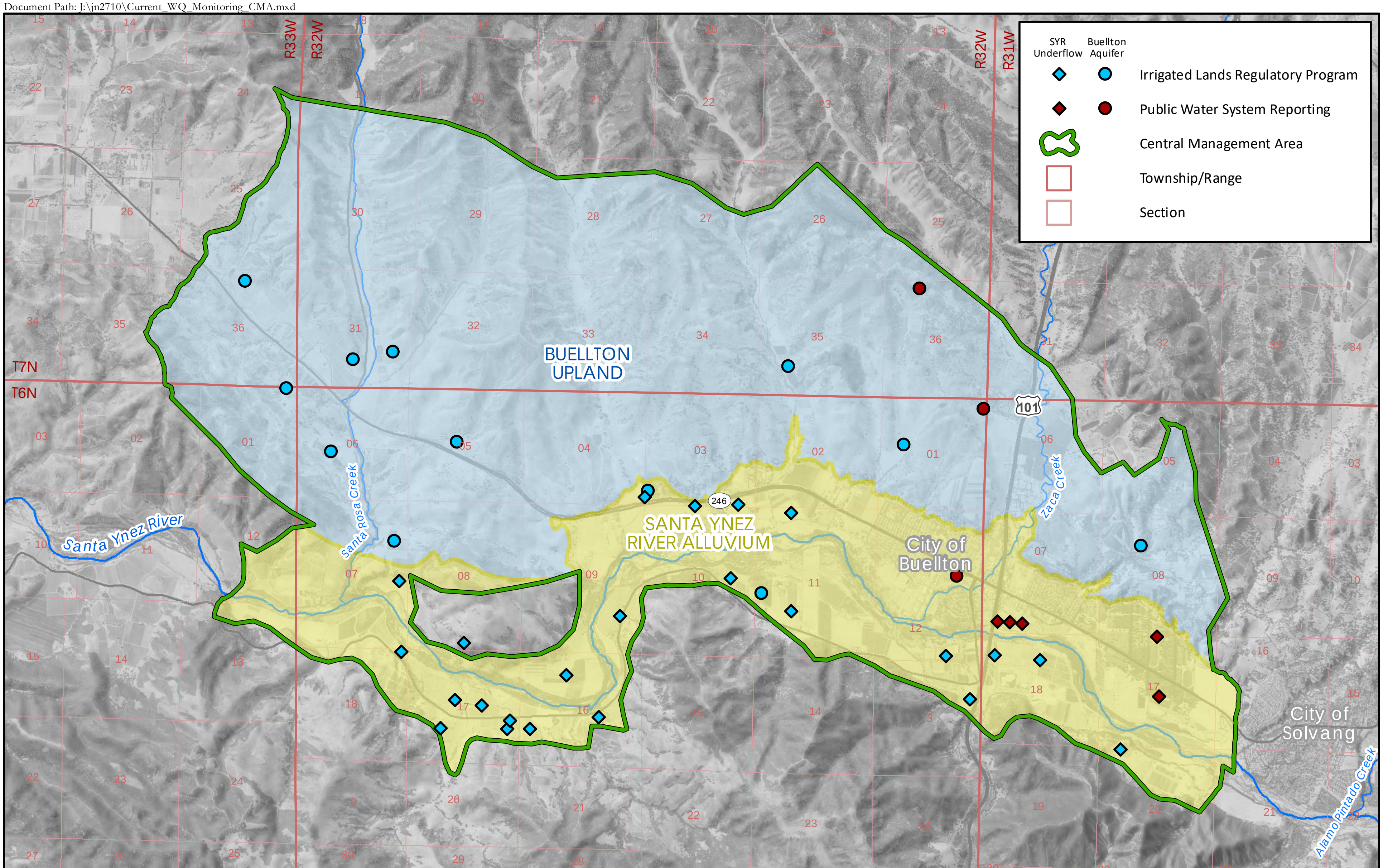

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CURRENT WATER QUALITY MONITORING PROGRAMS

0 0.5 1 Miles

N

Note:
Wells shown were monitored 2015-2021.

FIGURE 3a.2-2

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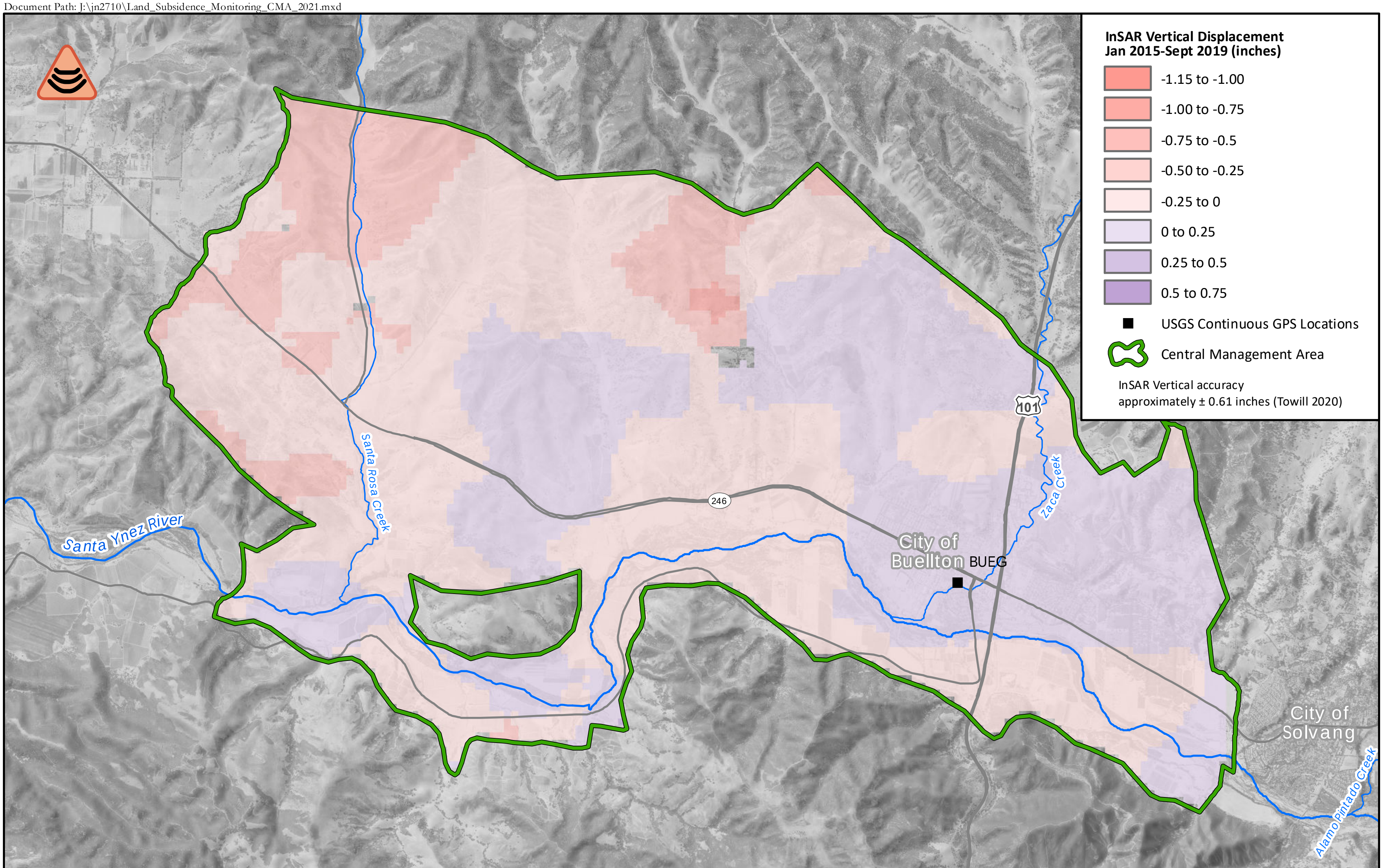

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LAND SUBSIDENCE MONITORING
WITHIN CENTRAL MANAGEMENT AREA

0 0.5 1 Miles

N

Sources:
USGS National Elevation Dataset, 2002
NAIP (2018)
Dudek (2020), DWR (2020)

FIGURE 3a.2-3

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Table 3a.2-3
Summary of Existing CMA Groundwater Quality Monitoring Networks
Spring 2015 through Spring 2021

Monitoring Network	Monitoring Frequency	Buellton Aquifer	SYRA Underflow	Total Participating Wells
Public Water Systems Report	Quarterly	3	5	8
Irrigated Lands Regulatory Program[124]	Annual or Biannual	12	23	35
Subtotal of Principal Aquifers:		60	15	28

Municipal water systems, including the City of Buellton and other small public water companies, also report the collected groundwater quality data to the Safe Drinking Water Information System (SDWIS) and Drinking Water Information Clearinghouse (DRINC), which are the federal (EPA) and state (SWRCB) websites, respectively. In the CMA, the Public Water System wells provide representative data for both the Buellton Aquifer and the SYRA. Commercially irrigated agricultural lands are required to periodically submit groundwater quality data to the ILRP and within the CMA there are participating wells that provide data for both the Buellton Aquifer and the SYRA, as listed above in Table 3a.2-3.

3a.2-4 Seawater Intrusion

Seawater intrusion is not applicable to the CMA due to the inland location and distance between the CMA and the Pacific Ocean (greater than 20 Santa Ynez River miles), as described in both the HCM and GC portions of the basin setting.

3a.2-5 Land Subsidence

Land subsidence monitoring has been conducted recently (since 2015) for the CMA using remote sensing Interferometric Synthetic Aperture Radar (InSAR) data which tracks vertical elevation changes to an accuracy of approximately 0.61 inches[125] (Towill 2020). These satellite data are collected by the European Space Agency and processed by TRE ALTAMIRA Inc. under contract with the DWR. Since June 2015, data has been collected and made publicly available monthly (TRE ALTAMIRA 2020). These data are used to

124 ILRP values here represent reporting groups.
125 95% Confidence of within 15.50 millimeters (0.05 feet) when compared to continuous global positioning system (CGPS) data for the period January 1, 2015 through September 19, 2019.

evaluate and estimate monthly and annual land surface elevation changes since data collection was initiated in 2015.

In addition to the available InSAR data, a USGS continuous global positioning system (CGPS) station (BUEG) was installed near the city of Buellton and has been collecting vertical displacement data since January 2015 as shown on **Figure 3a.2-3**. Land subsidence has not been observed within the CMA by any of the GSA member agencies; nor has subsidence affected any of the existing water infrastructure within the CMA, as indicated in Chapter 2 (HCM and GC).

3a.2-6 Surface Water Monitoring

Surface water monitoring within the Basin is conducted through stream gages placed along the Santa Ynez River and confluences of key tributaries. Currently there are no active USGS stream gages within the CMA boundaries, however there are three active USGS stream gages located up and downstream from the CMA (GC Figure 2b.6-1) which allow for estimation of streamflow or surface water conditions within the CMA. **Table 3a.2-4** summarizes the existing stream gauges that provide data contributing to the evaluation of CMA surface water conditions. Locations for USGS stream gages within the immediate vicinity of the CMA are shown in Chapter 2b, GC Figure 2b.6-1.

Table 3a.2-4
USGS Stream Gages relevant to the CMA

Status	USGS Gage Name	Gage Number	Start Year	End Year	Upstream of or Within the CMA
Active	SANTA YNEZ R A SOLVANG CA	11128500	1929	2021 (active)	Upstream
Active	ZACA C NR BUELLTON CA	11129800	1964	2021 (active)	Upstream
Active	SANTA YNEZ R A NARROWS NR LOMPOC CA	11133000	1952	2021 (active)	Downstream

Gages 11128500 and 11129800 (Table 3a.2-4) are located within one mile of the CMA and are a good measure of the surface water inflows into the CMA. Gage 11133000 is located approximately 12 miles downstream of the CMA, so the surface water outflow from the CMA can be improved with additional data. To address this data gap, spot flow measurements of the surface water outflow from the CMA are proposed to be taken for a period of one year in order to develop a relationship with Gage 11133000. These new streamflow measurements will be near a previous USGS gage “Santa Ynez River at Santa Rosa Damsite near Buellton” (USGS ID 11131000; Figure 2b.6-1, GC).

Additionally, as described in Chapters 1 and 2, SWRCB Orders WR 73-37, 89-18, 2019-0148 determined that water observed in the SYRA is Santa Ynez River underflow and is considered the same as surface water flows (Appendix 1d-B). Wells screened in the SYRA are considered underflow wells and are monitored by the USBR on a monthly basis. The data collected from the SYRA wells by the USBR are reported to the SYRWCD and used to manage surface water flows in accordance with the SWRCB Order WR 73-37 and subsequent orders.

A variety of data sources are available for the CMA. They are used to monitor current surface water conditions and fluxes within the CMA, and to assist with compliance with SWRCB Order WR 73-37, 89-18, 2019-0148. The available data sources and their uses are listed below.

- Upstream conditions of Lake Cachuma and Bradbury Dam operations, including imports from State Water Project water, are monitored by USBR daily.
- The Central Coast Water Authority (CCWA) which operates the pipeline transporting State Water Project (SWP) water (HCM Figure 2a.3-9) to the Basin, monitors the SWP deliveries to the watershed.
- Precipitation in the CMA is measured at the Buellton Fire Station. Data for Water Year 1955-present (2021) is published by the Santa Barbara County Flood Control & Water Conservation District (Figure 2a.3-2 and Figure 2a.3-3).

3A.3 RECOMMENDED MONITORING NETWORKS

The recommended CMA monitoring network is discussed in the following subsections. The recommended monitoring network was developed to facilitate data collection to support early identification of groundwater changes that could potentially result in undesirable results and to guide the CMA GSA toward their established groundwater sustainability goals over the implementation horizon. The recommended monitoring network, including filling identified data gaps, is intended to identify temporal trends in groundwater conditions. The data collected from the recommended monitoring networks will support the established Sustainable Management Criteria (SMC) and guide the CMA GSA in decision making on projects and management actions within the CMA, as warranted. **Table 3a.3-1** is a summary of the representative monitoring wells.

3a.3-1 Groundwater Levels

As described above, the groundwater level monitoring network is focused on the Buellton Aquifer and not the Santa Ynez River Alluvium, in accordance with SWRCB Order WR 2019-0148.[126] The existing wells monitored for groundwater levels by the various agencies will continue, and of those, a subset being selected as representative monitoring wells within the CMA, as discussed in Section 3a.1.

3a.3-1-1 Representative Monitoring Wells Selection

Existing groundwater level monitoring wells located within the CMA were evaluated for selection as representative monitoring wells using the tiered approach outlined below. Each well was evaluated for each tier of criteria. If Tier 1 data was known or available for a well, the well would then be screened for Tier 2 criteria, and so on for Tiers 3 and 4. If Tier 1 and 2 criteria were met, the well was considered potentially suitable for inclusion in the monitoring networks for the CMA. If Tiers 1 through 4 criteria were met, the well was evaluated for potential suitability as a representative monitoring well for one of the established SMCs. Tier 4 evaluation was only conducted if a well was determined potentially suitable to monitor multiple SMCs.

126 SWRCB Order WR 73-37 and other orders and decisions of the SWRCB provide for the management of both River surface and underflow as surface water flows by the SWRCB.

Table 3a.3-1
Representative Monitoring Wells

RMW Name	WQ Well ID	DB Well ID	Subarea	Principal Aquifer	Screen Interval (ft bgs)	Sustainability Indicator(s) Monitored
7N/33W-36J1	NA	82	Buellton Upland	Buellton Aquifer	Unknown	GW level, GW in Storage
7N/32W-31M1	NA	75	Buellton Upland	Buellton Aquifer	Unknown	GW level, GW in Storage
6N/31W – 7F1	NA	90	Santa Ynez River Alluvium	Buellton Aquifer	Unknown	GW level, GW in Storage
6N/32W-12K1, 12K2	Buellton Well 09	909	Santa Ynez River Alluvium	Buellton Aquifer	Unknown	GW level, GW in Storage, WQ
7N/32W-35	AGL020014946	3337	Buellton Upland	Buellton Aquifer	Unknown	WQ, GW Level (Future), GW in Storage (Future)
6N/32W - 7	AGL020036041	3220	Buellton Upland	Buellton Aquifer	120 -300	WQ, GW Level (Future), GW in Storage (Future)
7N/33W-36	AGL020021622	3173	Buellton Upland	Buellton Aquifer	Unknown	WQ
7N/32W-31	AGL020001355	3137	Buellton Upland	Buellton Aquifer	330 – 810 (Multiple)	WQ
6N/32W-3	AGL020008330	3076	Santa Ynez River Alluvium	Buellton Aquifer	280 - 480	WQ
6N/31W-8	AGL020028450	3139	Buellton Upland	Buellton Aquifer	Unknown	WQ (Future?)
6N/32W – 9G1			Santa Ynez River Alluvium	Santa Ynez River Alluvium Underflow	NA	Interconnected Surface Water
6N/32W – 13G2			Santa Ynez River Alluvium	Santa Ynez River Alluvium Underflow	NA	Interconnected Surface Water
6N/32W – 17R1			Santa Ynez River Alluvium	Santa Ynez River Alluvium Underflow	8 - 28	Interconnected Surface Water

NA - Not Applicable

The tiering criteria utilized to select CMA representative monitoring wells is shown below.

Tier 1

- part of an existing monitoring network
- access available for monitoring
- existing DWR databases (CASGEM, GAMA, SWIS, etc.)

Tier 2

- xyz well location data
- well boring log
- total boring depth
- well screen interval
- principal aquifer screened

Tier 3

- historical data
- spatial location and consideration of upgradient and downgradient conditions

Tier 4

- suitable to monitor multiple SMCs

Table 3a.3-2 below, summarizes the existing wells in the primary Buellton Aquifer identifying whether the monitored wells are part of the existing State of California Department of Water Resources CASGEM program, identifying well names (includes CASGEM names or State well IDs), the principal aquifer each well is screened in and the frequency of monitoring. Locations of the wells are shown on **Figure 3a.3-1.**

Table 3a.3-2
Buellton Aquifer Wells Groundwater Level Data
Spring 2015 through Spring 2021

Subarea	Principal Aquifer	DBID	State ID	USGS ID	CASGEM ID	CASGEM Type	Frequency
Buellton Upland	Buellton Aquifer	82	7N/33W-36J1	343824120175201	23895	Voluntary	Biannual
Buellton Upland	Buellton Aquifer	75	7N/32W-31M1	343821120173601	23681	Voluntary	Biannual
Santa Ynez Alluvium	Buellton Aquifer	90	6N/31W-7F1	343655120111201	49120	CASGEM	Biannual
Santa Ynez Alluvium	Buellton Aquifer	909	6N/32W-12K2	343649120114401	-	n/a	Monthly

The distribution of existing wells across the principal aquifer indicates sufficient monitoring is feasible by utilizing the existing wells, with a few exceptions in the Buellton Upland subarea, as described below.

3a.3-1-2 Groundwater Levels Data Gaps

The density of wells measuring water levels is currently sufficient according to the Best Management Practices (BMPs) document for SGMA (DWR, December 2016). For basins like the CMA that pump between 1,000 and 10,000 AFY, the BMPs recommended to have 2 wells per 100 square miles. The CMA currently has 4 wells per 30 square miles. Nonetheless, the number of wells monitoring water levels in the CMA is still identified as a data gap due to the goal of improving the monitoring of groundwater levels through redundancy and better spatial distribution to represent the heterogeneous nature of the clay deposits in the Buellton Aquifer. Alluvial canyons within the Buellton Upland subarea of the CMA are not currently included in the existing Groundwater Level monitoring network, as shown by the polygons lacking well locations on Figure 3a.3-1. Obtaining access to existing groundwater wells in these areas and adding them to the recommended Groundwater Level monitoring program could potentially fill these identified data gaps. Efforts to determine whether wells exist in these areas, and if so, how public outreach would be conducted to gather well information is included in Chapter 5 (Plan Implementation).

In addition, data gaps exist on the well construction information for the representative monitoring wells. This data gap will be addressed in Chapter 5 (Plan Implementation) by performing video surveys in representative monitoring wells to confirm well construction.

3a.3-2 Groundwater Storage

The data collected from the Groundwater Level monitoring network will be used to evaluate changes in groundwater levels within the Buellton Aquifer and to estimate changes in groundwater in storage. Therefore, the Groundwater Level and Groundwater Storage monitoring networks are considered equivalent so the collected data will be used to evaluate both sustainability indicators for identification of potential undesirable results. If additional wells are added to the groundwater level network, the estimated groundwater in storage calculations will be modified to include those wells, as appropriate.

3a.3-3 Groundwater Quality

It is recommended to continue to use the existing Groundwater Quality well monitoring network, well monitored by the public water systems and by commercial irrigation within the CMA. The GSA will collect data from these programs annually to support evaluation of groundwater quality trends and tracking groundwater management progress to reach CMA sustainability goals. **Figure 3a.3-2** shows the representative monitoring wells along with all wells in the current monitoring network. The distribution of existing wells across the principal aquifer indicates sufficient monitoring is feasible by utilizing the existing wells. Because the monitoring wells already provide adequate spatial distribution, additional monitoring wells are identified as an improvement, not a data gap.

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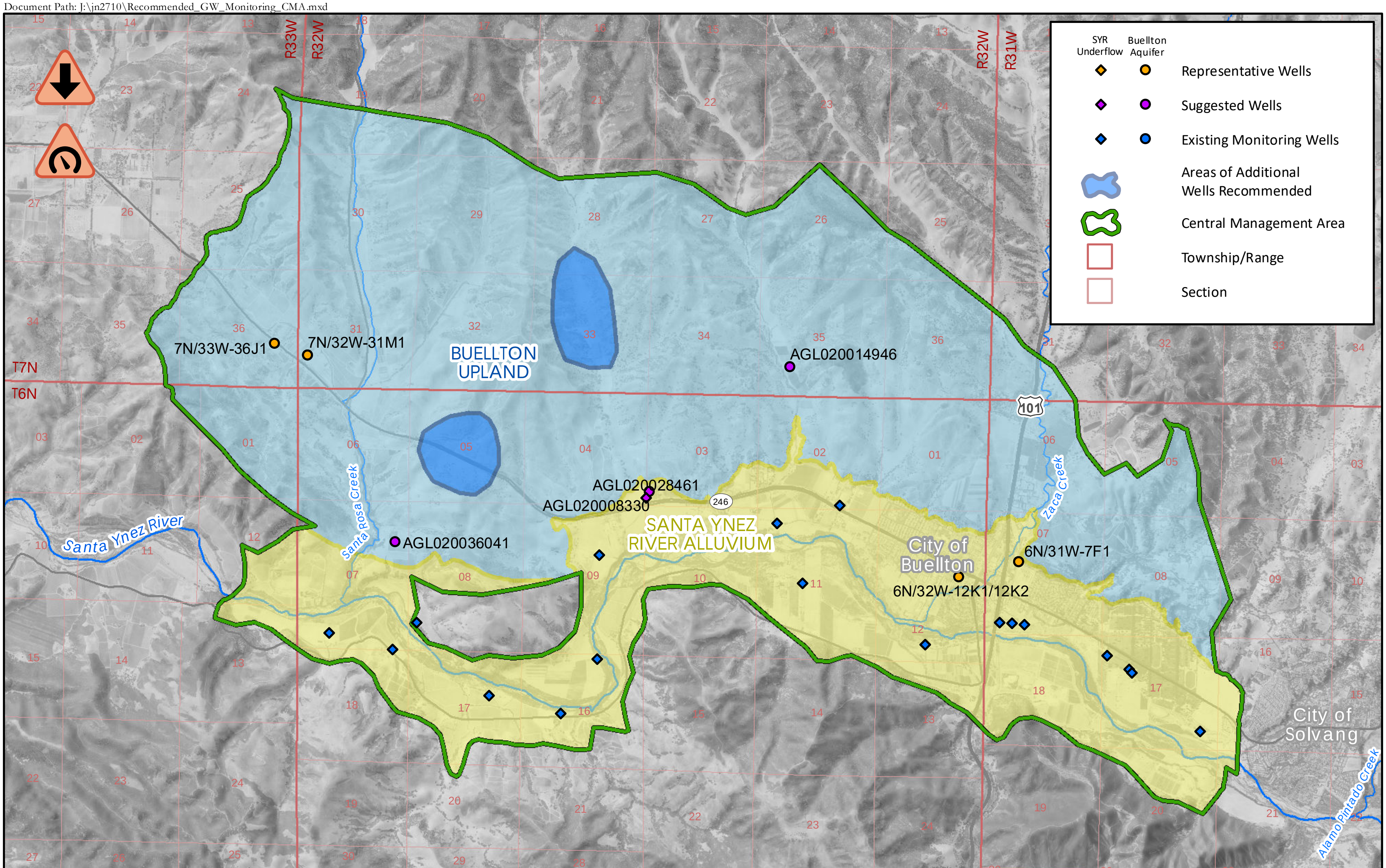

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Groundwater Sustainability Agency

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

FIGURE 3a.3-1

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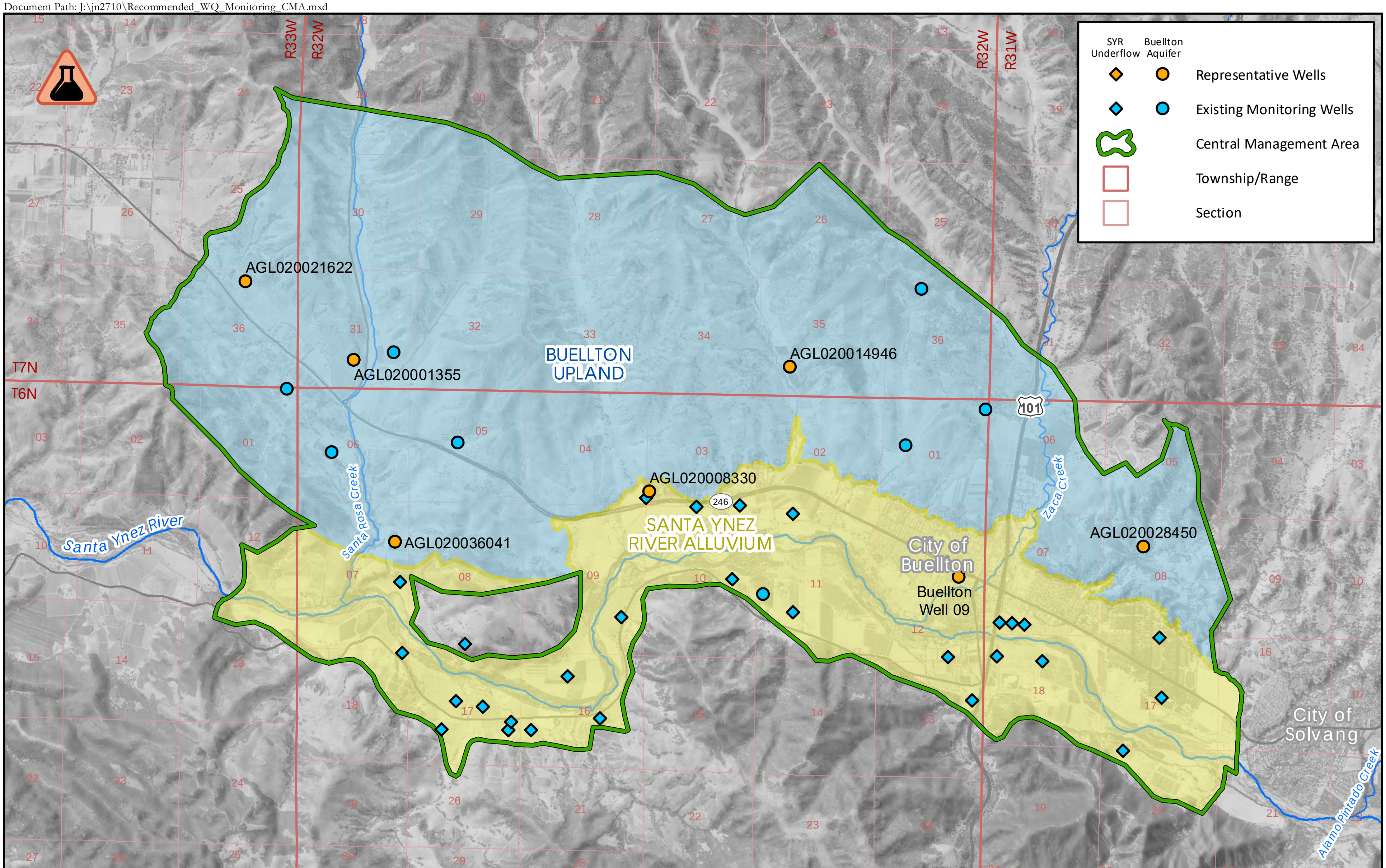

CMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR WATER QUALITY

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0 0.5 1 Miles

N

FIGURE 3a.3-2

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3a.3-4 Seawater Intrusion

Seawater intrusion is not applicable to the CMA and therefore a monitoring network is not needed or recommended in the CMA.

3a.3-5 Land Subsidence

As described in Section 2b, Groundwater Conditions, 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. Based on these findings, a direct-measurement monitoring network for potential land subsidence is not recommended within the CMA. However, a remote-sensing option for land subsidence monitoring using InSAR data will be implemented. Available InSAR coverage for the CMA are deemed sufficient and will be evaluated for indications of ongoing or permanent land subsidence. InSAR uses radar returns to measure total vertical displacement of the land surface.

In addition to the available InSAR data, a USGS continuous global positioning system (CGPS) station (BUEG) was installed near City of Buellton and has been collecting vertical displacement data since January 2015, as shown on Figure 3a.2-3. Data from this site will be used to supplement the InSAR data.

Additionally, it is recommended that CCWA periodically be contacted. Since 1997 CCWA has operated the large-scale water supply infrastructure in the basin: the pipeline which carries SWP water through the CMA to the City of Buellton and Lake Cachuma (Figure 2a.3-9, HCM). CCWA would likely be able to affirm if negative outcomes are occurring such as differential settling.

3a.3-6 Surface Water Depletions and Groundwater Dependent Ecosystems

The SGMA Regulations, 23 CCR § 354.28 (b), states that,

> *(6) Depletions of interconnected surface water. The minimum threshold for depletions of interconnected surface water shall be the volume of surface water depletions caused by groundwater use that has significant and unreasonable adverse impacts on beneficial uses of the surface water. The minimum threshold established for depletions of interconnected surface water shall be supported by the following:*

(A) The location, quantity, and timing of depletions of interconnected surface water.

(B) A description of the groundwater-surface water model used to quantify surface water depletion. If a numerical groundwater and surface water model is not used to quantify surface water depletion, the Plan shall identify and describe an equally effective method, tool, or analytical model to accomplish the requirements of this Paragraph.

Item (6)(B) requires a numerical model to estimate the depletions of interconnected surface water, not the use of a monitoring network to measure depletions of interconnected surface water. Therefore, the Surface Water Depletion monitoring network will include two primary elements.

- Use of underflow water level monitoring as presented on **Figure 3a.3-3** as a proxy to evaluate potential Surface Water Depletions and potential impacts to Groundwater Dependent Ecosystems, and
- Continued use of existing stream gage data for surface water inflows into the CMA and use of new streamflow measurements for surface water outflows to support numerical modeling estimates.

Additionally, data from the Buellton Aquifer groundwater levels will be utilized to assess potential surface water depletions and relationships to groundwater conditions changes to ensure there is no more surface water depletion due to groundwater extraction than prior to 2015. These monitoring data will be used to guide the CMA in groundwater management decisions to support the sustainability goals outlined in Section 3b.1.

For the entire Santa Ynez River Valley Groundwater Basin (all three management areas), a streamflow gage is proposed near the mouth of the Santa Ynez River near the estuary in order to measure the total surface water outflow from the entire system. Previously the USGS had a gage called “Santa Ynez River at Barrier near Surf” (USGS Gage ID 11135500) but this gage was discontinued in 1965. By restarting measurements at this historical site, the total surface water budget can be tracked from Bradbury Dam to the Pacific Ocean.

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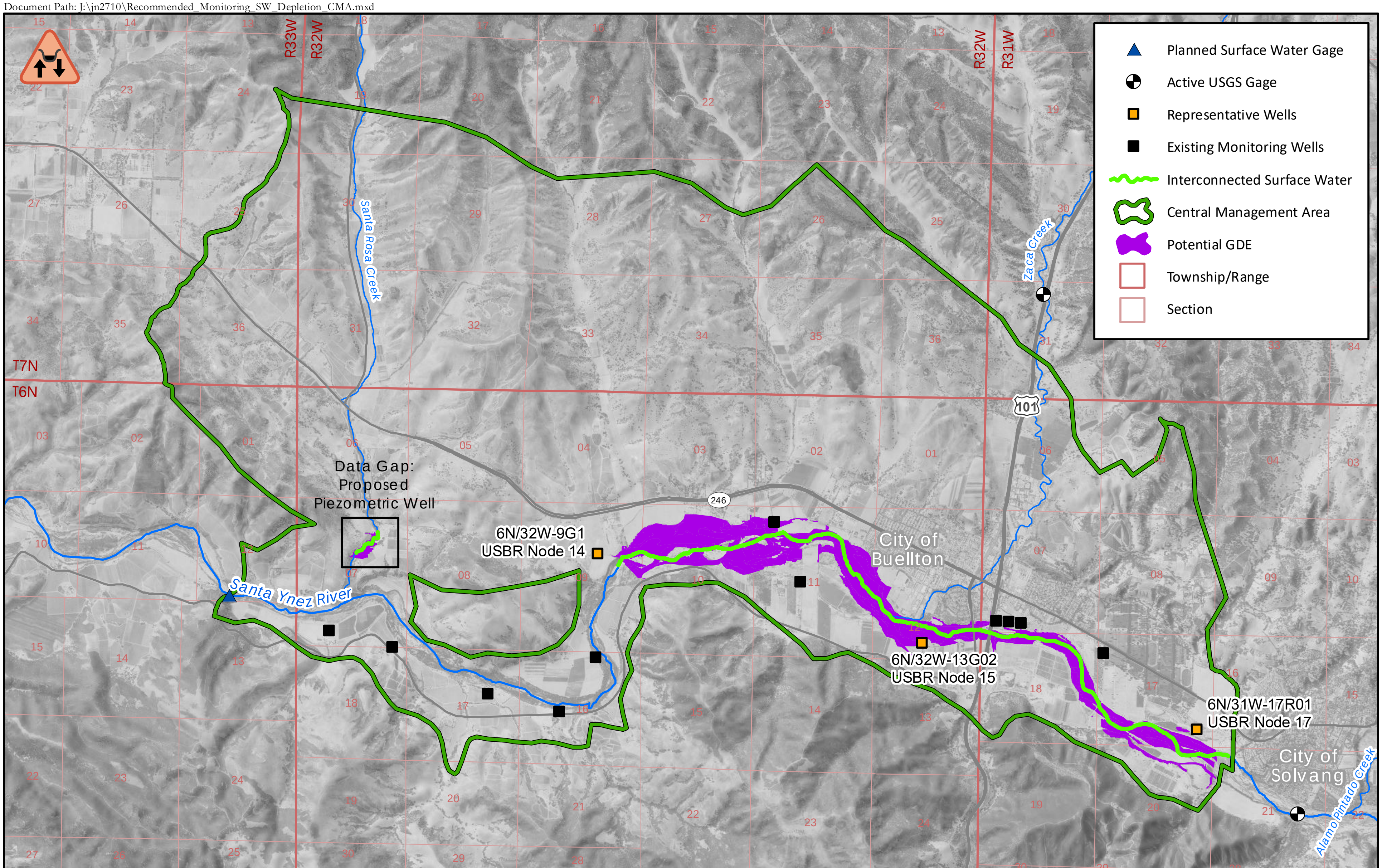

Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

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CMA MONITORING NETWORK AND REPRESENTATIVE MONITORING FOR INTERCONNECTED SURFACE WATER AND GROUNDWATER DEPENDENT ECOSYSTEMS

0 0.5 1 Miles

N

FIGURE 3a.3-3

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3A.4 MONITORING PROTOCOLS

To fulfill the additional monitoring recommended below, monitoring protocols will be conducted in accordance with DWR's *Monitoring Networks and Identification of Data Gaps BMP*, which uses DWR's 2010 publication of *California Statewide Groundwater Elevation Monitoring (CASGEM) Program Procedures for Monitoring Entity Reporting* (**Appendix 3a-A**) for the groundwater level sampling protocols. This publication includes protocols for equipment selection, setup, use, field evaluation, and sample collection techniques. The plan is to collect static groundwater elevation measurements for the representative groundwater level wells at least two times per year, to represent seasonal low and seasonal high groundwater conditions.[127]

3a.4-1 Identified CMA Data Gaps for Monitoring Network

Data gaps for groundwater levels are identified within the CMA for the Buellton Aquifer in the Buellton Upland subarea. The limited number of wells screened in the Buellton Aquifer in the Buellton Upland limit the GSA ability to evaluate current and historical groundwater levels conditions and associated groundwater management decisions or actions. Plans to fill the identified data gap are discussed in detail in Chapter 5, Implementation, and are briefly summarized below.

Additionally, an identified data gap exists near the confluence of Santa Rosa Creek and the Santa Ynez River, where GDEs are mapped at the boundaries of the Buellton Upland and the Santa Ynez River Alluvium subareas. The lack of well data or a stream gage at this location limits the GSA ability to evaluate current conditions related to the groundwater-surface-water connection and the associated GDEs in this area.

3a.4-2 Plans to Fill Identified CMA Data Gaps in Monitoring Network

Ideal spatial locations for monitoring within the Buellton Upland are identified on Figure 3a.3-1 where access to non-production wells screened in the Buellton Aquifer would provide useful data to the GSA to

[127] 23 CCR § 354.34(c)(1)(B) Static groundwater elevation measurements shall be collected at least two times per year, to represent seasonal low and seasonal high groundwater conditions.

evaluate current groundwater level conditions and support sustainable groundwater management decisions in alignment with the Sustainability Goals described in Section 3b.1.

Generally, the project would identify parcels within the specific portions of the Buellton Upland subarea where data would be useful to fill the identified data gaps. The project will describe outreach efforts to engage the parcel owners to better understand whether groundwater wells exist, and their condition, in the target areas. If groundwater wells do exist, access to the well completion information will be requested from well owners, if available. If well construction information is unavailable and parcel owners agree, well inspection activities may be conducted to evaluate well construction. If groundwater wells do not exist or are not completed in a manner that would provide useful data, the GSA may consider the potential to install new groundwater wells in the target areas in an effort to close the identified data gaps.

For the identified data gap near the confluence of Santa Rosa Creek and the Santa Ynez River, installation of a piezometer may be appropriate if an existing well is not present or available, to evaluate the groundwater-surface-water connection and the associated GDEs identified in this area.

Streamflow measurements will be collected for one year near a previous USGS gage “Santa Ynez River at Santa Rosa Damsite near Buellton” (USGS ID 11131000; Figure 2b.6-1, GC) to address the surface flow data gap. These measurements will be correlated to flow data at an existing USGS gage about 12 miles downstream (USGS ID 11133000) that has a long period of record. If the correlation is poor, the plan could then be to establish a new long-term gage to monitor the surface water outflow from the CMA.

SECTION 3B – SUSTAINABLE MANAGEMENT CRITERIA

The Central Management Area Groundwater Sustainability Agency (CMA GSA) has defined the sustainability goal with consideration of the beneficial uses and users and in coordination with the entire Santa Ynez River Valley Groundwater Basin (Basin or SYRVGB). This section of the GSP presents the sustainability goal for the CMA, including a description of how the sustainability goal was determined, how sustainability will be achieved and maintained, and how sustainability will be monitored and assessed through the 50-year planning and implementation horizon. Each component of the Sustainable Management Criteria (SMC) is presented below as it applies to the specific conditions of the CMA, beginning with the sustainability goal (Section 3b.1),[128] followed by the undesirable results pertaining to the sustainability indicators (Section 3b.2), minimum thresholds used as indicators of potentially undesirable conditions (Section 3b.3), and, where appropriate, measurable objectives marking specific benchmarks on the way to achieving sustainability (Section 3b.4), and the effects of sustainable management criteria on neighboring basins (Section 3b.5). The sustainable management criteria defined in this GSP will be periodically re-evaluated through the SGMA-required annual reports and periodic updates and adjusted as needed to achieve and maintain sustainability in accordance with the sustainability goal (Section 1a).

[128] A sustainability indicator refers to "any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results" (23 CCR § 351(ah)).
A minimum threshold means "a numeric value for each sustainability indicator used to define undesirable results" (23 CCR § 351(t)).
A measurable objective means "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (23 CCR § 351(s)).

3B.1 SUSTAINABILITY GOAL

In accordance with the Sustainable Groundwater Management Act (SGMA), the sustainability goal for the Santa Ynez River Valley Groundwater Basin (Basin) is to sustainably manage the groundwater resources in the Western, Central, and Eastern Management Areas to ensure that the Basin is operated within its sustainable yield for the protection of reasonable and beneficial uses and users of groundwater. The absence of undesirable results, as defined by SGMA and the Groundwater Sustainability Plans (GSPs), will indicate that the sustainability goal has been achieved. Sustainable groundwater management as implemented through the GSPs is designed to ensure that:

(1) Long-term groundwater elevations are adequate to support existing and future reasonable and beneficial uses throughout the Basin,
(2) A sufficient volume of groundwater storage remains available during drought conditions and recovers during wet conditions,
(3) Groundwater production, and projects and management actions undertaken through SGMA, do not degrade water quality conditions in order to support ongoing reasonable and beneficial uses of groundwater for agricultural, municipal, domestic, industrial, and environmental purposes.

Groundwater resources will be managed through projects and management actions implemented under the GSPs by the respective Groundwater Sustainability Agencies (GSAs). Management of the Basin will be supported by monitoring groundwater levels, groundwater in storage, groundwater quality, land surface elevations, interconnected surface water, and seawater intrusion. The GSAs will adaptively manage any projects and management actions to ensure that the GSPs are effective and undesirable results are avoided.

The sustainability criteria for the CMA was developed using historical data, including groundwater elevations, groundwater quality, and satellite imagery. These data are discussed in detail in Chapter 2b, Basin Setting.

The Buellton Upland and Santa Ynez River Alluvium are the two subareas that compose the CMA. Additional groundwater elevation data is needed in the Buellton Upland subarea of the CMA. Existing groundwater elevation data in the CMA is limited to isolated areas in the western and southeastern one third of the subarea. The need for additional data has been identified as a data gap (Section 2b.1-3, Groundwater Conditions). Groundwater elevation data at the few locations has been collected since the 1940s. The direction of groundwater flow is from north to south across the subarea toward the Santa Ynez River (Section 2b.1-2, Groundwater Conditions). Although there is adequate aerial distribution of water quality monitoring wells within the Buellton Upland subarea, data gaps exist related to well construction information and historical trends of some constituents (Section 3a, Monitoring Network).

3b.1-1 The Santa Ynez River Alluvium

Water in the Santa Ynez River Alluvium upstream of the Lompoc Narrows is recognized as underflow of the Santa Ynez River since SWRCB Decision D 886 and WR 73-37 and regulated and managed by SWRCB the same as surface flows. Because underflow of the Santa Ynez River is considered the same as surface water, the Santa Ynez River Alluvium would not be classified as a principal aquifer or managed by a GSP under SGMA. As such, the sustainability indicators within the subarea are controlled by these State requirements and Cachuma Reservoir releases in accordance with applicable regulations. These include supporting Santa Ynez River base flow to support rearing juvenile steelhead (*O. mykiss*), monitoring for specific surface water pool depths, groundwater dependent ecosystems (GDEs), and other beneficial uses of Santa Ynez River streamflow. Although the Santa Ynez River Alluvium subarea is within the DWR defined Santa Ynez River Valley Groundwater Basin (DWR Basin No. 3-15), the CMA GSA has no authority to regulate conditions within the alluvial underflow of the River as it is not considered groundwater as defined by SGMA.[129] The CMA GSA has authority over the groundwater in older formations below the alluvium which are continuous with the older formations in Buellton Upland subarea (Section 2a.2, HCM), which together are the Buellton Aquifer.

3b.1-2 Buellton Aquifer Data Gaps

Data and information that is currently and historically available for the Buellton Aquifer is summarized in Section 2b (Groundwater Conditions) and Section 3a (Monitoring Network). Data gaps include temporal and spatial groundwater elevation data used to evaluate and monitor groundwater in storage, surface

[129] CWC Section 10721 (g) "Groundwater" means water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water that flows in known and definite channels.

and groundwater connectivity, and GDEs. As part of GSP implementation, the CMA GSA will identify, additional existing wells that are suitable for reducing data gaps within the subarea (Section 3a, Monitoring Network and Chapter 5, Implementation). Wells for the monitoring program will be selected based on location, use, accessibility, and availability of construction information. Where possible, they will be non-producing wells to best obtain readings representative of static groundwater conditions within the aquifer. Wells fulfilling the appropriate requirements will be added to the GSA monitoring program along with the four existing volunteer wells included in the current CASGEM program within the Buellton Upland subarea. Where necessary to collect adequate data to evaluate the sustainability indicators, additional representative monitoring wells (RMWs) may be constructed. Such RMWs may include piezometers proximal to potential GDEs and monitoring wells in areas where none are available. Adding at least two more additional wells to the RMWs is scheduled to be implemented within two years of GSP submittal to DWR. Based on data and information obtained through the addition of monitoring capabilities within the CMA, the sustainable management criteria presented below will be modified as appropriate through the GSP periodic updates to achieve sustainability according to the stated Sustainability Goal (Section 3b.1).

The extent of the Buellton Aquifer underlying Santa Ynez River Alluvium, and exact number of wells pumping from which aquifer, in the Santa Ynez River Alluvium subarea is also a data gap. Where the Buellton Aquifer underlies the Santa Ynez River Alluvium, sustainable management criteria relevant to the Buellton Aquifer will apply to the wells that pump in part or in whole from the Buellton Aquifer. The current estimated extent of the Buellton Aquifer within the Santa Ynez River Alluvium Subarea is the reach east of Buellton Bend within the CMA and for wells deeper than 130 feet, which is estimated to represent roughly 15% of all wells within Santa Ynez River Alluvium subarea. As part of the implementation of this GSP, the CMA GSA will identify criteria to determine which aquifer is being pumped based on the current aerial geophysical study recently surveyed in November 2020 and aquifer properties described in the HCM. A program will be established for well owners in this area to register their wells as either part of the Buellton Aquifer or totally within the Santa Ynez River Alluvium (Chapter 5, Implementation).

3B.2 UNDESIRABLE RESULTS

Under the Sustainable Groundwater Management Act (SGMA), undesirable results occur when groundwater conditions occurring throughout the CMA cause significant and unreasonable impacts to any of six sustainability indicators:

- Significant and Unreasonable Chronic Lowering of Groundwater Levels
- Significant and Unreasonable Reduction of Groundwater in Storage
- Significant and Unreasonable Seawater Intrusion (not applicable to CMA)
- Significant and Unreasonable Degradation of Water Quality Resulting from Groundwater Withdrawal
- Significant and Unreasonable Land Subsidence Resulting from Groundwater Withdrawal
- Significant and Unreasonable Reduction of Interconnected Surface Water and Groundwater Resulting from Groundwater Withdrawal

The CMA GSA is required to characterize undesirable results for each indicator unless "undesirable results to one or more sustainability indicators are not present and are not likely to occur in the basin."[130] Except for seawater intrusion, each of the six sustainability indicators has the potential to occur within the CMA and each has been evaluated regarding undesirable results. No undesirable results are currently occurring within the Buellton Upland subarea related to any of the sustainability indicators as a result of groundwater extraction. Because groundwater usage and conditions may lead to undesirable results, the CMA GSA has defined significant and unreasonable results for each applicable sustainability indicator. Each of the sustainability indicators for which there are data gaps or too little data to fully evaluate the

[130] 23 CCR § 354.26 (d) An Agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators.

related undesirable results will be further defined by the development of additional monitoring capabilities through GSP implementation (Section 3b.1-2, Chapter 5).

3b.2-1 Chronic Lowering of Groundwater Levels – Undesirable Results

Chronic lowering of groundwater levels that indicate a depletion of supply[131] is an undesirable result applicable to, but not occurring within, the CMA. Chronic lowering of groundwater levels in the Buellton Upland would occur in the form of lowered groundwater elevations that significantly and unreasonably reduce the total volume of water in storage, eliminate or reduce the ability of production wells to economically access groundwater, or cause disconnection from surface water that sustains habitat or groundwater dependent ecosystems (GDEs). Beneficial uses within the CMA are presented in Section 2a.4 (HCM) and Section 2b.3-1 (GC) and include municipal and domestic supply, agriculture, and industry, and environmental uses, all of which are supplied, at least in part by groundwater. The primary cause of groundwater conditions that would lead to chronic lowering of groundwater levels is groundwater production more than natural and artificial recharge over a period that contains both wet and dry water years. Groundwater elevations in the CMA will be used to determine whether significant and unreasonable reduction of groundwater storage occurs. Historical data indicates there has not been any loss in total groundwater in storage over the last 49 years, a period containing both wet and dry climate cycles (Section 2b, GC)

In the Buellton Upland subarea, groundwater extractions, monitored since 1994, peaked in 2015 with recent drought conditions at approximately 4,600 AFY (Section 2b, Groundwater Conditions). Groundwater elevation hydrographs from monitoring wells in the Buellton Upland subarea generally indicate historical low elevations during previous drought periods including the early 1970s, late 1990s (Figures 2b.1-4AB, GC). Groundwater elevation generally recovers readily from low levels in response to wet or average precipitation (7N/33W-36J1, 7N/32W-31M1, 6N/32W-06K1, **Appendix 3b-A** Hydrographs) indicating that there has not historically been chronic lowering of groundwater levels. Throughout the period, groundwater extractions correlated approximately with climate, increasing during dry periods and decreasing during wet periods (Figure 2b.2-4, GC).

131 23 CCR § 354.28(c)(1)

There is not current or historical evidence of widespread undesirable results related to declining groundwater levels including groundwater elevations dropping below well design capacity or impacts to or loss of GDEs. In accordance with the Santa Ynez River Water Conservation District (SYRWCD) policy, groundwater production and well status (active or inactive) is reported by groundwater users including for agriculture, municipal, and domestic well owners (Stetson 2021). **Figure 3b.2-1** illustrates that the number of inactive wells has remained relatively constant throughout the period of record including through historical and recent droughts, suggesting that wide-spread undesirable results resulting from chronic groundwater level decline have not occurred. The historical groundwater pumping presented in Water Budget (Section 2c) also indicates no decrease in groundwater pumping over time, also suggesting that wide-spread undesirable results resulting from chronic groundwater level decline have not occurred. This is also consistent with input from water users in the CMA during the GSA and CAG meetings that no significant and unreasonable effects associated with groundwater level decline have been observed historically in the CMA.

Based on historical groundwater elevation data, the undesirable result related to water level decline is the groundwater level at which beneficial uses may be disrupted by groundwater levels dropping below the tops of screens. Conditions that threaten long-term groundwater accessibility for agricultural, municipal, and domestic supply correspond to static water levels that stabilize within the perforated sections of a groundwater extraction well. Static groundwater elevations that reside within the perforated sections of an extraction well may lead to pump failure from entrained air or insufficient net positive suction head (Driscoll, 1986; Roscoe Moss, 1990). In addition, the introduction of entrained air may increase well screen fouling from increased biological activity and geochemical reactions that lead to mineral precipitation (Driscoll, 1986; Schneiders, 2003).

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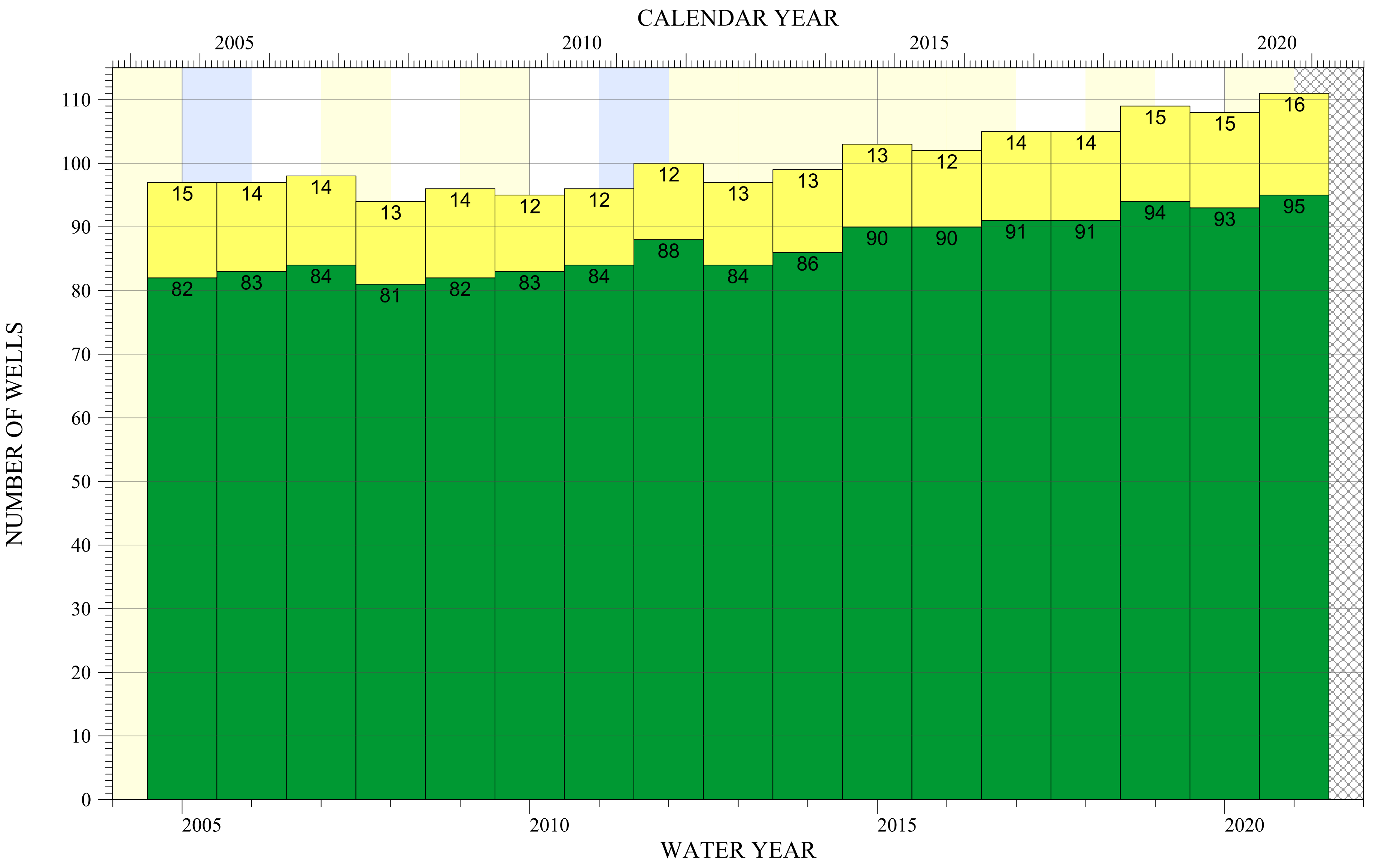

District Zone A, Santa Ynez River Alluvium, Excluded

Source: Santa Ynez River Water Conservation District (2005-2021)

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REGISTERED
ACTIVE AND INACTIVE WELLS
DISTRICT ZONE D

Water Year Type (1942-2020)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

Well Type
Active
Inactive

FIGURE 3b.2-1

I:\DATA\2710\Analyses\2021-04 Timeseries Active Inactive Wells\CMA SMC Fig 3-02 Wells Timeseries.grf 7/2/2021 M. McCammon

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Figure 3b.2-2 is a well impact analysis (**Appendix 3b-B**) indicating that groundwater levels that drop 10 feet below 2020 conditions result in about 30 percent of the top of municipal and domestic well screens becoming exposed. This remains the case to about 20 feet below 2020 water levels. The criteria for undesirable results related to declining groundwater is the level at which about one third of municipal and domestic well screens become exposed with consideration of historical low groundwater levels and allowance for operational flexibility. This well impact analysis along with agreement with historical low water elevations was accepted by the CMA GSA Committee as the basis for establishing undesirable results and minimum thresholds. Data Gaps related to groundwater levels and groundwater in storage in the Buellton Upland will be addressed with implementation of an expanded monitoring program (Section 3b.1-2).

(b) (1) Cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results

Chronic lowering of groundwater levels in the CMA may occur if groundwater extractions exceed the sustainable yield over a period that contains both wet and dry water year types. In addition, chronic lowering of groundwater elevations may be caused by reductions in surface water releases from the Cachuma Reservoir and reduced surface flows in the Santa Ynez River. Surface water releases through the Cachuma reservoir through the CMA to the Pacific Ocean are managed by the State Water Resources Control Board under Order WR 2019-0148.

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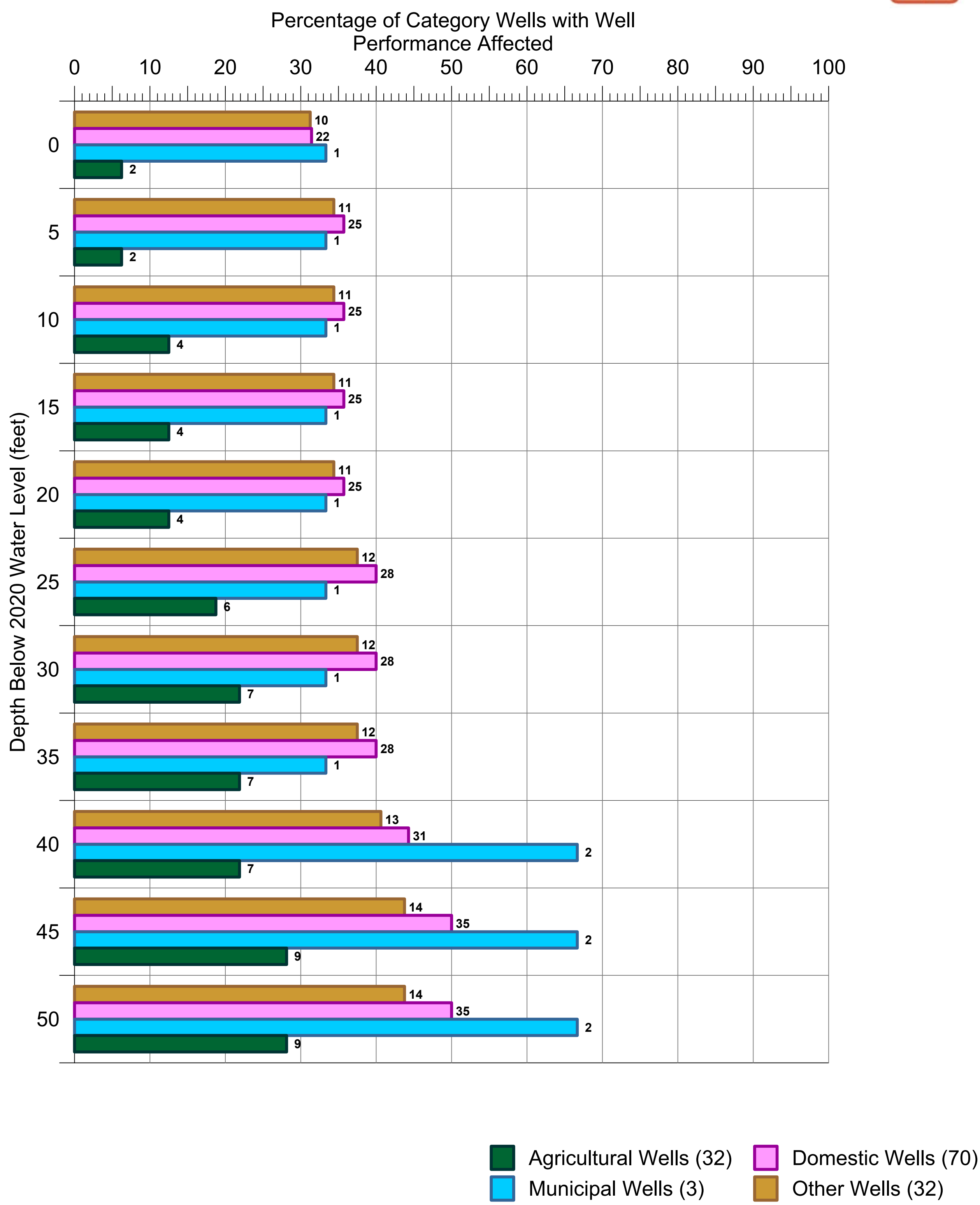

Other = Well use not recorded on well log or used for observation/ cathodic protection only.

STETSON ENGINEERS INC.

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

WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

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(b) (2) Criteria used to define when and where the effects of groundwater conditions cause undesirable results. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Undesirable results associated with chronic lowering of groundwater levels will be defined in the CMA by collecting semi-annual (spring and fall) groundwater elevation measurements at representative monitoring wells completed in the Buellton Aquifer (Figure 3a.3-1, Monitoring Network). Undesirable results associated with chronic declines in groundwater elevations will be characterized by comparing groundwater elevations at each well to established minimum threshold groundwater elevations. 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[132] years would correspond to an undesirable result associated with chronic lowering of groundwater elevations. The criteria of 50% of the monitoring wells addresses the potential cumulative effects from pumping and GSA management on basin-scale water level conditions. Requiring two or more consecutive non-drought years of minimum threshold exceedances provides confirmation that the chronic lowering of groundwater elevations is not drought related, making it more likely attributed to groundwater pumping.[133] GSA management actions (Chapter 4) will be planned to accommodate drought periods and ensure short-term impacts can be offset by increases in groundwater levels or storage during normal or wet periods.

(b) (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur from undesirable results

Chronic lowering of groundwater elevations may lead to an undesirable result in the CMA if groundwater elevations drop to a level that significantly and unreasonably reduces the total volume of groundwater in storage, eliminates or reduces the ability of production wells to economically access groundwater, or causes a disconnection from surface water that sustains habitat or groundwater dependent ecosystems (GDEs). Conditions that threaten long-term groundwater accessibility for agricultural, municipal, and

132 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.

133 CWC Section 10721(x): "Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods."

domestic supply correspond to static water levels that stabilize within the perforated sections of a groundwater extraction well. Static groundwater elevations that reside within the perforated sections of an extraction well may lead to pump failure from entrained air or insufficient net positive suction head (Driscoll, 1986; Roscoe Moss, 1990). In addition, the introduction of entrained air may increase well screen fouling from increased biological activity and geochemical reactions that lead to mineral precipitation (Driscoll, 1986; Schneiders, 2003).

3b.2-2 Reduction of Groundwater in Storage – Undesirable Results

Reduction of groundwater in storage is an undesirable result to, but not occurring within, the CMA. The undesirable result for decline in storage is less water available for beneficial users, meaning that the water is physically not present to be extracted. Reduction of groundwater in storage is also associated with undesirable results established for chronic lowering of groundwater levels and may be associated with undesirable results associated with land subsidence. The primary cause of reduction of groundwater in storage would be groundwater production in excess of natural and artificial recharge during a climate period containing both wet and dry water years. Significant and unreasonable reduction of groundwater in storage would impact beneficial uses and users of groundwater in the Buellton Upland subarea by limiting the volume of groundwater available for domestic, municipal, industrial, and agricultural supplies.

Groundwater elevation is used as a proxy for groundwater in storage in this GSP. Based on well construction information, historical groundwater production, and water level data, the undesirable result for groundwater in storage is equivalent to that for groundwater levels, i.e., the groundwater level at which about thirty percent of the top of domestic and municipal well screens become exposed (Appendix 3b-B). A review of groundwater elevation data in the CMA indicates that groundwater in storage in the Buellton Upland has rebounded after each dry period since the mid-1980s and increased during wet periods. An indicator of undesirable results related to reduction of storage would be a net decline in storage over a period containing both wet and dry cycles. There was no net change in groundwater in storage during the historical period from 1982 through 2018 (Section 2b, GC; Figure 2c.2-4, Water Budget). There is no historical evidence of widespread negative impacts related to diminished water in storage even during extended dry periods. In addition, the availability of imported water to the City of Buellton from the State Water Project provides operational flexibility for reduction of groundwater in storage to the extent that it remains available during drought conditions occurring in Central California (Chapter 2).

Data Gaps related to groundwater levels and groundwater in storage in the Buellton Upland will be addressed with implementation of an expanded monitoring program (Section 3b.1-2; Chapter 5)

(b) (1) Cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results

Significant and unreasonable reduction of groundwater in storage may occur if groundwater production exceeds the sustainable yield of the CMA over a period containing both wet and dry water year types. In addition, chronic lowering of groundwater elevations may be caused by reductions in surface water releases from the Cachuma Reservoir and reduced surface flows in the Santa Ynez River. Indirectly this could occur if reductions in Santa Ynez River water result mean water production is transferred to the Buellton Aquifer. Surface water releases through the Cachuma reservoir to the CMA are managed under the State Water Resources Control Board Order WR 2019-0148.

(b) (2) Criteria used to define when and where the effects of groundwater conditions cause undesirable results. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Undesirable results associated with a reduction of groundwater in storage will be defined in the CMA by collecting semi-annual (spring and fall) groundwater elevation measurements at wells completed within the Buellton Aquifer. Undesirable results associated with reduction of groundwater in storage will be characterized by comparing groundwater elevations at each well to established minimum threshold groundwater elevations. 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 years would correspond to an undesirable result associated with a significant and unreasonable reduction of groundwater in storage.

(b) (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur from undesirable results

Reduction of groundwater in storage can lead to an undesirable result in the CMA if the total volume in storage drops to levels that eliminates or reduces the ability of production wells to economically access or produce groundwater. Conditions that threaten long-term groundwater accessibility for agricultural, municipal, and domestic supply correspond to static water levels that stabilize within the perforated sections of a groundwater extraction well. Static groundwater elevations that reside within the perforated sections of an extraction well may lead to pump failure from entrained air or insufficient net positive suction head (Driscoll, 1986; Roscoe Moss, 1990). In addition, the introduction of entrained air may increase well screen fouling from increased biological activity and geochemical reactions that lead to mineral precipitation (Driscoll, 1986; Schneiders, 2003).

3b.2-3 Seawater Intrusion – Undesirable Results

Seawater intrusion is a sustainability indicator that is not applicable to the CMA. The western boundary of the CMA is over 15 miles inland from the coast and groundwater elevations have remained above 200 feet NAVD 88 for the period of record (GC, Figures 2b.1-3 through 2b.1-5CD). Because sea water intrusion is a sustainability indicator that is not applicable to the CMA, there are no undesirable result defined for its occurrence.

Seawater intrusion is a sustainability indicator is applicable to the WMA. If this sustainability indicator in the WMA indicates an issue, this may affect basin wide water balance. This would include uses in the CMA and EMA.

3b.2-4 Degradation of Water Quality – Undesirable Results

Degradation of water quality is an undesirable result applicable to the CMA but not occurring in the Buellton Aquifer. Water quality is monitored throughout the Buellton Upland subarea and within the Santa Ynez River Alluvium subarea where wells are completed within the Buellton Aquifer (Figure 3a.3-2, Monitoring Network). Groundwater quality data within the Buellton Upland is geographically sufficient but limited temporally to the recent past (**Table 3b.2-1**). The relationship between pumping and water quality is a data gap. There could be multiple causes for possible future degraded water quality besides groundwater pumping, including wastewater treatment and agricultural and industrial sources (Haas et. al. 2019). The CMA GSA will only be responsible for addressing degradation of groundwater quality caused by pumping and/or GSP implementation.

Groundwater served by the City of Buellton for municipal supply is treated in compliance with Title 22 of the California Code of Regulations. The sustainable management criteria for groundwater quality are based primarily on the Central Coast Basin Water Quality Control Plan (CCWQCP) prepared by the California State Water Boards (Section 2b.3, GC). Water quality within the Buellton Upland subarea meets most Water Quality Objectives (WQOs) established by the CCWQCP. Undesirable results related to groundwater quality are defined as water quality for any constituent of concern that is not sufficient for the beneficial uses within the Basin.

3b.2-4-1 Point Source Pollutants

All known point sources of contamination related to industrial releases have been managed in compliance with applicable State laws and regulations. All but two sites within the CMA have been remediated and closed per the applicable regulations (Section 2b.3, GC). The two remaining sites are within the Santa Ynez Alluvial subarea and not subject to CMA GSA oversite (Figure 2b.3-1, GC). Undesirable results associated with point sources of contamination is overseen by the State Water Resources Control Board and are not established as part of this GSP. Any project management or actions under this GSP will not influence plume migration and negatively influence groundwater quality.

3b.2-4-2 Constituents of Potential Concern

Constituents of potential concern within the CMA include TDS, chloride, sulfate, boron, sodium, and nitrate (Section 2b.3, GC). **Table 3b.2-1** lists the Water Quality Objectives (WQOs) established for each constituent according to the CCWQCP. Note that the WQOs are averages for monitoring well samples collected throughout the CMA for the period 2015 to 2018 and are designated according to the beneficial uses within the CMA (Section 2b.3-1-1, GC). Median water quality concentrations for individual constituents are calculated for the years 2015 to 2018. Time-series graphs of historical groundwater quality data for relevant constituents by well are included as **Appendix 3b-C** and summarized in **Table 3b.2-2**.

3b.2-4-2-1 Total Dissolved Solids (TDS) Undesirable Results

Agriculture use is the predominant beneficial use of groundwater within the CMA (Section 2a.4, HCM). Based on crop types and crop sensitivities within the CMA, the undesirable result for TDS is evaluated based on the SMCL of 1,000 mg/L instead of WQO of 1,500 mg/L (Section 3b.3-4). This more restrictive threshold allows for future crop types that may be more sensitive to salinity and reduces the need to extract and apply additional water to flush soils.

Table 3b.2-1
Median Groundwater Quality Objectives (mg/L) and Average 2015-2018 Salt and Nutrient Concentrations (mg/L) in the Buellton Aquifer CMA

Salinity as Total Dissolved Solids (TDS)			Chloride		Sulfate		Boron		Sodium		Nitrate as N		
Objective (mg/L)	SMC (mg/L)	Average 2015-2018	Objective (mg/L)	Average 2015-2018	Objective (mg/L)	Average 2015-2018	Objective (mg/L)	Average 2015-2018	Objective (mg/L)	Average 2015-2018	Objective (mg/L)	MCL (mg/L)	Average 2015-2018
1,500	1,000	379	150	58	700	77	0.5	NA	100	41	1	10	3.5

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Table 3b.2-2
Historical Water Quality Summary, Representative Monitoring Wells

				Salinity as Total Dissolved Solids (TDS)			Chloride (Cl)			Sulfate (SO_4)			Sodium (Na)			Nitrate as Nitrogen		
DMS ID	Well ID	State ID	Approximate	Approximate TDS Range	Most Recent TDS	Currently Exceeds TDS MO?	Approximate Cl Range	Most Recent Cl	Currently Exceeds Cl MO?	Approximate SO_4 Range	Most Recent SO_4	Currently Exceeds SO_4 MO?	Approximate Na Range	Most Recent Na	Currently Exceeds Na MO?	Approximate N Range	Most Recent N	Currently Exceeds N MO?
3173	AGL020021622	7N/33W-36	2014 – 2018	200 – 520	200	No	30 – 90	30	No	15 – 175	15	No	26 – 70	28	No	2.0 – 11.5	?	?
3137	AGL020001355	7N/32W-31	2014 – 2018	180 – 240	180	No	30 – 40	30	No	15	15	No	32 – 31	31	No	2.5 – 3.1	2.5	No
3337	AGL020014946	7N/32W-35	2014 – 2018	380 – 650	440	No	40 – 70	40	No	90 – 220	120	No	32 – 58	35	No	0.5 – 18.5	0.5	No
3076	AGL020008330	6N/32W-3	2014 – 2018	990 – 1220	980	No	110 – 130	130	No	200 – 415	210	No	78 – 150	78	No	2.0 – 20	2	No
909	Buellton Well 09	6N/32W-12K02	1992 – 2019	660 – 780	740	No	45 – 60	60	No	180 – 250	225	No	42 – 60	58	No	0.2 – 4.8	1.7	No

Notes: All concentrations are mg/L,

TDS = Total Dissolved Solids, WQ Objective = 1,000

Cl = Chloride, WQ Objective = 150

SO_4 = Sulfate, WQ Objective = 700

Na = Sodium, WQ Objective = 100

N = Nitrate, WQ Objective = 10

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3b.2-4-2-2 Nitrates (NO_3) Undesirable Results

Sources of nitrate within the CMA may include septic systems, fertilizer, animal waste, and wastewater. Although the forms of nitrogen potentially found in groundwater include nitrate, nitrite, and ammonia, nitrate is the predominate concern within the CMA (Section 2b.3-4-6, GC). The maximum contaminant level (MCL) for nitrate in drinking water is 10 mg/L for nitrate as nitrogen. High levels of Nitrate are considered to be undesirable for other uses, including watering of livestock and sensitive crop irrigation, at concentrations exceeding 100 mg/L and 5 to 30 mg/L, respectively (Section 2b.3, GC). The CCWQCP WQO is for nitrate and nitrite as nitrogen is 1 mg/L for the Buellton Upland subarea. Because the most sensitive use of groundwater within the CMA is potentially untreated groundwater served through domestic wells, undesirable result for water quality degradation related to groundwater production is a nitrate concentration of 10 mg/L, the MCL for potable water. The median nitrate concentration in the Buellton Upland subarea was 3.5 from 2015 to 2018, below the 10 mg/L, threshold. Therefore, nitrate concentration does not present an undesirable result within the CMA.

3b.2-4-2-3 Other Constituents of Potential Concerns

Median groundwater quality concentrations for the relevant constituents are in all cases below the objectives or modified objectives for TDS and Nitrate (Table 3b.2-1). Constituent concentrations measured in individual representative wells for the period of available record indicate occasional exceedance of the objectives for isolated measurements in individual wells (Table 3b.2-2). In every well and for each constituent, the most recent sample analysis is below the objectives, except the TDS concentration which was near 1,000 mg/L for one well (Table 3b.2-2). Based on these data, undesirable results are not occurring within the Buellton Aquifer with respect to groundwater quality.

(b) (1) Cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results

Adverse water quality conditions in the CMA are driven by the use and discharge of treated wastewater within the Basin (RWQCB 2019), local agricultural practices, and Santa Ynez River water quality. Because there could be multiple causes for possible future degraded water quality besides groundwater pumping, including wastewater treatment and agricultural and industrial sources (Haas et. al. 2019), a study will be conducted on the cause(s), if and when the water quality thresholds are exceeded, in order to address appropriately.

(c) (2) Criteria used to define when and where the effects of groundwater conditions cause undesirable results. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Undesirable results associated with degradation of water quality will be quantified by collecting annual TDS, chloride, sulfate, boron, sodium, and nitrate concentration measurements from wells completed in the Buellton Aquifer. Salt and nutrient concentration measurements collected at each well will be compared to the established salt and nutrient concentration minimum thresholds (Section 3b.3-4). Groundwater management decisions and pumping can influence local well water quality. Hence, minimum threshold exceedances for individual constituents in more than 50% of the monitoring wells for 2 or more consecutive years is considered an undesirable result associated with degradation of water quality in the CMA. The criteria of 50% of the representative monitoring wells addresses the potential cumulative effects from management decisions and pumping on basin-scale water quality conditions. Requiring two or more consecutive non-drought years of minimum threshold exceedances provides confirmation that the degraded water quality is not drought related, making it more likely attributed to groundwater pumping and/or management actions

(d) (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur from undesirable results

Water quality degradation beyond current conditions in the CMA may impact municipal, domestic, and agricultural usage by exceeding salt and nutrient crop tolerances and drinking water standards and increase treatment costs by municipalities (Section 2b.3, GC). Undesirable results associated with point sources of contamination is overseen by the State Water Resources Control Board (Section 2b.3, GC) and are not established as part of this GSP.

3b.2-5 Land Subsidence – Undesirable Results

Inelastic land subsidence is an undesirable result not occurring or likely to occur in the future within the CMA. Undesirable results due to land subsidence are damage to surface infrastructure and collapsed pore space meaning reduced aquifer storage and hydraulic conductivity. There is little to no evidence of land subsidence within the CMA that has disrupted infrastructure, land use, or beneficial use of groundwater (Section 2b.5, GC). Areas where minor land subsidence has been measured by remote sensing data is a small area of the Buellton Upland above Cañada de la Laguna, where there is little to no reported groundwater use (Section 2b.5, GC), which is an area not associated with active agriculture. There is no evidence of historical infrastructure failure attributable to inelastic land subsidence from groundwater extraction (Section 2b.5, GC). Note that land subsidence may occur from forces other than those related to groundwater extraction, including tectonic forces.

Land subsidence from groundwater extraction is not expected to become an undesirable result within the CMA due to hydrogeologic conditions that are not conducive to land subsidence and because SMCs for other sustainability indicators will preclude the lowering of groundwater levels significantly below the historical low elevation. The undesirable result is defined as land subsidence resulting from groundwater extraction that substantially interferes with surface land uses.

(e) (1) Cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results

Groundwater production in excess of the sustainable yield may result in significant and unreasonable land subsidence if the subsidence, "substantially interferes with surface land uses."[134] Subsidence related to groundwater extraction can occur with groundwater elevations maintained below previous historical low water levels and in the presence of extensive fine-grained sediments. Groundwater Conditions (Section 2b.5) found that extensive fine-grained sediments are not documented as occurring in the CMA.

[134] CWC Section 10721(x)(5) Significant and unreasonable land subsidence that substantially interferes with surface land uses.

(f) (2) Criteria used to define when and where the effects of groundwater conditions cause undesirable results. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Groundwater production is not expected to induce land subsidence within the CMA. Land surface elevations will be continuously monitored using InSAR data and continuous GPS monitoring data (Figure 3a.2-3, Monitoring Network). Land subsidence associated with groundwater production that exceeds half a foot from 2015 conditions may impact infrastructure and land usage in the CMA.

(g) (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur from undesirable results

Land subsidence from groundwater extraction is not expected to become an undesirable result within the CMA due to hydrogeologic conditions that are not conducive to land subsidence and because SMCs for other sustainability indicators will preclude the lowering of groundwater levels below the historical low elevation. Based on the potential for land subsidence resulting from groundwater withdrawal in the CMA, the undesirable result is defined as land subsidence resulting from groundwater extraction that causes half a foot of subsidence from 2015 conditions and interferes with land use or infrastructure.

3b.2-6 Interconnected Surface and Groundwater – Undesirable Results

Depletion of interconnected surface water is potentially an undesirable result applicable to the CMA. This potentially occurs when surface flow enters the aquifer and replaces groundwater that has been pumped or when baseflow contribution of groundwater to the surface flows are reduced, resulting in streamflow depletion. Undesirable results are evaluated relative to groundwater pumping and management and a 2015 baseline,[135] and are considered occurring if streamflow depletion due to groundwater pumping and management under SGMA exceed the streamflow depletion due to groundwater pumping and management prior to 2015. There are no perennial rivers, creeks, or wetlands within the CMA (Section

135 Groundwater management is currently only part of the overall watershed conditions that impact the flows of the Santa Ynez River. Surface water rights and groundwater rights are not determined or altered as part of this groundwater management plan, as per CWC Section 10720.5.

2b.6, GC). Ephemeral channels include the Santa Ynez River, Zaca Creek, Santa Rosa Creek, and related tributaries (Section 2a, HCM; Section 2b, GC).

The Santa Ynez River is the predominant interconnected surface water and groundwater system in the CMA and the River and associated vegetation extends from the EMA to the WMA (Figure 2a.4-4, HCM). Over much of the CMA the Santa Ynez River and underflow flows through a bedrock channel (Figures 2a.1-1 and 2a.1-3b, HCM). The Santa Ynez River underflow, and indirectly with the Santa Ynez River surface flow, can only potentially interact with the groundwater in the Buellton Aquifer only in the area where they are directly connected east of the Buellton Bend (Figures 2b.6-3 and 2b.6-4, GC).

Santa Ynez River underflow is primarily influenced and replenished by releases from Cachuma Reservoir. SWRCB manages and regulates this river underflow no different than River surface flows in accordance with SWRCB Order WR 2019-0148.[136] Because all groundwater in the Santa Ynez River Alluvium is underflow of the Santa Ynez River and considered flows of the Santa Ynez River it does not contain groundwater as defined by SGMA and is not classified as a principal aquifer or managed by a GSP under SGMA (Appendix 1b-B). Interconnected surface and groundwater, and the groundwater dependent ecosystems (GDEs) within the Santa Ynez River Alluvium is not within the purview of the CMA GSA. Because the flow from the Buellton Aquifer would have to go through the underflow deposits before reaching the river and surface flows are regulated by the SWRCB, the potential effect of groundwater pumping on surface flow relative to pre-2015 conditions is expected to be minimal. However, due to a data gap of the extent of the Buellton Aquifer underneath the underflow deposits east of the Buellton Bend, the quantity and timing of water flowing from the Buellton Aquifer to the underflow deposits of the Santa Ynez River and indirectly to the surface flow is a data gap.

3b.2-6-1 Groundwater Dependent Ecosystems

For Groundwater Dependent Ecosystems (GDEs) the undesirable result is when groundwater levels drop below the ecosystem, such as the root zone. If the ecosystem is in surface water reliant on discharge from groundwater, lowering of groundwater levels below land surface would mean no more surface water.

136 SWRCB Order WR 73-37 and other orders and decisions of the SWRCB provide for the management of both River surface and underflow as surface water flows by the SWRCB.

The Natural Communities Commonly Associated with Groundwater Dataset mapped wetlands and vegetation within the CMA (Figure 2a.4-4, HCM), were screened to eliminate wetland and vegetation identified in the database that were not GDEs (Figure 2b.6-4, Groundwater Conditions). Screening was based, in part, on hydrographs from existing monitoring wells in which the depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems (Rohde et al. 2018) The resulting locations of potential GDEs, those communities that could not definitely be eliminated from the NCCAG database, is shown on Figure 2b.6-4 (GC). Potential GDEs exist only within the Santa Ynez River Alluvium subarea and in a small area at the south end of Santa Rosa Creek. There is no indication of undesirable results related to this potential GDE at the downstream end of Santa Rosa Creek.

For the eastern area of the Santa Ynez River Alluvium that overlies the Buellton Aquifer, there is no indication of undesirable results and that historical groundwater elevations in the overlying Santa Ynez River Alluvium underflow were sufficient to support habitat and ecosystem health along the Santa Ynez River due to managed releases from Cachuma Reservoir (Jones and Stokes, 2000).

As discussed in Section 2a.4-6 (HCM) two key species in the CMA[137] have habitat that includes the CMA portion of the Santa Ynez River: Southwestern willow flycatcher (*Empidonax traillii extimus*) and Southern California steelhead (*O. mykiss*).

(h) (1) Cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results

Undesirable results associated with a depletion of interconnected surface water and groundwater in the CMA may be caused by groundwater production in excess of the sustainable yield over a period that contains wet and dry water years. Extended periods of groundwater production in excess of the sustainable yield may lead to groundwater elevations that drop below historical low water levels. The lowering of groundwater elevations in areas along the Santa Ynez River may also be caused by surface water diversions from the Santa Ynez River Alluvium underflow and by reductions in water rights or other releases from the Cachuma Reservoir. Surface water releases through the Cachuma reservoir to the CMA

[137] California tiger salamander's critical habitat has been identified in the CMA tributaries; however, due to depths to groundwater greater than 30 feet (Section 2b.6), this habitat will not be affected by management under SGMA.

are managed by the State Water Resources Control Board under Order WR 2019-0148. The lowering of groundwater levels below historical lows in the Santa Ynez River Alluvium underflow potentially impacts habitat and ecosystem health along the Santa Ynez River.

(i) (2) Criteria used to define when and where the effects of groundwater conditions cause undesirable results. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Using groundwater levels adjacent to the Santa Ynez River, undesirable results associated with a depletion of interconnected surface water and groundwater will be quantified by measuring groundwater elevations semi-annually at three representative monitoring points located adjacent to the Santa Ynez River (Figure 3a.3-3, Monitoring Network) and maintaining water levels above historical low groundwater levels. Significant and undesirable results are defined as groundwater elevations that drop to 15 feet below channel thalweg elevations in two out of the three representative monitoring wells for two consecutive non-drought[138] years (Section 3b.3-6). Groundwater elevations measured at these wells will be compared to minimum threshold groundwater elevations (Section 3b.3-6) to characterize whether groundwater production is causing significant and unreasonable depletion of interconnected surface water.

(j) (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur from undesirable results

Potential effects on beneficial uses and users of the surface water in the Santa Ynez River include reduction in flows relative to pre-2015 flow conditions. Undesirable results associated with a depletion of interconnected surface water would be groundwater elevations that impact habitat health and enhance surface water depletion rates along the Santa Ynez River.

138 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.

The effects can further be categorized into potential effects on water needs for all life history stages by key species. As discussed in Section 2a.4-6 (HCM) two key species in the CMA[139] along the Santa Ynez River include Southwestern willow flycatcher (*Empidonax traillii extimus*) and Southern California steelhead (*O. mykiss*).

For the Southwestern willow flycatcher (Figure 2a.4-6, HCM), impacts would be related to the vegetation that the groundwater dependent ecosystem supports as described in the Final Environmental Impact Report of the Cachuma Project (SWRCB, 2011):

> The southwestern willow flycatcher nests in thickets of trees and shrubs approximately 10-25 feet or more in height, with dense foliage from approximately 0 – 15 feet aboveground, and often a high canopy cover percentage. In addition, nesting willow flycatchers virtually always nest near surface water or saturated soil. At some nest sites, surface water may be present early in the breeding season but only damp soil is present by late June or early July.

The potential undesirable result for Southwestern willow flycatchers would be if management under SGMA caused groundwater tables to lower to levels prior to 2015 conditions due to groundwater extraction which cause either a decrease in quantity and density of trees and shrubs used by the willow flycatcher or a decrease in surface water habitat during the willow flycatcher nesting season.

For the Southern California steelhead (*O. mykiss*), the life history stages with different flow requirements that could potentially be affected are adult migration, juvenile migration, spawning, and rearing (SWRCB, 2011). The potential undesirable result for steelhead would be if management under SGMA caused groundwater tables to lower to levels prior to 2015 conditions due to groundwater extraction which cause a decrease in surface flow below one of the flow requirements for any life history stage. One process that relates particularly to groundwater management is the groundwater contributions that maintain pool habitat along the Santa Ynez River during the summer and late fall. Groundwater contributions can provide thermal refugia for steelhead. In the case of the CMA, the direct contribution to pools would be from the underflow alluvial deposits administered by the SWRCB. However, the Buellton Aquifer could

139 California tiger salamander's critical habitat has been identified in the CMA tributaries; however, due to depths to groundwater greater than 30 feet (Section 2b.6), this habitat will not be affected by management under SGMA.

indirectly cause undesirable results by affecting the level of water in the underflow deposits relative to pre-2015 flow conditions.

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3B.3 MINIMUM THRESHOLD

This section describes the minimum thresholds established for chronic lowering of groundwater levels, significant and unreasonable reduction of groundwater in storage, degraded water quality, disconnected surface and groundwater, and land subsidence related to groundwater withdrawals that substantially interferes with surface land uses. The minimum thresholds of 15-feet below 2020 water levels is described below and avoids undesirable results related to the beneficial uses within the CMA. **Table 3b.3-1** summarizes the minimum thresholds established for each applicable sustainability indicator at the 13 RMWs. Data gaps are noted where applicable and will be filled with the implementation of the GSP described in Chapter 5.

Table 3b.3-1
Minimum Thresholds at Representative Monitoring Wells

RMW	WQ ID	Chronic Decline in Groundwater Levels and Groundwater in Storage (ft NAVD 88)	Chronic Decline in Groundwater Levels Trigger Point (ft NAVD 88)	Reduction of Groundwater Storage (ft NAVD 88)	Degradation of Water Quality (mg/L) TDS/Cl/SO_4/Na/N
7N/33W-36J1	NA	357	362	357	NA
7N/32W-31M1	NA	359	364	359	NA
6N/31W – 7F1	NA	292	297	292	NA
6N/32W-12K1, 12K2	Buellton Well 09	276	281	276	1,000/150/700/100/10
7N/32W-35	AGL020014946	TBD	TBD	TBD	1,000/150/700/100/10
6N/32W - 7	AGL020036041	TBD	TBD	TBD	1,000/150/700/100/10
7N/33W-36	AGL020021622	NA	NA	NA	1,000/150/700/100/10
7N/32W-31	AGL020001355	NA	NA	NA	1,000/150/700/100/10
6N/32W-3	AGL020008330	NA	NA	NA	1,000/150/700/100/10
6N/31W-8	AGL020028450	NA	NA	NA	1,000/150/700/100/10

Notes: All concentrations are mg/L, TBD - To Be Determined, NA - Not Applicable
TDS = Total Dissolved Solids, WQ Objective = 1,000
Cl = Chloride, WQ Objective = 150
SO_4 = Sulfate, WQ Objective = 700
Na = Sodium, WQ Objective = 100
N = Nitrate, WQ Objective = 10

3b.3-1 Chronic Lowering of Groundwater Levels – Minimum Thresholds

Minimum threshold groundwater elevations at the 4 RMWs (Appendix 3b-A) were established to: (i) protect municipal, agricultural, and domestic groundwater users and supply, (ii) prevent potential land subsidence, and (iii) maintain 2015 levels of water quality and surface water-groundwater connection along the Santa Ynez River. The rationale in choosing the minimum thresholds to prevent significant and unreasonable results in the CMA has two major components: 1) the minimum threshold water level will be set to limit the impact on existing groundwater well screen intervals; and 2) the minimum threshold should not be more than 15-feet below basin-wide current 2020 water levels.

Available data indicates that historical low groundwater elevations were about 15 to 20 feet below current 2020 levels with no undesirable results occurring at that time. In addition, a well impact analysis was developed to evaluate static water levels associated with the top of well screens for domestic, municipal, and agricultural beneficial uses. Based on the above considerations, the minimum threshold for chronic lowering of groundwater levels in the Buellton Upland Aquifer was chosen by the CMA GSA to be 15 feet below 2020 groundwater levels in half of the RMWs for a period of two consecutive non-drought years[140] (**Table 3b.3-1** and Appendix 3b-A). 15 feet below 2020 groundwater elevations is the level at which 30 percent of domestic and municipal wells would begin to entrain air into the screens and is established with consideration of operational flexibility and beneficial use types within the basin (Appendix 3b-B). About 10 percent of agricultural wells would be impacted at this level.

Avoiding potential significant and unreasonable undesirable results for other sustainable management criteria[141] including groundwater storage, water quality, land subsidence, surface water depletions, and groundwater dependent ecosystems was another consideration for setting groundwater level thresholds. Groundwater storage is related to groundwater levels, and is determined from groundwater levels. Seawater intrusion is not applicable to the CMA. The CMA generally does not show impaired water quality at depth, and in the Santa Ynez River Alluvium subarea the water from the underlying Buellton Aquifer is generally better than the shallower water that is underflow of the Santa Ynez River. Declines in

140 2 or more consecutive years that are classified as Dry or Critically Dry (Section 2b, GC) will be defined as drought years. All other year types and combination of year types will be defined as non-drought years for the purpose of defining undesirable results under this groundwater sustainability plan.

141 23 CCR § 354.28 (c)(1)(B) Potential effects on other sustainability indicators.

groundwater level if they were to occur is not expected to result in impairment to water quality, unlike some other groundwater basins. Land subsidence is not expected due to the aquifer properties (Section 2b.5, Groundwater Conditions), even if groundwater levels were to significantly decline. Interconnected surface water and related impacts to groundwater dependent ecosystems are primarily dependent on SWRCB managed surface water river releases, and the connection between river underflow and the groundwater levels in the underlying Buellton Aquifer east of the Buellton Bend is a data gap. Additional groundwater levels (below, Section 3b.3-6) are specifically designated to measure and protect against surface water depletions.

Groundwater levels within the Buellton Upland Aquifer respond readily to precipitation events. Therefore, the occurrence of the minimum threshold for two non-drought years was selected to allow for short term dry periods which would not result in the occurrence of undesirable results. GSA management actions (Section 4) will be planned to accommodate drought periods and ensure short-term impacts can be offset by increases in groundwater levels or storage during normal or wet periods. The criteria of half of the RMPs wells addresses the GSA management on basin-scale water level conditions.

Minimum threshold water levels for RMWs, 7N/32W-35, and 6N/32W-36 will be established with the collection of additional data and at least two additional RMPs will be established to fill existing data gaps within the Buellton Upland subarea in the areas shown on **Figure 3a.2-1** (Monitoring Network) and described in further detail in Chapters 4 and 5. Groundwater elevations measured at each of the RMPs will be reported to DWR in the annual reports that will follow the submittal of this GSP.

Chronic Lowering of Groundwater Levels Trigger Point

To allow adequate time for the implementation of projects and management actions to address declining water levels prior to the occurrence of minimum thresholds, an early warning "trigger point" has been established. The trigger point is activated with groundwater levels reaching five feet above the established water level minimum thresholds in half of the RMWs for a period of one year, (minimum thresholds are reported in **Table 3b.3-1**). In addition, another early management trigger will be when the capacity of municipal water supplies is impacted by greater than 20%. For example, for the Buellton Aquifer, this will occur when the City of Buellton's municipal total well pumping capacity is reduced by 20% due to groundwater level decline. This will trigger early management actions such as requesting water rights releases from the Cachuma Reservoir (see Section 4 for more details and discussion).

3b.3-2 Reduction in Groundwater Storage– Minimum Thresholds

Undesirable results related to groundwater storage is not occurring in the CMA and has not occurred historically (Section 3b.2-2). There is a direct correlation between the volume of groundwater in storage and groundwater levels at the RMWs. Therefore, groundwater levels in the Buellton Aquifer will be used as a proxy for significant and unreasonable loss of groundwater in storage with minimum thresholds defined as the decline of water levels to 15 feet below 2020 groundwater levels in half of the RMWs for a period of two consecutive non-drought years (Table 3b.3-1). The proposed Buellton Upland groundwater monitoring program will provide additional elevation data with which to implement this sustainable management criteria (Chapter 4).

Reduction in Groundwater Storage Trigger Point

As with the undesirable result of the chronic lowering of groundwater levels, a trigger point for the reduction of groundwater in storage has been established to begin preliminary management actions to mitigate loss of groundwater in storage. The trigger point is activated with groundwater levels reaching 15 feet below the 2020 groundwater levels in half of the RMWs for a period of one year (Table 3b.3-1). Projects and management actions appropriate to declining water levels and reduction of groundwater in storage will be implemented with the occurrence of the trigger point (Chapter 4).

3b.3-3 Seawater Intrusion – Minimum Thresholds

Seawater intrusion is a sustainability indicator that is not applicable to the CMA, therefore there is no CMA minimum threshold is established for its occurrence.

3b.3-4 Degraded Water Quality – Minimum Thresholds

Sustainable management criteria related to degraded groundwater quality are based largely on the WQOs from the CCWQCP (Section 3b.2-2). Undesirable results for degradation of groundwater quality are not currently occurring within the Buellton Upland Aquifer and available data indicates that recent concentrations of the identified constituents of concern are below the objectives set (Table 3b.3-1). With the exception of total dissolved solids and nitrate, the minimum thresholds applied to groundwater quality within the Buellton Upland are the Median Groundwater Quality Objectives from the CCWQCP. The minimum thresholds are the SMCL and MCL for total dissolved and nitrate, respectively (Section 3b.2-4). Undesirable results for water quality occur with exceedance of any of the relevant constituents at half of the RMWs (Monitoring Network Figure 3a.3-2; Table 3b.3-1). The criteria of half of the RMPs wells addresses the GSA management on basin-scale water level conditions.

3b.3-5 Land Subsidence – Minimum Thresholds

Inelastic land subsidence is not presently nor is it likely to become an undesirable result within the CMA (Section 3b.2-5). The CMA is at low risk for groundwater subsidence due to the absence susceptible fine-grained materials (Section 2b, GC). Minor changes in land surface elevations since the SGMA benchmark of 2015 likely result from forces unrelated to groundwater production because both land subsidence and rise have been noted and the hydrogeology does not include areas of thick, extensive clay that is typically prone to collapse. Localized lowering of land surface elevation may have occurred from causes other than groundwater withdrawal, including tectonic movement, slope failure, and excavation or grading for construction. In addition, the minimum threshold established for decline of water levels would preclude substantial land subsidence because thresholds are near historical low water elevations.

The GSA proposes to monitor publicly available land subsidence satellite and continuous GPS data and report changes on a three-year basis (Section 2b, GC). The land subsidence minimum threshold is a decline of six inches from the 2015 land surface elevation resulting from groundwater extractions and that interferes with land uses or infrastructure. Land use and infrastructure disruption will be determined by communication with relevant agencies and beneficial use representatives including the City of Buellton, Santa Ynez River Water Conservation District, CalTrans, and the Central Coast Water Authority.

3b.3-6 Depletion of Interconnected Surface and Groundwater –Minimum Thresholds

Interconnected ground and surface water and GDEs within the Buellton Upland subarea were screened as described in Section 3b.2-6. No undesirable results are currently occurring. The CMA GSA will fill data gaps related to groundwater elevation near the identified potential GDEs with the installation and monitoring of a piezometer proximal to the potential GDE at the lower end of Santa Rosa Creek. An adaptive management approach is proposed for this area consisting of evaluation of groundwater conditions and management of groundwater extractions and potentially nearby well construction. If the potential GDE is determined to be an actual GDE, the minimum threshold would be groundwater levels that drop below 15 feet below ground surface (bgs) at the GDE location for a period of one year and corresponding with a decline in GDE health. At a piezometer this means water levels that drop 15 feet below the channel thalweg.

For the eastern area of the Santa Ynez River Alluvium that overlies the Buellton Aquifer, the minimum threshold would be groundwater levels in the Santa Ynez River Alluvium underflow that drop below 15 feet bgs at the GDE location for a period of one year and corresponding with a decline in GDE health (**Appendix 3b-D**).

3b.3-7 Relationship between Minimum Thresholds for all Sustainability Indicators

Groundwater levels are used as a proxy for the sustainability indicators of groundwater in storage and groundwater dependent ecosystems. The RMWs established for evaluating undesirable results related to declining water level and loss of groundwater in storage monitor groundwater level in the Buellton Aquifer. Those established to monitor groundwater dependent ecosystems are shallow wells that monitor groundwater level in the Santa Ynez Alluvial Aquifer. The minimum thresholds established for each are independent. Where there is a data gap in the connectivity between the two aquifers in the eastern part of the Santa Ynez Alluvial subarea, the projects and management actions described in Chapter 4 will contribute to an understanding of the degree and impact of connectivity. Based on this information, sustainability criteria may be revised.

In addition, water levels in the Santa Ynez Alluvium are influenced by the State regulations described in Section 1d, Plan Area. Groundwater elevation in RMWs in the aquifer has not historically declined below the minimum threshold established and is unlikely to do so in the future (Appendix 3b-D). Where a potential GDE exists outside of the Santa Ynez River Alluvial subarea, the data gap of groundwater level will be addressed through projects and management actions and the minimum threshold adjusted, if appropriate.

The source of applicable constituents and the relationship between them and groundwater level is a data gap for groundwater quality in the CMA. Therefore, it is not currently possible to evaluate the potential interaction between water quality and minimum thresholds set for the other sustainability indicators.

3B.4 MEASURABLE OBJECTIVES

Measurable objectives are "*quantifiable goals for the maintenance and improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin.*"[142] Based on the sustainability goal (Section 3b.1) and undesirable results (Section 3b.2) for the CMA, measurable objectives were established for the relevant sustainability indicators (**Table 3b.4-1**). Monitoring for this groundwater management plan are primarily direct measurement of groundwater in wells.

Table 3b.4-1
Measurable Objectives at Representative Monitoring Wells

RMW	WQ ID	Chronic Decline in Groundwater Levels and Groundwater in Storage Measurable Objective (ft NAVD 88)	Reduction of Groundwater Storage Measurable Objective (ft NAVD 88)	Degradation of Water Quality (mg/L) TDS/Cl-/SO4/NA/N
7N/33W-36J1	NA	379	379	NA
7N/32W-31M1	NA	402	402	NA
6N/31W – 7F1	NA	307	307	NA
6N/32W-12K1, 12K2	Buellton Well 09	301	301	1,000/150/700/100/10
7N/32W-35	AGL020014946	TBD	TBD	1,000/150/700/100/10
6N/32W - 7	AGL020036041	TBD	TBD	1,000/150/700/100/10
7N/33W-36	AGL020021622	NA	NA	1,000/150/700/100/10
7N/32W-31	AGL020001355	NA	NA	1,000/150/700/100/10
6N/32W-3	AGL020008330	NA	NA	1,000/150/700/100/10
6N/31W-8	AGL020028450	NA	NA	1,000/150/700/100/10

Notes: All concentrations are mg/L, TBD - To Be Determined, NA - Not Applicable
TDS = Total Dissolved Solids, WQ Objective = 1,000
CL- = Chloride, WQ Objective = 150
SO4 = Sulfate, WQ Objective = 700
NA = Sodium, WQ Objective = 100
N = Nitrate, WQ Objective = 10

142 23 CCR § 351(s)

3b.4-1 Chronic Lowering of Groundwater Levels – Measurable Objectives

The measurable objective established for chronic lowering of groundwater levels is the spring 2011 groundwater elevation. Groundwater elevations in spring 2011 preceded recent drought conditions and followed a ten-year period of near normal climate (Section 2c, Water Budget). The 2011 groundwater levels ranged from near historical high to near historical mean elevations in Buellton Upland Aquifer representative monitoring wells (RMWs) (Section 2b, GC). Measurable objectives are achieved when the 2011 groundwater elevation is reached in half of the RMWs.

Current water levels in many of the existing RMWs are near the respective 2011 groundwater elevation (6N/31W – 7F1). At some RMW locations, the current groundwater level is approximately 30 feet below the 2011 groundwater elevation (7N/32W-31M1). Current water levels in three of the RMWs are within 10 feet of the measurable objective. Undesirable results are not occurring related to declining groundwater levels (Section 3.2) and trigger points have been established to prevent the occurrence of undesirable results. The sustainability goal for the CMA is currently being achieved with allowance for operational flexibility.

The sustainability goal is currently being met within the CMA (Section 3b.1) and the CMA is not experiencing undesirable results associated with any of the six sustainability indicators identified as part of SGMA.

With its implementation, the groundwater monitoring program for the Buellton Aquifer will provide adequate data to assess the measurable objective for chronic lowering of groundwater levels. Existing monitoring wells will be used to evaluate sustainable management criteria until additional wells are added through the proposed expansion of the monitoring (Chapter 4 and 5).

3b.4-2 Reduction of Groundwater in Storage – Measurable Objectives

Groundwater elevation is used as a proxy for groundwater in storage. Undesirable results of groundwater in storage have not occurred within the Buellton Upland even during historical drought periods (Section 3b.2-2). The measurable objective for groundwater in storage is the same as that for decline in groundwater levels, the 2011 groundwater level occurring in half of the RMWs (Table 3b.4-1).

3b.4-3 Seawater Intrusion – Measurable Objectives

There is no measurable objective established related to seawater intrusion for the CMA because it is a sustainability indicator that is not applicable to the CMA.

3b.4-4 Degraded Water Quality – Measurable Objectives

Undesirable results for degradation of groundwater quality are not currently occurring within the Buellton Aquifer and current water quality is well below applicable standards (Section 3b.2-5). Except for total dissolved solids and nitrate, the measurable objectives applied to groundwater quality within the Buellton Upland are the Median Groundwater Quality Objectives from the CCWQCP. The measurable objectives are the SMCL and MCL for total dissolved solids and nitrate, respectively. Measurable objectives are not specifically set for water quality but are understood to coincide with the minimum thresholds established. Distinct water quality minimum thresholds will be re-evaluated with annual and periodic updates of this GSP and may be established if, over the period of implementation, constituents of concern exhibit an increasing trend approaching the measurable objectives.

3b.4-5 Land Subsidence– Measurable Objectives

Undesirable results related to land subsidence have not occurred historically and are not likely to occur within the CMA. Land subsidence monitoring will rely on publicly available InSAR and continuous GPS data (Section 3b.2-5). The measurable objective is land subsidence of less than two inches as compared to 2015 InSAR data resulting from groundwater extraction.

3b.4-6 Depletions of Interconnected Surface Water and Groundwater – Measurable Objectives

Additional groundwater level data is needed proximal to the identified potential GDE (Section 3b.2-6-1) and is identified as a data gap for the CMA. As a mitigation, a potential project for the CMA is the installation of a piezometer in the vicinity of the GDE. The measurable objective would be set after determining existing conditions through filling of the data gap, if appropriate. For the eastern area of the Santa Ynez River Alluvium that overlies the Buellton Aquifer, the measurable objective would be groundwater levels in the Santa Ynez River Alluvium underflow that drop below 5 feet below the channel thalweg elevation (Appendix 3b-D). Groundwater elevations 5 feet below the channel thalweg would ensure that the soil would be wet and be able to provide water for the GDEs along the riparian corridor.

3b.5 Interim Milestones

"Interim milestone" refers to a target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan.[143] The objective of setting interim milestones is establishing progress steps "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."[144] The sustainability goal is currently being met within the CMA (Section 3b.1) and the CMA is not experiencing undesirable results associated with any of the six SGMA sustainability indicators identified as part of SGMA.

Interim milestones coincide with the five-year plan assessments (Section 5a.5), and will be evaluated and updated as part of the five-year plan assessment process.

3b.5-1 Groundwater Elevation Milestones

The sustainability goal is currently being met within the CMA (Section 3b.1) and the CMA is not experiencing undesirable results associated with chronic groundwater level decline. The interim milestones for groundwater elevations are therefore set to be the same as the measurable objectives., that is with the 5-year (2027), 10-year (2032), and 15-year (2037) having groundwater levels at the 2011 groundwater level or higher in half of the representative monitoring wells (RMWs).

3b.5-2 Groundwater Storage Milestones

The sustainability goal for the CMA with regards to groundwater storage is currently being met (Section 3b.4-1). The interim milestones for storage are therefore set to be the same as the measurable objectives., that is with the 5-year (2027), 10-year (2032), and 15-year (2037) having groundwater levels at the 2011 groundwater level or higher in half of the representative monitoring wells (RMWs).

143 23 CCR § 351(q) "Interim milestone" refers to a target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan.

144 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.

3b.5-3 Seawater Intrusion Milestones

There are no milestones established related to seawater intrusion for the CMA because seawater intrusion is a sustainability indicator that is not applicable to the CMA as an inland management area.

3b.5-4 Water Quality Milestones

Groundwater quality in the CMA is currently suitable for agricultural, domestic, and municipal supply purposes (Section 3b.2-4). The interim milestones are therefore set to be the same as the measurable objectives with the 5-year (2027), 10-year (2032), and 15-year (2037).

3b.5-5 Land Subsidence Milestones

Inelastic land subsidence is not occurring or likely to occur in the CMA (see Section 2b.5, GC; Section 3b.2-5, Section 3b.3-5). Land subsidence includes rapid changes in land surface, and differential settling which can damage or destroy infrastructure.

The interim milestones for land subsidence are therefore set as a rate of change of no more than three inches in a five-year period. That is a 5-year (2027) of no more than three inches since 2022, 10-year (2032) of no more than three inches since 2027, and 15-year (2037) of no more than three inches since 2032.

3b.5-6 Interconnected Surface Water Milestones

Conditions of the Santa Ynez River surface water and river underflow are primarily influenced and maintained by operation of upstream reservoirs. Management of these reservoirs and diversions from river surface water and river underflow includes as inputs: local watershed runoff, water exports to the south coast, and imports through the CCWA pipeline from the State Water Project and other sources (see Appendix 1d-B).

The interim milestones for interconnected surface water are relative to the river underflow and are established the same as the measurable objectives (Section 3b.4-6). That is a 5-year (2027), 10-year (2032), and 15-year (2037) interim milestones of water levels at the 5 feet below channel thalweg elevation.

3B.6 EFFECTS OF SUSTAINABLE MANAGEMENT CRITERIA ON NEIGHBORING BASINS

There are no neighboring groundwater basins that border the CMA. The CMA of the Santa Ynez River Valley Groundwater Basin is bounded to the north by the Purisima Hills and Purisima Anticline, which acts as a barrier between the principal aquifers in the CMA and the San Antonio Creek Valley Groundwater Basin to the north (Section 1d, Plan Area, and Section 2a, HCM). Along the southern boundary of the CMA, the Santa Ynez River Valley Groundwater Basin is bordered by the Santa Ynez Mountains (Section 1d, Plan Area, and Section 2a, HCM).

The CMA has limited connectivity to the EMA to the east and the WMA to the west. Because the three management areas are sub-areas of the larger Basin, the GSPs for each management area have been coordinated for consistency. Where CMA connectivity is through the Santa Ynez River, the shallow groundwater stored within the alluvium is treated as surface water. In these cases, sustainability indicators are subject to applicable state laws and regulations not within the jurisdiction of the CMA GSA (Section 3b.1-1).

An additional area of connectivity between the CMA and EMA is north of the City of Solvang (Section 2a, HCM). In these areas, groundwater subflow from the Careaga Sand formation may discharge to the CMA from the EMA (Section 2a, HCM). Average historical subflow to the CMA from the adjacent management areas is approximately 90 AFY, less than three percent of the average total groundwater inflow of 3,550 AFY (Section 2c, Water Budget). In addition, the EMA is hydrogeologically up-gradient of the CMA. Therefore, the CMA will not impact the EMA.

The CMA is hydrogeologically up-gradient from the WMA and the average historical outflow from the CMA is approximately 690 AFY, which is two percent of the average total groundwater recharge of 31,030 AFY to the WMA (WMA GSP). In addition, the water level minimum threshold within the Santa Rita Upland is five feet lower than the CMA, thereby maintaining a groundwater gradient toward the WMA.

Groundwater elevations have historically occurred several hundred feet lower in the Santa Rita Upland subarea of the WMA compared to the Buellton Upland subarea of the CMA. This difference in groundwater levels indicates a potential hydrogeologic barrier to groundwater movement between the

Santa Rita Upland and Buellton Upland. The extent and nature of this barrier is a data gap, which is currently being assessed with the Airborne Electromagnetic (AEM) geophysical survey performed in November 2020. Currently no subflow is assumed across the upland area boundary (Section 2c, Water Budget).

Groundwater within the CMA is of generally better quality than groundwater in the WMA (Chapter 2) and increased flows will not negatively impact groundwater quality in the WMA. There is minimal groundwater exchange between the EMA and CMA and the EMA is upgradient from the CMA. Therefore, groundwater quality within the CMA will not negatively impact that of the EMA.

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CHAPTER 4: PROJECTS AND MANAGEMENT ACTIONS

SECTION 4A – SUMMARY OF PROJECT AND MANAGEMENT ACTIONS

As established in Chapters 2 and 3, based on historical and current data, undesirable results associated with chronic lowering of groundwater levels have not been observed, and are not currently occurring, within the CMA. Groundwater pumping estimates for current conditions (2011 through 2018) indicate that annual groundwater production within the CMA is within 10% of the estimated perennial yield of the CMA Basin. Due to absence of undesirable results for all sustainability indicators, the CMA basin is currently sustainable.

As established in Chapters 2 and 3, based on historical and current data, undesirable results associated with chronic lowering of groundwater levels have not been observed, and are not currently occurring, within the CMA. Groundwater pumping estimates for current conditions (2011 through 2018) indicate that annual groundwater production within the CMA is within 10% of the estimated perennial yield of the CMA (2,800 AFY). However, future water demands are projected to increase due to climate change and increases in agriculture and population (Section 2c- Water Budget). While not currently producing undesirable results, groundwater level declines in the Buellton Upland should be managed with Projects and Management Actions (PMAs) as soon as practical to maintain sustainability into the future. Overall, based on the Water Budget presented in Section 2c, PMAs are planned for the CMA to address drought-related declining groundwater level trends and to achieve a net gain of approximately 200 AFY in the Water Budget. Otherwise, groundwater storage could continue to decline by 200 AF each year, and water levels in some Representative Monitoring Sites may fall beneath their Minimum Thresholds. Similarly, additional PMAs are identified to adaptively address possible changes in water demand, climate changes, and achieve a net gain of up to 600 AFY in the Water Budget by the year 2072.

PMAs are employed to avoid or mitigate undesirable results. As stated in SGMA Regulations, the GSP must include "*a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing* *conditions in the basin*."[145] Implementation of the management actions and projects presented below are intended to respond to possible changes in basin conditions, and maintain operation of the CMA within its sustainable yield.

PMAs described in this chapter are designed to support sustainability goals, measurable objectives, and address potential future undesirable results identified for the Basin (Chapter 3). In general, there are two different categories of PMAs: PMAs that address water demand and PMAs that address water supply. Chapter 4 presents four groups of water demand and water supply PMAs, and implementation of each group is determined by current and projected future conditions. As explained below, the need and timing of a particular project within each group is determined by early warning triggers.

1. **General Management PMAs (Group 1 PMAs)**. Group 1 PMAs are planned under current and future Basin conditions. The primary objective of Group 1 PMAs is management of groundwater extractions and recharge to ensure that excessive lowering of groundwater levels during periods of drought is sufficiently offset by increases in groundwater levels and storage during the other periods. An additional Group 1 PMAs objective is to protect current water quality, groundwater dependent ecosystems, avoid impacts from land subsidence and depletion of surface water due to groundwater pumping. Implementation activities related to monitoring and initially identified data gaps are described in detail in the next Chapter, Plan Implementation (Chapter 5).

2. **Early Warning PMAs (Group 2 PMAs)**. The early warning trigger was established by the CMA GSA to act as an advisory indicator that conditions in the Basin are approaching Minimum Thresholds. Group 2 PMAs are implemented when the early warning trigger is reached, and at the latest if a Minimum Threshold has been reached (see Chapter 3b). Implementation of Group 2 PMAs also initiates planning for potential Group 3 PMAs to ensure timely project start-up should they be needed.

[145] 23 CCR §354.44 (a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

3. **Minimum Threshold PMAs (Group 3 PMAs)**. Group 3 PMAs are implemented if conditions in the basin do not meet the Minimum Threshold for one or more of the six Sustainability Indicators (see Chapter 3b).

4. **Other PMAs (Group 4 PMAs).** Group 4 PMAs have been identified for use if the Groups 1, 2, and 3 PMAs are insufficient to maintain the sustainability goal for the Basin. In the future, additional PMAs may be identified and added to this list of PMAs as part of future GSP evaluations and updates. Additionally, the GSA may elect to implement one or more the projects in Group 4 PMAs at any time to achieve the sustainability goal for the Basin.

Table 4a.1-1 provides a list of the PMAs organized by the four groups and their supply/demand categories. Section 4b discusses the General Management PMAs (Group 1 PMAs) planned for implementation under current conditions: Water Conservation Management Action, Groundwater Extraction Fees and Well Meter Management Action, the Supplemental Imported Project, Increased Stormwater Recharge Project. Section 4c discusses PMAs that would be implemented if the Early Warning Triggers or Minimum Thresholds are reached (Group 2 and 3 PMAs), including: Cachuma Reservoir Water Rights Releases Management Action, Supplemental Conditions on New Wells Management Action, the Annual Pumping Allocation Plan, and Voluntary Fallowing Management Action. Section 4d discusses the other PMAs identified to date (Group 4 PMAs), including a Recycled Water Project, a Non-native Vegetation Removal Project, and Agricultural Land Retirement.

Table 4a.1-1
Summary of Project and Management Actions in the CMA to Achieve Current and Future Groundwater Sustainability

	Demand	Supply
Group 1	Water Conservation	Supplemental Imported Water Program
	Groundwater Extraction Fees and Well Meters	Increased Stormwater Recharge
Group 2	Supplemental Conditions on New Wells	Water Rights Releases Request
Group 3	Annual Pumping Allocation Plan	
Group 4	Non-native Vegetation Removal	Recycled Water Project
	Agricultural Land Retirement/ Pumping Allowance	Drought Mitigation - by Pumping Optimization and Deepen Existing Wells
		Zaca Creek/ Santa Rosa Creek Recharge Pond Project

With the implementation of the Group 1 PMAs, it is anticipated that CMA groundwater production will be maintained at sustainable levels primarily through demand management. Combined, the Water Conservation and Tiered Fees and the Well Meters Management Actions are anticipated to meet the needs of the current and future CMA Water Budget which are estimated to be an additional 200 to 600 AFY. These programs will reduce the annual pumping demands on the CMA Principal Aquifer (Buellton Aquifer).

The SGMA Regulations[146] state the GSP shall include a description of the projects and management actions that include the following:

1. **A list of projects and management actions** proposed in the GSP with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The GSP shall include the following:
    a. A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which an agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.
    b. The process by which an agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
2. If overdraft conditions are identified through the analysis required by Section 354.18, the GSP shall describe projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
3. A summary of the **permitting and regulatory process** required for each project and management action.
4. The status of each project and management action, including a **time table** for expected initiation and completion, and the accrual of expected benefits.

146 23 CCR §354.44. Projects and Management Actions

5. An **explanation of the benefits** that are expected to be realized from the project or management action, and how those benefits will be evaluated.
6. An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of an agency, an explanation of the source and reliability of that water shall be included.
7. A description of the **legal authority** required for each project and management action, and the basis for that authority within an agency.
8. A description of the **estimated cost** for each project and management action and a description of how the Agency plans to meet those costs.
9. A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or deletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The proposed PMAs are supported by the best available information and best available science and have considered the level of uncertainty associated with the CMA setting during development. A summary of proposed PMAs and other potential PMAs that are planned for the CMA are discussed in the subsections below. The GSP is a planning document, and consequently, the level of detail provided for the proposed Projects and Management Actions reflect the necessary level of specificity. After the PMAs are fully developed, specific design and/or implementation plans will be prepared, as applicable and necessary. These plans will be made available to the public prior to any Board action for implementation. If one, or more, of the planned PMAs cannot be implemented, the CMA GSA will consider additional actions to reach sustainability. **Table 4a.1-2** provides a summary sustainability benefits, timetable, permits required, estimated benefit and cost ratio for all PMAs.

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Table 4a.1-2

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
Group 4 - Pending further	Non-native Vegetation Removal	x	x		x		Santa Barbara County, USACE, DWR, CDFW, CEQA, SWRCB	20-200	Low to Medium

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
decision by GSA to initiate	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

SECTION 4B – PLANNED PROJECTS AND MANAGEMENT ACTIONS (GROUP 1)

Project and Management Actions (PMAs) in Group 1 will be implemented under current conditions. This section does not cover monitoring, addressing data gaps, or the annual reporting, which are addressed in further detail in Chapter 5 Implementation.

The ongoing implementation of Group 1 PMAs, including groundwater pumping demand reductions through the Water Conservation and the Tiered Fee and Well Meter Programs, will maintain the sustainability of the Basin by balancing the possible future Water Budget deficits of up to 600 AFY resulting from demand increases and climate change. Additionally, Group 1 PMAs can also begin to increase groundwater recharge with in-lieu supplemental imported water and stormwater capture and infiltration projects. **Table 4b.1-1** provides a summary of a proposed timeline for the completion of major milestones related to this group of projects.

Table 4b.1-1
5-Year Timeline of Sustainability Project and Management Actions – General Management (Group 1)

Water Year	2022			2023				2024				2025				2026				**'27**
Fiscal Year	2021-22		2022-23				2023-24				2024-25				2025-26				2026-27	
Calendar Year	2022				2023				2024				2025				2026			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Water Conservation Plan																				
Strategic Plan																				
Implementation																				
Well Meters and Groundwater Extraction Fees																				
Water Rates Study																				
Implementation																				
Supplemental Imported Water																				
Develop Long Term Fund																				
Ongoing Implementation																				
Buellton Upland Bioswale																				
Study and Design																				
Permitting and Construction																				
Ongoing Implementation																				

4B.1 PROJECT AND MANAGEMENT ACTION NO. 1: BASIN-WIDE CONSERVATION EFFORTS

4b.1-1 Project Description

The municipalities and agricultural landowners in the CMA have previously adopted conservation measures within their respective service areas. For example, Senate Bill 7 of Special Extended Session 7 (SBX7- 7) of 2009 requires that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20% by the year 2020. Similarly, agricultural water users in the CMA have participated in existing conservation management programs as provided by the Cachuma Resource Conservation District (CRCD). For example, the CRCD's Mobile Irrigation Lab helps farmers and managers of schools and parks save water, energy, and money through onsite irrigation system analysis and technical assistance to improve water use efficiency.[147]

The CMA GSA will coordinate with the existing agencies and programs, and develop additional voluntary, rebate-based, or mandatory conservation efforts for domestic, municipal, and agricultural beneficial uses within the CMA. A Water Conservation Strategic Plan, or similar document, will be developed that considers CMA GSA stakeholder concerns, integrates with existing conservation programs, and meets the health and safety water requirements for communities that rely on groundwater within the CMA. As part of water conservation strategic plan development, the CMA GSA will confer with domestic and municipal groundwater producers (namely the City of Buellton and the small mutual water companies) to discuss historical and current conservation measures governing landscape irrigation, wash-downs, and other potential savings as a guide to establish new voluntary conservation measures on a basin-wide level. The CMA GSA will utilize the Strategic Plan to promote and coordinate priority conservation projects for implementation. The Water Conservation Strategic Plan will supplement and augment existing conservation programs. For municipal and domestic uses throughout the CMA, a goal in the Strategic Plan may be developed to achieve per-capita water consumption levels similar to the City of Lompoc, as shown in **Table 4b.1-2**.

147 Irrigation Evaluations. Cachuma Resource Conservation District. Web site. https://www.rcdsantabarbara.org/irrigation-evaluations Accessed 2021-08-10.

Table 4b.1-2
Current Year (2020) Per Capita Water Use

	Per Capita Water Use (Gallons per Capita per Day)	
	Based on Total M & I	Based on Residential Water
City of Buellton	164	95
Mission Hills CSD	124	118
City of Lompoc	81	60
City of Solvang	189	134

Source: Santa Barbara County Water Agency. Website. http://waterwisesb.org Accessed 2021-08-18.
*** Per Capita Use is shown as (a) total Municipal & Industrial (M&I) water divided by population and
(b) Single & Multi-Family Residential use divided by population.
Lot size and landscape water usage are major factors affecting Gallons/Person/Day

The programs listed below may assist or expand urban water conservation in the CMA GSA:

1. High Water Use Outreach (High Use Reports)
2. Meter Audits to Proactively Detect Leaks (Leak Reports) and Leak Repair Programs
3. Rebates on Water-Saving Fixtures (e.g., clothes washers)
4. Rebates on Sustainable Landscape Conversion Programs
5. Water Awareness Outreach Events (Library/Outdoor Market events)

The CMA GSA can coordinate with Santa Barbara County to investigate the potential for, and feasibility of, water conservation in the industrial water uses in the CMA. For example, in conjunction with County staff, the CMA GSA can explore whether industrial water demands can be met by alternative non-potable supplies (e.g., recycled water and/or brackish water).

The CMA GSA can also coordinate with agricultural groundwater users to investigate the potential for, and feasibility of, additional water conservation in irrigation practices. The CMA GSA can coordinate with the existing agricultural conservation programs of the CRCD and the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Conservation Technical Assistance (CTA) Program. In particular funding sources may be identified to support the free services of CRCD's Mobile Irrigation Lab that performs irrigation audits and promotes enhanced efficient irrigation. Best management practices for conservation can be implemented basin wide (e.g., conversion to non-water intensive methods for frost protection and increased use of soil amendments to reduce water use and improve crop yields). The CMA GSA can seek to partner with other programs to support new weather and crop water use monitoring stations, and employ remote sensing data acquisition and analysis to optimize irrigation scheduling and deliveries.

4b.1-2 Project Benefits

Increased water conservation has a direct benefit by reducing groundwater production. The decrease in demand from baseline conditions is estimated to be approximately 10% to 30% of current groundwater production, when considered together with well production metering (see Section 5a) and the new groundwater extraction fees (see Project and Management Action No. 2 – Groundwater Extraction Fees and Meters). Based on 2018 total groundwater pumping for the Buellton Aquifer (3,000 AFY), the potential yield from water conservation is expected to be 300 to 900 AFY. This would meet the goal of achieving an additional 200 to 600 AFY needed to bring the water budget for the CMA into balance currently and in the future (Water Budget, Section 2c).

Management action benefits due to the reduction of groundwater pumping are anticipated to include the following:

- Increase in groundwater storage as compared to current trends and baseline conditions;
- Improved and rising groundwater levels;
- Improvements to water quality are due to reduction of irrigation return flows;
- Prevent depletions of surface water;
- Prevent degradation of groundwater dependent ecosystems, and
- Prevention of land subsidence conditions.

These benefits protect all beneficial uses of groundwater for agricultural, municipal, domestic, industrial, and environmental purposes. The measures for assessing this management action's benefits, relative to the measurable objectives and minimum thresholds established in Section 3b, will be monitored groundwater levels, groundwater quality, and changes in groundwater storage in the CMA. Additionally, water savings can be documented for the water conservation efforts implemented.

4b.1-3 Justification

Due to the current lack of supplemental water supplies, conservation efforts are a necessary tool to achieve the CMA's sustainability goal. Furthermore, contrary to water conservation programs, there is a high cost to acquire and convey supplemental water supplies. When implemented, basin-wide conservation measures will reduce groundwater production and therefore reduce the necessity of supplemental water.

4b.1-4 Project Costs

CMA conservation efforts if implemented, are expected to cost $50,000 to $75,000 to plan and approximately $30,000 to $40,000 annually to implement. Tasks needed to develop a conservation plan include: evaluating current conservation measures, methods to augment existing conservation programs, determining opportunities for additional conservation, conducting public outreach, meeting with groundwater producers, and drafting and adopting conservation related ordinances.

The costs for implementing a conservation program may increase if rebate programs are also implemented. These costs include advertising, marketing, customer service, processing rebate applications, purchasing water-conserving fixtures and appliances, vendor coordination, and issuing rebates. Optional water audits for existing irrigation would include additional costs for expanding CRCD's Mobile Irrigation Lab, which performs irrigation audits and promotes enhanced efficient irrigation.

Costs may be funded through fees, grants, and pumping assessments, or combinations thereof.

4b.1-5 Permitting and Regulatory Process

This management action currently does not require the CMA GSA to obtain approved permits.

4b.1-6 Public Notice

Public Notices will be issued prior to the CMA GSA's adoption of any new conservation programs Additionally, materials will be available to the public describing opportunities for voluntary conservation and available rebate programs sponsored by the CMA GSA.

4b.1-7 Implementation Process and Timetable

Prior to implementing basin-wide conservation measures, the CMA GSA will determine acceptable conservation measures based on an analysis of historical and current conservation measures enforced by the CMA member agencies. Commencing in 2022, the CMA GSA will coordinate with existing water conservation program activities managed by the City of Buellton, small mutual water companies, and the Cachuma Resource Conservation District (CRCD) to assess the potential to expand or modify existing conservation programs to achieve the Basin's sustainability goal.

The CMA GSA will develop a Water Conservation Strategic Plan which will be implemented over the GSP planning and implementation horizon.

4b.1-8 Legal Authority

As the sole GSA for the CMA, the CMA GSA has the legal authority to manage groundwater within the CMA pursuant to SGMA (Section 1b.1-3, Administrative Information). As such, SGMA grants the CMA GSA broad powers, including the legal authority to: conduct investigations; adopt rules, regulations, ordinances and resolutions; require registration of groundwater extraction facilities and measurement of groundwater extractions by a water-measuring device satisfactory to the GSA; enter into written agreements and funding with private parties to assist in, or facilitate the implementation of, a GSP or any elements of the GSP; provide for the measurement of groundwater extractions; regulate groundwater extractions; impose fees on the extraction of groundwater and to fund the costs of groundwater management; and perform any act necessary or proper to carry out the purposes of SGMA.[148]

In accordance with SGMA "Nothing in this part, or in any groundwater management plan adopted pursuant to this, part determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights."[149] Accordingly, this GSP does not determine or alter such surface water or groundwater rights.

148 CWC Section 10725, 10725.2, 10725.4, 10725.6, 10725.8, 10726.2, 10726.4, 10726.5, 10730, 10730.2

149 CWC Section 10720.5 (b)

More specifically, SGMA grants the CMA GSA authority to "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells."[150] SGMA statute authorizes[151] the CMA GSA to "propose and update fees" and to "monitoring compliance and enforcement" of the GSP. Accordingly, SGMA grants the CMA GSA the legal authority to implement basin-wide conservation measures as a GSP management action. The legal authority granted to the CMA GSA under SGMA statutes does not preclude other governing agencies from participating in or contributing to the implementation of basin-wide conservation measures. As such, the CMA GSA will coordinate and cooperate with the appropriate stakeholders and governing agencies in implementing basin-wide conservation measures.

150 CWC Section 10726.4 Additional Authorities of Groundwater Sustainability Agency
151 CWC Section 10725 Powers and Authorities

4B.2 PROJECT AND MANAGEMENT ACTION NO. 2: IMPLEMENT GROUNDWATER EXTRACTION FEES WITH MANDATORY WELL METERING AND UPDATE WELL REGISTRATION

4b.2-1 Management Action Description

A charges framework is the fundamental structure for managing groundwater pumping and funding. A pump charge is just one of many things the GSA will consider in the future (e.g., parcel charge/ fee or both). By charging fees for various levels of pumping, the CMA GSA can both promote voluntary pumping reductions and provide a source of funding for GSA operations, monitoring, additional projects and management actions.

The charges framework can be developed in the first year of GSP implementation. Program details will be developed by the GSA with input from Basin Stakeholders, and multiple funding pathways can be utilized as permitted by SGMA regulations (e.g., parcel tax or pumping fees). Exempt groundwater users could include de-minimis pumpers or other classes of pumpers that are not managed by this GSP, who can be required to provide an alternate method to account for pumping.

If a pumping fee is established in the CMA, its rates and structure may be modified in the future and/or may be adjusted depending on groundwater conditions and program effectiveness.

Alternatively, a groundwater extraction fee structure would promote conservation and voluntary pumping reductions, and would work in tandem with the water conservation measures. Groundwater users would have incentives to switch to less water-intensive activities, or implement water use efficiencies. Alternatively, a groundwater user may instead opt to pay higher groundwater extraction rates in order to produce more groundwater.

Implementation Actions Related to Groundwater Extraction Fees

Objectives for extraction fees are to utilize well metering and up-to-date well registrations to accurately track and manage groundwater production (see Section 5a.3). Plans for a well metering program and update to well registrations will begin development during the first year of GSP implementation. Well metering will support the Groundwater Extraction Fee management action to promote voluntary water conservation and track performance of the Water Conservation actions. SGMA does allow de-minimis well users to be exempt from metering, but the CMA GSA may elect to require de-minimis users to report their water usage using other methods. The CMA GSA can develop additional guidelines for possible alternatives to well meters, including correlating energy usage with the volume of water pumped.

4b.2-2 Management Action Benefits

The effect of groundwater extraction fees will reduce groundwater production and reduce the likelihood of triggering minimum thresholds. In conjunction with metering and water conservation, demand is expected to be reduced by 10% to 30% from the current groundwater production[152]. Based on 2018 total groundwater pumping for the Buellton Aquifer (3,000 AFY), the potential yield from water conservation is expected to be 300 to 900 AFY. This would meet the goal of achieving an additional 200 to 600 AFY needed to bring the water budget for the CMA into balance currently and in the future (Water Budget, Section 2c). Management action benefits are anticipated to be the same as water conservation (Section 4a.2-1) including improved and rising groundwater levels due to reduction in groundwater pumping.

The corresponding cumulative gain of groundwater in storage, compared to no action conditions over the 50-year planning horizon, is estimated to be approximately 15,000 to 45,000 acre-feet. Additionally, the proposed management action will decrease the probability of requiring Group 3 or Group 4 PMAs. The combination of metering, conservation and groundwater extraction fees can potentially maintain the sustainability goal by reducing groundwater production in the CMA and reducing the potential for undesirable results.

The measures for assessing this management action's benefits, relative to the measurable objectives and minimum thresholds established in Section 3b, will be monitored groundwater levels and groundwater quality within the CMA. Additionally, groundwater production by groundwater users will be reported to the CMA GSA to monitor anticipated reductions in production.

152 Research at the Irrigation Technology Center at Texas A&M University has demonstrated that water measurement by itself can reduce crop irrigation water use by 10 percent. When measurement was combined with education about proper on-farm irrigation management, water use was reduced by 20 to 40 percent (TWRI, 2001).

4b.2-3 Justification

Due to the current unavailability of supplemental water supplies, providing incentives for voluntary reduction of groundwater pumping with groundwater extraction fees, in tandem with metering, and expanding current conservation efforts can potentially maintain groundwater sustainability in the Basin. Furthermore, compared to the relatively low costs of water conservation, meters and extraction fees, the high cost to acquire and convey supplemental water supplies would significantly impact all water users in the CMA.

4b.2-4 Costs

The CMA GSA will incur costs to develop the initial groundwater extraction fee management action. The costs would include hiring a water rate and utility fee specialist to evaluate options and policies for the CMA GSA. Costs will include stakeholder outreach and conducting public workshops on what type and details of a groundwater extraction fee program the CMA should have. The administration overhead for these management actions combined (fees, well meters, and well registration) is estimated at $100,000 to $175,000 in the first year of GSP implementation. After the initial set-up in the first year, administrative costs to run all program components are estimated to be $40,000 to $50,000 annually. The costs to set up groundwater extraction fees will be funded through imposition of applicable fees and to the extent they can be obtained, grants, or a combination thereof.

4b.2-5 Permitting and Regulatory Process

Development and implementation of the groundwater extraction fees would be developed in accordance with all applicable laws. The CMA GSA will follow all regulatory requirements associated with the environmental processes including public noticing and review requirements.

4b.2-6 Public Notice

Development of the groundwater extraction fees will include stakeholder outreach, public workshops, and public hearings to receive input from the Basin groundwater users. The public and interested parties will be given the opportunity to provide input to the CMA GSA. The CMA GSA will provide sufficient public notice of a public hearing to adopt the groundwater extraction fees and required well meter policies, as required by California Law.

4b.2-7 Implementation Process and Timetable

Prior to implementing groundwater extraction fees, the CMA GSA will determine an acceptable fee structure based in part on an analysis of historical and current water production volumes. Commencing in 2022, the CMA GSA will compile pertinent information to use in the development of a groundwater extraction fees structure. The CMA GSA will also develop a Water Rates Study with different alternatives. It is anticipated that the Water Rates Study could be completed by April 2023. After completion of the rate study, public hearings will be held such that the GSA can consider implementing the new groundwater extraction fee management action by October 2023 for water year 2024.

4b.2-8 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the authority to “perform any act necessary or proper” to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[153] Specifically, SGMA statue authorizes the CMA GSA to “propose and update fees” and to “monitoring compliance and enforcement” of the GSP.[154] Moreover, SGMA statue authorizes the imposition of fees on the extraction of groundwater to fund costs of groundwater management.[155] Accordingly, SGMA grants the CMA GSA the legal authority to implement the GSP management action set forth above.

153 CWC Section 10725.2 Authority of Groundwater Sustainability Agency
154 CWC Section 10725.4 Investigations
155 CWC Section 10730 and 10730.2

4B.3 PROJECT NO. 3: SUPPLEMENTAL IMPORTED WATER PROGRAM

4b.3-1 Project Description

The City of Buellton currently imports State Water Project from the CCWA, ranging from 165 AF in 2018 to 345 AF in 2020. Because the CCWA pipeline delivery infrastructure is already set up for deliveries to the City of Buellton, the capital costs of delivering additional imported water from CCWA to the CMA local municipal distribution system should be evaluated. The purchase of supplemental water supplies would prolong the yield of t groundwater resources in lieu of the City's pumping of 300 AFY from the Buellton Aquifer.

The lack of availability of SWP and other external water supplies may be addressed through water banking. The CMA GSA may store wet-year deliveries of its purchased water supplies in a groundwater banking program and arrange for the stored deliveries to be withdrawn or exchanged for use in the CMA. Participation in a groundwater banking program would improve the reliability of the CMA GSA's purchased water supplies during dry years, periods of high demand, and disruptions in water deliveries. Participation in a groundwater banking program may also allow the CMA GSA to purchase additional water supplies during wet periods.

4b.3-2 Project Benefits

The purchase of supplemental State Water Project water, would decrease the local groundwater pumping demand from the Buellton Aquifer. The reduced groundwater pumping would benefit the local groundwater levels and storage. Even a small purchase of 50 AFY on average would help meet the goal of achieving an additional 200 to 600 AFY needed to bring the water budget for the CMA into balance currently and in the future (Water Budget, Section 2c).

4b.3-3 Justification

The CMA GSA needs to utilize various strategies to maintain the sustainability of the Basin groundwater. Because the CCWA pipeline and delivery system is already in place for the CMA, developing a funding program to purchase supplemental imported water is a logical choice. Given the uncertainties associated with climate change and impacts to the natural recharge of the local groundwater, current domestic and municipal users may not be able to meet demands without an augmented water supply. Accordingly, the CMA GSA will work with potential water supply sellers and transfer partners to secure additional opportunities to purchase and convey imported water supplies to the CMA.

4b.3-4 Project Costs

The CMA GSA will dedicate an initial $100,000 to $120,000 to develop a fund dedicated to the purchase of supplemental imported water and potential banking opportunities. Costs for this project may be funded through fees, grants, State and Federal appropriations, pumping assessments, or combinations thereof.

4b.3-5 Permitting and Regulatory Process

Because the City of Buellton is already a Member Agency of the CCWA, the CMA GSA should partner with the City of Buellton for this management action to streamline any permitting processes. The CMA GSA will follow all regulatory requirements associated with the environmental processes including public noticing and review requirements.

4b.3-6 Public Notice

The public and relevant entities will be given the opportunity and time to participate in and provide feedback on the procurement of imported water supplies through the project's environmental review processes.

4b.3-7 Implementation Process and Timetable

The CMA GSA will work with potential water supply sellers and transfer partners to secure additional opportunities to purchase and convey imported water supplies to the CMA in the first year of GSP implementation (2022).

4b.3-8 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the legal authority to "perform any act necessary or proper" to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[156] Specifically, SGMA statue grants the CMA GSA authority to "appropriate and acquire surface water or groundwater and surface water or groundwater rights, import surface or groundwater into the agency, and conserve and store within or outside the agency that water for any purpose necessary or proper to carry out the provisions of this part, including, but not limited to, the spreading, storing, retaining, or percolating into the soil of the waters for subsequent use or in a manner consistent with the provisions of Section 10727.2."[157] Accordingly, SGMA grants the CMA GSA the legal authority to implement the development of imported water supplies as a GSP management action. The legal authority granted to the CMA GSA under SGMA statute does not preclude other governing agencies from participating in or contributing to the implementation of the imported water project(s). As such, the CMA GSA will coordinate and cooperate with the appropriate stakeholders and governing agencies in implementing the imported water project(s).

4b.3-9 Source and Reliability

The running long-term average of Table A deliveries for CCWA contractors is approximately 58% of the total Table A entitlement (DWR 2020). During droughts, the State Water Project (SWP) allocation can be at or near zero. However, the Santa Barbara County Integrated Regional Water Management Plan identified about 10,000 – 19,000 AFY of unused SWP water that could be used as a supplemental water supply (Dudek 2019).

The hydrologic variability of SWP and other external water supplies may be addressed through water banking. The CMA GSA may store wet-year deliveries of its purchased water supplies in a groundwater banking program and arrange for the stored deliveries to be withdrawn or exchanged for use in the CMA.

156 CWC Section 10725.2 Authority Of Groundwater Sustainability Agency; Notice

157 CWC Section 10726.2 Additional Authorities Of Groundwater Sustainability Agency Relating To Acquisitions; Augmentation Of Local Water Supplies; Transfers And Exchanges Of Water; And Treatment

Participation in a groundwater banking program would improve the reliability of the CMA GSA's purchased water supplies during dry years, periods of high demand, and disruptions in water deliveries. Participation in a groundwater banking program may also allow the CMA GSA to purchase additional water supplies during wet periods.

The CMA GSA's adaptive management approach to CMA management includes a periodic evaluation of the current feasibility of procuring imported water supplies. At a minimum, this periodic evaluation will be conducted at the scheduled 5-year report periods. The other Group 1 PMAs, not including the supplemental imported water program, are anticipated by themselves to maintain sustainability and if needed Group 2 and 3 PMAs will be enacted. Should it be determined with certainty that imported water supplies will be unavailable (or unavailable at a reasonable cost), the CMA GSA can consider modifications to the GSP to revise the Group 1 PMAs to the make implementation of the GSP more economical.

4B.4 PROJECT MANAGEMENT ACTION NO. 4: INCREASE STORMWATER RECHARGE

4b.4-1 Project Description

The Water Quality, Supply, and Infrastructure Improvement Act (Proposition 1) was approved on November 4, 2014 to provide $200 million from the Stormwater Grant Program (SWGP) for matching grants to public agencies (among other stakeholders) to implement multi-benefit stormwater management projects in California (CMA Plan Area, Section 1d.4-2-4). As part of this program, the County of Santa Barbara Water Agency worked with local agencies to produce the "Santa Barbara County-Wide Integrated Stormwater Resource Plan" (Geosyntec 2018). This plan studied potential stormwater capture and infiltration projects as an option for recharging local groundwater supplies for use in Santa Barbara County GSPs.

As part of the implementation of this GSP, the CMA GSA will partner with the Santa Barbara County Water Agency and the City of Buellton to fund the next steps in implementing three stormwater capture and infiltration projects.

1. City of Buellton Avenue of the Flags Bioretention with Underdrains
2. City of Buellton Agricultural Runoff Detention Basin
3. New Bioretention Bioswale Project in the Buellton Upland

Because the 2018 County Stormwater plan already determined the conceptual project design and benefits of the City of Buellton projects, the next step is to develop the conceptual project design and benefits for a new bioswale project in the Buellton Upland, preferably in the boundary of a small mutual water company and a project with multi-benefits and submit the project for inclusion in the County's clean water stormwater program. The CMA GSA can then partner with the County and the City of Buellton to help permit and build these projects more swiftly than acting independently.

4b.4-2 Project Benefits

The Avenue of the Flags Bioretention Project was estimated to provide about 20 AFY of recharge on average and provide water quality benefits including reducing the nitrogen loading by 300 lbs/year. A bioswale project in the Buellton Upland would be expected to provide similar benefits. With the increased precipitation intensity predicted under climate change, the benefits of slowing urban runoff and increasing infiltration into the groundwater table would be greater than current conditions. Projects that increase stormwater recharge will also be designed as multiple-benefit projects including water supply, water quality and elements to support wildlife and aquatic species.

4b.4-3 Justification

Due to the current unavailability of supplemental water supplies, further developing and expanding local supplies is of paramount importance. It is feasible for the community to make immediate increases in groundwater supplies without extreme changes, alterations to the character of the community, loss of livelihoods, and great financial costs, among other negative impacts. Additionally, the high cost to acquire and convey supplemental water supplies will impact the financial status of the CMA's residents and local entities. Accordingly, the CMA GSA will benefit working with the County on the Proposition 1 clean water initiatives that include these stormwater capture and infiltration projects

4b.4-4 Project Costs

The CMA GSA will dedicate an initial $25,000 to $35,000 to develop a conceptual project design and benefits study for a new Bioretention Bioswale Project in the Buellton Upland for submittal to the County's master Stormwater Resources plan list. After all the projects have been accepted by the County, the CMA GSA will partner with the County on the next phase of developing a design build document that also addresses the requirements of all permits and environmental regulations.

4b.4-5 Permitting and Regulatory Process

The preparation of a conceptual project design and benefits study for a stormwater capture and infiltration project does not require any permits. In the next phase of a design build document, the CMA GSA will work with the County and City of Buellton on meeting all regulatory requirements associated with the stormwater capture and infiltration projects.

4b.4-6 Public Notice

The public and other interested parties will be given the opportunity and time to participate in and provide feedback on the stormwater capture and infiltration projects through the project's environmental review processes.

4b.4-7 Implementation Process and Timetable

The conceptual project design and benefits study for a new Bioretention Bioswale Project in the Buellton Upland will be completed in the first year of GSP implementation (2022). The project will be sent to the County for inclusion on the County's master Stormwater Resources plan list. After all the projects have been accepted by the County, the CMA GSA will partner with the County and City of Buellton on the next phase of developing a design build document that also addresses the requirements of all permits and environmental regulations. Construction of the infrastructure for the proposed stormwater capture and infiltration projects could begin in the second year of implementation (2023), pending partnership with the County program.

4b.4-8 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the legal authority to "perform any act necessary or proper" to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[158] Specifically, SGMA statue grants the CMA GSA authority to conserve and store waters by "spreading, storing, retaining, or percolating into the soil of the waters for subsequent use" and "transport, reclaim, purify, desalinate, treat, or otherwise manage and control polluted water, wastewater, or other waters for subsequent use in a manner that is necessary or proper to carry out the purposes of this part."[159] Accordingly, SGMA grants the CMA GSA the legal authority to implement stormwater capture and infiltration projects as a GSP management action. The legal authority granted to the CMA GSA under the SGMA statute does not preclude other governing

158 CWC Section 10725.2 Authority Of Groundwater Sustainability Agency; Notice

159 CWC Section 10726.2 Additional Authorities Of Groundwater Sustainability Agency Relating To Acquisitions; Augmentation Of Local Water Supplies; Transfers And Exchanges Of Water; And Treatment

agencies from participating in or contributing to the implementation of stormwater capture and infiltration projects.

4b.4-9 Source and Reliability

The CMA GSA's stormwater capture and infiltration projects will rely on the availability of local precipitation.

SECTION 4C – RESPONSIVE PROJECTS AND MANAGEMENT ACTIONS (GROUPS 2 AND 3)

Group 2 and 3 Project and Management Actions (PMAs) can be implemented when the early warning and Minimum Threshold triggers have been reached (see Chapter 3). If 50% of Representative Monitoring Wells reach the early warning trigger for low groundwater levels, the early warning Group 2 PMAs will be implemented. The Group 3 PMAs should also be developed at this stage to ensure timely implementation if and when needed. If 50% of Representative Monitoring Wells (RMWs) reach the Minimum Threshold in two consecutive non-drought years, then the Group 3 Annual Pumping Allocation management action will be implemented. The CMA GSA can also decide to implement the Groups 2 and 3 PMAs before reaching the early warning and Minimum Thresholds, if desired. Earlier implementation can improve groundwater conditions to reach the measurable objectives more quickly and ensure that the Minimum Thresholds for the Basin are not reached. Additional PMAs (Group 4 PMAs) can also be included into Groups 2 and 3 PMAs as needed for potential drought management in the future.

It is not expected that the Group 2 PMAs will be necessary to implement. The ongoing implementation of PMA's in Group 1, including groundwater pumping demand reductions up to 900 AFY through the Water Conservation and the Groundwater Extraction Fee and Well Meter Programs, will maintain the current groundwater conditions and maintain the sustainability of the Basin by balancing the projected future Water Budget deficits (up to 600 AFY). If the projects and management actions required for maintaining sustainability in Group 1 PMAs either fails to be implemented or does not achieve expected results, the Annual Pumping Allocation (PMA No. 7 described below) can be implemented. This management action does not alter existing water rights but will provide a clear structure and strong incentive to reduce groundwater pumping to within the sustainable yield of the basin while funding potential replacement water if the basin users decide to pump more than the sustainable yield.

4C.1 PROJECT AND MANAGEMENT ACTION NO. 5: WATER RIGHTS RELEASE REQUEST

4c.1-1 Project Management Description

If the early Minimum Threshold triggers are reached, the CMA GSA can make a request to the SYRWCD, a CMA member agency, for a water rights releases from upstream Cachuma Reservoir as described in Chapter 2.3-4. For the CMA, the only type of water rights releases that would provide groundwater recharge benefit is referred to as an "Above Narrows Account" (ANA) releases. This CMA action can only be a request to the SYRWCD because the SWRCB Order 2019-0148 gives the SYRWCD the authority to request ANA releases subject to and in accordance with the requirements of WR 2019-0148. The ANA releases would be subject to availability of ANA credits in storage in Cachuma Reservoir.

4c.1-2 Project Benefits and Justification

Percolation from the Santa Ynez River channel is an important source of recharge to the Santa Ynez River alluvium in the CMA. During ANA releases, water is released from Cachuma Reservoir which recharges the subterranean underflow of the river channel deposits. This water can help maintain groundwater dependent ecosystems in the reach between Solvang and the Buellton Bend. ANA releases have averaged about 4,300 AFY since 1990, and this has become a valuable source of water during periods of drought.

4c.1-3 Project Costs

There are no capital costs anticipated with requesting water rights releases.

4c.1-4 Permitting and Regulatory Process and Public Notice

This management action currently does not require the CMA GSA to obtain approved permits or provide public notice. The SYRWCD is the party responsible for notifying the public.

4c.1-5 Implementation Process and Timetable

This policy by the CMA GSA could be voted and implement in the first year of GSP implementation (2022).

4c.1-6 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the authority to "perform any act necessary or proper" to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[160] Accordingly, the GSA has sufficient authority to make said request to SYRWCD.

160 CWC Section 10725.2 Authority Of Groundwater Sustainability Agency; Notice

4C.2 MANAGEMENT ACTION NO. 6: SUPPLEMENTAL CONDITIONS ON NEW WELL

4c.2-1 Management Action Description

If the early Minimum Threshold triggers of low groundwater levels are reached, the CMA GSA can require supplemental conditions that would apply to new wells. The CMA GSA could create an ordinance limiting uses for new wells during times of extraordinary droughts and low groundwater levels.

4c.2-2 Project Benefits and Justification

If more than 50% of the representative monitoring wells have reached the early warning trigger (five feet above the Minimum Thresholds), the CMA GSA can take actions to reduce groundwater pumping demands. New uses of groundwater would further exacerbate the lowering of the groundwater levels at the expense of existing groundwater users. The benefits would be an increase in groundwater storage as compared to baseline conditions due to reduction in groundwater pumping

4c.2-3 Project Costs

There are no capital costs anticipated with establishing an ordinance temporarily prohibiting new wells for new projects during times of extraordinary droughts and low groundwater levels.

4c.2-4 Permitting and Regulatory Process and Public Notice

This management action does not require the CMA GSA to obtain approved permits. The public and relevant entities will be given notice of the CMA GSA's ordinance temporarily prohibiting new wells for new projects during times of extraordinary droughts and low groundwater levels.

4c.2-5 Implementation Process and Timetable

This policy, if implemented by the CMA GSA, could be voted on and implemented in a year in which groundwater levels in more than 50% of the representative monitoring wells are within five feet of the GSP Minimum Thresholds (early warning triggers).

4c.2-6 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the authority to "perform any act necessary or proper" to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[161]

161 CWC Section 10725.2 Authority Of Groundwater Sustainability Agency; Notice

4C.3 MANAGEMENT ACTION NO. 7: IMPLEMENT ANNUAL PUMPING ALLOCATION PLAN, TRANSIENT POOL AND FALLOWING PROGRAM (IF NECESSARY)

4c.3-1 Project Description

The Group 1 PMAs, including groundwater pumping demand reductions up to 900 AFY through the Water Conservation and the Groundwater Extraction Fee and Well Meter Programs are expected to maintain sustainability of groundwater conditions. So, Group 2 PMAs are not expected to be necessary. However, if the Group 1 PMAs fail to be implemented or do not achieve the expected results, the GSA may elect to implement additional management actions to improve groundwater conditions above Minimum Thresholds. This could include the establishment of annual groundwater pumping allocations (Annual Pumping Allocations) based on the sustainable yield of the CMA[162]. These Annual Pumping Allocations could be used for the purpose of assigning pumping fees (Augmentation Fees). The Augmentation Fees would in turn provide the funding for the development of supplemental water supplies and other projects and management actions to achieve sustainability. Accordingly, these Annual Pumping Allocations are not a determination of water rights in that they do not prohibit the pumping of groundwater. Rather, all groundwater pumpers continue to possess the right to produce groundwater provided they pay the Augmentation Fee. Groundwater production in excess of Annual Pumping Allocations would be subject to an Augmentation Fee in an amount that is determined to be sufficient for the acquisition of supplemental water supplies pursuant to this pumping allocation plan.

The details of this management action still need to be developed through public workshops by the GSA. Some optional components of this management action could include a transient pool and voluntary fallowing program which is used to phase out groundwater production over time.

[162] The current estimate of the sustainable yield, defined by SGMA as the maximum quantity of water that can be withdrawn annually without causing undesirable results, is currently estimated to be 2,800 AFY for the CMA. The sustainable yield may change as projects and management actions are implemented that increase basin recharge and increase the volume of water that can be withdrawn annually without causing undesirable results.

4c.3-2 Project Benefits

The proposed management action will directly result in significantly less groundwater production and will help alleviate and mitigate any potential overdraft conditions if Minimum Thresholds are exceeded. Management action benefits due to reduced groundwater pumping are anticipated to include the following:

- Increase in groundwater storage as compared to current trends and baseline conditions;
- Improved and rising groundwater levels;
- Improvements to water quality are due to reduction of irrigation return flows;
- Prevent depletions of surface water ; and
- Prevention of land subsidence conditions.

The measurements for assessing the benefits of the proposed management actions, relative to the measurable objectives and minimum thresholds established in Chapter 3, will be monitored groundwater levels and groundwater quality in the CMA. Additionally, groundwater production by groundwater users will be reported to the CMA GSA to monitor anticipated reductions in production.

4c.3-3 Justification

The Annual Pumping Allocation Program would be necessary to reach sustainability in the future if the Group 1 PMAs do not yield 200 to 600 AFY due to the current unavailability of a supplemental water supplies and the costs of obtaining the supplemental supplies if/when they become available. The estimated current sustainable yield of 2,800 AFY does not entirely support projected future groundwater production. Under this management action, the CMA GSA will work with groundwater users in the CMA to determine an equitable process for assigning allocations. The beneficial uses of groundwater will subsequently be evaluated based on water rights priorities. Accordingly, all groundwater users and uses will be equitably considered and prioritized, as required by SGMA.

4c.3-4 Costs

The CMA GSA will incur costs to develop the Annual Pumping Allocations and the Augmentation Fees. There will also be administrative costs and engineering costs for conducting hearings, verifying pumping documentation, and preparing the final report to the CMA GSA governing body with the recommendations, among other implementation tasks. The preliminary cost estimate for developing these allocation and fee programs is $225,000.

The CMA GSA will also incur administrative costs to implement and manage the Fallowing Program. Additionally, the CMA GSA may incur costs to purchase Transient Pool Allocations from groundwater pumpers electing to enroll in the Fallow Program estimated to be up to $300,000. Administrative costs to run all program components are estimated to be $40,000 annually.

The Annual Pumping Allocation Program costs will be funded through imposition of applicable fees and to the extent they can be obtained, grants, or a combination thereof.

4c.3-5 Permitting and Regulatory Process

Implementation of the Annual Pumping Allocation Program may be subject to environmental regulations and could require the preparation of environmental studies. The CMA GSA will follow all regulatory requirements associated with the environmental processes including public noticing and review requirements.

4c.3-6 Public Notice

Development of the Annual Pumping Allocation Plan will include stakeholder outreach, public workshops, and public hearings to receive input from the basin groundwater users. The public and relevant entities will be given the opportunity and time to present historical pumping documentation provided to the CMA GSA. The CMA GSA will provide sufficient public notice of a public hearing to adopt the Annual Pumping Allocation.

4c.3-7 Implementation Process and Timetable

The CMA GSA would determine each groundwater pumper's Annual Pumping Allocation and/or Transient Pool Allocation no later than when the Group 2 PMAs are in effect after early warning triggers have been reached. The CMA GSA could also decide to preemptively explore this management action earlier, if desired. All groundwater pumpers will be asked to submit records of their historical pumping and other relevant material to the CMA GSA. The CMA GSA Water Resources Manager would review the materials and provide a draft recommended Annual Pumping Allocation and/or Transient Pool Allocation of each groundwater pumper who submitted materials to the CMA GSA. All groundwater pumpers would submit comments on the draft recommendation to the Water Resources Manager. The Water Resources Manager would consider these comments and present a final report and recommendation to the CMA GSA Board for consideration. Those receiving a Transient Pool Allocation may elect to join the Fallowing Program.

4c.3-8 Legal Authority

As explained in Section 1b.1-3 (Administrative Information), SGMA grants the CMA GSA, as a groundwater sustainability agency, broad powers including the authority to "perform any act necessary or proper" to implement SGMA regulations and allows the CMA GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation.[163] Specifically, CWC Sections 10726.2 and 10726.4 provide the CMA GSA with the authority to develop and implement an Annual Pumping Allocation Plan, Transient Pool and Fallowing Program to meet the needs of the Basin. CWC Section 10725.4 authorizes the CMA GSA to "propose and update fees" and to "monitoring compliance and enforcement" of the GSP. CWC Sections 10730 and 10730.2 authorize the GSA to impose fees on extraction of groundwater to fund the costs of groundwater management. Accordingly, SGMA grants the CMA GSA the legal authority to implement the GSP management action set forth above. Draft recommendations of each groundwater pumper's Annual Pumping Allocation will be prepared in accordance with existing California water rights laws, with consideration to beneficial uses of water in the CMA.

163 CWC Section 10725.2 Authority Of Groundwater Sustainability Agency; Notice

SECTION 4D – OTHER PROJECTS AND MANAGEMENT ACTIONS (GROUP 4)

Group 4 Project and Management Actions (PMAs) are not current commitments by the CMA GSA for implementation. Group 4 PMAs will be considered in the future by the CMA GSA for further study and development. However, if one of the Project and Management Actions required for sustainability in Groups 1-3 either fails to be implemented or does not have the expected results, further actions will be required to achieve sustainability. In that case, appropriate projects and/or management actions will be chosen from those listed under Group 4. As work on supplemental water supply and resource management efforts is ongoing, it may be the case that additional projects will be identified and added to the Group 4 list in future GSP updates (see Table 4a.1-1).

The current Group 4 PMAs include the following supply-related PMAs:

- Recycled Water Project;
- Regional Seawater Desalination Plant; and
- Zaca Creek/ Santa Rosa Creek Recharge Pond Project.

The current Group 4 PMAs include the following demand-related PMAs:

- Non-native Vegetation Removal
- Agricultural Land Retirement/ Pumping Allowance
- Drought Mitigation by Pumping Optimization and Deepen Existing Wells

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 reach sustainability in the CMA. Proposed projects and management actions may be modified, as necessary, if the intended project benefits are not realized in the intended timeframe.

CHAPTER 5: PLAN IMPLEMENTATION

This Chapter describes proposed and planned projects and tasks associated with implementation of the GSP for the CMA. The implementation projects and tasks are planned to be undertaken over a four-year implementation timeline by (2026), for inclusion in the Five-Year Plan Assessments due in 2027. As previously described in Section 3b, undesirable results are not identified as occurring presently within the CMA. The projects identified for implementation are designed to meet SGMA requirements, including reporting and addressing data gaps, and will act to ensure the current conditions of the Basin are maintained or improved into the future.

Preliminary cost estimates are provided for the proposed implementation projects and tasks. The preliminary cost estimates are based on 2021-dollar amounts. The current inflation rate in 2021 is 5.39%, the second year it has been over 5% since 1981 and the highest it has been since 1990.[164] Prior to this general inflation, construction and material costs were already rapidly increasing due to the 2018 tariffs of 25% on steel and 10% on aluminum. The CMA GSA will be adaptive towards inflation and changes in inflation rates in future budgeting decisions.

164 Consumer Price Index (CPI) inflation was 5.39% for the period June 2020-June 2021. U.S. Bureau of Labor Statistics. https://www.bls.gov/cpi/ (Accessed 2021-07-22). Labor costs and construction costs are rising more rapidly.

SECTION 5A – IMPLEMENTATION PROJECTS

This section describes project and tasks to implement the CMA GSP. **Table 5a.1-1** summarizes the implementation projects.

Table 5a.1-1
Summary of Implementation Projects

Project Category	Task	Type	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)

5A.1 COMPLETING ONGOING FIELD INVESTIGATIONS

Certain field investigations commenced during the development of this GSP following preliminary review of potential data gaps. Full implementation of the CMA GSP includes completing these projects (described below).

5a.1-1 Surveying Representative Wells

During the summer of 2020, wells that were part of the existing groundwater monitoring programs conducted by the County of Santa Barbara were surveyed to improve vertical accuracy of well elevations. As part of the development of this project including the Representative Monitoring Program, several additional wells were suggested for ground surveying due to uncertainty in actual locations. This implementation project would improve the location information for these wells to an accuracy of better than plus or minus (±) half a foot (±0.5 feet). Wells with elevation data uncertainly of greater than ±0.5 feet were indicated in the Appendices 3b-A and 3b-D with a "±" designation attached to the elevation.

In CMA the following would need to be surveyed:

- 7N/32W-31M1, current accuracy ±20 feet
- 6N/32W-12K2, current accuracy ±5 feet

The surveying work for these wells is expected to take a two-person team less than a day of work to meet this precision requirement. Expected cost for completion are $2,000 to $4,000. A completion target date to perform the work is set for the end of calendar year 2022 (December 31, 2022).

5a.1-2 SkyTEM Airborne Geophysics Results

During the Summer and Fall of 2019, the CMA GSA applied for a California Proposition 68 grant for an Airborne Electromagnetic (AEM) geophysical survey of the CMA, with the intent to capture a coherent three-dimensional regional scale geophysical data set of the majority of the CMA, including areas lacking information on historical wells. The overall intent of the AEM data set would be to improve the three-dimensional geologic model and subsequent groundwater modeling. The groundwater model is used to calculate the water budget and projections about future conditions. Additionally, this geophysical data may provide a regional snapshot of the groundwater level, as well as the presence of highly saline water.

Grant funding for the project was awarded in Spring 2020. However, due to pandemic SARS-CoV-2 (COVID-19) conditions (Section 1c.1, Appendix 1c-A), the international team conducting the survey was prevented from entering the country which delayed the survey of the first AEM flight to November 2020. Data processing of the November 2020 geophysical data is ongoing and may include recent published USGS geophysics data and maps (Sweetkind et al. 2021).

Implementation of the AEM data into the GSP to improve management of the basin is a multi-phase process that likely will take up to two years to complete. The funding for the AEM Project included plans for completion of the following remaining phases of work, as deemed necessary after review of the data and initial results.

I. Complete processing of the raw geophysical point data into three-dimensional data.

II. Using this geophysical data, update the three-dimensional geological model.

III. Incorporate the updates from the three-dimensional geological model into the groundwater model. Run groundwater model calibration checks.

IV. Use the updated groundwater model to update water budget and other projections.

Proposition 68 grant funding (see Section 5c) for the SkyTEM AEM was designated for the SkyTEM AEM survey in 2020. However, with the recent unexpected inflation, additional funding may need to be acquired. The Phase I work is planned to have a completion date by the end of water year 2022 (September 30, 2022), with the Phase II-IV task being updated during water year 2023 (September 30, 2023).

5a.2 Monitoring Network Data Gaps

In addition to filling the preliminary data gaps partially addressed above in Section 5a.1, additional data gaps have been identified in the earlier chapters of this GSP. Projects included here address data gaps to improve management of the CMA groundwater. Land subsidence is also a consideration for improving monitoring data. However, the locations for additional land subsidence monitoring are not included as part of the implementation projects and can be reviewed for further consideration the annual updates of this CMA GSP.

5a.2-1 Video Logging and Sounding of Representative Wells

During implementation of the GSP, additional data may be collected for wells that were identified as representative wells in the basin that have missing well completion information. Missing well completion information includes the depth of perforation intervals, and the total current depth of the well. This implementation project will require conducting field investigations to collect information about these wells. **Table 5a.2-1** lists the wells that were identified as partially lacking needed information.

Table 5a.2-1
CMA Representative Wells with Unknown Depths or Screened Intervals

SGMA Indicator(s)	DBID	State Id	Well Depth	Perforations / Screen Intervals
GWL	82	7N/33W-36J1	known	TBD
GWL	75	7N/32W-31M1	known	TBD
GWL	90	6N/31W-7F1	known	TBD
SW-GDE	1120	6N/32W-9G1	known	TBD
SW-GDE	1115	6N/32W-13G2	known	TBD
SW-GDE	1111	6N/31W-17R1	known	TBD

GWL = Groundwater Level; SW-GDE = Surface Water and Groundwater Dependent Ecosystems; TBD = To Be Determined

The Video Logging Representative Wells project consists of conducting video logs to identify perforation or screen intervals in each of wells. This would be supplemented by sounding of the well bottom, and the depth to water.

Each well is expected to cost approximately $1,250 to $2,000 for video logging. Expected cost for completion of 6 wells would be approximately $7,500 to $12,000 in additional funding. This is a project that falls within the scope of the DWR Technical Support Services (TSS) program. The TSS program may be able to provide this at a lower cost to the CMA GSA. A target date for completing the video logging and sounding of representative wells is end of water year 2023 (September 30, 2023).

5a.2-2 Add Suggested Wells to Groundwater Level Monitoring Program

The Monitoring Network (Section 3a) identified that additional wells for groundwater levels and water quality monitoring are recommended to be added to the Buellton Upland. Figure 3a.3-1 (Monitoring Network) shows the locations where these wells are located. In addition, for the identified data gap near the confluence of Santa Rosa Creek and the Santa Ynez River, installation of a piezometer may be appropriate if an existing well is not present or available, to evaluate the groundwater-surface-water connection and the associated GDEs identified in this area.

Four existing wells are identified as reporting water quality as part of the Irrigated Land Regulatory Program to be added to the water level monitoring network. These wells are private wells part of commercial irrigation projects. One well is in the upper Cañada de Laguna, and would provide information on the northeast Buellton Upland, two of the wells are an expected upper (SYRA underflow) and lower (Buellton Aquifer) in the Santa Ynez River alluvium, and the last is at the base of Santa Rosa Creek in the Buellton Upland. If these wells are unable to be added to the groundwater levels, the CMA GSA should evaluate drilling a new dedicated monitoring wells near these locations.

Adding these wells to the groundwater level monitoring network would be a several step process:

1) Secure permission and access rights from the well owners to monitor water levels at those locations.

2) Collect the necessary data to establish these as groundwater level monitoring wells. This includes establishing measuring points for each well to meet the vertical accuracy requirements of 0.5 feet or better.[165] This could require a survey of the well location. In accordance with SGMA

[165] 23 CCR § 352.4.

requirements well construction information would be collected, or video logging and well sounding.

3) Work with the well owner and the monitoring entity to establish water level monitoring dates in spring and fall where the wells are not pumped to ensure that the measured water levels are representative of static waters.

The cost involved in implementing this project depends on engagement and cooperation with the existing well owners. Labor costs in securing permission and access rights is part of the overhead costs of the GSA. If access is granted conducting the measuring point survey, well sounding, and video logging an estimated cost of around $2,000 to $4,000 per well, with a project cost of $8,000 to $12,000 for all four.

5a.2-3 Drill Dedicated Groundwater Level Monitoring Wells

The Monitoring Network (Section 3a) identified two areas where groundwater level monitoring would be required. This includes the upper Cañada de Palos Blancos, and on the saddle between the Santa Ynez River and Santa Rosa Creek near highway 246. As a preliminary step the CMA GSA is conducting outreach to parcel owners about potential existing wells that could be used for the purposes of groundwater monitoring.

Both well locations include public lands (Figure 1d.2-1, Plan Area). The area in the Cañada de Palos Blancos includes land owned by the Bureau of Land Management. The saddle area includes a parcel owned by CCWA and is the location of CCWA Tank 7 (Figure 1d.2-3). The aquifer at the Cañada de Palos Blancos is estimated at up to 1,000 feet deep, while it is up to 2,000 feet deep at the CCWA Tank 7 location (Figure 2a.2-2, HCM).

Nested monitoring wells installed at both locations would provide data to evaluate hydraulic gradients in these areas. Each of the nested wells will be installed submersible water level logger or pressure transducers to collect groundwater level throughout the year. Preliminary estimate for two wells that partially penetrate the aquifer is $330,000, with the cost in part depending on the final well site and design details. These wells would only be necessary if the outreach to utilize existing wells is not successful.

Due to expense of drilling and installing the proposed nested wells, the plan is to conduct outreach to the community to locate any potential lower cost alternatives. This outreach is expected to run through the end of water year 2022 (September 30, 2022), and the CMA GSA may plan to revisit this issue at that time.

5a.2-4 Install Surface Water Gage

For the benefit of improving accuracy of monitoring of the CMA surface water outflows, spot flow measurements of the surface water outflow from the CMA for a period of one year will be conducted near a previous USGS gage “Santa Ynez River at Santa Rosa Damsite near Buellton” (USGS ID 11131000; Figure 2b.6-1, GC). This data will be correlated with an existing (USGS ID 11131000; Figure 2b.6-1, GC). Depending on the quality of the correlation, recommendations will be made to monitor the surface water outflows from the CMA using the relationship with the existing gage or to develop a new permanent surface flow gage. A target date for completion of this study would be no later than the end of water year 2024 (September 30, 2024).

5A.3 IMPROVED MANAGEMENT INFORMATION

The following implementation projects would improve the CMA GSA tracking effectiveness of the progress of plan implementation.

5a.3-1 Update Well Registration Program

Currently all wells within the CMA are part of the SYRWCD registry of all water-producing facilities within its jurisdiction. Property owners must register any new water-producing facility within 30 days or be guilty of a misdemeanor.[166] Figure 3b.2-1 (Sustainable Management Criteria) shows that as of March 2021 there are 111 wells (95 active, 16 inactive) identified in SYRWCD Zone D which is approximately representative of the Buellton Aquifer of the CMA.

Additional information is needed on production wells in the geographic bounties of the Santa Ynez River Alluvium subarea. Specifically, information is needed that identifies the aquifer from which wells extract water. As part of the implementation of this GSP, additional information would be useful to verify and improve information about production wells. Specifically, to identify which wells are pumping from the shallow underflow of the Santa Ynez River (which are regulated by SWRCB outside of SGMA) and which wells are pumping from the deeper Buellton Aquifer (subject to SGMA) in the reach between Solvang and Buellton Bend.

The following additional information would be requested for all current registered wells, and any new well that is registered in the CMA.

- Location of the well to within 103 feet[167] or better. Consumer mobile phones are typically able to provide accuracy to within 16 feet and would be sufficient for this purpose.

- Well log information, such as Well Completion report "Driller's Log" or geophysical logs, if available.

166 CWC Section 75640

167 Locations reported in degrees minutes seconds (format like 34° 36' 33" N) indicates accuracy of ±103 feet. Locations reported in decimal degrees to four digits (i.e. 34.6092° N) indicates accuracy of ±37 feet.

- Well information in the Irrigated Land Regulatory Program, which includes the site name and location identifier for the well on the property.

- Well metering, as described in section 5a.5-2.

Implementation is expected to involve relatively minor costs to the well owners and to the well registration program administration. A target date for the completion of the updates to the well registration is by the end of SYRWCD Fiscal Year 2023-2024 (June 30, 2024).

5a.3-2 Well Metering Requirement

This implementation project involves assessments of groundwater production where metered water usage for wells is estimated based on crop acres, population, livestock, landscape use, and pond evaporation. These factors for estimating usage are from the SYRWCD instructions pamphlet (SYRWCD, 2010) and currently "applied as published and are not to be altered for wet or dry reporting periods or irrigation methods." The recommendation of the GSP is that the use of static factors be phased out and replaced by water meter installations at wells provide well owners and incentive for efficient water use.

Metering would also help with verifying crop water use. Crops can be irrigated using various methods and variable efficiency. Irrigation improvements may include changes to reduce evaporation, like changes to the timing of irrigation application, replacing sprinkler systems with drip irrigation systems, and so forth. The benefits from these improvements in terms of increased water use efficiency are variable, and can require capital expenditures that are not compensated or incentivized under a single crop requirement system. Using well water meters for irrigation in combination with management actions described in Chapter 4 involving groundwater extraction fees would allow well owners to be incentivized for moving to more efficient water use with existing crops.

The GSP would also have benefit from more accurate measurements of the water that is being produced from the groundwater basin, which could better inform accurate estimates of sustainable yield and management decisions as part of the overall goal of ensuring future water availability.

Demand management measures from the Urban Water Management Act (UWMA) require that urban water suppliers not yet fully operating with proper water meters explain plans for installing water meters. While the CMA GSA is not subject to the UWMA, the GSA should give similar considerations as water metering requirements specified in the UWMP.

Installation costs for well meters are dependent on the size and flow rate required. In 2021, low flow water meters (less than 35 gallons per minute [gpm]) suitable for domestic use cost as little as $200, while high flow meters (up-to 600 gpm) suitable for large scale agriculture use can cost upwards of $800. Full water meter installation would include labor costs, which could easily be double or more the cost of the meter.

In recognition of the costs involved for water meter installations, it is recommended that metering be phased in over two years, with a target date of completion by end of calendar year 2024 (December 31, 2024). The GSA may provide financial incentives to help encourage and offset the metering costs.

5A.4 DATA MANAGEMENT SYSTEM MAINTENANCE

The Data Management System (DMS) was previously described in Section 1e.1 of this CMA GSP. The DMS is a centralized source for water information regarding the CMA. Aspects of the CMA DMS include a SQL database with water data, geographic information system (GIS) files, a map server to make the information available, electronic copies of reports, and a web interface to view these various data sets. The DMS Web interface includes interactive mapping and graphing, including a specific interface to track how the CMA is meeting the Sustainable Management Criteria (SMCs).

Costs related to maintain the DMS include rental costs for the server space and registration of the domain name. Because the DMS utilizes a computer system located on the internet the sever software requires periodic updates and software patches to ensure security. To keep the DMS as a relatively up-to-date resource, data and reports must be periodically added as they become available. With data that is collected and transmitted through telemetry, an automated update system can be developed to lessen the labor involved. Total annual costs to the CMA GSA for updating the DMS are expected to be around $10,000 to $15,000 per year, mostly in labor to update data and reports. Some of this cost may be counted in the annual reporting estimate.

If new features or updates are needed for the DMS, these items can involve additional labor costs to develop which can be highly dependent on the specifics of the feature needed.

5A.5 REPORTING AND PLAN UPDATES

SGMA regulations require that the GSA periodically update DWR on the status of the CMA including process of the GSP implementation, and periodically assessing the GSP for potential improvements, or as a result of changing conditions. Ongoing communication with groundwater users and the entire community will also be key for the process of GSP implementation. The following sub-sections describe how these required SGMA tasks plan to be accomplished.

5a.5-1 Annual Reports

In accordance with SGMA, the CMA is required to provide an annual report for the water year (October 1 to September 30 the following year) within six months following the end of the water year, and no later than "April 1 of each year following the adoption of the Plan."[168] These annual reports are to include general information about the Basin, groundwater elevation, contour maps, groundwater extraction data, surface water availability, total water use, and progress made towards GSP implementation.

Data on the first half of the water year[169] is compiled annually in the Santa Ynez River Water Conservation District's required "E*ngineering Investigation and Report upon Ground Water Conditions*"[170] (Stetson 2021, and previous annual reports) based on a July 1 to June 30 year.[171] A preliminary report is published in March,[172] and a final investigation including spring conditions data collected in March, is published at the end of April. The engineering investigation provides information for the SYRWCD's Board of Directors to consider regarding overdraft, water production, and obligated water purchases. Other annual reports on water resources are published throughout the year. Additional reports include the Santa Barbara County Hydrology report,[173] Annual Monitoring Summary for Biological Opinion, and the City of Buellton Annual Water Supply Report. Other annual reporting is provided Consumer Confidence Reports which are a federal requirement that larger public water systems (i.e., City of Buellton and CCWA) publish general

168 23 CCR § 356.2 Annual Reports
169 See the discussion regarding Water Year in the front matter.
170 CWC § 75560
171 CWC Section 75507
172 CWC Section 75570
173 Santa Barbara County Hydrology reports use a September 1st -August 31st water year.

information regarding their drinking water quality. Annual SGMA updates will commence with the inclusion of information compiled from these various annual reports and address the additional required elements of the SGMA annual reporting.

The general schedule for completion of the GSP annual reports is based on collecting data representing the fall season or end of the water year conditions which are typically collected through the end of October. Data would be updated into the DMS at that time. Following the data collection and compilation, the updated GSP document would be drafted and compiled in November and December of the year with presentation to the GSA committee expected for The January or February. The January and February presentation would include a public newsletter (see Section 1c and Appendix 1c-D). The final version of the annual GSP report would be submitted to DWR in mid-March.

The first of these GSP annual reports is for the water year ending September 30, 2021, prior to adoption and submittal of the GSP in January 2022. The first annual report is due by April 1, 2022.[174] This first annual report is to include updates about conditions in the basin since the previous year described in the GSP.

The first two years of developing the annual report will likely involve development time. Starting with the third year (report on water year 2023), preparation of the annual report is expected to be relatively less time intensive. The SYRWCD annual engineering investigation report costs approximately $18,000 each year, on average, to update and produce.[175] Once the annual report is mature, reproducing it in subsequent years will likely be similar in terms of costs.

5a.5-2 Five-Year Plan Assessment

In accordance with SGMA, the CMA is required to provide a written assessment of the GSP at least every five years.[176] This includes an updated description of current groundwater conditions, discussion of project or management actions, any potential GSP updates, evaluation of any significant new information or change in water use, and a general assessment of monitoring. Each of the Group 1 PMAs should have

174 Personal Com. Anita Regmi, DWR Rep., 2021-05-25
175 Costs for producing the 2021 SYRWCD report which was representative average year. Inflation at the current 5.39% CPI annual rate means the same level of effort will cost around $19,000 in 2022 dollars, and $20,000 in 2023 dollars.
176 23 CCR § 356.4. Periodic Evaluation by Agency

been enacted and have some data available to evaluate the PMAs for further development or to move Group 4 PMAs to Group 1 for implementation. The UWMPs are planning documents for municipal and retail supplies who serve more than 3,000 customers or serving more than 3,000 acre-feet annually. These documents are also updated on five-year cycles. Information from any 2025 UWMA plans (due in 2026) may be incorporated into the 2025 plan assessment. UWMPs include discussion of how a water supplier is planning for water supply reliability in normal, single dry, and multiple dry water years, and under future droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions. UWMPs also include updates to population projections and future water demands. CCWA is the only water supplier in the CMA which is currently required to produce an UWMP.

Other data that may be updated in the Five-Year Plan Assessments include census population data, agricultural land use, and pumping data. Agricultural uses of land may also change over this five-year time frame. Particular crops that are planted depend on local and global demand and trade including emerging crops, such as cannabis, which may become more prevalent.

The expected schedule for completion of the Five-Year Plan Assessment (due in 2027) is expected to be a two-year process with updates starting in July 2025. This timeline should take into consideration the CMA GSA committee needs and would allow for periods of CMA GSA member agency staff, committee, and public review on the draft and resolution of comments prior to submittal of the Five-Year Plan Assessment to DWR. It is expected there will be additions and updates that will have occurred as a result of implementation.

In addition to updating the Five-Year Plan Assessment, to incorporate all requirements, this implementation project is expected to have outreach and engagement components including several presentations to the CMA GSA Committee and newsletters to inform the public.

Several of the Planning and Management Actions (Chapter 4) may rely on findings about conditions within the CMA, including population, agricultural lands, and sustainable yield. The Five-Year Plan Assessment would update these numbers and provide the GSA an opportunity to update management actions as a result of any changes made within the CMA.

SECTION 5B – IMPLEMENTATION TIMELINE

The CMA GSA plans to start implementation of the GSP after adoption and submittal of the GSP by the CMA Committee in January 2022. **Table 5b.1-1** is a timeline summarizing the projects and actions planned and described in Section 5a. The Project and Management Actions described in Chapter 4 are primarily driven due to trigger conditions within the basin and may occur simultaneously with the projects identified and listed here.

Table 5b.1-1
5-Year Implementation Timeline of CMA GSP

Water Year	2022			2023				2024				2025				2026				'27
Fiscal Year	2021-22		2022-23				2023-24				2024-25				2025-26				2026-27	
Calendar Year	2022				2023				2024				2025				2026			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Surveying Representative Wells																				
SkyTEM Airborne Geophysics																				
Raw Data Processing																				
Update 3D Geologic Model																				
Update Groundwater Model																				
Logging and Sounding Wells																				
Add Suggested Wells to GWL																				
Drill Monitoring Wells (outreach)																				
SW Gage Installation																				
Access, Permitting, Design																				
Installation																				
Well Registration Update																				
Well Metering Mandate																				
Data Updates																				
SMGA WY Annual Reports																				
Five-Year Plan Assessment																				
Data Updates																				
Document Updates																				
Public Comments																				
Finalizing Plan Assessment																				

SECTION 5C – PLAN FUNDING

This section describes funding for this CMA GSP, as well as opportunities for funding from State and Federal sources. This expands on the administrative details introduced in Section 1b.

5C.1 FUNDING FOR DEVELOPMENT OF THIS GSP

Development of this GSP and associated work activities required for development, preparation and submittal of the Groundwater Sustainability Plan (GSP) for the Santa Ynez River Valley Basin (SYRVGB) was funded by a combination of local contributions from member agencies and state grants.[177] State funding that contributed to the development of this GSP included the following grant programs.

Table 5c.1-1
State of California Grant Contributions to
Development of this Groundwater Sustainability Plan

Management Areas	Grant Program	Funding Amount	Award Date	Project Title
WMA, CMA, EMA	Proposition 1, Round 2, Sustainable Groundwater Planning Grant Program	$1,000,000	2018	Santa Ynez River Valley Basin GSP Planning and Preparation
WMA, CMA	Prop. 68, Round 3, Sustainable Groundwater Planning Grant Program	$296,000	2019	Airborne Electromagnetic Survey of the WMA and CMA of the Santa Ynez River Valley Basin

The two voting CMA member agencies (City of Buellton and Santa Ynez River Water Conservation District) funded the remainder of the costs through a cost sharing agreement. The Santa Barbara County Water Agency (SBCWA), as a non-voting member, is not responsible for any other costs related to the CMA GSP development. All member agencies are responsible for their own costs to attend and participate in the CMA GSA committee.

177 Project: Santa Ynez River Valley Basin GSP Planning and Preparation. Reference number 3860-PM-285. Bond Accountability. California Natural Resources Agency.

5C.2 FUNDING FOR FUTURE CMA GSA ACTIVITIES

In accordance with SGMA[178], the CMA GSA has a financial plan to implement future costs of this GSP. These costs include the implementation projects (Section 5a) needed to resolve data gaps and improve management, and project and management actions (Chapter 4) as needed to improve groundwater conditions in the basin.

GSP implementation costs are expected to require a broad variety of funding sources, from State, and local sources. Total population of the Plan Area is approximately 5,900 people, with the City of Buellton population approximately 5,100.

The CMA GSA is currently funded by a cost sharing agreement between the two voting CMA GSA member agencies (City of Buellton and Santa Ynez River Water Conservation District). Future costs are anticipated to be funded through fees created by the GSA, and or continuing cost-sharing between agencies. In addition, the exact governance structure of the Santa Ynez River Valley Groundwater Basin may change in the future to a Joint Powers Authority (JPA), in which there maybe cost-sharing between the management areas (WMA, CMA, and EMA). There also may be opportunities to obtain implementation grants from the State of California.

Under SGMA[179] following adoption of this GSP, the CMA GSA will have the authority to directly collect fees on the extraction of groundwater from the basin to fund costs of groundwater management including, but not limited to, fees that increase based on the quantity of groundwater produced annually, the year in which the production of groundwater commenced from a groundwater extraction facility, and impacts to the Basin. The exact mechanisms and structure of obtaining funding from the local community to manage the local groundwater resources still needs to go through additional planning including stakeholder outreach, public workshops and GSA hearings. The local funding mechanisms may include a combination of assessments, property related fees, and/or non-tax fees based on property acres, number of wells, and/or amount of groundwater extracted.

[178] 23 CCR § 355.4 (b)(9) "Whether the Agency has the legal authority and financial resources necessary to implement the Plan."

[179] CWC Section 10730.2

5c.2-1 Potential State of California Grant Programs

As a small community[180] the CMA GSA (and the City of Buellton) is eligible for Technical Assistance (TA) Funding Program. Projects that TA funds include improvement of drinking water, wastewater, groundwater quality, and storm water programs.

Other state of California sources of funding includes State Water Resource Control Board loans and Grants. Following state grant programs may be applicable:

- Clean Water State Revolving Fund (CWSRF)
- Drinking Water State Revolving Fund (DWSRF)
- Small Community Grant Fund
- Groundwater Grant Fund (Chapter 10, Prop 1)
- Parks and Water Bond (Chapter 11, Prop 68)

DWR is providing additional financial assistance to initiate GSPs under the Proposition 1- Integrated Regional Water Management (IRWM) Implementation Grant Program.[181] Approximately $403 million in grant funding is being made available for implementation projects with at least $51 million being made available for projects that provide benefits specifically to Disadvantaged Communities (DAC). DWR also provides Technical Support Services (TSS)[182] to support GSAs. The TSS offered support includes: monitoring well installation, geophysical logging, borehole video logging and other field activities.

180 Defined as a population of less than 10,000,

181 Implementation Grant Program. Integrated Regional Water Management. Department of Water Resources. Web site. https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1/Implementation-Grants Accessed 2021-09-01.

182 Assistance and Engagement. Department of Water Resources. Web site. https://water.ca.gov/programs/groundwater-management/assistance-and-engagement Accessed 2021-09-01.

5c.2-2 Potential Federal Grant Programs

Federal grant programs that may be applicable to the CMA. Several grants include support for defense communities like the CMA which in part is a bedroom community for the Vandenberg Space Force Base, a critical Department of Defense installation.

- Water Infrastructure Financing and Integration Act (WIFIA)
- Reclamation Integration Financing and Integration Act (RIFIA)
- Bureau of Reclamation – WaterSMART Program
- Department of Defense
    - Defense Communities Infrastructure Program
    - Readiness and Environmental Protection Integration Act (REPI)
- Water Resources Development Act (WRDA)
- U.S. Department of Agriculture
    - Community Facilities program
    - Regional Conservation Program

Surface and underflows of the Santa Ynez River are managed through releases of the Federal Bureau of Reclamation operated Cachuma Project under the State Water Resources Control Board. National Oceanographic and Atmospheric Administration (NOAA) through comments indicated interest in the additional plan element[183] discussing local groundwater dependent ecosystems. NOAA Fisheries provides grants[184] for management, research, monitoring, and outreach activities that have direct conservation benefits for listed species under the Endangered Species Act, as well as the pacific salmon and steelhead.

183 CWC Section 10727.4 Additional Plan Elements: "where appropriate […] (l) Impacts on groundwater dependent ecosystems."

184 Funding & Financial Services. National Oceanographic and Atmospheric Administration. Website. https://www.fisheries.noaa.gov/funding-opportunities/ Accessed 2021-08-31.

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Section 5b: Implementation Timeline

No External Citations.

Section 5c: Plan Funding

No External Citations.

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CHAPTER 7: APPENDICES

Chapter 1 – Introduction and Plan Area

Appendix 1b-A:

Memorandum of Understanding for Implementation of the Sustainable Groundwater Management Act in the Santa Ynez River Valley Groundwater Basin Dated May 23, 2016

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MEMORANDUM OF UNDERSTANDING
FOR IMPLEMENTATION OF THE
SUSTAINABLE GROUNDWATER MANAGEMENT ACT
IN THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

THIS MEMORANDUM OF UNDERSTANDING ("MOU") is made and effective as of MAY 23, ______, 2016, by and between the Parties executing the MOU below, each a "Party" and collectively the "Parties," with reference to the following facts:

A. In 2014, the State of California enacted the Sustainable Groundwater Management Act (Water Code Sections 10720 et seq.), referred to in this MOU as the "SGMA" or "Act," as subsequently amended, pursuant to which certain agencies may become "Groundwater Sustainability Agencies" and adopt "Groundwater Sustainability Plans" in order to manage and regulate groundwater in underlying groundwater basins. The Act defines "basin" as a basin or sub-basin identified and defined in California Department of Water Resources (DWR) Bulletin 118. Each Party is a local agency located within the Santa Ynez River Valley Groundwater Basin (Bulletin 118, Basin No. 3-15, "Basin") and is qualified to become a Groundwater Sustainability Agency and adopt a Groundwater Sustainability Plan under the Act for all or a portion of the Basin.

B. Bulletin 118 describes the Basin as being in three portions, that being Eastern, Central and Western. Santa Ynez River Water Conservation District ("Santa Ynez") has historically recognized various "sub-basins" within the Basin for purposes of administering its groundwater charge program and other water management functions, generally the same as Bulletin 118 (except that part of the Lompoc Uplands is designated as Santa Rita Uplands). The respective areas as recognized by Bulletin 118 and Santa Ynez historically are set forth at paragraph 2 below, classified consistent with the portions of the Basin described in Bulletin 118.

C. The Parties all overlie portions of the Basin as it is currently defined by the DWR and wish to participate in the implementation of the Act within the Basin. As a result, coordination and cooperation between Parties is necessary in order to determine respective roles and the manner in which they will implement the Act.

D. The Parties wish to provide a framework for cooperative efforts for implementation of the Act in the Basin, to help ensure that the Act is implemented in the Basin through local control and management, and is implemented effectively, efficiently, fairly, and at reasonable cost.

THEREFORE, in consideration of the mutual promises set forth below and to implement the goals described above, the Parties agree as follows:

1. Purpose. The primary purpose of this MOU is to facilitate a cooperative and ongoing

working relationship between the Parties that will allow them to explore, study, evaluate, develop and implement mutually beneficial approaches and strategies for implementing the Act in the Basin.

2. Organization of SGMA Compliance for the Basin/Management Areas. The County of Santa Barbara ("County") overlies the entire Basin and Santa Ynez overlies most of the Basin, the principal exceptions being its boundaries do not include all of Vandenberg AFB and only overlie about one-third of the Santa Ynez Uplands. The Basin, organized by tentative Management Areas consistent with the portions of the Basin recognized in Bulletin 118, and the respective Parties to the MOU within each, are summarized as follows:

a. **Eastern--Santa Ynez Uplands**

Santa Ynez River Water Conservation District, Improvement District No. 1 ("ID#1")\

City of Solvang ("Solvang")

Santa Ynez

County

b. **Central--Buellton Uplands**

City of Buellton ("Buellton")

Santa Ynez

County

c. **Western--Lompoc Terrace, Lompoc Plain and Lompoc Uplands (including Santa Rita Uplands)**

City of Lompoc ("Lompoc")

Vandenberg Village Community Services District ("Vandenberg Village CSD")

Mission Hills Community Services District ("Mission Hills CSD")

Santa Ynez

County

To the extent authorized by the Act, any other local agencies, federal agencies, tribes, and mutual water companies that wish to participate in the SGMA process may participate in the respective Management Area in which they are located upon entering into an agreement or MOU upon terms and conditions the Parties agree to including, paying their respective share of costs for implementing SGMA.

These three Management Areas cover the entire Basin that is subject to SGMA. The Santa Ynez River Alluvium zone is generally recognized as constituting "under flow" of the Santa Ynez River, and thereby not "groundwater" for purposes of SGMA. This zone is not subject to SGMA but falls under the jurisdiction of the State Water Resources Control Board, to the extent applicable.

These tentative Management Areas (and the Santa Ynez River Alluvium zone), along with the approximate boundaries of each of the Parties (except the County), are shown on the attached map.

3. Formation of a Groundwater Sustainability Agency ("GSA"). The Parties contemplate that collectively they will elect to be a GSA and file with DWR for the entire Basin pursuant to Section 10723 of the Act and follow the procedures therein specified, such that the filing with DWR is completed prior to June 30, 2017. Alternatively, separate GSAs may be filed for each of the three Management Areas described in Paragraph 2 above collectively by the respective Parties in each Area. No GSA election shall be filed for the entire Basin or for a Management Area without the respective Parties reviewing the proposed election. Santa Ynez will coordinate efforts for the Parties to meet and agree upon conditions under which they collectively elect to become a GSA for the entire Basin or by Management Area. If a Party withdraws from this MOU as provided at Section 10 below, they reserve the right to elect to be a GSA for the lands within its boundaries.

4. Development of Groundwater Sustainability Plans ("GSPs"). The Parties contemplate that separate GSPs will be developed for each of the three Management Areas by the Parties listed for each Management Area in Paragraph 2. As a part of their cooperative efforts under this MOU, the Parties shall discuss and explore the formation of one or more new joint powers authorities ("JPA") or similar arrangements to develop and implement a GSP for each Management Area. In the event multiple GSPs are developed, a coordination agreement as provided for in Section 10727.6 of the Act shall be established among the Management Areas. The Parties will also evaluate the feasibility of submitting an alternative plan for the Basin pursuant to Section 10733.6 of the Act. Santa Ynez will coordinate efforts of the Parties to meet and cooperatively develop GSPs for each Management Area. None of the Parties are obligated to execute such a JPA.

5. Costs. Each Party shall bear all costs it incurs with respect to its activities under this MOU. Costs incurred in connection with this MOU for the joint benefit of all Parties shall be borne as determined by subsequent agreement of the Parties.

6. Staff. Each Party shall designate a principal contact person and other appropriate staff members and consultants to participate on such Party's behalf in activities undertaken pursuant to this MOU. Santa Ynez shall be responsible for coordinating meetings and other activities under this MOU with the principal contact persons for the other Parties. Meetings shall occur as the principal contacts determine are necessary, as each Party shall make its expertise and resources reasonably available for activities under this MOU.

7. Ongoing Cooperation. The Parties acknowledge that activities under this MOU will require the frequent interaction between them in order to pursue opportunities and resolve issues that arise. The Parties shall work cooperatively and in good faith. The goal of the Parties shall be to preserve flexibility with respect to the implementation of the Act.

8. Notices. Any formal notice or other formal communication given under the terms of this MOU shall be in writing and shall be given personally, by facsimile, by electronic mail (email), or by certified mail, postage prepaid and return receipt requested. Any notice shall be delivered or addressed to the Parties at the addressees' facsimile numbers or email address set forth below under each signature and at such other address or facsimile numbers as shall be designated by notice in writing in accordance with the terms of this Agreement. The date of receipt of the notice shall be the date of actual personal service, confirmed facsimile transmission, or email, or three days after the postmark on certified mail.

9. Entire Agreement/Amendments/Counterparts. This MOU incorporates the entire and exclusive agreement of the Parties with respect to the matters described herein and supersedes all prior negotiations and agreements (written, oral, or otherwise) related thereto. This MOU may be amended (including without limitation to add new Parties) only in a writing executed by all of the Parties. This MOU may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

10. Termination/Withdrawal. This MOU shall remain in effect unless terminated by the mutual consent of the Parties. Upon 30 days written notice any of the Parties may withdraw from this MOU, and the MOU shall remain in effect for the remaining Parties. No Party shall be liable to any other if it elects to withdraw from this MOU, except that it shall remain liable for its pro-rata share of any joint benefit costs incurred pursuant to Paragraph 5 that it previously agreed to fund.

11. Assignment. No rights or duties of any of the Parties under this MOU may be assigned or delegated without the express prior written consent of all of the other Parties, and any attempt to assign or delegate such rights or duties without such written consent shall be null and void.

IN WITNESS WHEREOF, the Parties have executed this MOU as of the date first above written.

COUNTY OF SANTA BARBARA WATER AGENCY

By: ______________________

Address: 130 E. Victoria St., Suite 200, Santa Barbara, CA 93101

Email tfayram@cosbpw.net

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: Bruce A. Wales

Address: PO Box 719
Santa Ynez, CA 93460
Email bwales at SYRWCD.com

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By: ____________________

Address: PO Box 157
Santa Ynez, CA 93460
Email cdahlstrom@SYRWD.org

CITY OF SOLVANG

By: ____________________

Address: ____________________

____

Email ____________________

CITY OF BUELLTON

By: ____________________

Address: ____________________

____

Email ____________________

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: ______________________________

Address: ______________________________
____
Email ______________________________

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By: ______________________________

Address: ______________________________
____
Email ______________________________

CITY OF SOLVANG

By: [signature]
City Manager

Address: 1644 Oak St
Solvang, CA 93463
Email bradv@cityofsolvang.com

CITY OF BUELLTON

By: ______________________________

Address: ______________________________
____
Email ______________________________

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: ______________________________

Address: ______________________________

Email ______________________________

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By: ______________________________

Address: ______________________________

Email ______________________________

CITY OF SOLVANG

By: ______________________________

Address: ______________________________

Email ______________________________

CITY OF BUELLTON

By: [signature]
MARC BIERDZINSKI, CITY MANAGER

Address: P.O. Box 1819
Buellton CA 93427

Email MARCB @ CITYOFBuellton.com

CITY OF LOMPOC

By: ______________________

Address: 100 Civic Center Plaza
Lompoc CA 93436
Email [illegible]

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: ______________________

Address: ______________________

Email ______________________

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: ______________________

Address: ______________________

Email ______________________

5738-99\00038624.000

CITY OF LOMPOC

By: ______________________________

Address: ___________________________
____

Email ___________________________

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: Robert H Wyckoff

Address: 3757 Constellation Road
Lompoc, CA 93436

Email rewyckoff@verizon.net

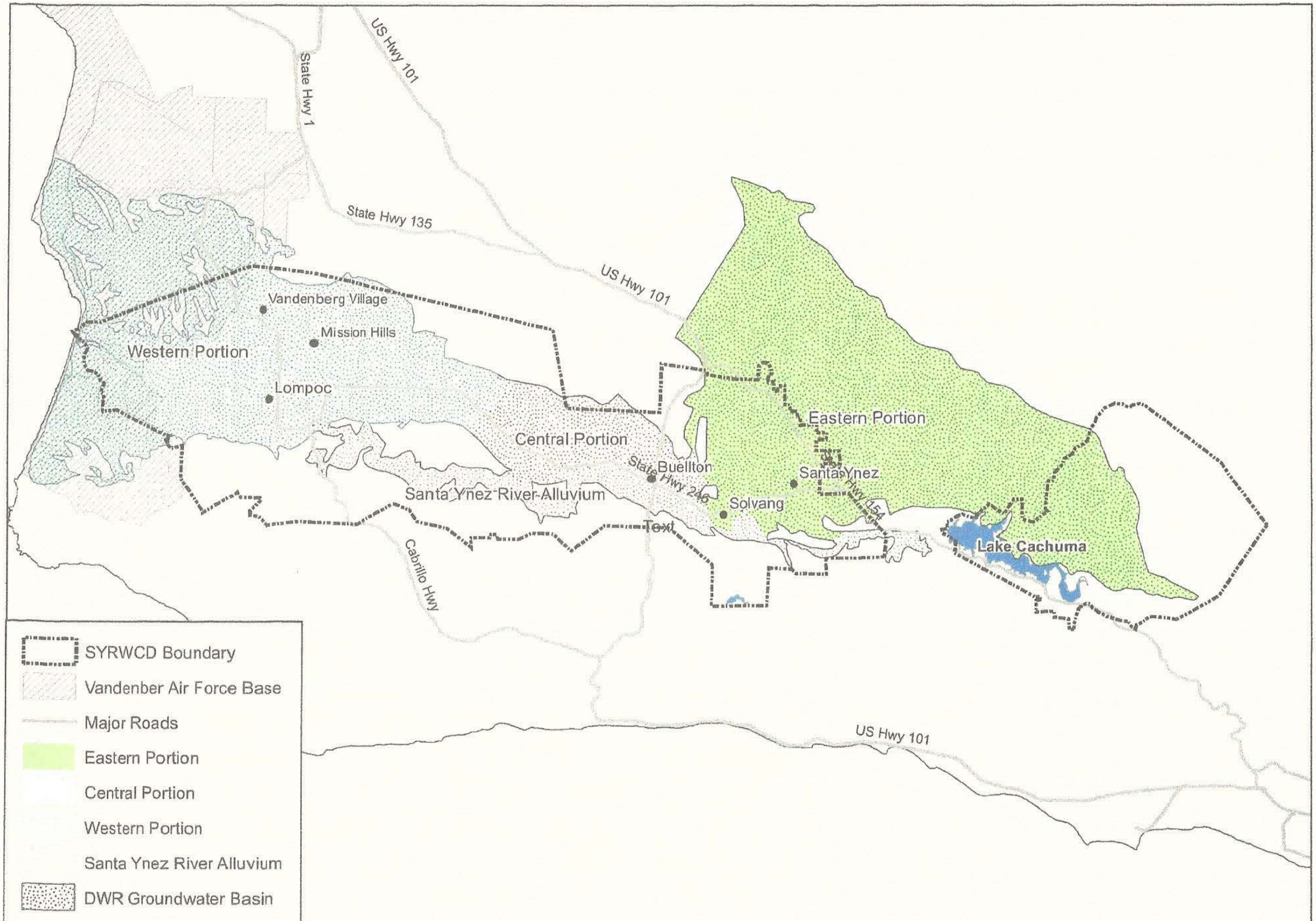
MISSION HILLS COMMUNITY SERVICES DISTRICT

By: M.W. Riley

Address: 1550 E. Burton Mesa
Blvd, Lompoc, CA 93436

Email mr@mhcsd.

5738-99\00038624.000



Notes: Basin Data from DWR Bulletin 118 (2003) 1 inch = 5 miles	Santa Ynez River Water Conservation District **Santa Ynez Valley Groundwater Basin** DWR Bulletin 118 (2003)	N W E S	Date: 11/30/2015 Miles 0 2.5 5

Chapter 1 – Introduction and Plan Area

Appendix 1b-B:

SYRWCD Letter, Notice of Decision to Become a Groundwater Sustainability Agency - Santa Ynez River Valley Groundwater Basin, Central Management Area, Dated February 2, 2017

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

CITY OF BUELLTON,
SANTA BARBARA COUNTY WATER AGENCY AND
SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

February 2, 2017

Mr. Mark Nordberg, GSA Project Manager
Sustainable Groundwater Management Section
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Notice of Decision to Become a Groundwater Sustainability Agency - Santa Ynez River Valley Basin, Central Management Area

Dear Mr. Nordberg:

Per Section §10723.8(a) of the California Water Code, the Santa Ynez River Water Conservation District (SYRWCD), the City of Buellton (City) and the Santa Barbara County Water Agency (County Water Agency) hereby give notice of their decision to form the Central Management Area Groundwater Sustainability Agency (GSA) for the Central Portion of the Santa Ynez River Valley Basin (Basin Number 3-015, DWR Bulletin 118) which includes the Buellton Uplands and all reaches of the Santa Ynez River within the Central Portion of the Santa Ynez River Valley Basin. However, it should be noted that under the Sustainable Groundwater Management Act (SGMA), surface waters are exempt from SGMA.

SGMA, passed in 2014, requires that all basins designated as high- or medium-priority are to be managed under a groundwater sustainability plan (GSP) or coordinated GSPs (Section §10720.7). The California Department of Water Resources (DWR) designated the Santa Ynez River Valley Basin (the Basin) as a medium-priority basin not in overdraft.

Water Code §10723.8(a)(1) requires that this GSA notification include information regarding the service area boundaries of the GSA, local public agencies and the boundaries of the basin the GSA intends to manage. Exhibit 1 includes three figures to satisfy those requirements. Figure 1 shows the Santa Ynez River Valley Basin identifying three portions within the basin as described in DWR Bulletin 118. Figure 2 shows the three management areas and service area boundaries of all local public agencies within the Santa Ynez River Valley Basin. Figure 3 shows the boundary of the Central Management Area. The digital GIS data corresponding to the three figures in Exhibit 1 is included with this submittal.

The Central Portion will consist of the Central Management Area GSA. The agencies that will be part of the Central Management GSA include the City, SYRWCD and the County Water

Agency, herein referred to as the "CMA Agencies". The CMA Agencies are the only public agencies in the CMA GSA, as defined by SGMA, eligible to form a GSA. The CMA GSA will be a non-overlapping, multi-agency GSA with boundaries that follow the entire Central Portion of the Santa Ynez River Valley Basin, as defined by the 2016 version of DWR Bulletin 118. The CMA Agencies agreed to form a GSA under a Memorandum of Agreement (MOA) as discussed below.

A public hearing (Water Code §10723 (b)) on the CMA GSA formation was held on November 8, 2016 at the Buellton City Council Chambers, as required by SGMA. The public hearing was jointly held by the CMA Agencies. A copy of the public notice for the public hearing is provided in Exhibit 2.

On November 10, 2016, the Buellton City Council passed Resolution 16-26 wherein the City resolved to become a member of the CMA GSA in cooperation with the other CMA Agencies. On December 6, 2016, the Board of Supervisors for Santa Barbara County, serving as Water Agency Directors, passed Resolution 16-284 wherein the County Water Agency resolved to become a member of the CMA GSA in cooperation with the other CMA Agencies. On January 11, 2017, the Board of Directors for the SYRWCD passed Resolution 665 wherein the SYRWCD resolved to become a member of the CMA GSA in cooperation with the other CMA Agencies. Exhibit 3 contains a copy of each approved resolution to form the Santa Ynez River Basin, CMA GSA by each CMA Agency.

The MOA between the City, SYRWCD and the County Water Agency to form the Santa Ynez River Basin CMA GSA is provided as Exhibit 4.

Water Code §10723.8(a)(1) also requires information regarding other agencies managing or proposing to manage groundwater within the basin. The Santa Ynez River Valley Basin is one basin divided into three portions by DWR as shown on Figure 1 in Exhibit 1. In addition to the CMA GSA, there will be two other GSAs formed in the Santa Ynez River Valley Basin, which in total cover the entire basin (with a total of three GSAs), including the Western Management Area and the Eastern Management Area. The three GSAs will lie contiguously from west to east across the Santa Ynez River Valley Basin with no over-lapping boundaries. All areas of the Basin are included in one of the three GSAs.

The Western Portion of the Basin will consist of the Western Management Area GSA. The agencies, as defined by the Act that will be part of the Western Management GSA include the SYRWCD, the City of Lompoc, Vandenberg Village Community Services District, Mission Hills Community Services District, and the County Water Agency. A public hearing on the Western Management GSA formation was held on November 17, 2016 at the Lompoc City Council Chambers. The public hearing was jointly held by the five agencies forming the GSA.

The Eastern Portion of the Basin will consist of the Eastern Management Area GSA. The agencies, as defined by the Act include the SYRWCD, the City of Solvang, the Santa Ynez River Water Conservation District Improvement District Number One (ID No. 1), and the County Water Agency. Public outreach is in progress and a public hearing for the Eastern Management Area GSA is scheduled for February 16, 2017.

Per California Water Code §10723.2, GSAs shall consider the interests of all beneficial uses and users of groundwater within their service area, as well as GSA members who are responsible for implementing GSPs. A list summarizing the Users and Uses of Groundwater in the CMA is provided as Exhibit 5. The list was developed pursuant to Water Code §10723.2 and describes how these users and uses will be considered during the development and operation of the GSA and GSP for the CMA. If additional interested parties are discovered, they will be included in the development and operation of the GSA and the development and implementation of the agency's sustainability plan (Water Code §10723.8(a)(4)).

Water Code §10723.4 states that a GSA shall also establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. Any person may request in writing, to be placed on the list of interested persons. The CMA GSA will establish and maintain such a list of persons interested in receiving notices.

Except for the authorities granted to a GSA pursuant to Part 2.74 of Division 6 of the California Water Code (SGMA), and the MOA itself providing for the rights and duties of the parties, no bylaws, ordinances, or authorities have been adopted by the SYRWCD, City, or County Water Agency relating to the Santa Ynez River Valley Basin, CMA GSA (Water Code §10723.8(a)(3)).

The undersigned hereby represents that the information required by the California Water Code §10728.3 is included within this notice and that the notification process is complete. If you have any further questions or require any clarification regarding the information provided in this GSA Notification submittal, please do not hesitate to contact Mr. Bill Buelow at the Santa Ynez River Water Conservation District at 805-693-1156 or by email at bbuelow@syrwcd.com. Mr. Buelow will be the primary point of contact for the CMA GSA.

Sincerely,

Bruce Wales

Bruce Wales.
General Manager
Santa Ynez River Water Conservation District

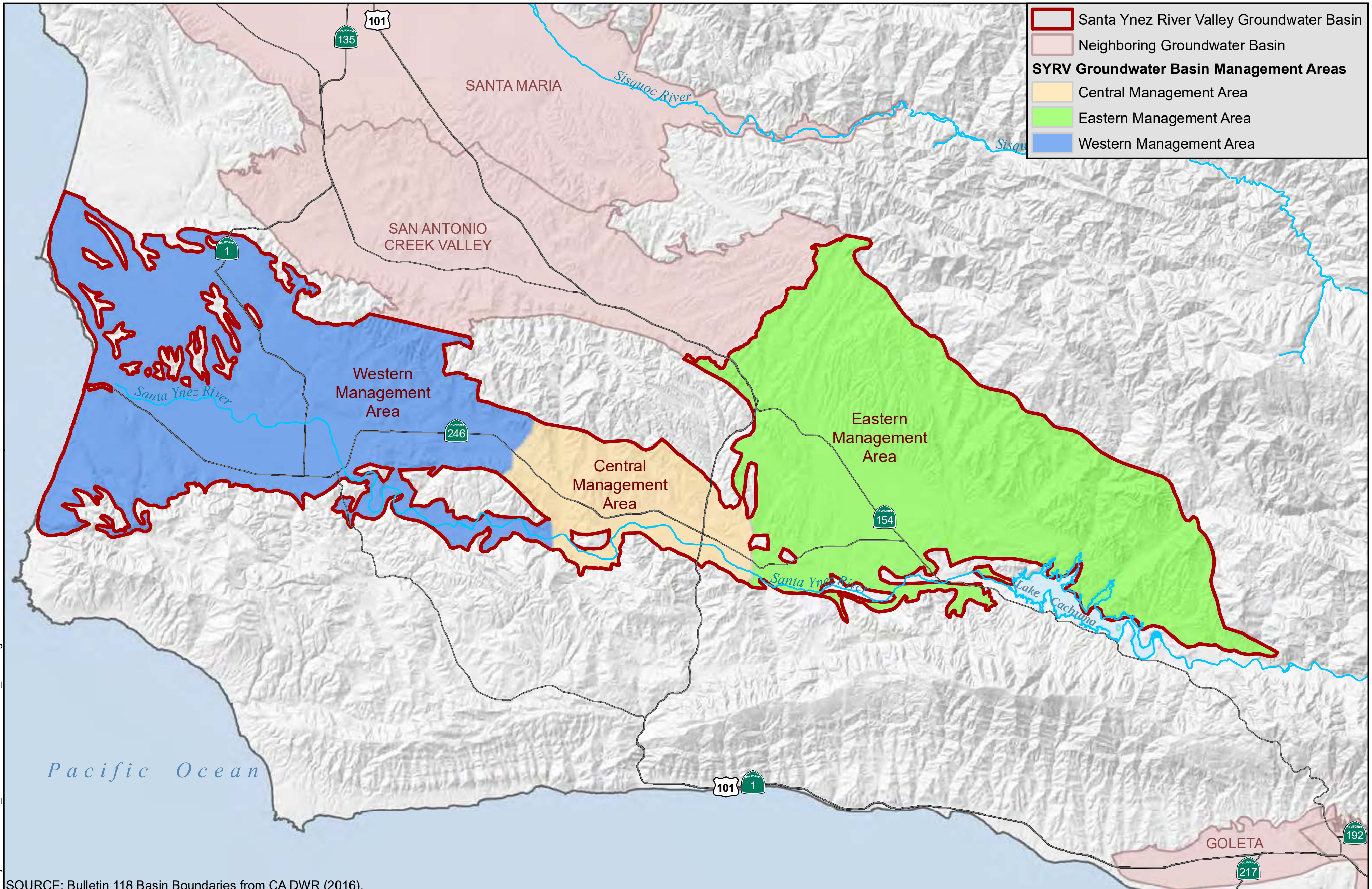
cc: Rose Hess, City of Buellton
Matt Young, Santa Barbara County Water Agency
Tim Ross, DWR Southern Regional Office
Brian Monese, DWR Southern Regional Office
Anita Regmi, DWR Southern Regional Office
Chris Petersen, GEI Consultants

Exhibit 1 – Figures
Figure 1 – Santa Ynez River Valley Groundwater Basin Management Areas

Figure 2 – Santa Ynez River Valley Groundwater Basin Management Areas and Local Jurisdictions
Figure 3 – Santa Ynez River Valley Groundwater Basin CMA GSA
Exhibit 2 – Copies of Notices for Public Hearing on November 8, 2016
Exhibit 3 – Copies of Approved Resolutions Forming the CMA GSA
Exhibit 4 – Signed Copy of Memorandum of Agreement to form the CMA GSA
Exhibit 5 – List of Uses and Users of Groundwater in the CMA GSA

Exhibit 1

Figures



SOURCE: Bulletin 118 Basin Boundaries from CA DWR (2016).

Santa Ynez River Valley
Groundwater Basin GSA Formation
Santa Barbara County, California

Santa Ynez River Water Conservation District

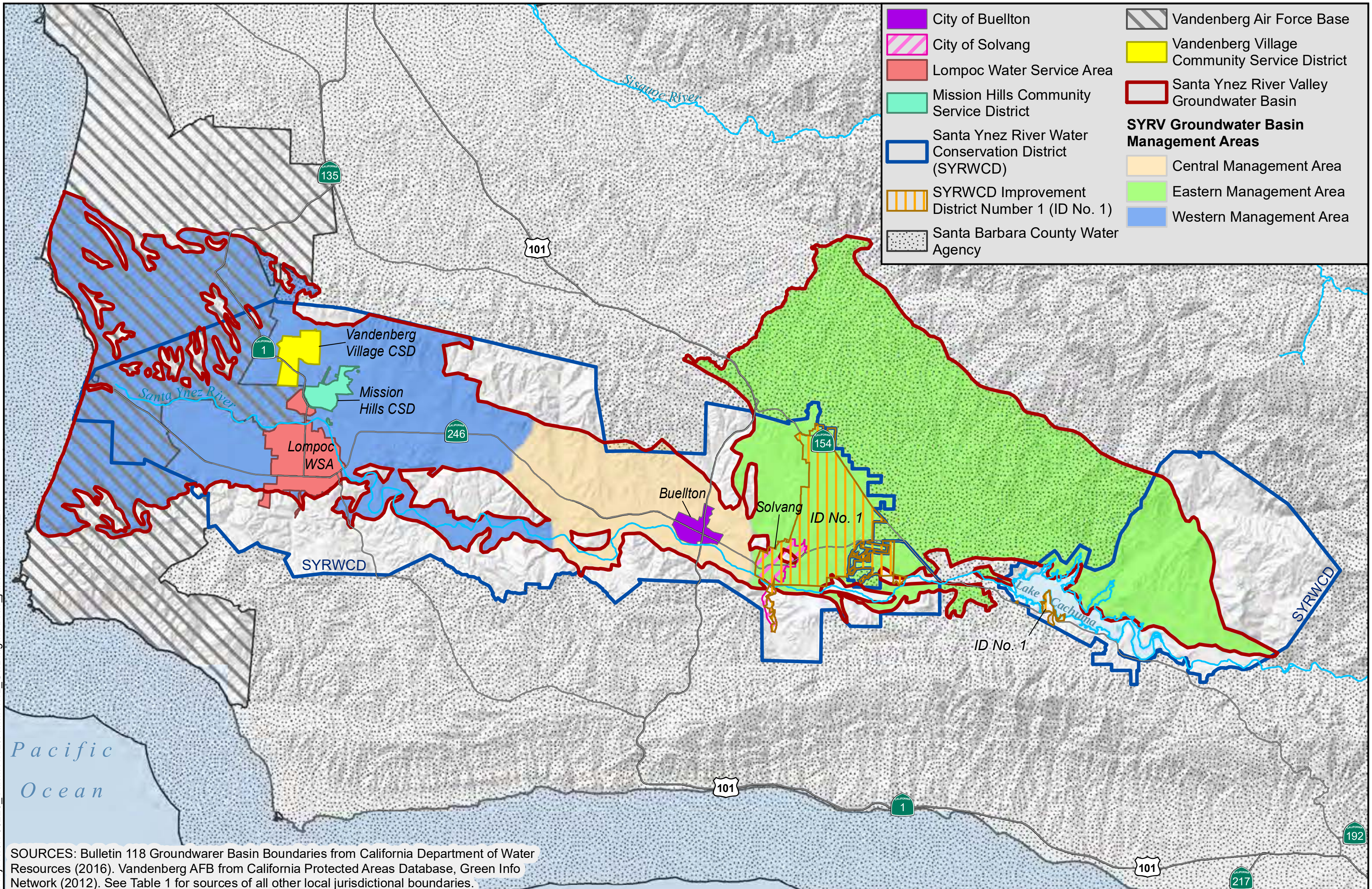
GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN MANAGEMENT AREAS

JANUARY 2017

FIGURE 1

25Jan2017 Z:\Projects\1700220_SantaYnez\SantaYnez_GwBMgmtAreas.mxd SET



SOURCES: Bulletin 118 Groundwarer Basin Boundaries from California Department of Water Resources (2016). Vandenberg AFB from California Protected Areas Database, Green Info Network (2012). See Table 1 for sources of all other local jurisdictional boundaries.

Santa Ynez River Valley
Groundwater Basin GSA Formation
Santa Barbara County, California

Santa Ynez River Water Conservation District

GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN MANAGEMENT AREAS AND LOCAL JURISDICTIONS

JANUARY 2017

FIGURE 2

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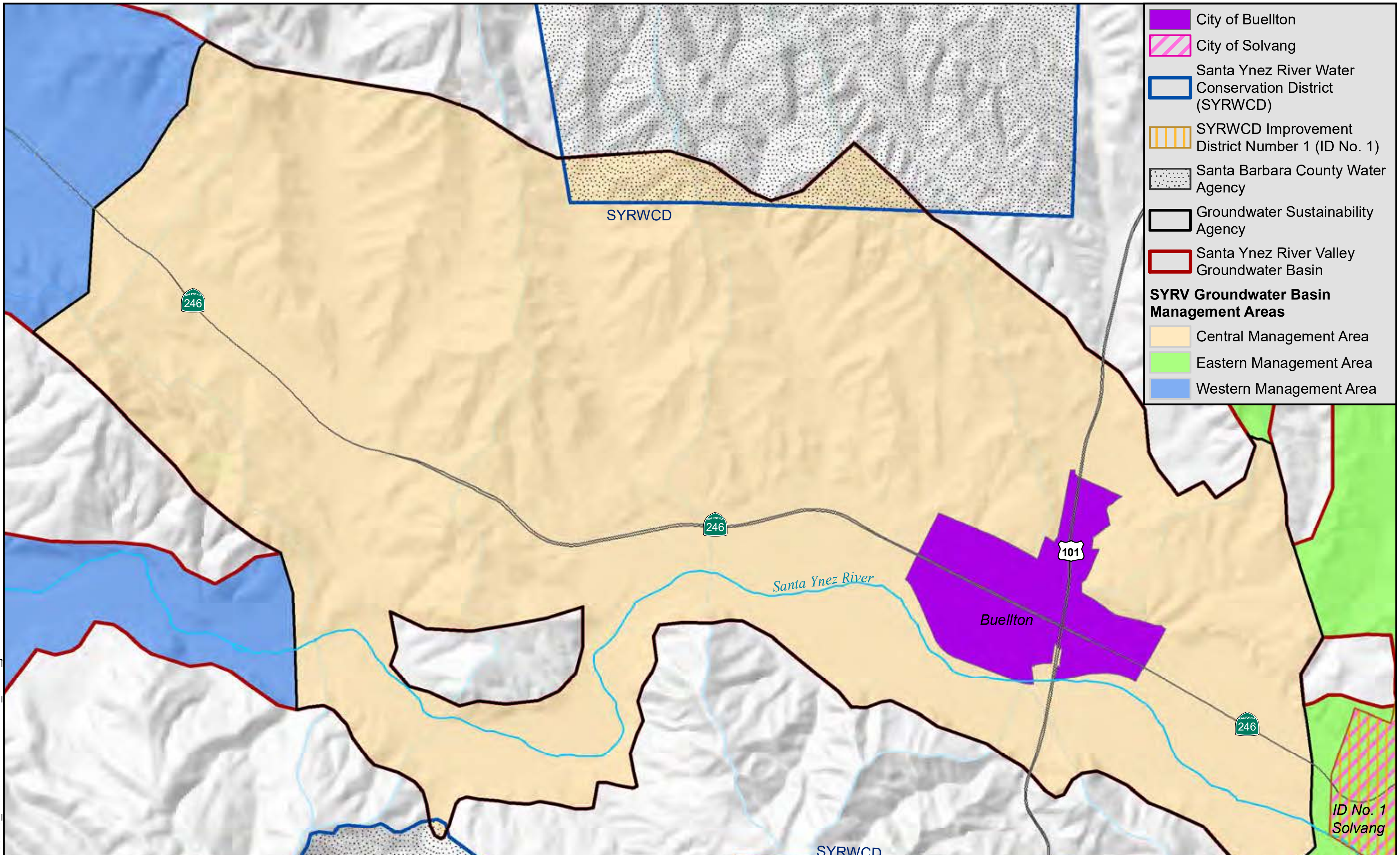
25Jan2017



SOURCES: Bulletin 118 Groundwarer Basin Boundaries from California Department of Water Resources (2016). Vandenberg AFB from California Protected Areas Database, Green Info Network (2012). See Table 1 for sources of all other local jurisdictional boundaries.

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Miles

Santa Ynez River Valley
Groundwater Basin GSA Formation
Santa Barbara County, California

Santa Ynez River Water Conservation District

GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
CENTRAL MANAGEMENT AREA GSA

JANUARY 2017

FIGURE 3

25Jan2017 Z:\Projects\1700220_SantaYnez\SantaYnez_GSAs_jurisd.mxd SET

Exhibit 2

Copies of Notices for Public Hearings

SANTA BARBARA NEWS PRESS
Proof of Publication
(2015.5C.C.P)

Superior Court of
the State of California
In and For The County of Santa Barbara

In the Matter of:

Legal 51406
Ad# 3869696

Notice to Form Groundwater Sustainability

The undersigned, being the principal clerk of the printer of the Santa Barbara News Press, a newspaper of general circulation, printed and published daily in the City of Santa Barbara, County of Santa Barbara, California and which newspaper has been adjudged a newspaper of general circulation by the Superior Court in the County of Santa Barbara, State of California, Adjudication Number 47171; and that affiant is the principal clerk of said Santa Barbara News Press. That the printed notice hereto annexed was published in the SANTA BARBARA NEWS-PRESS, in the issues of the following named dates

October 28, 2016

all in the year 2016 I hereby certify (or declare) under penalty of perjury that the foregoing is true and correct.

Executed on this 28th of October, 2016 at Santa Barbara, CA.

P. Matsumaru

P. Matsumaru

NOTICE TO FORM GROUNDWATER SUSTAINABILITY AGENCY

NOTICE IS HEREBY GIVEN that, pursuant to California Water Code section 10723 (b), representatives of the Santa Ynez River Water Conservation District (District), City of Buellton (City) and County of Santa Barbara Water Agency (County) will hold a public hearing on Tuesday, November 8, 2016 at 6:30 PM at the City of Buellton City Council Chambers located at 140 West Highway 246 in Buellton, California.

The purpose of the joint meeting and hearing is to consider whether the District, City and County should decide to become a Groundwater Sustainability Agency (GSA) for the Central Management Area (CMA) portion of the Santa Ynez River Valley Groundwater Basin (Basin). The CMA consists of the Buellton Uplands. The GSA would take joint actions to achieve compliance under the Sustainable Groundwater Management Act of 2014.

The hearing is open to the public and any person present will have the opportunity to be heard. For further information regarding this matter, please contact District Office at (805) 693-1156.

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

BRUCE A. WALES
SECRETARY TO THE BOARD

Oct. 28/2016--51406

Exhibit 3

Copies of Approved Resolutions forming the GSA

RESOLUTION NO. 16-26

RESOLUTION OF THE CITY COUNCIL OF BUELLTON, CALIFORNIA, DECIDING TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT FOR THE CENTRAL MANAGEMENT AREA

WHEREAS, the California legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act (California Water Code § 10720 et seq.) as amended, which became effective January 1, 2015; and

WHEREAS, pursuant to the Sustainable Groundwater Management Act (SGMA), sustainable groundwater management is intended to occur pursuant to Groundwater Sustainability Plans that are created and adopted by local Groundwater Sustainability Agencies; and

WHEREAS, Bulletin 118 describes the Santa Ynez River Valley Groundwater Basin (Basin) in three portions: eastern, central, and western; the western portion consists of the Lompoc Plain, Lompoc Terrace, and Lompoc Uplands; the central portion is the Buellton Uplands, and the eastern portion is the Santa Ynez Uplands; For purposes of administering its groundwater usage program and other water management functions, the Santa Ynez River Water Conservation District (District) also generally recognizes these hydrogeologic units; for the purpose of implementing SGMA, each portion of the Basin as described by DWR is designated as a corresponding groundwater "Management Area" as defined by the Act, this Resolution concerns the central portion of the Basin, known as the "Central Management Area"; and

WHEREAS, pursuant to California Water Code §10723(a), a Local Agency or combination of Local Agencies, as defined in California Water Code §10721(n), may decide to become or form a Groundwater Sustainably Agency; and

WHEREAS, the City of Buellton (City) overlies a portion of the Central Management Area, has a water supply, manages water and has land-use responsibilities, and is therefore a "Local Agency" as defined by California Water Code §10721 (n); and

WHEREAS, Santa Ynez River Water Conservation District (District) is a California Water Conservation District formed and operating pursuant to an in accordance with Division 21 of the California Water Code (commencing with Water Code §74000) and overlies over ninety-nine percent of the Central Management Area, manages water and has water management powers and is therefore a "Local Agency" as defined within California Water Code 10721 (n); and

WHEREAS, the Santa Barbara County Water Agency (County Water Agency) overlies the Central Management Area including the less than 1 percent not overlain by the District. The County Water Agency is therefore a "Local Agency" as defined by the California Water Code 10721 (n); and

WHEREAS, the City, District, and County Water Agency collectively include all of the lands within the Central Management Area of the Basin; and

WHEREAS, the City desires to form a Groundwater Sustainability Agency in conjunction with the District and the County Water Agency, and which may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, the City in conjunction with the District and County Water Agency held a public hearing on November 8, 2016 pursuant to California Water Code section §10723(b), after publication of notice of such hearing pursuant to California Government Code section §6066; and

WHEREAS, at the public hearing, the City, District and County Water Agency considered oral and written comments to the extent provided by the public; and

WHEREAS, it would be in the best interests of the City to form a Groundwater Sustainability Agency, in conjunction with the District and the County Water Agency.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BUELLTON DOES RESOLVE, DETERMINE, FIND, AND ORDER AS FOLLOWS:

1. That the foregoing is true and correct.

2. That the City of Buellton herein decides to form a Groundwater Sustainability Agency in conjunction with the District and County Water Agency, known as the Central Management Area Groundwater Sustainability Agency (Agency), and which shall have all the powers granted to a groundwater sustainability agency pursuant to the Sustainable Groundwater Management Act.

3. That the portion of the groundwater basin that the Agency hereby created shall manage shall be that portion of the basin as depicted in the notification provided to the Department of Water Resources as the Central Management Area, pursuant to California Water Code 10723.8, and which boundary may be modified from time to time.

4. That the Agency hereby created shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans, as required by California Water Code section §10723.2.

5. That the Agency hereby created shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents, as required by California Water Code section §10723.4.

6. That the City Manager of the City of Buellton shall be authorized to execute a Memorandum of Agreement or other legal agreement(s) with the District and the County Water Agency, and cause notice to be given to the California Department of Water Resources of the

decision of the City in conjunction with the District and County Water Agency to create the above referenced Groundwater Sustainability Agency.

PASSED, APPROVED and ADOPTED, by the Buellton City Council on the 10th day of November 2016.

Ed Andrisek

Ed Andrisek
Mayor

ATTEST:

Linda Reid

Linda Reid
City Clerk

I, Linda Reid, City Clerk of the City of Buellton, do hereby certify that the foregoing Resolution No. 16-26 was duly adopted by the City Council of the City of Buellton at the regular meeting held on the 10th day of November 2016 by the following vote of the Council:

AYES:	5	Council Members Connolly, Elovitz, Sierra, Vice Mayor Baumann, and Mayor Andrisek
NOES:	0	
ABSENT:	0	
ABSTAIN:	0	

Linda Reid
City Clerk

RESOLUTION OF THE
BOARD OF DIRECTORS OF THE SANTA BARBARA COUNTY WATER AGENCY
STATE OF CALIFORNIA

RESOLUTION TO PARTICIPATE IN THE FORMATION OF A GROUNDWATER SUSTAINABILITY AGENCY PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT FOR THE CENTRAL MANAGEMENT AREA FOR THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN	)))))))))	**RESOLUTION NO.** 16-284

WHEREAS, the California legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act (California Water Code § 10720 *et seq.*) as amended, which became effective January 1, 2015; and

WHEREAS, pursuant to the Sustainable Groundwater Management Act (SGMA), sustainable groundwater management is intended to occur pursuant to Groundwater Sustainability Plans (GSP) that are created and adopted by local Groundwater Sustainability Agencies (GSA); and

WHEREAS, the California Department of Water Resources (DWR) Bulletin 118 describes the Santa Ynez River Valley Groundwater Basin (Basin) in three portions: eastern, central, and western; the western portion consists of the Lompoc Plain, Lompoc Terrace, and Lompoc Uplands; the central portion is the Buellton Uplands, and the eastern portion is the Santa Ynez Uplands; for the purpose of implementing SGMA, each portion of the Basin as described by DWR is designated as a corresponding groundwater "Management Area" as defined by the Act, this Resolution concerns the Central portion of the Basin, known as the "Central Management Area"; and

WHEREAS, pursuant to Water Code §10723(a), a Local Agency or combination of Local Agencies, as defined in Water Code §10721(n), may decide to become or form a Groundwater Sustainably Agency; and

WHEREAS, the Santa Barbara County Water Agency (County Water Agency) overlies the Central Management Area, including the less than 1 percent of the total area not overlain by other local agencies, and is a "Local Agency" as defined in Water Code §10721(n); and

WHEREAS, the County Water Agency, the Santa Ynez River Water Conservation District and the City of Buellton are "Local Agencies" as defined in Water Code §10721(n) and collectively include all of the lands within the Central Management Area of the Basin; and

WHEREAS, the County Water Agency desires to form a Groundwater Sustainability Agency in conjunction with the Santa Ynez River Water Conservation District, the City of Buellton, and which may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, the County Water Agency in conjunction with the Santa Ynez River Water Conservation District and the City of Buellton, held a public hearing on November 9, 2016 pursuant to Water Code §10723(b), after publication of notice of such hearing pursuant to California Government Code §6066; and

WHEREAS, at the public hearing, the County Water Agency, the Santa Ynez River Water Conservation District, and the City of Buellton considered oral and written comments provided by the public; and

WHEREAS, it would be in the best interests of the County Water Agency to form a Groundwater Sustainability Agency, in conjunction with the Santa Ynez River Water Conservation District and the City of Buellton.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS: that the Board of Directors of the Santa Barbara County Water Agency declares and directs as follows:

1. That the foregoing recitals are true and correct.

2. That the Board of Directors of the Santa Barbara County Water Agency herein decides to form a Groundwater Sustainability Agency in conjunction with the Santa Ynez River Water Conservation District and the City of Buellton, and which shall have all the powers granted to a groundwater sustainability agency pursuant to the Sustainable Groundwater Management Act.

3. That the portion of the groundwater basin that the Agency hereby created shall manage shall be that portion of the basin as depicted in the notification provided to the Department of Water Resources as the Central Management Area, pursuant to California Water Code 10723.8, and which boundary may be modified from time to time.

4. That the Agency hereby created shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans, as required by California Water Code §10723.2.

5. That the Agency hereby created shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents, as required by California Water Code §10723.4.

6. That the Chair of the Board of Directors of the Santa Barbara County Water Agency shall be authorized to execute a Memorandum of Agreement with the Santa Ynez River Water Conservation District and the City of Buellton, and cause notice to be given to the California Department of Water Resources of the decision of the Board of Directors of the Santa Barbara

County Water Agency in conjunction with the Santa Ynez River Water Conservation District and the City of Buellton to create the above referenced Groundwater Sustainability Agency.

PASSED, APPROVED, AND ADOPTED by the Board of Directors of the Santa Barbara County Water Agency, State of California, on this 6th day of December, 2016 by the following vote:

AYES: Supervisor Wolf, Supervisor Adam, and Supervisor Lavagnino

NAYS: Supervisor Carbajal, and Supervisor Farr

ABSENT: None

ABSTAIN: None

ATTEST:
MONA MIYASATO,
COUNTY EXECUTIVE OFFICER
Ex Officio Clerk of the Board of Directors of the Santa Barbara County Water Agency

By: Russ Baker
Deputy

ACCEPTED AND AGREED:
SANTA BARBARA COUNTY WATER AGENCY

By: Pete Adam
Peter Adam, Chair, Board of Directors

APPROVED AS TO FORM:
MICHAEL C. GHIZZONI
COUNTY COUNSEL

By: Johannah L Hartley
Deputy

RESOLUTION NO. 665

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SANTA YNEZ RIVER WATER CONSERVATION DISTRICT DECIDING TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT FOR THE CENTRAL MANAGEMENT AREA

WHEREAS, the California legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act (California Water Code § 10720 et seq.) as amended, which became effective January 1, 2015; and

WHEREAS, pursuant to the Sustainable Groundwater Management Act, sustainable groundwater management is intended to occur pursuant to Groundwater Sustainability Plans that are created and adopted by local Groundwater Sustainability Agencies; and

WHEREAS, Bulletin 118 describes the Santa Ynez River Valley Groundwater Basin (Basin) in three portions: eastern, central, and western; the western portion consists of the Lompoc Plain, Lompoc Terrace, and Lompoc Uplands; the central portion is the Buellton Uplands, and the eastern portion is the Santa Ynez Uplands; for purposes of administering its groundwater usage program and other water management functions, the Santa Ynez River Water Conservation District (District) also generally recognizes these hydrogeologic units; for the purpose of implementing SGMA, each portion of the Basin as described by DWR and recognized by the District, is designated as a corresponding groundwater "Management Area" as defined by the Act; this Resolution concerns the central portion of the Basin, known as the "Central Management Area"; and

WHEREAS, pursuant to California Water Code §10723(a), a Local Agency or combination of Local Agencies, as defined in California Water Code §10721(n), may decide to become or form a Groundwater Sustainably Agency; and

WHEREAS, Santa Ynez River Water Conservation District (District) is a California Water Conservation District formed and operating pursuant to and in accordance with Division 21 of the California Water Code (commencing with Water Code §74000), manages water and has water management powers and overlies over ninety-nine percent of the Central Management Area, and is therefore a "Local Agency" as defined within California Water Code 10721 (n); and

WHEREAS, the City of Buellton (City) overlies a portion of the Central Management Area, has a water supply, manages water and has land-use responsibilities, and is therefore a "Local Agency" as defined by California Water Code §10721 (n); and

WHEREAS, the Santa Barbara County Water Agency (County Water Agency) overlies the Central Management Area including the less than one percent not overlain by the District and the Santa Barbara County Planning and Development Department has land use responsibilities. The County Water Agency is therefore a "Local Agency" as defined by the California Water Code 10721 (n); and

WHEREAS, the District, City and County Water Agency collectively include all of the lands within the Central Management Area of the Basin; and

WHEREAS, the District desires to form a Groundwater Sustainability Agency in conjunction with the City and the County Water Agency, to represent the interests of all residents and landowners within the District, and particularly those not otherwise represented by the City and which Groundwater Sustainability Agency may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, the District in conjunction with the City and County Water Agency held a public hearing on November 8, 2016 pursuant to California Water Code section §10723(b), after publication of notice of such hearing pursuant to California Government Code section §6066; and

WHEREAS, at the public hearing, the Santa Ynez River Water Conservation District Board of Directors considered oral and written comments to the extent provided by the public; and

WHEREAS, on December 6, 2016 the Santa Barbara County Board of Supervisors made a resolution to join the Central Management Area GSA in conjunction with the District; and on November 10, 2016 the City of Buellton made a resolution to join the Central Management Area CSD in conjunction with the District; and

WHEREAS, it is in the best interests of the District to form a Groundwater Sustainability Agency, in conjunction with the City and the County Water Agency.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS: that the Board of Directors of the Santa Ynez River Water Conservation District declares and directs as follows:

1. That the foregoing recitals are true and correct.

2. That Santa Ynez River Water Conservation District herein decides to form a Groundwater Sustainability Agency in conjunction with the City and County Water Agency, known as the Central Management Area Groundwater Sustainability Agency (Agency), and which shall have all the powers granted to a groundwater sustainability agency pursuant to the Sustainable Groundwater Management Act.

3. That the portion of the groundwater basin that the herein formed Agency shall manage shall be that portion of the basin as depicted in the notification provided to the Department of Water Resources as the Central Management Area, pursuant to California Water Code 10723.8, and which boundary may be modified from time to time.

4. That the Agency hereby created shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans, as required by California Water Code section §10723.2.

5. That the Agency hereby created shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents, as required by California Water Code section §10723.4.

6. That the General Manager of Santa Ynez River Water Conservation District shall be authorized to execute a memorandum of agreement or other legal agreement(s) with the City and the County Water Agency, and cause notice to be given to the California Department of Water Resources of the decision of District in conjunction with the City and County Water Agency to create the above referenced Groundwater Sustainability Agency.

WE, THE UNDERSIGNED, being the duly qualified and acting President and Secretary, respectively, of the Board of Directors of the Santa Ynez River Water Conservation District do hereby certify that the above and foregoing resolution was duly adopted and passed by the Board of Directors of said District at a special meeting duly held on the 11th day of January, 2017 by the following roll call vote:

AYES, and in favor thereof, Directors:	Steve Jordan Art Hibbits Brett Marymee Cynthia Allen Larry Flinkingshelt
NOES, Directors:	None
ABSENT/ABSTAINING, Directors:	None

Cynthia Allen, President

Bruce A. Wales, Secretary

Exhibit 4

Signed Copy of Memorandum of Agreement

MEMORANDUM OF AGREEMENT
FOR FORMATION OF A GROUNDWATER SUSTAINABILITY AGENCY FOR THE CENTRAL MANAGEMENT AREA
IN THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN UNDER THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT

THIS MEMORANDUM OF AGREEMENT ("MOA") is made and effective as of January 11, 2017, by and between the Parties executing the MOA below, each a "Party" and collectively the "Parties," with reference to the following facts:

A. In 2014, the State of California enacted the Sustainable Groundwater Management Act (Water Code Sections 10720 et seq.), referred to in this MOA as the "SGMA" or "Act," as subsequently amended, pursuant to which certain public agencies may become "Groundwater Sustainability Agencies" (GSA) and adopt "Groundwater Sustainability Plans" (GSP) in order to manage and regulate groundwater in underlying groundwater basins. The Act defines "basin" as a basin or sub-basin identified and defined in California Department of Water Resources (DWR) Bulletin 118. Each Party is a local public agency located within the Santa Ynez River Valley Groundwater Basin (Bulletin 118, Basin No. 3-15, "Basin") and is qualified to become a GSA and adopt a GSP under the Act for all or a portion of the Basin.

B. Bulletin 118 describes the Basin as being in three portions, that being Eastern, Central and Western. It further describes the Western Portion as consisting of the Lompoc Plain, Lompoc Terrace and Lompoc Uplands; the Central Portion as the Buellton Uplands and the Eastern Portion as the Santa Ynez Uplands. For purposes of administrating its groundwater usage program and other water management functions, the Santa Ynez River Water Conservation District (District) also generally recognizes these various hydro-geologic units. For the purpose of implementing SGMA, each portion of the Basin as described by DWR and recognized by the District, is designated as a groundwater "Management Area" as defined by the Act.

C. The Parties are the agencies qualified to be a GSA under the Act for the Central (Buellton Uplands) Management Area of the Basin, as that Area is recognized by Bulletin 118 and the District. The map attached hereto as Exhibit A designates the boundaries of the Central Management Area (CMA) and the other Management Areas of the Basin.

D. It was determined that separate GSAs for each of the three Management Areas would be most efficient to implement SGMA in the Basin. The three GSAs will be managed by an Intra-Basin Coordination Agreement, with the District as the point of contact with DWR, pursuant to §10727.6 of the Act and California Code of Regulations, Title 23, §357.4. On May 23, 2016, the Parties, along with the other agencies qualified to be a GSA within the Basin, entered into a MOU (SGMA Implementation MOU) which recognized the three Management Areas of the Basin which correspond to DWR's three portions, and outlined the process for formation of GSAs and development of GSPs for the Basin. These three Management Areas cover the entire Basin that is subject to SGMA. Attached as Exhibit B is a chart of the anticipated organization of the three GSAs.

E. For the purpose of SGMA, there are two exclusions from the Act including "de minimis" produced water (two or less acre-feet/year) and water extracted from river alluvium. Bedrock wells in the CMA generally produce two acre-feet/year or less which is considered "de minimis" by SGMA and therefore not generally subject to the Act. The Santa Ynez River Alluvium zone is generally recognized as constituting "under flow" of the Santa Ynez River, and thereby not "groundwater" for purposes of SGMA and not regulated by the Act. The water produced in river alluvium falls under the jurisdiction of the State Water Resources Control Board (SWRCB), to the extent applicable.

F. The Parties wish to provide a framework to form a GSA and to implement SGMA in the CMA, such that the implementation is through local control and management and is implemented effectively, efficiently, fairly and at a reasonable cost.

THEREFORE, in consideration of the mutual promises set forth below and to implement the goals described above, the Parties agree as follows:

1. Formation of the Central Management Area GSA for the Buellton Uplands (CMA). The purpose of this MOA is to form a GSA for the CMA prior to June 30, 2017, and to facilitate a cooperative and ongoing working relationship between the Parties that will allow them to explore, study, evaluate, develop and implement mutually beneficial approaches and strategies for development of a GSP for the CMA. By execution of this MOA, the Parties collectively determine and elect to be the GSA for the Central (Buellton Uplands) Management Area of the Basin. It is presumed the CMA GSA will be the sole GSA for this portion of the Basin.

2. Organization of the Management Area. The District covers approximately 99.95% of the CMA including the City of Buellton and the Bobcat Springs Mutual Water Company. The Santa Barbara County Water Agency ("County Water Agency") covers the remaining 0.05% of the CMA that is not within the District. The City of Buellton, the District and the County Water Agency represent all of the public agencies (as defined by the Act) that are eligible to form a GSA in the CMA. The formation of the CMA GSA is supported by the following:

a. The District has monitored groundwater production and groundwater storage in the Basin, including the CMA, since 1979.

b. The District and the City of Buellton prepared a Groundwater Basin Management Plan for the CMA in October 1995. The plan was approved under AB 3030.

c. Buellton practices conjunctive use during wet and dry periods between the Santa Ynez river channel and the CMA in coordination with the Districts' water rights releases under SWRCB Order 89-18.

d. Areas of the CMA represented by the County Water Agency have "de minimis" groundwater production, if any, and represent less than 0.05% of the total Management Area. Therefore, the County Water Agency will not be a voting Committee member of the CMA GSA nor will it have any financial responsibility for funding the GSA or GSP activities for the CMA, except for the cost of its staff participation in meetings.

e. In addition to the consideration of the interests of groundwater users in the CMA GSA, the Santa Barbara County Planning and Development Department, Bob Cat Springs Mutual Water Company, and members of the agricultural community, will be invited to participate on the GSA's Advisory Committee.

3. Development of Groundwater Sustainability Plans ("GSPs"). Separate GSPs will be developed for each of the three Management Areas, including the CMA. The GSPs will be prepared incorporating the Coordination Agreement for the Basin, as provided for in Section §10727.6 of the Act. The District will coordinate efforts of the Parties and be the point of contact with DWR, as defined by the Act, to meet and cooperatively develop the GSP for the CMA. In developing the GSP this GSA shall consider all beneficial uses and users of groundwater in the CMA, including the interests listed at Section §10723.2 of the Act.

4. GSA Governing Body. There is hereby established a GSA Committee for the CMA which shall be subject to the following:

a. The District and the City of Buellton shall each have one vote in the CMA GSA and will be represented by a person or persons from their respective entities. The County Water Agency will be an ex-officio member and will have non-voting status as a member of the GSA. The County Water Agency will be represented by one person or persons as appointed by the County Water Agency Board of Directors.

b. The GSA Committee may adopt resolutions, bylaws and policies to provide further details for conducting its affairs consistent with this MOA and applicable law and amend same from time to time. Meetings of the GSA Committee shall be called, noticed and conducted subject to the provisions of the Ralph M Brown Act (Govt. Code sections 54950 et seq.)

c. A quorum of the GSA Committee to transact business shall be both voting members. Since there are only two voting members of the CMA, in order to pass any proposition or resolution, a unanimous vote will be required.

d. The composition, voting procedures and powers of the GSA Committee shall be reviewed and reaffirmed or modified as part of the process to adopt a GSP, which is due no later than January 30, 2022.

5. Powers/Development of GSP. The GSA Committee shall have all the powers that a GSA is authorized to exercise as provided by the Act, including developing a GSP consistent with the Act and DWR's regulations and imposing fees to pay for GSA and GSP activities. The GSA Committee shall proceed in a timely fashion to develop a GSP for the CMA, including considering the interests of all beneficial users of groundwater within the CMA as prescribed by Section §10723.2 of the Act, as well as the requirements set forth in the Coordination Agreement for the Basin.

6. Costs. The voting Parties each shall bear the costs incurred with respect to activities under this MOA to participate on the GSA Committee and its proceedings and related matters. Costs incurred to retain consultants to assist with development of the GSP and perform related studies as approved by the GSA Committee and to implement the GSP shall be borne by the voting Parties in equal portions, unless otherwise agreed to by the voting Parties. The Parties may consider levying a charge pursuant to the Act. There are several vehicles to capture costs for implementing SGMA pursuant to §10730 et seq. of the Act. The County Water Agency, as an ex-officio member,

is only responsible for its own costs to attend and participate on the GSA Committee and is not responsible for any other costs contemplated in this MOA or related to the CMA GSA or GSP.

7. Staff. Each Party shall designate a principal contact person, if other than the designated GSA Committee member, and other appropriate staff members and consultants to participate on such Party's behalf in activities undertaken pursuant to this MOA. The District shall be responsible for meetings and other activities under this MOA with the GSA Committee and principal contact persons for the other Parties, and shall be the point of contact with DWR. Informal staff meetings may occur as needed.

8. Ongoing Cooperation. The Parties acknowledge that activities under this MOA will require the frequent interaction between them in order to pursue opportunities and resolve issues that arise. The Parties shall work cooperatively and in good faith. The goal of the Parties shall be to preserve flexibility with respect to the implementation of the Act and consistency with the other GSAs in the Basin, as per the Coordinating Agreement.

9. Notices. Any formal notice or other formal communication given under the terms of this MOA shall be in writing and shall be given personally, by facsimile, by electronic mail (email), or by certified mail, postage prepaid and return receipt requested. Any notice shall be delivered or addressed to the Parties at the addressees' facsimile numbers or email addresses set forth below under each signature and at such other address, facsimile number or email address as shall be designated by notice in writing in accordance with the terms of this Agreement. The date of receipt of the notice shall be the date of actual personal service, confirmed facsimile transmission or email, or three days after the postmark on certified mail.

10. Entire Agreement/Amendments/Counterparts. This MOA incorporates the entire and exclusive agreement of the Parties with respect to the matters described herein and supersedes all prior negotiations and agreements (written, oral, or otherwise) related thereto. This MOA may be amended only in a writing executed by all of the voting Parties. This MOA may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

11. Termination/Withdrawal. This MOA shall remain in effect unless terminated by the unanimous consent of the voting Parties. Upon 60 days written notice, any of the Parties may withdraw from this MOA and the MOA shall remain in effect for the remaining Parties. A withdrawing voting Party shall be liable for expenses incurred through the effective date of the withdrawal and for its share of any contractual obligations incurred by the CMA GSA while the withdrawing voting Party was a party to this Agreement.

12. Assignment. No rights or duties of any of the Parties under this MOA may be assigned or delegated without the express prior written consent of all of the other Parties, and any attempt to assign or delegate such rights or duties without such written consent shall be null and void.

13. Indemnification. In lieu of and notwithstanding any provision of law, including, but not limited to, California Government Code § 895 *et seq*., the Parties agree to indemnify, defend (with counsel reasonably approved by the County Water Agency) and hold harmless the County Water Agency and its officers, officials, employees, agents and volunteers from and against any and all claims, actions, losses, damages, judgments, and/or liabilities arising out of this MOA from any cause whatsoever, including the acts, errors or omission of any person or entity and for any costs or expenses (including but not limited to attorneys' fees) incurred by the County Water Agency on account of any claim except where such indemnification is caused by the sole negligence or willful misconduct of the County Water Agency.

IN WITNESS WHEREOF, the Parties have executed this MOA as of the date first above written.

CITY OF BUELLTON

By: [signature]
Marc Bierdzinski, City Manager
Address: 107 W. Highway 246
Buellton, CA 93427
Email marcb@cityofbuellton.com
Facsimile 805-686-0086

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: Bruce A. Wales
Address: SYRWCD
3669 Sagunto St. Suite 108
Santa Ynez, CA 93460
Email bwales@syrwcd.com
Facsimile 805-693-1156

SANTA BARBARA COUNTY WATER AGENCY

By: (Signature on following page)
Address: __________
Email __________
Facsimile __________

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D

ATTEST:
Mona Miyasato
County Executive Officer
Clerk of the Board, Ex Officio Clerk of the Santa Barbara County Water Agency

By: ______________________
Deputy Clerk

SANTA BARBARA COUNTY WATER AGENCY:

By: ______________________
Chair, Board of Directors

Date: 12-6-16

RECOMMENDED FOR APPROVAL:
Santa Barbara County Water Agency

By: ______________________
Department Head

APPROVED AS TO FORM:
Risk Management

By: ______________________
Risk Management

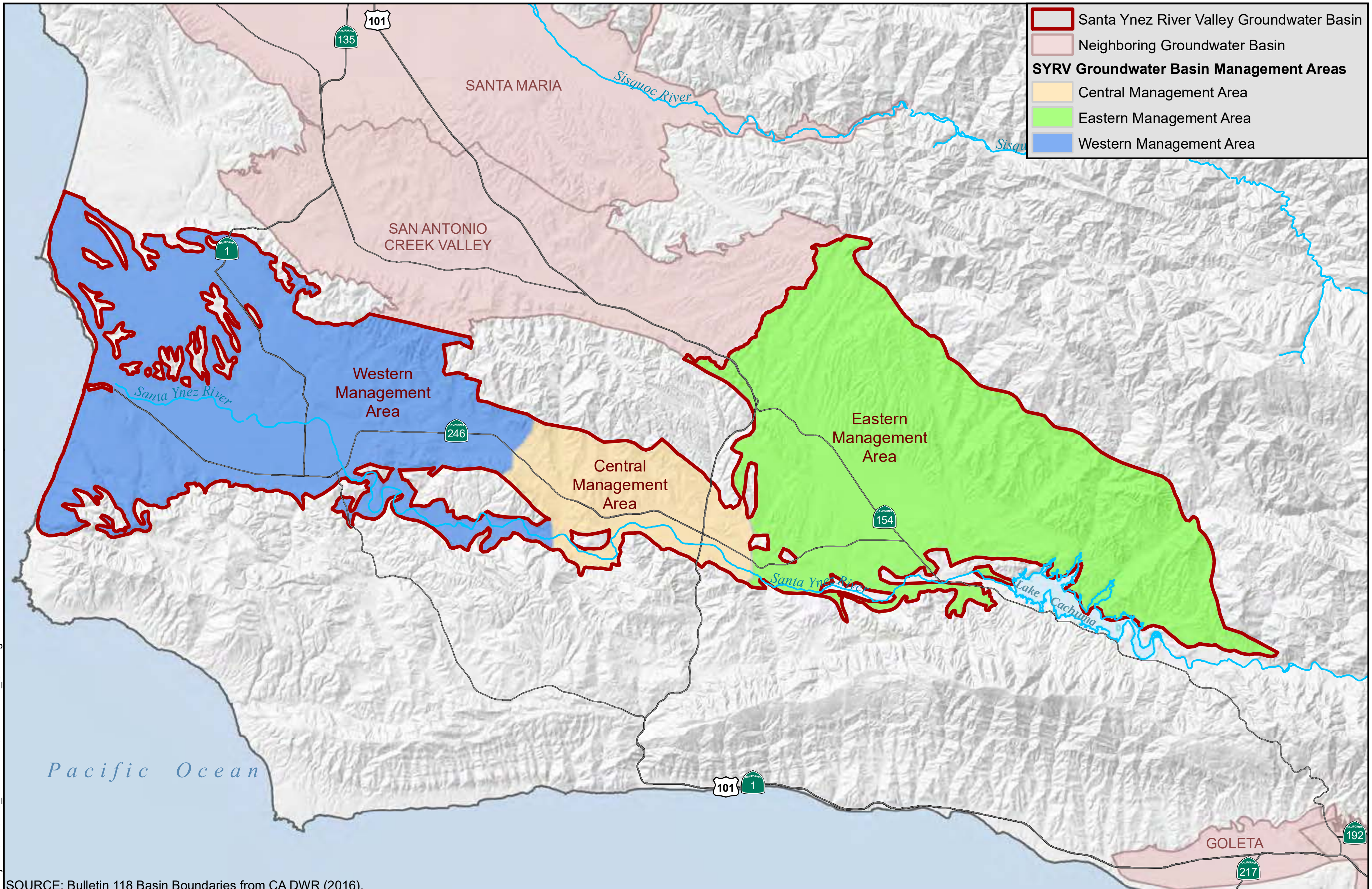
APPROVED AS TO FORM:

Michael C. Ghizzoni
County Counsel

By: ______________________
Deputy County Counsel

APPROVED AS TO ACCOUNTING FORM:
Theodore A. Fallati, CPA
Auditor-Controller

By: ______________________
Deputy



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Miles

Santa Ynez River Valley
Groundwater Basin GSA Formation
Santa Barbara County, California

Santa Ynez River Water Conservation District

GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN MANAGEMENT AREAS

JANUARY 2017

FIGURE 1

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EXHIBIT B

Santa Ynez River Valley Basin
GSA Organization

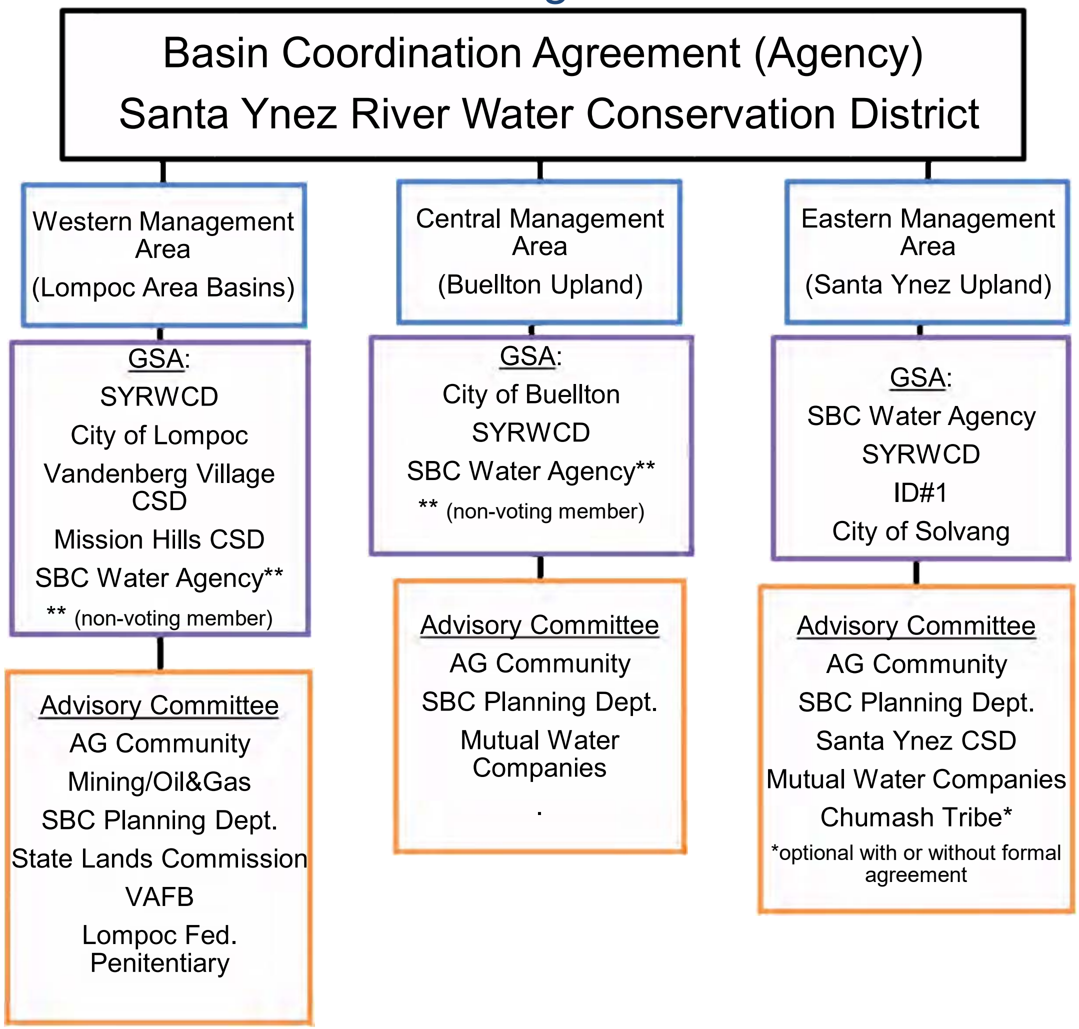

Exhibit 5

List of Uses and Users of Groundwater in the CMA

SANTA YNEZ RIVER VALLEY BASIN
CENTRAL MANAGEMENT AREA
GROUNDWATER SUSTAINABILITY AGENCY

LIST OF ALL BENEFICIAL USES AND USERS OF GROUNDWATER

In accordance with Section 10723.2 and Section 10723.8 (a)(4) of the SGMA, the following parties have or will be contacted to determine how best to consider and protect their interests throughout the formation of the GSA, development of a GSP, and implementation of the GSP. These interests include, but are not limited to the following:

(a) Holders of overlying groundwater rights, including (1) agricultural users and (2) domestic water-well owners: The City of Buellton and Santa Ynez River Water Conservation District (SYRWCD) are GSA members. Domestic water-well owners and agricultural users will be invited to join the CMA GSA Advisory Committee.

(b) Municipal Well Operators: The City of Buellton is a member of the GSA.

(c) Public Water Systems: Representatives from several mutual water companies in the CMA will be invited to sit on the CMA GSA Advisory Committee.

(d) Local Land Use Planning Agencies: The City of Buellton is a member of the CMA GSA and the Santa Barbara County Planning Department is a member of the CMA GSA Advisory Committee.

(e) Environmental Users of Groundwater: None.

(f) Surface Water Users: SYRWCD calls for water-rights releases under Order from the State of California Water Quality Control Board. The City of Buellton diverts water from and discharges wastewater to the alluvial underflow of the Santa Ynez River. Agricultural interests (vineyards and truck crops) that are registered with SYRWCD and have riparian rights will be invited to serve on the CMA Advisory Committee.

(g) Federal Government: None.

(h) California Native American Tribes: None.

(i) Disadvantaged Communities: None.

(j) Entities Listed in SGMA Section 10927 that are monitoring groundwater elevations in all or part of the CMA managed by the GSA: The City of Buellton monitors its wells and the Santa Barbara County Water Agency is the CASGEM agency within the CMA. Both are members of the GSA.

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Chapter 1 – Introduction and Plan Area

Appendix 1b-C:

Intra-Basin Administrative Agreement for
Implementation of the
Sustainable Groundwater Management Act in the
Santa Ynez River Valley Groundwater Basin

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Intra-Basin Administrative Agreement

For Implementation of the Sustainable Groundwater Management Act

In the Santa Ynez River Valley Groundwater Basin

This Intra-Basin Administrative Agreement ("Agreement") is made and effective as of February 26, 2020 ("Effective Date") by and between the Parties executing this Agreement below, each referred to herein as a "Party" and collectively as the "Parties."

A. **WHEREAS**, in 2014 the State of California enacted the Sustainable Groundwater Management Act, including but not limited to Water Code section 10720 et seq., referred to in this Agreement as the "Act" or "SGMA," as subsequently amended, pursuant to which certain agencies may become or participate in "Groundwater Sustainability Agencies" ("GSAs") and prepare, adopt, and implement "Groundwater Sustainability Plans" ("GSPs") to achieve sustainable groundwater management in basins throughout the State. The Act defines a groundwater "basin" as a basin or sub-basin identified and defined in California Department of Water Resources ("DWR") Bulletin 118 or as modified pursuant to the Act. Each Party is a local agency located within the Santa Ynez River Valley Groundwater Basin (Bulletin 118, Basin No. 3-15, "Basin"), each is qualified to become a GSA or participate in a GSA or multiple GSAs, and each is authorized to adopt a GSP or participate in the adoption of a GSP or multiple GSPs under the Act for all or a portion of the Basin, as applicable; and

B. **WHEREAS**, the Parties previously executed a "Memorandum of Understanding for Implementation of the Sustainable Groundwater Management Act in the Santa Ynez River Valley Groundwater Basin" dated May 23, 2016 ("2016 MOU") to, among other things, provide for the initial organization of the Basin according to three separate Management Areas, ensure the timely formation and filing of a separate GSA for each of the three Management Areas, and establish the basis for a cooperative and ongoing working relationship between and among the Parties and GSAs for implementing the goals and requirements of SGMA throughout the Basin; and

C. **WHEREAS**, in accordance with SGMA and the 2016 MOU, three separate GSAs have been formed and are operating within the Basin, wherein one GSA represents the Western Management Area, one GSA represents the Central Management Area, and one GSA represents the Eastern Management Area; and

D. **WHEREAS**, the Western Management Area Groundwater Sustainability Agency ("WMA GSA") was formed by the City of Lompoc, the Vandenberg Village Community Services District, the Mission Hills Community Services District, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to the January 11, 2017 Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Western Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act ("WMA MOA"); and

E. **WHEREAS**, the Central Management Area Groundwater Sustainability Agency ("CMA GSA") was formed by the City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to the January 11, 2017 Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Central Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act ("CMA MOA"); and

F. **WHEREAS**, the Eastern Management Area Groundwater Sustainability Agency ("EMA GSA") was formed by the City of Solvang, the Santa Ynez River Water Conservation District, Improvement District No.1, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to the April 27, 2017 Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Eastern Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act ("EMA MOA"); and

G. **WHEREAS**, the Parties hereto wish to supplement and provide a further framework for cooperative and ongoing efforts among themselves and among the WMA GSA, the CMA GSA, and the EMA GSA for implementation of SGMA throughout the Basin in a manner that is effective, efficient, fair, and at reasonable costs.

THEREFORE, in consideration of the Recitals set forth above and the mutual promises set forth below, the Parties agree as follows:

1. Purpose. The primary purpose of this Agreement is to facilitate a cooperative and ongoing working relationship between the Parties and among the WMA GSA, the CMA GSA, and the EMA GSA that will allow them to explore, study, evaluate, develop, and carry out mutually beneficial approaches and strategies for implementing SGMA throughout the Basin in an effective, efficient, fair, and cost-effective manner.

2. Development of Separate Groundwater Sustainability Plans.

   (a) In accordance with the WMA MOA, the CMA MOA, and the EMA MOA, a separate GSP will be developed by the respective GSAs for each of the three Management Areas identified in the Recitals above. As a part of their cooperative and ongoing efforts under this Agreement, the Parties through their respective GSAs shall continue to discuss and explore the potential formation of one or more new joint powers authority or alternative arrangement(s) to implement the GSPs and carry out the objectives and requirements of SGMA throughout the Basin in a coordinated fashion.

   (b) As further described at Section 3 below, the Parties acknowledge and agree that the respective GSPs must be developed in a coordinated fashion and that a Coordination Agreement must be developed and submitted to the California Department of Water Resources ("DWR") together with the three GSPs for the Basin. As foundation to the Coordination Agreement, and in accordance with Section 10727.6 of the Act, the Parties further acknowledge and agree that their respective GSAs shall coordinate with each other in the preparation of the respective GSPs to ensure that the GSPs utilize the same data and methodologies for the following assumptions:

- Groundwater elevation data;
- Groundwater extraction data;
- Surface water supply;
- Total water use;
- Change in groundwater storage;
- Water budget; and
- Sustainable yield.

(c) Governance and decision-making processes within the individual GSAs shall be governed by the respective Memoranda of Agreement described in the Recitals above, as those documents may be modified or supplemented from time to time by applicable bylaws, policies, amendments, or other agreements.

3. Coordination Agreement. Because multiple GSPs will be developed for the Basin, the Parties agree that a Coordination Agreement shall be developed and entered in accordance with Sections 10727(b)(3), 10727.6, and 10733.4(b)(3) of the Act, and the requirements and elements set forth in Section 357.4 of Title 23 of the California Code of Regulations ("SGMA Regulations") to ensure that the GSPs are developed and implemented utilizing the same data and methodologies and that elements of the GSPs necessary to achieve the sustainability goal for the Basin are based upon consistent interpretations of the basin setting.

Because developing and executing the Coordination Agreement is a prerequisite to filing the respective GSPs, the Parties agree to commence negotiation of the Coordination Agreement through their respective GSAs as soon as practicable, but no later than July 1, 2020. In the event that essential terms and elements of the Coordination Agreement, as set forth by Section 357.4 of the SGMA Regulations, have not been developed in draft for consideration by the Parties and the respective GSAs by June 1, 2021, any Party to this Agreement may demand in writing to the other Parties that the remaining process for developing and finalizing the Coordination Agreement be administered with the services of a mediator as provided by Section 7 below.

4. Sharing of DWR Grant Funds. The Parties acknowledge that the Santa Ynez River Water Conservation District (SYRWCD) is the grantee of a DWR Proposition 1 grant award of $1,000,000 ("DWR Grant Funds") on behalf of the respective GSAs for the three Management Areas and that such DWR Grant Funds are administered pursuant to the 2018 Grant Agreement Between the State of California (DWR) and the SYRWCD ("DWR Grant Agreement"). The Parties agree, individually and through their respective GSAs, that the DWR Grant Funds shall be shared and allocated equally (one-third each) among the WMA GSA, the CMA GSA, and the EMA GSA on behalf of the respective Management Areas for development of their

respective GSPs and related SGMA costs as authorized by the DWR Grant Agreement; and that if any GSA does not incur costs that are reimbursable from its respective one-third share of DWR Grant Funds, such unutilized funds shall be allocated equally (one-half each) to the two remaining GSAs; and that if either of the two remaining GSAs does not incur costs that are reimbursable from its one-half share of such remaining DWR Grant Funds, such unutilized funds shall be allocated to the one remaining GSA; and if the remaining GSA does not incur costs that are reimbursable from such remaining DWR Grant Funds, such unutilized funds shall be administered in accordance with the DWR Grant Agreement. Subject to the requirements of the DWR Grant Agreement, decisions related to the use and application of DWR Grant Funds within any given Management Area shall be made by the respective GSA for that Management Area.

5. Cost Sharing Among GSAs and Securing Joint Services.

(a) The Parties anticipate the need or opportunity from time to time to perform certain services or activities that are common to and will benefit all three Management Areas and GSAs in preparing their respective GSPs, which services or activities otherwise would be funded individually through the GSAs, and where jointly securing and undertaking such services or activities can improve efficiencies in preparing the GSPs and save costs at a Basin-wide level. These common and mutually beneficial services, activities, and associated costs may include, but are not limited to, SGMA website development, data management systems, technical review, and administrative support. Any decision(s) on a case-by-case basis to secure and undertake services or activities that are common and mutually beneficial to the three Management Areas and GSAs, and to incur the costs associated with any such decision(s), shall require prior approval by all three GSAs, wherein the method, terms, and costs for securing and undertaking such services or activities shall be presented to each GSA as part of the aforementioned approval requirements.

(b) Costs incurred for services or activities that are undertaken as described in Section 5(a) above shall be equally apportioned among and paid by the three GSAs (one-third each); provided, however, that each GSA shall make its own determination in coordination with SYRWCD of whether to seek reimbursement for its proportionate share of such costs from DWR Grant Funds made available to that GSA as described in Section 4 above. Cost sharing within the individual GSAs shall be administered in accordance with the terms of the WMA MOA, the CMA MOA, and the EMA MOA, along with any applicable amendments to those documents

(c) SYRWCD shall coordinate cost sharing among the GSAs and administer any agreement or contract to provide such services or activities on behalf of the three GSAs as described in Section 5(a) above; provided, however, that SYRWCD may elect in the future not to provide such coordination or administration services, and provided further that the GSAs may agree in writing for a different Party or third-party to coordinate such cost sharing or to administer any such agreement or contract as part of the approval requirements described in Section 5(a) above. The Parties agree that the costs incurred by SYRWCD or other Party or third-party for providing such coordination or administration services shall be apportioned and shared by the GSAs in accordance with this Section 5.

(d) Subject to the availability of DWR Grant Funds and other sources of funding that may be available to any of the GSAs, all other SGMA-related costs that are not shared among the three GSAs in accordance with this Agreement, including but not limited to those for preparation and implementation of their respective GSPs, shall be borne by the respective GSAs and Parties thereto in accordance with their respective Memoranda of Agreement described in the Recitals above, as those documents may be modified or supplemented from time to time by applicable bylaws, policies, amendments, or other agreements. Nothing in this Agreement is intended to nor shall limit any Party or any of the GSA from seeking recovery of SGMA-related costs, including but not limited to those for preparation or implementation of the GSPs, from water users and other persons and entities in any lawful manner, including but not limited to the authorities provided by SGMA.

6. Ongoing Cooperation. In accordance with the primary purpose of this Agreement, the Parties agree to coordinate with each other in good faith to ensure a cooperative and ongoing working relationship between the Parties and among the WMA GSA, the CMA GSA, and the EMA GSA that will allow them to explore, study, evaluate, develop, and carry out mutually beneficial approaches and strategies for implementing SGMA throughout the Basin in an effective, efficient, fair, and cost-effective manner. In furtherance of this purpose, each Party shall identify a principal contact person and other appropriate staff and/or consultant(s) to participate on such Party's behalf in carrying out this Agreement.

7. Dispute Resolution.

(a) The Parties agree to mediate any claim or dispute arising from this Agreement before filing any court action; provided, however, that any Party may elect not to mediate, where any Party that elects not to mediate or commences a court action based on a dispute or claim arising from this Agreement without first attempting to resolve the matter through mediation as provided in this Section 7 shall not be entitled to recover attorneys' fees or costs, even if such fees and costs otherwise would be available to that Party in any such action. A Party shall satisfy the requirement for "first attempting to resolve the matter through mediation" by proceeding or otherwise participating in accordance with the entire process set forth in Section 7(b) below.

(b) In the event of a claim or dispute, or where the Parties or respective GSAs cannot reach agreement on any matter arising under this Agreement, including but not limited to preparing GSPs in a coordinated fashion as described in Section 2(b) above, or developing a Coordination Agreement as described in Section 3 above, any Party may provide a written Notice of Dispute to the other Parties that describes in detail the claim or disputed matter ("Dispute"). Upon issuance of a Notice of Dispute, a meeting shall be conducted within twenty (20) calendar days from the date of the Notice of Dispute among all Parties that elect to participate in the meeting as a good faith attempt to resolve the Dispute informally ("Informal Dispute Resolution"). In the event the Dispute is not resolved through Informal Dispute Resolution within thirty (30) calendar days from the date of the Notice of Dispute, the Party that initially provided the Notice of Dispute shall provide a separate written notification to all Parties that participated in the Informal Dispute Resolution process which identifies three mediator candidates, all of whom must be an attorney, engineer, or hydrogeologist experienced and familiar with SGMA, to mediate the Dispute ("Formal Dispute Resolution"). Furthermore, all mediator candidates must be unbiased neutrals who are not participants in any of the GSAs in the Basin and who are not officials, officers, employees, contractors, consultants, or agents of any of the Parties to this Agreement. Within ten (10) days of receiving a written notification of qualified mediator candidates, all Parties that elect to participate in such Formal Dispute Resolution may provide a written response consenting to one or more of the mediator candidates or identifying up to three additional qualified mediator candidates. Thereafter, if a mediator is not mutually-agreed upon by said participating Parties from the combined list within fifteen (15) calendar days, each party shall submit two potential mediators that they would approve and a mediator shall be picked by a non-party through random selection from the Parties' combined lists of remaining mediators. Once initiated, the mediation shall be completed within 30 days.

(c) Mediation fees, if any, shall be divided equally among the Parties that elect to be involved in a mediation process pursuant to Section 7(b) above. Each Party involved in the mediation shall be responsible for its own attorneys' fees and costs.

(d) This Section 7 shall not preclude any Party from meeting and conferring with any other Party or Parties to mutually resolve a dispute or claim prior to requesting or participating in the mediation processes described in Section 7(b) above.

(e) This Section 7 shall not preclude any Party from seeking a preliminary injunction or other interlocutory relief if necessary to avoid irreparable harm or damages.

8. Indemnification. To the extent authorized by law, each Party shall defend, indemnify, and hold harmless the other Parties and their respective elected officials, officers, supervisors, employees, agents, contractors, and consultants from and against any and all damages, demands, actions, claims, or liabilities for the indemnifying Party's acts or omissions arising from carrying out this Agreement.

9. Miscellaneous/General Provisions.

(a) Notices. Any formal notice required or other formal communication given under the terms of this Agreement shall be in writing to all of the Parties and shall be given personally, by electronic mail (email), or by certified mail, postage prepaid and return receipt requested.

The date of receipt of any written notice provided hereunder shall be the date of actual personal service, or email, or three days after the postmark on certified mail.

(b) Entire Agreement/Amendments/Counterparts. This Agreement incorporates the entire and exclusive agreement of the Parties with respect to the matters described herein and supersedes all prior negotiations and agreements (written, oral, or otherwise) related thereto, including the 2016 MOU; provided, however, this Agreement does not amend, supersede, or modify the WMA MOA, the CMA MOA, or the EMA MOA as described in the Recitals above, as those documents may be amended or supplemented. This Agreement may be amended (including without limitation to add new Parties) only in a writing executed by all of the Parties. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

(c) Termination/Withdrawal. This Agreement shall remain in effect unless terminated by the mutual consent of the Parties. Upon 30 days written notice to the other Parties, any Party may withdraw from this Agreement, and the Agreement shall remain in effect for the remaining Parties. No Party shall be liable to any other Party for electing to withdraw from this Agreement.

(d) Assignment. No rights or duties of any of the Parties under this Agreement may be assigned or delegated without the express prior written consent of all of the other Parties, and any attempt to assign or delegate such rights or duties without such written consent shall be null and void.

(e) Insurance. Each Party shall maintain its own insurance coverage through commercial insurance, self-insurance, or a combination thereof, against any claim, expense cost, damage or liability arising out of the performance of its responsibility pursuant to this Agreement, to the extent insurable.

(f) Counsel. The Parties recognize that as of the Effective Date of this Agreement, independent legal counsel has not been retained to represent any of the three GSAs in the Basin. Until such time as any Party may decide otherwise within its sole and absolute discretion, each Party agrees, in its individual capacity and as a member agency of its respective GSA, to utilize its own legal counsel for all purposes, including but not limited to those related in any way to compliance with SGMA and any and all other legal requirements, to rely exclusively upon the legal advice of its own legal counsel, and to bear all of its own fees, costs, and expenses for legal counsel, including but not limited any experts or consultants retained through legal counsel on behalf of that Party. This arrangement shall not be construed in any way to create an attorney-client relationship or a duty of loyalty between an attorney and any Party other than the direct client of that attorney, and no such relationship will be deemed to arise by implication as a result of this

Agreement. The provisions of this Section 9(f) shall not be affected in the event, if any, that any or all of the GSAs in the Basin determine(s) to retain independent legal counsel.

(g) CEQA. The Parties recognize and agree that, pursuant to 10728.6 of the Act and Public Resources Code Section 21065, neither this Agreement nor the preparation or adoption of a GSP constitutes a "project" or approval of a project under the California Environmental Quality Act ("CEQA") or the State CEQA Guidelines.

(h) No Third-Party Beneficiaries. This Agreement is not intended and shall not be construed to confer any benefit or create any right for any third party, or to provide the power or right of a third party to bring an action to enforce any of the terms of this Agreement.

(i) Attorneys' Fees and Costs. Subject to the provisions of Section 7 above, if any action at law or equity, including an action for declaratory relief, is brought to enforce or interpret the provisions of this Agreement, the prevailing Party or Parties, as determined by the court, shall be entitled to recover reasonable attorneys' fees and costs which shall be determined by the court. The attorneys' fees and costs to be awarded shall be made to fully reimburse the prevailing Party or Parties for all reasonable attorneys' fees and costs, including but not limited to expert fees, costs, and expenses actually incurred in good faith, regardless of the size of the judgment or outcome of the action; provided, however, that recoverable fees awarded to any prevailing party shall not exceed the rate of three hundred and twenty-five dollars ($325.00) per hour for attorneys or experts.

(j) Authority/Binding Effect. Each Party represents and warrants that the individual(s) executing this Agreement is authorized to do so and thereby obligate such Party to perform all acts required by this Agreement, and that the consent, approval or execution of or by any third party is not required to legally bind the Party to this Agreement.

(k) Incorporation of Recitals. The Recitals set for the above are hereby imported into this Agreement.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date first written above.

[*Signature Pages Below*]

SANTA BARBARA COUNTY WATER AGENCY

ATTEST:
MONA MIYASATO,
COUNTY EXECUTIVE OFFICER
Ex Officio Clerk of the Board Directors
of the Santa Barbara County Water Agency

By: Sheila de la Guerra
Deputy

SANTA BARBARA COUNTY WATER AGENCY

By: Gregg Hart
Gregg Hart, Chair, Board of Directors

APPROVED AS TO FORM:
MICHAEL C. GHIZZONI
COUNTY COUNSEL

By: ______
Deputy

APPROVED AS TO FORM:
RAY AROMATORIO, ARM, AIC
RISK MANAGER

By: ______

RECOMMENDED FOR APPROVAL:
SCOTT D. MCGOLPIN
PUBLIC WORKS DIRECTOR

By: ______
Deputy Public Works Director

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: Kevin Walsh
Kevin D. Walsh, General Manager

Address: P.O. Box 719
Santa Ynez, CA 93460

Email: kwalsh@syrwcd.com

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO.1

Date: December 12, 2019

By: ______________________________
Jeff Clay, President

ATTEST:

By: Mary Martone
Mary Martone, Secretary

CITY OF SOLVANG

By: ______________________________
Xenia Bradford
Acting City Manager

Address: 1644 Oak Street, Solvang, CA 93463

Email: xeniab@cityofsolvang.com

APPROVED AS TO FORM:

City Attorney: Price, Postel and Parma, LLP

By: ______________________________
Chip Wullbrandt
City Attorney

CITY OF BUELLTON

By: Holly Sierra
Holly Sierra, Mayor

Address: P.O. Box 1819
Buellton, CA 93427

Email: hollys@cityofbuellton.com

CITY OF LOMPOC

CITY OF LOMPOC, a municipal corporation

By: ______________________________
James Throop, City Manager

Attest:

By: ______________________________
Stacey Haddon, City Clerk

Approved as to form:

By: ______________________________
Jeff Malawy, City Attorney

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

7 Jan 2020

Katherine A. Stewart, President
Board of Directors

Date

APPROVED AS TO FORM:

12/23/19

Michael A. Munoz
Senior Deputy County Counsel

Date

ATTEST:

1/7/20

Stephanie Garner
Secretary, Board of Directors

Date

MISSION HILLS COMMUNITY SERVICES DISTRICT

Bruce Nix, President
Board of Directors

2-26-20
Date

Loch A Dreizler
General Manager

2.27.20
Date

ATTEST:

Kayla Barker
Secretary, Board of Directors

2-26-20
Date

Chapter 1 – Introduction and Plan Area

Appendix 1b-D:

Coordination Agreement

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<u>Santa Ynez River Valley Groundwater Basin Coordination Agreement</u>

This Coordination Agreement ("Agreement") is made by and between the Santa Ynez River Valley Groundwater Basin Western Management Area Groundwater Sustainability Agency ("WMA GSA"), the Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency ("CMA GSA"), and the Santa Ynez River Valley Groundwater Basin Eastern Management Area Groundwater Sustainability Agency ("EMA GSA") pursuant to the Sustainable Groundwater Management Act (Water Code, div. 6, part 2.74) ("SGMA"). WMA GSA, CMA GSA, and EMA GSA are referred to herein collectively as the "Parties" and individually as a "Party" or a "GSA." This Agreement shall be effective as of January 1, 2022 ("Effective Date").

Recitals

A. WHEREAS, SGMA requires all groundwater basins designated as high or medium priority by the California Department of Water Resources ("DWR") to be managed by one or more Groundwater Sustainability Agencies ("GSAs") pursuant to one or more Groundwater Sustainability Plans ("GSPs").

B. WHEREAS, the Santa Ynez River Valley Groundwater Basin (DWR Bulletin 118 Basin Number 3-015) ("Basin") has been designated as a medium-priority basin by DWR.

C. WHEREAS, the WMA GSA was formed by the City of Lompoc, the Vandenberg Village Community Services District, the Mission Hills Community Services District, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to that Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Western Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act, dated January 11, 2017 ("WMA MOA").

D. WHEREAS, the CMA GSA was formed by the City of Buellton, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to that Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Central Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act, dated January 11, 2017 ("CMA MOA").

E. WHEREAS, the EMA GSA was formed by the City of Solvang, the Santa Ynez River Water Conservation District, Improvement District No. 1, the Santa Ynez River Water Conservation District, and the Santa Barbara County Water Agency pursuant to the Memorandum of Agreement for Formation of a Groundwater Sustainability Agency for the Eastern Management Area in the Santa Ynez River Valley Groundwater Basin Under the Sustainable Groundwater Management Act, dated April 27, 2017 ("EMA MOA").

F. WHEREAS, each Party is authorized to prepare and adopt a GSP under SGMA for a portion of the Basin, and pursuant to the WMA MOA, the CMA MOA, and the EMA MOA, each Party determined to prepare a separate GSP for its respective Management Area in the Basin.

G. WHEREAS, in February 2020, the individual member agencies of the Parties executed that Intra-Basin Administrative Agreement for Implementation of the Sustainable Groundwater Management Act in the Santa Ynez River Valley Groundwater Basin, dated February 26, 2020 ("Intra-Basin Agreement").

H. WHEREAS, Water Code section 10727.6 requires each GSA to "coordinate with other agencies preparing a groundwater sustainability plan within the basin to ensure that the plans utilize the same data and methodologies."

I. WHEREAS, Water Code section 10727(b)(3) requires that multiple GSPs implemented by multiple GSAs must be coordinated pursuant to a coordination agreement that covers the entire Basin.

J. WHEREAS, in the Intra-Basin Agreement, the member agencies of the Parties agreed to develop and execute this Agreement in accordance with Water Code sections 10727(b)(3), 10727.6, and 10733.4(b)(3), and California Code of Regulations, title 23, Section 357.4.

K. WHEREAS, throughout the process of developing the three GSPs for the Basin, numerous activities were undertaken within each Management Area and among the Management Areas and Parties pursuant to Water Code section 10727.6 to coordinate on a full range of topics relevant to SGMA, including, without limitation, the following:

1. Shared data and methodologies for the topics listed in Water Code section 10727.6
2. Description of geologic units in each Management Area
3. Description of principal aquifers and proposed management under SGMA
4. Methodology for assessing factors such as agricultural and municipal water demands, groundwater and surface water production, irrigation return flow, irrigation efficiencies, crop water use factors, mountain front recharge, stream infiltration, septic return flow, evapotranspiration, municipal water use (inside and outside), non-municipal domestic water use, and discharge from wastewater treatment plants, including manner of disposal
5. Groundwater model domain, layering, layer elevations and thicknesses, ground surface digital elevation model, and numerical model code
6. Precipitation and streamflow data including existing and discontinued gauges
7. Historical water level data
8. Deliveries and use of imported State Water Project ("SWP") water
9. Deliveries and use of Cachuma Project water
10. Diversions and use of Santa Ynez River water
11. Phreatophyte water use
12. Parameters for each principal aquifer, including transmissivity, storativity, and porosity
13. Land use survey datasets and trends throughout the Basin
14. Groundwater flux between Management Areas and the adjacent groundwater basin

15. Base period for water budgets
16. Mountain front recharge
17. Geophysical investigations
18. Criteria for selection of monitoring networks and sustainable management criteria
19. Estimates of funding needs for implementation of the GSPs

L. WHEREAS, consultants for the Parties, including GSI Water Solutions, Inc., Stetson Engineers Inc., and Geosyntec Consultants, participated in at least 35 meetings to discuss the development and coordination of technical elements of the three GSPs for the Basin, in addition to numerous meetings of Citizens' Advisory Groups in each Management Area.

Agreement

Now, therefore, the Parties agree as follows:

Article 1. Purpose

The purpose of this Agreement is to comply with SGMA coordination agreement requirements, ensure that the multiple GSPs within the Basin have been prepared utilizing the same data and methodologies for designated assumptions, as required under Water Code section 10727.6 and California Code of Regulations, title 23, sections 350 et seq. ("SGMA Regulations"), and ensure that the elements of the GSPs are appropriately coordinated to support sustainable groundwater management throughout the Basin.

The Parties intend that this Agreement be a description of how the multiple GSPs, developed by the individual GSAs, are implemented together to satisfy the requirements of SGMA. Each Party will include this Agreement as part of its individual GSP.

Article 2. Plan Manager and Point of Contact – § 357.4(b)(1)

§2.1 Designation of Plan Manager

(a) The Parties designate the current Groundwater Program Manager of the Santa Ynez River Water Conservation District ("SYRWCD") to serve as the Plan Manager for the GSAs, as defined in SGMA Regulations section 351(z). In the event (i) said Plan Manager ceases to be employed by SYRWCD, (ii) SYRWCD elects to discontinue said designation of Plan Manager, or (iii) any Party requests the designation of a new Plan Manager, the Parties shall consider the designation of a new Plan Manager.

(b) The designation of a new Plan Manager requires unanimous agreement by the Parties. Any failure to obtain unanimous agreement shall be subject to the dispute resolution procedures set forth in this Agreement.

§2.2 Responsibilities of Plan Manager

(a) The Plan Manager shall serve as the point of contact for DWR as specified in SGMA Regulations section 357.4(b)(1).

(b) The Plan Manager shall submit or direct the submittal of all GSPs, GSP amendments, supporting information, monitoring data, other pertinent information, annual reports, and periodic evaluations to DWR as required by SGMA and the SGMA Regulations.

(c) The Plan Manager has no authority to take any action on behalf of the GSAs or a particular GSA without the specific direction and authority of the GSAs or the particular GSA, respectively.

Article 3. Responsibilities and Procedures – § 357.4(b)(2)

§3.1 Responsibility of the Parties

The Parties shall work collaboratively to comply with SGMA, the SGMA Regulations, and this Agreement in the implementation of their GSPs. This Agreement does not otherwise affect each Party's responsibility to implement the terms of its respective GSP. Rather, this Agreement is a mechanism through which the Parties will coordinate portions of the multiple GSPs to ensure such GSP coordination complies with SGMA and the SGMA Regulations.

§3.2 Procedure for Timely Exchange of Information

The Parties will continue to exchange information through collaboration and/or informal requests made among staff for the member agencies of the Parties. Nothing in this Agreement shall be construed to prohibit any Party from requesting or exchanging information with any other Party by any other informal or formal means.

§3.3 Procedure for Dispute Resolution

(a) The Parties agree to mediate any claim or dispute arising under this Agreement or concerning a Party's compliance with the requirements of SGMA before filing any court action ("Dispute"). Any Party may elect not to mediate a Dispute, but if a Party commences a court action without first attempting to resolve the matter through mediation that Party will not be entitled to recover attorneys' fees or costs, even if such fees or costs would otherwise be available to that Party in any such action. A Party will satisfy the requirement for "first attempting to resolve the matter through mediation" by proceeding or otherwise participating in accordance with the entire process set forth in this article.

(b) In the event of a Dispute, or where the Parties cannot reach agreement on any matter arising under this Agreement or concerning a Party's compliance with the requirements of SGMA, any Party may issue a Notice of Dispute to the other Parties that describes in detail the claim or disputed matter. Within twenty (20) calendar days from the date of the Notice of Dispute, at least one meeting shall be conducted among the Parties who choose to participate as a good faith attempt to resolve the Dispute informally ("Informal Dispute Resolution").

(c) In the event the Dispute is not resolved through Informal Dispute Resolution within forty-five (45) calendar days from the date of the Notice of Dispute, the Party that issued the initial Notice of Dispute shall provide a separate written notification to all Parties that participated in the Informal Dispute Resolution process which identifies three mediator candidates, each of whom must be an attorney, engineer, or hydrogeologist experienced and familiar with SGMA, to mediate the Dispute ("Formal Dispute Resolution"). All mediator candidates must be unbiased neutrals who are not participants in any of the GSAs in the Basin and who are not officials, officers, employees, contractors, consultants, or agents of any of the Parties to this Agreement or a Parties' member agencies. Within ten (10) days of receiving a written notification initiating Formal Dispute Resolution, all Parties that elect to participate in such Formal Dispute Resolution may provide a written response consenting to one or more of the mediator candidates or identifying up to three additional qualified neutral mediator candidates. Thereafter, if a mediator is not mutually agreed upon by said participating Parties from the combined list within fifteen (15) calendar days, each Party will submit two potential mediators that they would approve and a mediator will be picked by a non-Party through random selection from the Parties' combined lists of remaining mediators. Once initiated, the Formal Dispute Resolution will conclude within forty-five (45) calendar days.

(d) Mediation fees, if any, will be equally divided among the Parties that elect to participate in a mediation. Each Party involved in the mediation will be responsible for its own attorneys' fees and costs.

(e) This article shall not preclude any Party from meeting and conferring with any other Party or Parties to mutually resolve a Dispute prior to requesting or participating in the mediation processes described in this article. This article shall not preclude any Party from seeking a preliminary injunction or other interlocutory relief if necessary to avoid irreparable harm or damages.

(f) For purposes of this article, the Parties agree that up to two (2) representatives from each member agency of each Party may participate in any meetings or discussions related to Informal Dispute Resolution or Formal Dispute Resolution processes.

(g) If the Parties to this Agreement enter into any agreement for the joint exercise of powers or amendment to the Inter-Basin Agreement, they may provide in such agreement or amendment for dispute resolution procedures that may replace, revise, or supplement the procedures in this article.

Article 4. Groundwater Level Data and Monitoring Network – § 357.4(b)(3)(A)

§4.1 Coordinated Monitoring Networks

The Parties have developed coordinated monitoring networks in accordance with SGMA Regulations sections 354.32 through 354.40. The monitoring networks comprise wells included in the California Statewide Groundwater Elevation Monitoring ("CASGEM") Program and other existing monitoring networks maintained by federal, state, and local agencies. Wells were selected based on their adequacy under DWR's regulations and Best Management Practices. A map of the combined network, as well as a table of the included wells, is attached hereto as Appendix 1. A Party may add or remove wells from the monitoring network in its respective GSP by providing written notice to the other Parties and to the Plan Manager. The coordinated monitoring networks are intended to accomplish the following objectives:

(a) demonstrate progress toward achieving measurable objectives described in the respective GSPs;

(b) monitor potential impacts to beneficial uses and users of groundwater in the Basin;

(c) monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds described in the respective GSPs; and

(d) monitor and quantify annual changes in water budget components.

§4.2 Groundwater Elevation Data

Groundwater elevation data to be used for the purposes of estimating changes in groundwater storage, evaluating sustainable management criteria, preparing annual reports, and measuring groundwater sustainability will be collected via the coordinated monitoring networks described in article 4.1 above and Appendix 1 to this Agreement.

Article 5. Coordinated Water Budgets – § 357.4(b)(3)(B)

§5.1 Coordinated Budgets

In accordance with SGMA Regulations section 354.18, the Parties have prepared coordinated water budgets for the Basin, relying on common assumptions and sources of data. The historical water budget in each GSP uses data from water years 1982-2018. The current water budget in each GSP uses data from water years 2011-2018. The projected water budget in each GSP analyzes conditions for water years 2018-2072.

§5.2 Groundwater Extraction Data

Groundwater extractions within the boundaries of the SYRWCD are subject to reporting requirements imposed by SYRWCD under the Water Conservation District Act (Wat. Code, §§ 74000, *et seq.*). The water budgets utilize those reported numbers within those boundaries. For lands outside the boundaries of SYRWCD, the water budgets estimate extractions by calculating crop evapotranspiration for particular land uses, relying on the same crop duty factors used by the SYRWCD. In addition, for small public water systems (pumping outside of SYRWCD), reported pumping data was utilized from the California Drinking Water Information Clearinghouse ("DRINC"). All Management Areas currently have plans to require well metering, or an alternative approved method, to increase the accuracy of reported groundwater extraction data.

§5.3 Surface Water Supply

The water budgets utilize streamflow gages for the Santa Ynez River and certain tributaries maintained by the United States Geological Survey. For data regarding the Cachuma Project (including releases from Bradbury Dam), the water budgets use data from the United States Bureau of Reclamation. For data regarding State Water Project deliveries, the water budgets use data from the Central Coast Water Authority ("CCWA").

§5.4 Total Water Use

Total water use in the water budgets is calculated using assumptions based on historical estimates provided in Stetson Engineers (1992) *Santa Ynez River Water Conservation District, Water Resources Management Planning Process, Phase I: Baseline Data and Background Information* and groundwater extraction data reported to the SYRWCD. In addition, surface water use for State Water Project and Cachuma Project deliveries are based on records from the CCWA and Reclamation, respectively.

§5.5 Change in Groundwater Storage

The water budgets calculate change in groundwater storage using the data described in this article. For deep percolation of precipitation, the water budgets use the United States Geological Survey's Basin Characterization Model (May 2017; Retrieved October 2020). For subsurface inflows and outflows, modeling was coordinated between the GSAs and the flows across Management Area boundaries are consistently accounted for across the water budgets. Change of groundwater in storage in each Management Area is calculated by 1) developing water level elevation contour maps using representative wells for each reporting period, 2) computing a change in elevation between reporting periods, 3) computing the volume of aquifer this represents, and 4) multiplying a storage coefficient value by the aquifer volume to compute the volumetric change in storage (positive or negative relative to the previous reporting period).

Article 6. Sustainable Yield and Undesirable Results – § 357.4(b)(3)(C)

§6.1 Determination of Sustainable Yield

Sustainable yield is defined in SGMA as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus that can be withdrawn annually from a groundwater supply without causing an undesirable result." As further set forth in the GSPs, each Party has estimated the sustainable yield of its respective Management Area in the Basin by using a calculated water budget and related adjustments based on particular circumstances in each Management Area that may create undesirable results as defined by SGMA and established by the respective GSAs in the Basin.

§6.2 Estimate of Sustainable Yield

The respective GSPs estimate the sustainable yield of the Basin to be 42,070 acre-feet per year (AFY), with 12,870 AFY in the EMA, 2,800 AFY in the CMA, and 26,400 AFY in the WMA. This estimate is subject to future revision based on changes in conditions and additional data regarding water budget components and the potential for undesirable results in the respective Management Areas.

Article 7. Process for Submissions to DWR – § 357.4(d)

§7.1 GSP and Coordination Agreement Submission

The Parties shall submit their respective GSPs to DWR through the Plan Manager in accordance with SGMA and the SGMA Regulations. In accordance with SGMA Regulations section 357.4(c), the Parties intend that adherence to the provisions and procedures set forth in articles 1 through 7 of this Agreement, along with adherence to the provisions and procedures of the Intra-Basin Agreement and the respective GSPs, will provide the necessary platform and mechanisms to ensure that the GSPs, implemented together, will satisfy the requirements of SGMA (including but not limited to Water Code sections 10727.2, 10727.4, and 10727.6) and ensure sustainable groundwater management for the entire Basin.

§7.2 Periodic Evaluations and Plan Amendments

The periodic evaluations required by SGMA Regulations section 356.4, as well as any amendments to any GSP, shall be submitted to DWR through the Plan Manager. A Party intending to amend its GSP shall endeavor in good faith to provide the other Parties with as much advance notice of such activity as practically possible, but in any event no less than what SGMA and the SGMA Regulations require for public notice.

§7.3 Monitoring Data

As provided by SGMA Regulations section 354.40, the Plan Manager shall submit monitoring data on forms provided or approved by DWR and included in the Annual Reports.

§7.4 Annual Reports

Each Party, for its respective GSP, shall endeavor to provide the data and information required by SGMA Regulations section 356.2 to the Plan Manager by January 31 of the year in which an Annual Report is due. Draft annual reports shall be provided by the Plan Manager to the Parties for approval, and the final reports shall be submitted to DWR by the Plan Manager after final approval by the Parties.

Article 8. Coordinated Data Management Systems – § 357.4(e)

The Parties have developed two separate Data Management Systems, one for the EMA and the other for the CMA and WMA, that are capable of storing and reporting information relevant to the development and implementation of the respective GSPs, including Basin monitoring. The Parties will coordinate with the Plan Manager to ensure that these systems collect, store, and report the data necessary for implementation of the GSPs and reporting to DWR.

Article 9. Adjudicated Areas and Adopted Alternatives - § 357.4(f)

As of the Effective Date of this Agreement, no portions of the Basin have been adjudicated or have submitted an alternative to a GSP for DWR approval pursuant to Water Code section 10733.6.

Article 10. Duration, Modification, and Termination

§10.1 Duration of Agreement

This term of this Agreement shall begin on the Effective Date and continue until modified or terminated as provided for in this article.

§10.2 Review and Modification

This Agreement shall be reviewed by the Parties as part of each five-year assessment of the GSPs and may be supplemented, amended, or modified only by the unanimous written agreement of the Parties.

§10.3 Adding Parties

By unanimous written agreement of the existing Parties, a new or additional GSA or GSAs may be added to this Agreement if such entity or entities will submit a GSP within the Basin.

§10.4 Termination/Withdrawal

This Agreement may be terminated by the unanimous written approval of the Parties. Upon thirty (30) calendar days written notice to the other Parties, any Party may withdraw from this Agreement, and the Agreement shall remain in effect for the remaining Parties.

Article 11. Groundwater Rights

The Parties agree that nothing in this Agreement represents or should be construed as the determination of any claim or assertion of a groundwater right; specifically, the Parties agree that the coordinated water budget information or data does not amount to an allocation, or otherwise represent a determination, validation, or denial of any claimed or asserted groundwater right.

Article 12. General Provisions

§12.1 Entire Agreement

This Agreement incorporates the entire and exclusive agreement of the Parties with respect to the matters described herein and supersedes all prior negotiations and agreements (written, oral, or otherwise) related thereto; provided, however, this Agreement does not amend or modify the WMA MOA, the CMA MOA, the EMA MOA, or the Intra-Basin Agreement, as those documents may be amended or supplemented. The Recitals set forth above are hereby incorporated into this Agreement.

§12.2 Execution in Counterparts

This Agreement may be executed in two or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

§12.3 Notices

Any formal notice required or other formal communication given under the terms of this Agreement will be in writing to all of the Parties and will be given personally, by electronic mail (email), by certified mail (postage prepaid and return receipt requested), or by express courier (with confirmation of receipt). The date of receipt of any written notice provided hereunder will be the date of actual personal service, email, or courier service, or three days after the postmark on certified mail.

§12.4 Counsel

The Parties recognize that as of the Effective Date, independent legal counsel has not been retained to represent any of the three Parties. The Parties agree that the participation of counsel for any individual member agency of a Party in matters related to this Agreement will not be construed to create an attorney-client relationship or a duty of loyalty between the attorney and any Party, and no such relationship will be deemed to arise by implication as a result of this Agreement. The provisions of this article will not be affected in the event that any or all of the Parties determine(s) to retain independent legal counsel.

Date: 12-14-21

Chris Brooks

Western Management Area GSA
By: Chris Brooks
Its: Chairperson

Date: 12/14/2021

E. Andrisek

Central Management Area GSA
By: Edwald Andrisek
Its: Chairperson

Date: 12/20/2021

J Brett Marymee

Eastern Management Area GSA
By: J. Brett Marymee
Its: Chairperson

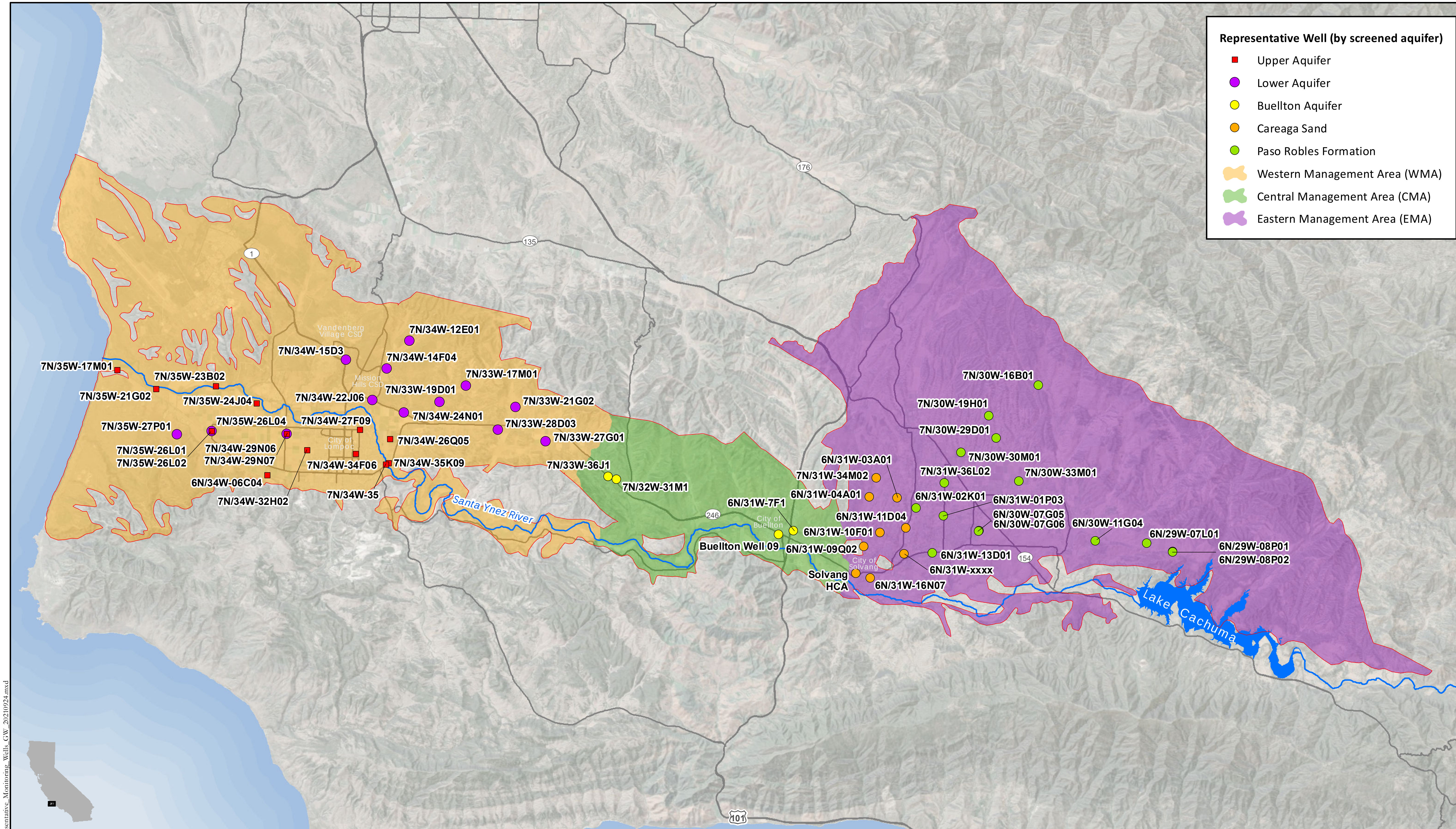
Appendix 1.
Representative Monitoring Wells for Groundwater Levels in Santa Ynez River Valley Groundwater Basin

Management Area	Subarea	State ID	Principal Aquifer
CMA	Buellton Upland	7N/33W-36J1	Buellton
CMA	Buellton Upland	7N/32W-31M1	Buellton
CMA	Santa Ynez Alluvium	6N/31W-7F1	Buellton
CMA	Santa Ynez Alluvium	6N/32W-12K2	Buellton
WMA	Lompoc Plain	7N/34W-35K9	Upper
WMA	Lompoc Plain	7N/34W-26Q5	Upper
WMA	Lompoc Plain	7N/34W-34F6 (Lompoc 2)	Upper
WMA	Lompoc Plain	7N/34W-27F9	Upper
WMA	Lompoc Plain	6N/34W-6C4	Upper
WMA	Lompoc Plain	7N/34W-29N6	Upper
WMA	Lompoc Plain	7N/35W-26L01	Upper
WMA	Lompoc Plain	7N/35W-26L02	Upper
WMA	Lompoc Plain	7N/35W-24J4	Upper
WMA	Lompoc Plain	7N/35W-21G2	Upper
WMA	Lompoc Plain	7N/35W-17M1	Upper
WMA	Lompoc Plain	7N/34W-32H2	Upper
WMA	Lompoc Plain	7N/35W-23B2	Upper
WMA	Lompoc Plain	7N/35W-26L04	Lower
WMA	Lompoc Plain	7N/34W-29N7	Lower
WMA	Lompoc Plain	7N/34W-24N1	Lower
WMA	Lompoc Plain	7N/34W-22J6	Lower
WMA	Santa Rita Upland	7N/33W-28D3	Lower
WMA	Santa Rita Upland	7N/33W-21G2	Lower
WMA	Santa Rita Upland	7N/33W-27G1	Lower
WMA	Lompoc Terrace	7N/35W-27P01	Lower
WMA	Lompoc Upland	7N/34W-15D3	Lower
WMA	Lompoc Upland	7N/34W-14F4	Lower
WMA	Lompoc Upland	7N/33W-17M1	Lower

Appendix 1.
Representative Monitoring Wells for Groundwater Levels in Santa Ynez River Valley Groundwater Basin

Management Area	Subarea	State ID	Principal Aquifer
WMA	Lompoc Upland	7N/33W-19D1	Lower
WMA	Lompoc Upland	7N/34W-12E1	Lower
EMA	Santa Ynez Upland	6N/29W-07L01	Paso Robles
EMA	Santa Ynez Upland	6N/29W-08P01	Paso Robles
EMA	Santa Ynez Upland	6N/29W-08P02	Paso Robles
EMA	Santa Ynez Upland	6N/30W-07G05	Paso Robles
EMA	Santa Ynez Upland	6N/30W-07G06	Paso Robles
EMA	Santa Ynez Upland	6N/30W-11G04	Paso Robles
EMA	Santa Ynez Upland	6N/31W-01P03	Paso Robles
EMA	Santa Ynez Upland	6N/31W-02K01	Paso Robles
EMA	Santa Ynez Upland	6N/31W-13D01	Paso Robles
EMA	Santa Ynez Upland	7N/30W-16B01	Paso Robles
EMA	Santa Ynez Upland	7N/30W-19H01	Paso Robles
EMA	Santa Ynez Upland	7N/30W-29D01	Paso Robles
EMA	Santa Ynez Upland	7N/30W-30M01	Paso Robles
EMA	Santa Ynez Upland	7N/30W-33M01	Paso Robles
EMA	Santa Ynez Upland	7N/31W-36L02	Paso Robles
EMA	Santa Ynez Upland	7N/31W-34M02	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-03A01	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-04A01	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-09Q02	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-10F01	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-11D04	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-16N07	Careaga Sand
EMA	Santa Ynez Upland	6N/31W-xxxx1	Careaga Sand
EMA	Santa Ynez Upland	Solvang HCA1	Careaga Sand

FIGURE 1



REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

STETSON ENGINEERS INC.

GSI Water Solutions, Inc.

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

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

EMA Santa Ynez River Valley Groundwater Basin Eastern Management Area Groundwater Sustainability Agency

DRAFT

0 2 4 Miles

N

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

Document Path: J:\jn2735\Representative_Monitoring_Wells_GW_20210924.mxd

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Chapter 1 – Introduction and Plan Area

Appendix 1c-A:

Draft Final Public Outreach and Engagement Plan,
Central Management Area,
Dated February 2020

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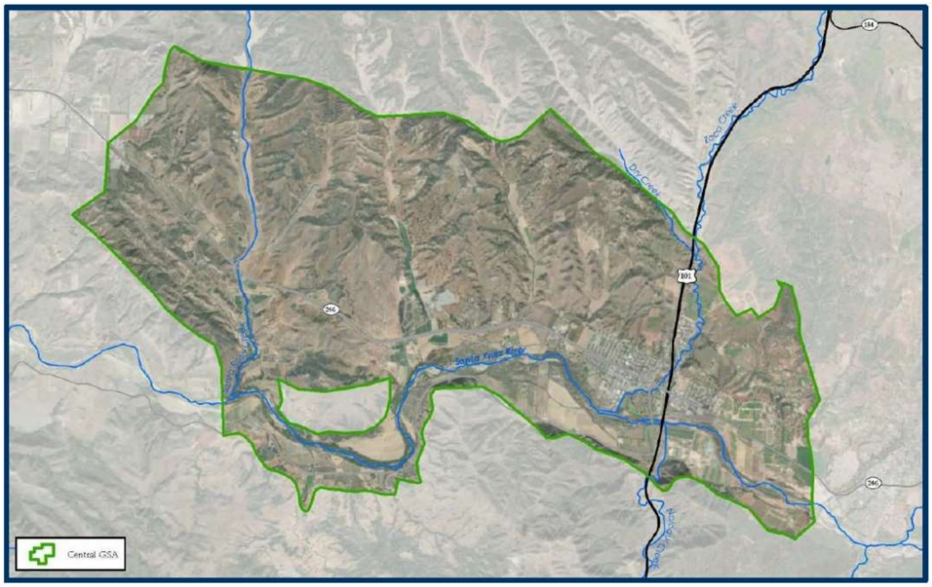
DRAFT FINAL
PUBLIC OUTREACH AND ENGAGEMENT PLAN



CMA

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

Prepared by:

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants

FEBRUARY 2020

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FIGURES

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GLOSSARY OF TERMS/ABBREVIATIONS

Acronym/Abbreviation	Definition
Aquifer	An underground layer of water-bearing permeable rock, rock fractures or unconsolidated material (gravel, sand, or silt) that yields significant amounts of groundwater to wells or springs (Department of Water Resources Bulletin 118)
CAG	Citizen Advisory Group
CMA	Santa Ynez River Valley Groundwater Basin Central Management Area
COB	City of Buellton
Committee	Central Management Area Groundwater Sustainable Agency Committee
DWR	California Department of Water Resources
EMA	Santa Ynez River Valley Groundwater Basin Eastern Management Area
Engagement	Efforts made to understand and involve stakeholders and their concerns in activities and decisions of the Groundwater Sustainability Agency
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
SGMA	Sustainable Groundwater Management Act of 2014
Stakeholder	An individual or entity interested or affected by the Groundwater Sustainability Plan
SWRCB	State Water Resources Control Board
SYRVGB	Santa Ynez River Valley Groundwater Basin
SYRWCD	Santa Ynez River Water Conservation District
SBCWA	Santa Barbara County Water Agency
WMA	Santa Ynez River Valley Groundwater Basin Western Management Area

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1 BACKGROUND ON SUSTAINABLE GROUNDWATER MANAGEMENT ACT

The Sustainable Groundwater Management Act (SGMA), signed into law by Governor Jerry Brown on September 16, 2014, created a new framework for groundwater management in California. The framework includes a structure and schedule to achieve sustainable groundwater management within 20 years. The California Department of Water Resources (DWR) has historically managed the state's central repository for groundwater data. Under SGMA, DWR provides guidance, financial assistance, and technical support for compliance with state requirements. The State Water Resources Control Board (SWRCB) provides the regulatory backstop under SGMA, taking over basin management and assessing fees if local groundwater management is not successful in complying with the requirements of SGMA.

SGMA established a new structure for local groundwater management through Groundwater Sustainable Agencies (GSAs). The formation of GSAs for all basins that the DWR designated as high and medium priority groundwater basins was required by July 1, 2017. Each GSA for these high and medium priority basins must then develop a Groundwater Sustainability Plan (GSP) that details how sustainable groundwater management will be achieved within 20 years of implementing the GSP. Sustainable groundwater management is defined by SGMA as *the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results*. This avoidance of undesirable results is measured through six sustainability indicators:

1. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon,
2. Significant and unreasonable reduction of groundwater storage,
3. Significant and unreasonable seawater intrusion,
4. Significant and unreasonable degradation of water quality,
5. Significant and unreasonable land subsidence, and
6. Depletion of interconnected surface water and groundwater that has significant and unreasonable adverse impacts on beneficial uses of the surface water.

The GSP is a tool used to help the GSA sustainably manage the basin. The criteria for sustainable management, including determining what is significant and unreasonable within the parameters of SGMA for the groundwater basin managed by that GSA, must be assessed, with input from stakeholders, before the GSP can be adopted.

1.1 Sustainable Groundwater Management Act Requirements for Stakeholder Engagement

Stakeholder engagement is an important component of any successful long-term planning effort and is required by the SGMA (Sections 10720–10730) and GSP Regulations (Section 353–354). Each GSA shall encourage and support active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin (Section 10727.8). The GSA must also allow for voluntary participation by Native American tribes and the federal government (Section 10720.3). The GSA may appoint and consult with an advisory committee (Section 10727.8) and must consider the interests of all beneficial uses and users of groundwater within the basin (Section 10723.2).

Engaging members of the public in groundwater sustainability planning can improve public understanding of the technical, financial and political considerations the GSA factors into their decision-making process. Participation by the public can also improve the GSA's understanding of the potential impacts of their decisions. SGMA recognized the importance of stakeholder engagement and laid out specific requirements for stakeholder engagement within each of the following four phases of SGMA:

Phase 1: GSA Formation and Coordination

- Establish and maintain a list of interested parties (Section 10723.4).
- Provide public notice of the GSA formation (Section 10723[b]).
- Conduct a GSA formation public hearing (Section 10723[b]).
- Notify DWR of the GSA formation (Section 10723[b]).
- Provide a written statement to DWR as well as the cities and counties within the GSA boundary, describing how interested parties may participate in the GSP development (Section 10727.8).

Phase 2: GSP Preparation and Submission

- Submit initial notification of intent to prepare a GSP (Section 353.6).
- Prepare a GSP that considers beneficial uses and users of groundwater when describing undesirable results, minimum thresholds, projects and actions (Section 10727.8, Section 10723.2, and Section 354.10).
- The GSP must include a communication section that includes the following (Section 354.10):
    - Explanation of the GSA's decision-making process;
    - List of public meetings at which the GSP was discussed;
    - Identification of opportunities for public engagement and a discussion of how public input and response will be used;
    - Description of how the GSA encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin;

  - Description of how the GSA will inform the public about progress implementing the GSP, including the status of projects and actions.
- Public noticing and public meeting procedures prior to adopting, submitting, or amending a GSP (Section 10728.4).

Phase 3: GSP Review and Evaluation

- Upon GSA adoption of the GSP and submittal to DWR, the GSP will be available on the DWR website for a 60-day public comment period. Any person may provide comments to the DWR on the GSP. DWR will consider the comments received prior to completing their evaluation and assessment of the GSP (Section 353.8).

Phase 4: Implementation and Reporting

- SGMA requires assessments and re-evaluation of the GSP at least every 5- years.
- GSA's must provide public notice and hold public meetings prior to amending the GSP (Section 10730).
- Public notice is required before the GSA imposes or increases fees (Section 10730). The GSA must also follow other applicable laws and regulations associated with the assessment of fees including the requirements of Proposition 218.

Appendix A to this document includes a table with the statutory requirements to assist the GSA in tracking progress towards meeting the requirements throughout each of the four phases.

2 SANTA YNEZ RIVER VALLEY BASIN

The Santa Ynez River Valley Groundwater Basin (SYRVGB), as described in DWR Bulletin 118, lies under approximately 319 square miles of land in the Santa Ynez Valley in Santa Barbara County. The boundaries of the SYRVGB, as determined by DWR, are the Purisima Hills on the northwest, the San Rafael Mountains on the northeast, the Santa Ynez Mountains to the south, and the Pacific Ocean on the west. The SYRVGB has established the following three management areas:

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

As described in Bulletin 118, the CMA includes the Buellton Upland, the WMA, is comprised of the Lompoc Plain, Lompoc Terrace, Lompoc Upland and Santa Rita Valley, and the EMA includes the Santa Ynez Upland. Each Management Area also contains their respective section of the Santa Ynez River alluvium. Figure 1 shows the SYRVGB boundaries and the three management areas and Figure 2 shows the CMA boundaries. Local agencies within the management areas collaborated to form GSAs for each of the management areas in accordance with the Memorandum of Understanding for Implementation of the SGMA in the Santa Ynez River Valley

Groundwater Basin dated May 23, 2016. The three GSAs have continued to coordinate and have entered into an Intra-Basin Administrative Agreement for Implementation of the SGMA in the Santa Ynez River Valley Groundwater Basin. The three GSAs will enter into a formal SGMA compliant coordination agreement prior to submittal of the GSPs to DWR.

Figure 1: Santa Ynez River Valley Groundwater Basin and Management Areas Boundaries

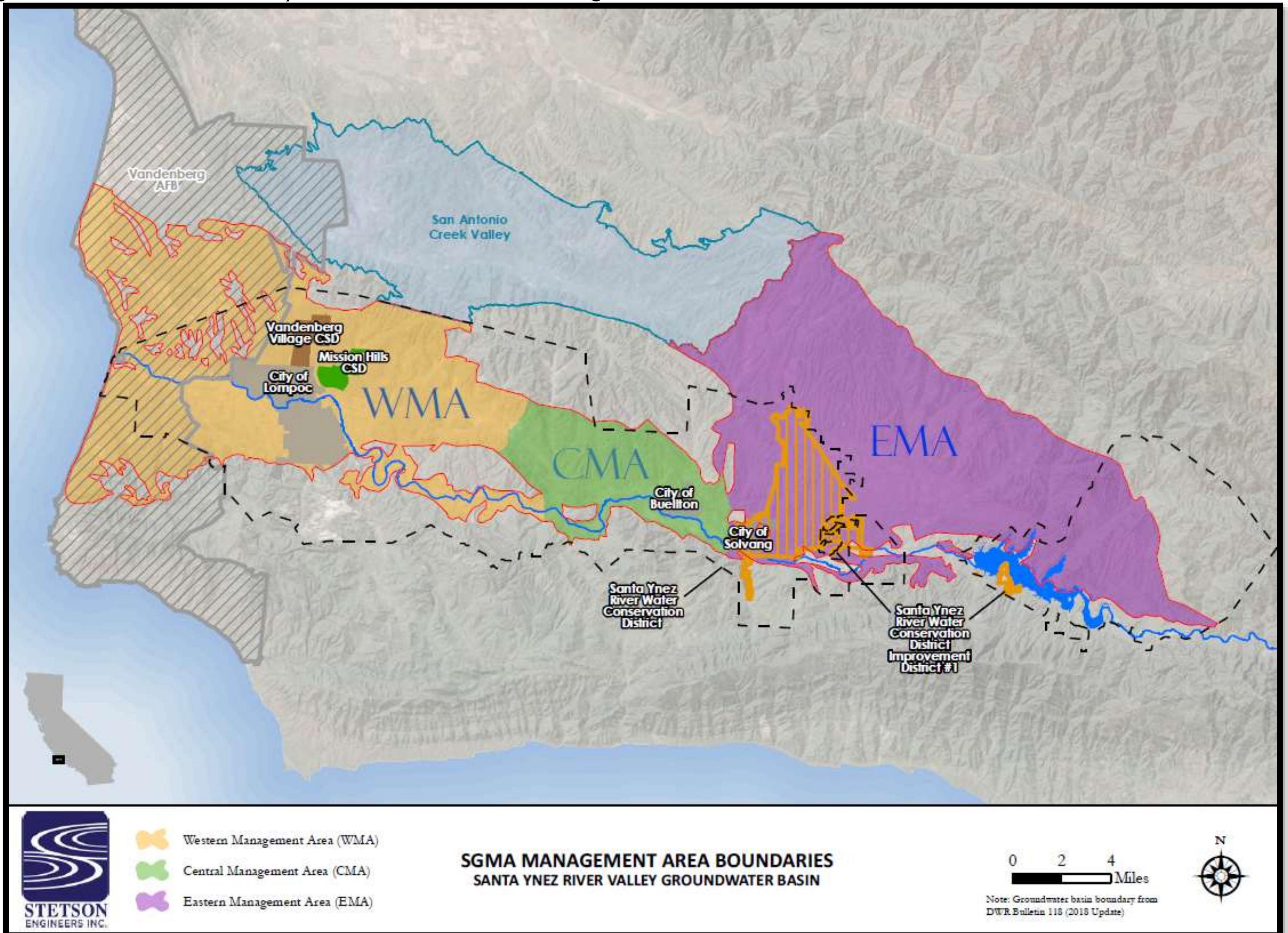
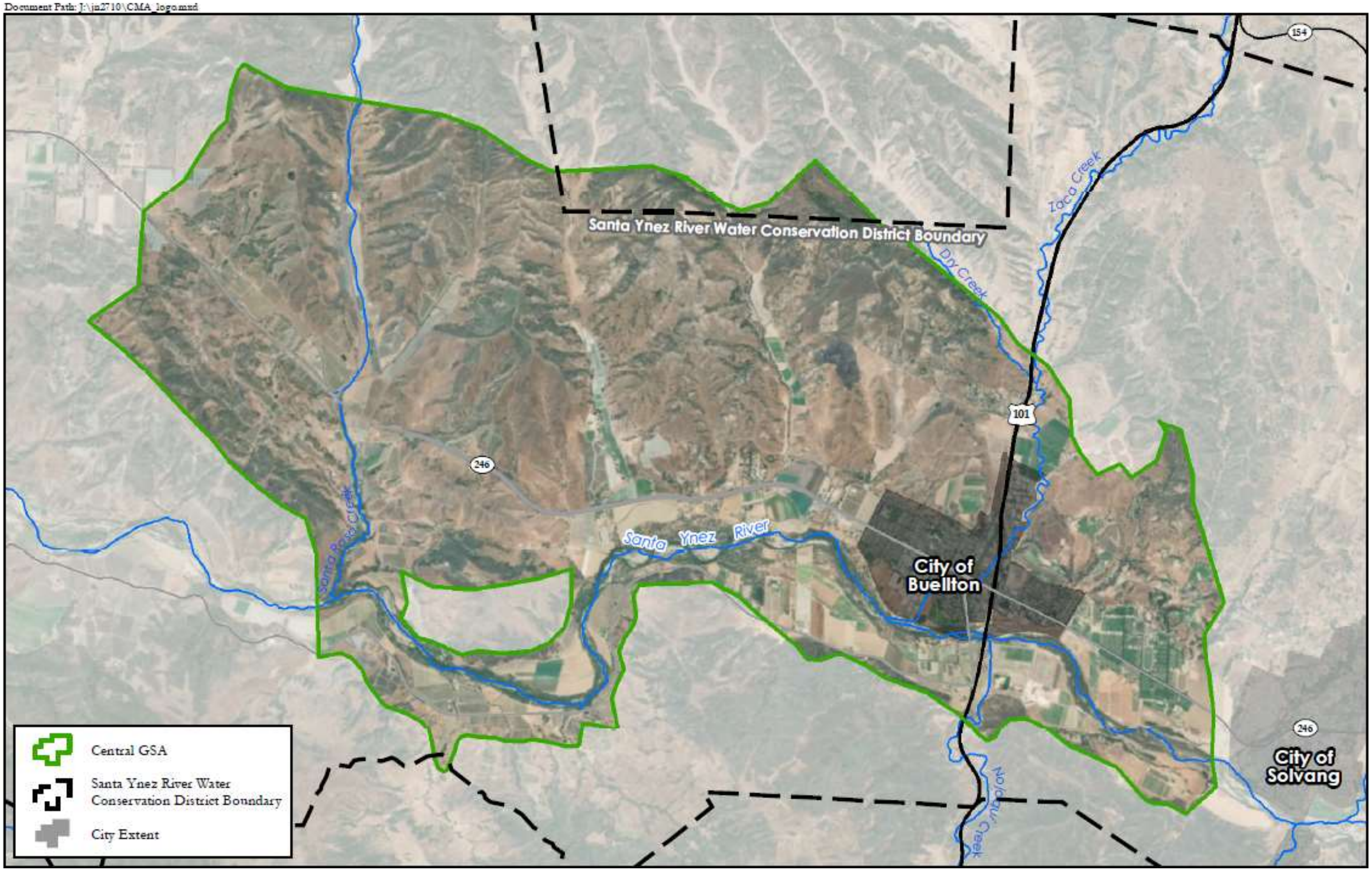


Figure 2: Central Management Area Boundary



3 CENTRAL MANAGEMENT AREA

Land use within the CMA is approximately 95% agriculture with a small amount of residential, commercial and industrial uses in the county unincorporated areas and the City of Buellton comprising nearly 5% of the land over the CMA. The CMA includes the Santa Ynez River alluvial deposits and those of the older Buellton Uplands. For the most part, the water bearing alluvial deposits have limited hydrologic contact with those of the uplands. In addition to the Santa Ynez River alluvium, the CMA includes the Buellton Uplands. The Santa Ynez River Water Conservation District (SYRWCD) jurisdiction includes the entire CMA. The SYRWCD, formed in 1939, has the responsibility of administering and protecting water uses within the SYRVGB. In conjunction with the groundwater replenishment in the CMA, Santa Ynez River water is stored in Cachuma Reservoir in accordance with the SWRCB Order WR 89-18. Releases from Cachuma Reservoir replenish the alluvial groundwater basin based on the accrual of credits water stored in the Above Narrows account in the Reservoir. Within the CMA, the City of Buellton has contracted for imported water from the State Water Project.

3.1 Stakeholders and Interested Parties

Interested parties and stakeholders in the CMA include residents, domestic well owners, public agency representatives, landowners, non-governmental organizations, agricultural well owners, and business owners. Any member of the public can request (in writing) to be added to the list of interested parties and receive updates via email. Stakeholders can also subscribe to the interested parties list at www.santaynezwater.org.. In November 2019, the email addresses of the stakeholders and interested parties identified during the GSA formation and subsequent GSA activities were merged into a centralized email distribution list through www.santaynezwater.org. This list will be updated as individuals subscribe and unsubscribe through the website. This master list of stakeholders and interested parties will be used to distribute meeting announcements and important updates including the availability of documents for review and comment. A list of beneficial uses and users of groundwater within the CMA is included as Appendix B. Appendix C includes a detailed indexed map of the CMA so individuals can identify whether or not they reside within the CMA.

3.2 Central Management Area Groundwater Sustainability Agency Formation

The CMA GSA was formed on January 11, 2017, through a Memorandum of Agreement between the City of Buellton, the SYRWCD, and the Santa Barbara County Water Agency. The CMA filed a notice of intent to form a GSA with the DWR and became the exclusive GSA for the CMA in May 2017.

3.3 Decision-Making Process

CMA GSA member agencies formed a GSA Committee, comprised of a representative appointed from each member agency. The CMA GSA Committee (Committee) is responsible for implementing the requirements of SGMA including overseeing the development of a CMA GSP and coordinating activities between the agencies and GSAs within the SYRVGB. The members appointed by the City of Buellton and the SYRWCD each have one vote and representatives from both agencies must be present for a quorum at Committee meetings. A representative, appointed by the Santa Barbara County Water Agency participates in the Committee as a non-voting member.

3.4 Central Management Area Groundwater Sustainability Plan

The Committee hired a consultant team to develop a GSP in compliance with SGMA for adoption by the GSA and submittal to DWR by January 1, 2022.

4 PURPOSE

This Public Outreach and Engagement Plan has been developed as a communication tool to help stakeholders understand the importance of participation in groundwater sustainability planning and lay the framework of how stakeholders can actively engage in the GSA and GSP planning efforts.

In 2018, DWR released a guidance document for GSP Stakeholder Communication and Engagement that details best practices including the development of Communication and Engagement Plans to increase transparency in the GSP development process. The Committee will prepare a GSP for the CMA in accordance with the SGMA, to guide future management decisions. Example management decisions include: the amount of water that can be pumped from the CMA without causing undesirable results; and new project development to enhance water resource management. The SGMA act, as well as the state agencies implementing SGMA (DWR, SWRCB), have mandated public and stakeholder outreach and engagement during GSP development. The Committee supports and encourages active involvement from diverse social, cultural, and economic groups within the SYRVGB to ensure relevant and interested stakeholders and the public are involved throughout the GSP development. This Public Outreach and Engagement Plan provides a framework for clear communication and transparency throughout the GSP development and implementation process. It will be updated as needed.

4.1 Defining Sustainability for the Central Management Area

During GSP development, the Committee will request stakeholder feedback as they develop criteria for "significant and unreasonable" undesirable results for the CMA. The Citizen Advisory Group (CAG) will play a role in reviewing technical information generated for the GSP, from the stakeholder perspective, and is expected to form consensus on key sustainable management recommendations for the Committee's consideration. The Committee may also request feedback from the CAG and stakeholders regarding specific projects and management actions that could be used to sustainably manage groundwater within the CMA.

4.2 Outreach and Engagement Goals

Outreach and engagement for the CMA began during the GSA formation process. Information about the GSA formation was posted on the Santa Barbara County website (https://www.countyofsb.org/pwd/gsa.sbc). Individual landowners and groundwater pumpers within the CMA were contacted directly to discuss requirements of the SGMA and potential future changes to groundwater management in the CMA. The individual CMA member agencies including the City of Buellton and SYRWCD issued public notices of intent of participate in the CMA GSA and held public meetings to receive comments. The Santa Barbara County Board of Supervisors also held a public meeting regarding the formation of the CMA GSA. Public notices, announcing the various meeting and public hearings to form the CMA GSA were also published in the *Santa Barbara News Press*. Additionally, there were one on one meetings held between SYRWCD Staff and several SYRWCD constituent groundwater pumpers to provide information on SGMA and the formation of GSAs in the SYRVGB.

The Committee's goal is to build and maintain a collaborative and inclusive processes for stakeholder engagement and GSP development and to consider the interests of diverse social, cultural, and economic elements of the population within the CMA during development of the GSP. This includes the interests of all beneficial uses and users of groundwater. Collaborative and inclusive processes will assist in making the GSP more resilient by increasing public buy-in, promoting compliance, and enhancing the quality of information on which the GSP is based. The Committee has established an open and ongoing list of interested persons to whom notices are and will be sent regarding meetings of the CMA GSA, GSP development, and other SGMA-related activities. This approach will increase the success of the GSP by fostering early public participation, development of stakeholder supported management strategies, and enhancing the data quality and basis of GSP development. Specifically, the Committee will implement the following tiered outreach strategy to actively engage a diverse group of stakeholders in the development of the GSP:

1. Facilitate engagement of a diverse group of stakeholders in the development of the GSP through the CAG.
2. Provide regular updates on GSP development progress via email to the list of interested parties;
3. Build and maintain a website where stakeholders can obtain CMA GSA information, ask questions, and provide comments; and
4. Hold public meetings where members of the public can ask questions and provide comment.

This four-tiered engagement strategy is designed to give a diverse group of stakeholders multiple forums to participate, as appropriate based on their level of interest, availability, and communication style. The Committee will continuously evaluate stakeholder outreach and engagement goals. The Committee may adjust the engagement strategy and/or provide additional outreach opportunities as needed throughout the GSP development and implementation process.

5 GROUNDWATER SUSTAINABILITY PLAN ENGAGEMENT OPPORTUNITIES

5.1 Staying Informed

The best way for interested parties to get the latest information on the GSP development process is to subscribe to the email distribution list. Interested parties can subscribe to the email distribution list from the CMA GSA's website (www.santaynezwater.org). Additional outreach to beneficial users will be conducted as appropriate to direct users to the website to subscribe to electronic project updates and meeting announcements. Outreach may include announcements with water bills, media releases, announcements through agricultural industry organizations (i.e., The Farm Bureau, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, Santa Barbara County Vintners, the Santa Barbara County Cattlemen's Association and Santa Barbara County Cattlewomen's Association), or other methods as appropriate. Regular communications will be distributed at least quarterly via email throughout the GSP development process. Emails will provide notice of public meetings and other important updates.

5.2 Providing Feedback to the Groundwater Sustainability Agency

Questions and comments regarding the CMA GSA and GSP development process can be sent via the feedback link on the CMA GSA's website (www.santaynezwater.org). All Committee and CAG meetings are open to the public and provide opportunity for the public to comment. The CMA GSA may also hold special meetings or workshops focused on obtaining feedback on components of the GSP. The CMA GSA will provide members of the public opportunities to provide comment on the GSP before adoption. Comments on the GSP are requested in writing, in electronic format, through the online comment form. Comments on the GSP that are entered into the online comment form will be submitted to DWR as part of the public record along with a summary of how the comments were considered and/or incorporated in the final GSP. Electronic links to the online comment form will be provided to interested parties via email and via public notice for the public at-large. The public and stakeholders will be provided with information about the timeframe and process for submitting electronic, written comments. If needed, Staff will provide assistance in completing the online comment submittal form (contact information provided in section 6). Notice of opportunities to comment will also be posted on the CMA GSA website (www.santaynezwater.org).

5.3 Citizen Advisory Group Representation

The purpose of a CAG is to provide additional public input to the Committee, representative of various categories of groundwater uses and users within the CMA, as set forth by the SGMA. In addition to providing their individual perspectives, CAG members serve in respective capacities, representing different categories of groundwater uses and users in the CMA. All CAG members are expected to work collaboratively with each other, with at-large stakeholders and members of the public, with the Committee, with staff of the member agencies of the CMA GSA, with the other GSAs within the SYRVGB, related agencies, and agency staff members. At various points during development of the GSP, the CAG may be asked to provide perspective on elements or sections of the GSP and on the final draft of the GSP. Stakeholders can obtain additional information about the CAG by emailing cma.gsa.syrgb@gmail.com.

5.4 Groundwater Sustainability Plan Engagement Summary

Expected roles, responsibilities, and opportunities for engagement throughout the GSP development process are summarized in Figure 3. The Committee may provide additional opportunities or adjust the process as needed to meet the needs of stakeholders and/or the requirements of SGMA.

Figure 3: Groundwater Sustainability Plan Development Roles and Responsibilities

Groundwater Sustainability Plan Development Participants	Roles and Responsibilities for Groundwater Sustainability Plan Development
Central Management Area (CMA) Groundwater Sustainable Agency (GSA) Voting Member Agencies: Santa Ynez River Water Conservation District (SYRWCD) and City of Buellton Santa Ynez River WATER CONSERVATION DISTRICT	• Oversee Groundwater Sustainability Plan (GSP) development • Approve costs and budgets • Conduct public hearings • Consider stakeholder feedback • Adopt the GSP • Provide direction to GSA staff
CMA GSA Non-Voting Member Agency: Santa Barbara County Water Agency	• Participate in GSA meeting and CAG meetings as appropriate • Provide guidance to the GSA
CMA GSA Staff CMA	• Administer the GSA and CAG • Provide notice of public meetings • Manage GSP consultant team

Citizen Advisory Group (CAG) 	• Review technical information • Confer with other groundwater users and interested parties • Provide feedback and recommendations to the CMA GSA
Interested Parties 	• Attend GSA meetings and workshops • Read newsletters • Provide input on draft and final GSP
GSP Consultant Team STETSON ENGINEERS INC. DUDEK Geosyntec consultants	• Develop draft GSP components • Present information and make changes as directed by the GSA • Prepare final CMA GSP

6 CONTACT US

The best way to stay informed and receive the most current information for the CMA GSA and GSP development is to subscribe to the email distribution list. To subscribe, send an email to cma.gsa.syrgb@gmail.com. Additional information may be obtained by contacting:

- **Name:** Bill Buelow
- **Title:** SGMA Program Manager
- **Phone Number:** 805.693.1156 ext. 403
- **Direct Email:** bbuelow@syrwcd.com
- **Website:** www.santaynezwater.org

APPENDIX A: SUSTAINABLE GROUNDWATER MANAGEMENT ACT REQUIREMENTS FOR PUBLIC OUTREACH AND ENGAGEMENT

Public outreach and engagement are an important component of any successful long-term planning effort and is required by the Sustainable Groundwater Management Act (SGMA) (Sections 10720–10730) and Groundwater Sustainability Plan (GSP) Regulations (Sections 353–354). This appendix provides a quick reference to how the Central Management Area (CMA) Groundwater Sustainable Agency (GSA) will meet these requirements.

Sustainable Groundwater Management Act Requirement	Central Management Area GSA
The Groundwater Sustainable Agency (GSA) must encourage and support active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin. (Sustainable Groundwater Management Act [SGMA] Section 10727.8)	Implement a tiered outreach strategy as discussed in Section 4.1 of this plan.
The GSA must also allow for voluntary participation by Native American tribes and the federal government (SGMA Section 10720.3).	The Santa Ynez Band of Chumash Indians are a participant in the Eastern Management Area (EMA) and EMA Citizen Advisory Group (CAG).
The GSA must consider the interests of all beneficial uses and users of groundwater within the basin (SGMA Section 10723.2).	CAG representation as discussed in section 5.3 of this plan.
The GSA may appoint and consult with a CAG (SGMA Section 10727.8)	CAG formation as discussed in section 5.3 of this plan.
Establish and maintain a list of interested parties (SGMA Section 10723.4).	See discussion under section 3.1 of this plan.
Provide public notice of the GSA formation (SGMA Section 10723[b]).	Completed on October 28, 2016; November 22, 23, 29, and 30 2016; December 28, 2016;
Notify Department of Water Resources (DWR) of the GSA formation (SGMA Section 10723(b).	Uploaded to DWR Portal on February 15, 2017
Conduct a GSA formation public hearing (SGMA Section 10723(b).	Public hearings were conducted on November 8 (all Central Management Area entities) November 10, 2016 (City of

Sustainable Groundwater Management Act Requirement	**Central Management Area GSA**
	Buellton [COB]) and December 6, 2016 (County); and January 11, 2017 (Santa Ynez River Water Conservation District [SYRWCD])
Provide a written statement to DWR as well as the cities and counties within the GSA boundary, describing how interested parties may participate in the GSP development (SGMA Section 10727.8).	Completed on May 16, 2018
Submit initial notification of intent to prepare a GSP (GSP Regulations Section 353.6).	Completed on May 16, 2018
Prepare a GSP that considers beneficial uses and users of groundwater when describing undesirable results, minimum thresholds, projects and actions (SGMA Section 10727.8, Section 10723.2, and GSP Regulations Section 354.10). The GSP must include a communication section that includes the following (GSP Regulations Section 354.10): • Explanation of the GSA's decision-making process; • List of public meetings at which the GSP was discussed; • Identification of opportunities for public engagement and a discussion of how public input and response will be used; • Description of how the GSA encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin; • Description of how the GSA will inform the public about progress implementing the Plan, including the status of projects and actions.	To be completed in the draft and final GSP.
Public noticing and public meeting procedures prior to adopting, submitting, or amending a GSP (SGMA Section 10728.4).	To be completed in the draft and final GSP.

Sustainable Groundwater Management Act Requirement	Central Management Area GSA
Upon GSA adoption of the GSP and submittal to DWR, the GSP will be available on the DWR website for a 60-day public comment period. Any person may provide comments to the DWR on the GSP. DWR will consider the comments received prior to completing their evaluation and assessment of the GSP (GSP Regulations Section 353.8).	To be completed by DWR.
GSA's must provide public notice and hold public meetings prior to amending the GSP (SGMA Section 10730).	To be completed as discussed in the final GSP.
Public notice is required before the GSA imposes or increases fees (SGMA Section 10730).	To be completed as discussed in the final GSP.

APPENDIX B: LIST OF BENEFICIAL USES AND USERS

In accordance with Section 10723.2 and Section 10723.8 (a)(4) of the Sustainable Groundwater Management Act (SGMA), the following parties have or will be contacted to determine how best to consider and protect their interests throughout the formation of the Groundwater Sustainable Agency (GSA), development of a Groundwater Sustainability Plan (GSP), and implementation of the GSP.

These interests include, but are not limited to the following:

(a) Holders of overlying groundwater rights, including (1) agricultural users and (2) domestic water-well owners: The City of Buellton (COB) and Santa Ynez River Water Conservation District (SYRWCD) are GSA members. Domestic water-well owners and agricultural users are serving as the Central Management Area (CMA) GSA Citizen Advisory Group (CAG).

(b) Municipal Well Operators: The COB is a member of the GSA.

(c) Public Water Systems: Representatives from several mutual water companies in the CMA were invited to apply to become a member of the CMA GSA CAG.

(d) Local Land Use Planning Agencies: The COB is a member of the CMA GSA and the Santa Barbara County Planning Department, through Santa Barbara County Water Agency, is a member of the CMA GSA.

(e) Environmental Users of Groundwater: The California Department of Fish and Wildlife was added to the list of interested parties and was invited to apply to become a member of the CMA GSA CAG. Environmental Non-Governmental Organizations and the National Marine Fisheries Services are also included on the list of interested parties.

(f) Surface Water Users: SYRWCD calls for water-rights releases under Order from the State of California Water Resources Control Board (SWRCB). The COB pumps groundwater and discharges treated wastewater to the alluvial underflow of the Santa Ynez River. Agricultural interests (i.e., vineyards, orchards, row crops and animal husbandry) that have reported groundwater production with SYRWCD were invited to serve on the CMACAG.

(g) Federal Government: None.

(h) California Native American tribes: None. (Santa Ynez Band of Chumash Indians are in the Eastern Management Area [EMA])

(i) Disadvantaged Communities: There currently are no areas within the CMA GSA that are mapped as Disadvantaged Communities. Areas within the COB have been mapped as Disadvantaged Communities in the past and are represented on the CMA GSA by the COB.

(j) Entities Listed in SGMA Section 10927 that are monitoring groundwater elevations in all or part of the CMA managed by the GSA: The COB monitors its wells and the Santa Barbara County Water Agency is the California State Groundwater Elevation Monitoring agency within the CMA. Both are members of the GSA.

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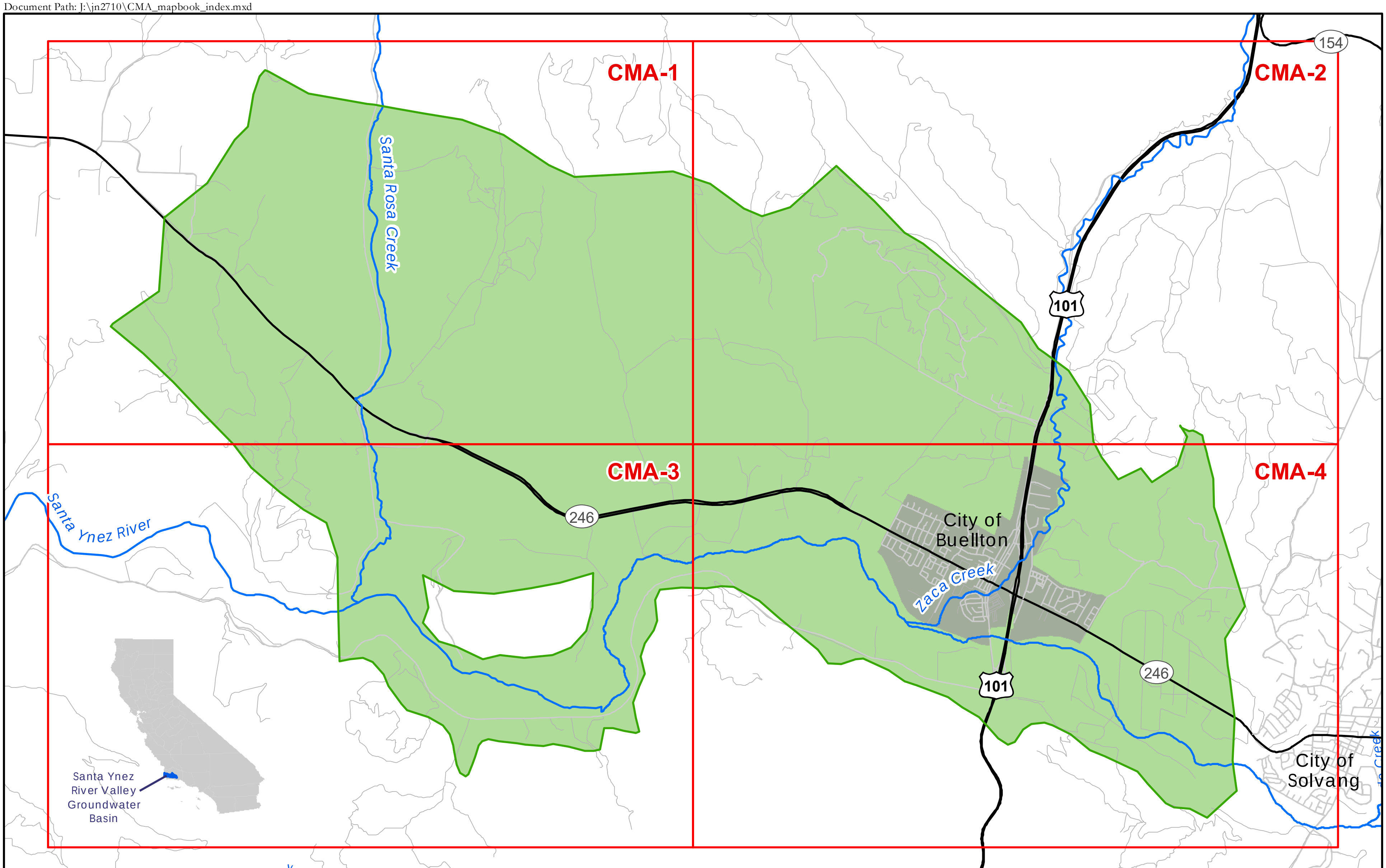

STETSON ENGINEERS INC.

Central GSA

City of Buellton

WESTERN MANAGEMENT AREA BOUNDARY

MAPBOOK INDEX

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY AGENCY

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CMA INDEX

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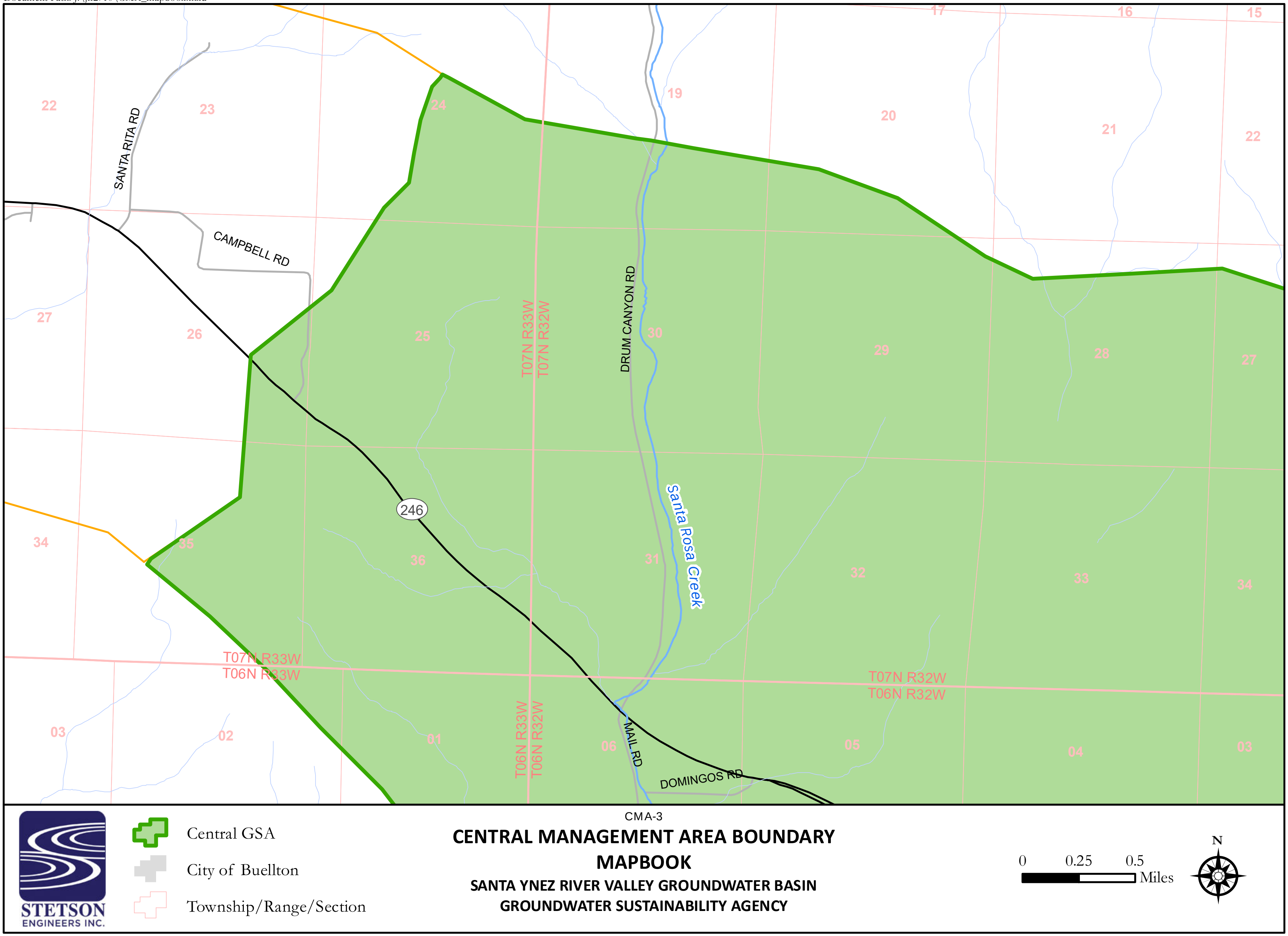
MAP CMA- 1



STETSON ENGINEERS INC.

CENTRAL MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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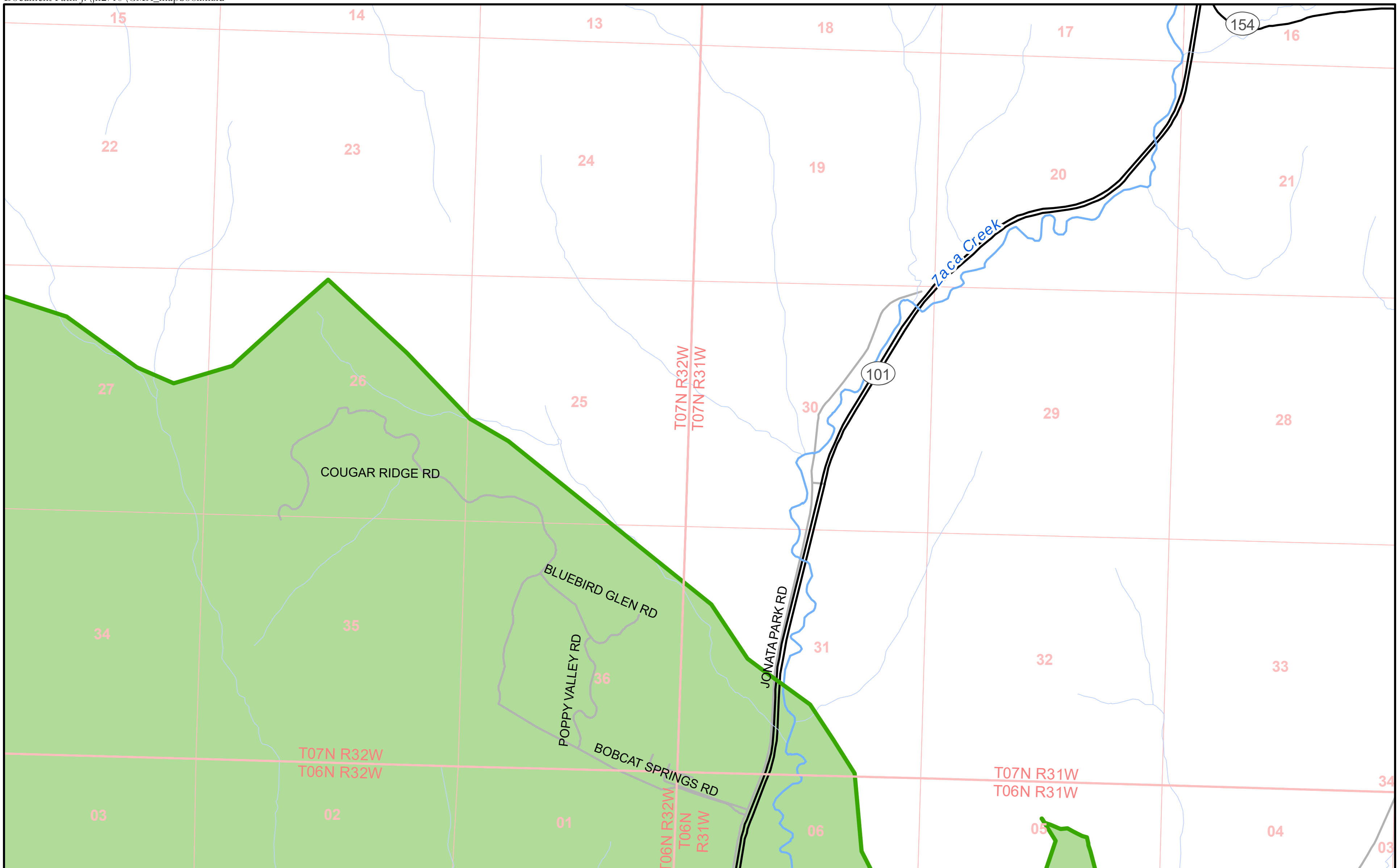
MAP CMA- 2



CMA-4

Central GSA

City of Buellton

Township/Range/Section

CENTRAL MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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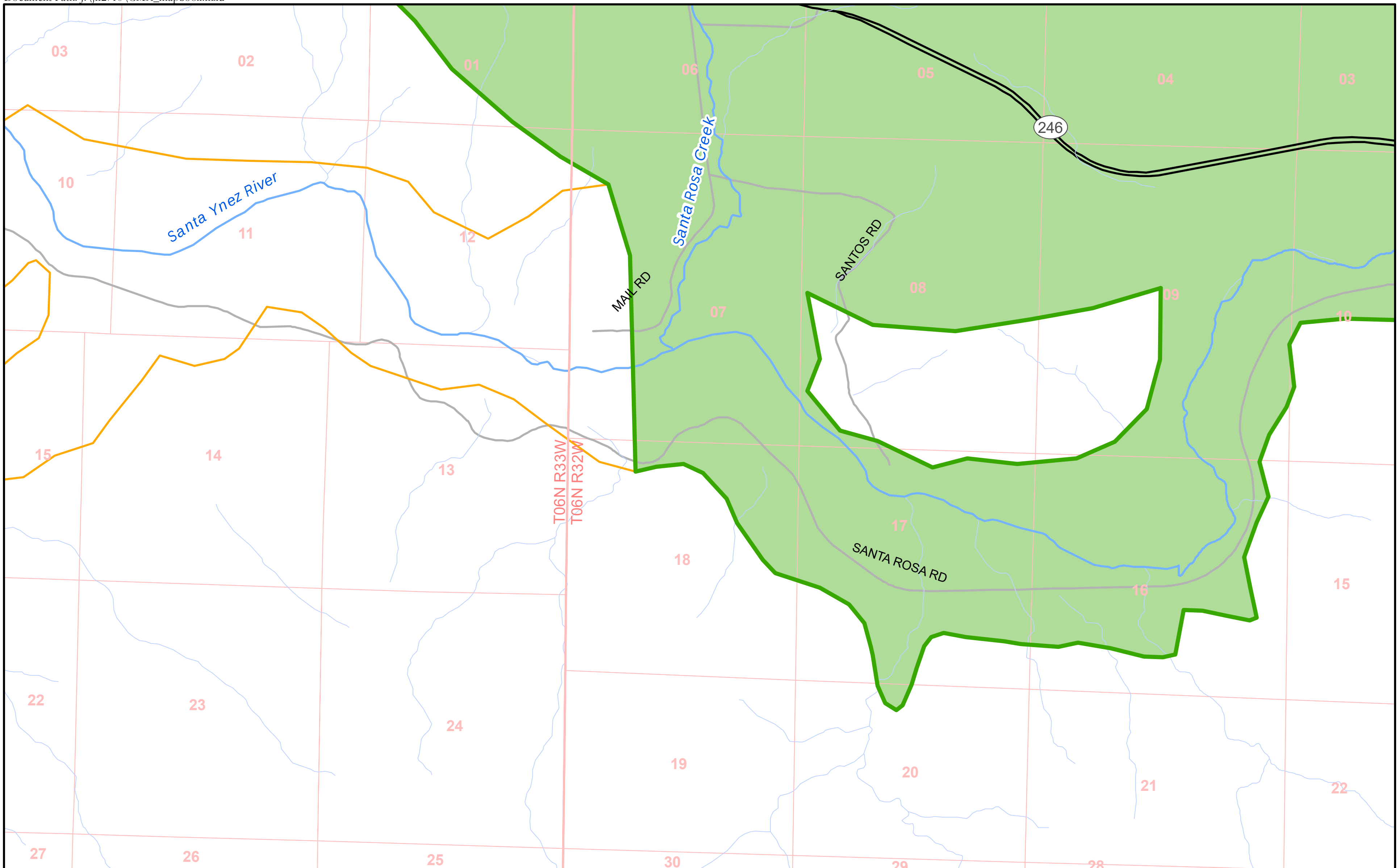
CMA-1

MAP CMA- 3



CMA-4

Central GSA

City of Buellton

Township/Range/Section

CENTRAL MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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STETSON ENGINEERS INC.

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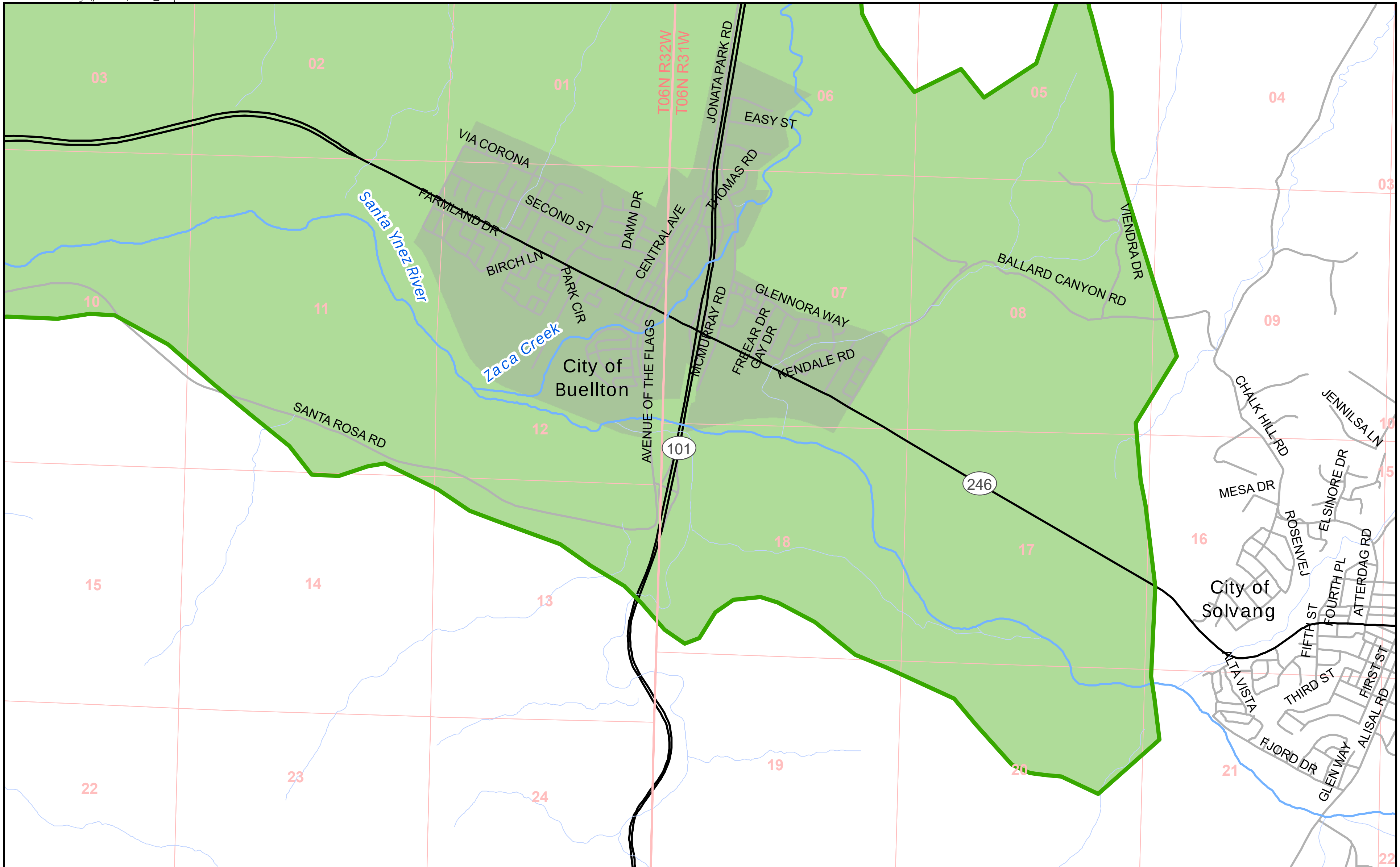
CMA-2

MAP CMA- 4

CMA-3



Central GSA

City of Buellton

Township/Range/Section

CENTRAL MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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STETSON ENGINEERS INC.

Chapter 1 – Introduction and Plan Area

Appendix 1c-B:

Santa Ynez SGMA Meeting List,
as of November 17, 2021

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Summary of SGMA Meetings in the Santa Ynez River Valley Basin		
Area	**Date**	**Organizations / Outreach Type**
CMA	11/8/2016	CMA Agencies / GSA formation Public Meeting (2) - SGMA Required
CMA	11/10/2016	City of Buellton / GSA formation Public Meeting (2) - SGMA Required
WMA	11/17/2016	WMA Agencies / GSA formation Public Meeting (2) - SGMA Required
WMA	12/6/2016	City of Lompoc / GSA formation Public Meeting (2) - SGMA Required
All	12/6/2016	Santa Barbara County Board of Supervisors / GSA formation Public Meeting (2) – SGMA Required
WMA	12/6/2016	Vandenberg Village CSD / GSA formation Public Meeting (2) – SGMA Required
WMA	12/21/2016	Mission Hills Board of Directors / GSA Formation Meeting – SGMA Required
All	1/11/2017	District / GSA formation Public Meeting (2) - SGMA Required
EMA	4/6/2017	ID No 1. / GSA formation Public Meeting (2) – SGMA Required
EMA	4/24/2017	City of Solvang / GSA formation Public Meeting (2) – SGMA Required
EMA	4/27/2016	EMA Agencies / GSA formation Public Meeting (2) - SGMA Required
WMA	5/18/2016	District, Mission Hills CSD Board / SGMA Information Meeting
WMA	7/20/2016	District, Vandenberg Village) CSD and Vandenberg AFB / SGMA Informational Meeting
WMA	9/2/2016	District and Mission Hills CSD Staff / SGMA Informational Meeting
WMA	9/7/2016	Freeport-McMoRan Oil and Gas/ **Letter of intent** to participate (1)
WMA	10/12/2016	Imerys Minerals California, Inc/ **Letter of intent** to participate (1)
WMA	10/17/2016	Vandenberg AFB / **Letter of intent** to participate (1)
WMA	10/26/2016 and 11/3/2016	District and Lompoc Valley Growers Association / SGMA Informational meetings (2)
WMA	11/17/2016	District and VVCSD Staff / SGMA information meeting
CMA	9/1/2016	District and Buellton City Staff / SGMA information meeting
CMA/EMA	2/7/2017	District Staff and Rancheria LLC (Jim Buell and Fred Kelly) / SGMA information meeting
CMA/EMA	2/10/2017	District Staff and Investors of America – (Dierberg and Star Lane Vineyards - Tyler Tomas) / SGMA information meeting
EMA	6/29/2016	District, ID No 1 and Santa Ynez Band of Chumash Indians / SGMA information meeting (2)
EMA	8/19/2016 and 8/21/2017	Santa Ynez Band of Chumash Indians / **Letters of intent** to participate (1)
EMA	1/19/2017	District Staff and Rancho Laguna (Susan Petrovich) / SGMA information meeting
EMA	1/19/2017	District Staff and Midland School (Tom Rogowski) / SGMA information meeting
EMA	1/20/2017	District Staff and Elbar Ranch (John Webster) / SGMA information meeting
EMA	1/20/2017	District Staff and Sycamore Ranch (aka Neverland Ranch – Kyle Forsyth) / SGMA info meeting
EMA	1/20/2017	District Staff and Santa Barbara Thoroughbreds MWC (Bob Sinclair) /SGMA information meeting
EMA	1/23/2017	District Staff and Rancho Visitadores (John Balch) / SGMA information meeting
EMA	1/31/2017	District Staff and Kiani Ranch (Dan Bushman and Cody Delunas) / SGMA information meeting
EMA	2/6/2017	District Staff and Fess Parker Ranch (Eli Parker) / SGMA information meeting
EMA	2/9/2017	District Staff and Chamberlain Ranch (Fred Chamberlain, Mary Hayden, Russell Chamberlain) / SGMA information meeting
EMA	2/10/2017	District Staff and Gainey Ranch (Doug Mosebar) / SGMA information meeting
EMA	2/14/2017	District Staff and Rancho San Juan (Bill Jackson) / SGMA information meeting
EMA	2/16/2017	EMA, MWCs, Public, We Watch / SGMA informational meeting, (2)
All	05/26/2016	**Intent to Participate** in SGMA; Memorandum of Understanding (All SY GSA Agencies)
All	7/26/2017	National Marine Fisheries Service**/ Letter of intent** to participate (1)
All	8/24/2017	District and WE Watch / SGMA Status Meeting (2)
All	12/12/2018	Public Meeting Presentation of SGMA Fact Finding Mission to Denmark by Bill Buelow to Joint Meeting of Boards of Directors of Mission Hills and Vandenberg Village CSDs
All	1/7/2019	Santa Ynez Men's Forum Presentation/SGMA Status
CMA	10/22/2018	GSA Meeting

Summary of SGMA Meetings in the Santa Ynez River Valley Basin		
WMA	10/24/2018	GSA Meeting
EMA	10/25/2018	GSA Meeting
WMA	1/23/2019	GSA Meeting
EMA	1/24/2019	GSA Meeting
CMA	1/28/2019	GSA Meeting
CMA	4/22/2019	GSA Meeting
WMA	4/24/2019	GSA Meeting
EMA	4/25/2019	GSA Meeting
CMA	7/29/2019	GSA Meeting
WMA	7/24/2019	GSA Meeting
EMA	7/25/2019	GSA Meeting
EMA	9/05/2019	CAG Meeting
CMA	9/12/2019	GSA and CAG Meetings
WMA	9/25/2019	GSA Meeting
EMA	9/30/2019	CAG Meeting
WMA	10/9/2019	CAG Meeting
CMA	10/10/2019	CAG Meeting
WMA	10/23/2019	GSA Meeting
EMA	10/24/2019	GSA Meeting
CMA	10/28/2019	GSA Meeting
EMA	1/9/2020	CAG Meeting
CMA	2/24/2020	GSA Meeting
WMA	2/26/2020	GSA Meeting
EMA	2/27/2020	GSA Meeting
CMA	5/18/2020	GSA Meeting
WMA	5/20/2020	GSA Meeting
EMA	5/21/2020	GSA Meeting
EMA	6/2/2020	CAG Meeting
CMA	6/4/2020	CAG Meeting
CMA	6/18/2020	CAG Meeting
WMA	6/24/2020	CAG Meeting
CMA	8/24/2020	GSA Meeting
WMA	8/26/2020	GSA Meeting
EMA	8/27/2020	GSA Meeting
WMA	10/21/2020	GSA Special Meeting HCM Workshop
CMA	10/26/2020	GSA Special Meeting HCM Workshop
CMA	11/11/2020	CAG Meeting
WMA	11/12/2020	CAG Meeting
CMA	11/16/2020	GSA Regular Meeting
WMA	11/18/2020	GSA Regular Meeting
EMA	11/19/2021	GSA Regular Meeting
EMA	12/10/2021	GSA Special Meeting HCM Workshop
EMA	1/21/21	GSA Special Meeting Water Budget and Numeric Groundwater Model
CMA	1/25/2021	GSA Special Meeting
WMA	1/27/2021	GSA Special Meeting
EMA	2/17/2021	GSA Citizens Advisory Group Meeting
CMA	2/22/2021	GSA Regular Meeting
WMA	2/24/2021	GSA Regular Meeting

Summary of SGMA Meetings in the Santa Ynez River Valley Basin		
EMA	2/25/2021	GSA Regular Meeting
WMA	3/16/2021	GSA Citizens Advisory Group Meeting
CMA	3/18/2021	GSA Citizens Advisory Group Meeting
EMA	3/25/2021	GSA Special Meeting
CMA	4/12/2021	GSA Special Meeting
WMA	4/14/2021	GSA Special Meeting
EMA	4/15/2021	GSA Special Meeting
CMA	4/26/2021	GSA Special Meeting
WMA	4/28/2021	GSA Special Meeting
EMA	4/29/2021	GSA Special Meeting
CMA	5/10/2021	GSA Special Meeting
EMA	5/11/2021	GSA Citizens Advisory Group Meeting
WMA	5/11/2021	GSA Citizens Advisory Group Meeting
WMA	5/12/2021	GSA Special Meeting
CMA	5/13/2021	GSA Citizens Advisory Group Meeting
EMA	5/13/2021	GSA Special Meeting
CMA	5/24/2021	GSA Regular Meeting
WMA	5/26/2021	GSA Regular Meeting
EMA	5/27/2021	GSA Regular Meeting
CMA	6/17/2021	GSA Citizens Advisory Group Meeting
WMA	6/24/2021	WMA Citizen Advisory Group Meeting
EMA	7/7/2021	EMA CAG Meeting
EMA	7/22/2021	Special EMA GSA Meeting
CMA	7/26/2021	Special CMA GSA Meeting
WMA	7/27/2021	WMA CAG Meeting
CMA	7/27/2021	CMA CAG Meeting
WMA	7/28/2021	Special WMA GSA Meeting
WMA	8/6/2021	Vandenberg Village Breakfast Rotary Club
CMA	8/23/2021	Regular CMA GSA Meeting
WMA	8/25/2021	Regular WMA GSA Meeting
EMA	8/26/2021	Regular EMA GSA Meeting
CMA	9/9/2021	Buellton City Council Presentation
WMA	10/20/2021	Special GSA Meeting
CMA	10/20/2021	Special GSA Meeting
EMA	10/21/2021	Special GSA Meeting
CMA	10/25/2021	Special GSA Meeting
WMA	10/27/2021	Special GSA Meeting
EMA	10/28/2021	Special GSA Meeting
CMA	11/15/2021	Regular GSA Meeting
WMA	11/17/2021	Regular GSA Meeting
EMA	11/18/2021	Regular GSA Meeting
EMA	11/18/2021	Regular GSA Meeting
WMA	12/8/2021	Special GSA Meeting
EMA	12/9/2021	Special GSA Meeting
CMA	1/3/2022	Special GSA Meeting: GSA Adoption
WMA	1/5/2022	Special GSA Meeting: GSA Adoption
EMA	1/6/2022	Special GSA Meeting: GSA Adoption

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Chapter 1 – Introduction and Plan Area

Appendix 1c-C:

Restrictions on Public Meetings due to SARS-COV-2 (COVID-19)

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APPENDIX 1C-C: RESTRICTIONS ON PUBLIC MEETINGS DUE TO SARS-COV-2 (COVID-19)

This appendix documents restrictions of in-person meetings for the GSA Committee and Citizens Advisory Group during the development of the GSP, related to local outbreaks of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in the Santa Ynez River Valley Groundwater Basin.

Governor of California, Proclamations and Executive Orders

March 4, 2020. **Proclamation of a State of Emergency.**

March 12, 2020. **Executive Order N-25-20.** Temporarily waives requirements in the Bagley-Keene Act and Brown Act for teleconferencing public meetings.

March 12, 2020. **Executive Order N-29-20.** Revised waver for Bagley-Keene Act and Brown Act for teleconferencing public meetings.

March 19, 2020. **Executive Order N-33-20.** Statewide public stay at home order.

California Department of Public Health, State Public Health Orders

March 19, 2020. **Order of the State Public Health Officer.** Statewide stay-at-home order.

Santa Barbara County Public Health Department, Health Officer Orders

March 12, 2020. **Declaration of a Local Health Emergency by the County Health Officer and Public Health Director for the Coronavirus (COVID-19)**

July 13, 2020. **Health Officer Order No. 2020-12.5** County of Santa Barbara for the Control of COVID-19 Phased Reopening Within Santa Barbara County. Closing all indoor activity.

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

PROCLAMATION OF A STATE OF EMERGENCY

WHEREAS in December 2019, an outbreak of respiratory illness due to a novel coronavirus (a disease now known as COVID-19), was first identified in Wuhan City, Hubei Province, China, and has spread outside of China, impacting more than 75 countries, including the United States; and

WHEREAS the State of California has been working in close collaboration with the national Centers for Disease Control and Prevention (CDC), with the United States Health and Human Services Agency, and with local health departments since December 2019 to monitor and plan for the potential spread of COVID-19 to the United States; and

WHEREAS on January 23, 2020, the CDC activated its Emergency Response System to provide ongoing support for the response to COVID-19 across the country; and

WHEREAS on January 24, 2020, the California Department of Public Health activated its Medical and Health Coordination Center and on March 2, 2020, the Office of Emergency Services activated the State Operations Center to support and guide state and local actions to preserve public health; and

WHEREAS the California Department of Public Health has been in regular communication with hospitals, clinics and other health providers and has provided guidance to health facilities and providers regarding COVID-19; and

WHEREAS as of March 4, 2020, across the globe, there are more than 94,000 confirmed cases of COVID-19, tragically resulting in more than 3,000 deaths worldwide; and

WHEREAS as of March 4, 2020, there are 129 confirmed cases of COVID-19 in the United States, including 53 in California, and more than 9,400 Californians across 49 counties are in home monitoring based on possible travel-based exposure to the virus, and officials expect the number of cases in California, the United States, and worldwide to increase; and

WHEREAS for more than a decade California has had a robust pandemic influenza plan, supported local governments in the development of local plans, and required that state and local plans be regularly updated and exercised; and

WHEREAS California has a strong federal, state and local public health and health care delivery system that has effectively responded to prior events including the H1N1 influenza virus in 2009, and most recently Ebola; and

WHEREAS experts anticipate that while a high percentage of individuals affected by COVID-19 will experience mild flu-like symptoms, some will have more serious symptoms and require hospitalization, particularly individuals who are elderly or already have underlying chronic health conditions; and

WHEREAS it is imperative to prepare for and respond to suspected or confirmed COVID-19 cases in California, to implement measures to mitigate the spread of COVID-19, and to prepare to respond to an increasing number of individuals requiring medical care and hospitalization; and

WHEREAS if COVID-19 spreads in California at a rate comparable to the rate of spread in other countries, the number of persons requiring medical care may exceed locally available resources, and controlling outbreaks minimizes the risk to the public, maintains the health and safety of the people of California, and limits the spread of infection in our communities and within the healthcare delivery system; and

WHEREAS personal protective equipment (PPE) is not necessary for use by the general population but appropriate PPE is one of the most effective ways to preserve and protect California's healthcare workforce at this critical time and to prevent the spread of COVID-19 broadly; and

WHEREAS state and local health departments must use all available preventative measures to combat the spread of COVID-19, which will require access to services, personnel, equipment, facilities, and other resources, potentially including resources beyond those currently available, to prepare for and respond to any potential cases and the spread of the virus; and

WHEREAS I find that conditions of Government Code section 8558(b), relating to the declaration of a State of Emergency, have been met; and

WHEREAS I find that the conditions caused by COVID-19 are likely to require the combined forces of a mutual aid region or regions to appropriately respond; and

WHEREAS under the provisions of Government Code section 8625(c), I find that local authority is inadequate to cope with the threat posed by COVID-19; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes, including the California Emergency Services Act, and in particular, Government Code section 8625, **HEREBY PROCLAIM A STATE OF EMERGENCY** to exist in California.

IT IS HEREBY ORDERED THAT:

1. In preparing for and responding to COVID-19, all agencies of the state government use and employ state personnel, equipment, and facilities or perform any and all activities consistent with the direction of the Office of Emergency Services and the State Emergency Plan, as well as the California Department of Public Health and the Emergency Medical Services Authority. Also, all residents are to heed the advice of emergency officials with regard to this emergency in order to protect their safety.

2. As necessary to assist local governments and for the protection of public health, state agencies shall enter into contracts to arrange for the procurement of materials, goods, and services needed to assist in preparing for, containing, responding to, mitigating the effects of, and recovering from the spread of COVID-19. Applicable provisions of the Government Code and the Public Contract Code, including but not limited to travel, advertising, and competitive bidding requirements, are suspended to the extent necessary to address the effects of COVID-19.

3. Any out-of-state personnel, including, but not limited to, medical personnel, entering California to assist in preparing for, responding to, mitigating the effects of, and recovering from COVID-19 shall be permitted to provide services in the same manner as prescribed in Government Code section 179.5, with respect to licensing and certification. Permission for any such individual rendering service is subject to the approval of the Director of the Emergency Medical Services Authority for medical personnel and the Director of the Office of Emergency Services for non-medical personnel and shall be in effect for a period of time not to exceed the duration of this emergency.

4. The time limitation set forth in Penal Code section 396, subdivision (b), prohibiting price gouging in time of emergency is hereby waived as it relates to emergency supplies and medical supplies. These price gouging protections shall be in effect through September 4, 2020.

5. Any state-owned properties that the Office of Emergency Services determines are suitable for use to assist in preparing for, responding to, mitigating the effects of, or recovering from COVID-19 shall be made available to the Office of Emergency Services for this purpose, notwithstanding any state or local law that would restrict, delay, or otherwise inhibit such use.

6. Any fairgrounds that the Office of Emergency Services determines are suitable to assist in preparing for, responding to, mitigating the effects of, or recovering from COVID-19 shall be made available to the Office of Emergency Services pursuant to the Emergency Services Act, Government Code section 8589. The Office of Emergency Services shall notify the fairgrounds of the intended use and can immediately use the fairgrounds without the fairground board of directors' approval, and

notwithstanding any state or local law that would restrict, delay, or otherwise inhibit such use.

7. The 30-day time period in Health and Safety Code section 101080, within which a local governing authority must renew a local health emergency, is hereby waived for the duration of this statewide emergency. Any such local health emergency will remain in effect until each local governing authority terminates its respective local health emergency.

8. The 60-day time period in Government Code section 8630, within which local government authorities must renew a local emergency, is hereby waived for the duration of this statewide emergency. Any local emergency proclaimed will remain in effect until each local governing authority terminates its respective local emergency.

9. The Office of Emergency Services shall provide assistance to local governments that have demonstrated extraordinary or disproportionate impacts from COVID-19, if appropriate and necessary, under the authority of the California Disaster Assistance Act, Government Code section 8680 et seq., and California Code of Regulations, Title 19, section 2900 et seq.

10. To ensure hospitals and other health facilities are able to adequately treat patients legally isolated as a result of COVID-19, the Director of the California Department of Public Health may waive any of the licensing requirements of Chapter 2 of Division 2 of the Health and Safety Code and accompanying regulations with respect to any hospital or health facility identified in Health and Safety Code section 1250. Any waiver shall include alternative measures that, under the circumstances, will allow the facilities to treat legally isolated patients while protecting public health and safety. Any facilities being granted a waiver shall be established and operated in accordance with the facility's required disaster and mass casualty plan. Any waivers granted pursuant to this paragraph shall be posted on the Department's website.

11. To support consistent practices across California, state departments, in coordination with the Office of Emergency Services, shall provide updated and specific guidance relating to preventing and mitigating COVID-19 to schools, employers, employees, first responders and community care facilities by no later than March 10, 2020.

12. To promptly respond for the protection of public health, state entities are, notwithstanding any other state or local law, authorized to share relevant medical information, limited to the patient's underlying health conditions, age, current condition, date of exposure, and possible contact tracing, as necessary to address the effect of the COVID-19 outbreak with state, local, federal, and nongovernmental partners, with such information to be used for the limited purposes of monitoring, investigation and control, and treatment and coordination of care. The

notification requirement of Civil Code section 1798.24, subdivision (i), is suspended.

13. Notwithstanding Health and Safety Code sections 1797.52 and 1797.218, during the course of this emergency, any EMT-P licensees shall have the authority to transport patients to medical facilities other than acute care hospitals when approved by the California EMS Authority. In order to carry out this order, to the extent that the provisions of Health and Safety Code sections 1797.52 and 1797.218 may prohibit EMT-P licensees from transporting patients to facilities other than acute care hospitals, those statutes are hereby suspended until the termination of this State of Emergency.

14. The Department of Social Services may, to the extent the Department deems necessary to respond to the threat of COVID-19, waive any provisions of the Health and Safety Code or Welfare and Institutions Code, and accompanying regulations, interim licensing standards, or other written policies or procedures with respect to the use, licensing, or approval of facilities or homes within the Department's jurisdiction set forth in the California Community Care Facilities Act (Health and Safety Code section 1500 et seq.), the California Child Day Care Facilities Act (Health and Safety Code section 1596.70 et seq.), and the California Residential Care Facilities for the Elderly Act (Health and Safety Code section 1569 et seq.). Any waivers granted pursuant to this paragraph shall be posted on the Department's website.

I FURTHER DIRECT that as soon as hereafter possible, this proclamation be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this proclamation.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 4th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-25-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus remains a threat, and further efforts to control the spread of the virus to reduce and minimize the risk of infection are needed; and

WHEREAS state and local public health officials may, as they deem necessary in the interest of public health, issue guidance limiting or recommending limitations upon attendance at public assemblies, conferences, or other mass events, which could cause the cancellation of such gatherings through no fault or responsibility of the parties involved, thereby constituting a force majeure; and

WHEREAS the Department of Public Health is maintaining up-to-date guidance relating to COVID-19, available to the public at http://cdph.ca.gov/covid19; and

WHEREAS the State of California and local governments, in collaboration with the Federal government, continue sustained efforts to minimize the spread and mitigate the effects of COVID-19; and

WHEREAS there is a need to secure numerous facilities to accommodate quarantine, isolation, or medical treatment of individuals testing positive for or exposed to COVID-19; and

WHEREAS, many individuals who have developmental disabilities and receive services through regional centers funded by the Department of Developmental Services also have chronic medical conditions that make them more susceptible to serious symptoms of COVID-19, and it is critical that they continue to receive their services while also protecting their own health and the general public health; and

WHEREAS individuals exposed to COVID-19 may be temporarily unable to report to work due to illness caused by COVID-19 or quarantines related to COVID-19 and individuals directly affected by COVID-19 may experience potential loss of income, health care and medical coverage, and ability to pay for housing and basic needs, thereby placing increased demands on already strained regional and local health and safety resources such as shelters and food banks; and

WHEREAS in the interest of public health and safety, it is necessary to exercise my authority under the Emergency Services Act, specifically Government Code section 8572, to ensure adequate facilities exist to address the impacts of COVID-19; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567, 8571 and 8572, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. All residents are to heed any orders and guidance of state and local public health officials, including but not limited to the imposition of social distancing measures, to control the spread of COVID-19.

2. For the period that began January 24, 2020 through the duration of this emergency, the Employment Development Department shall have the discretion to waive the one-week waiting period in Unemployment Insurance Code section 2627(b)(1) for disability insurance applicants who are unemployed and disabled as a result of the COVID-19, and who are otherwise eligible for disability insurance benefits.

3. For the period that began January 24, 2020 through the duration of this emergency, the Employment Development Department shall have the discretion to waive the one-week waiting period in Unemployment Insurance Code section 1253(d) for unemployment insurance applicants who are unemployed as a result of the COVID-19, and who are otherwise eligible for unemployment insurance benefits.

4. Notwithstanding Health and Safety Code section 1797.172(b), during the course of this emergency, the Director of the Emergency Medical Services Authority shall have the authority to implement additions to local optional scopes of practice without first consulting with a committee of local EMS medical directors named by the EMS Medical Directors Association of California.

5. In order to quickly provide relief from interest and penalties, the provisions of the Revenue and Taxation Code that apply to the taxes and fees administered by the Department of Tax and Fee Administration, requiring the filing of a statement under penalty of perjury setting forth the facts for a claim for relief, are suspended for a period of 60 days after the date of this Order for any individuals or businesses who are unable to file a timely tax return or make a timely payment as a result of complying with a state or local public health official's imposition or recommendation of social distancing measures related to COVID-19.

6. The Franchise Tax Board, the Board of Equalization, the Department of Tax and Fee Administration, and the Office of Tax Appeals shall use their administrative powers where appropriate to provide those individuals and businesses impacted by complying with a state or local public health official's imposition or recommendation of social

distancing measures related to COVID-19 with the extensions for filing, payment, audits, billing, notices, assessments, claims for refund, and relief from subsequent penalties and interest.

7. The Governor's Office of Emergency Services shall ensure adequate state staffing during this emergency. Consistent with applicable federal law, work hour limitations for retired annuitants, permanent and intermittent personnel, and state management and senior supervisors, are suspended. Furthermore, reinstatement and work hour limitations in Government Code sections 21220, 21224(a), and 7522.56(b), (d), (f), and (g), and the time limitations in Government Code section 19888.1 and California Code of Regulations, title 2, sections 300-303 are suspended. The Director of the California Department of Human Resources must be notified of any individual employed pursuant to these waivers.

8. The California Health and Human Services Agency and the Office of Emergency Services shall identify, and shall otherwise be prepared to make available—including through the execution of any necessary contracts or other agreements and, if necessary, through the exercise of the State's power to commandeer property – hotels and other places of temporary residence, medical facilities, and other facilities that are suitable for use as places of temporary residence or medical facilities as necessary for quarantining, isolating, or treating individuals who test positive for COVID-19 or who have had a high-risk exposure and are thought to be in the incubation period.

9. The certification and licensure requirements of California Code of Regulations, Title 17, section 1079 and Business and Professions Code section 1206.5 are suspended as to all persons who meet the requirements under the Clinical Laboratory Improvement Amendments of section 353 of the Public Health Service Act for high complexity testing and who are performing analysis of samples to test for SARS-CoV-2, the virus that causes COVID-19, in any certified public health laboratory or licensed clinical laboratory.

10. To ensure that individuals with developmental disabilities continue to receive the services and supports mandated by their individual program plans threatened by disruptions caused by COVID-19, the Director of the Department of Developmental Services may issue directives waiving any provision or requirement of the Lanterman Developmental Disabilities Services Act, the California Early Intervention Services Act, and the accompanying regulations of Title 17, Division 2 of the California Code of Regulations. A directive may delegate to the regional centers any authority granted to the Department by law where the Director believes such delegation is necessary to ensure services to individuals with developmental disabilities. The Director shall describe the need justifying the waiver granted in each directive and articulate how the waiver is necessary to protect the public health or safety from the threat of COVID-19 or necessary to ensure that services to individuals with developmental disabilities are not disrupted. Any waiver granted by a directive shall expire 30 days from the date of its issuance. The Director may grant one or more 30-day extensions if the waiver continues to be necessary

to protect health or safety or to ensure delivery of services. The Director shall rescind a waiver once it is no longer necessary to protect public health or safety or ensure delivery of services. Any waivers and extensions granted pursuant to this paragraph shall be posted on the Department's website.

11. Notwithstanding any other provision of state or local law, including the Bagley-Keene Act or the Brown Act, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to attend and to address the local legislative body or state body, during the period in which state or local public officials impose or recommend measures to promote social distancing, including but not limited to limitations on public events. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

    In particular, any otherwise-applicable requirements that

    (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;
    (ii) each teleconference location be accessible to the public;
    (iii) members of the public may address the body at each teleconference conference location;
    (iv) state and local bodies post agendas at all teleconference locations;
    (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and
    (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

    are hereby suspended, on the conditions that:

    (i) each state or local body must give advance notice of each public meeting, according to the timeframe otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and
    (ii) consistent with the notice requirement in paragraph (i), each state or local body must notice at least one publicly accessible location from which members of the public shall have the right to observe and offer public comment at the public meeting, consistent with the public's rights of access and public comment otherwise provided for by the Bagley-Keene Act and the Brown Act, as applicable (including, but not limited to, the requirement that such rights of access and public comment be made available in a manner consistent with the Americans with Disabilities Act).

In addition to the mandatory conditions set forth above, all state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 12th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-29-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus continues to spread and is impacting nearly all sectors of California; and

WHEREAS the threat of COVID-19 has resulted in serious and ongoing economic harms, in particular to some of the most vulnerable Californians; and

WHEREAS time bound eligibility redeterminations are required for Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries to continue their benefits, in accordance with processes established by the Department of Social Services, the Department of Health Care Services, and the Federal Government; and

WHEREAS social distancing recommendations or Orders as well as a statewide imperative for critical employees to focus on health needs may prevent Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries from obtaining in-person eligibility redeterminations; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567 and 8571, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. As to individuals currently eligible for benefits under Medi-Cal, CalFresh, CalWORKs, the Cash Assistance Program for Immigrants, the California Food Assistance Program, or In Home Supportive Services benefits, and to the extent necessary to allow such individuals to maintain eligibility for such benefits, any state law, including but not limited to California Code of Regulations, Title 22, section 50189(a) and Welfare and Institutions Code sections 18940 and 11265, that would require redetermination of such benefits is suspended for a period of 90 days from the date of this Order. This Order shall be construed to be consistent with applicable federal laws, including but not limited to Code of Federal Regulations, Title 42, section 435.912, subdivision (e), as interpreted by the Centers for Medicare and Medicaid Services (in guidance issued on January 30, 2018) to permit the extension of

otherwise-applicable Medicaid time limits in emergency situations.

2. Through June 17, 2020, any month or partial month in which California Work Opportunity and Responsibility to Kids (CalWORKs) aid or services are received pursuant to Welfare and Institutions Code Section 11200 et seq. shall not be counted for purposes of the 48-month time limit set forth in Welfare an Institutions Code Section 11454. Any waiver of this time limit shall not be applied if it will exceed the federal time limits set forth in Code of Federal Regulations, Title 45, section 264.1.

3. Paragraph 11 of Executive Order N-25-20 (March 12, 2020) is withdrawn and superseded by the following text:

   Notwithstanding any other provision of state or local law (including, but not limited to, the Bagley-Keene Act or the Brown Act), and subject to the notice and accessibility requirements set forth below, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body or state body. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

   In particular, any otherwise-applicable requirements that

   (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;

   (ii) each teleconference location be accessible to the public;

   (iii) members of the public may address the body at each teleconference conference location;

   (iv) state and local bodies post agendas at all teleconference locations;

   (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and

   (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

   are hereby suspended.

   A local legislative body or state body that holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, consistent with the notice and accessibility requirements set forth below, shall have satisfied any requirement that the body allow members of the public to attend the meeting and offer public comment. Such a body need not make available any physical location from which members of the public may observe the meeting and offer public comment.

Accessibility Requirements: If a local legislative body or state body holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, the body shall also:

(i) Implement a procedure for receiving and swiftly resolving requests for reasonable modification or accommodation from individuals with disabilities, consistent with the Americans with Disabilities Act and resolving any doubt whatsoever in favor of accessibility; and

(ii) Advertise that procedure each time notice is given of the means by which members of the public may observe the meeting and offer public comment, pursuant to subparagraph (ii) of the Notice Requirements below.

Notice Requirements: Except to the extent this Order expressly provides otherwise, each local legislative body and state body shall:

(i) Give advance notice of the time of, and post the agenda for, each public meeting according to the timeframes otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and

(ii) In each instance in which notice of the time of the meeting is otherwise given or the agenda for the meeting is otherwise posted, also give notice of the means by which members of the public may observe the meeting and offer public comment. As to any instance in which there is a change in such means of public observation and comment, or any instance prior to the issuance of this Order in which the time of the meeting has been noticed or the agenda for the meeting has been posted without also including notice of such means, a body may satisfy this requirement by advertising such means using "the most rapid means of communication available at the time" within the meaning of Government Code, section 54954, subdivision (e); this shall include, but need not be limited to, posting such means on the body's Internet website.

All of the foregoing provisions concerning the conduct of public meetings shall apply only during the period in which state or local public health officials have imposed or recommended social distancing measures.

All state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 17th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

EXECUTIVE ORDER N-33-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS in a short period of time, COVID-19 has rapidly spread throughout California, necessitating updated and more stringent guidance from federal, state, and local public health officials; and

WHEREAS for the preservation of public health and safety throughout the entire State of California, I find it necessary for all Californians to heed the State public health directives from the Department of Public Health.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567, 8627, and 8665 do hereby issue the following Order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1) To preserve the public health and safety, and to ensure the healthcare delivery system is capable of serving all, and prioritizing those at the highest risk and vulnerability, all residents are directed to immediately heed the current State public health directives, which I ordered the Department of Public Health to develop for the current statewide status of COVID-19. Those directives are consistent with the March 19, 2020, Memorandum on Identification of Essential Critical Infrastructure Workers During COVID-19 Response, found at: https://covid19.ca.gov/. Those directives follow:

ORDER OF THE STATE PUBLIC HEALTH OFFICER
March 19, 2020

To protect public health, I as State Public Health Officer and Director of the California Department of Public Health order all individuals living in the State of California to stay home or at their place of residence except as needed to maintain continuity of operations of the federal critical infrastructure sectors, as outlined at https://www.cisa.gov/identifying-critical-infrastructure-during-covid-19. In addition, and in consultation with the Director of the Governor's Office of Emergency Services, I may designate additional sectors as critical in order to protect the health and well-being of all Californians.

Pursuant to the authority under the Health and Safety Code 120125, 120140, 131080, 120130(c), 120135, 120145, 120175 and 120150, this order is to go into effect immediately and shall stay in effect until further notice.

The federal government has identified 16 critical infrastructure sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety, or any combination thereof. I order that Californians working in these 16 critical infrastructure sectors may continue their work because of the importance of these sectors to Californians' health and well-being.

This Order is being issued to protect the public health of Californians. The California Department of Public Health looks to establish consistency across the state in order to ensure that we mitigate the impact of COVID-19. Our goal is simple, we want to bend the curve, and disrupt the spread of the virus.

The supply chain must continue, and Californians must have access to such necessities as food, prescriptions, and health care. When people need to leave their homes or places of residence, whether to obtain or perform the functions above, or to otherwise facilitate authorized necessary activities, they should at all times practice social distancing.

2) The healthcare delivery system shall prioritize services to serving those who are the sickest and shall prioritize resources, including personal protective equipment, for the providers providing direct care to them.

3) The Office of Emergency Services is directed to take necessary steps to ensure compliance with this Order.

4) This Order shall be enforceable pursuant to California law, including, but not limited to, Government Code section 8665.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 19th day of March 2020.

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GAVIN NEWSOM
Governor of California

ATTEST:

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ALEX PADILLA
Secretary of State

ORDER OF THE STATE PUBLIC HEALTH OFFICER
March 19, 2020

To protect public health, I as State Public Health Officer and Director of the California Department of Public Health order all individuals living in the State of California to stay home or at their place of residence except as needed to maintain continuity of operations of the federal critical infrastructure sectors, as outlined at https://www.cisa.gov/identifying-critical-infrastructure-during-covid-19. In addition, and in consultation *with* the Director of the Governor's Office of Emergency Services, I may designate additional sectors as critical in order to protect the health and well-being of all Californians.

Pursuant to the authority under the Health and Safety Code 120125, 120140, 131080, 120130(c), 120135, 120145, 120175 and 120150, this order is to go into effect immediately and shall stay in effect until further notice.

The federal government has identified 16 critical infrastructure sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety, or any combination thereof. I order that Californians working in these 16 critical infrastructure sectors may continue their work because of the importance of these sectors to Californians' health and well-being.

This Order is being issued to protect the public health of Californians. The California Department of Public Health looks to establish consistency across the state in order to ensure that we mitigate the impact of COVID-19. Our goal is simple, we want to bend the curve, and disrupt the spread of the virus.

The supply chain must continue, and Californians must have access to such necessities as food, prescriptions, and health care. When people need to leave their homes or places of residence, whether to obtain or perform the functions above, or to otherwise facilitate authorized necessary activities, they should at all times practice social distancing.

SONIA Y. ANGELL, MD, MPH

3/19/2020
DATE

DECLARATION OF A LOCAL HEALTH EMERGENCY BY THE COUNTY HEALTH OFFICER AND PUBLIC HEALTH DIRECTOR FOR THE CORONAVIRUS (COVID-19) AND TO ISSUE HEALTH ORDERS AS APPROPRIATE AND NEEDED

WHEREAS, Section 101040 of the California Health and Safety Code authorizes the local health officer to take any preventative measure that may be necessary to protect and preserve public health from any public hazard during an emergency; and

WHEREAS, Section 101080 of the California Health and Safety Code authorizes the local health officer to declare a local health emergency in the health officer's jurisdiction, or areas thereof, whenever the health officer reasonably determines there is an imminent and proximate threat of the introduction of any contagious, infectious, or communicable disease, chemical agent, noncommunicable biologic agent, toxin, or radioactive agent; and

WHEREAS, a novel coronavirus, COVID-19, causes infectious disease and was first detected in Wuhan City, Hubei Province, China in December 2019. Symptoms of COVID-19 include fever, cough, and shortness of breath; outcomes have ranged from mild to severe illness, and in some cases death. The Centers for Disease Control and Prevention considers the virus to be a very serious public health threat; and

WHEREAS, on March 4, 2020, Governor Newsom declared a state of emergency for conditions caused by COVID-19; and on March 11, 2020, the World Health Organization declared COVID-19 a global pandemic; and

WHEREAS, on March 11, 2020, Governor Newsom and California Public Health state officials recommended that non-essential gatherings should be postponed or cancelled across the state at least until the end of March, in order to implement social distancing guidelines intended to protect all individuals, particularly those who are at higher risk for severe illness for COVID-19; and

WHEREAS, as of March 12, 2020 there were 198 confirmed COVID-19 cases in California of which 24 cases are from repatriation flights and 4 deaths; and

WHEREAS, the local health officer finds that based on the foregoing and out of abundance of caution, there is an imminent and proximate threat of the introduction of COVID-19 in the County of Santa Barbara and a need to protect those most at risk.

NOW, THEREFORE, THE LOCAL HEALTH OFFICER HEREBY DECLARES that a local health emergency exists in the County of Santa Barbara due to an imminent and proximate threat to the public health, within the meaning of Section 101080 of the Health and Safety Code, by the introduction of COVID-19 in the County of Santa Barbara.

FURTHER, IT IS HEREBY ORDERED THAT:

1. Effective immediately until March 30, 2020, consistent with the Governor's social distancing guidance, the Health Officer is mandating cancellation or postponement of nonessential gatherings of 250 or more people, and small gatherings shall include six (6) foot distancing between participants particularly those at high risk for severe illness of COVID-19.
2. This order applies in the incorporated and unincorporated areas of Santa Barbara County.
3. Example of essential events this health order does not apply to: regular school classes, work, essential services, congregant living situations including dormitories and homeless encampments, essential public transportation, airport travel, shopping at a store or mall, operations of federal or state courts, and public meetings of local legislative bodies, including but not limited to: the Board of Supervisors, City Councils, School Districts, and other local agencies. Specific guidance can be found in the attached document and at PublicHealthSBC.org.

IT IS FURTHER DECLARED AND ORDERED that during the existence of said local health emergency, the powers, functions, and duties of the Health Officer shall be those prescribed by state law, including but not limited to the provisions of 101085 of the Health and Safety Code, and by pertinent ordinances and resolutions of this County.

IT IS FURTHER DECLARED, pursuant to California Health and Safety Code Section 101080 the local health emergency shall not remain in effect for a period in excess of seven (7) days unless it has been ratified by the Board of Supervisors and upon termination of the State Emergency, shall be reviewed by the Board of Supervisors, at least every 30 days until the local health emergency is terminated.

This Declaration may be signed in counterparts.

Henning Ansorg, MD Santa Barbara County Health Officer	3/12/2020 Date
Van Do-Reynoso, MPH, PhD Santa Barbara County Public Health Director	3/12/2020 Date

HEALTH OFFICER ORDER NO. 2020-12.5
COUNTY OF SANTA BARBARA

FOR THE CONTROL OF COVID-19
PHASED REOPENING WITHIN SANTA BARBARA COUNTY

Health Officer Order No. 2020-12.5 Supersedes and Replaces Health Officer Order No. 2020-12.4

Effective Date: July 14, 2020, 5:00 p.m. PDT

(Changes are underlined.)

Please read this Order carefully. Violation of or failure to comply with this Order may constitute a misdemeanor punishable by fine of up to $1,000, imprisonment, or both. (Health and Safety Code §§ 101029, 120295 et seq.) Violators are also subject to civil enforcement actions including fines or civil penalties per violation per day, injunctive relief, and attorneys' fees and costs.

This Health Officer Order No. 2020-12.5 supersedes and replaces Health Officer Order No. 2020-12.4 that was effective July 6, 2020. Nothing in this Health Officer Order No. 2020-12.5 supersedes State Executive Orders or State Heath Officer Orders. COVID-19 industry specific guidance provided by the California Department of Public Health is available at: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Guidance.aspx#

Summary: As required by the State Public Health Officer Order of July 13, 2020, this Health Officer Order orders closure of indoor operations for: gyms and fitness centers; places of worship; protests; offices for non-essential critical infrastructure sectors defined at covid19.ca.gov; personal care services (including nail salons, massage parlors, and tattoo parlors); hair salons and barbershops; and malls as listed in Attachment A. These Businesses may operate outdoors if they follow industry-specific State guidance including the use of face coverings and social distancing. Businesses that must stay closed and are not allowed to reopen physical locations at this time are listed in the Attachment A. This Order reaffirms the reopening of some, but not all, Businesses (as defined) within the County of Santa Barbara. Businesses allowed to reopen must comply with requirements to protect against COVID-19 and social distancing.

WHEREAS, on March 4, 2020, Governor Newsom declared a state of emergency for conditions caused by a novel coronavirus, COVID-19, and on March 11, 2020, the World Health Organization declared COVID-19 a global pandemic, and on March 12, 2020, the County of Santa Barbara declared a local emergency and a local health emergency in relation COVID-19 in the community; and

WHEREAS, in the County of Santa Barbara as well as throughout California and the nation, there are insufficient quantities of critical healthcare infrastructure, including hospital beds, ventilators and workers, capable of adequately treating mass numbers of patients at a single time – should the virus spread unchecked; and

WHEREAS, in direct response to the lack of healthcare infrastructure, governments across the nation are taking actions to slow the spread of COVID-19 in order to "flatten the curve" of infection and reduce the numbers of individuals infected at any one time by minimizing situations where the virus can spread; and

WHEREAS, in furtherance of this effort, on March 19, 2020, Governor Newsom issued Executive Order N-33-20 requiring all persons residing in the State to remain in their homes or places of residence, except as needed to maintain the continuity of operations for critical infrastructure (the "State Stay-at-Home Order"); and

WHEREAS, also on March 19, 2020, the State Public Health Officer ordered all individuals living in the State of California to stay home or at their place of residence, except as needed to maintain continuity of operations for the federal critical infrastructure sectors, which was updated on March 28, 2020; and

WHEREAS, on March 20, 2020, the State Public Health Officer designated a list of Essential Critical Infrastructure Workers, to help state, local, tribal, and industry partners as they work to protect communities, while ensuring continuity of functions critical to protect public health and safety, which was updated on March 22, 2020; and

WHEREAS, on May 4, 2020, Governor Newsom issued Executive Order N-60-20 to allow reopening of lower-risk businesses and spaces ("Stage Two"), and then to allow reopening of higher-risk businesses and spaces ("Stage Three") and to allow a County to pursue a variance to move further into the stages upon notification and certification of a written attestation to the California Department of Public Health (CDPH); and

WHEREAS on May 7, 2020, the State Public Health Officer ordered that upon certification a County may move through the stages of reopening at their own pace as long as the sectors are given guidance from the State about reopening requirements; and

WHEREAS, on May 20, 2020, the CDPH approved and posted to the State's website the County of Santa Barbara's Variance Attestation allowing the County to move through the stages; and

WHEREAS, the CDPH issued guidance regarding various businesses and activities including for places of worship and providers of religious services and cultural ceremonies, hair salons and barbershops, schools and school-based programs; childcare; day camps; casinos operated by sovereign tribal nations; music, film and television production; professional sports without live audiences; campgrounds, RV Parks and outdoor recreation; hotels; cardrooms, satellite wagering facilities and racetracks; family entertainment centers; restaurants, bars and wineries; fitness facilities, museums, zoos, aquariums and galleries; extended personal care services; and

WHEREAS, on July 1, 2020, CDPH instructed counties which had been on State's County Monitoring list for more than three consecutive days to immediately close all bars, breweries, pubs and brewpubs, as well as indoor operations of Businesses for specified industries and sectors. On July 6, 2020, the County of Santa Barbara had been on the State's County Monitoring list for 21 days and complied with CDPH's instruction; and

WHEREAS, on July 13, 2020, the State Public Health Officer ordered counties which have been on the State's County Monitoring list for more than three consecutive days to close indoor operations of: gyms and fitness centers; places of worship; protests; offices for non-essential critical infrastructure sectors defined at covid19.ca.gov; personal care services (including nail salons, massage parlors, and tattoo parlors); hair salons and barbershops; and malls, attached hereto as Attachment C and incorporated by this reference. As of July 14, 2020, the County of Santa Barbara has been on the State's County Monitoring list for 29 days. Therefore, this Order is closing indoor operations of gyms and fitness centers; places of worship; protests; offices for non-critical infrastructure sectors defined at covid19.ca.gov; personal care services (including nail salons, massage parlors, and tattoo parlors); hair salons and barbershops; and malls. Indoor operation of these Businesses have been found to promote the mixing of populations beyond households which leads to an increase in community spread of COVID-19; and

WHEREAS, on July 13, 2020, CDPH mandated that all CDPH industry or sector guidance issued to date must be followed including all infectious control measures, and the use of face coverings both indoors and outdoors in certain settings; and

WHEREAS, the County Health Officer finds: (1) the County has received repeated reports that some businesses have refused to comply with the State Stay-at-Home Order and State guidance; (2) the reported activities are inconsistent with the State Stay-at-Home Order and/or Stage Two or Stage Three of the California Resilience Roadmap; (3) guidance for businesses is required to prevent the potential increased spread of COVID-19 which would add strain to the County of Santa Barbara health care system; (4) without the guidance and restrictions described herein some businesses are likely to continue to impair efforts at mitigating the spread of the illness both within the County and statewide; and (5) distinctions made in this Order are to minimize the spread of COVID-19 that could occur through proximity and duration of contact between individuals; and

WHEREAS, the intent of this Order is to order businesses in the County of Santa Barbara regarding operations under the State Stay-at-Home Order and the Stage Two and Stage Three of the California Resilience Roadmap, and to slow the spread of COVID-19 to the maximum extent possible. All provisions of this Order should be interpreted to effectuate this intent.

ACCORDINGLY, UNDER THE AUTHORITY OF CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 101040, 101085, AND 120175, TITLE 17 CALIFORNIA CODE OF REGULATIONS SECTION 2501, THE HEALTH OFFICER OF THE COUNTY OF SANTA BARBARA ORDERS:

1. This Order 2020-12.5 is effective 5:00 p.m. (PDT) July 14, 2020 and continuing until 5:00 p.m. (PDT), on August 12, 2020 or until it is extended, rescinded, superseded, or amended in writing by the County of Santa Barbara Health Officer ("Health Officer"). This Order applies in the incorporated and unincorporated areas of Santa Barbara County ("County").

2. "Business" or "Businesses" for the purpose of this Health Officer Order is defined to mean any institution, establishment, public or private agency, for-profit, non-profit, or educational entity, whether an organization, corporate entity, partnership, or sole proprietorship.

3. All Businesses except those listed in Attachment A, as attached hereto and incorporated by this reference, may remain open or open, upon completion of, and in accordance with all of the following:
   a. Perform a detailed risk assessment including reviewing State and local guidance relevant to the Business and create a site-specific protection plan;
   b. Train employees about how to limit the spread of COVID-19 including how to screen themselves for COVID-19 symptoms and when to stay home. COVID-19 symptoms are described in Attachment B;
   c. Set up individual control measures and screenings;
   d. Put disinfection protocols in place;
   e. Observe "Face Covering" orders in effect from the local health officer and/or the California Department of Public Health;
   f. <u>If operating outdoors, a tent, canopy, or other sun shelter may be used as long as the sides are not closed;</u>
   g. Complete the RISE attestation, including its social distancing protocol, and self-certification process at: <u>https://recoverysbc.org/reopen-your-business/</u>. (if a Business does not have access to the internet it can call 833-688-5551); and
   h. Post the self-certification at the Business location.

4. **Emergency Food Permit.** Breweries, bars, brewpubs, pubs, wineries, and tasting rooms that serve alcoholic beverages but that do not have an on-site permitted food facility and would like to serve food:
   a. Must obtain an Emergency Food Permit issued by the Santa Barbara County Health Department to temporarily serve food.
   b. A brewery, bar, brewpub, pub, winery, or tasting room in possession of an Emergency Food Permit issued by the Santa Barbara County Health Department may continue to temporarily serve food at their discretion, unless otherwise suspended, revoked, or terminated.
   c. A brewery, bar, brewpub, pub, winery, or tasting room in possession of an Emergency Food Permit issued by the Santa Barbara County Health Department may cease operations of food service at their discretion, but in doing so may be subject to closure of the physical location.

5. Businesses that must keep physical locations closed are listed in Attachment A, as attached hereto and incorporated by this reference. Businesses listed in Attachment A may continue to provide services so long as those services can be provided remotely and without individuals physical present at the Business location, unless an exception applies. Maintenance to prevent property damage of the Businesses listed in Attachment A is allowed. This list may be amended from time to time, as required for our region's response to COVID-19.

6. **Gatherings are not allowed.** <u>As required by the State Public Health Officer Order of July 13, 2020, all gatherings are prohibited unless otherwise excepted.</u>

a. A "gathering" is any event or convening that brings together people in a single room or single space at the same time, such as an auditorium, stadium, arena, large conference room, meeting hall, cafeteria, or any other indoor or outdoor space.

b. This restriction applies to all non-essential professional, social, and community gatherings regardless of their sponsor. Gatherings that do not meet the aforementioned definition should only be conducted when they are essential—that is, if the activity is essential and could not be postponed or achieved without gathering, meaning that some other means of communication could not be used to conduct the essential function.

IN ADDITION TO THE ABOVE ORDER THE HEALTH OFFICER STRONGLY RECOMMENDS that retailers designate specific hours of operation for their stores to accommodate populations at high risk of developing severe COVID-19 disease, such as persons over the age of 65 years.

This Order is issued as a result of the worldwide pandemic of COVID-19 which has infected at least 13,365,559 individuals worldwide, in 213 countries and territories, including 4140 cases, and 31 deaths in the County, and is implicated in over 578,316 worldwide deaths.

This Order is issued based on evidence of continued community-based transmission of COVID-19 both within the County and worldwide, scientific evidence regarding the most effective approach to slow transmission of communicable diseases generally and COVID-19 specifically, as well as best practices as currently known and available to protect the public from the risk of spread of or exposure to COVID-19.

This Order is issued because of the propensity of the virus to spread person to person and also because the virus physically is causing property loss or damage due to its proclivity to attach to surfaces for prolonged periods of time.

This Order is intended to reduce the likelihood of exposure to COVID-19, thereby slowing the spread of COVID-19 in communities worldwide. As the presence of individuals increases, the difficulty and magnitude of tracing individuals who may have been exposed to a case rises exponentially.

This Order is issued in accordance with, and incorporates by reference: the March 4, 2020 Proclamation of a State Emergency issued by Governor Gavin Newsom; the March 12, 2020 Declaration of Local Health Emergency and Proclamation of Emergency based on an imminent and proximate threat to public health from the introduction of novel COVID-19 in the County; the March 17, 2020 Resolution of the Board of Supervisors ratifying the County Declaration of Local Health Emergency and Proclamation of Emergency regarding COVID-19; the guidance issued on March 11, 2020 by the California Department of Public Health regarding large gatherings of 250 people or more; Governor Gavin Newsom's Executive Order N-25-20 of March 12, 2020 preparing the State to commandeer hotels and other places of temporary residence, medical facilities, and other facilities that are suitable as places of temporary residence or medical facilities as necessary for quarantining, isolating or treating individuals who test positive for COVID-19 or who have had a high-risk exposure and are thought to be in the incubation period; the March 13, 2020 Presidential Declaration of a National Emergency due to the national impacts of COVID-19; the guidance issued on March 15, 2020 by the Centers for Disease Control and Prevention, the California Department of Public Health, and other public health officials through the United States and around the world recommending the cancellation of gatherings involving more than fifty (50) or more persons in a single space at the same time; the March 16, 2020 order of the State Public Health Officer prohibiting all gatherings with expected presence above ten (10) individuals; Governor Newsom's Executive Order N-33-20 of March 19, 2020 ordering all persons to stay at home to protect the health and well-being of all Californians and to establish consistency across the state in order to slow the spread of COVID-19; the March 22, 2020, Presidential Declaration of a Major Disaster in California beginning on January 20, 2020 under Federal Emergency Management Agency (FEMA) Incident DR-4482-CA; and, Governor Newsom's Executive Order N-60-20 of May 4, 2020 to allow reopening of lower-risk businesses and spaces ("Stage Two"), and then to allow reopening of higher-risk businesses and spaces ("Stage Three"), and directing the Public Health Officer to establish criteria and procedures to determine whether and how particular local jurisdictions may implement public health measures that depart from the statewide directives of the State Public Health Officer; the July 13, 2020 State Public Health Officer Order.

This Order is made in accordance with all applicable State and Federal laws, including but not limited to: Health and Safety Code sections 101040 and 120175; Health and Safety Code sections 101030 et seq., 120100 et seq.; and Title 17 of the California Code of Regulations section 2501.

If any provision of this Order or the application thereof to any person or circumstance is held to be invalid by a court of competent jurisdiction, the remainder of the Order, including the application of such part or provision to other persons or circumstances, shall not be affected and shall continue in full force and effect. To this end, the provisions of this Order are severable.

The violation of any provision of this Order constitutes a threat to public health. Pursuant to Government Code sections 26602 and 41601 and Health and Safety Code sections 101029 and 120295, the Health Officer requests that the Sheriff and all chiefs of police in the County ensure compliance with and enforce this Order. Per Health and Safety Code section 101029, "the sheriff of each county, or city and county, may enforce within the county, or the city and county, all orders of the local health officer issued for the purpose of preventing the spread of any contagious, infectious, or communicable disease. Every peace officer of every political subdivision of the county, or city and county, may enforce within the area subject to his or her jurisdiction all orders of the local health officer issued for the purpose of preventing the spread of any contagious, infectious, or communicable disease. This section is not a limitation on the authority of peace officers or public officers to enforce orders of the local health officer. When deciding whether to request this assistance in enforcement of its orders, the local health officer may consider whether it would be necessary to advise the enforcement agency of any measures that should be taken to prevent infection of the enforcement officers."

Copies of this Order shall promptly be: (1) made available at the County Public Health Department; (2) posted on the County Public Health Department's website (publichealthsbc.org); and (3) provided to any member of the public requesting a copy of this Order.

IT IS SO ORDERED:

Henning Ansorg, M.D.
Health Officer
Santa Barbara County Public Health Department

ATTACHMENT A

HEALTH OFFICER ORDER NO. 2020-12.5
COUNTY OF SANTA BARBARA

Businesses that Must Keep Physical Locations Closed

1. Amphitheaters, concert halls and venues, performing arts centers
2. Amusement and theme parks
3. Arenas
4. Banquet halls
5. <u>Barbershops and Hair Salons, except outdoor operations, if outdoor operations are allowed by the licensing or permitting authority.</u>
6. Brewpubs, breweries, bars, and pubs must close until those establishments are allowed to resume operation per state guidance and local permission, unless they are providing sit-down, dine-in meals. Alcohol may only be sold in the same transaction as a meal.
    a. Brewpubs, breweries, bars, and pubs that provide sit-down meals must follow the CDPH dine-in restaurant guidance, shall offer only outdoor dining, and should continue to encourage takeout and delivery service whenever possible.
    b. Brewpubs, breweries, bars, and pubs that do not provide sit-down meals, but wish to operate under this Order must obtain an Emergency Food Permit as described above.
    c. Venues that are currently authorized to provide off sale beer, wine, and spirits to be consumed off premises and do not offer sit-down, dine-in meals shall follow CDPH guidance for retail operations.
    d. Producers of beer, wine, and spirits must follow CDPH guidance for manufacturing operations.
    e. Brewpub, breweries, bars and pubs must offer foodservice during all hours of operation.
    f. This Section 5 applies to bars located at permitted food facilities.
7. Cardrooms, except outdoor operations
8. Climbing gyms
9. Community centers
10. Conference and convention centers
11. Dance halls, dances
12. Dine-in Restaurants, except outdoor dining, take-out and delivery
13. Fairs, festivals, public exhibitions
14. Family Entertainment Centers (for example: bowling alleys, miniature golf, batting cages and arcades) except outdoor operations
15. <u>Fitness centers, gyms, and studios including but not limited to those for dance, yoga, pilates, crossfit, cycling, boxing, and martial arts, except outdoor operations</u>

16. In-person higher education including technical schools, colleges, universities, adult education, and trade schools (distance learning is permitted)
17. Live performance venues, live theatre, and live performances
18. Lounges
19. Malls, except outdoor operations
20. Movie theatres, except outdoor operations
21. Museums, except outdoor exhibits and operations
22. Music events, concerts
23. Nightclubs including private social clubs
24. Offices for non-essential critical infrastructure sectors, defined at covid19.ca.gov, except outdoor operations
25. Indoor paintball, laser tag, or air soft facilities
26. Parties and Receptions. Outdoor wedding ceremonies (religious or non-religious) are permitted so long as the July 6, 2020 CDPH guidance for Places of Worship and Providers of Religious Services available at https://covid19.ca.gov/pdf/guidance-places-of-worship.pdf./ is followed. Indoor ceremonies are not allowed at this time. Occupancy at outdoor venues is limited by the natural limits of the venue that permit social distancing of six feet between people from different households. Receptions for weddings are not allowed.
27. Personal Care Services (including nail salons, massage parlors, and tattoo parlors), except outdoor operations, if outdoor operations are allowed by the licensing or permitting authority.
28. Places of Worship, except outdoor operations
29. Playgrounds
30. Protests, except outdoor operations
31. Raceways
32. Rodeos, equestrian events
33. Roller derby
34. Skating rinks, such as ice and roller, except outdoor operations (These facilities may operate on a reservation or appointment-only basis for individual physical fitness activities or skills training following the guidance provided for gyms and fitness centers. No open (public) skating, group practices or team / club events are allowed. All indoor operations must close.)
35. Saunas and steam rooms
36. Organized sports (except professional sports without a live audience)
37. Sports stadiums and facilities (except as necessary for professional sporting events without live audiences)
38. Trampoline and bounce houses
39. Wineries and tasting rooms, except outdoor operations
40. Zoos, except outdoor exhibits and operations

ATTACHMENT B

HEALTH OFFICER ORDER NO. 2020-12.5
COUNTY OF SANTA BARBARA

COVID-19 SELF-EVALUATION

The County Health Officer has defined COVID-19 symptoms as follows:

Mild to Moderate Symptoms Related to or
Other Respiratory Illness such as:

Sore Throat

Runny Nose

Fever

Chills

Not Feeling Well

Sneezing

Coughing

Gastro-Intestinal symptoms such as:

Soft Stool

Stomach Cramps

New loss of smell and/or taste

ATTACHMENT C

State of California—Health and Human Services Agency
California Department of Public Health

SONIA Y. ANGELL, MD, MPH
State Public Health Officer & Director

GAVIN NEWSOM
Governor

Statewide Public Health Officer Order, July 13, 2020

On March 19, 2020, I issued an order directing all individuals living in the State of California to stay at home except as needed to facilitate authorized, necessary activities or to maintain the continuity of operations of critical infrastructure sectors. I then set out California's path forward from this "Stay-at-Home" Order in California's Pandemic Resilience Roadmap. On May 7th, I announced that statewide data supported the gradual movement of the entire state into Stage 2 of the Pandemic Resilience Roadmap. On May 8th, the Governor outlined a process where counties that met specific criteria could move more quickly than other parts of the state through Stage 2 of modifying the Stay-at-Home order, including certain businesses deemed higher risk.

The statewide data has since demonstrated a significant increase in the spread of COIVD-19, resulting in public health conditions that demand measures responsive to those conditions be put into place with haste. On June 28, 2020, the California Department of Public Health (CDPH) issued guidance setting forth the need to close bars and similar establishments in counties that – due to concerning levels of disease transmission, hospitalizations, or insufficient testing – had been on the County Monitoring List, which includes counties that show concerning levels of disease transmission, hospitalizations, insufficient testing, or other critical epidemiological markers, for 14 days. On July 1, 2020, CDPH issued guidance specific to counties on the County Monitoring List for three consecutive days, requiring closure of the indoor operations of various sectors, including restaurants, wineries, and certain entertainment venues, as well as all bars indoor and outdoor. Based on my judgment as the State Public Health Officer, it is now necessary to take these steps statewide, to take additional steps for counties on the County Monitoring List, and to continue to monitor and modify the process of reopening.

The current data reflect that community spread of infection is of increasing concern across the state. On July 1, 2020, there were 19 counties on the County Monitoring List. As of July 13, 2020, there are 32 counties on the list, and additional counties may soon be added as data warrants. In addition to the impact on the general population, community spread increases the likelihood of expanded transmission of COVID-19 in congregate settings such as nursing homes, homeless shelters, jails and prisons. Infection of these vulnerable populations in these settings can be catastrophic. Higher

CDPH, MS 0500 ● P.O. Box 997377 ● Sacramento, CA 95899-7377
(916) 558-1784
Internet Address: www.cdph.ca.gov

levels of community spread also increase the likelihood of infection among individuals at high risk of serious outcomes from COVID-19, including the elderly and those with underlying health conditions who might live or otherwise interact with an infected individual.

The Pandemic Resilience Roadmap classifies bars, pubs, breweries, brewpubs, dine-in restaurants, wineries and tasting rooms, family entertainment centers, zoos, museums, and cardrooms as Stage 2 or Stage 3 sectors with high risk of transmission due to a number of features of the businesses and the behaviors that occur within them. Public health studies have shown that the risk of transmission is exacerbated in indoor spaces, particularly when lacking appropriate ventilation. These sectors are settings where groups convene and may mix with others for a prolonged period of time, increasing the risk of escalating the transmission rate of COVID-19. While physical distancing is critical to mitigating exposure, it is more effective at protecting an individual with brief exposures or outdoor exposures. In contrast to indoor spaces, wind and the viral dilution in outdoor spaces can help reduce viral load.

Bars, both indoor and outdoor, have additional risk factors. A bar, foundationally, is a social setting where typically not only small groups convene, but also where groups mix with other groups. Bars also have an added risk imposed by the consumption of alcohol as a primary activity offered in such venues. Alcohol consumption slows brain activity, reduces inhibition, and impairs judgment, factors which contribute to reduced compliance with recommended core personal protective measures, such as the mandatory use of face coverings and maintaining six feet of distance from people in different households, both indoors and outdoors. Louder environments and the cacophony of conversation that are typical in bar settings also require raised voices and greater projection of orally emitted viral droplets.

For counties on the County Monitoring List, the risks and impacts of disease transmission are even greater. The science suggests that for indoor operations the odds of an infected person transmitting the virus are dramatically higher compared to an open-air environment. Thus, for those counties on the list, it is necessary to close indoor operations for additional sectors which promote the closed-space mixing of populations beyond households and/or make adherence to physical distancing with face coverings difficult, including: gyms and fitness centers, places of worship, protests, offices for non-Critical Infrastructure sectors as designated on covid19.ca.gov, personal care services (including nail salons, massage parlors, and tattoo parlors), hair salons and barbershops, and malls.

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NOW, THEREFORE, I, as State Public Health Officer and Director of the California Department of Public Health, order all of the following:

Statewide Order Relative to Bars, Pubs, Brewpubs, and Breweries

1. Bars, pubs, brewpubs, and breweries, whether operating indoors or outdoors, shall be closed across the state, unless an exception below applies.

   a. Bars, pubs, brewpubs, and breweries, may operate outdoors if they are offering sit-down, outdoor, dine-in meals. Alcohol can be sold only in the same transaction as a meal. When operating outdoors, they must follow the dine-in restaurant guidance and should continue to encourage takeout and delivery service whenever possible.
   b. Bars, pubs, brewpubs, and breweries that do not provide sit-down meals themselves, but can contract with another vendor to do so, can serve dine-in meals when operating outdoors provided both businesses follow the dine-in restaurant guidance and alcohol is sold only in the same transaction as a meal.
   c. Venues that are currently authorized to provide off sale beer, wine, and spirits to be consumed off premises and do not offer sit-down, dine-in meals must follow the guidance for retail operations and offer curbside sales only.
   d. Concert, performance, or entertainment venues must remain closed until they are allowed to resume modified or full operation through a specific reopening order or guidance. Establishments that serve full meals must discontinue this type of entertainment until these types of activities are allowed to resume modified or full operation.

2. Indoor operations shall be restricted across the state as specified below:

   a. Dine-in restaurants must close indoor seating to customers. During this closure all dine-in restaurants may continue to utilize outdoor seating and must comply with the guidance for outdoor dining. Restaurants should continue to encourage takeout and delivery service whenever possible.
   b. Wineries and tasting rooms must close indoor services to customers. During this closure all wineries and tasting rooms operating outdoors must comply with the guidance for restaurants, wineries, and bars.
   c. Family entertainment centers and movie theaters must close indoor services and attractions to customers.
      1. Family entertainment centers may continue to provide outdoor services and attractions to customers, and must comply with the guidance for movie theaters and family entertainment centers.

2. Drive-in movie theaters may continue to operate and should follow additional applicable guidance for drive-in movie theaters.

d. Indoor attractions at zoos and museums must close to visitors.

1. Zoos and museums may continue to operate outdoor attractions and must follow the guidance for zoos and museums.

e. Cardrooms must close indoor services to customers and must follow the guidance for cardrooms.

Order for Closure of Additional Indoor Sectors for Counties on Monitoring List

3. Counties that currently appear on CDPH's County Monitoring List and have been on the list for three consecutive days, and counties that subsequently appear for three consecutive days or more while this order remains effective, must close all indoor operations of the following types of businesses/events/activities:

a. Gyms and Fitness Centers
b. Places of Worship
c. Protests
d. Offices for Non-Critical Infrastructure Sectors
e. Personal Care Services (including nail salons, massage parlors, and tattoo parlors)
f. Hair salons and barbershops
g. Malls

Terms of Orders

4. This order shall go into effect immediately.

5. These closures shall remain in effect until I determine it is appropriate to modify the order based on public health conditions.

6. Outdoor operations may be conducted under a tent, canopy, or other sun shelter but only as long as no more than one side is closed, allowing sufficient outdoor air movement.

7. I will continue to monitor the epidemiological data and will modify the sectors that may be open both statewide and in counties on the Monitoring List as required by the evolving public health conditions. If I determine that it is appropriate to reopen, close, or modify the operations of any additional sectors, those sectors will be posted at: https://covid19.ca.gov/roadmap-counties/.

8. My guidance mandating the wearing of face coverings and my guidance prohibiting gatherings continue to apply statewide, except as specifically permitted in other orders or guidance documents. To prevent further spread of COVID-19 to and within other

jurisdictions within the State, Californians should not travel significant distances and should stay close to home.

9. This order is issued pursuant to the authority under EO N-60-20, and Health and Safety Code sections 120125, 120130(c), 120135, 120140, 120145, 120150, 120175,120195 and 131080.

Sonia Y Angell, MD, MPH
State Public Health Officer & Director
California Department of Public Health

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Chapter 1 – Introduction and Plan Area

Appendix 1c-D:

Sustainable Groundwater Management Act
Newsletter No.1 through No.6 and
Press Releases

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PUBLIC NOTICE

The following notice was run in the Santa Barbara News Press on December 17 and 24, 2021.

Notice of Public Hearings for adoption of the Groundwater Sustainability Plans for the Santa Ynez River Valley Groundwater Basin

Pursuant to California Water Code Section 10728.4, the Groundwater Sustainability Agencies (GSAs) of the Santa Ynez River Valley Groundwater Basin (Basin) (DWR Bulletin 118 Groundwater Basin: 3-015) will hold Public Hearings to accept public comment and consider adoption of the Final Groundwater Sustainability Plan (GSP) for the respective management area of the Basin.

- **Central Management Area (CMA) GSP: Monday, January 3, 2022 at 10:00 am**
- **Western Management Area (WMA) GSP: Wednesday, January 5, 2022 at 10:00 am**
- **Eastern Management Area (EMA) GSP: Thursday, January 6, 2022 at 6:30 pm**

Public participation will be available via Zoom. For additional information on methods of participation in the Public Hearings, GSA Committee meetings and to review the Final Groundwater Sustainability Plans, visit **SantaYnezWater.org**. The public hearings may be continued to subsequent meetings of the GSA Committees.

The GSPs were prepared in response to passage of the Sustainable Groundwater Management Act of 2014 and applies to areas within the three management areas of the Basin. The public, agencies and other interested parties are invited to attend the public hearings and provide written and verbal comments. Comments received during the public hearing will be considered by the GSA Committee for its determination to adopt the proposed GSP. For more information, contact Bill Buelow at (805) 693-1156 or email BBuelow@SYRWCD.com.

DEC 17, 24 / 57842

Sustainable Groundwater Management Quarterly Newsletter No. 1 June 2020

Santa Ynez River Valley Groundwater Basin (SYRVGB)

The Sustainable Groundwater Management Act (SGMA), signed into law in 2014, created a new framework for groundwater management in California. SGMA established a new structure for local groundwater management through Groundwater Sustainability Agencies (GSAs). The SYRVGB has three management areas each with their own GSA Committee comprised of local participating Agencies:

Western Management Area (WMA) GSA Committee

• Santa Ynez River Water Conservation District • City of Lompoc
• Mission Hills CSD • Vandenberg Village CSD
• Santa Barbara County Water Agency

Central Management Area (CMA) GSA Committee

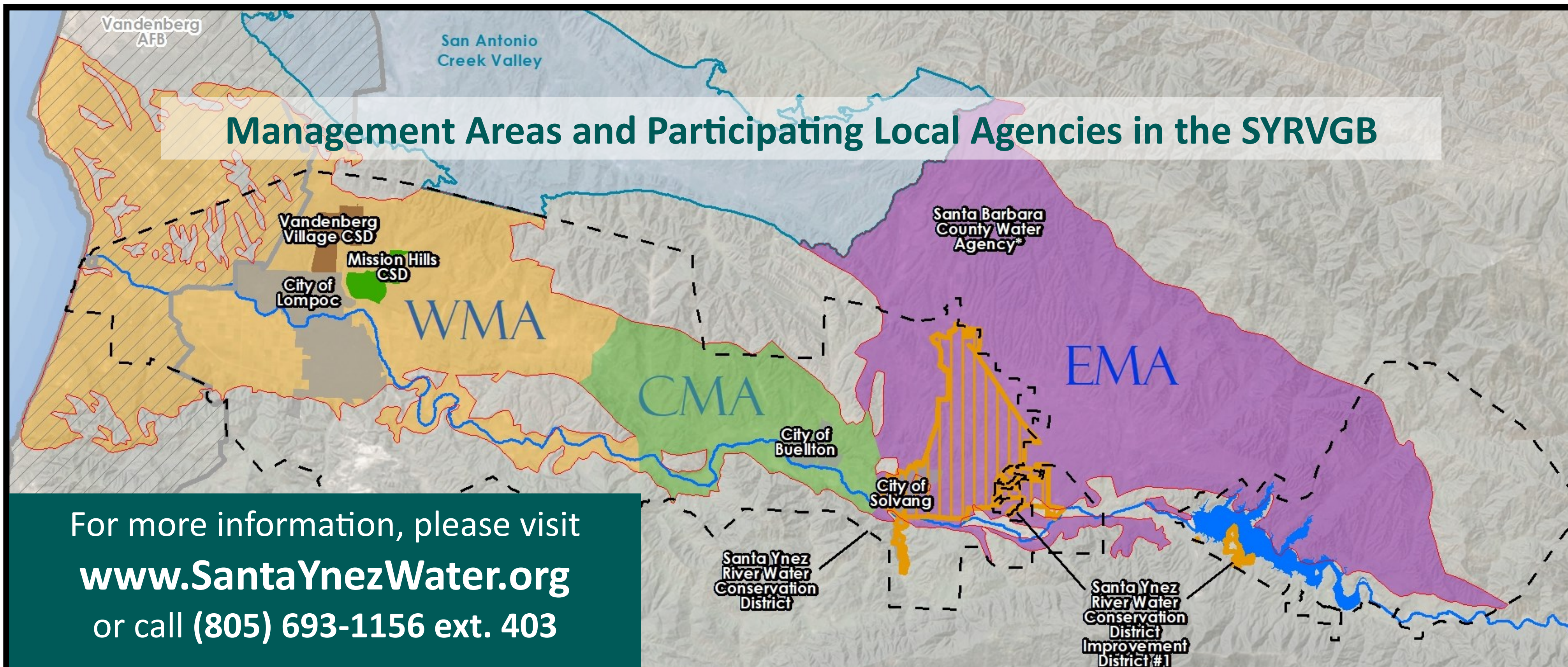
• Santa Ynez River Water Conservation District • City of Buellton
• Santa Barbara County Water Agency

Eastern Management Area (EMA) GSA Committee

• Santa Ynez River Water Conservation District • City of Solvang
• Santa Barbara County Water Agency • Santa Ynez River Water Conservation District, Improvement District No. 1

Each GSA Committee is preparing its own Groundwater Sustainability Plan (GSP) that will describe the path to groundwater sustainability. **The GSPs will determine how much groundwater can be used in the future and could include restrictions on pumping.**

All three GSPs will be completed in early 2022. Progress updates will be given in each quarterly GSA Committee meeting and draft documents will be available for public review and comment on the website (*www.SantaYnezWater.org*). **Participation by members of the community in developing the GSPs is important and each of the GSA Committees has adopted an outreach and engagement plan to guide the public participation process.**



For more information, please visit
www.SantaYnezWater.org
or call **(805) 693-1156 ext. 403**

Boletín trimestral de la Gestión Sostenible de las Agua Subterránea No. 1 junio 2020

Cuenca de Agua Subterránea del Valle del Río Santa Ynez (SYRVGB, por sus siglas en inglés)

La Ley de Gestión Sostenible de las Aguas Subterránea (SGMA, por sus siglas en inglés), firmado en ley en el 2014, estableció un nuevo marco para la gestión de el agua subterránea en California. La SGMA estableció una nueva estructura para la gestión del agua subterránea local por medio de Agencia de Sostenibilidad del Agua Subterránea (GSA, por sus siglas en inglés). La SYRVGB tiene tres zonas de gestión, cada una con su propio comité de GSA compuesto por agencias participantes locales:

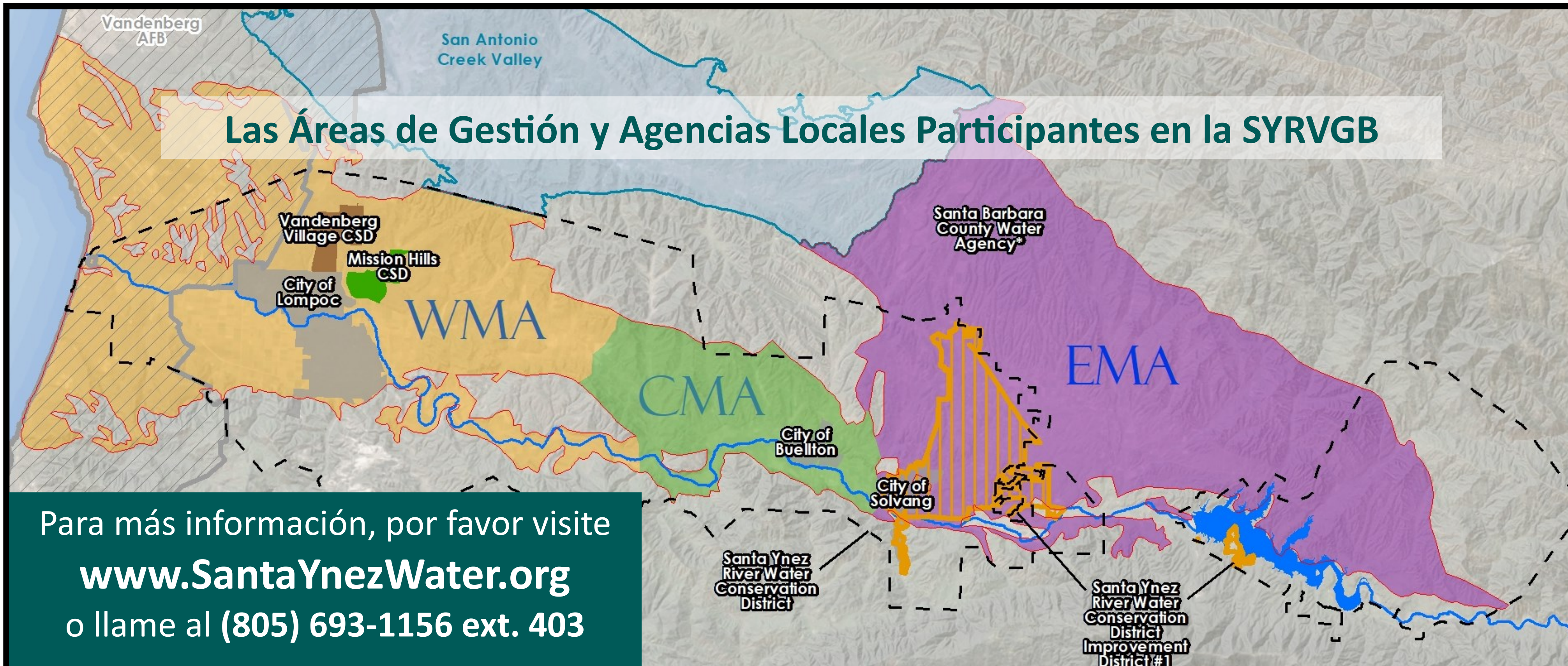
Zona de Gestión del Oeste (WMA, por sus siglas en inglés) Comité de GSA
- Distrito de Conservación de Agua del Río Santa Ynez • Ciudad de Lompoc
- Mission Hills CSD • Vandenberg Village CSD
- Agencia de Agua del Condado de Santa Bárbara

Zona de Gestión Central (CMA, por sus siglas en inglés) Comité de GSA
- Distrito de Conservación de Agua del Río Santa Ynez • Ciudad de Buellton
- Agencia de Agua del Condado de Santa Bárbara

Zona de Gestión del Este (EMA, por sus siglas en inglés) Comité de GSA
- Distrito de Conservación de Agua del Río Santa Ynez • Ciudad de Solvang
- Agencia de Agua del Condado de Santa Bárbara • Agua del Río Santa Ynez Distrito de Conservación, Distrito del Mejoramiento No. 1

Cada comité de GSA está preparando su propio Plan de Sostenibilidad del Agua Subterránea (GSP, por sus siglas en inglés) que describirá el camino para la sostenibilidad de el agua subterránea. **Los GSPs determinarán cuanta agua subterránea se puede usar en el futuro y podría incluir restricciones en el bombeo.**

Los tres GSPs se completarán a principios del 2022. Se darán actualizaciones de progreso en cada junta trimestral del Comité de GSA y los documentos estarán disponibles al público para revisar y comentar en la página web (*www.SantaYnezWater.org*). **Es importante la participación de los miembros de la comunidad en el desarrollo de los GSPs y cada uno de los comités de GSA han adoptado un plan de alcance y compromiso para guiar el proceso de la participación del público.**



Sustainable Groundwater Management Act Newsletter No. 2 December 2020

Santa Ynez River Valley Groundwater Basin

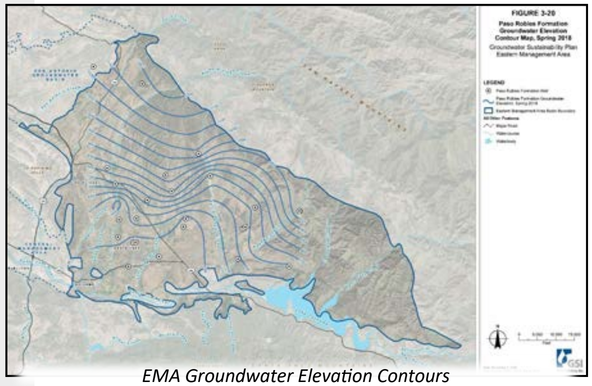
The Sustainable Groundwater Management Act (SGMA), enacted January 2015, creates a new framework for groundwater management. The management plan developed by this process will regulate future groundwater use and will be completed in early 2022.

In accordance with SGMA, DRAFT Hydrogeological Conceptual Models (HCM) have been prepared for each management area within the Santa Ynez River Groundwater Basin, including the Eastern Management Area (EMA), the Central Management Area (CMA), and the Western Management Area (WMA). Each HCM describes the basin setting and outlines the physical characteristics of the specific management area, identifies principal aquifers, and the uses and users of groundwater. The HCM documents for the EMA, CMA, and WMA are **now available for public review and comment at *SantaYnezWater.org*.** Additional DRAFT documents describing groundwater conditions will be released for public review and comment, soon.

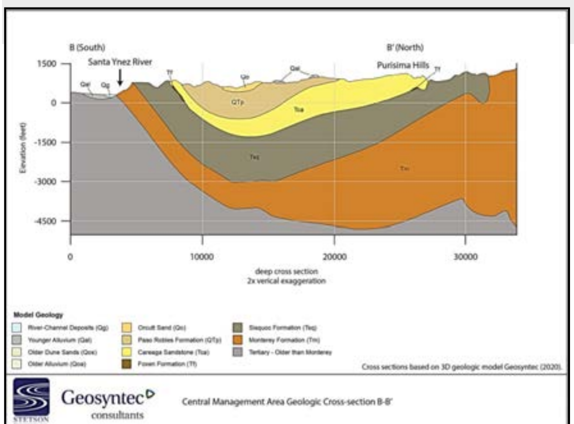
Check SantaYnezWater.org for schedule of Public Meetings and Workshops

Hydrogeological Conceptual Model: Provides understanding of basin setting, physical characteristics and basin geometry (geology), hydrogeologic conditions, land use, and groundwater uses and users.

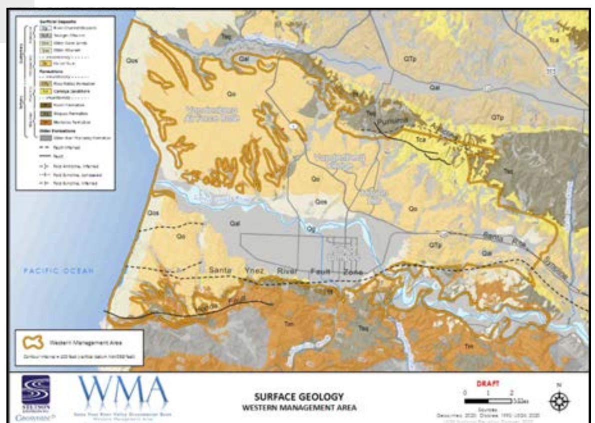
HCMs include a series of geologic maps and scaled cross-sections to provide a representation and geographic view of different data sets, as demonstrated by these examples from the draft HCMs.



EMA Groundwater Elevation Contours



CMA Geologic Cross-section



WMA Surface Geology

For more information, meeting announcements, and draft documents, please visit

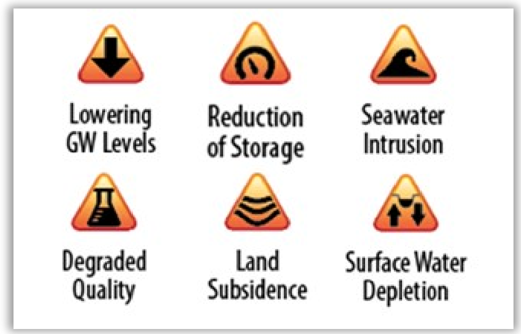
SantaYnezWater.org

or call **(805) 693-1156 ext. 403**

Sustainable Management Criteria

Sustainable Groundwater Management is defined by the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon, 20 years, without causing undesirable results.

Avoidance of undesirable results is measured through **six sustainability indicators:**



The Groundwater Sustainability Agency Committees will request public feedback on the **six sustainability indicators** and associated undesirable results based on findings presented by the basin's consultants. Public feedback to establish undesirable results thresholds will be considered to work toward sustainable groundwater management. Public participation is important at this step to develop appropriate undesirable results thresholds in order to develop a plan for sustainable groundwater management. For meeting announcements and information on how to participate, please visit the website at *SantaYnezWater.org* .

Boletín Informativo No. 2 de la Ley de Gestión Sostenible del Agua Subterránea Diciembre 2020

Cuenca de Agua Subterránea del Valle del Río Santa Ynez

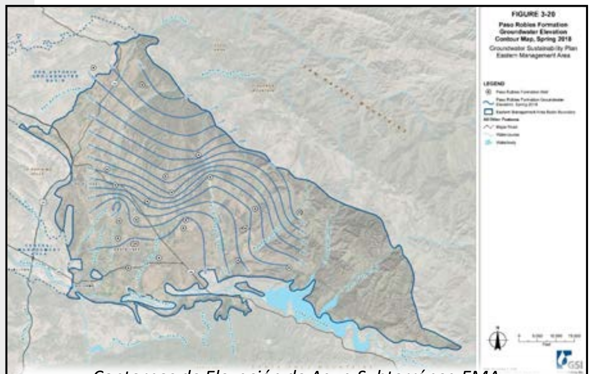
Visite SantaYnezWater.org para conocer el calendario de Reuniones Públicas y Talleres

La Ley de Gestión Sostenible del Agua Subterránea (SGMA, por sus siglas en inglés), promulgada en enero del 2015, crea un nuevo marco para la sostenibilidad del agua subterránea. El plan de sostenibilidad desarrollado por este proceso regulará el uso futuro del agua subterránea y se completará a principios de 2022.

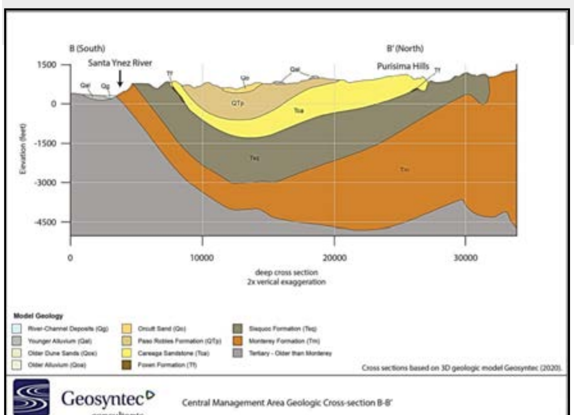
De acuerdo con la SGMA, se han preparado BORRADORES de Modelos Conceptuales Hidrogeológicos (HCM, por sus siglas en inglés) para cada área de gestión dentro de la Cuenca de Agua Subterránea del Río Santa Ynez, incluyendo el Área de Gestión Oriental (EMA, por sus siglas en inglés), el Área de Gestión Central (CMA, por sus siglas en inglés) y el Área de Gestión Occidental (WMA, por sus siglas en inglés). Cada HCM describe el entorno de la cuenca y describe las características físicas del área de gestión específica, identifica los principales acuíferos, y los usos y usuarios del agua subterránea. Los documentos de HCM para EMA, CMA, y WMA ya **están disponibles para su revisión y comentarios públicos en *SantaYnezWater.org*.** Pronto se publicarán documentos BORRADORES adicionales que describen las condiciones del agua subterránea para su revisión y comentarios públicos.

Modelo Conceptual Hidrogeológico: Proporciona una comprensión del entorno de la cuenca, las características físicas y la geometría de la cuenca (geología), las condiciones hidrogeológicas, el uso de la tierra y los usos y usuarios del agua subterránea.

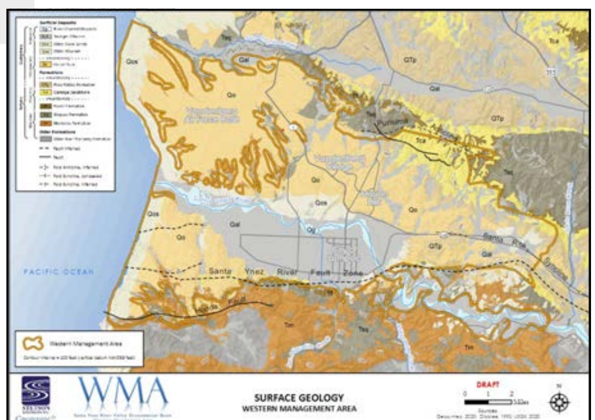
Los HCM incluyen una serie de mapas geológicos y secciones transversales escaladas para proporcionar una representación y vista geográfica de diferentes conjuntos de datos, como lo demuestran estos ejemplos de los borradores de HCM.



Contornos de Elevación de Agua Subterránea EMA



Sección Transversal Geológica CMA



Geología de Superficie WMA

Para obtener más información, anuncios de reuniones, y documentos preliminares, visite

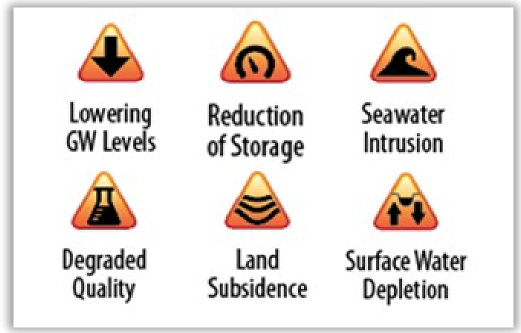
SantaYnezWater.org

o llame al **(805) 693-1156 ext. 403**

Criterios de Gestión Sostenible

La Gestión Sostenible del Agua Subterránea se define como la gestión y uso del agua subterránea de manera que se pueda mantener durante el horizonte de planeación e implementación, 20 años, sin generar resultados indeseables.

El evitar resultados indeseables se mide a través de **seis indicadores de sostenibilidad:**



Los Comités de la Agencia de Sostenibilidad del Agua Subterránea solicitarán la retroalimentación del público sobre los **seis indicadores de sostenibilidad** y los resultados indeseables asociados basados en los hallazgos presentados por los consultores de la cuenca. Se considerará que la retroalimentación del público para establecer umbrales de resultados no deseados tiene como fin la gestión sostenible del agua subterránea. La participación pública es importante en este paso para desarrollar umbrales de resultados indeseables apropiados con el fin de desarrollar un plan de sostenibilidad del agua subterránea. Para conocer los anuncios de reuniones e información sobre cómo participar, visite el sitio web *SantaYnezWater.org.*

Sustainable Groundwater Management Act Newsletter No. 3 March 2021

Santa Ynez River Valley Groundwater Basin

Check SantaYnezWater.org for schedule of Public Meetings and Workshops

The Sustainable Groundwater Management Act (SGMA), enacted January 2015, creates a new framework for groundwater management. The management plan developed by this process will regulate future groundwater use and will be completed in early 2022.

The building blocks that inform a Groundwater Sustainability Plan (GSP) are:

Basin Setting

Characterizes the basin, evaluates and assesses current and historical conditions, and quantifies groundwater flows into and out of the basin.

Summarized through the Hydrological Conceptual Model, Groundwater Conditions, and Water Budget.

Drafts Completed

Numerical Groundwater Model

A computational method that represents an approximation of the hydrologic system.

A useful tool for estimating the potential hydrologic effects of proposed water management activities.

Pending

Sustainable Management Criteria (SMC) Workshops

Emphasizing local control of groundwater management through public engagement.

Workshops are utilized to establish appropriate thresholds for undesirable results to develop a plan for sustainable groundwater management.

Coming Soon

Groundwater Sustainability Plan Sections

Plan Area and Basin Setting

- Description of the Plan Area
- Basin Setting

Sustainable Management Criteria

- Sustainability Goal
- Measurable Objectives
- Minimum Thresholds
- Undesirable Results
- Monitoring Network

Actions to Achieve Sustainability Goal

- Proposed Projects
- Proposed Management Actions

Plan Implementation

- Estimate of GSP Costs
- Schedule
- Annual Reporting
- Periodic Evaluations

The various DRAFT documents/chapters released for this plan will be compiled and form the larger GSP document as shown to the left. There are **multiple opportunities for the public to comment** on the chapters and full GSP before it is finalized in 2022.

For more information, meeting announcements, and to review and comment on draft documents, please visit

SantaYnezWater.org or call **(805) 693-1156 ext. 403**

Boletín sobre la Ley de Gestión Sostenible del Agua Subterránea No. 3 Marzo 2021

Cuenca del Agua Subterránea del Rio Valle Santa Ynez

Visite SantaYnezWater.org para programar las Reuniones y los Talleres Públicos

La Ley de Gestión Sostenible del Agua Subterránea (SGMA, por sus siglas en inglés), promulgada en enero de 2015, crea un marco para la gestión del agua subterránea. El plan de gestión desarrollado por este proceso regular el uso futuro del agua subterránea y se completará a principios del 2022.

Los componentes que informan el Plan de Sostenibilidad del Agua Subterránea (GSP, por sus siglas en inglés) son:

Configuración de la Cuenca

Caracteriza la cuenca, evalúa y determina las condiciones actuales e históricas, y cuantifica el flujo del agua subterránea hacia y desde la cuenca.

Resumido por el Modelo Conceptual Hidrológico, las Condiciones del Agua Subterránea y el Presupuesto del Agua.

Proyectos Finalizados

Modelo del Agua Subterránea Numérica

Un método computacional que representa una aproximación del sistema hidrológico .

Una herramienta útil para calcular los efectos hidrológicos potenciales de las actividades propuestas sobre la gestión del agua.

Pendiente

Talleres Sobre los Criterios de la Gestión Sostenible (SMC)

Enfatizar el control local de la gestión del agua subterránea a través de la participación del público.

Los talleres se utilizan para establecer umbrales adecuados de los resultados no deseables para poder desarrollar un plan para la gestión del agua subterránea sostenible.

Próximamente

Secciones del Plan de Sostenibilidad Del Agua Subterránea

Espacio del Plan y Configuración de la Cuenca

- Descripción del Espacio del Plan
- Caracteriza la cuenca

Criterios para la Gestión de Sustentabilidad

- Meta de Sostenibilidad
- Objetivos Mensurables
- Umbrales Mínimos
- Resultados No Deseables
- Red de Monitoreo

Acciones para Lograr el Objetivo de Sostenibilidad

- Proyectos Propuestos
- Acciones de Gestión Propuestas

Implementación del Plan

- Estimado del Costo del GSP
- Calendario
- Reporte Annual
- Evaluaciones Periódicas

Los diversos BORRADORES de los documentos y capítulos publicados para este plan serán recopilados a partir del documento GSP más grande como se muestra a la izquierda. **Habrá múltiples oportunidades para que el público comente** sobre los capítulos y el GSP completo antes de que se finalice el proyecto en el 2022.

Para más información, anuncios sobre las juntas, o para revisar y comentar sobre los documentos, por favor visite SantaYnezWater.org o llame al (805) 693-1156 ext. 403

Sustainable Groundwater Management Act Newsletter No. 4 June 2021

Santa Ynez River Valley Groundwater Basin

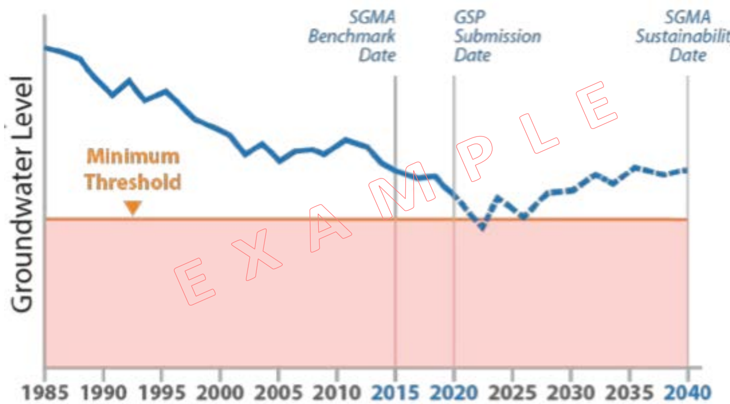
The Sustainable Groundwater Management Act (SGMA), enacted January 2015, creates a new framework for groundwater management. The management plan (GSP) developed by representatives from local municipalities and agencies will manage and regulate future groundwater use. The GSP will be completed in early 2022.

Check SantaYnezWater.org for schedule of Public Meetings and Workshops

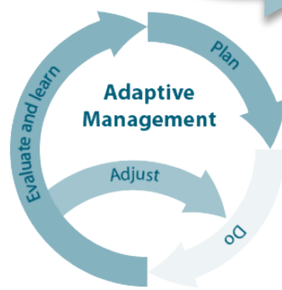
Groundwater Sustainability Agencies (GSAs) must consider and document the conditions at which each of the six sustainability indicators become significant and unreasonable in their basin.

Setting Minimum Thresholds

Based on the GSA's decision of what is significant and unreasonable, they will choose a representative value that is to be avoided. This value becomes the **Minimum Threshold**.



Avoidance of the defined undesirable results must be achieved within 20 years of Groundwater Sustainability Plan (GSP) implementation. GSPs must clearly define a planned pathway to reach sustainability.



Potential Management Actions and Projects

1. Identify list of management actions and projects
2. Evaluate benefits and costs
3. Select subset of preferred management actions and projects and prioritize them
4. Develop implementation plan and schedule

Relationship between Minimum Thresholds and Management Actions

- Early management actions to be initiated upon submittal of the GSP.
- Regularly monitor and evaluate six sustainability indicators to take actions BEFORE Minimum Threshold is reached.
- Use projects and management actions assessed in the GSP to avoid undesirable results caused by exceeding Minimum Thresholds.

For more information, meeting announcements, and to review and comment on draft documents, please visit
SantaYnezWater.org or call **(805) 693-1156 ext. 403**

Boletín sobre la Ley de Gestión Sostenible del Agua Subterránea No. 4 Junio 2021

Cuenca del Agua Subterránea del Rio Valle Santa Ynez

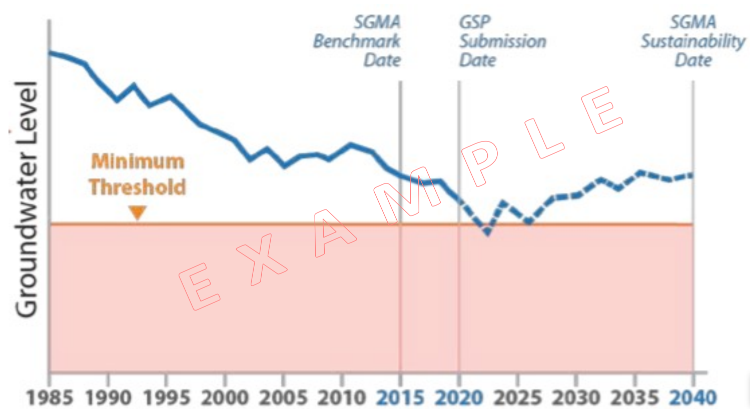
La Ley de Gestión Sostenible del Agua Subterránea (SGMA), promulgada en Enero del 2015, crea un nuevo marco para la gestión del agua subterránea. El plan de gestión (GSP) elaborado por representantes de los municipios y organismos locales, gestionará y regulará el futuro uso del agua subterránea y estará completado a principios del 2022.

Visite SantaYnezWater.org para programar las Reuniones y los Talleres Públicos

Las Agencias de Sostenibilidad del Agua Subterránea (GSAs) deben considerar y documentar las condiciones en las que cada uno de los seis indicadores de sostenibilidad se vuelven significativos y no razonables en su cuenca.

Establecimiento de Umbrales Mínimos

Basándose en la decisión de la GSA sobre lo que es significativo y no razonable, elegirán un valor representativo que debe ser evitado. Este valor se convierte en el **Umbral Mínimo**.



Se deben evitar los resultados no deseables definidos en un plazo de 20 años a partir de la implementación del Plan de Sostenibilidad del Agua Subterránea (GSP). Los GSP deben definir claramente una vía planificada para alcanzar la sostenibilidad.

Posibles Acciones y Proyectos de Gestión

1. Identificar la lista de acciones y proyectos de gestión
2. Evaluar los beneficios y costos
3. Seleccionar un subconjunto de acciones y proyectos de gestión preferentes y priorizarlos
4. Desarrollar un plan y un cronograma de implementación

Relación entre los Umbrales Mínimos y las Acciones de Gestión

- ◊ Las acciones tempranas de gestión se iniciarán tras la presentación del GSP.
- ◊ Supervisar y evaluar periódicamente seis indicadores de sostenibilidad para tomar medidas ANTES de que se alcance el Umbral Mínimo.
- ◊ Utilizar los proyectos y las acciones de gestión evaluados en el GSP para evitar resultados no deseables causados por la superación de los Umbrales Mínimos.

Para más información, anuncios sobre las juntas, o para revisar y comentar sobre los documentos, por favor visite SantaYnezWater.org o llame al (805) 693-1156 ext. 403

Sustainable Groundwater Management Act Newsletter No. 5 September 2021

Santa Ynez River Valley Groundwater Basin

The three Groundwater Sustainability Agencies (GSAs) in the Santa Ynez River Valley Groundwater Basin have prepared **Groundwater Sustainability Plans (GSPs)** as required by the Sustainable Groundwater Management Act (SGMA) of January 2015. Final Drafts of the three GSPs are available for public review and comment online at SantaYnezWater.org. The Final GSPs must be submitted to the California Department of Water Resources (DWR) by January 31, 2022. Upon submittal, DWR will host a public comment period on the Final GSPs via its website.

Schedule of Public Meetings, Workshops, and Comment Periods located at SantaYnezWater.org

COMMENT NOW

SGMA is implemented at the local level

Public Review and Comment on the Groundwater Sustainability Plans

All three Draft GSPs are available on-line

SantaYnezWater.org

PUBLIC COMMENT PERIODS:

See website for exact dates or sign-up for email notifications.

Draft GSP: 45 days in September - October, 2021

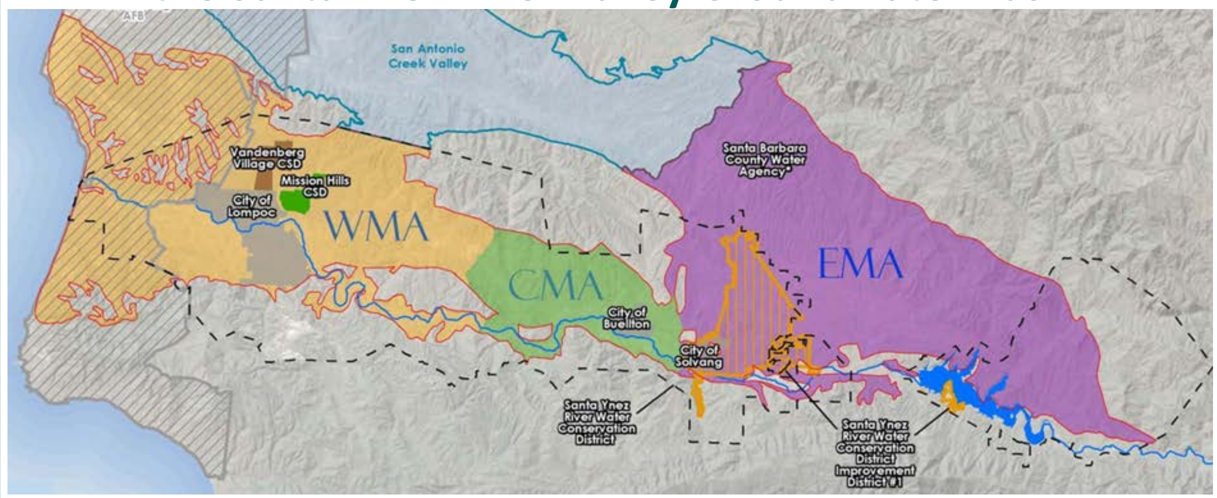
Final GSP: 75 days in February-March 2022

Final GSPs will also be available online.

Western Management Area GSP
Central Management Area GSP
Eastern Management Area GSP

A printed copy will be available for review at the following public libraries: Solvang, Buellton, Lompoc, and Vandenberg Village.

Three Groundwater Sustainability Agencies (GSAs) in the Santa Ynez River Valley Groundwater Basin



Next Steps:

- **September/October 2021:** Public Review of Draft GSPs
- **October 2021:** Citizen Advisory Groups Meetings to discuss Draft GSPs
- **October 2021:** GSA Committee Meetings to discuss Draft GSPs
- **December 2021/January 2022:** GSP Adoption by GSA Committees
- **January 31, 2022:** Final GSPs due to DWR
- **February/March 2022:** Public Review of Final GSPs (comment via DWR website)

For more information, meeting announcements, and to review and comment on draft documents, please visit

SantaYnezWater.org or call **(805) 693-1156 ext. 403**

Cuenca de Aguas Subterráneas del Valle del Río Santa Ynez

Las tres Agencias de Sostenibilidad de Aguas Subterráneas (GSAs) en la Cuenca de Aguas Subterráneas del Valle del Río Santa Ynez han preparado **Planes de Sostenibilidad de Aguas Subterráneas (GSPs)** como lo requiere la Ley de Gestión Sostenible de Aguas Subterráneas (SGMA) de enero de 2015. Los Borradores Finales de los tres GSP están disponibles para su revisión pública y comentarios en línea en SantaYnezWater.org. Los GSP Finales deben ser presentados al Departamento de Recursos Hídricos de California (DWR) antes del 31 de enero de 2022. Una vez presentados, el DWR organizará un período de comentarios públicos sobre los GSP Finales a través de su página web.

Calendario de Reuniones Públicas, Talleres y Períodos de Comentarios en SantaYnezWater.org

COMENTE AHORA

La SGMA es aplicada a nivel local

Revisión y Comentarios Públicos sobre los Planes de Sostenibilidad de Aguas Subterráneas

Los tres Borradores de los GSP están disponibles en línea SantaYnezWater.org

PERÍODOS DE COMENTARIOS PÚBLICOS :

Consulte el sitio web para conocer las fechas exactas o regístrese para recibir notificaciones por correo electrónico.

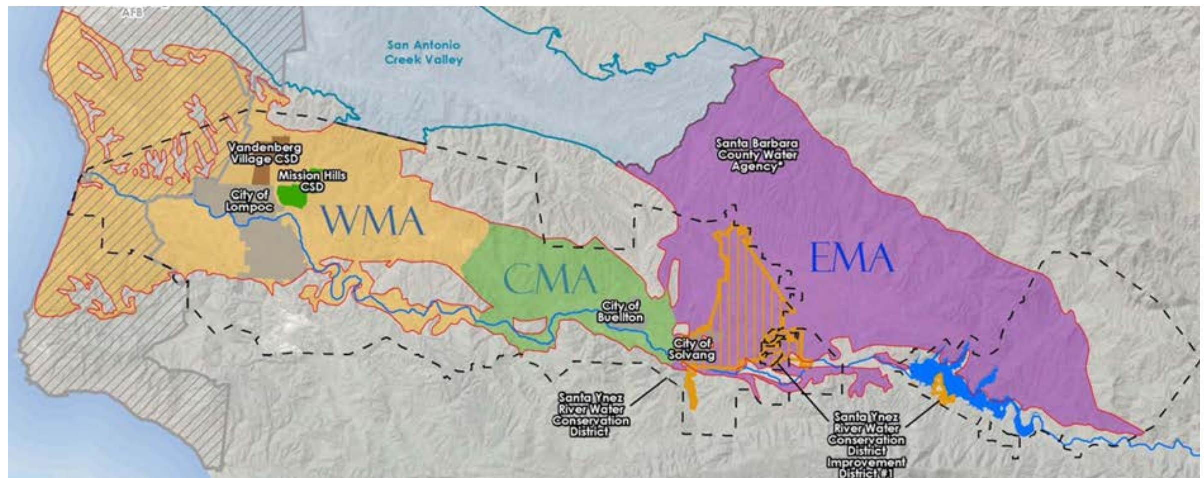
Borrador del GSP: 45 días en septiembre - octubre, 2021

GSP Final: 75 días en febrero - marzo, 2022
Los GSP Finales también estarán disponibles en línea.

GSP del Área de Gestión Occidental (WMA)
GSP del Área de Gestión Central (CMA)
GSP del Área de Gestión Oriental (EMA)

En las siguientes bibliotecas públicas, estará disponible una copia impresa para su revisión: Solvang, Buellton, Lompoc y Vandenberg Village.

Tres Agencias de Sostenibilidad de Aguas Subterráneas (GSA) en la Cuenca de Aguas Subterráneas del Valle del Río Santa Ynez



Próximos Pasos:

- **Septiembre/octubre 2021:** Revisión Pública de los Borradores de los GSP
- **Octubre 2021:** Reuniones de Grupos Consultivos de Ciudadanos para discutir los Borradores de los GSP
- **Octubre 2021:** Reuniones del Comité de la GSA para discutir los Borradores de los GSP
- **Diciembre 2021/enero 2022:** Aprobación del GSP por los Comités de la GSA
- **31 de enero, 2022:** GSP Finales por el DWR
- **Febrero/marzo 2022:** Revisión Pública de los GSP Finales (comentarios a través del sitio web del DWR)

Para más información, anuncios de reuniones y para revisar y comentar los borradores de los documentos, visite
SantaYnezWater.org o llame al **(805) 693-1156 ext. 403**

Sustainable Groundwater Management Act Newsletter No. 6 December 2021

Santa Ynez River Valley Groundwater Basin

The three Groundwater Sustainability Agencies (GSAs) in the Santa Ynez River Valley Groundwater Basin have prepared **Groundwater Sustainability Plans (GSPs)** as required by the Sustainable Groundwater Management Act (SGMA) of January 2015. The **GSPs** establish a framework to manage and regulate future groundwater use. The GSPs will be submitted to the California Department of Water Resources (DWR) in January 2022. **The California Department of Water Resources (DWR) will post the GSPs online and open a 60-day public review and comment period directly through the DWR SGMA PORTAL website.**

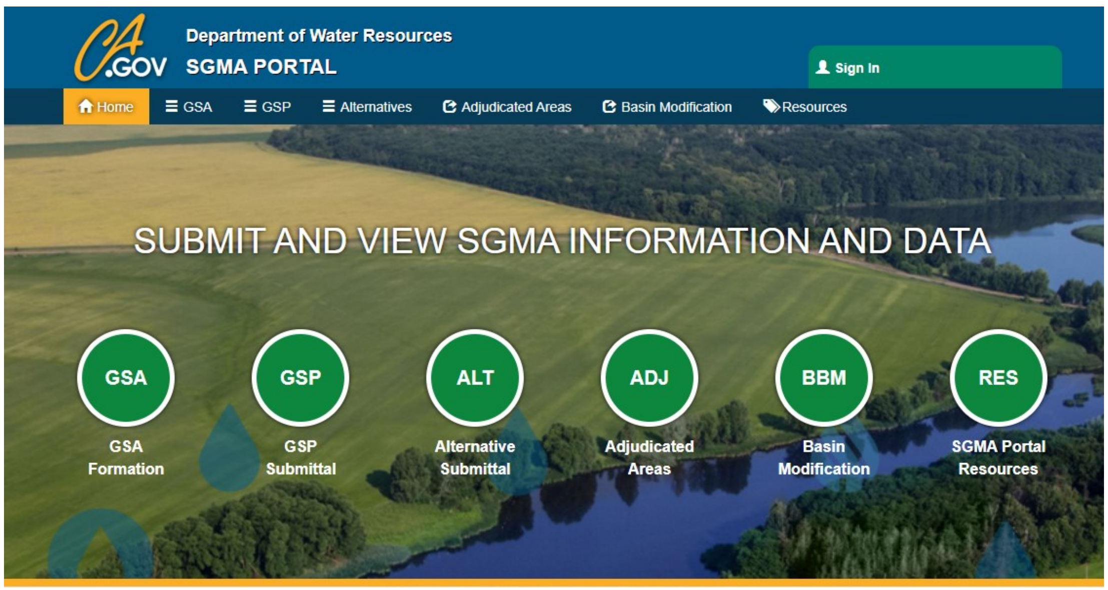
DWR PUBLIC REVIEW & COMMENT PERIOD

Provide comments directly to DWR for **60 days in February-March 2022**

See DWR's "SGMA PORTAL" website for exact dates.

How to view a Submitted GSP and/or submit a public comment:

Visit the DWR SGMA Portal at **https://sgma.water.ca.gov/portal/**



All three GSPs are available online

SantaYnezWater.org

GSA Public Hearings on GSPs

Visit SantaYnezWater.org
for in-person meeting locations
and remote participation information

Monday, January 3, 2022 at 10:00 a.m.
Central Management Area GSP

Wednesday, January 5, 2022 at 10:00 a.m.
Western Management Area GSP

Thursday, January 6, 2022 at 6:30 p.m.
Eastern Management Area GSP

A printed copy will be available for review
at the following public libraries:
Solvang, Buellton, Lompoc, and Vandenberg Village.

Local government at work for you and with you

For more information, please visit SantaYnezWater.org

or call **(805) 693-1156 ext. 403** ***Versión en español disponible bajo petición.***

Schedule of Public Hearings and Meetings is located at SantaYnezWater.org

Cuenca de Aguas Subterráneas del Valle del Río Santa Ynez

Las tres Agencias de Sostenibilidad de Aguas Subterráneas (GSAs) en la Cuenca de Aguas Subterráneas del Valle del Río Santa Ynez han preparado **Planes de Sostenibilidad de Aguas Subterráneas (GSPs)** como lo requiere la Ley de Gestión Sostenible de Aguas Subterráneas (SGMA) de enero de 2015. Los **GSPs** establecen un marco de trabajo para manejar y regular el futuro uso de las aguas subterráneas. Los GSPs serán sometidos al Departamento de Recursos Hídricos de California (DWR) en enero 2022. **El Departamento de Recursos Hídricos de California (DWR) posteará el GSPs en línea y abrirá una revisión pública y período de comentarios de 60-días directamente a través del sitio web DWR Portal de la SGMA.**

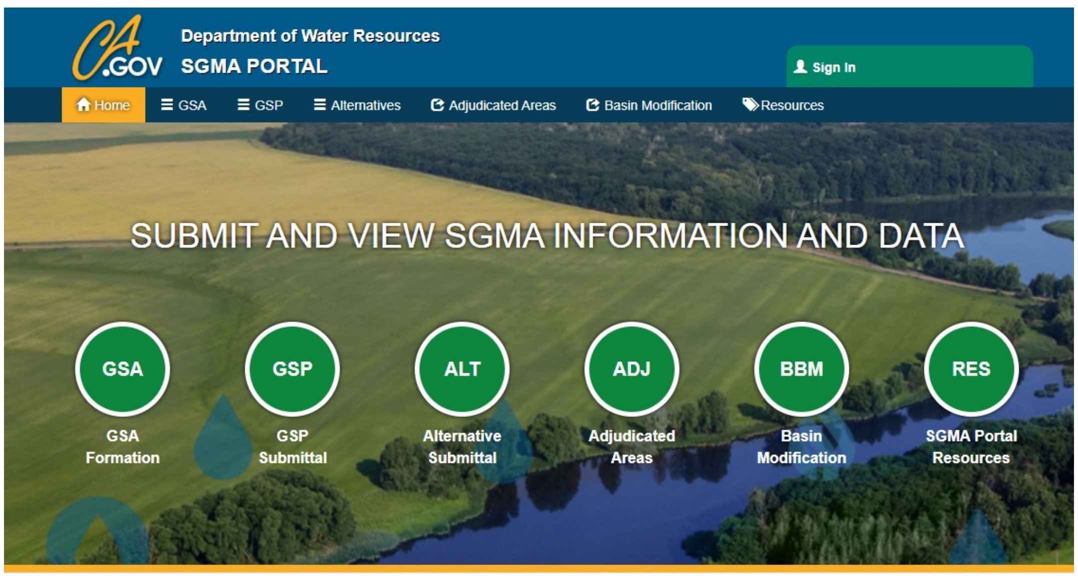
Período de Revisión y Comentario Público del DWR

Provee comentarios directamente al DWR por 60 días **en febrero-marzo 2022**

Vea la página web "Portal de la SGMA" para las fechas exactas.

¿Cómo ver un GSP presentado y/o presentar un comentario público:

Visite el Portal de la SGMA del DWR en **https://sgma.water.ca.gov/portal/**



Todos los tres GSPs están disponibles en línea SantaYnezWater.org

Audiencias Públicas GSA sobre GSPs

Visite SantaYnezWater.org
para ubicaciones de las reuniones en persona
e información referente a la participación remota

Lunes, 3 de enero de 2022 a las 10:00 a.m

GSP del Área de Gestión Central

Miércoles 5 de enero de 2022 a las 10:00 a.m.

GSP del Área de Gestión Occidental

Jueves 6 de enero de 2022 a las 6:30 p.m.

GSP del Área de Gestión Oriental

Una copia impresa estará disponible para revisión
en las siguientes bibliotecas públicas:
Solvang, Buellton, Lompoc, y Villa Vandenberg.

El gobierno local trabajando para ustedes y con ustedes

Para más información, por favor visitar SantaYnezWater.org

o llame al **(805) 693-1156 ext. 403**

El horario de las Audiencias Públicas y las Reuniones está localizado en **SantaYnezWater.org**

PUBLIC WORKS DEPARTMENT
123 E. Anapamu St. • Santa Barbara, CA 93101
(805) 568-3000 • FAX (805) 568-3019
www.countyofsb.org/PWD

PRESS RELEASE
NOV 2, 2020

Contact: Matt Young
Water Resources Program Manager
(805) 568-3546; mcyoung@cosbpw.net

COUNTY TO CONDUCT GROUNDWATER SURVEY FLIGHTS

(Santa Barbara, California) – Residents of the Santa Ynez and Lompoc Valleys may see an unusual sight in the skies this Novmeber: a low-flying helicopter carrying a large hexagonal frame. This unique equipment is part of a project to map aquifers and improve our understanding of groundwater in the area. The project is being conducted by Santa Barbara County and the Santa Ynez River Water Conservation District in cooperation with the local water agencies that comprise the three Groundwater Sustainability Agencies in the Santa Ynez River Valley Groundwater Basin.

During the Aerial Electromagnetic Method survey (AEM), instruments suspended approximately 100 feet above the ground use an electromagnetic signal to measure the subsurface. The signal interacts with the geologic materials below the ground, stimulates a response from those materials, and generates another signal that is picked up by receivers. The technology allows for fast data acquisition from the air. Data are continually acquired while the helicopter makes its 600-mile flight between 50 to 75 miles per hour. This process produces images that reveal the detailed variation in the earth's electrical properties, down to 1,000 feet below the land surface. When combined with well data and knowledge of the geology, these data will refine understanding —in three dimensions—of the geographic extent of sands, gravels, and clays that make up the aquifers of the regional groundwater system.

Many protocols are in place to ensure the safety of the mission. The airborne geophysical survey will be conducted by pilots who are specially trained for low-level flying. The helicopter will not fly over businesses, homes, other inhabitable structures, or confined animal feeding operations. The intensity of the magnetic field generated by the AEM transmitter is below 1% of the accepted general public exposure level. At 60 hertz, the magnetic field experienced by standing next to the transmitter is the same as standing 1 foot away from a toaster. Similar AEM surveys have been conducted throughout California with no reported ill effects to humans or animals. Flights are scheduled to occur for five to seven days beginning November 15. However, the flight period may be extended. Please visit www.santaynezwater.org/aem-survey-ema for up-to-date information.

-30-

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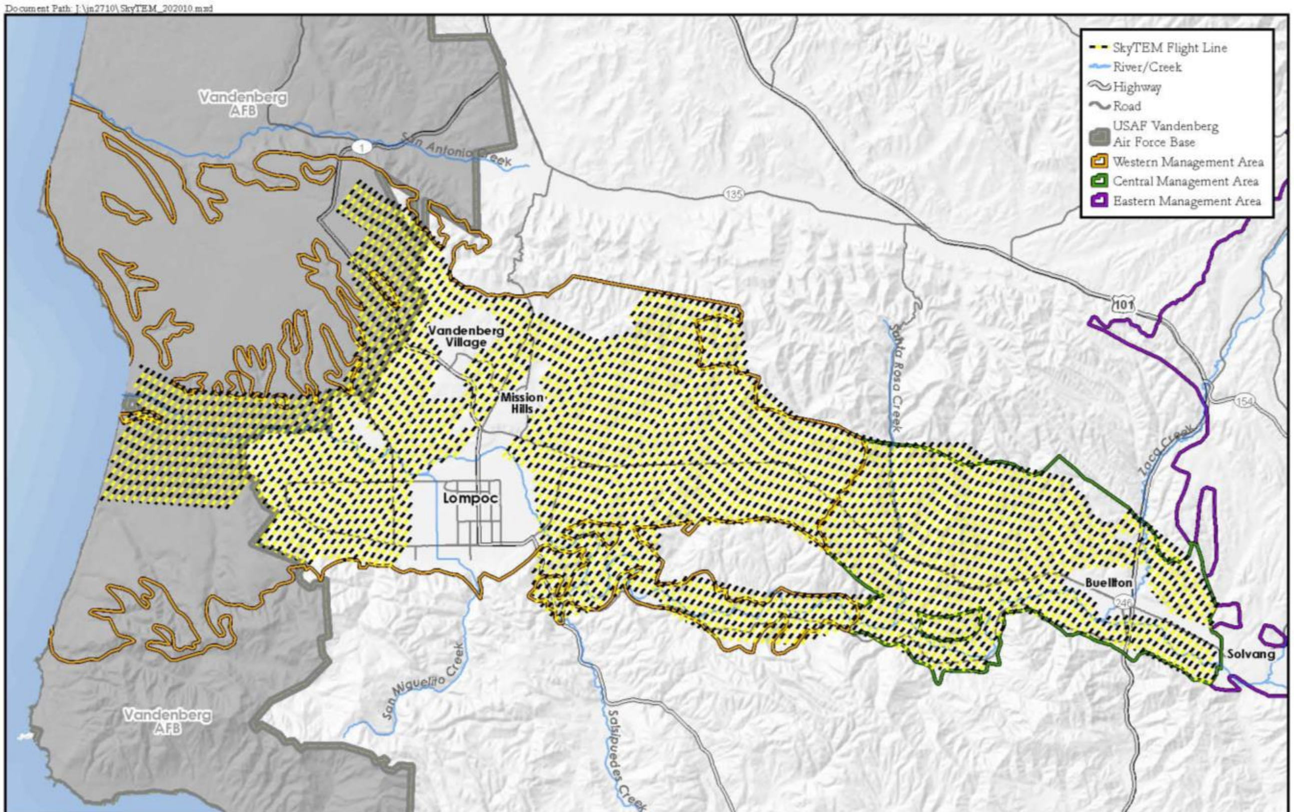


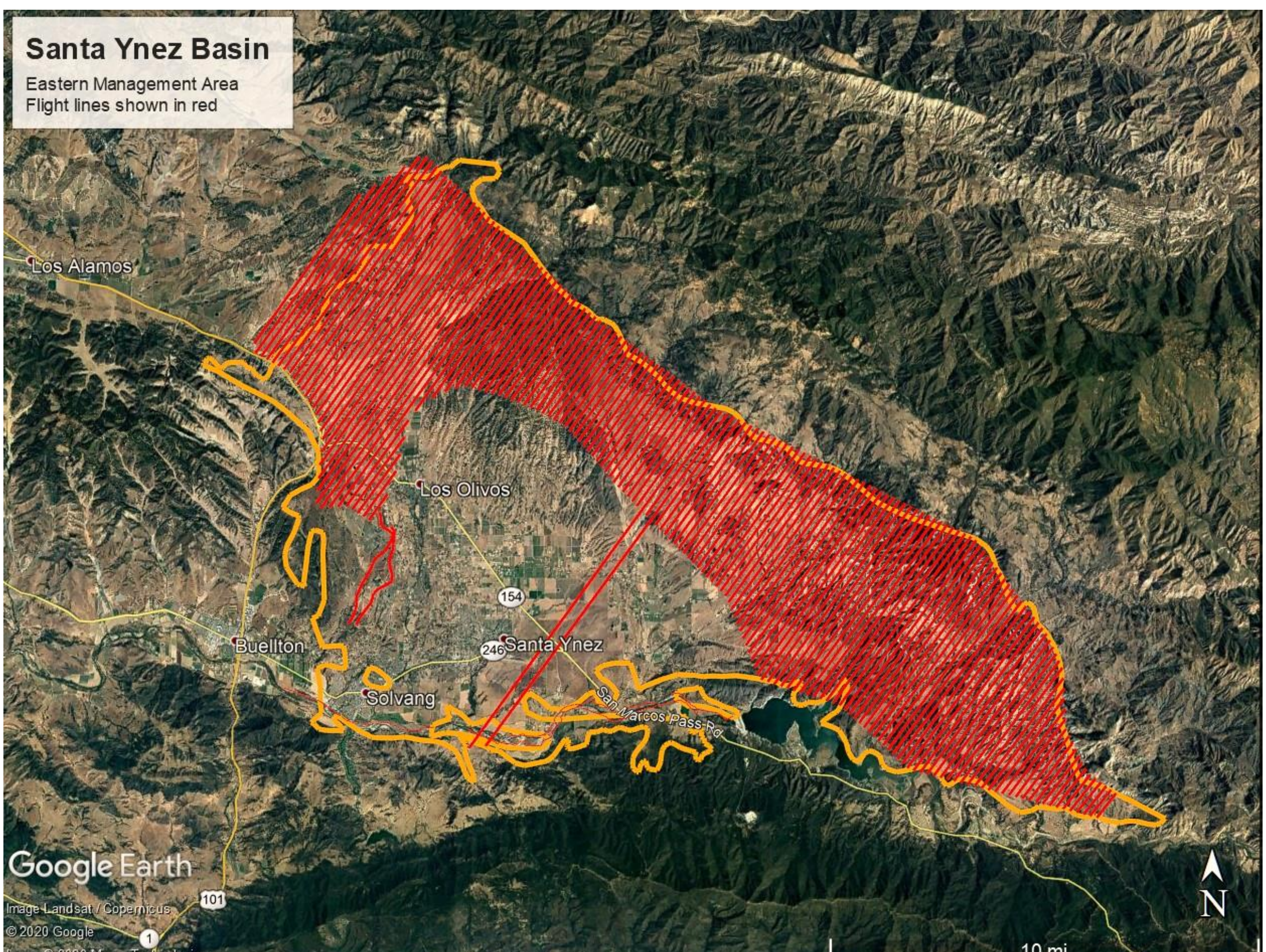
STETSON ENGINEERS INC.

DRAFT
10/8/2020

PROPOSED AEM SURVEY
SANTA YNEZ RIVER WATER CONSERVATION DISTRICT
ON BEHALF OF SANTA YNEZ RIVER GROUNDWATER BASIN
WESTERN AND CENTRAL MANAGEMENT AREAS

0 1.5 3 Miles

Source: Ramboll, 2019



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Chapter 1 – Introduction and Plan Area

Appendix 1c-E:

Groundwater Communication Portal,
Location: California,
Client: California Department of Water Resources
by GEI Consultants, 2018

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PROJECT

Groundwater Communication Portal

Location: California

Client: California Department of Water Resources

Service Dates

Start: 2018

Completion: Ongoing

Key Elements

- Maintain list of interested parties
- Allow interested parties to self-register
- Post meeting details and documents
- Automatically notify interested parties with the click of a button
- Maintain a calendar of events
- Send e-mail blasts
- Collect public comments on draft GSP documents

Both SGMA and the GSP Regulations require stakeholder engagement. GEI advises outreach to begin early in the GSP process. Early stakeholder engagement can lead to improved outcomes and broader support for the GSP, as interested parties are allowed active input to the decision-making process. Outreach continues throughout GSP development and implementation.

GEI developed a tool to help our clients with their outreach efforts. The tool, referred to as the Groundwater Communication Portal (GCP), can be customized for your basin to help track your engagement efforts. The GCP is a web-based outreach tool where you can post events and automatically inform interested parties with the click of a button. Interested parties can register with the GCP to stay informed about GSP development and visit the GCP to comment on draft GSP documents.

The GCP serves as a repository for all information about your GSA's meetings, interested parties, and public comments. Storing all stakeholder engagement information in one place is beneficial both for creating the communications section of your GSP and for continued tracking of outreach efforts moving forward to GSP 5-Year Updates and implementation.

To see an example GCP, visit www.bigvalleygsp.org

Santa Ynez Basin Groundwater Communication Portal (GCP)

The Santa Yenz Basin is utilizing an online tool to assist with SGMA outreach efforts. The tool, referred to as the Groundwater Communication Portal (GCP), is a web-based application where basin GSAs can post events and automatically inform interested parties. Interested parties can register with the GCP to stay informed about events related to GSP development in any of the three management areas.

The GCP serves as a repository for all information about GSA meetings and interested parties. Storing all stakeholder engagement information in one place will be beneficial both for creating the communications section of the GSP and for continued tracking of outreach efforts moving forward to GSP 5-Year Updates and implementation.

The administrative functions of the GCP give administrators, such as agency and consulting staff, the power to organize and facilitate outreach efforts. A login is required for access to the administrative functions which are described below.

GCP Features

- Maintains the GSAs' lists of interested parties
- Allows interested parties to self-register
- Displays meeting details and documents
- Automatically notifies interested parties with the click of a button
- Tracks who was notified and who replied to event invitations
- Generates a calendar of events
- Supports e-mail blasts
- Tracks outreach efforts with a communication log
- Stores project documents and collects public comments

Interested Party Maintenance

The existing lists of contacts for the EMA, WMA, and CMA were imported into the GCP when it was configured. All interested parties can visit the GCP and self-register at any time. The GCP is promoted at meetings and the website is printed on collateral materials. Administrators may access and edit the interested parties list at any time and have the option to export the list to a spreadsheet format.

Event Notification

The GCP generates a calendar based on events input by administrators. Each event allows attachments of relevant documents such as agendas and presentations. Administrators can notify interested parties about an event with the click of a button. The GCP will automatically send invitations to the interested parties and track responses.

Public Comments

All interested parties are encouraged to submit comments both in general and on draft documents. Administrators upload documents for public review to the portal and choose when to open or close the comment period. The public can submit comments through the GCP using an online form. Comments are stored in a database and can be sorted by variables such as chapter, submission date, or GSA. Administrators can enter responses to comments and post for public view.

Communication Log

The communication log is used by anyone acting on behalf of the GSA to interact with stakeholders and interested parties. It tracks outreach efforts that occur outside of regular public meetings – such as phone calls, emails, in person meetings, and postal mail. When a communication occurs, the person representing the GSA is responsible to complete a form that's entered the communication log. The form collects information such as who was involved in the communication, where/when the communication occurred, and what the outcomes of the communication were. Attachments, such as scanned handwritten notes, email documents, or Word documents, can be added to the communication log for storage in the database.

E-mail blasts

An e-blast feature allows administrators to send out information that isn't attached to an event. E-blasts are useful to inform interested parties when a new document is posted for public comment or when a public comment period is closing soon.

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Chapter 1 – Introduction and Plan Area

Appendix 1d-A:

Stetson Engineers Technical Memorandum,
Santa Ynez River Valley Groundwater Basin
Internal Management Area Boundary Changes,
Dated August 10, 2021

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TECHNICAL MEMORANDUM

STETSON ENGINEERS INC.
2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: sr@stetsonengineers.com

TO: California Dept of Water Resources DATE: August 10, 2021

FROM: Stetson Engineers JOB NO: Santa Ynez SGMA

RE: Santa Ynez River Valley Groundwater Basin - Internal Management Area Boundary Changes

SUMMARY

This memorandum describes two changes to the internal boundaries of the three management areas (MA) in the Santa Ynez River Valley Groundwater Basin[1] (SYRVGB). The first change to the internal MA boundary between the Central and Eastern Management Areas (CMA and EMA) is based on a request from one of the EMA agencies (the City of Solvang) and updated parcel boundaries provided by the Santa Barbara County Assessors Office. The second change to the internal MA boundary between the Western Management Area (WMA) and CMA is based on an analysis of hydrogeologic and hydrologic information. The two changes are shown on Figures 1 and 2. It should be noted that none of the external DWR Bulletin 118[1] boundaries of the SYRVGB were affected by the two internal boundary changes and none of the changes are considered materially substantial as defined by the California Department of Water Resources (DWR). Table 1 below summarizes the total number of acres of the SYRVGB and the three MAs based on original versus changed boundaries:

Table 1. Summary of Acres of Management Areas of the Santa Ynez River Valley Groundwater Basin

	Area within Original Boundaries (Acres)	Area within revised Boundaries (Acres)	% change
Western Management Area (WMA)	85,300	85,600	0%
Central Management Area (CMA)	21,200	21,000	1%
Eastern Management Area (EMA)	96,500	96,400	0%
Total Santa Ynez River Valley Groundwater Basin	203,000	203,000	0%

[1] The extents of the SYRVGB were determined by the Department of Water Resources in Bulletin 118 ("DWR") and are based on regional geology studies. The SYRVGB is identified as California basin 3-15.

Summary of Changes to CMA-EMA Internal MA Boundary

The changes to the CMA-EMA CMA boundary includes moving the previous boundary approximately 0.2 miles east from its original location. This change is based on updated Santa Barbara County Assessor parcel boundaries and avoids the splitting of parcels between two MAs. The changed boundary also follows a topographic and geologic break around the western side of Skytt Mesa, a prominent topographic feature in the area. The original versus changed boundary between the CMA and EMA are shown on Figure 1.

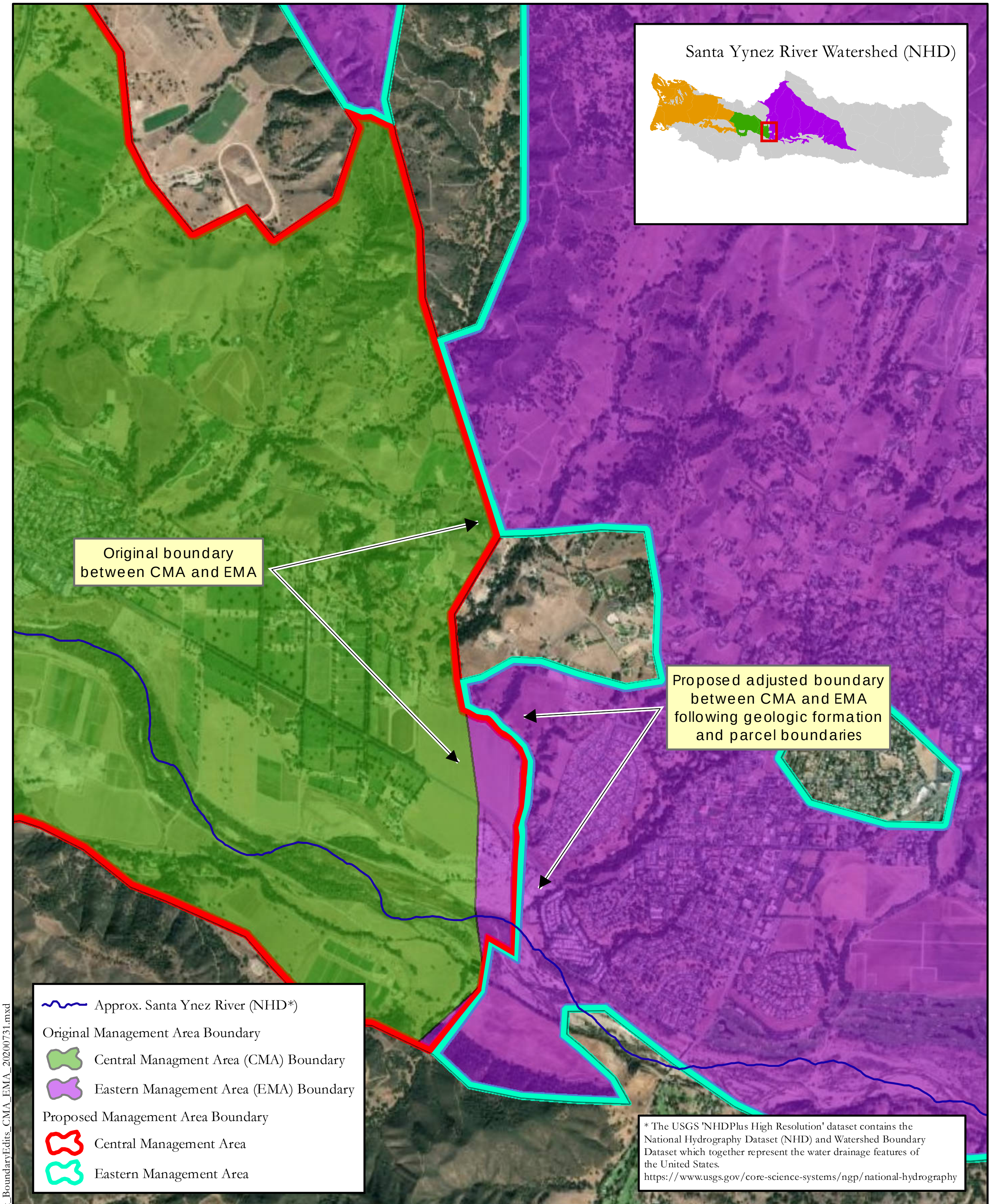
Summary of Changes to WMA-CMA Internal Boundary

The change to the WMA-CMA boundary includes moving the previous boundary approximately 0.8 miles west from its current location and also accomplishes the following:

1) Aligns the WMA-CMA boundary with the surface water drainage area boundary, the local topography and hydrogeology.
2) Encloses a large portion of the Careaga formation within the CMA, which aids in calculations for the water budget.
3) Aligns the WMA-CMA boundary to the historically used Santa Ynez River Water Conservation District (SYRWCD) boundary in the Buellton and Santa Rita Uplands.
4) Shortens the boundary between the WMA-CMA, which will aid in the calculation of the groundwater flux between the WMA and CMA.
5) Moves the WMA-CMA boundary at the Santa Ynez River nearer to a former USGS gauge location (ID 11131000) and a bedrock high. The new boundary is less arbitrary than the previous boundary and will aid in the calculation of groundwater and surface water flux between the CMA and WMA.

Figure 2 shows the original and draft proposed boundary between the WMA-CMA.

FIGURE 1



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STETSON ENGINEERS INC.

DRAFT
7/31/2020

PROPOSED BOUNDARY ADJUSTMENTS
CENTRAL AND EASTERN MANAGEMENT AREAS

Proposed adjusted boundary between CMA and EMA following geologic water-bearing formation boundary and parcels; No exterior DWR Bulletin 118 boundaries are changed.

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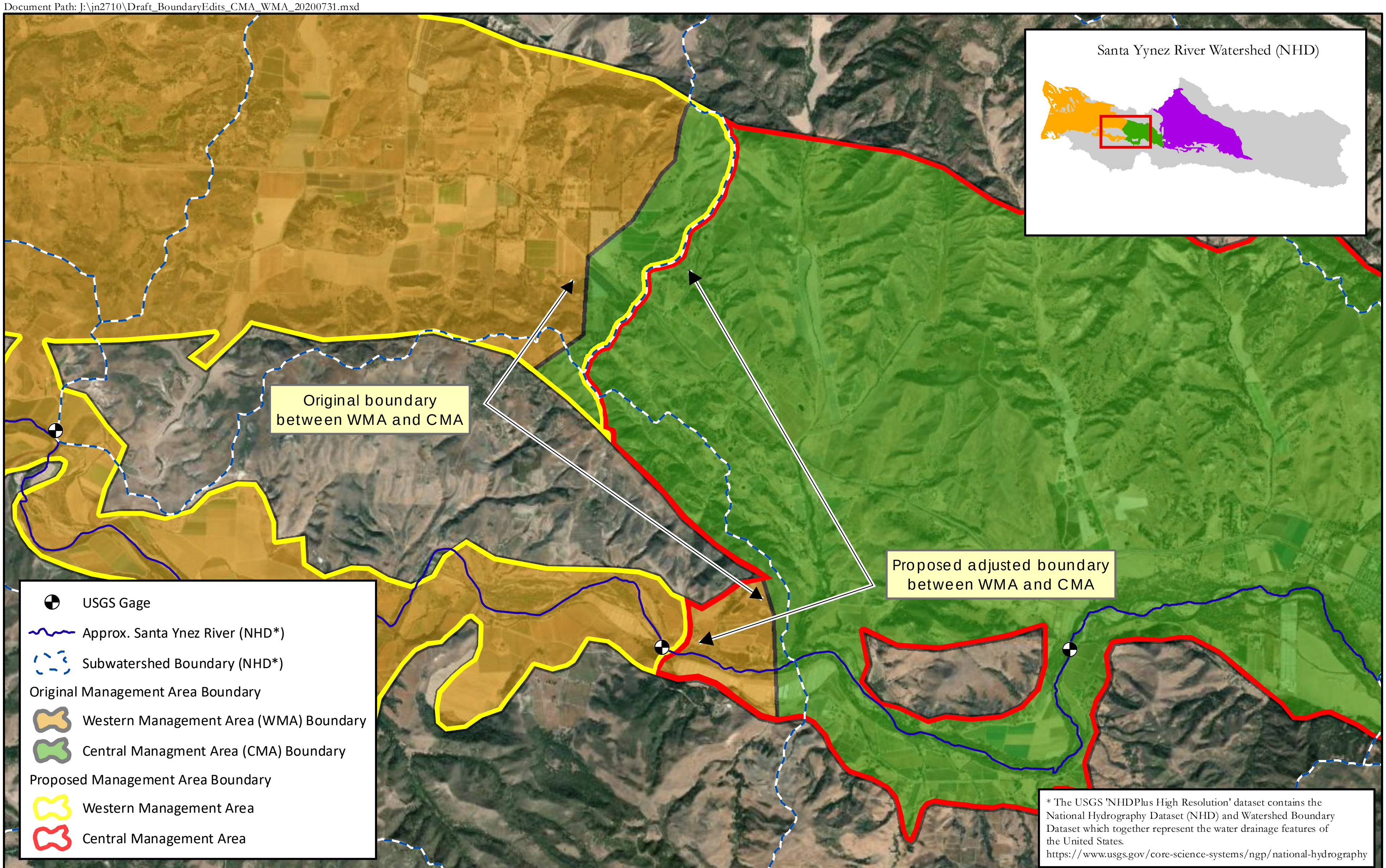

STETSON ENGINEERS INC.

DRAFT
7/31/2020

PROPOSED BOUNDARY ADJUSTMENTS
CENTRAL AND WESTERN MANAGEMENT AREAS

0 0.5 1 Miles

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This map proposes that internal management area boundaries within the Santa Ynez River Groundwater Basin be redrawn to follow watershed boundaries more accurately and to utilize a historical USGS gage location; no exterior DWR Bulletin 118 boundaries are changed.

FIGURE 2

Chapter 1 – Introduction and Plan Area

Appendix 1d-B:

Stetson Engineers Technical Memorandum
Hydrogeological Basis for
Characterization of Water within
the Santa Ynez River Alluvium Upstream of the
Lompoc Narrows as Underflow of the River in a
Known and Definite Channel
Dated December 15, 2021

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TECHNICAL MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: sr@stetsonengineers.com

TO:	**Santa Ynez River Water Conservation District**	DATE:	**December 2021**
FROM:	**Ali Shahroody** **Curtis Lawler**	JOB NO:	**1126-2**
RE:	**Hydrogeological Basis for Characterization of Water within the Santa Ynez River Alluvium Upstream of the Lompoc Narrows as Underflow of the River in a Known and Definite Channel**		

1 INTRODUCTION

This memorandum documents the hydrogeological basis for the characterization of the water within the Santa Ynez River Alluvium as underflow of the river flowing in a known and definite channel. The area of this underflow is located downstream of Lake Cachuma and upstream of the Lompoc Narrows[1] (Figure 1).[2] The Groundwater Sustainability Plans ("GSPs") that have been developed for the Western, Central, and Eastern Management Areas of the Santa Ynez River Valley Groundwater Basin, referred to as Bulletin 118 Basin No. 3-015 ("Basin"), appropriately characterize this water as underflow of the river within the jurisdiction of and regulated by the State Water Resources Control Board ("State Board"), and not "groundwater" as defined by the Sustainable Groundwater Management Act ("SGMA"). For purposes of SGMA, "groundwater" is defined as "water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water but <u>does not include water that flows in known and definite channels</u>." (Wat. Code, § 10721(g), emphasis added.) Water that flows in known and definite channels is regulated by and subject to the jurisdictional authority of the State Board in the same manner as surface water. (See Wat. Code § 1200 et seq.)

Importantly, SGMA does not require Groundwater Sustainability Agencies ("GSAs") or GSPs to legally establish the distinction between groundwater and surface water in a basin. Instead, GSPs must identify and describe the respective systems, characterize their interrelationship, and explain the basis of those analyses. (See, e.g., SGMA Regulations § 354.18.)In this Basin, the GSPs have reasonably relied upon and utilized the longstanding technical and administrative record that identifies the Santa Ynez River Alluvium above the Lompoc Narrows as a known and definite subsurface channel of the lower Santa Ynez River. In fact, diversion and use of this

[1] This memorandum does not attempt to characterize subsurface water within or downstream of the Lompoc Plain, nor does it make any determination about the particular water rights of any water user.
[2] This underflow area also corresponds to the Above Narrows Area as defined by the United States Bureau of Reclamation ("Reclamation") and to Zone A of the Santa Ynez River Water Conservation District.

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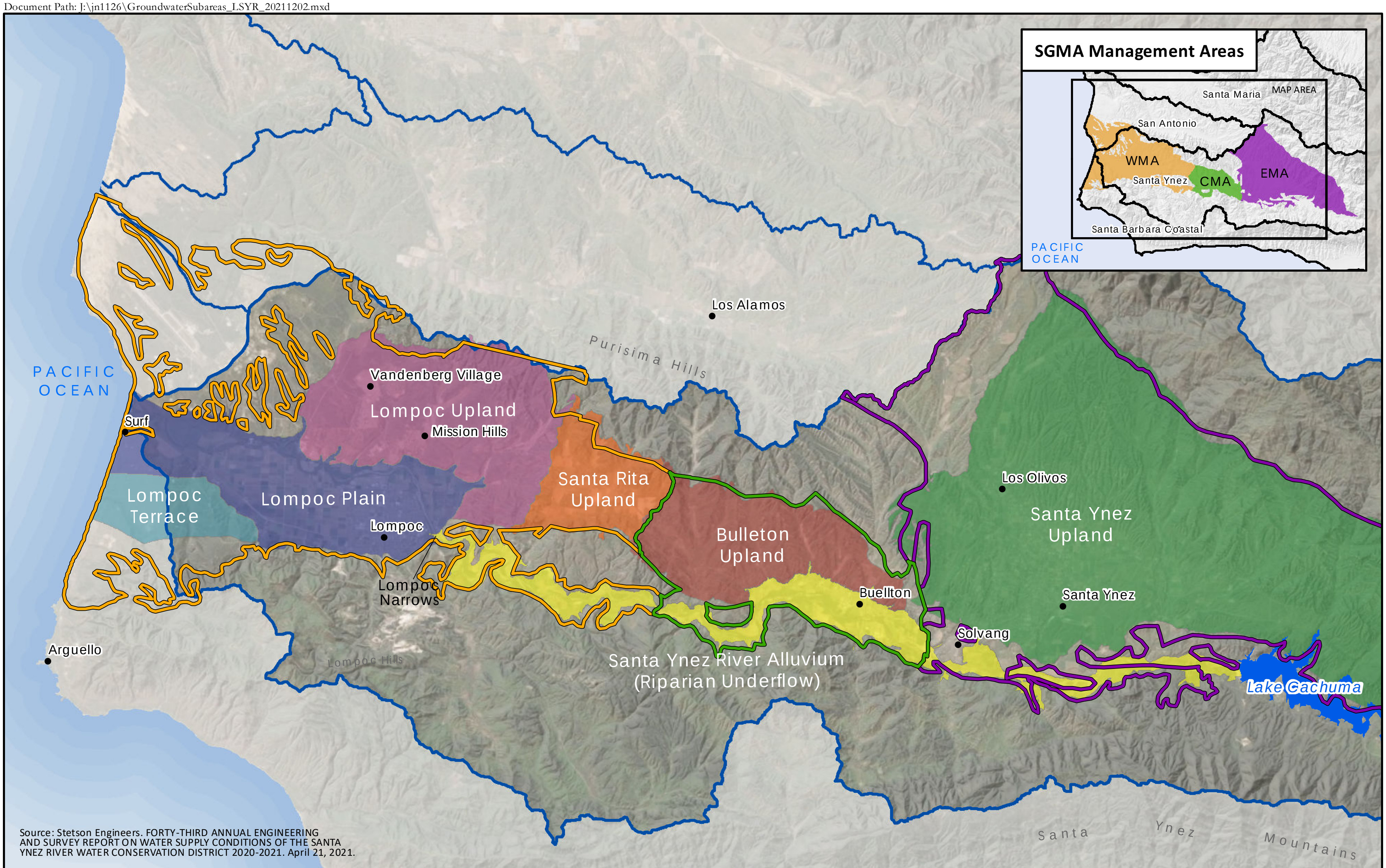

Source: Stetson Engineers. FORTY-THIRD ANNUAL ENGINEERING AND SURVEY REPORT ON WATER SUPPLY CONDITIONS OF THE SANTA YNEZ RIVER WATER CONSERVATION DISTRICT 2020-2021. April 21, 2021.

STETSON ENGINEERS INC.

- Santa Ynez River Watershed
- Central Management Area
- Western Management Area
- Eastern Management Area

GROUNDWATER SUBAREAS AND UNDERFLOW LOWER SANTA YNEZ RIVER

DRAFT

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FIGURE 1

subsurface water have historically been regulated by the State Board, which has characterized it as underflow of the Santa Ynez River since at least Water Rights Decision 886 in 1958. The State Board further reinforced this characterization of this alluvium in Water Rights Decisions 1338 and 1486 when it considered applications and granted permits to divert underflow of the river: “The Santa Ynez River in the reach between Cachuma Dam and Robinson Bridge, where it enters the Lompoc subarea, flows over recent river channel deposits and the younger alluvium that range in width from a few hundred feet to about one mile and in thickness from 40 to 85 feet. <u>The underflow of the river moves slowly through these deposits.</u>” (State Board Decision 1338, pp. 3-4, emphasis added.)[2]

State Board Water Rights Order (“WRO”) 73-37, as amended by WRO 89-18 and incorporated in WRO 2019-0148, has also defined the Santa Ynez River “Above Narrows” alluvial deposits as underflow, and states in relevant part that water shall be released “from Lake Cachuma in such amounts and at such times and rates as will be sufficient, together with inflow from downstream tributary sources, to supply downstream diversions of the surface flow under vested prior rights to the extent water would have been available for such diversions from unregulated flow.” (WRO 73-37, Paragraph 5.) Notably, the downstream diversions referenced in these State Board WROs and Water Rights Decisions are made from wells constructed in the underflow of the Santa Ynez River alluvium. As recognized by the State Board and as further discussed below, the geology of the River-channel Deposits and the Younger Alluvium demarcate a known and definite channel through which this subsurface water flows, with older and less permeable formations forming the bed and banks.

2 DESCRIPTION OF THE SUBSURFACE CHANNEL

The geology of the shallow and water bearing sediments of the Santa Ynez River below Lake Cachuma is discussed in United States Geological Survey (“USGS”) Water Supply Papers 1107 and 1467. Along much of the Santa Ynez River below Lake Cachuma, the river overlies River-channel Deposits and the Younger Alluvium. These water-bearing units are located in a river-cut channel through older non-water bearing units of the thick Tertiary aged Monterey Formation (primarily lower permeability clays) and other older units. The River-channel Deposits comprise the materials intermittently transported by the present river. The Younger Alluvium includes quaternary alluvial fill of recent age that extends alongside the Santa Ynez River in the flood plain.

[2] For certain purposes, such as under the Water Conservation District Law, underflow of the lower Santa Ynez River has been referred to as groundwater. (See, e.g., Wat. Code, § 75500 et seq.)

In addition to the State Board record discussed above, the USGS papers provide substantial evidence that reasonably support several technical conclusions:

1. The Santa Ynez River replenishes the River-channel Deposits and Younger Alluvium.
2. Older impermeable formations along the south side of the river form the underflow channel limits on that side. The older formations rise steeply to the south where more rainfall and runoff typically occurs due to the higher elevations and orographic effects.
3. Older impermeable formations along the north side of the river form underflow channel limits on that side. These formations form a bedrock lip that separates older less permeable formations (Paso Robles and Careaga Sand) from the River-channel Deposits and Younger Alluvium adjacent to the Santa Ynez River. There are some additional permeable depositions to the north along tributaries, however the bottom elevations of those depositions are higher than the top of the river channel basin.
4. In the Buellton area, there is limited hydrologic continuity between the Younger Alluvium and the older less permeable formations (Paso Robles and Careaga Sand) which are exposed to the base of the Younger Alluvium. There are extensive clay zones in the upper portion of the Paso Robles and Careaga Sands in this area. This clayey material restricts the hydrologic continuity of Santa Ynez River underflow to the deeper aquifer (see also, Stetson, 1977; Stetson, 1992).

Figure 1 shows the plan view and width of the River-channel Deposits and the Younger Alluvium in the Santa Ynez River Alluvium subarea. Upstream of the Lompoc Narrows, the subsurface channel of the Santa Ynez River ranges from 0.5 to 1.5 miles in width. Figure 2 shows a cross-section of this geology at the Highway 154 Bridge, which is representative of the subsurface channel of the lower Santa Ynez River above the Lompoc Narrows. Throughout the reach from Lake Cachuma to the Lompoc Narrows, the subsurface channel composed of River-channel Deposits and Younger Alluvium ranges from 25 to 150 feet in thickness and is typically 30 - 80 feet thick (Stetson, 1992).

The permeability of the river gravel deposits along the Santa Ynez River ranges from 100 to 700 feet per day with typical values of about 500 feet per day (USGS, 1951). This permeability of the River-channel Deposits and the Younger Alluvium is further indicative of the direct connectivity between the surface and underflow of the Santa Ynez River. In contrast, the permeability of the clays and shales that form the bed and banks for the majority of the subsurface channel would be expected to be less than 0.01 feet per day based on the hydrogeologic properties of clays and shales (Freeze and Cherry, 1979).

In the Buellton area, between Solvang and the Buellton Bend where the subsurface channel River-channel Deposits and the Younger Alluvium are in contact with the older formations of

Components of Subterranean Flow
(aka Surface Flow occurring in Underflow Channel)
at Highway 154 Bridge

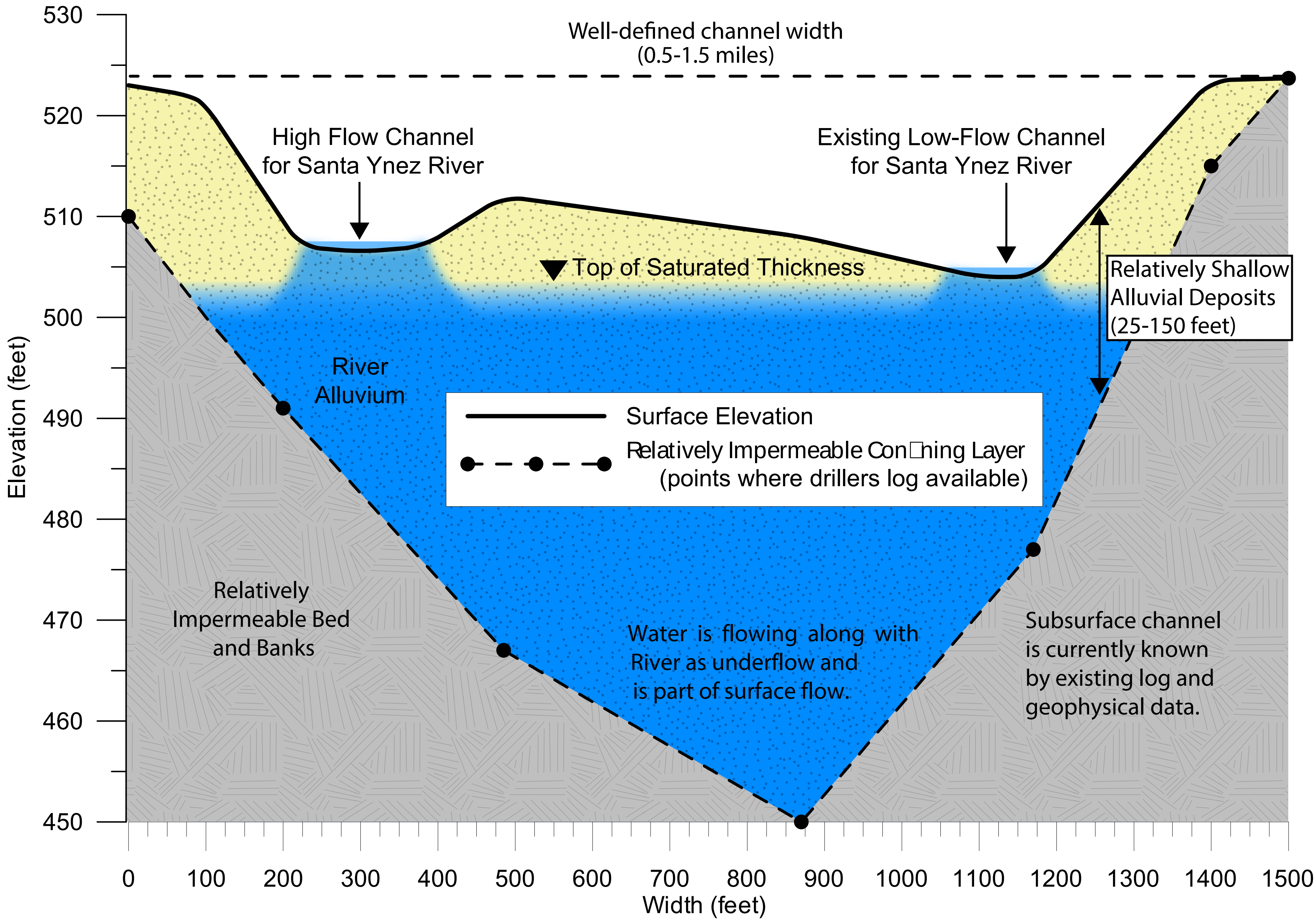


FIGURE 2

Paso Robles and Careaga Sands, the permeability of the bed and banks is estimated to range from 0.1 to 3 feet per day (Stetson, 2020). This permeability is two to three orders of magnitude less than the permeability of the River-channel Deposits and the Younger Alluvium in the subsurface channel and thus relatively impermeable.

3 EVIDENCE OF UNDERFLOW

The direct hydraulic connection between the River-channel Deposits and the Younger Alluvium and the surface flow in the Santa Ynez River upstream of the Lompoc Narrows is evidenced by the high permeability of the river alluvium and responses in water levels of alluvial wells during surface flows. In USGS Water Supply Paper 1107 (USGS, 1951), this area of underflow was described as follows:

> The unconsolidated deposits beneath and adjacent to the river transmit a certain amount of underflow which is not measured at the successive gaging stations. Obviously, however, this underflow is an integral part of the water resources of the river valley.

The hydraulic connection between the subsurface channel deposits and the Santa Ynez River is described in USGS Water Supply Paper 1467 as follows (USGS, 1959, emphasis added):

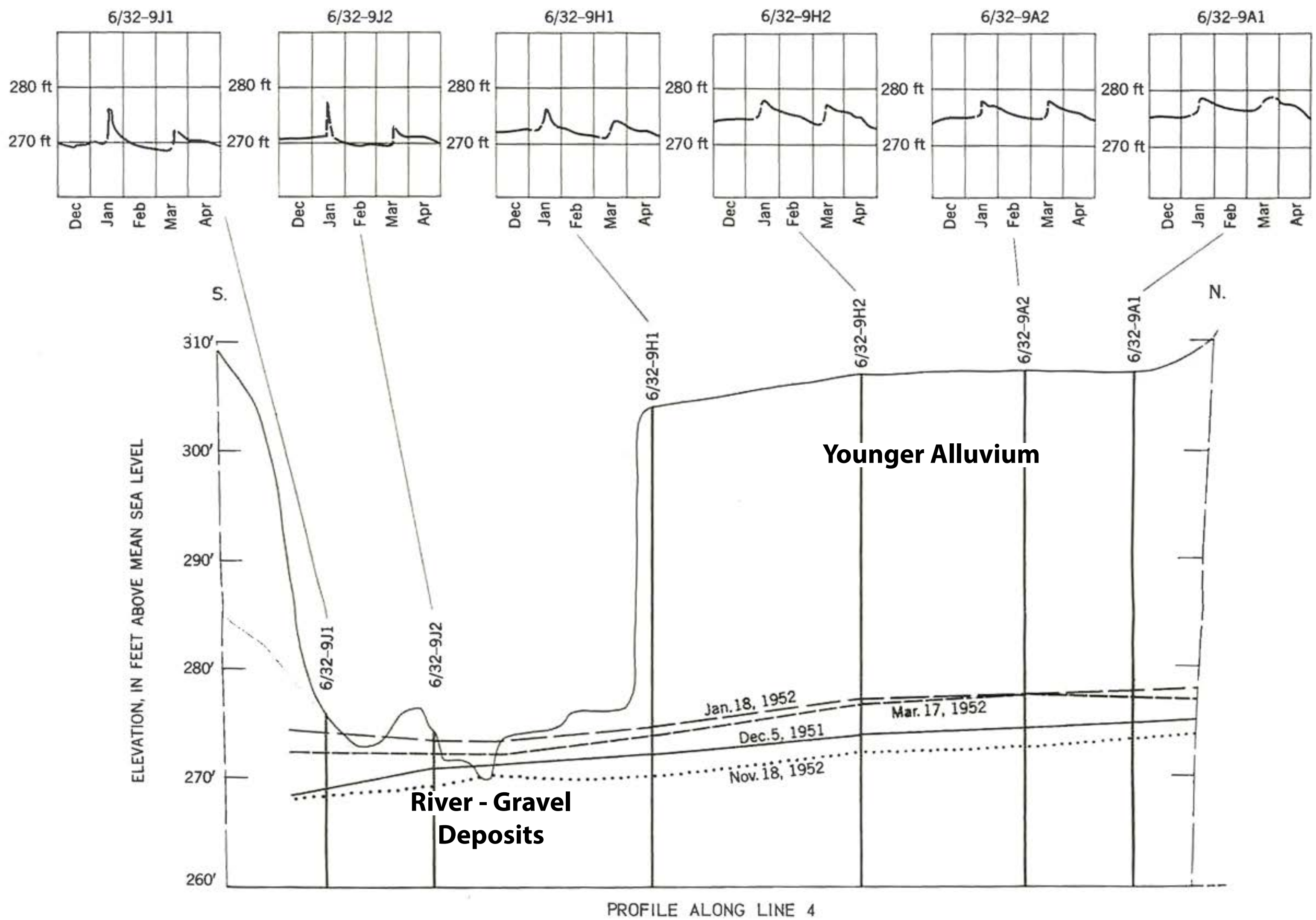
> The Santa Ynez River in the reach between Cachuma Dam and Robinson Bridge flows on a body of alluvial deposits that ranges in width from a few hundred feet to more than a mile and in maximum thickness from about 40 to about 185 feet. These deposits, *which are in hydraulic contact with the river*, form a ground-water storage reservoir from which water can be pumped to irrigate the agricultural lands adjacent to the river.

As described above, the hydraulic connection between the water level in the subsurface channel deposits and surface flow is so strong that the water levels in the underflow channel are entirely dependent upon flow in the Santa Ynez River. In fact, the existence of a relatively impermeable subsurface channel and a hydrologic connection between surface and subsurface flows in this area have been relied upon by the State Board, to determine when water is to be released from Bradbury Dam to satisfy downstream water rights.

The Santa Ynez River Valley experienced a prolonged drought from 1947 through 1951, followed by storms in early 1952. Figure 3 shows that over the drought and recovery periods the response of wells to surface flow in the Santa Ynez River is immediate and illustrates the direct connection between subsurface water levels and the surface stream. This quick response in water levels in the underflow is also evident after water rights releases from Bradbury Dam during periods when no storms are occurring.

The hydrograph for well 6N/32W- 9A1 located in the Younger Alluvium about a half mile from the river responds quickly to flow in the river similar to the well located in the River-channel

Response to River Flow



STETSON ENGINEERS INC.

Source: U.S. Geological Survey. 1959. Wilson. USGS Water Supply Paper 1467.

Figure 3 - Underflow Water Level Response to Surface Flow upstream of Buellton Bend in January and March 1952

Deposits, 6N/32W- 9J2. In the USGS Water Supply Paper 1107 (USGS, 1951), the USGS further describes the connection in both geologic formations:

> Thus, throughout its reach from San Lucas Bridge downstream to about 3,000 feet beyond Robinson Bridge, no thick impermeable strata intervene between the bed of the Santa Ynez River and the lower member of the younger alluvium. Accordingly, throughout that reach there is free interchange of water between the river and the lower member of the younger alluvium. Therefore, the lower member contains and transmits river underflow. Also, as its cross-sectional area is much greater than that of the river-channel deposits, the lower member transmits the bulk of that underflow.

4 CONCLUSION

Based on extensive evidence, as well as Stetson's experience of more than 50 years working in the Santa Ynez River Valley for a number of agencies, including work for the State Board, we believe that the water in the River-channel Deposits and the Younger Alluvium downstream of Lake Cachuma and upstream of the Lompoc Narrows constitutes underflow in a definite and known channel with a defined and relatively impermeable bed and banks. This finding is also consistent with the practice of the State Board, which has considered applications and granted permits for diversion of underflow of the Santa Ynez River. (See, e.g., State Board Water Rights Decisions 886, 1338, 1486; State Board WROs 73-37, 89-18, 2019-0148; USGS Papers 1107, 1467.) Accordingly, this water is distinct from "groundwater" as defined by SGMA. In addition to the technical analyses contained in the respective GSPs for the Basin, the information described herein has been used to support the descriptions and analyses of the groundwater system and surface water systems of the Basin in accordance with the provisions of SGMA and the SGMA Regulations.

5 REFERENCES

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Chapter 1 – Introduction and Plan Area

Appendix 1d-C:

Santa Barbara County, California,
Code of Ordinances, Chapter 34A – Wells
Dated June 19, 2018

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CHAPTER 34A
WELLS[1]

Sec. 34A-1. Declaration of purpose, findings and intent.

It is the purpose of this chapter to establish minimum standards for the construction, modification, inactivation and destruction of water wells (hereafter wells) within the unincorporated area of Santa Barbara County in such a manner that the groundwater of the county will not be contaminated or polluted. In adopting these standards, it is the intent of the board of supervisors to ensure that water obtained from these wells will be suitable for beneficial uses and will not jeopardize the health, safety and general welfare of the people of the county.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-2. Definitions.

(a) Unless the context requires otherwise, the definitions set forth in this section shall govern the construction of this chapter.

(b) Words not otherwise defined in the ordinance codified in this chapter shall have the meaning ascribed to them in Chapter II of the California Department of Water Resources Bulletin No. 74-81 Water Well Standards and California Department of Water Resources Bulletin 74-90 (Supplement to 74-81), and as each may be amended by their successors (hereinafter referred to as "the Bulletins").

(1) "Abandoned well" means a well that has not been used for a period of one year and the property owner has not demonstrated an intention to use the well by filing a letter of intention of future use with the administrative authority and or has not maintained the well in accordance with the standards contained in section 34A-12.

(2) "Administrative authority" shall mean Santa Barbara County Health Officer or Environmental Health Services with the following exception:

Wells constructed for the purpose of monitoring or abating contaminants in underground waters that are associated with a hazardous materials release shall be subject to the administrative authority of the Santa Barbara County Fire Department or its designated successor for enforcement of statutes, ordinances or regulations related to hazardous materials, hazardous wastes or hazardous substances as set forth on the Santa Barbara County Code, Chapter 15, Fire Prevention, as amended from time to time.

(3) "Applicant" shall mean:

[1]Editor's note(s)—Ord. No. 12-4844, adopted Sept. 11, 2012, amended Ch. 34A in its entirety to read as set out herein. The former Ch. 34A, §§ 34A-1—34A-12, pertained to similar subject matter and derived from Ord. No. 3458, § 1.

(A) The legal owner(s) or person(s) who has a legal possessory interest, whether by lease easement or other legal claim, of the property on which the well is to be constructed, modified or repaired, inactivated or destroyed; or

(B) The owner's agent authorized to act on behalf of or represent the owner in water well permit activities; or

(C) A licensed well drilling contractor who shall perform the work at the request of the property owner or owner's agent.

(4) "Contamination" and "pollution" shall have the meanings ascribed to them by California Water Code, Section 13050.

(5) "County" shall mean the County of Santa Barbara, acting through its Board of Supervisors or Environmental Health Services as the duly authorized administrative authority.

(6) "Destruction" shall mean the complete filling of the well in accordance with the procedures outlined in the Bulletins.

(7) "Emergency" shall mean a circumstance which is either:

(A) An imminent threat of or is actually contaminating or polluting the groundwater of Santa Barbara County; or

(B) Jeopardizes the health or safety of the people of the county; or

(C) Will cause a substantial or immediate loss of property, crops or livestock.

(8) "Exploratory boring" shall mean any soil boring drilled for geotechnical or environmental purposes that penetrates an aquifer or penetrates to within ten vertical feet of an aquifer.

(9) "Hydrogen sulfide (H_2S) gas" is a colorless, highly toxic and explosive gas that can be associated with and released during water well drilling activities. It is heavier than air, has a distinctive "rotten egg" odor which can saturate olfactory senses and is considered immediately dangerous to life and health (IDLH) at one hundred parts per million (ppm) in air.

(10) "H_2S meter" means an intrinsically safe instrument capable of detecting H_2S gas within the range 1.0 parts per million (ppm) to four hundred ppm.

(11) "Inactive well" shall mean a well not routinely operated but capable of being made operable with minimum effort.

(12) "Modification" shall only mean the deepening of a well, re-perforation, sealing or replacement of a well casing.

(13) "Monitoring well" shall have the meaning as defined by Section 13712 of the California Water Code or its successor.

(14) "Nuisance" shall mean any condition which creates the potential for unsanitary or unsafe conditions resulting from water well drilling or operation activities, as determined by the administrative authority. A nuisance shall also mean a well or component thereof which contaminates or pollutes, or potentially may contaminate or pollute, the groundwater or that jeopardizes or threatens the health and safety of the public.

(15) "Person" shall mean any individual, firm, partnership, general corporation, association or governmental entity. A governmental entity, as used herein, shall not include any local agency exempt from the application of the ordinance codified in this chapter pursuant to state law.

(16) "Water well" or "well" shall mean any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into the ground. It shall include geothermal heat exchange

wells and cathodic protection wells, as defined in California Water Code Sections 13711 and 13713. This definition shall not include:

(A) Oil and gas wells, or geothermal resource wells constructed under the jurisdiction of the California State Department of Conservation, except those wells converted to use as water wells; or

(B) Wells used for:

(1) Dewatering excavation during construction;

(2) Stabilizing hillsides or earth embankments;

(3) Geologic borings, unless said boring penetrates an aquifer or is within ten vertical feet of an aquifer;

(C) Springs;

(D) Disposal and injection wells constructed or converted under the jurisdiction of the California Regional Water Quality Control Board or the Environmental Protection Agency underground injection control program.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-3. Acts prohibited, permit required.

(a) It shall be unlawful for any person to construct, modify or destroy any well, including test holes, unless such person has obtained a valid permit issued by the administrative authority for the specific work to be performed or in the case of an emergency, fully complied with the provisions of this chapter relating to emergencies.

(b) It shall be unlawful for any person to construct, modify or destroy any well unless such construction, modification, or destruction is in accordance with the standards set forth in this chapter.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-4. Permit procedure for construction, modification or destruction of wells.

(a) An application for a permit required by this chapter shall be made in writing on such forms as may be prescribed by the administrative authority. The application shall be signed by the applicant and accompanied by the appropriate fee as established by resolution of the Santa Barbara County Board of Supervisors. No part of said fee shall be refundable except as provided in such fee resolution.

(b) An application for a permit shall include the following:

(1) Name and mailing address of the applicant and the legal owner of the property;

(2) California licensed well drilling contractor's name, address, and contractor's license number and a statement that the contractor drilling the well is licensed under the provisions of Water Code Section 13750.5 as a well drilling contractor and such license is in full force and effect; or

A statement that the applicant is exempt from the provisions of Water Code Section 13750.5 and the basis for the exemption;

(3) Estimated or proposed depth of the well, casing material, sealing material, sealing method, use of the well, and drilling method to be used;

(4) Location of the property and well site including street address and assessor's parcel number;

(5) A plot plan indicating the location of the well with respect to the following items:

(A) Property lines;

(B) Sewage disposal systems or works carrying or containing sewage or industrial wastes within a two-hundred-foot radius of the proposed well;

(C) All perennial, seasonal, natural, or artificial water bodies or watercourses, including the location of the one-hundred-year floodplain as defined by the Santa Barbara County Flood Control, if applicable;

(D) Drainage pattern of the property;

(E) Existing wells on the property;

(F) Access roads and easements (water, sewer, utility, roadway);

(G) Existing and/or proposed structures;

(H) Animal or fowl enclosures, pens, paddocks, stockyards within a one-hundred-foot radius of proposed well site;

(I) Overhead power lines;

(J) Other sources of contamination such as landfills and hazardous materials sites.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-5. Fees.

(a) Each application for a well construction, modification or destruction permit shall be accompanied by the established permit fee.

(b) A supplemental hourly fee shall be charged to the applicant for any inspection service by the administrative authority as follows:

(1) Staff time in excess of two hours on-site for witnessing annular seals;

(2) Witnessing seals after regular business hours or on weekends or recognized holidays;

(3) The abatement of nuisances or hazards resulting from the well drilling operation;

(4) Staff time in excess of the hourly time limit, as established in the fee resolution for permit processing and related inspections.

(c) The board of supervisors may, by resolution, adopt such fees as allowed under Section 101325 of the California Health and Safety Code and may prescribe such terms and conditions as may be necessary to enable the County of Santa Barbara to recover the reasonable and necessary costs incurred by the county in administrating this chapter.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-6. Permit approval.

(a) If the administrative authority finds the application for a permit requested pursuant to this chapter to contain all the required information and the proposed work is in compliance with all applicable standards as specified in this chapter, the administrative authority shall issue a well permit.

(b) If an application is found to be incomplete, the administrative authority shall notify the applicant in writing, advising the applicant of the specific information or documentation that is required to complete the application.

(c) Should the applicant wish to make any changes to the approved permit, the change shall be approved by the administrative authority in writing prior to commencing work. If changes to the well casing size or an increase in the total depth of the well is required during the course of construction of the well due to unforeseen circumstances, the administrative authority shall be notified in a manner prescribed by the administrative authority prior to making the change.

(d) A permit issued for construction of a well applies to the construction of one completed well. Prior approval from the administrative authority is required if the well is to be moved to a location other than that designated on the approved permit. Any preliminary tests holes that are not developed into completed wells are to be properly filled with compacted backfill material prior to relocating the drill site.

(e) The permit approval received from the administrative authority is separate from any other permit or clearance that may be required by another governmental agency or entity.

(f) Prior to the issuance of a new well construction or modification permit, any abandoned wells on the property shall be declared inactive or destroyed in accordance with acceptable standards provided in the ordinance codified in this chapter.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-7. Permit denial, suspension and revocation.

(a) Permits may be denied if the specific work as proposed would violate the terms, conditions or standards of this chapter.

(b) The administrative authority may suspend or revoke any permit issued pursuant to this chapter as follows:

  (1) Whenever it determines that the applicant, or the applicant's agents, employees or the licensed well drilling contractor performing the work have misrepresented any material facts in the permit application or have violated any provision of this chapter or any terms and conditions of the permit;

  (2) Whenever it determines that a condition resulting from any work performed under such a permit constitutes a nuisance as defined herein;

  (3) If the responsible party, employees or the drilling contractor continues to work on a project past the state at which an inspection has been prescribed pursuant to this chapter unless that inspection has been completed or waived by the administrative authority.

(c) Except in emergency situations, before the administrative authority suspends or revokes a well permit, the administrative authority shall notify the applicant of the opportunity to show cause why the permit should not be suspended or revoked.

(d) No person whose permit has been suspended or revoked shall continue to perform any work until receiving written permission from the administrative authority. The permit shall not be reinstated until the violation has been abated.

(e) Upon suspending or revoking any permit, the administrative authority shall order the applicant to perform any work reasonably necessary to protect the groundwater and/or public health and abate the emergency condition. No person who has been issued a permit pursuant to this chapter shall fail to comply with such order.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-8. Permit transferal and expiration.

(a) A permit issued under the provisions of this chapter is non-transferable.

(b) Every permit issued pursuant to this chapter shall expire upon completion of the work authorized thereby. In any event such permit shall expire one year from the date of issuance unless a written request by the applicant for an extension is approved by the administrative authority; in which case a single one year time extension may be granted. Once a permit has expired no further work shall be performed unless and until the applicant has received a permit extension or a new permit.

(c) Applications that are not approved by the administrative authority due to submission of insufficient information shall expire one year after notification to the applicant of such deficiency.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-9. Appeal.

(a) Any person whose application for a permit has been denied, suspended, or revoked may appeal to the director of environmental health services in writing within ten days after receiving written notification of such action. Said appeal shall specify the reasons thereof. The director of environmental health services shall set the appeal for the hearing at the earliest practicable time, and shall notify the appellant in writing of the established time and place at least ten days prior to the date of the hearing.

(b) After the completion of the appeal hearing, the director of environmental health services may affirm, modify or reverse, wholly or in part, the order or determination being appealed.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-10. Emergency.

In the event of an emergency, a person may construct, modify or destroy a well without the permit required by this chapter; provided that:

(a) Such work is performed in conformance with the standards set forth herein;

(b) The administrative authority is notified in writing of such emergency work by the following business day; and

(c) An application for the required permit is made within three business days after initiation of such emergency work.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Sec. 34A-11. Hydrogen sulfide detection, reporting and mitigation.

(a) The licensed well drilling contractor performing the work on a well that will exceed one thousand two hundred feet in depth shall keep a properly maintained and calibrated hydrogen sulfide H_2S gas monitor at the drill site at all times during well drilling activities. The meter shall be in operation at all times during the well drilling activities. The meter shall be calibrated per manufacturer recommendations and at least prior to each new drilling operation or after each use. A calibration log shall be maintained and kept with the meter for inspection by administrative authority on request.

(b) If hydrogen sulfide gas is detected at levels exceeding 1.0 ppm for more than ten minutes or twenty ppm instantaneously, the licensed professional shall immediately contact Environmental Health Services, the Santa Barbara County Air Pollution Control District and the California Office of Emergency Services as required by Section 2631 of Title 19 of the California Code of Regulations. If the release poses a potential threat to public health off-site or the release may violate Santa Barbara County Air Pollution Control District (APCD) Rule 310 (Odorous Organic Sulfides) or Rule 303 (Nuisance) the licensed well drilling contractor or their designee shall immediately call 911 and report the release. If the release occurs outside normal business hours, the licensed professional driller or designee shall immediately report the release to 911.

(c) Mitigation measures shall be implemented immediately if the H_2S release exceeds limits established in subsection (b) or may violate APCD Rule 310 (levels at or beyond property line of 0.06 ppm or 0.03 ppm averaged over three minutes and ten minutes, respectively) or cause detectable odors at or beyond the fenceline (APCD Rule 303). Mitigation measures must result in prompt, effective and sustained reduction of H_2S to below levels on and off the property in accordance with subsections (a) and (b).

(d) Current phone numbers for the agencies specified in subsection (b) shall be maintained on the job site and all personnel are to be trained on appropriate emergency notification procedures.

(Ord. No. 5046, 6-19-2018)

Sec. 34A-12. Standards for wells.

(a) Standards for construction, repair or modification, destruction or inactivation of wells as set forth in the Bulletins, are hereby adopted as part of this chapter, with the following additional clarification and requirements for well construction:

(1) The annular space between the casing and surrounding formation shall be a minimum of three inches greater than the casing and shall be sealed to a minimum depth of fifty feet below ground surface;

(2) The sealing material shall be pumped into the annular space using a tremie pipe;

(3) The minimum set up time allowed for annular seal materials shall be in accordance with the Bulletins. When additives to shorten setting time are proposed to be used with the sealing material, setup time may be reduced per the additive manufacturer's specification. No additional construction or well development activity may resume until the sealing material has sufficient time for proper set up;

(4) Every well shall be equipped with an adequately sized opening by which disinfecting agents may be conveniently introduced directly into the well casing. This opening shall be protected against entrance of contaminants by use of a watertight cap or plug;

(5) Before being placed in service, every new, deepened, repaired or reconstructed individual domestic or community water supply well shall be thoroughly disinfected utilizing the procedures set forth in Appendix C of the Bulletins;

(6) Upon completion of the drilling process, the well head shall be sealed in accordance with the Bulletins, so as to prevent entry of contaminants into the casing;

(7) Drilling waste shall be controlled and may not be discharged so as to create conditions which violate water quality control board regulations, other state laws, federal regulations or local ordinances;

(8) Mud pits created to confine drilling mud shall be maintained during the well drilling operation so as not to be a safety hazard. It shall be the well drilling contractor's responsibility to properly earth fill the mud pit(s) upon completion of the job;

(9) The location and design of all wells, including horizontal or lateral wells, shall be approved by the administrative authority on a case-by-case basis prior to construction or modification of such wells;

(10) A concrete base or pad shall be constructed at ground surface around the top of the well casing and contact the annular seal as per the Bulletins, except for cathodic protection wells and monitoring wells which will follow California Well Standards Bulletin 74-90 or its successors.

(A) The soil under the pad must be thoroughly compacted and the pad shall have a minimum thickness of four inches above grade, extend two feet laterally in all directions and slope away from the exterior of the casing;

(B) A minimum of forty-eight hours setting time shall be required on bentonite well seals before a concrete base or pad is installed around the well casing;

(C) The well pad for turbine pump installations shall be constructed to allow for additional weight and soil bearing capacity as per the Bulletins;

(D) The well casing shall extend a minimum of eighteen inches above the finished grade.

(b) The administrative authority may approve requests for variances from the provisions of this chapter if it is determined that complete compliance with the prescribed standards is not possible or practical due to site characteristics and that the variance will not endanger groundwater quality or jeopardize public health and safety.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Editor's note(s)—Ord. No. 5046, adopted June 19, 2018, renumbered the former sections 34A-11—34A-20 as sections 34A-12—34A-21. The historical notation has been preserved for reference purposes.

Sec. 34A-13. Standards for inactive wells.

(a) Upon receipt of notification by the administrative authority that an existing well that has not been used for a period of one year has been classified as an abandoned well, the property owner shall properly destroy the well as set forth in section 34A-13 or submit a letter of intention of future use. When this letter is received by the administrative authority, the well will be re-classified as inactive. As evidence of this intention for future use, the owner shall demonstrate that:

(1) The well has no defects which may impair water quality or the water-bearing formations penetrated;

(2) If the pump has been removed, the well has been fitted with a watertight cover that cannot be removed without the use of tools to prevent the entrance of debris or contamination;

(3) The well is marked so that is can be clearly seen;

(4) The area surrounding the well is maintained clear of brush or debris.

(b) Additional evidence to demonstrate that the well is capable of being made operational and that the well does not result in impairment of ground water quality may be required by the administrative authority.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-14. Destruction of wells.

(a) Abandoned wells shall be properly destroyed under permit and inspection from the administrative authority as provided in this chapter. Failure to destroy an abandoned well will constitute a nuisance, as defined, and the administrative authority will take appropriate measures to mitigate the nuisance.

(b) Destruction of wells and borings shall consist of the complete filling of the well in accordance with the procedures described in the Bulletins.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-15. Construction inspections.

(a) An applicant or his/her designated agent shall obtain a confirmed inspection appointment with the administrative authority at least forty-eight hours prior to the estimated time for the required inspections as listed below:

(1) Annular seal installation on a well;

(2) Final inspection of a completed well installation;

(3) Destruction of wells.

(b) At the discretion of the administrative authority, the required notification for a scheduled inspection may be reduced.

(c) Inspections shall be scheduled during standard business hours. The administrative authority may, at its discretion, waive an inspection. Such a decision by the administrative authority shall not be deemed a waiver of any future inspections. In the event that an inspection is waived, the applicant or his/her designated agent shall supply any and all documentation requested by the administrative authority to demonstrate compliance with the standards contained in this chapter.

(d) With prior approval, an inspection by the administrative authority may be waived when the placement of the annular seal is completed under the supervision of a registered professional geologist or a registered professional civil engineer. When supervising the placement of an annular seal, a registered professional geologist or registered professional civil engineer shall provide a written statement with wet signature stamp to the administrative authority within thirty days of completion of the work, certifying that they personally witnessed the placement of the seal and detailing the seal depth, thickness, seal material and method of placement.

(e) Within five days after the work on a well has been completed, the administrative authority shall be notified by the person performing the work so the final inspection may be conducted. The well concrete pad, disinfection tube and either water tight gasket seal or a well cap shall be in place for this inspection. The administrative authority may waive the onsite inspection of a conductor casing cap if verified in writing by the registered professional civil engineer, registered professional geologist or C57 water well drilling contractor.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-16. Final approval.

(a) Final approval of the well shall be based on satisfactory completion of the following:

(1) Any person who has drilled, dug, excavated or bored a well subject to this chapter shall, within thirty days after completion of the work, furnish the administrative authority with a copy of the state driller's report. The well driller shall notify the county if submission of the report is to be delayed.

(2) Payment for all costs of related county services shall be submitted to the administrative authority prior to final approval of the well.

(b) No well shall be placed into use until final approval is granted by the administrative authority.

(c) Any newly constructed well that has not been completed or given final approval of the construction within ninety days of the cessation of drilling shall be declared out of service by the administrative authority, and shall be immediately inactivated or properly destroyed by the property owner.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-17. Nuisance.

Upon a finding by the administrative authority that an inactive, abandoned or in-operational well or well drilling activity constitutes a nuisance, as defined herein, the county shall take the necessary action to abate such nuisance. The owner of the property where the well is located and/or the person causing the nuisance thereon shall be jointly liable for the reasonable costs incurred by or at the request of the administrative authority for abatement of the nuisance.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-18. Powers and duties of the administrative authority.

(a) The administrative authority may adopt policies and procedures to implement and administer this chapter.

(b) Within the unincorporated area of Santa Barbara County, the administrative authority is authorized and directed to enforce the provision of this chapter. It is authorized to consult with qualified experts in any matter concerning well construction and ground water protection to the extent it deems it reasonably necessary to assist in carrying out its duties under this chapter. The administrative authority may request and shall receive the assistance and cooperation of other officials of the County of Santa Barbara, so far as may be necessary in the discharge of its duties.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-19. Rights to inspect.

The administrative authority shall have the right to enter any property at any reasonable time to make inspections and examination for the purposes of administration and enforcement of this chapter, subject to the provision of the Code of Civil Procedure Sections 1822.50-1822.60.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-20. Severability.

If any section, subsection clause or provision of this chapter is held invalid, the remainder of this chapter shall not be affected by such invalidity.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

Sec. 34A-21. Remedies.

Any violation of the provisions of this chapter by any person is also subject to administrative fines as provided in chapter 24A of this Code.

(Ord. No. 12-4844, 9-11-2012; Ord. No. 5046, 6-19-2018)

Note(s)—See note at section 34A-12.

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Chapter 1 – Introduction and Plan Area

Appendix 1d-D:

City of Buellton, California,
Buellton Municipal Code, Chapter 8.20 Water Wells
Accessed December 14, 2021

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Chapter 8.20 WATER WELLS

8.20.010 Purpose.

It is the purpose of the ordinance codified in this chapter to regulate the: (1) construction, (2) modification or repair, (3) destruction, (4) inactivation of wells in such a manner that the groundwater of the city will not be contaminated or polluted, and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety or welfare of the people of this city. (Ord. 11-01 § 4, 2011)

8.20.020 Acts prohibited, permit required.

A. It is unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such person has:

1. Obtained a permit issued from the city for the specific work to be performed; or

2. In the case of an emergency, fully complied with the provisions of this chapter relating to emergencies.

B. It is unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such construction, modification or repair, destruction or inactivation is in accordance with the standards set forth in this chapter. (Ord. 11-01 § 4, 2011)

8.20.030 Definitions.

For the purpose of this chapter:

A. Applicant. "Applicant" shall mean:

1. The legal owner(s) of the property on which the well is to be constructed, modified or repaired or destroyed;

2. That owner's agent authorized in writing to make this application; or

3. A licensed well drilling contractor who shall perform the work on the well.

B. Contamination and Pollution. "Contamination and pollution" shall have the meanings ascribed to them by California Water Code Section 13050.

C. City. "City" shall mean the city of Buellton, acting through its city council or the city health officer, as the duly authorized representative of the city council.

D. Destruction. Destruction of wells shall consist of the complete filling of the well in accordance with the procedures outlined in Bulletin 74-81, "Water Well Standards: State of California," of the California Department of Water Resources.

E. Emergency. "Emergency" shall mean a circumstance which is either:

1. An imminent threat of or is actually contaminating or polluting the groundwater of the city; or

2. Jeopardizes the health or safety of the people of the city; or

3. Will cause a substantial or immediate loss of property, crops or livestock.

F. Inactive Well or Inactivation. An "inactive well" is one not routinely operating but capable of being made operable with a minimum effort. It shall be considered abandoned and proper destruction required when it has not been used for a period of one year, unless the owner demonstrates his or her intention to use the well again. Inactivation of a well shall be accomplished by filing a permit stating the intention to reuse the well and properly maintaining the well as inactive per the requirements of Bulletin 74-81.

G. Modification or Repair. “Modification” or “repair” shall only mean the deepening of a well, reperforation, sealing or replacement of a well casing.

H. Nuisance. “Nuisance” shall mean a well which threatens to or which contaminates or pollutes the groundwater of this city in such a way that it jeopardizes the health and safety of the public. A nuisance also means anything which creates an unsanitary or unsafe condition resulting from water well drilling activity.

I. Person. “Person” shall mean any individual, firm, partnership, general corporation, association or governmental entity. Governmental entity, as used herein, shall not include any local agency exempt from the application of the ordinance codified in this chapter pursuant to state law.

J. Well or Water Well. The term “well” or “water well” means any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into the ground. It shall also include “cathodic protection wells,” as defined in California Water Code, Section 13711. This definition shall not include:

1. Oil and gas wells, or geothermal wells constructed under the jurisdiction of the California State Department of Conservation, except those wells converted to use as water wells; or

2. Wells used for the purpose of:

a. Dewatering excavation during construction, or

b. Stabilizing hillsides or earth embankments.

K. Words not otherwise defined in the ordinance codified in this chapter shall have the meaning ascribed to them in Chapter II of the California Department of Water Resources Bulletin No. 74-81 (Water Well Standards) and Chapter II of 74-1 (Cathodic Protection Well Standards), as each may be amended. (Ord. 11-01 § 4, 2011)

8.20.040 Permits.

Application for the permit required by this chapter shall be:

A. Made in writing to the city on such forms as may be prescribed by the city;

B. Signed by the applicant; and,

C. Accompanied by a fee established by this chapter (no part of said fee shall be refundable); and,

D. Shall include but not be limited to the following:

1. Applicant’s name and address; a statement that the person drilling the well is licensed under the provisions of Chapter 9 of Division 3 of the Business and Professions Code as a well drilling contractor and such license is in full force and effect; the number of such license; or, in lieu of the two latter enumerated matters, a statement that the applicant is exempt from the provisions of Chapter 9 of Division 3 of the Business and Professions Code and the basis for the alleged exemption,

2. Estimated or proposed depth of the well, casing material, sealing material, sealing method, use of the well, and drilling method to be used,

3. Location of the property and well site including street address and/or assessor’s parcel number; and the legal owner of the property,

4. A plot plan indicating the location of the well with respect to the following items:

a. Property lines,

b. Sewage disposal systems or works carrying or containing sewage or industrial wastes within a two hundred foot radius of the proposed well,

c. All perennial, seasonal, natural, or artificial water bodies or watercourses, including location of one hundred year floodplain, if applicable,

d. Drainage pattern of the property,

e. Existing wells within a one hundred foot radius of the proposed well,

f. Access roads and easements (water, sewer, utility, roadway),

g. Existing and/or proposed structures,

h. Animal or fowl enclosures, pens, paddocks, stockyards within a one hundred (100) foot radius of proposed well site,

5. Permits shall be issued subject to the terms, conditions and standards of this chapter and may be denied only if the specific work to be performed of construction, modification or repair, destruction or inactivation as proposed would violate the terms, conditions or standards of this chapter,

6. The issuance of a permit hereunder shall be deemed to be an administrative, ministerial, nondiscretionary act, and if an applicant complies with the terms, conditions, and standards of this chapter, said permit shall be issued within five working days,

7. A permit issued for construction of a well covers the construction of one completed well. If the well driller proposes to change the site of the well from that shown on the site plan of a permit, the change in site must be approved by the city prior to drilling. The city shall give approval or disapproval of the change in site within twenty-four (24) hours of notification by the well driller,

8. Every permit issued pursuant to this chapter shall expire upon completion of the task authorized thereby; however, in any event such permit shall expire one year from date of issuance,

9. Guarantee of Performance. Prior to the issuance of a permit, the person drilling the well shall post with the city a cash deposit or bond to guarantee compliance with the terms of this chapter and the applicable permit. Such cash or bond to be in any amount deemed necessary by the health officer to include but not be limited to the remedy of improper work, but not in excess of the total estimated cost of such work. Licensed well drilling contractors shall not be required to post a bond or deposit guaranteeing performance. Eighty-five (85) percent of the deposit or bond shall be returned to the permittee when the work has been completed to the satisfaction of the health officer; the remaining fifteen (15) percent of the bond shall be returned after one year of satisfactory well operation as determined by the health officer. These percentages may vary to cover special conditions and circumstances in order to guarantee performance and compliance with this chapter. (Ord. 11-01 § 4, 2011)

8.20.050 Standards.

Standards for construction, repair or modification, destruction or inactivation are set forth in Chapter II of the California Department of Water Resources Bulletin No. 74-81, Water Well Standards, and Bulletin No. 74-1, Cathodic Protection Well Standards, and are hereby adopted as part of this chapter, with the following additional clarification and requirements for well construction.

A. Annular Space. Gravity installation of the sealant in an annular space of a well is acceptable if the interval to be sealed is dry and the interval depth is fifty (50) feet or less. Sealant shall be pumped into the space using a tremie or grout pipe when there is water in the annulus, or the annulus exceeds fifty (50) feet.

B. Disinfection Tube. Every well shall be equipped with an adequately sized opening by which disinfecting agents may be conveniently introduced directly into the well casing. This opening shall be protected against entrance of contaminants by installation of a watertight cap or plug.

C. Drilling Waste. Drilling waste must be controlled and may not be discharged so as to create conditions which violate Water Quality Control Board Regulations, other state laws, federal regulations or local ordinances.

D. Mud Pits. Mud pits created to confine drilling mud shall be maintained during the well drilling operation so as not to be a safety hazard. It shall be the well driller’s responsibility to properly earth fill the mud pit(s) upon completion of the job.

E. Setup Time. The minimum time that must be allowed for annular seals containing Type II and III (six-sack) cement to set shall be sixteen (16) hours before construction operations on the well may be resumed. When additives to shorten setting time are used with the cement, this setup time may be reduced to a minimum of twelve (12) hours before air jetting, bailing, swabbing, test pumping or further construction on the well may be resumed.

F. Log of Well. Any person who has drilled, dug, excavated or bored a well subject to this chapter, shall within thirty (30) days after completion of the work, furnish the city with a copy of the state driller's report. The well driller shall notify the city if submission of the log is to be delayed.

G. Horizontal Wells. The location and design of horizontal or lateral wells shall be approved by the city on a case-by-case basis prior to approval to construct or reconstruct such wells.

H. Administrative Variance. The health officer may grant an administrative variance to the provisions of this chapter where written evidence is submitted that a modification of the standards will not endanger the health or safety of the public and strict compliance would be unreasonable in view of all the circumstances. (Ord. 11-01 § 4, 2011)

8.20.060 Emergency.

In the event of an emergency, a person may construct, modify or repair, destroy or inactivate a well without the permit required by this chapter; providing, that:

A. Such work is performed in conformance with the standards set forth herein;

B. The city is notified of such emergency work by the following city working day; and

C. An application for the required permit is made within three city working days after initiation of such emergency work. (Ord. 11-01 § 4, 2011)

8.20.070 Enforcement.

A. The city may suspend or revoke a well permit issued under this chapter whenever the city determines that a condition resulting from any work performed under such a permit constitutes a nuisance as defined herein, or when the applicant, his or her agents, employees or the licensed well drilling contractor performing the work:

1. Violates any provision of this chapter or any terms and conditions of the permit; or

2. Misrepresents any material facts in the application for a permit.

B. Except in emergency situations, before the city suspends or revokes a well permit, the city shall make reasonable effort to notify the applicant and the licensed well driller performing work under the permit if he or she is not the applicant and to provide an opportunity for each to show cause why the permit should not be suspended or revoked.

C. Upon notification by the city that the permit is suspended or revoked, or finding that no valid permit has been issued, no further work shall be performed until such violation has been abated.

D. Rules and Regulations. The health officer may adopt rules and regulations to implement and administer this chapter. (Ord. 11-01 § 4, 2011)

8.20.080 Nuisance.

Upon finding by the city that a well or well drilling activity constitutes a nuisance, as defined herein, the city may take the necessary action to abate such nuisance. The property owner where the well is located and/or the person causing the nuisance thereof shall be jointly liable for the reasonable costs incurred by or at the request of the city for abatement of the nuisance. (Ord. 11-01 § 4, 2011)

8.20.090 Appeal.

Any person whose application for a permit has been suspended, revoked or denied or whose request for an administrative variance has been denied may appeal to the city council in writing within ten days after the notice of such suspension, revocation or denial. Said appeal shall specify the reasons therefor and shall be accompanied by a filing fee, if any, as established by the council. The city clerk shall set the appeal for the hearing and shall give notice to the appellant and the appropriate city personnel of the time and place of the hearing. (Ord. 11-01 § 4, 2011)

8.20.100 Inspection.

A. The city shall be notified at least twenty-four (24) hours in advance to make an inspection of:

1. The sealing of the annular space on a well;

2. The destruction of wells; and

3. Any other operation which may be stipulated on the permit by the city to cope with special or unusual conditions.

B. The city shall have the right to enter upon any property at any reasonable time to make inspections and examinations for the purpose of enforcement of this chapter, subject to the provisions of Code of Civil Procedure Section 1822.50 et seq. (Ord. 11-01 § 4, 2011)

8.20.110 Application—Fees.

A. Each application for a well construction or modification permit shall be accompanied by a permit fee of one hundred fifty-five dollars ($155.00).

B. Each application for a well destruction or inactivation permit shall be accompanied by a permit fee of ninety-five dollars ($95.00).

C. An additional fee of thirty dollars ($30.00) per hour shall be charged to the permittee for any inspection service by the health officer which exceeds two hours on-site for witnessing annular seals, and the abatement of nuisances or hazards resulting from the well drilling operation. These application fees may be modified by resolution of the city council. (Ord. 11-01 § 4, 2011)

8.20.120 Penalties.

Any person who violates any provision of this chapter is guilty of a misdemeanor. Each offense shall be punishable by a fine of not less than twenty-five dollars ($25.00) or more than one thousand dollars ($1,000.00) or by imprisonment in the City Jail for a term not exceeding six months, or by both such fine and imprisonment. Each day such offense continues shall constitute a separate offense. (Ord. 11-01 § 4, 2011)

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Chapter 1 – Introduction and Plan Area

Appendix 1e-A:

Draft Final Data Management Plan,
Central Management Area,
Dated February 2020

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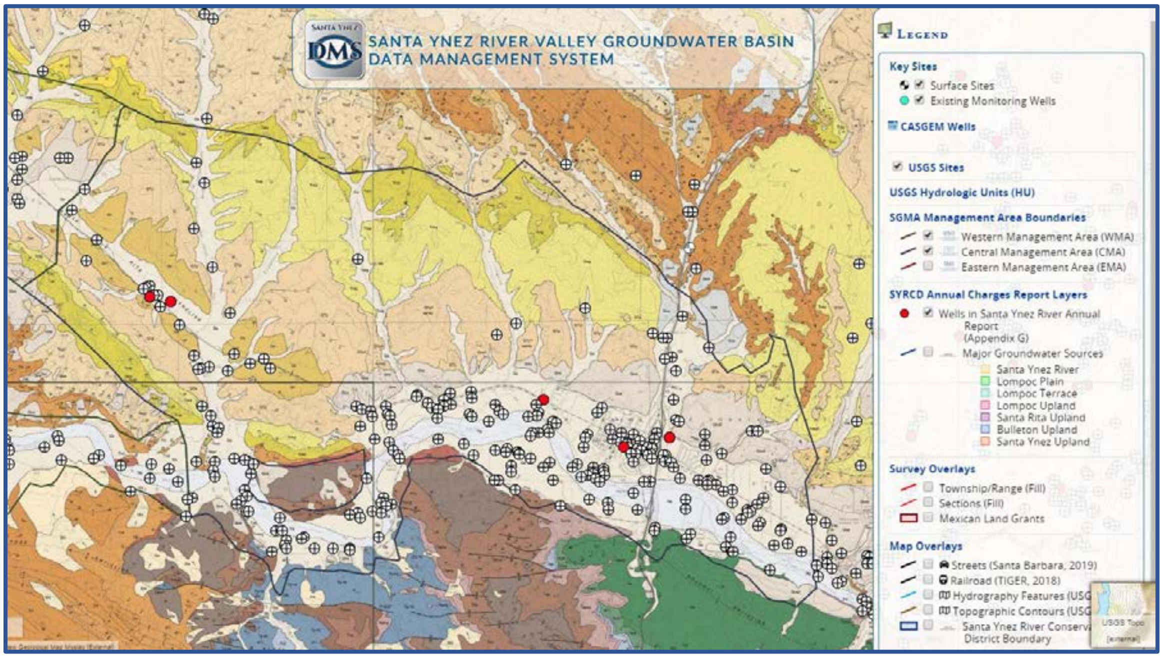
DRAFT FINAL
DATA MANAGEMENT PLAN



Screenshot including streaming geologic maps from the U.S. Geological Survey.

CMA

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

Prepared by:

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants

FEBRUARY 2020

TABLE OF CONTENTS

Section **Page No.**

FIGURES

GLOSSARY OF TERMS/ABBREVIATIONS

Acronym/Abbreviation	Definition
API	Application Programming Interface
ASCII	American Standard Code for Information Interchange
BibTeX	*Software Name (Bibliography for TeX)*
CA	California
CASGEM	California Statewide Groundwater Elevation Monitoring
CEDEN	California Environmental Data Exchange Network
CMA	Central Management Area
CSD	Community Services District
CSS	Cascading Style Sheets
CSV	comma-separated values
DMS	Data Management System
DOGGR	Division of Oil, Gas, and Geothermal Resources
DOI	Digital Object Identifier
DWR	California Department of Water Resources
elog	electrical log
EMA	Eastern Management Area
Esri	*Company name (formerly Environmental Systems Research Institute)*
GIS	geographic information system
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HTML 5	Hypertext Markup Language, version 5
HTTP	Hypertext Transfer Protocol
JPEG	Joint Photographic Experts Group
JSON	JavaScript Object Notation

Acronym/Abbreviation	Definition
LAMP	Linux, Apache, MySQL, PHP (or Perl, or Python)
LAS	Log ASCII
MariaDB	*Software Name*
MLA	Modern Language Association; in the context of a citation style
MySQL	*Software Name*
PHP	PHP: Hypertext Preprocessor
QGIS	*Software Name (formerly Quantum GIS)*
REST	Representational state transfer
RIS	Research Information Systems
SFTP	SSH File Transfer Protocol
SGMA	Sustainable Groundwater Management Act
SQL	Structured Query Language
SSH	Secure Shell
SYRVGB	Santa Ynez River Valley Groundwater Basin
SYRWCD	Santa Ynez River Water Conservation District
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
VPS	virtual private server
WAT	California Water Code
CMA	Central Management Area
XML	Extensible Markup Language
XMP	Extensible Metadata Platform

1 INTRODUCTION

State of California law, the Sustainable Groundwater Management Act (SGMA), requires that all groundwater basins identified by the state as medium- or high-priority groundwater basins achieve sustainability by January 2042. To meet this target, state law requires the creation and implementation of a Groundwater Sustainability Plan (GSP) covering all of the identified groundwater basins. Each basin can have a single plan or multiple plans submitted under a coordination agreement. The SGMA law requires a Data Management System (DMS), a tool to organize and maintain data as part of GSP preparation and implementation. The DMS will be used throughout the GSP process.

The Santa Ynez River Valley Groundwater Basin (SYRVGB) is located in Santa Barbara County in the central coast region of California (Figure 1-1). California Department of Water Resources (DWR) made a determination in 2014 that the SYRVGB was a medium-priority groundwater basin and subject to a January 31, 2022, deadline for developing a GSP. To best address specific concerns and conditions unique to portions of the basin, the SYRVGB has been divided into three management areas run by separate Groundwater Sustainability Agencies (GSAs). The Central Management Area (CMA) GSA is responsible for preparing the GSP for its portion of the SYRVGB with the remainder of the SYRVGB managed by the two other management areas: the Western Management Area (WMA) and Eastern Management Area (EMA). This document describes how the DMS is being implemented as part of the GSP development for the CMA (Figure 1-2).

The CMA consists of the Central portion of the SYRVG as shown in Figure 1-2. The subareas of the CMA consist of the Buellton Upland and the portion of the Santa Ynez River alluvium east of the confluence with Santa Rosa Creek and west of the City of Solvang. The CMA committee comprises representatives of three member public agencies. One agency, the City of Buellton, has a public water system and is wholly within the CMA. The two remaining public agencies, the Santa Ynez River Water Conservation District (SYRWCD) and the Santa Barbara County Water Agency, are water management agencies that do not directly supply drinking water but their authorities extend into all three management areas.

This report describes the structure and content of the DMS being prepared for the CMA. Chapter 2 reviews the goals of the DMS, which include meeting the statutory requirements under SGMA, as well as aiding in the development of the GSP. Chapter 3 describes the architecture of the DMS, including the technical computer software, hardware, and data storage components. Chapter 4 describes the data sources (e.g., federal, state, and local resources) that will be housed in the DMS. Chapter 5 describes user access features, including the procedures to login, query, and import/export data from and to the DMS. Chapter 6 identifies the security considerations in the DMS and the various administrative duties and roles in developing and maintaining the DMS.

The CMA and WMA have reserved the following domain name for access to their DMS:

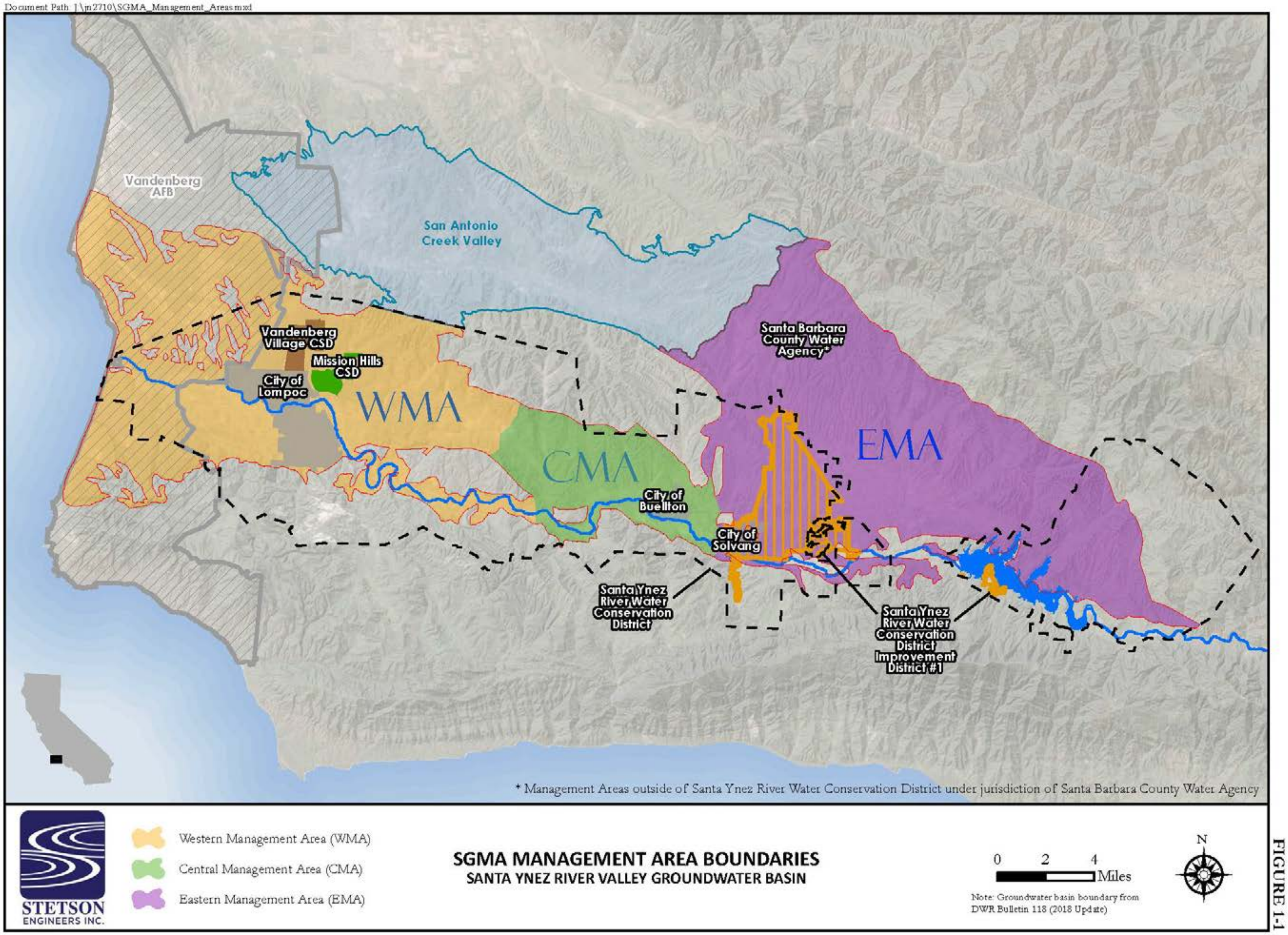
https://sywater.info/

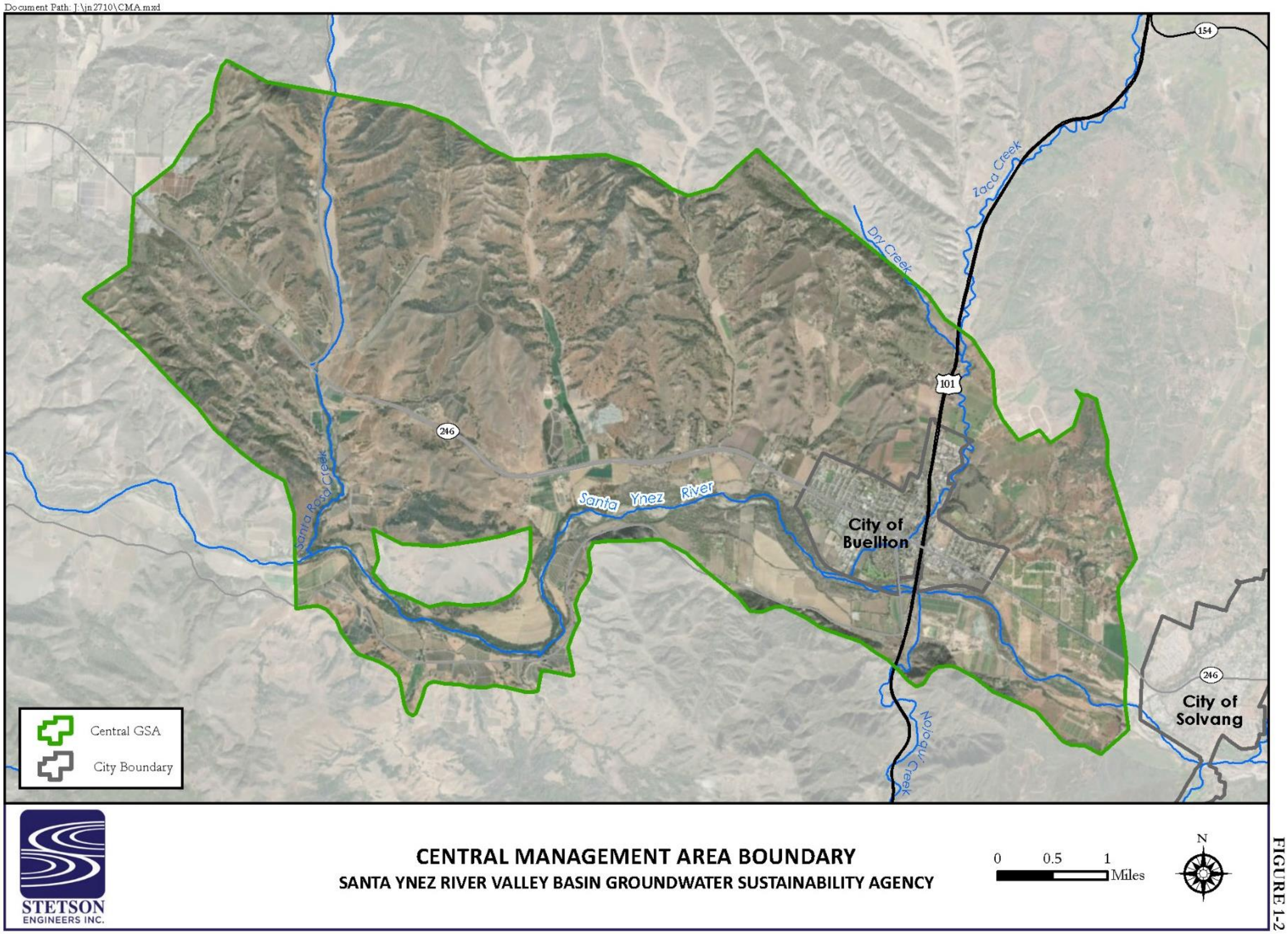
1.1 Goals of the Sustainable Groundwater Management Act

The California legislature identified the following specific goals that intended to be achieved as a result of the execution of the SGMA (CA WAT Section 10710.2):

> In enacting this part, it is the intent of the Legislature to do all of the following:
>
> (a) To provide for the sustainable management of groundwater basins.
>
> (b) To enhance local management of groundwater consistent with rights to use or store groundwater and Section 2 of Article X of the California Constitution. It is the intent of the Legislature to preserve the security of water rights in the state to the greatest extent possible consistent with the sustainable management of groundwater.
>
> (c) To establish minimum standards for sustainable groundwater management.
>
> (d) To provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater.
>
> (e) To avoid or minimize subsidence.
>
> (f) To improve data collection and understanding about groundwater.
>
> (g) To increase groundwater storage and remove impediments to recharge.
>
> (h) To manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner.
>
> (i) To provide a more efficient and cost-effective groundwater adjudication process that protects water rights, ensures due process, prevents unnecessary delay, and furthers the objectives of this part.

To achieve the goals identified by SGMA, the DMS will be a central source for groundwater data, specifically for the CMA, providing up-to-date technical information regarding basin conditions. Collecting and centralizing these data is a step towards meeting the goals of protecting water rights and ensuring local agencies continue to manage groundwater while minimizing state intervention. In addition to meeting these intentions, SGMA specifically requires the use of a DMS.


Document Path: J:\jn2710\SGMA_Management_Areas.mxd
Vandenberg AFB
San Antonio Creek Valley
Vandenberg Village CSD
Mission Hills CSD
City of Lompoc
WMA
CMA
EMA
Santa Barbara County Water Agency*
City of Buellton
City of Solvang
Santa Ynez River Water Conservation District
Santa Ynez River Water Conservation District Improvement District #1
* Management Areas outside of Santa Ynez River Water Conservation District under jurisdiction of Santa Barbara County Water Agency
STETSON ENGINEERS INC.
Western Management Area (WMA)
Central Management Area (CMA)
Eastern Management Area (EMA)
SGMA MANAGEMENT AREA BOUNDARIES
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
0 2 4 Miles
Note: Groundwater basin boundary from DWR Bulletin 118 (2018 Update)
N
FIGURE 1-1


Document Path: J:\jn2710\CMA.mxd
154
Zaca Creek
Dry Creek
101
246
Santa Ynez River
Santa Rosa Creek
City of Buellton
City of Solvang
Nojoqui Creek
Central GSA
City Boundary
STETSON ENGINEERS INC.
CENTRAL MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY BASIN GROUNDWATER SUSTAINABILITY AGENCY
0 0.5 1 Miles
N
FIGURE 1-2

2 GOALS OF DATA MANAGEMENT SYSTEM

DMS implementation goals include improving data collection and storage, and assisting in the understanding and future reporting about groundwater conditions in the CMA. The SGMA GSP Regulations, Section 352.6., on Data Management Systems states:

> Each Agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin.
>
> Source: CA WAT Section 10733.2. Reference: CA WAT Sections 10727.2, 10728, 10728.2, and 10733.2.

Per these regulations, there are two main goals of the DMS, (1) to support the development of the GSP and (2) to provide a data framework for the continued monitoring of the CMA. The DMS will serve as the central repository of information during the development and implementation of the GSP.

2.1 Support of Hydrogeologic Conceptual Model Development

One of the first uses of the DMS is in supporting the development of the hydrogeologic conceptual model. The hydrogeologic conceptual model describes the regional geologic structural setting and current conditions of the CMA groundwater basin, as well as the components of water exchange throughout the hydrogeologic system.

The DMS contains information about the existing wells in the basin. For each of these wells, existing data have been or will soon be populated within the tables of the DMS, including groundwater level data, well construction information, well logs, geophysical data, pumping test data, water quality data, and pumping data. In addition, the DMS houses data related to land subsidence, surface water flows, and total water use in the CMA.

Use of the DMS will allow for rapid determination regarding which parameters currently have data gaps and/or uncertainty to aid in the preparation of the Data Gaps Analysis and the course of action required to acquire any additional data that are needed to support sustainable groundwater management. The Data Gaps Analysis is a required assessment of the monitoring network as part of the GSP and the 5-year assessment. It requires each GSP to identify any lack of information that significantly affects the understanding of basin setting or evaluation or of the efficacy of the GSP implementation.[1]

[1] Groundwater Sustainability Regulations 23 CCR Section354.38

2.2 Monitoring Network

The DMS is being used to store and access the CMA data, which will include the CMA Monitoring Network data. The Monitoring Network is a SGMA concept, which will consist of the groundwater monitoring, surface water monitoring, and other sites where data will be collected to evaluate if the basin is sustainable during the implementation phase of the project.

According to the SGMA, "sustainable management" means that none of the following six indicator criteria occur:

1. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon
2. Significant and unreasonable reduction of groundwater storage
3. Significant and unreasonable seawater intrusion
4. Significant and unreasonable degradation of water quality
5. Significant and unreasonable land subsidence
6. Depletion of interconnected surface water and groundwater that has significant and unreasonable adverse impacts on beneficial uses of the surface water

SGMA requires that the GSP identify how each sustainability indicator criteria will be quantified from measurements from the Monitoring Network. The GSP is required to include quantitative goals in terms of minimum thresholds and 5-year interim milestones for each sustainability indicator criteria and, during implementation phase, meet the identified minimum thresholds and interim milestones.

As part of ensuring reliability of results, SGMA identifies particular requirements for groundwater monitoring, surface water monitoring, and other sites to be included in the Monitoring Network. For some existing monitoring sites in SYRVGB, this includes additional criteria that must be met before the existing monitoring site can be used as part of the Monitoring Network for SGMA. Data collected from the CMA Monitoring Network will follow the GSP Regulations Best Management Practices, specifically *Monitoring Protocols, Standards, and Sites* (DWR 2016c), and *Monitoring Networks and Identification of Data Gaps* (DWR 2016b). Existing sites may be supplemented as needed to ensure each indicator criteria is sufficiently monitored.

The output from the DMS will be constructed for easy input into the DWR's GSP submittal tool, which will be used for SGMA monitoring report submittals.

3 SYSTEM ARCHITECTURE

The DMS system architecture is based upon the needs and requirements of the CMA. If during the development of the SGMA project, additional or different needs are identified, aspects of the architecture may be adjusted to satisfy these needs.

The plan for the DMS is that a user's primary mode of interaction will be to open and interact with a web application through a modern web browser. Several user levels and roles have been established with different access privileges, and some roles have limited administrative capacity.

3.1 Platforms

The DMS platform for the CMA will be a web application built on the Linux Apache MySQL PHP (LAMP) web stack, which is a mature open source platform, scalable to the needs of the CMA. The LAMP web stack consists of the following set of software:

- L Linux operating system, currently the DMS is on a Fedora Linux distribution
- A Apache webserver
- M MySQL-compatible database (database) server, currently the DMS is on a MariaDB installation
- P PHP scripting

In additional to the database server, a map server is also being run on the system to provide access to certain kinds of complex geospatial data. A map server is an intermediary program that takes the source geographic information system (GIS) data and provides it on demand in a format that client interface programs can access. Currently, this map server is the QGIS server program and the MapProxy cache program. Additional user notification is provided through an email service, currently through the Postfix program.

End user interaction with the DMS is through a web application, which interfaces with the LAMP stack with a standard web front end, using JavaScript, CSS, and HTML 5, which requires the user to have a modern web browser.

3.2 Scripts

In addition to the components of the DMS that react to the user input or push telemetry, the DMS as a system includes scheduled programming. Most of these scripts are written in Perl or Python. Scripting is for various automated items, which include automated pull requests to telemetry, automated quality control, automated user notification, and general automated application maintenance.

3.3 Data Location

The DMS is planned to be contained and stored within a single server, which will include the data and scripting as described in Section 3.4, Data Types. The DMS web application is designed to function without any external dependencies; however, some external third-party map data may be provided as links rather than mirrored within the system. Externally linked map data and layers are not controlled by the DMS and may become unavailable, which requires the user have an internet connection to access.

The DMS is currently located on a virtual private server (VPS) rented from a datacenter. VPS hosting is a fixed server with dedicated resources for a set price, unlike cloud hosting where resources are not fixed, and price is related to metered usage of resources. The VPS was selected for more predictable pricing. The current VPS provider for the CMA DMS is Host Winds.

Because the DMS data are contained within a single server, the DMS can easily be transferred to many other server configurations, maintaining flexibility for future requirements.

3.4 Data Types

There are a range of data types that are included as part of the DMS. To the extent possible, data will be inserted in the database; however, there is additional information that is not easily included in the database (e.g., technical reports, some well and surface site files, complex geospatial data).

3.4.1 Database

The primary use of the database will be to host indexed data that can contain the following types of data:

- **Time-Invariant Location Data** – This data is used for indexing and describing locations (e.g., wells and surface sites such as stream gages).
- **Time-Variant Data** (e.g., groundwater water levels, pumping data, or streamflow) – This data generally consists of a location index, a measurement time, a measurement type identifier, a value, and a value qualifier
- **General Information –** This information is used in the interpretation of the previously listed data types (e.g., U.S. Geological Survey [USGS] parameter code list, various set regulatory tables). Each well will have corresponding database fields containing the well identifier data, site information, construction details, and well screen information.
- **Basin Condition Document Metadata –** Metadata fields include publication data, author, alternative Digital Object Identifier (DOI) or URL web address, and geographic extents; not all documents will have all metadata fields. DOI is a persistent document identifier that is designed as fixed way to resolve a document through an intermediary

service that maintains a link to the active resource, unlike a URL, which is a direct link to where it is currently located.
- **Web Application Access Data** – This data includes web users, web user roles, and items such as the web user contact information, specific access-granted roles, and encrypted copies of web user passwords. Other data included here would be access logs which track usage of the web application, including web user, IP addresses, login times, and browser details.

The DMS database plan is to exclude stakeholder information used for communication and outreach.

3.4.2 Technical Report Format

A second set of data, which are indexed by the database but not contained within, are digital copies of published and unpublished documents regarding conditions within the basin. These are saved in the standard PDF. These will be provided and saved using unique identifiers, and the metadata will be stored in the database.

3.4.3 Well and Surface Site Data

Additional data types indexed by, but not contained, in the database include the following:

- Photographs of the wells and surface sites are expected to be stored outside of the database in JPEG format. Panoramic images, if they are included, are expected to have the included metadata (XMP format) set properly.
- Well completion reports are expected to be stored as PDFs. Most of the data interpreted from the well completion reports will be entered into the database tables. These may include, as part of the report package, pump test summaries and geophysical data (e.g., electrical logs and gamma ray logs).
- Interpreted well logs are expected to be stored as comma-separated value (CSV) files.

3.4.4 Geospatial Data

In addition to the geospatial data included in the database, there are other geospatial datasets that are included as part of the DMS. These include both vector and raster datasets, and a summary of these geospatial data types are as follows:

- Geographic vector datasets that that are relatively simple in terms of styling and small in terms of file size are generally saved in as GeoJSON format. This format is a structured version of the JSON (JavaScript Object Notation), a JavaScript data-interchange format, specifically for geospatial data. Additionally, the DMS may have programming (JavaScript) that adds interactivity based on the fields contained in the file.
- For large or complex vector datasets or raster datasets, the datasets are stored in the original format (e.g., Esri shapefile) and made accessible through the map server following

the Web Map Service protocol. When data are requested by the user, the map server renders the GIS format data into image tiles, which are then sent to the user.

- For some large or complex datasets, data may be pre-rendered and stored as a series of image tiles.

The selection of the method of storing and transmitting a geospatial dataset depends on the details of the dataset and needed output, as well as on constraints (e.g., available computing resources).

In addition to the key geospatial data that are hosted on the DMS server, the DMS may link to external geospatial data hosted by third parties. Currently, this linked external third-party geospatial data are primarily from federal and State of California servers, and include various aerial imagery, supplemental topographic data, and geological maps with copyright restrictions. Third-party data by nature are not controlled or managed by the DMS, so availability may be subject to change. The server currently provides a cache of some of these third-party data services to reduce the impact on these third-party services.

To protect confidentiality of data, access to the map server and other data requires an active login to the DMS website, which is not available to third parties.

3.5 Backup

The following two separate types of backup are used to ensure reliability of the DMS:

- **Cloud backup**, which includes automated nightly backup snapshot to a cloud storage system. This currently uses the restic program, which includes built-in encryption and authentication to protect data and ensure data integrity. Backup using this method occurs automatically, and backup snapshots in this system are removed automatically after 60 days.
- **Physical backup**, which are a transfer of a copy of the entire DMS to a dedicated physical hard drive located at a different and physically secured location. These backups are conducted on a periodic basis, currently once a quarter. The process currently has several manual steps in downloading and transferring copies of the files. Backup snapshots are expected to be available for years.

In addition to the whole DMS backup, portions of the programming code common to other DMS projects are entered into one of several distributed version control to track changes and quickly roll out patches and improvements. The centralized location of these files (i.e., the repositories) are currently on GitHub, a subsidiary of Microsoft. These repositories are utilized whenever changes are made to the common code base.

3.6 Intra-Basin Consistency/Formats

The SYRVGB was divided into three management areas for SGMA to address specific concerns and conditions unique to portions of the basin: the CMA, WMA, and EMA (Figure 1-1).

There are two consultant teams performing GSP activities in the SYRVGB. The two teams are working together to ensure intra-basin coordination to submit three GSPs, one for each Management Area.

Management Area	Physical Description	Committee Agencies
CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency	• Santa Ynez River alluvium east of the confluence with Santa Rosa Creek to just west of the City of Solvang • Buellton Upland	• City of Buellton • Santa Ynez River Water Conservation District • Santa Barbara County Water Agency
WMA Santa Ynez River Valley Groundwater Basin Western Management Area Groundwater Sustainability Agency	• Santa Ynez River alluvium west of the confluence with Santa Rosa Creek to the 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
EMA Santa Ynez River Valley Groundwater Basin Eastern Management Area Groundwater Sustainability Agency	• 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 CMA and WMA both have a similar management history and similar datasets from SYRWCD, so currently both CMA and WMA use the same database and general interface. Some specific data tables and data views are only relevant to a single management area. Data management plans for the WMA and EMA were prepared separately.

The EMA is being organized through a different consultant utilizing a separate and different system. Currently, the plan is to develop a common protocol to share data with the EMA.

The primary method of consistency between the three management areas of the SYRVGB will be to use a common dataset generated by third parties. The CMA and WMA team has provided the EMA team with source datasets from the USGS, County of Santa Barbara, and U.S. Bureau of Reclamation (USBR).

Where there are unique datasets generated in one or more of the management areas, the EMA consultant has agreed to work together to ensure that any unique data can be shared across the basin. If there are data to be shared on a regular basis, the EMA consultant and the CMA and WMA consultant team have agreed to work together to develop a common protocol for sharing data (e.g., an XML, JSON, or structured Excel file[2]) through which all three management areas can communicate.

[2] XML (Extensible Markup Language) is a markup language for making documents that are human and machine-readable, and can contain data structures. JSON is the JavaScript data-interchange format likewise can contain data structures. Excel file refers to the common Microsoft Excel document formats of the CSV, XLS (Excel 97-Excel 2003), XLSX (an XML-based format for 2007), which also can contain data structures.

4 DATA SOURCES AND QUALITY

The existing historical and current water resources monitoring and management programs within the CMA will be utilized and incorporated into the DMS as described in the following sections, including federal, state, and local programs.

4.1 Data Sources

4.1.1 Federal Data Sources

A key federal source of data will be the USGS, which includes historical groundwater elevations and surface water flows. Data are stored electronically in the National Water Information System files and are retrievable from the USGS Water Resources website. This dataset is reviewed by the USGS and available through well-formatted interfaces, called REST Application Programming Interfaces (APIs), which provide data in a structured XML format upon request. Included is location information, necessary measurement information[3] in addition to the measurement result, a description of the measurement being conducted, and the units of measurement. In addition, the CMA has numerous USGS hydrogeological studies, whose data will be incorporated in the CMA DMS.

Another federal dataset is from the USBR, which holds the water rights permits for the Cachuma Reservoir, located about 35 miles upstream of Lompoc. As part of the conditions of this permit, USBR collects monthly groundwater level data along the Santa Ynez River alluvium and within the Lompoc Plain.

4.1.2 State Data Sources

State of California sources of data include the DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) Program. DWR works cooperatively with local agencies (County of Santa Barbara), referred to as CASGEM "Monitoring Entities," to collect and maintain groundwater elevation data in a manner that is readily and widely available to the public through the CASGEM online reporting system.[4]

The state will be a source for well drilling information. DWR has compiled well completion reports for successful and unsuccessful groundwater wells and has made these available online with

[3] Additional metadata about the measurement. For water level data, this includes indicators that the measurement is impacted by recent or nearby pumping, estimated, etc. For water quality data, this may include method accuracy, as well as meaning of non-detect or other "zero" values.

[4] As of 2019, there are four CASGEM wells in SYRVGB: one in the CMA and three in the CMA. The County of Santa Barbara is the current source agency for collecting and sending to DWR the groundwater level data for both the CASGEM wells and CASGEM voluntary wells.

redacted personal information (per CA WAT Section 13752[2])[5]. These well completion reports describe aspects of the installed well and generally include driller well logs that describe the nature of the formations encountered while drilling. Because there are over 2,000 wells in the SYRVGB, data from wells determined to be "key wells" will be included in the DMS. These key wells are the wells which are most useful for assessing the basin. A key well has a known and accurate well location (geographically and vertically), depth of the well, availability and completeness of the lithological log, availability of geophysical logs, and proximity to other wells or key features. Not all wells will be designated as a "key well".

Additionally, information about petroleum and gas wells will be retrieved from the California Division of Oil, Gas, and Geothermal Resources (DOGGR) database. This dataset includes geophysical well logs, generally as an analog PDF rather than in the digital Log ASCII (LAS) format. Key wells in this dataset will be identified, and information such as geological horizons and other pertinent geologic data will be entered in the DMS.

These databases will be reviewed, and well sites with useful information will be incorporated into the CMA DMS. The State Water Resources Control Board's water rights database will also be queried for information to import into the CMA DMS (e.g., location information).

For water quality, two additional state databases will be utilized for the CMA DMS, including the State Water Resources Control Board Groundwater Ambient Monitoring and Assessment Program database and California Environmental Data Exchange Network (CEDEN).

For climate data, the California Irrigation Management Information System stations in the Santa Ynez River watershed will also be utilized in the CMA DMS. This data may also be used for the determination of water use in the basin.

4.1.3 County Data Sources

The Santa Barbara County Water Agency currently conducts precipitation monitoring and, as of Spring 2019, conducts annual groundwater level monitoring that was previously conducted by the USGS. Precipitation and groundwater data from the county will be included in the CMA DMS.

The Santa Barbara County Water Agency provided copies of their staff "field notebook," which documents the water level collection activities. The field documentation was originally developed by the USGS and includes various digital images, some of which are photos of wells, scans of water level documents such as owner contact information, site sketches, and other notes. As appropriate, these data will be incorporated into the DMS.

5 CA WAT Section 13752(b) "[...] the disclosure of a report [...] shall comply with the Information Practices Act of 1977 [...]"

The Santa Barbara County Department of Environmental Health Services has well records of wells that were drilled within the CMA. The data are organized by the Assessor's Parcel Number. These records are in hard copy form and are located at the Department of Environmental Health Services Santa Maria office. Many of the records were digitized as part of the data collection effort and are under review for possible inclusion in the DMS. Confidential or personal information will be redacted.

4.1.4 Municipal, Water District, and Other Data Sources

Data obtained from the CMA member agencies will be imported into the CMA DMS. This includes hydrogeologic data from the City of Buellton. In addition, available groundwater data from the SYRWCD will be obtained and imported into the CMA DMS. Data that are confidential will not be included in the CMA DMS.

SYRWCD records are expected to be the primary source of groundwater pumping data, as water users in the CMA and WMA have been required to report groundwater pumping on a bi-annual basis since start of the water supply reports in the 1979. The effort will be in digitizing many of these historical paper records.

4.2 Data Quality and Quality Control Plan

The SGMA GSP Regulations Section 354.44 (c) states that "Projects and management actions shall be supported by best available information and best available science." The above sources constitute the "best available information" for the CMA that is consistent with scientific and engineering professional standards of practice.

Data will be evaluated for validity and acceptable use for the GSP preparation. Data compilation and review will identify potential data gaps or unacceptable levels of uncertainty, which may facilitate focused discussions with the CMA GSA. When different sources of data have different values for the same parameter (i.e., well location or land surface elevation), a source and comments data field (column) will be associated with the current value.

Initially, all data will be collected and imported into the CMA DMS. Sites will be reviewed and screened in a three-tiered process for the purposes of potential inclusion in the CMA Monitoring Network. Sites in the Monitoring Network will be shared with the other two management areas:

Tier 1: Data Meets All Criteria for Inclusion in the GSP

Tier 1 data will be used in the future monitoring program for the CMA GSP. These data meet all the compliance criteria outlined in the SGMA regulations for inclusion in a SGMA Monitoring Network (i.e., SGMA GSP Regulations Section 352.4). Measurable objectives and minimum thresholds will be established as part of the evaluation of the SGMA sustainability indicators. Data will be field validated for inclusion in the CMA Monitoring Network.

Data evaluated as part of the Tier 1 review will be included in the DMS. This tier of data will be shared with the other management areas as part of intra-management area coordination agreement.

Tier 2: Meets Partial Criteria – May or May not be included in the GSP

Data that do not meet all the criteria for inclusion in the CMA GSP monitoring network may be useful in developing the hydrogeologic conceptual model. For example, if a well has a significant amount of historical water level data but lacks well casing or total depth information, or conversely, if a well has a lithological well log available but no historical water level data, these wells can still be used to develop the hydrogeologic conceptual model. Because SGMA GSP Regulations Section 352.4 (c) (3) states, "Well information used to develop the basin setting shall be maintained in the Agency's data management system," these additional wells are an important part of the CMA DMS.

Wells and surface sites that are identified in this tier of the process will be included in the DMS, but professional judgment will be used as to the relevance and usefulness of these data for the GSP. This tier of data may or may not be included as part of intra-management area coordination with the WMA and EMA.

Tier 3: Minimum Criteria – Not for Inclusion in the GSP

Data that do not meet the criteria for the CMA GSP (Tier 1) or have no useful information (Tier 2) will be included in Tier 3. As a default, this tier of data will be "turned off" (i.e., not visible) in the DMS but will be held in the DMS in case additional information is obtained in the future that would change the tier classification of the data. A low amount of effort will be employed on these sites, and wells as part of this layer will generally be excluded from intra-management area coordination with the WMA and EMA.

5 USER ACCESS

Users will primarily access the DMS through a web application; users will be assigned specific roles and given specific permissions to access the DMS. The web interface will require the user to access the DMS through a modern web browser; older browsers may provide less or no functionality.

5.1 Allowed Users

Development and use of the DMS is for the development and implementation of the GSP on behalf of the CMA GSA. It is intended that staff of the CMA GSA committee will have access to the DMS, as will the consultant team working for the CMA GSA committee.

Management Area	GSA Agencies
CMA Santa Ynez River Valley Groundwater Basin Central Management Area Groundwater Sustainability Agency	• City of Buellton • Santa Barbara County Water Agency • Santa Ynez River Water Conservation District
WMA Santa Ynez River Valley Groundwater Basin Western Management Area Groundwater Sustainability Agency	• City of Lompoc • Vandenberg Village CSD • Mission Hills CSD • Santa Barbara County Water Agency • Santa Ynez River Water Conservation District

5.1.1 Administrative Access

A selected staff member from one of the CMA GSA Agencies will have administrative access rights. Administrative access allows for adding, removing, and editing web user permissions, and the ability to upload and remove documents and data.

5.1.2 Staff and Other User Access

Identified staff from CMA member GSAs will have general access to view documents and data, including direct access to the map server. Documents and data may be restricted by management area or agency. Information that forms the eventual Monitoring Network to be submitted to DWR will be available to all staff. Other access may be granted as approved by the GSA Committee.

5.2 Login Procedures

Access to the DMS will be controlled through a username and password login system with a username having a specific defined role on the website; each role has specific defined privileges to access data or conduct limited administrative actions.

In most cases, the user's registered email can be used in lieu of the username. User information will be set to automatically populate the username and login information by default. To protect web user passwords if the DMS is ever compromised, web user passwords will be stored as encrypted hashes.

5.2.1 Account Recovery

The DMS includes automated retrieval of account access if username and/or passwords are forgotten. The application will email the web user to the email address on file, sending a recovery link that will allow the user to reset their password and regain access the DMS. This feature requires the web user to maintain control of their email account.

5.3 Queries

As described in Chapter 3, access through to the underlying MySQL-compatible database is mediated through the PHP programming.

DMS data in the database is generally accessed through two approaches: a well/site-specific approach or a data source approach.

5.3.1 Site-Specific Query

The site-specific approach has the user identify the data, well, or surface site of interest. The location of interest is selected by the user either through a map interface or through pages with a search and list features. Data are then provided about that well or surface site.

Well or site information may include well properties, images of the well or well log, geophysical logs, or time-series data (e.g., production, water level elevation, or depth to water) pulled from various databases.

This site-specific approach allows for additional insights to be provided to the user, such as the land surface at the site, well perforations, and relationship between water level depth and water level elevation at that well.

If public access is granted by the GSA committee, that access will be restricted to protect private or confidential information. Geospatial location information (e.g., particular well locations) may be truncated and/or randomized through this interface to de-identify personal or private information.

5.3.2 Data Source Approach

This approach has the user navigate to a page for each specific source of data. This includes groundwater level data and water quality, geophysical, well construction, surface water, and other data. The page consists of a map showing the sites the data were collected from, a list of sites, and the available data at each site. The user can select data either through the map or through the list, and can easily compare several sites for the given source. Using the interface, the user can compare one or more datasets to established thresholds, limits, or other criteria established by the GSA, state, or federal agency.

The way data will be viewed will be further developed as various datasets are incorporated into the DMS.

5.3.3 Mixed Graph Approach

This graphing feature allows pulling together two or more datasets that are not necessarily related by location or source of data. An example of this would be stream gage and depth to groundwater data, surface water and groundwater data, and water quality data. The DMS will include a search feature for identifying what datasets are available.

5.3.4 Library Search

The library currently provides several ways to search the metadata, including by title, year, and keywords.

5.4 Data Export

5.4.1 Water Data Export

All available graphs currently have a data export feature that exports the data queried in the graph to a Microsoft Excel file, in addition to providing download options into various image formats.

5.4.2 Library Metadata Export

The library functions include export features to a set of selected citation manager formats, including RIS, Microsoft Word XML, and BibTeX.

Citation management software is used in track works cited or used in the document and formatting to match specific bibliography and citation styles. Using citation management software is a best practice when writing for a publication, as various publications generally specify a bibliography and citation style such as the Chicago or MLA.

5.4.3 Library Document Download

Individual PDFs can be downloaded directly through the web interface. The DMS supports full pause and resume download functionality. The pause and resume feature on the server requires that the client software supports the HTTP range request, a feature that is available in all modern web browsers.[6]

5.5 Data Import

5.5.1 Library Data Import

Certain user roles allow editing of the library metadata, as well as uploading and deleting PDFs through the web user interface.

5.5.2 Water Data Import

Currently, the ability to import water data is limited to the DMS administrators. Some datasets that originate from third parties with published APIs (e.g., the USGS data through National Water Information System) may be automatically fetched and updated on a scheduled basis.

Additionally, if telemetry is deployed, the DMS may be configured to accept specific push requests, and DMS scripting can be configured for automated pull requests.

5.6 Annual Reports and Monitoring Network

SGMA Section 10728 on Annual Reporting by the GSA to DWR states:

> "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."

[6] Browser support for the HTTP Range request: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/Range#Browser_compatibility, accessed 2019-08-15.

The CMA DMS will be the primary tool used to compile these data each year for the annual report. The CMA DMS will contain the sites used in the CMA Monitoring Network (Section 2.2). The DMS is planned to automate the generation of the tables and figures for the annual report. The output from the DMS will be constructed to easily input to the DWR GSP submittal tool, which includes the process for the annual monitoring report submittal.

6 ADMINISTRATION

The DMS platform is built on top of a LAMP web stack, and depending on the administrative task, administration requires interaction with different portions of the stack, and different access levels. Some web user roles have limited ability to access or administer parts of the DMS platform; most administration tasks on the DMS will be conducted by the consultant team.

6.1 Security

Security covers several topics and concerns related to malicious actions such as damaging the system, intercepting information, denying access to the system, falsely spoofing the system, or using the system to cause damage to others. Since the DMS is expected to be connected to the internet, there are expected to be constant low-level attacks. A general defense-in-depth strategy has been employed.

6.1.1 Linux User Access Limitations

Currently the DMS firewall allows only specific whitelisted IP addresses to connect to the SFTP/SSH port (22) as the root user. This denies potential access to the thousands of daily attempted unauthorized logins.

General SFTP (port 22) user access can be granted to provide a secure way to share data. SFTP access spaces are in a chroot jail[7] and are denied shell access in order to limit the amount of potential damage from inappropriately disclosed usernames and passwords.

6.1.2 Database Access Limitations

Access to the database is not directly available to remote users through the standard MySQL port (3306) for direct login. All access must be from the local server (e.g., from PHP) or from a Linux user logged-in through an encrypted connection. This limits the potential for unencrypted data to be intercepted.

This is enforced at several levels. At the MySQL database level, all users are required to login from the localhost, additionally the server firewall blocks all incoming connections to that port.

6.1.3 Database Access User Levels

Access to the database is limited through a series of database users, each with specified user privileges allowing for certain actions on the database, as well as unique passwords. The DMS web interface communicates with the database using the least privileged user level in each instance.

[7] Term meaning setting an apparent root directory. Users and processes cannot identify files outside the root directory, and so this has the effect of disallowing access to any files outside of the specified directory tree, separately from any file permissions-based restrictions.

6.1.4 Software Database Protection

The DMS web interface has been programmed with an understanding of the potential for SQL injections. Strategies employed to limit this attack vector include input sanitation and parameterized SQL queries, as well as using connections with limited privileges.

6.1.5 Map server Access Limitations

The map server runs through the Apache web server, but access to the map server is intentionally limited so all access is from the local server (e.g., the PHP program). The primary reason for this limitation is to limit potential denial of service attacks against the DMS server, as the map server can be resource intensive.

In addition, the PHP program provides additional checks that the web user has logged in, as well as additional cache support enabling an overall faster experience for the web user.

6.1.6 Web User Password Protection

Strong passwords are encouraged for all web users of the DMS by providing examples of strong passwords and by providing calculation of the information density of the proposed password. User passwords are partially protected by a several second time out when incorrect passwords are entered, limiting the rate at which web passwords can be tested by a potential attacker.

As described in Section 5.2.1, an automated account recovery is provided. This automated recovery emails a recovery URL to the email address on file. This recovery URL is a random, time-sensitive, unique URL. This method of account recovery relies on the user securing and maintaining control of their associated email account.

6.2 Administration

Generally, administration of the database and DMS is to be primarily conducted by the CMA consultant team.

6.2.1 Web user Access and Roles

Web user roles and access privileges can generally be modified through the web interface, if the web user has been granted administrator role privileges. In addition to consultants, staff members from the lead agency (SYRWCD) are expected to have administrator privileges (Section 5.1.1). Otherwise, user privileges can be directly altered by modifying the database.

6.2.2 Database Administration

Currently, database administration requires a connection to the server (a Linux user login), as well as username and password for the database user with the required privileges for the administration task. A web user role with database administration through the web interface may be developed if needed.

6.2.3 Other Data Administration

Administration of the non-database data (e.g., well and surface site images, or GIS data) will be performed by the CMA consultant team. This requires modifying files in specific locations or modifying configuration files in the case of the map server.

These modifications require access to the primary Linux user. A web user role with a file manager administration through the web interface may be developed if needed.

6.2.4 Server Administration

Administration of the server (root access) will be performed by the CMA consultant team. Server administration requires the appropriate password and connection from a whitelisted IP address.

7 SUMMARY

This Data Management Plan describes both the proposed content and structure for the DMS that will meet the statutory requirements under SGMA. Data for the CMA will now be collected, reviewed, stored, and will be made available as described in this document; however, this plan will be amended based on ongoing needs of the CMA in developing the GSP.

The plan includes a discussion of the general architecture of the DMS, including aspects of the software to be used and strategies for incorporation of various types of data. As described, the DMS uses open source software for most of the architecture components. The plan identifies how all data types (e.g., GIS data and reports) will be handled in the DMS.

The plan discusses the expected sources of relevant data (e.g., federal, state, county, local, municipal) and how they will be collected for inclusion into the DMS. There is an identification of a tiered scheme for data collection and verification efforts, in order to focus efforts on higher impact data.

The plan also includes a general description of the web interface and access to the data stored within the system, and also outlines a process for exporting and importing various datasets into the system.

Finally, more details are provided with regards to various administration concerns, security steps taken to protect the system, as well as various ways in which administration of the system is planned.

The next step in the DMS process will be the continued population of the various datasets as outlined in this plan for the data compilation effort.

As the data compilation effort and population nears a completion, a technical memorandum will be produced to describe the data compilation effort as completed, including the data collected and sources. The technical memorandum will also provide updates and significant changes to the functions of the web based DMS.

8 REFERENCES CITED

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Chapter 1 – Introduction and Plan Area

Appendix 1e-B:

Draft Technical Memorandum
Phase I Data Compilation for the
Santa Ynez River Groundwater Basin Data Management System
(WMA and CMA),
Dated May 5, 2020

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DRAFT TECHNICAL MEMORANDUM

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TO:	GSA Agency Staff WMA Committee CMA Committee	DATE:	May 5, 2020
FROM:	Stetson Engineers	JOB NO:	2710/11 - Santa Ynez SGMA

RE: **DRAFT** Phase I Data Compilation for the Santa Ynez River Groundwater Basin Data Management System (WMA and CMA)

INTRODUCTION

This memorandum describes the first phase of data compilation collected and entered in to the data management system (DMS) developed for the Santa Ynez River Valley Groundwater Basin (SYRVGB) Western Management Area (WMA) and Central Management Area (CMA). This is a first step in developing and implementing a Sustainable Groundwater Management Act (SGMA) plan for these portions of the SYRVGB. It is anticipated that there will be additional phases of data that will be entered into the DMS. After each phase of data entry, this memorandum will be updated.

A description of the DMS was provided in the Data Management Plan (DMP), which included overall goals of the DMS, a description of the DMS platform, and how this addresses the needs of SGMA. This memorandum provides a snapshot view of data collected and entered into the DMS as of March 2020.

DATA COLLECTION GOALS

Different types of geologic and hydrogeologic data are required to prepare a Groundwater Sustainability Plan (GSP) that is compliant with the Sustainable Groundwater Management Act (SGMA) of 2014. Data from Federal, State and Local agencies as well as private well owners were collected with the goal to prepare parts of the GSP including:

1. Description of the basin, and basin characterization;
2. Development of the preliminary water budget for the basin
3. Preparation of the hydrogeological conceptual model.
   a. Development of three-dimensional (3-D) geological visualization tool."
4. Development of a groundwater flow model.
   a. Calibration of the groundwater model, to historical groundwater levels.
5. Evaluation of additional data needs or data gaps;
6. Data monitoring and recording relative to SGMA evaluation criteria and project and management goals.
   a. Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon.
   b. Significant and unreasonable reduction of groundwater storage.
   c. Significant and unreasonable seawater intrusion.
   d. Significant and unreasonable degradation of water quality.
   e. Significant and unreasonable land subsidence.
   f. Depletion of interconnected surface water and groundwater that has significant and unreasonable adverse impacts on beneficial uses of the surface water.

DMS UPDATES

The DMP was made Draft Final on February 18, 2020. There have been several updates and improvements to the DMS since the last revision of the DMP. These include the following added features:

- Direct connection to the map server for GIS desktop programs including ArcGIS and QGIS for authorized users was added to the DMS. Previously users were required to use a web browser to access data hosted through the map server.

- A new “entity at a glance” feature was added which summarizes information from a single agency or other entity associated with the GSAs.
- Modifications to email system for user notifications to improve email deliverability. This included additional DNS and other configurations to meet requirements of “anti-spam” filters and unique requirements such as the plain-text requirement for .mil email addresses.
- New feature that allows users to see how they’ve used the site, listing how many times they have logged over the last month, last six months, and all time.

SUMMARY OF DATA ON DMS

The focus of Phase I of data collection was geologic and hydrogeologic data which include direct measurements from agencies that monitor their respective groundwater systems. This data includes well locations, static groundwater level data, and groundwater pumping or production data. The following tables list data sets that were uploaded to the DMS.

GROUNDWATER LEVEL DATA

Type	Summary	Range	Sites	Records	Description
Monthly	City of Buellton	January 2003-March 2019	4	290	Static water level reads from the City of Buellton.
Monthly	City of Lompoc	March 1964-June 2008	10	3,504	Static water level reads from the City of Lompoc provided as part of the HCI model.
Monthly	USBR	October 1972-December 2019	58	38,556	Groundwater elevation data reported in the USBR Cachuma project monthly reports. Data was converted from NGVD29 to NAVD88, and includes source NGVD29 data.
Monthly	Vandenberg Village CSD	July 1959-October 2019	9	2,194	Static water level reads from Vandenberg Village CSD.
Semiannual	USGS NWIS	January 1940 - June 2019	2,150	76,712	Groundwater data available from the USGS NWIS (entire Santa Ynez Valley).
Semiannual	County of Santa Barbara Water Agency	March 2019 – October 2019	113	150	Groundwater elevation data provided by the County of Santa Barbara Water Agency. CASGEM data is a subset of this.

Groundwater Production Data

Type	Summary	Range	Sites	Records	Description
Daily	City of Buellton	August 2007-December 2017	4	12,300	Pumping records from the City of Buellton.
Monthly	City of Lompoc	March 2003-December 2013	11	4,456	Pumping records from the City of Lompoc provided as part of the HCI model and updates.
Daily	Vandenberg Village CSD	July 2005-June 2019	3	10,027	Daily pumping from Vandenberg Village CSD.
Monthly	DWR - Public Water System Statistics	January 1994-December 2018	9	1,368	Production records by public water system reported to DWR Water Use and Efficiency Branch.

Daily groundwater production data is generally provided through the DMS interface as monthly totals.

Groundwater Quality Data

Type	Summary	Range	Records	Description
Various	Waterboard GAMA	April 1911-October 2019	22,312	Selected water quality (TDS, Chloride, Sodium) from GeoTracker GAMA compilation. Includes areas in the EMA.

The above water quality data are in the database but are not available through the interface at this time.

Geospatial Data

Type	Summary	Presented	Description
Management Area	Project Extents	GeoJSON	Extents as posted to California Department of Water Resources. Based on Buellton 118 Update 2018 basin boundaries.
SYRWCD Annual Report	Groundwater Divisions	GeoJSON	Extents of key groundwater basins as reported in the 41st Santa Ynez Annual Report.
SYRWCD Annual Report	Wells	GeoJSON	Locations of wells as reported in the 41st Santa Ynez Annual Report.
Committee	SYRWCD	GeoJSON	Extents of SYRWCD developed from the county surveyor in 2012.
Committee	Lompoc	GeoJSON	Extents of City of Lompoc.
Committee	Vandenberg Village CSD	GeoJSON	Extents of Vandenberg Village CSD.
Committee	Mission Hills CSD	GeoJSON	Extents of Mission Hills CSD.
Committee	Buellton	GeoJSON	Extents of City of Buellton.
Committee	Solvang	GeoJSON	Extents of City of Solvang.
Committee	ID#1	GeoJSON	Extents of Improvement District No. 1.

Type	Summary	Presented	Description
General Location	Streets	Map Server (vector)	Roads for the County of Santa Barbara. Data was included with the County of Santa Barbara Parcel Data received in June 2019.
General Location	Railroads	Map Server (vector)	Railroad lines of the US sourced from the 2018 TIGER/Line, a product of the US Census Bureau.
Topography	Topographic Contours (USGS)	Map Server (vector)	USGS 1:24,000 scale contours for 1 Degree Quadrangles of Santa Maria West, and Santa Maria East. Sourced from the USGS from 7.5-minute contour maps.
Topography	Digital Elevation Model	Map Server (raster, rendered as hillshade)	Combined from three sources: 1) 1m sourced from NED, covering the entire CMA, and the WMA (except portions of Burton Mesa). Survey from 2018-2019. 2) 5m sourced from NOAA, covering the entire CMA and WMA. Source date in 2002. 3) 10m Digital Elevation Model (DEM) at 1/3 Arc-Second Resolution, downloaded from USGS National Map. Regional coverage of the 1 Degree Quadrangles of Santa Maria West, and Santa Maria East. Source date in 2008.
Surface Water	Watersheds / Hydrologic Units	GeoJSON	The Watershed Boundary Dataset (WBD) is a seamless, national hydrologic unit (HU) dataset developed by the USGS. Longer hydrologic unit codes (HUC) indicated a smaller watershed area. These are the HUC8 "Subbasin," HUC10 "Watershed," and HUC12 "Subwatershed." Sourced from the USGS.
Surface Water	Hydrography	Map Server (vector)	The National Hydrography Dataset (NHD) represents the water drainage network of the United States with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and streamgages. Sourced from the USGS.
Survey Information	Estimated Township/Ranges, Sections	Map Server (vector)	California Department of Water Resources Section fill. Township / Range dissolve. Sourced from Well Completion Report Map Application, downloaded in 2019. Note, "official" BLM Cadastral Survey Program does not include Mexican Land Grants, which are majority of the WMA and CMA.
Survey Information	Mexican Land Grants	GeoJSON	Territory granted as part the Mexican Rancho system.
Survey Information	County of Santa Barbara	Map Server (vector)	Parcels extents as provided by the County of Santa Barbara as of June 2019.
Reference	Vandenberg AFB	GeoJSON	Extents of Vandenberg AFB developed from the County of Santa Barbara parcel data, as received in June 2019.

In addition, to the above listed geospatial datasets, the DMS database includes specific site location information in the well table, surface water table, and USGS location table which are used to index the data tables such as water levels, water production, and water quality.

Geologic Model Geospatial Data

Development of the hydrogeologic conceptual model included the review and compilation of production and monitoring well logs, and lithological logs from a variety of sources including

Department of Water Resources (DWR) and the County of Santa Barbara Department of Environmental Health Services (EHS). The locations of available wells and boreholes were uploaded to the DMS. Wells and well logs were selected to be uploaded based on a twofold approach to evaluate the usefulness of each log as follows:

1. Identify and download available well logs for the basin from DWR. DWR organizes well logs by sections. Locations of deeper wells were identified, based upon information from the logs, and the lithology was determined. There are 497 "deeper" wells identified in the basin. The data from these wells are stored in a specific GIS layer specific to the deeper DWR wells.

2. Identify and download available well logs for the basin from the Santa Barbara County Environmental Health Services (EHS). EHS organizes well logs by parcel number. Wells for the CMA and WMA parcels were selected from the EHS files for the entire County. To limit the potential for duplicates, only parcels without a DWR well log were reviewed. There are 334 wells stored in a specific GIS layer specific to the EHS wells

LINKED GEOSPATIAL DATA

In addition to the geospatial data that are hosted on the DMS server, the DMS links to external geospatial data hosted by third parties. Third-party data by nature are not controlled or managed by the DMS, so availability may be subject to change. Data may be temporarily cached on the SYWATER server.

Type	Summary	Presented	Description
Geologic Map	Geologic map mosaic.	Cache	Mosaic of geological maps provided by the USGS National Geological Map Database (NGMDB).
Crop Map	Crop Classification.	Cache	DWR provided crop classification and land use for the 2016 main season agricultural season.
Hillshade	USGS Hillshade	Link	Supplied by the USGS "The National Map." Hill shade features only.
Hillshade	Color Hillshade	Link	Supplied by Stamen Design. Hill shading using quasi-natural vegetation colors.

Type	Summary	Presented	Description
Orthoimagery	NAIP 2012	Cache	NAIP[1] images from 2012 sourced from California Department of Fish and Wildlife images. Most recent complete imagery for the basin: More recent NAIP from 2014, 2016, and 2018 do not include portions of the WMA related to Vandenberg AFB.
Orthoimagery	NAIP 2018	Cache	Natural color imagery sourced from California Department of Fish and Wildlife images from 2018. Does not include portions of the WMA related to Vandenberg AFB.
Orthoimagery Color Infrared	NAIP 2018 CIR	Cache	Color infrared sourced from California Department of Fish and Wildlife images from 2018. Color infrared is used to identify vegetation. Does not include portions of the WMA related to Vandenberg AFB.
Orthoimagery	NAIP 2010	Link	Sourced from California Department of Fish and Wildlife images from 2010.
Orthoimagery	NAIP 2009	Link	Sourced from California Department of Fish and Wildlife images from 2009.
Orthoimagery	NAIP 2005	Link	Sourced from California Department of Fish and Wildlife images from 2005.
Topography Map	USGS Topography	Link	Supplied by the USGS "The National Map." Combined map showing roads, topographic contours, hill shade, and other map features.
Road Map	Open Street Map	Link	Supplied by Open Street Map. Community based mapping project.

LIBRARY OF REPORTS

The consultant team reviewed available documents from a variety of sources including local agencies, state, federal and local entities. As of January 23, 2020 there are 184 report entries related to the Santa Ynez groundwater basin. Documents were sourced from the following list of report repositories.

- Stetson Engineers physical and electronic libraries.
    - Including all Santa Ynez River Water Conservation District Annual Engineering and Survey Reports
- Santa Ynez River Water Conservation District physical and electronic libraries.
- Other documents as provided by the GSA Committee Agencies.

[1] National Agriculture Imagery Program (NAIP) are captured by the US Department of Agriculture (USDA). It consists of periodically acquired imagery at one-meter resolution, with an accuracy of six meters of ground control points. In most cases only natural color imagery is used and provided.

Natural color imagery means the color as presented matches the electromagnetic spectrum that was recorded, so the result image approximates what would be observed by a human observer. This is opposite of pseudo-color such as color infrared where the recorded data for some range of electromagnetic spectrum is mapped to each of the red, green, and blue color channels

- Reference documents gathered by Tim Durbin in development of historical City of Lompoc groundwater model and model update.
- USGS online publications warehouse, and map locations.
- DWR libraries
  - Urban Water Management Plans
  - DWR Bulletins
- General Plans
- County of Santa Barbara Reports (Groundwater Reports)

Future Data Phases

It is anticipated that there will be the additional future updates as additional data is provided and processed.

Additional Agency Data

GSA member agencies may provide additional data including pumping and water levels. The Santa Ynez River Water Conservation District is digitizing historical groundwater pumping data from its paper archive files once compiled, this data will be uploaded to the DMS.
GSA member agencies may provide additional water quality data. The current water quality data from the Waterboard GeoTracker GAMA is a compilation of water quality from Federal and state of California sources, which includes data that all public water agencies submit to the State. Once compiled the additional water-quality data will be uploaded to the DMS.

Data used to develop the water budget (not including groundwater data) will be uploaded to the DMS. This includes USGS gaged surface flows, Santa Barbara County precipitation data, and a summary of imported water by the Central Coast Water Authority.

Completed Groundwater Model and Water Budget

Developing the groundwater model and water budget may result in the identification of additional data sources which could be used in other components of the GSP. These additional data will be reviewed for potential inclusion in the DMS.

In addition some components of the model or model outputs as may also be uploaded to the DMS. Examples could include the 3D visualization model and numeric groundwater model output, which may include modeled water levels for selected time periods.

ONGOING FIELD WORK AND DATA COLLECTION

Data collected from field efforts will be reviewed and incorporated into the DMS as appropriate. Anticipated field work includes a surveying effort to verify measuring point elevation and special location accuracy. These survey data are required to meet SGMA standards and will be used for tracking land subsidence, water quality sampling, and future monitoring well installation projects. There will also be an Aerial Electro-Magnetic (AEM) survey of the CMA and WMA, which will inform and update the Hydrogeologic Model of those areas. Data from the AEM survey will be uploaded to the DMS.

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Chapter 2 – Basin Setting

Appendix 2a-A:

Geosyntec Consultants Draft Technical Memorandum, Regional Geology and 3D Geologic Model for the Santa Ynez River Valley Groundwater Basin, Dated May 12, 2020

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TO:	Stetson Engineers
SUBJECT:	DRAFT Technical Memorandum Regional Geology and 3D Geologic Model for the Santa Ynez River Valley Groundwater Basin
PREPARED BY:	Eryn Torres, Senior Professional Maygan Cline, Senior Geologist Mark Grivetti, Senior Principal Hydrogeologist
DATE:	May 12, 2020

1. INTRODUCTION

This technical memorandum is prepared as part of the hydrogeologic conceptual model (HCM) for the Western and Central Management Areas (WMA and CMA, respectively) Groundwater Sustainability Agencies[1] (GSAs) within the larger Santa Ynez River Valley Groundwater Basin (SYRVGB). This technical memorandum focuses on the geologic units within the SYRVGB, and the subsurface geologic model built to visualize those units. The aquifer characteristics of these units are then considered in a separate study which correlates principal aquifers within the basin. This technical memo describes the modeled geologic units and existing literature that identifies the water-bearing tendency of each unit but does not include an in-depth principal aquifer analysis or discussion.

The HCM is the conceptual understanding of the physical characteristics related to the regional hydrology, land use, geologic units and structures, groundwater quality, principal groundwater aquifers, and principle aquitards of the WMA and CMA portions of the SYRVGB (basin). Understanding the regional geologic setting and structural configuration is integral to conducting subsequent technical studies of the basin, including presence, absence and correlation of principal aquifers, identification of an appropriate monitoring network, numerical groundwater modeling, and identification of projects and management actions in accordance with the Sustainable Groundwater Management Act (SGMA).

A detailed subsurface three-dimensional model of the geologic units and structures (model) that comprise the basin was developed from publicly available published reports and data sources from the WMA and CMA GSAs. The model is intended for use as a visualization tool to communicate the regional geologic setting to the WMA and CMA GSAs, as well as the public, in accordance with SGMA. Additionally, the model will be used in concert with the Water Budget and the Data Management System to identify potential data gaps within the basin where additional data

[1] This technical memorandum does not include the Eastern Management Area (EMA) GSA within the SYRVGB. The EMA GSA is supported by a different consulting team.

collection may be warranted. Furthermore, model elements may be exported to support subsequent technical studies conducted in the basin for incorporation into a SGMA compliant Groundwater Sustainability Plan (GSP), due to the California Department of Water Resources (DWR) in January of 2022.

The remainder of this technical memorandum describes the geologic data and methodology used to build the model, including quality control methods implemented at the boundary of the CMA and EMA, for alignment with the model built by the EMA consultant team. Representative cross-sections and maps included as figures in this technical memorandum are derived from the model.

1.1 REGIONAL GEOLOGIC SETTING

The regional geology for the basin has been previously described in various publicly available reports. The previous reports contain comprehensive studies and descriptions of the geological formations in and surrounding the WMA and CMA, herein referred to as the basin, when describing the regional geology. The basin is located within the Transverse Range geomorphic province of California (Figure 1), which is characterized by east-west striking, complexly folded and faulted bedrock formations. The basin is an east-west trending, linear, irregular structural depression between rugged mountain ranges and hills within the Transverse Range in Santa Barbara County, CA. The basin is bounded by the Purisima Hills on the northwest, the San Rafael Mountains on the northeast, the Santa Ynez Mountains on the south, and the Pacific Ocean on the west. Primary structural features of the basin include large anticline-syncline pairs. These large folds are evident in the rocks and deposits in the lowland between the folded and faulted Santa Ynez Mountains on the south and the faulted San Rafael Mountains on the north (Upson and Thomasson, 1951). Regional geology is included in a plan view on Figure 2.

Geologic Formations Within the Basin

The geologic formations that comprise the water-bearing aquifers are defined as those with sufficient permeability, storage potential, and groundwater quality to store and convey groundwater. The geologic formations present in the basin are described below under "Geologic Formations." Further discussion of the water bearing characteristics of the aquifers is provided under "Aquifers." Stratigraphic representation of geologic formations included in the model are included in Figures 3 and 4.

Soils

Although not strictly a geologic formation, soils found in the study area are important in that they blanket most of the area, support vegetation, and provide varying degrees of infiltration depending on their characteristics. Soil typically vary with respect to the underlying geologic material. Soils underlain by consolidated deposits tend to be clayey loams, whereas soils underlain by unconsolidated deposits are typically sandy loams (Hydrologic Consultants, Inc., 1997 and references therein). Ultimately, both soils have formed from similar parent material, as the unconsolidated deposits are sourced from the erosion, transport and deposition of the underlying and surrounding consolidated deposits (i.e., shales and sandstones) that comprise the surrounding mountains and hills (Upson and Thomasson, 1951; Hydrologic Consultants, Inc., 1997).

River Channel Deposits (Qg)

Qg occurs within the modern-day Santa Ynez River channel and consists of fine-to-coarse sand, gravels, and thin discontinuous lenses of clay and silt (Upson and Thomasson, 1951; Wilson, 1959; Miller, 1976; Bright et al., 1992). The grain size typically decreases along the river's reach, fining towards the ocean (Upson and Thomasson, 1951). The Qg unit thickness ranges from 30-feet (ft) to 40-ft, with observations of localized deposits up to 70-ft thickness 6 miles west of the City of Buellton along the Santa Ynez River, however, these deposits are largely indistinguishable from the underlying alluvium (Upson and Thomasson, 1951). The Qg in the geologic model is interpreted using the Dibblee geologic map and from borehole data and is generally thought to be hydraulically connected to the Qa, described below.

Alluvium (fluvial-Qa)

Qa is composed of a coarse sand upper member and a fine sand lower member which have been previously described by others (Dibblee, 1950; Upson and Thomasson, 1951; Wilson, 1959; Miller, 1976; Bright et al., 1992). For the purposes of the geologic model described in Section 1.2 below, these units are not differentiated, and the alluvium was modeled as a single lithologic unit. Qa is composed of unconsolidated, normally graded gravel and medium-to-very coarse sand, which grades upwards into fine to coarse sand with rare gravels, then fines vertically upwards into fine sand, silt and clay (Upson and Thomasson, 1951; Wilson, 1959; Miller, 1976; Bright et al., 1992; Fugro Consultants, INC., 2014). The thickness of Qa varies from approximately 30 to 90-ft in the Buellton Subarea (Upson and Wilson, 1951) to approximately 170-ft to 200-ft in the Lompoc plain (Dibblee, 1950; Upson and Thomasson, 1951; Evenson and Miller, 1963; Miller, 1976; Bright et al., 1992). In sloped areas and drainages, the thickness of Qa varies from less than 10-ft to 50-ft (Fugro Consultants, INC., 2014). Qa is the principal source of groundwater in the Lompoc plain (Dibblee, 1950; Upson and Thomasson, 1951; Evenson and Miller, 1963; Miller, 1976; Berenbrock, 1988; Bright et al., 1992).

Terrace Deposits / Older Alluvium (fluvial-Qoa)

Qoa typically consists of unconsolidated to poorly consolidated sands and gravels with common silt and clay zones (Dibblee, 1950; Upson and Thomasson, 1951; Miller, 1976; Berenbrock, 1988; Bright et al., 1992). Qoa thickness varies from 0-50-ft (Bright et al., 1992), up to 150-ft (Upson and Thomasson, 1951; Miller, 1976; Berenbrock, 1988). Qoa underlies alluvium (Qa) in most of the southern Lompoc plain and caps hilltops, benches and upland areas of the Santa Ynez River and major tributaries (Upson and Thomasson, 1951; Miller, 1976; Berenbrock, 1988; Bright et al., 1992).

Orcutt Sand (eolian / nonmarine- Qo)

Qo consists of unconsolidated, well sorted, coarse to medium sand and clayey sand with scattered pebbles and gravel stringers (Upson and Thomasson, 1951; Bright et al., 1992). The top of the formation is locally indurated in Lompoc Valley and Burton Mesa by iron oxides, whereas the basal portion contains well-rounded pebbles of quartzite, igneous rocks, and Monterey chert and shale (Dibblee, 1950). Qo thickness varies from 0-300-ft (Upson and Thomasson, 1951; Evenson and Miller, 1963; Bright et al., 1992).

Paso Robles Formation (Alluvial fans- QTp)

QTp consists of poorly consolidated to unconsolidated, poorly sorted, gravels, sands, silts and clays (Dibblee, 1950; Upson and Thomasson, 1951; Wilson, 1959; Miller, 1976; Berenbrock, 1988; Bright et al., 1992; Yates, 2010). QTp varies in thickness from 2,800-ft in the Santa Ynez subarea (Upson and Thomasson, 1951) 6.5 miles west of the San Lucas Bridge, to 700-ft in Santa Rita Valley (Dibblee, 1950; Miller, 1976) and thins westward where it pinches out in the eastern Lompoc plain (Dibblee, 1950; Upson and Thomasson, 1951; Miller, 1976).

QTp yields water to wells throughout the study area (Upson and Thomasson, 1951; Miller, 1976; Berenbrock, 1988; Bright et al.,1992) and is the principal water bearing unit in the basin near lake Cachuma and in the Santa Ynez uplands (Yates 2010).

Careaga Sand (marine-Tca undifferentiated)

Tca yields water and consists of massive, fine-to-coarse sand, with lenses of gravels and fossil shells (Dibblee, 1950; Woodring and Bramlette, 1950; Upson and Thomasson, 1951; Wilson, 1959; Evenson and Miller, 1963; Miller, 1976). Clay and silt beds are characteristically absent, and the uniformity in grain-size and presence of seashells distinguish it from the overlying QTp (Dibblee, 1950; Upson and Thomasson, 1951). Tca is often differentiated into the upper coarse sand *Graciosa Member (*Tcag) and the lower, fine sand *Cebada Member* (Tcac), which have been described in literature (Dibblee, 1950; Woodring and Bramlette, 1950; Upson and Thomasson, 1951; Evenson and Miller, 1963; Miller, 1976; Berenbrock, 1988; Bright et al., 1992). Tca thickness can vary from 450-ft to1000-ft (Upson and Thomasson, 1951), but is typically observed between 500-ft to 800-ft thickness in the Lompoc area, surrounding Lompoc hills, and in the Buellton area (Dibblee, 1950; Evenson and Miller, 1963; Miller, 1976). The Careaga Formation has been previously identified as an important aquifer within the SYRVGB (Hoffman, 2018).

<u>Aquifers</u>

Comprehensive studies of the water-bearing aquifers in the basin have been developed and published in numerous reports that are listed in the Geologic Data Sources section of this memorandum. The aquifers are typically categorized into two categories: Santa Ynez River floodplain alluvium and upland deposits formations (referred to in the Lompoc Area as an Upper Aquifer and Lower Aquifer) and are described in detail below.

Santa Ynez River Floodplain Alluvium – Upper Aquifer

In the Lompoc Plain, the Santa Ynez River floodplain alluvium is referred to as the Upper Aquifer, which consists of Qg, and Qa. It has been divided into 3 parts (Bright *et al.*, 1997) identified as the shallow, middle and main zones, described below.

The Shallow Zone has an average thickness of 50-ft. It is composed of river channel deposits (30-ft to 40-ft thick) and shallow upper alluvium deposits.

The Middle Zone is composed of the lower portion of the upper alluvium (moderately permeable sand and gravel lenses interbedded with deposits of fine sand, silt, and clay). The interbedded fine sand, silt, and clay deposits confine or partly confine the sand and gravel lenses in the western, central, and northeastern plains. The thickness of sand and gravel lenses range from 5-ft to 40-ft.

The Main Zone is located within the lower member of alluvium and consists of medium to coarse sand and gravel, separated from the upper aquifer zones by lenses of silt and clay. The Main Zone overlays the unconsolidated deposits that form the Lower Aquifer in the Lompoc plain. In the eastern and northwestern regions of the Lompoc plain, the silt and clay layers are less continuous or absent. As a result, groundwater moves freely between the zones of the Upper Aquifer. In the southern plain, the sand and gravel deposits in the main zone are absent. The fine sand deposits of the shallow and middle zones are also less continuous or absent (Upson and Thomasson, 1951).

Upstream of the Lompoc Plain, the Santa Ynez River floodplain alluvium is often referred to just as the river alluvium (no zonation). The thickness of the river alluvium generally averages up to 70-ft (Upson and Thomasson, 1951). Because this unit overlies consolidated deposits that are non-water bearing (see Section 1.1.2), the subflow in this unit is considered a part of the Santa Ynez River flow and is regulated by the State Water Resources Control Board as part of surface water rights.

Upland Deposits Formations – Lower Aquifer

In the Lompoc area, the upland deposits formations are referred to collectively as the "Lower Aquifer" and consist of undifferentiated Terrace Deposits/Older Alluvium (Qoa), Orcutt Sand (Qo) and the Careaga Sand (Tca). These deposits are present beneath the Lompoc uplands, the Upper Aquifer through the eastern portion of the Lompoc plain, and Lompoc terrace.

The Paso Robles Formation (QTp) forms the Lower Aquifer beneath the Lompoc uplands and east river area of Lompoc plain. The Graciosa and Cebada Members of the Careaga Sand (Tca) are present beneath the Lompoc upland and most of the Lompoc plain. However, the Graciosa Member generally is absent or unsaturated. Where present, the Graciosa Member of the Careaga Sand (Tca) is the main producer of ground water in the Lower Aquifer.

These same formations (Qoa, Qo, QTp, and Tca) also make up the aquifers in the Santa Rita Upland and Buellton Upland.

Geologic Formations Surrounding the Basin

Additional Tertiary-Mesozoic age typically non-water-bearing bedrock units are present within and surrounding the basin. These units are important because they contribute to the geologic structure (Figure 5) of the basin and define the limits of the water-bearing aquifer units by limiting groundwater flow due to limited or non-permeability, reduced or no storage capacity, or poor groundwater quality. These constraining bedrock units within and surrounding the basin are included in the geologic model described in Section 1.2 and are described below.

Tertiary-Mesozoic Rocks

Tertiary-Mesozoic Rocks are consolidated non-water bearing units, all of marine origin. They consist of the near-shore marine *Foxen, Sisquoc,* and *Monterey Formations*. The Foxen Formation consists of light gray or tan massive claystone, siltstone, and/or mudstone (Dibblee, 1950; Woodring and Bramlette, 1950; Upson and Thomasson, 1951). The Sisquoc Formation is massive to very thin bedded, white diatomite and diatomaceous mudstones, with basal massive fine sands (Dibblee, 1950; Woodring and Bramlette, 1950; Upson and Thomasson, 1951). The Monterey Formation, primarily known for its vast oil reserves, consists of variably bedded siliceous shale, diatomaceous mudstone, porcelaneous shale, chert, phosphatic shale, silty shale, limestone, and a basal clay altered tuff (Dibblee, 1950; Woodring and Bramlette, 1950; Upson and Thomasson, 1951).

2. GEOLOGICAL MODEL

2.1 MODEL USE AND INTENT

The detailed subsurface three-dimensional model was developed as a visualization and communication tool to convey the regional geologic setting and confining features of the basin to WMA and CMA GSAs, and the public, in accordance with SGMA. Additionally, the model will be used in concert with the Water Budget and the DMS to identify potential data gaps within the basin where additional data collection may be warranted. Furthermore, model elements may be exported to support subsequent technical studies conducted in the basin for incorporation into a SGMA compliant Groundwater Sustainability Plan (GSP), due to the California Department of Water Resources (DWR) in January of 2022.

2.2 MODELING APPROACH

Modeling Software

The software used for the model is Seequent's Leapfrog Works (Leapfrog), an industry-standard geologic modeling software, designed to view and manage surface and subsurface data, build complex geologic models, visualize hydrogeological systems, understand the impact of water use, and provide jurisdictional authorities with tools to convey complex topics to the general public (Seequent, 2020).

Model Domain

The geologic model domain boundaries (model extent) were selected to encompass the entirety of the WMA and CMA, and slightly overlapping the EMA to the east. Ground surface elevations were defined using a combination of publicly available digital elevation models (DEM). Next, quantitative measurements for geologic units exposed at the ground surface were imported using existing literature and publicly available geologic maps. Contacts between those geologic units (surface between two different rock types) were defined as erosional or depositional, as the designation augments the model assumptions and subsurface interpolations. Once the contacts were defined, the volume between those contacts were filled according to the depositional environment, age of the geologic unit, and localized structure to form a complete geologic model. The data used to interpolate and interpret the geologic surfaces generated in 3D are described in detail in Section 1.2.3. Leapfrog's interpolation algorithm and manual manipulation according to professional judgement were used to adjust surfaces, as appropriate. Structural elements were also incorporated from existing literature and publicly available geologic maps. The generated result is a detailed subsurface geometric rendering of the geologic contacts presented in the attached cross-sections.

Data Quality

Data quality objectives include verification of alignment with existing literature and available geologic maps; and coordination with the EMA GSA and consultant team to review and confirm alignment between the modeled CMA/EMA boundary (boundary). To facilitate model alignment at the boundary, data review, modeling approach discussion and data sharing was conducted. The consultant teams for the CMA and EMA provided boundary data packages for review. Each consultant team reviewed the data received, organized and validated the data, then incorporated the data into their model to assess modeled boundary alignment. Geologic formations from locations were reviewed in both models, confirming assumptions across the boundary.

2.3 GEOLOGIC DATA SOURCES

Various publicly available data were sourced for compilation and assessment prior to incorporation into the model, described in detail below.

Borehole Data

Publicly available well bore and well completion information was obtained from the California Department of Water Resources (DWR) online inventory, the Santa Barbara County Public Health (CPH) historical paper well records, the Santa Ynez River Water Conservation District, and from the California Department of Oil and Gas and Geothermal Resources (CA DOGGR) open file report (USGS, 2010).

The DWR online database consists of redacted well completion reports of varying quality, and map locations of varying accuracy. Available well completion reports within the study area were obtained from the DWR online database using the DWR Well Completion Report Map Application and incorporated into a secure relational database for the purpose of building the model. Once the data were compiled, assessed and validated for their intended use, they were incorporated into the DMS prepared for the basin. The available well records are accompanied by a longitude and latitude provided by DWR; however, many records are simplified, and locations are centered in their respective township and range quadrant, within approximately one square miles of their actual location. Well locations were updated manually in GIS software using assessor parcel numbers (APN), hand-drawn maps, addresses, and other location information available in the well records.

Available historical County EHS well records were obtained in paper format, the files were digitized, and pertinent data was extracted. Well records were evaluated for useful information and incorporated as appropriate into the model.

Additional stratigraphic interpretations from 694 Oil and Gas wells were collected in digital format from the (USGS, 2010). The well information was sourced from the CA DOGGR records. These wells were originally interpreted to model the Santa Maria Basin and provide depositional trends and structural evolution of the basin.

In total, 916 well records were used from the study area there to build the model, including 349 DWR, 396 CPH, and 171 CA DOGGR well records. Of the total well records used, 518 well records are within the WMA and 221 are within the CMA. The geologic formations were transcribed from the DWR and CPH well logs for import to the geological model while interpretations from CA DOGGR were imported as interpreted.

<u>Surface Topography</u>

DEMs were used to provide a best estimate for ground surface elevation across the model domain. The primary DEM is based on USGS's recently released regional FEMA LiDAR surveys related to 2018 post-fire surveys. This DEM was collected at 1-meter accuracy and represents a bare earth surface with trees and features removed. USGS standard 1-meter DEMs are produced exclusively from high resolution light detection and ranging (LiDAR). In areas where a 1-meter accuracy DEM is not available a 1/3 arc-second equivalent (approximately 10-meter accuracy) used instead.

All DEMs were sourced from the National Map (TNM) via the USGS.

- *U.S. Geological Survey, 20190930, USGS NED one-meter x75y384 CA SoCal Wildfires B4 2018 IMG 2019: U.S. Geological Survey.*
- *U.S. Geological Survey, 20190924, USGS 13 arc-second n35w121 1 x 1 degree: U.S. Geological Survey. Sources for Descriptions of Geological Formations*

<u>Surface Geology</u>

i The model is composed of publicly available geologic data from the Unites States Geological Survey (USGS). Interpreted surface geology was publicly accessed via the

USGS Mapview database tool. Surface geology is comprised from the following USGS Quadrangles:

- *CMA: Solvang and Gaviota Quadrangle, Zaca Creek Quadrangle, Santa Rosa Hills and Sacate Quadrangle, and Los Alamos Quadrangle.*
- *WMA: Lompoc Hills and Point Conception Quadrangle, Point Arguello and Tranquillon Mountain Quadrangle, and Lompoc and Surf Quadrangle.*

Subsurface geology was partially interpolated using surface contacts of geologic units, as well as structural data (dip and dip azimuth) present in each quadrangle. Subsurface geology was extrapolated from a combination of surface contacts and structural data points from the geologic quadrangle using Leapfrog software.

The major formations shown in Figure 2 are described in Section 1.1 and included in the attached stratigraphic columns (Figures 3 and 4).

<u>Descriptions of Geological Formations</u>

There have been numerous investigations of geological formations of the basin by others in the past, some of which date back to the 1940s. Some of the more comprehensive reports for this area include the following:

- *Geology of Southwestern Santa Barbara County, California: Point Arguello, Lompoc, Point Conception, Los Olivos, and Gaviota Quadrangles* (Dibblee, 1950)
- *Geology and Ground-Water Features of Point Arguello Naval Missile Facility Santa Barbara County California* (Evenson and Miller, 1963)
- *Geology and Paleontology of The Santa Maria District California. USGS 222* (Woodring and Bramlette, 1950)
- *Evaluation of Ground-Water Flow and Solute Transport in the Lompoc Area, Santa Barbara County, California* (Bright *et al.*, 1997)
- *Preliminary Report on Water Storage Capacity of Unconsolidated Deposits Beneath Lompoc plain* (Upson, 1943)
- *Geology and Water Resources of the Santa Ynez River Basin, Santa Barbara County, California: Water-Supply Paper 1107* (Upson and Thomasson, 1951)
- *Ground-Water Hydrology and Quality in The Lompoc Area, Santa Barbara County, California, 1987-88: U.S. Geological Survey Water-Resources Investigations Report 91-4172* (Bright *et al.*, 1992)
- *Ground-Water Appraisal of Santa Ynez River Basin, Santa Barbara County, California: U.S. Geological Survey Water-Supply Paper 1467* (Wilson, 1959)

- *Development of A System of Models for The Lompoc Ground-Water Basin and Santa Ynez River* (Hydrologic Consultants, Inc., 1997)
- *Ground-Water Resources in The Lompoc Area, Santa Barbara County, California* (Miller, 1976)
- *Phase I Services, Preliminary Geotechnical Engineering Study, East Cat Canyon Oil Field, Sisquoc Area, Santa Barbara County, California* (Fugro Consultants, Inc., 2014)
- *Assessment of Groundwater Availability on the Santa Ynez Chumash Reservation* (Yates, 2010)
- *Digital tabulation of stratigraphic data from oil and gas wells in the Santa Maria Basin and surrounding areas, central California coast: U.S. Geological Survey Open-File Report 2010–1129* (USGS, 2010)

<u>Cross Sections from Previous Reports</u>

An important and useful resource to build the model was the large number of existing geologic information and cross sections from previous studies and reports conducted in the basin. The selected reports include the following:

- *Geology of Southwestern Santa Barbara County, California: Point Arguello, Lompoc, Point Conception, Los Olivos, and Gaviota Quadrangles* (Dibblee, 1950)
- *Geology and Water Resources of the Santa Ynez River Basin, Santa Barbara County, California: Water-Supply Paper 1107* (Upson and Thomasson, 1951)
- *Ground-Water Appraisal of Santa Ynez River Basin, Santa Barbara County, California: U.S. Geological Survey Water-Supply Paper 1467* (Wilson, 1959)
- *Ground-Water Hydrology and Quality in The Lompoc Area, Santa Barbara County, California, 1987-88: U.S. Geological Survey Water-Resources Investigations Report 91-4172* (Bright *et al*., 1992)
- *Geologic Map of The Zaca Creek Quadrangle, Santa Barbara County, California* (Dibblee, 1993)
- *Geologic Map of The Los Alamos Quadrangle, Santa Barbara County, California* (Dibblee, 1993)
- *Evaluation of Ground-Water Flow and Solute Transport in the Lompoc Area, Santa Barbara County, California: Water-Resources Investigations Report 97-4056* (Bright *et al*., 1997)
- *Development of A System of Models for The Lompoc Ground-Water Basin and Santa Ynez River* (Hydrologic Consultants, Inc., 1997)

- *Geophysical and Geotechnical Study Sewer Force Main Crossing, Santa Ynez River, Solvang, California* (Fugro West, Inc., 2007)

A total of 58 cross-sections from previous reports were digitized and imported into the model for visualization. The locations for the 58 cross-sections are included on Figure 6. The imported cross-sections were assessed for their agreement with model elements and used to validate the modeled surfaces, thicknesses and presence within the basin.

3. MODEL VISUALIZATIONS

Views from the model are presented as **Figures 2, 5**, and **6**. An aerial view of the outcropping geologic units and basin boundaries is presented as **Figure 2**. Generalized stratigraphic columns are presented as **Figures 3** and **4**. Cross-section views of the basin are presented in **Figure 5**. **Figure 6** provides an aerial view of modeled data, including well locations, cross-sections and geologic formations.

Figure 1: Site Location Map. Identifies basin location and geomorphic province information.

Figure 2: Geological Map and GSA Boundaries. Figure 2 presents an aerial view of the outcropping geologic units and basin boundaries. Areas of interest include Lompoc Terrace, Lompoc Plain, and Lompoc Upland and are included for reference purposes. The cross sections A-A’ through G-G’ are also shown on the figure.

Figures 3 and 4: Stratigraphic Columns (Shallow and Deep). These figures provide schematic stratigraphic columns with depths and short descriptions of each geologic formation.

- The shallow stratigraphic columns provide detailed descriptions for shallow formations **in the** WMA and CMA areas to the depth of the Tca (approximately 1,300 ft below ground surface).
- The deep column presents formation approximations from the surface to the Tm (approximately 9,000 ft below ground surface).

Figures 5: Geologic Cross Sections.

- **Cross-section A-A’** extends from west-to-east along the Santa Ynez River through the Lompoc Plane and intersects with Cross sections B-B’ and C-C’. In this area consolidated formations form a westward plunging syncline which propagates through the WMA.
- **B-B’** is located on the west side of the WMA with a south-to-north orientation similar to sections C-C’ through G-G’. Consolidated formations form a repeated syncline/anticline fold system that extends to the north of the model.
- **C-C’** extends through the middle of the WMA through the Lompoc Plain and Lompoc Upland and continue the syncline/anticline fold structure observed in cross section B-B’.
- **D-D’** is located near the northern boundary between the WMA and CMA and displays a similar fold structure to cross section B-B’ and cross section C-C’.

- **E-E'** extends across the Santa Ynez River at the southeast boundary between the WMA and CMA. The southern limb of the central syncline is observed at the northern end of cross section E-E' along the north side of the Santa Ynez River. The middle and north portions of the section are mainly composed of consolidated rocks.
- **F-F'** transects through the CMA, south of Los Alamos. The central syncline continues through southeast of the model with the southern limb of the central syncline of consolidated rocks below the Santa Ynez River.
- **G-G'** is location on the east side of CMA which extends across the Santa Ynez River, through the City of Buellton and up through the Zaca Creek bed. Similar to cross section
- **F-F'**, the southern limb of the central syncline is located in the south below the Santa Ynez River and the northern anticline repeating in the north below Zaca Creek.

Figure 6: Available Data. Presents spatial distribution of available data resources incorporated into the model and potential data gaps, as described in additional detail below.

4. DATA GAPS

The model results will be used in concert with the Water Budget, the DMS and future additional technical studies conducted by others to identify potential data gaps within the basin and where additional data collection may be warranted. Data gaps may include lack of groundwater wells in portions of the basin, absence of ground surface elevation or groundwater measurement elevation for existing wells, inconsistent groundwater elevation measurements for a given well, long well screens that span multiple groundwater aquifers – providing insufficient or unreliable data, well screens that penetrate the river alluvium and do not represent principal aquifers, and other similar data gaps. Identification of data gaps within the model, paired with data gaps identified in other technical studies will be compiled and will inform recommendations for additional data gathering, as appropriate.

As presented on **Figure 6**, available data incorporated into the geologic model includes 58 cross sections from existing literature and previously published reports, and data from 1,439 unique well borehole locations. Cross-sections presented on **Figure 6** generally fit one of the three following categories:

- <u>Lompoc Plain:</u> the majority of available historical cross sections transect the Lompoc Plain along the Santa Ynez River (west-to-east) or crossing the river (south-to-north), within and the WMA.
- <u>Long cross-sections</u>: these transect the WMA (five) and CMA (two) from the Santa Ynez Mountains in the south, toward the San Antonio Creek Groundwater Basin in the north.
- <u>Short cross-sections</u>: transect the Santa Ynez River in the WMA (four) and CMA (three).

Although historical cross-sections are unavailable for the WMA/CMA boundary and are limited at the CMA/EMA boundary, well borehole data in those areas suggest that the model may sufficiently interpolate available borehole data, and data gaps in these two areas may not exist.

Well borehole data from the publicly available resources used in the model (i.e., well records from DWR, CPH, DOGGR, existing literature, and previously published reports) are distributed across most areas of the basin, with the following exceptions:

- An approximate 5.4 square mile (mi^2) area along the northern boundary of the CMA, northwest of the City of Buellton; and
- An approximate 26 mi^2 area within the Vandenberg Air Force Base, located in the northwest portion of the WMA, north of the Lompoc Upland and along the Pacific coastline.

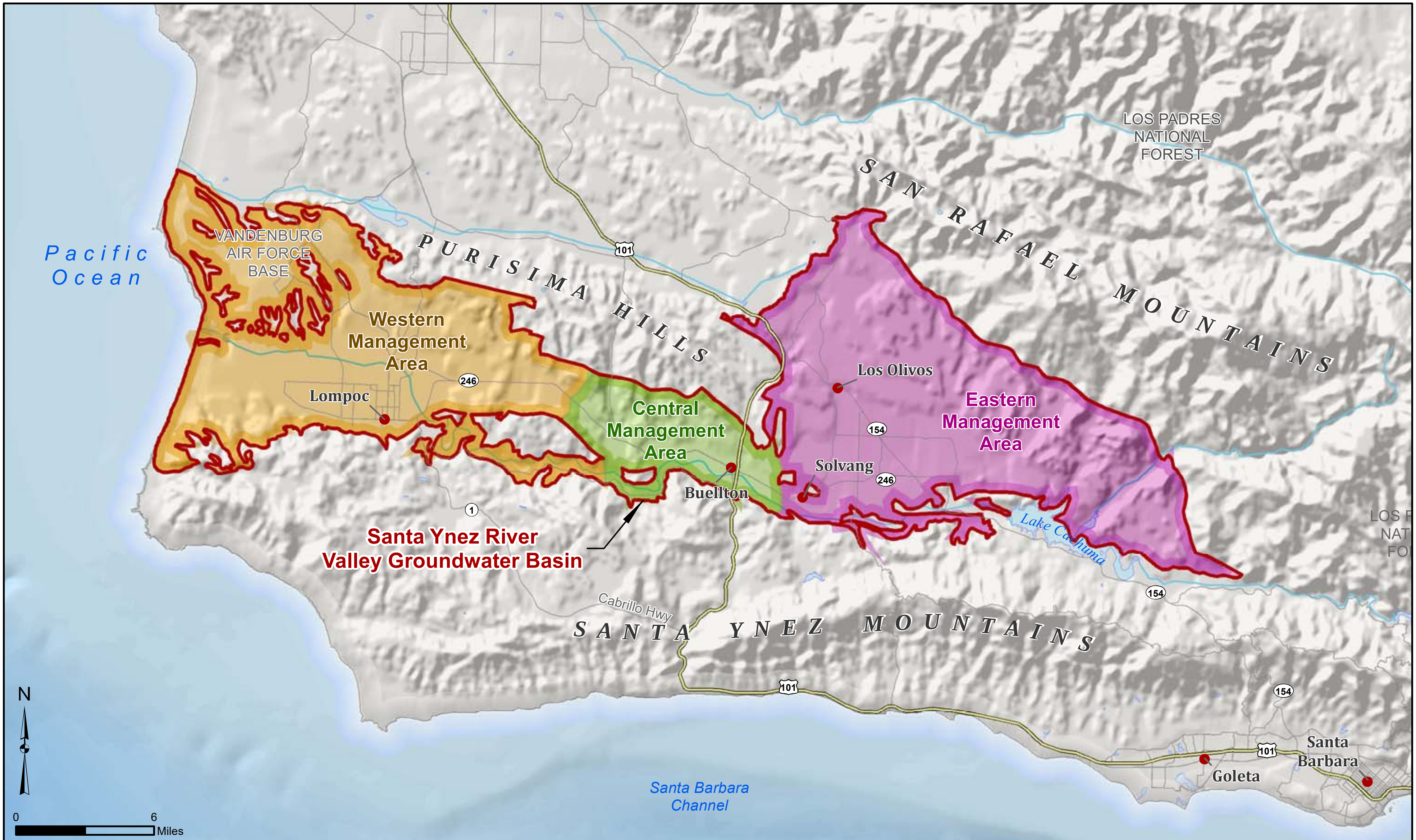
Historical borehole data for these two areas was not obtained from the publicly available resources searched and therefore, the lack of well borehole data in these areas may be considered a data gap. However, subsequent technical studies may determine that these areas are not necessarily vital to understanding and managing the groundwater flow regime of the SYRVGB, and additional data collection (advancement of well boring, or installation or well(s)) may not be necessary or recommended in these areas.

Additional data collected by the DWR endorsed SkyTEM program will be useful in validating and refining the geological structure of the WMA and CMA in the model. SkyTEM uses the Aerial Electromagnetic method (AEM) to obtain large scale geophysical data, useful for interpreting geology and the presence/absence of groundwater. The collected SkyTEM geologic data may be useful to refine modeled extent of geologic units to a depth of approximately 1,000 to 1,400 feet below the ground surface within the SYRVGW. The existing well borehole and cross-section data incorporated into the model and presented in this technical memorandum will be used to verify and interpret the SkyTEM survey results. The SkyTEM data may also be used to enhance subsequent technical studies, including numerical groundwater modeling to estimate the SYRVGB system, particularly the areas with data gaps (**Figure 6**), groundwater flow along the boundaries of the management areas, and along the Santa Ynez River and tributaries.

* * * * * *

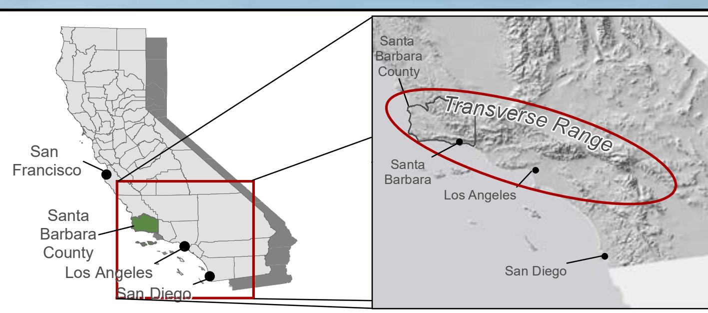
<u>Attachments</u>

Figure 1	Site Location Map
Figure 2	Geologic Map and GSA Boundaries
Figure 3	Shallow Stratigraphic Columns of Santa Ynez River Valley
Figure 4	Deep Stratigraphic Column of Santa Ynez River Valley
Figure 5	Geologic Cross Sections A-A’ through G-G’
Figure 6	Available Data Incorporated into Geologic Model



Explanation

- Santa Ynez River Valley Groundwater Basin
- Central Management Area
- Eastern Managment Area
- Western Management Area



Site Location Map

Santa Barbara County
California

Geosyntec consultants

Santa Barbara	April 2020

Figure 1

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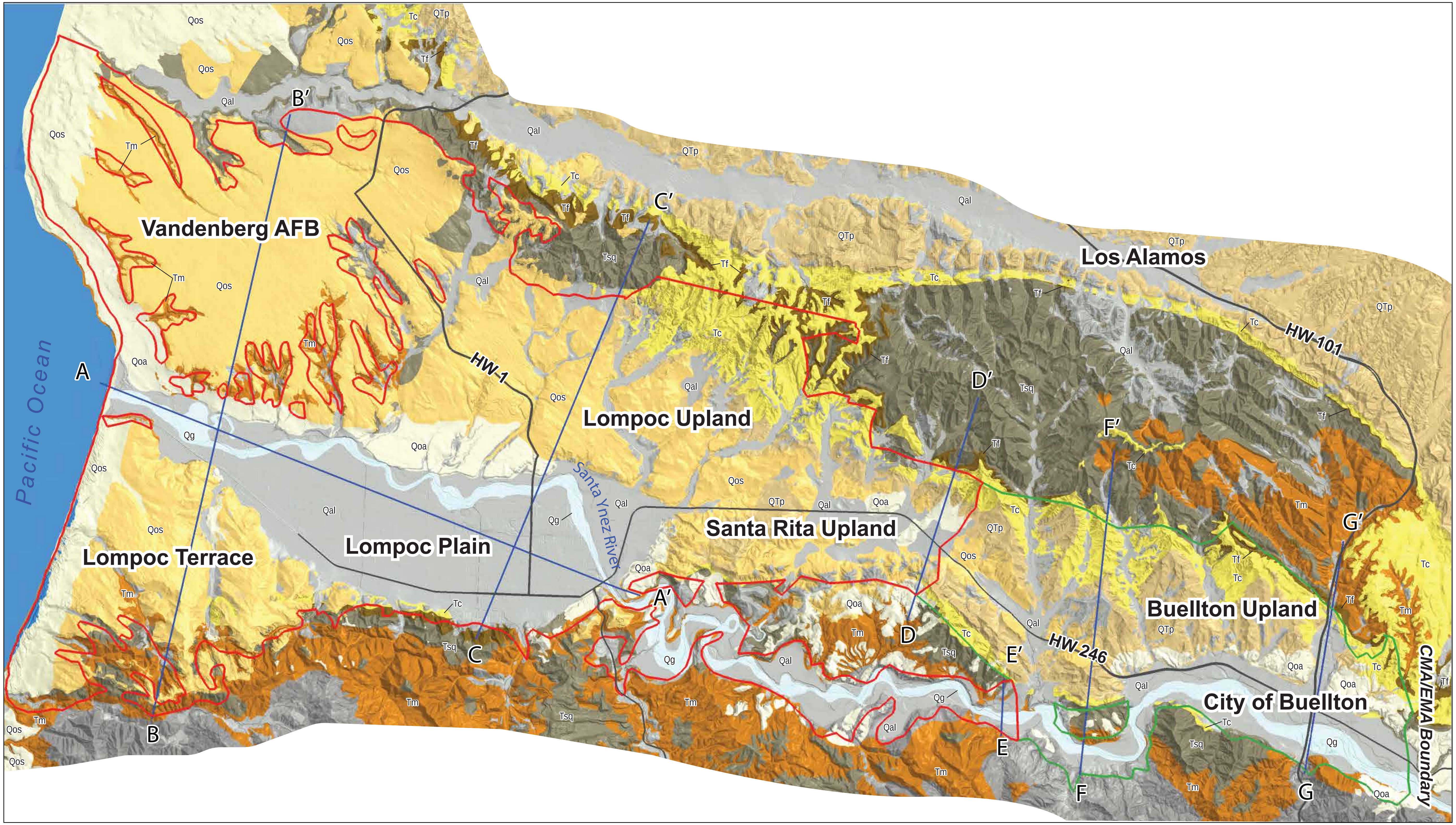


Legend

Cross Section Location

Western Management Area

Central Management Area

Model Geology

River-Channel Deposits (Qg)

Younger Alluvium (Qal)

Older Dune Sands (Qos)

Older Alluvium (Qoa)

Orcutt Sand (Qo)

Paso Robles Formation (QTp)

Careaga Sandstone (Tca)

Foxen Formation (Tf)

Sisquoc Formation (Tsq)

Monterey Formation (Tm)

Tertiary - Older than Monterey

N

0 10,000 20,000 Feet

Geologic Map and Boundaries

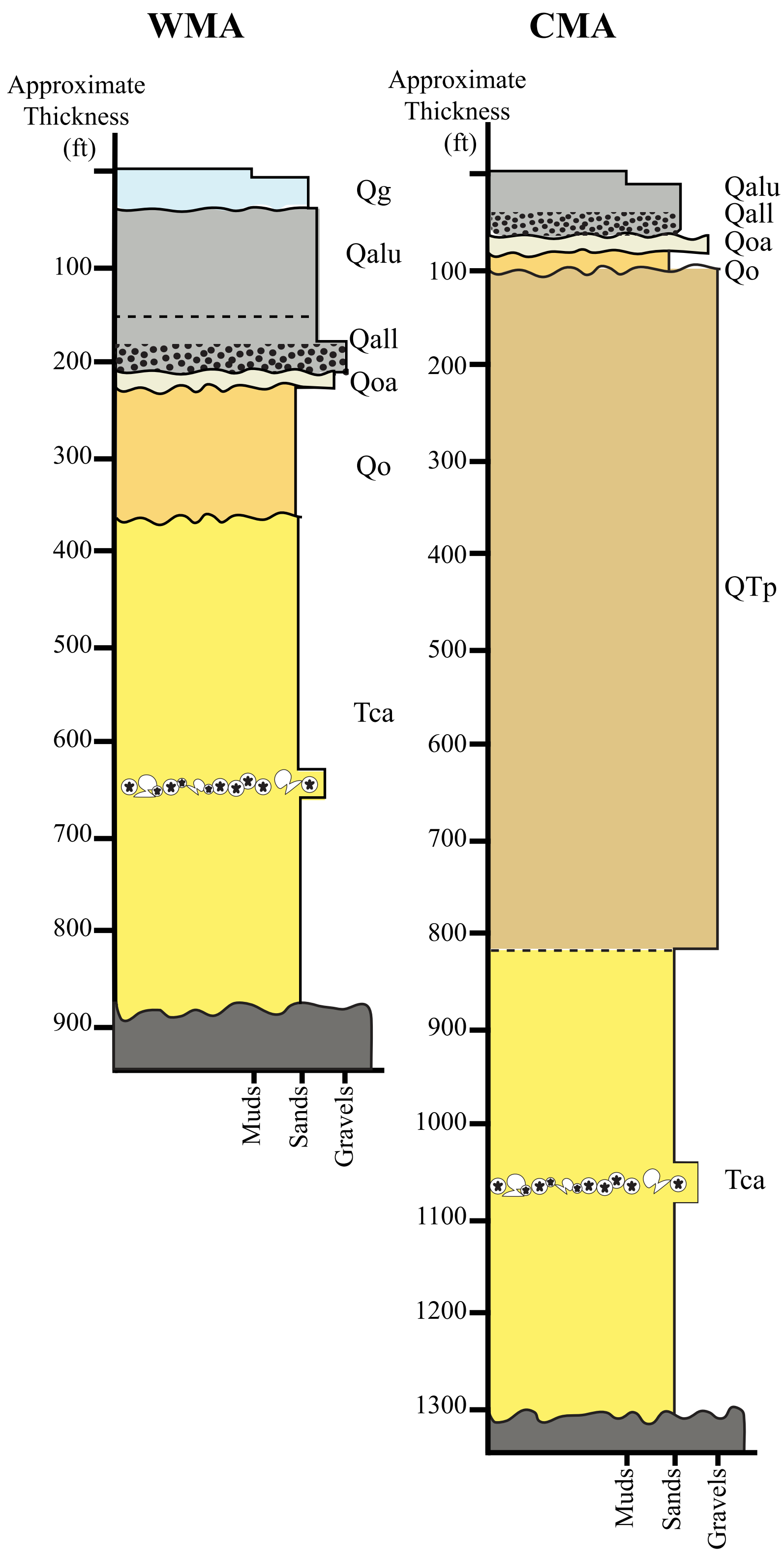
Santa Ynez River Valley
Santa Barbara County, CA

Geosyntec consultants

Santa Barbara | April 2020

Figure

2



Formation Descriptions

River Gravels (Qg):
Coarse to fine sand, gravel and thin lenses of clay and silt; occurs in the modern channel of Santa Ynez River.

Young Alluvium (Qal):
Unconsolidated sands, gravels, silts and clays.
Upper Member (Qalu): Clay, silt and fine-grained sand and gravel stringers.
Lower Member (Qall): Cobbles, gravels, and medium to coarse grained sand. Cobbles/gravels concentrated at base.

Older Alluvium (Qoa):
Unconsolidated gravels, sand, and silt.

Orcutt Sands (Qo):
Unconsolidated, well sorted coarse to medium-grained sand and clayey sand with scattered pebbles/gravel stringers.

Paso Robles Formation: (QTp):
Weakly consolidated lenticular beds of clay, fine to coarse-grained sand, and gravels.

Careaga Sandstone (Tca):
Weakly indurated, massive, fine to coarse-grained sand, with local lenses of pebbles and seashells.

Legend

Qg
Qal
Qoa
Qo
QTp
Tca
Gravel Bed
Seashells
Undifferentiated Tertiary Rocks
Unconformity

Geosyntec consultants

Shallow Stratigraphic Columns of Santa Ynez River Valley

Date:	April 2020	File No.:	
Project No.:	SB0959	Figure:	3

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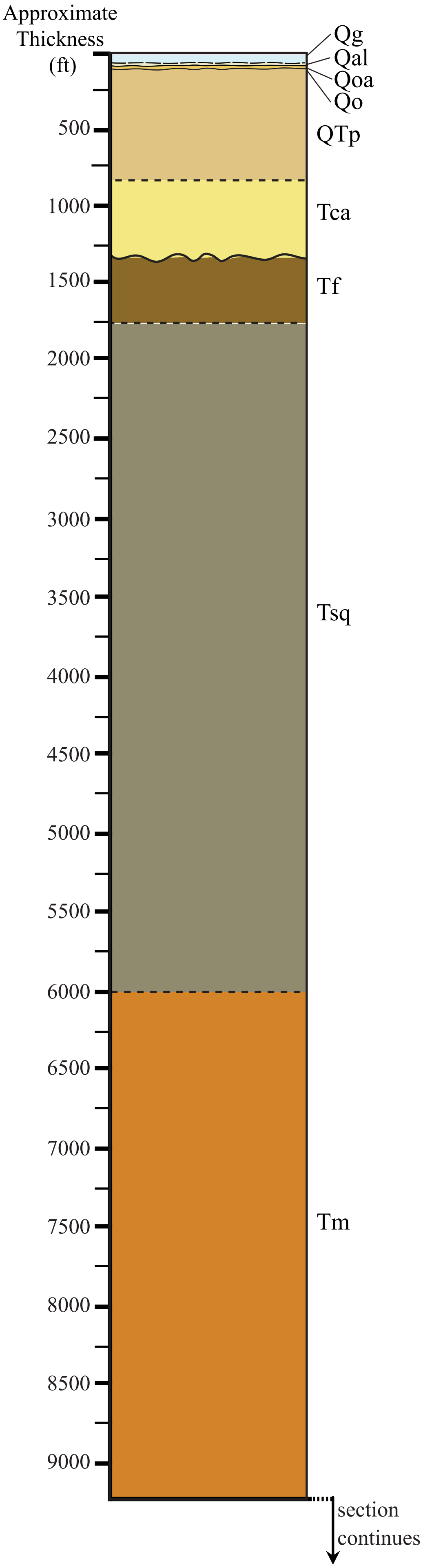


Formation Descriptions

River-Channel Deposits (Qg):
Coarse to fine sand, gravel and thin lenses of clay and silt; occurs in the modern channel of Santa Ynez River.

Younger Alluvium (Qal):
Unconsolidated sands, gravels, silts and clays.

Older Alluvium (Qoa):
Unconsolidated gravels, sand and silt.

Orcutt Sand (Qo):
Unconsolidated, well sorted, coarse to medium grained sand and clayey sand with scattered pebbles/gravel stringers.

Paso Robles Formation (QTp):
Weakly consolidated lenticular beds of clay, fine to coarse-grained sand, and gravels.

Careaga Sandstone (Tca):
Weakly indurated, massive, fine to coarse-grained sand, with local lenses of pebbles and seashells.

Foxen Formation (Tf):
Massive claystone/ siltstone/ mudstone.

Sisquoc Formation (Tsq):
Massive to very thin bedded, diatomaceous mudstone.

Monterey Formation (Tm):
Very well bedded siliceous shale, chert and diatomite.

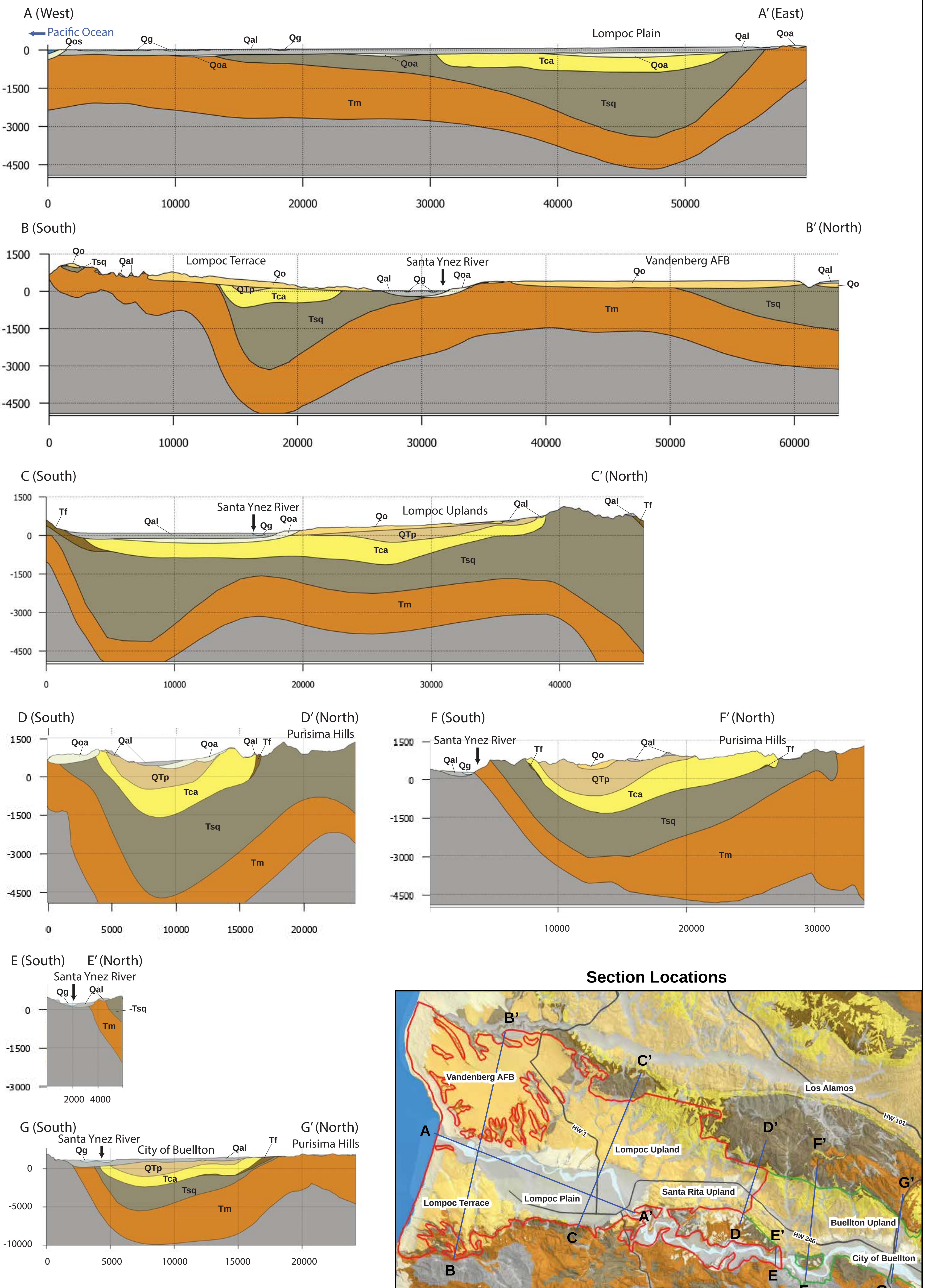
Legend

Qg
Qal
Qoa
Qo
QTp
Tca
Tf
Tsq
Tm
Unconformity

Geosyntec consultants

Deep Stratigraphic Column of Santa Ynez River Valley

Date: April 2020	File No.:
Project No.: SB0959	Figure: 4



Geologic Model

River-Channel Deposits (Qg)	Orcutt Sand (Qo)	Sisquoc Formation (Tsq)
Younger Alluvium (Qal)	Paso Robles Formation (QTp)	Monterey Formation (Tm)
Older Dune Sands (Qos)	Careaga Sandstone (Tca)	Tertiary - Older than Monterey
Older Alluvium (Qoa)	Foxen Formation (Tf)	

Notes:
All images displayed at 2x vertical exaggeration
All units in Feet

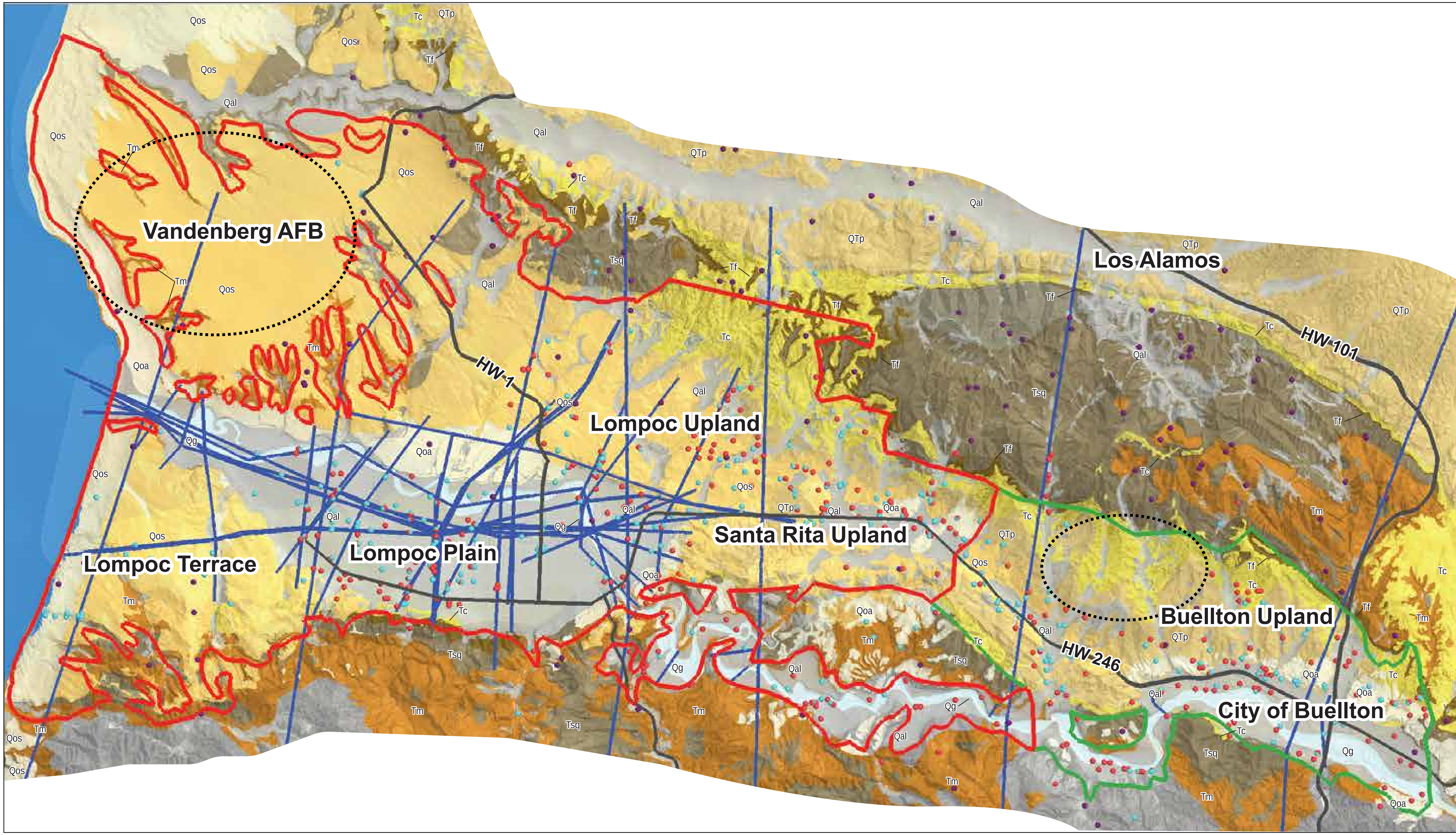
Geologic Cross Sections
A-A' through G-G'

Santa Ynez River Valley
Santa Barbara County, CA

Geosyntec consultants

Santa Barbara | April 2020

Figure
5



Legend

- DWR Log Location
- CPH Log Location
- OFR Log Location
- Cross Section from Previous Report
- Major Roadway
- Western Management Area
- Central Management Area

Model Geology

- River-Channel Deposits (Qg)
- Younger Alluvium (Qal)
- Older Dune Sands (Qos)
- Older Alluvium (Qoa)
- Orcutt Sand (Qo)
- Paso Robles Formation (QTp)
- Careaga Sandstone (Tca)
- Foxen Formation (Tf)
- Sisquoc Formation (Tsq)
- Monterey Formation (Tm)
- Tertiary - Older than Monterey
- Data Gap Regions

N

0 10,000 20,000 Feet

Available Data Incorporated Into Geologic Model

Santa Ynez River Valley
Santa Barbara County, CA

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Figure 6

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Chapter 2 – Basin Setting

Appendix 2b-A:

Dudek Land Subsidence Technical Memorandum 11736, Dated December 2020

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LAND SUBSIDENCE
TECHNICAL MEMORANDUM

To:	Curtis Lawler, Stetson Engineers
From:	Matt Naftaly, P.G., P.H., Dudek Kipp Vilker, P.E., Dudek
Subject:	Land Subsidence, West and Central Management Areas – Santa Ynez River Valley Groundwater Basin
Date:	October 30, 2020
Attachment(s):	Figure 1 – Land Subsidence Index Figure 2a – Land Subsidence Figure 2b – Land Subsidence Figure 2c – Land Subsidence Figure 2d – Land Subsidence Figure 2e – Land Subsidence Attachment A – Santa Ynez River Valley Groundwater Basin Subsidence Monitoring

This memorandum summarizes Dudek's findings regarding land subsidence potential within the Western Management Area (WMA) and Central Management Area (CMA) of the Santa Ynez Groundwater Basin (Basin) as it relates to the Sustainable Groundwater Management Act (SMGA) undesirable results. It is anticipated that this memorandum may provide the basis for the discussion of land subsidence within the Groundwater Sustainability Plan (GSP).

Land subsidence resulting from aquifer deformation may be of two kinds: elastic or inelastic. Elastic deformation occurs with the compression and expansion of sediments due to pore pressure changes that occur with fluctuations in water levels (Borchers and Carpenter 2014). Therefore, elastic deformation may be cyclical in nature corresponding to seasonal groundwater recharge or groundwater extraction. Elastic deformation does not result in permanent loss of pore space. Inelastic deformation may result in irreversible land subsidence and is commonly related to water extraction from fine grained sediments within clay or silt aquitards (Borchers and Carpenter 2014). Permanent land subsidence related to groundwater withdrawal generally occurs in an unconfined aquifer when groundwater elevations drop below the historic range. Land subsidence may result from causes other than withdrawal of groundwater including vertical displacement from tectonic forces or oil withdrawal.

Geologic Setting and Hydrogeologic Information

As described in the 2004 DWR California Groundwater Bulletin 118, the Basin is bounded by the Purisima Hills on the northwest, the San Rafael Mountains on the northeast, the Santa Ynez Mountains on the south, and the Pacific Ocean on the west. Groundwater occurs in unconsolidated alluvial and terrace deposits, including the Orcutt Formation, Paso Robles, and Careaga Formations. The thickness of water-bearing materials in the eastern portion of the Basin averages about 1,000-feet with a maximum of about 3,000-feet. The maximum thickness of the western portion of the basin is more than 1,500-feet near the Santa Rita syncline. The average specific yield for water-bearing materials in the western portion of the Basin is estimated to be 12 percent. The average specific yield for water-bearing materials in the Basin is estimated to be 8 percent (California's Groundwater Bulletin 118, 2004 and references therein).

According to Stratigraphic Columns of Santa Ynez River Valley (Geosyntec, May 2020), a typical section through the WMA is comprised of River Gravels consisting of coarse to fine sand, gravel and thin lenses of clay and silt; Young Alluvium consisting of unconsolidated sands, gravels, silts, and clays; Older Alluvium consisting of Unconsolidated gravels, sand, and silt; Orcutt Sand consisting of unconsolidated, well sorted coarse to medium-grained sand and clayey sand with scattered pebbles/gravel stringers; and Careaga Sandstone consisting of weakly indurated, massive, fine to coarse-grained sand, with local lenses of pebbles and seashells. The stratigraphy of the CMA is similar with the exception of River Gravels and the addition of a layer of Paso Robles Formation consisting of weakly consolidated lenticular beds of clay, fine to coarse-grained sand, and gravels.

Extremely fine-grained sediments that are susceptible to inelastic deformation within the aquifers and aquicludes of the WMA and CMA are generally not extensive or homogeneous enough to pose a great risk of land subsidence, even in the event of substantial dewatering. Inelastic compaction of coarse-grained sediment is usually negligible (Borchers and Carpenter 2014).

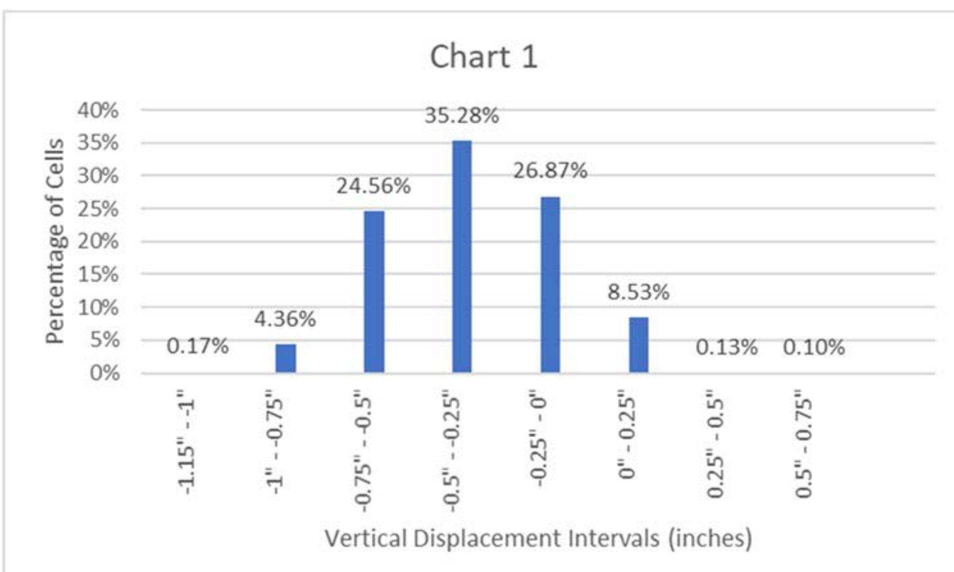
Historical Evidence of Land Subsidence

There is little or no documentation of physical evidence of subsidence such as well casing failure, infrastructure disruption, or earth fissures within the WMA and CMA. According to the 2013 City of Lompoc Groundwater Management Plan, there has been no evidence of land subsidence resulting from groundwater-level declines within the Lompoc Groundwater Basin portion of the WMA and the risk of future significant impacts is small because long-term groundwater levels have been mostly static. Dudek made inquiries to the Solvang Public Works Department, Caltrans (District 5), Department of Water Resources (DWR), and Santa Ynez River Water Conservation District regarding infrastructure related failures due to land subsidence within the Basin in the last 100 years. None of these agencies provided evidence of infrastructure disruption due to land subsidence. The Solvang Public Works representative commented that he could not recall any land subsidence issues throughout the Santa Ynez Valley (M. van der Linden, personal communication, August 12, 2020). John Brady of the Central Coast Water Authority (CCWA) engineering department indicated the presence of a 36-inch to 39-inch steel pipeline between Lake Cachuma and the Lompoc Valley, and north to the Santa Maria Valley, of which approximately 27-miles runs through the WMA and CMA. This pipeline is equipped with seismically triggered isolation valves and has been in place since 1990. Mr. Brady indicated that since the pipeline was built, there have been no triggers of the isolation valves and in his opinion, that there has been no groundwater related land subsidence in the area.

InSAR Vertical Displacement Data

Land Subsidence data is included in DWR's SGMA Data Viewer. Although data from USGS and DWR extensometers is available for parts of California, none are located near the Santa Ynez River Valley or within Santa Barbara County. The SGMA Data Viewer includes vertical displacement data for the Basin derived from InSAR (Interferometric Synthetic Aperture Radar). The TRE Altamira InSAR Dataset is collected by the European Space Agency from the Sentinel-1A satellite for California from January 2015 through September of 2019 and processed by TRE Altamira (DWR 2020). Although subsidence has been largely unmonitored until recently, analysis of the 100-meter by 100-meter (328-foot by 328-foot) calculation grid cells within the Basin indicates that the majority of the Management Areas have experienced total vertical displacement of less than a half-inch of uplift or subsidence between January 2015 and September 2019.

Vertical displacement of the Management Areas, divided into eight displacement intervals, is illustrated in Figures 1 and 2a through 2e attached. The InSAR raster dataset is displayed and uses the 100-meter by 100-meter grid cells to calculate vertical displacement. Within the Management Areas there are 63,516 cells. The maximum uplift of these cells is 0.51-inches while the maximum subsidence is -1.15-inches and the mean vertical displacement is -0.35-inches. Chart 1 shows the distribution of the number of cells within the eight intervals.



As illustrated in Chart 1 and Figures 1 and 2a-2e, only 4.53% of the WMA and CMA have undergone subsidence of greater than 0.75-inches. The interval with the largest number of cells is the interval displaying between 0.25-inches and 0.50-inches of subsidence, which accounts for 35.28% of the Management Areas.

As noted, variations in land surface elevation may result from temporary elastic or tectonic deformation. Available data indicates insignificant subsidence, likely from causes other than inelastic deformation.

Continuous Global Positioning System

UNAVCO, a non-profit university-governed consortium that facilitates geoscience research and education using geodesy, operates a network of continuous global positioning systems (CGPS) instruments across the Americas, including in California. While there are no stations located within the WMA or CMA of the Basin, there are three stations within the vicinity of the Basin which have recorded daily measurements through December 2020 dating back to between 1996 and 2000. The closest CGPS station to the Basin is station VNDP, located approximately 3-miles south of the southwestern corner of the WMA. Station ORES is located approximately 5-miles north of the northeastern corner of the WMA and station TJRN is located approximately 7-miles southeast of the southeastern corner of the CMA (Figure 1). Monitoring records indicate vertical displacement at station VNDP has decreased in elevation by approximately 40-millimeters (mm) (1.57-inches) since 1996. Monitoring records indicate vertical displacement at station ORES has decreased in elevation by about 230-mm (9.1-inches) since 1999. Monitoring records indicate vertical displacement at station TJRN has increased in elevation by about 10-mm (0.39-inches) since 2000 (UNAVCO 2020). Because none of the stations are located within the Santa Ynez Valley Groundwater Basin, they are not representative of land subsidence that may occur as a result of groundwater extraction within the basin. Stations TJRN and VNDP, located to the south of the WMA and CMA, are not within any DWR defined alluvial groundwater basins and may be representative of the active tectonic conditions of the region. Station ORES is within the San Antonio Creek Valley Groundwater Basin (DWR #3-014) and may be indicative of land subsidence conditions there.

Baseline and Ongoing Subsidence Monitoring

Given the low potential for, and incidence of, substantial land subsidence within the WMA and CMA, there may be the potential to monitor future land subsidence using existing, indirect tools such as the InSAR data discussed above. However, direct measurement of land subsidence may also be conducted via baseline and periodic land survey and may provide a greater level of accuracy and detail. Attachment A is a current proposal from Stantec Consulting Services Inc. for land survey monitoring within the WMA and CMA. Two transects have been identified for survey: in the WMA along Floradale Avenue, and in the CMA along the Avenue of Flags. Control points would be set in stable locations at opposite ends of a 2- to 3-mile line in both locations. Up to eight additional monitoring points could be established along the lines. After a baseline has been established, additional monitoring could take place at the desired frequency. The estimated cost for baseline surveys is $21,000 and for periodic monitoring is $9,000 for both areas.

InSar Data, which has been collected since January 2015 and is discussed above, may also provide accurate vertical displacement data. The data provides 16 mm vertical accuracy at a 95% confidence level (DWR 2020). Although there are occasional gaps in coverage within the Basin, the WMA and CMA are widely covered, and accurate data is expected to be produced in the future. The dataset is funded through mid-2023 and will most likely continue beyond that time (B. Brezing, personal communication, August 10, 2020).

Conclusions

The Basin is at low risk for subsidence as a result of inelastic deformation. Minor amounts of vertical displacement have been observed in the Basin between January 2015 and September 2019 but may be mostly the result of elastic processes. As shown in the InSAR data, only 4.53% of the Basin has experienced land subsidence greater than 0.75-inches between January 2015 and September 2019. Variations in land surface elevation may result from temporary elastic or tectonic deformation. Ongoing monitoring of potential land subsidence resulting from groundwater extraction may be conducted with existing remote data sources or direct land survey as discussed above.

References

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FIGURES

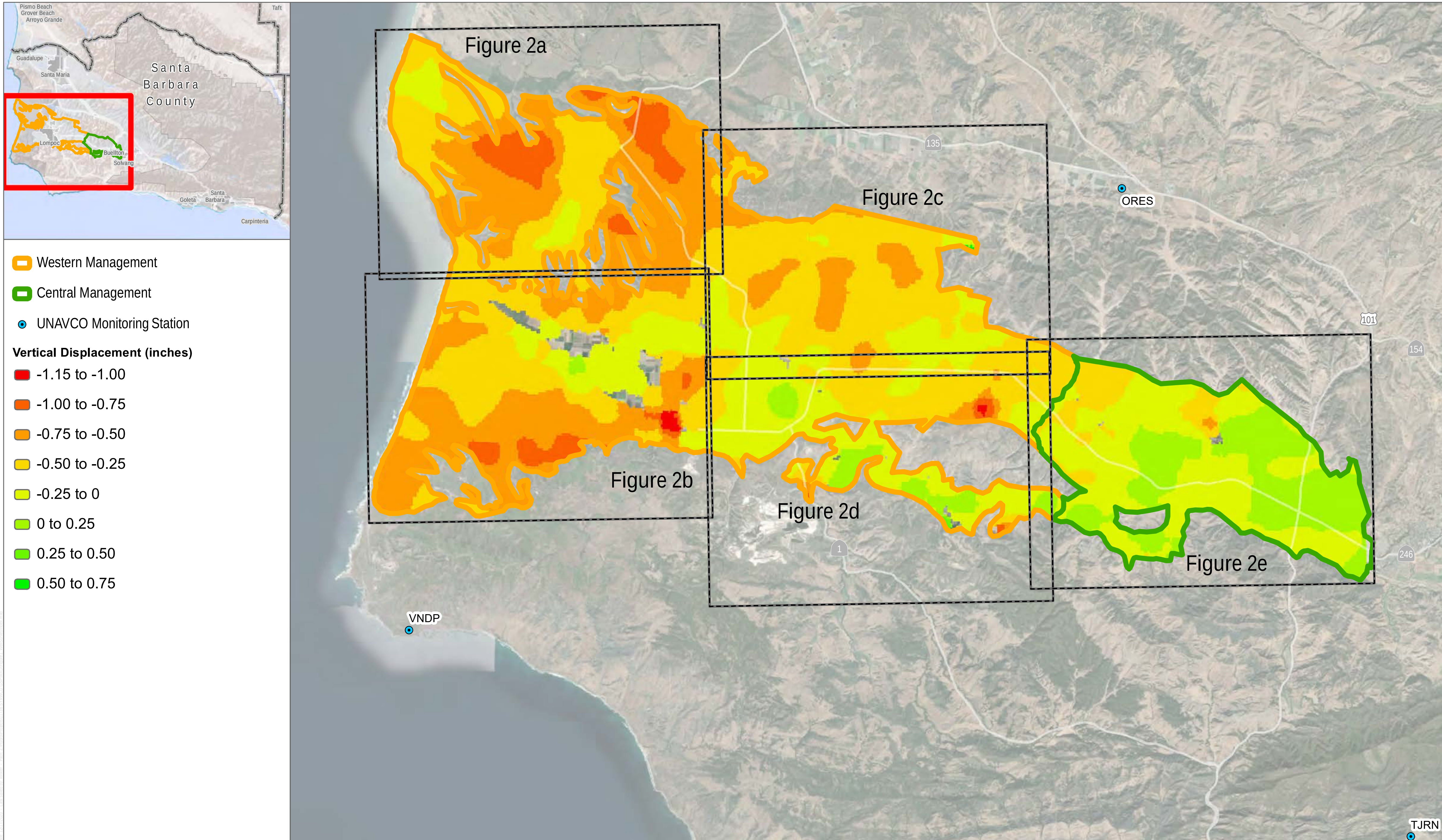
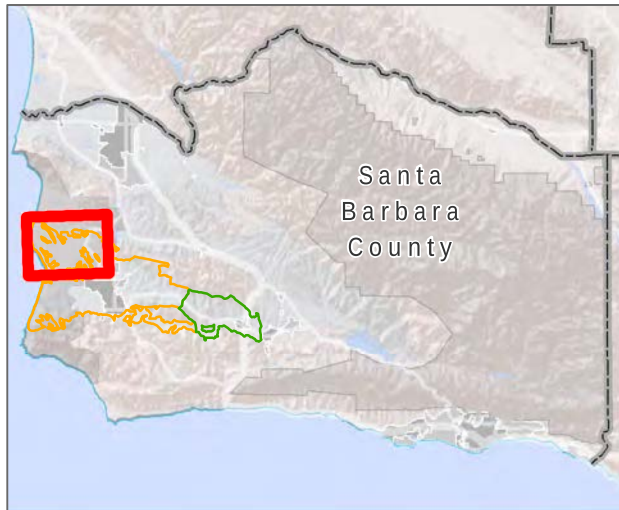
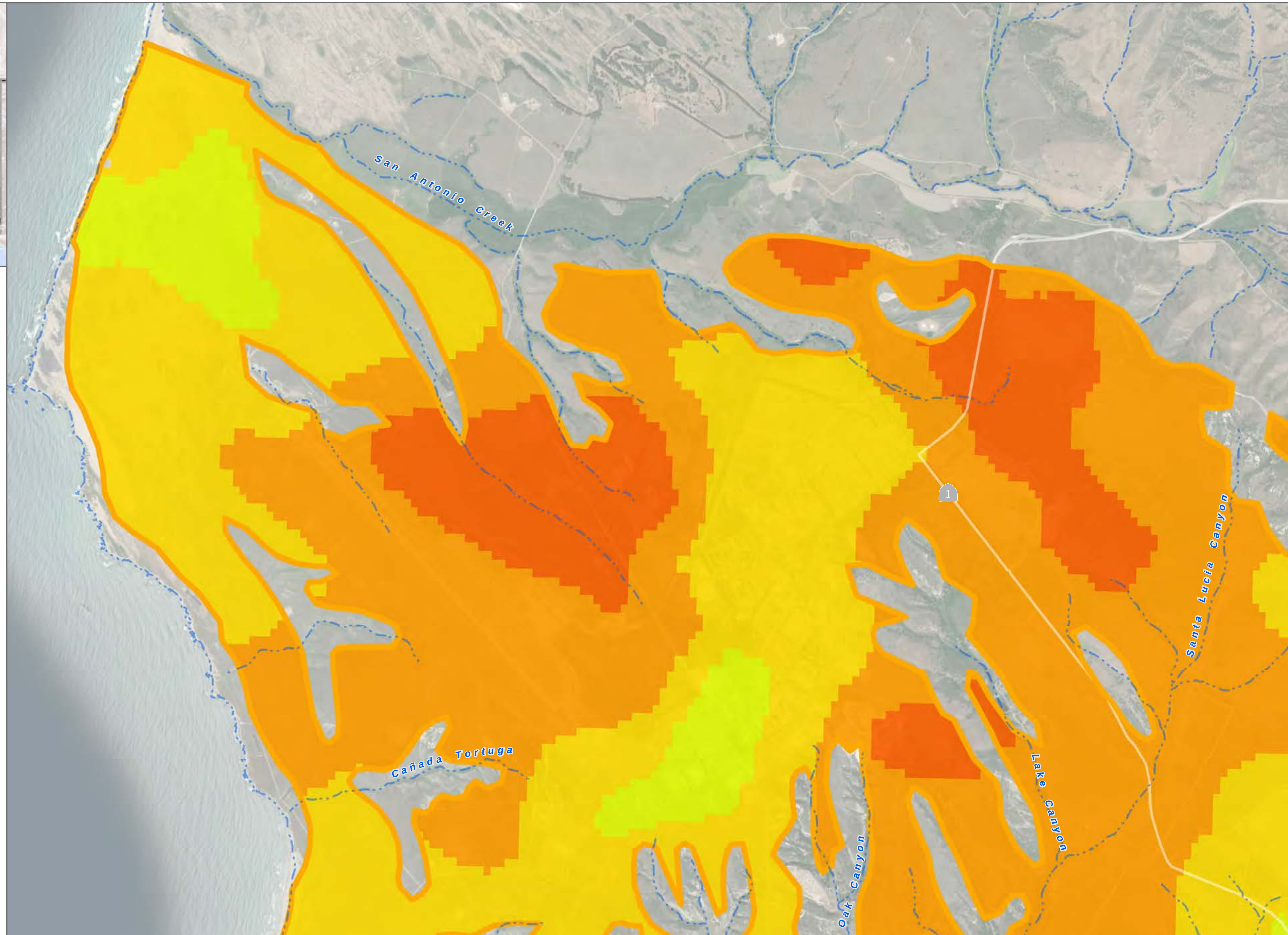


FIGURE 1

Land Subsidence Index

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas





Western Management Area

Vertical Displacement (inches)

- -1.15 to -1.00
- -1.00 to -0.75
- -0.75 to -0.50
- -0.50 to -0.25
- -0.25 to 0
- 0 to 0.25
- 0.25 to 0.50
- 0.50 to 0.75

Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

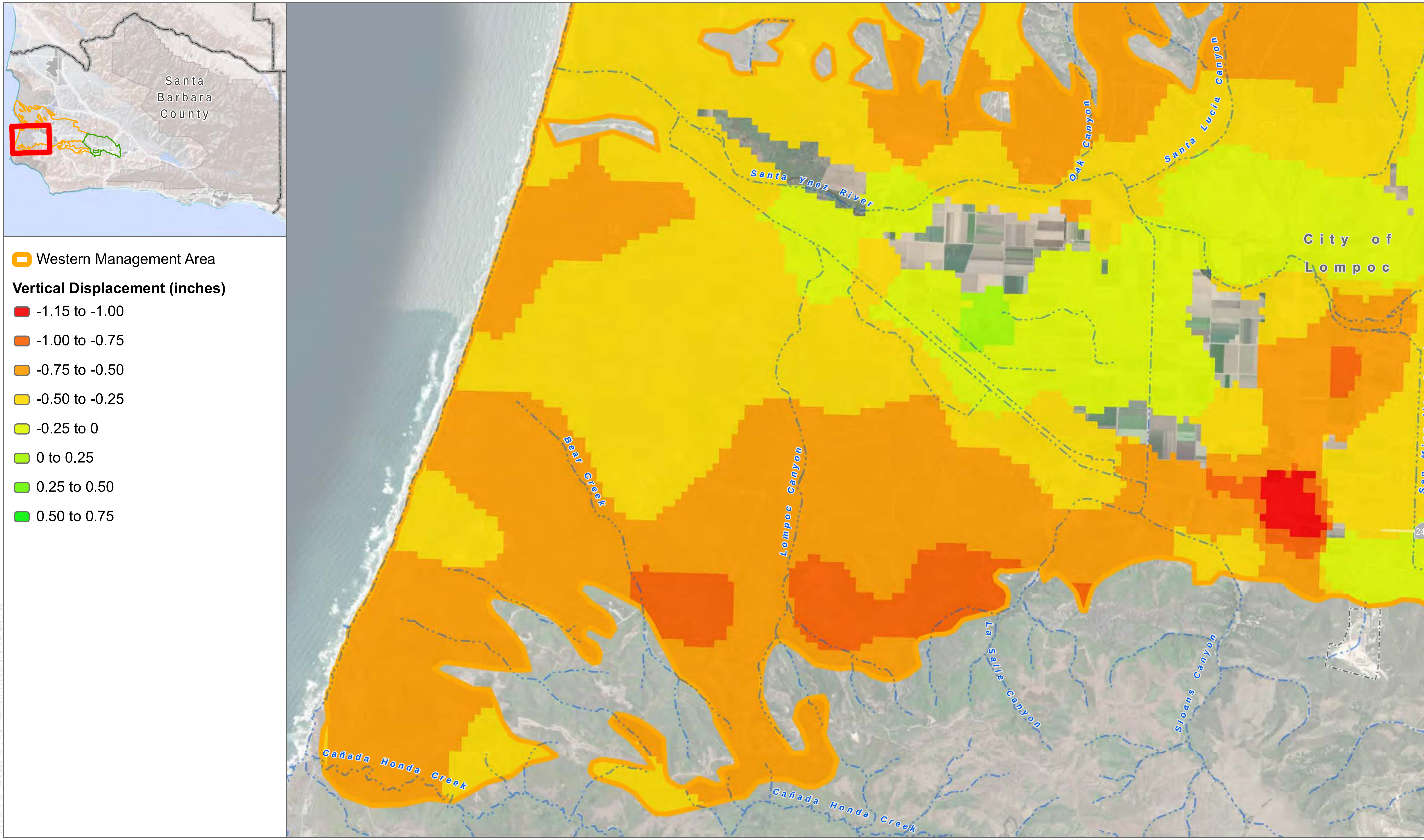
DUDEK

0 2,000 4,000 Feet

FIGURE 2a

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

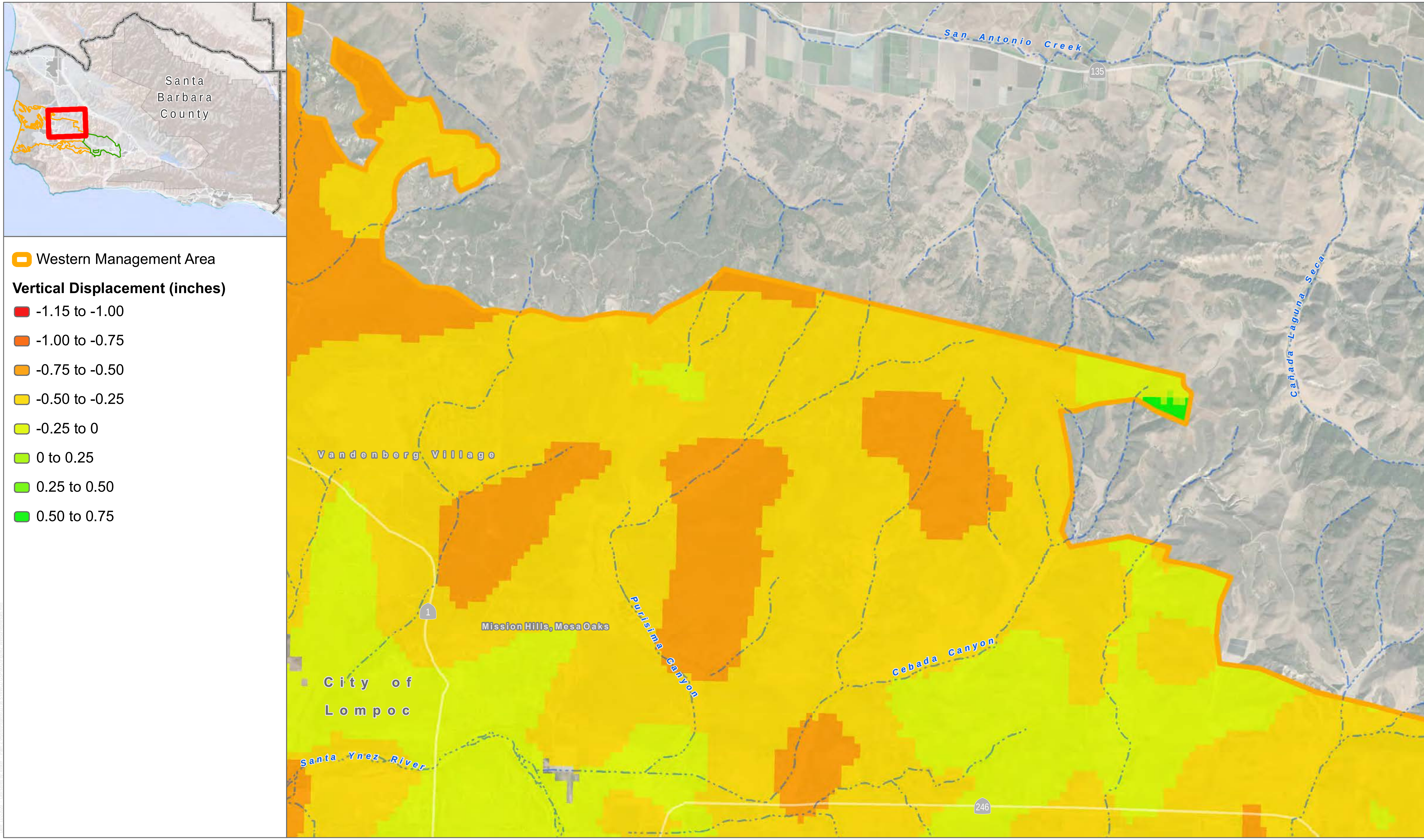
DUDEK

0 2,000 4,000 Feet

FIGURE 2b

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



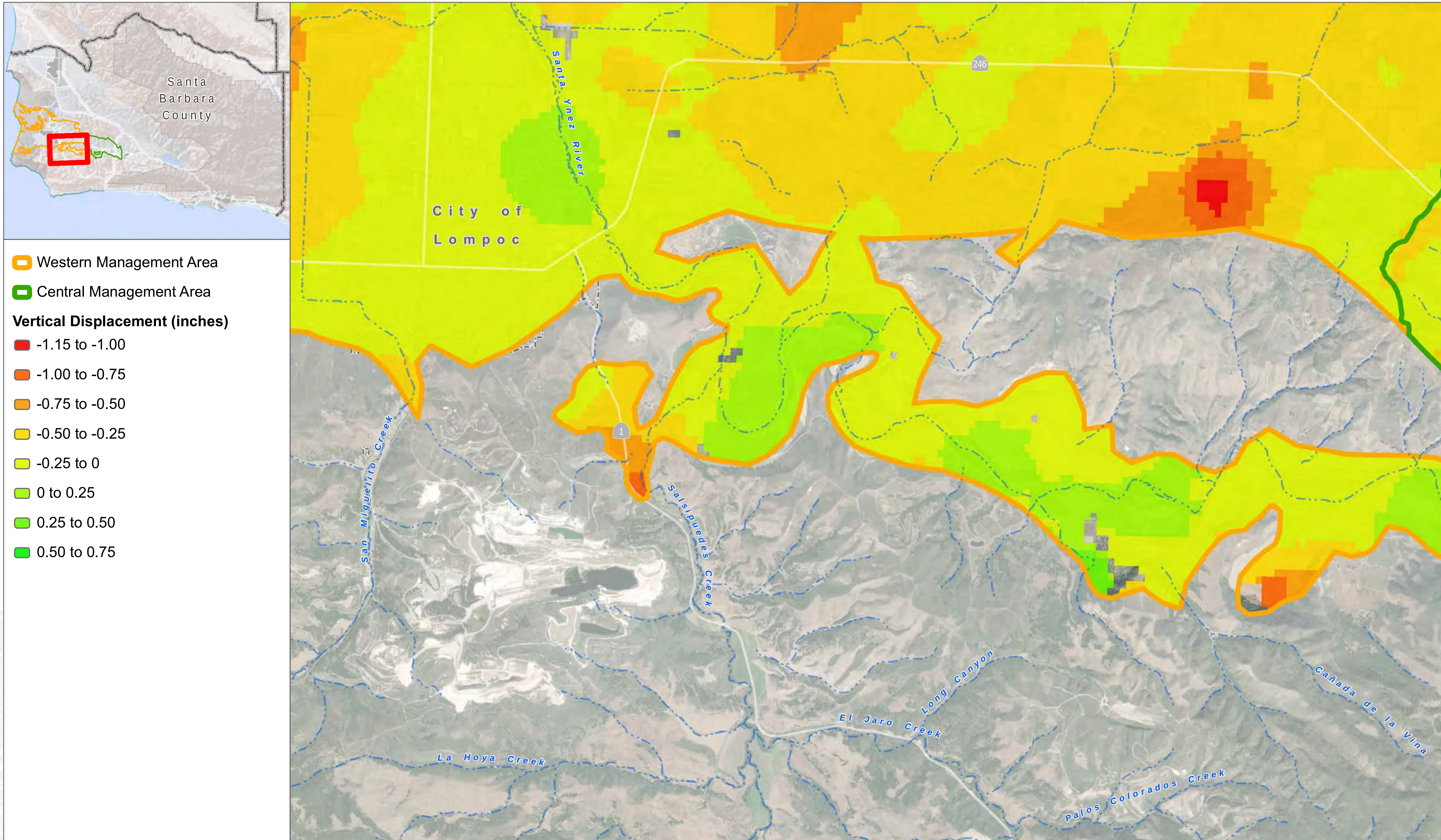
Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

DUDEK

FIGURE 2c

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

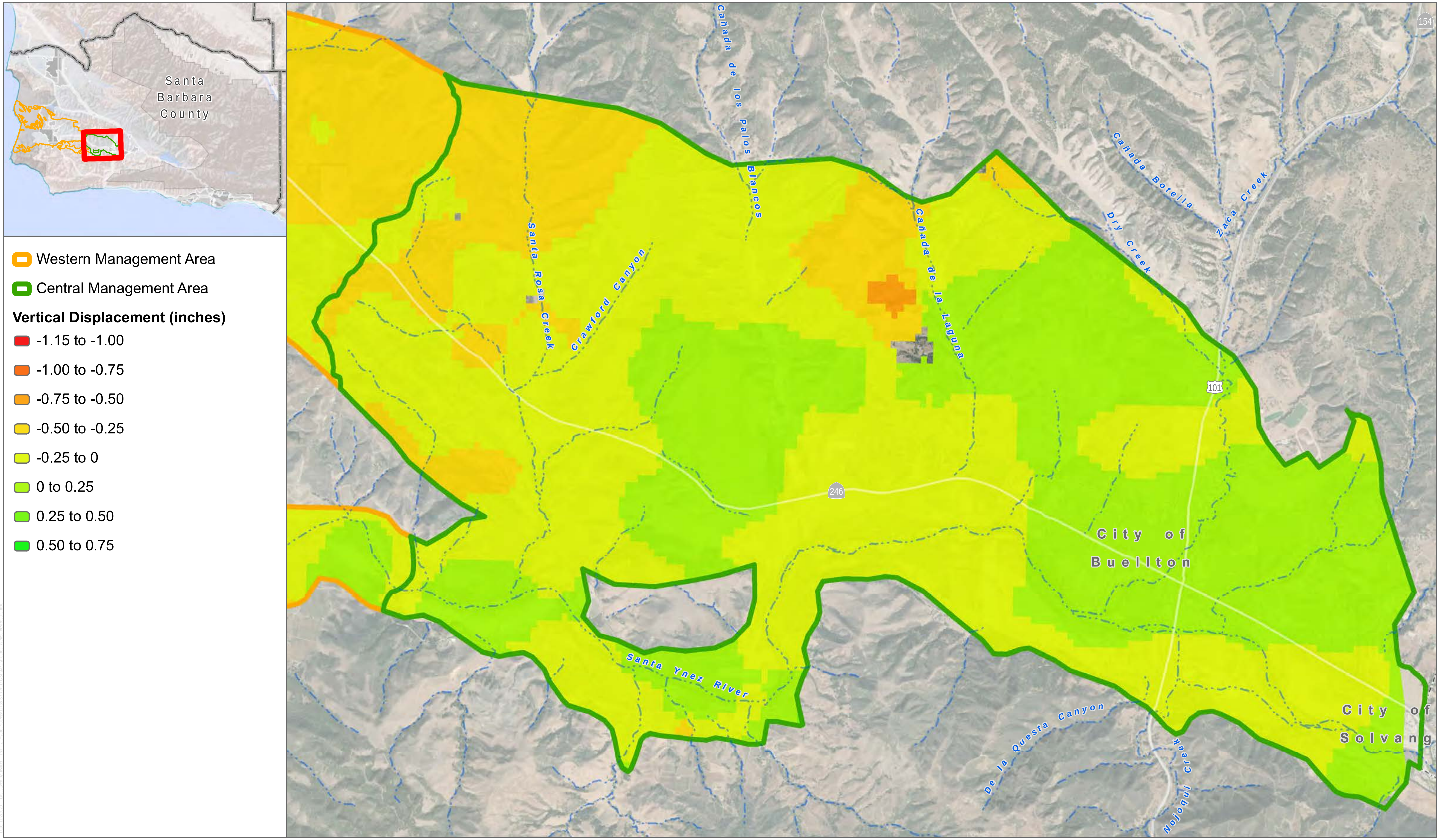
DUDEK

0 2,000 4,000 Feet

FIGURE 2d

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

DUDEK

FIGURE 2e

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas

Attachment A

Survey Estimate

Stantec Consulting Services Inc.
2646 Santa Maria Way Suite 107 Santa Maria CA 93455

06 August 2020

File: 206483000

Attention: Kipp Vilker
DUDEK
621 Chapala Street
Santa Barbara, CA 93101

Dear Mr. Vilker,

Reference: Santa Ynez River Valley Groundwater Basin Subsidence Monitoring

Thank you for contacting us regarding the Lompoc Subsidence study. We are very pleased to present to you this proposal and look forward to helping Stetson Engineers with this and future surveying needs.

UNDERSTANDING OF PROJECT REQUIREMENTS

We understand that Dudek is preparing a grant funding request for subsidence monitoring in the Santa Ynez River Valley Groundwater Basin (SYRVGB), monitoring is needed in the Western Management Area (WMA) and Central Management Area (CMA). Active water well pumping has created subsidence concerns and a monitoring network has been proposed to measure and quantify this anomaly. Stantec is prepared to assist in this effort according to the following scope of work for Control Baseline and Monitoring surveys.

At the time of this proposal, two baselines have been identified for survey: in the WMA along Floradale Avenue, and in the CMA along the Avenue of Flags. Additional monitoring baseline may be identified in the future and shall be addressed by additional authorization.

Thank you for considering Stantec for this project.

Regards,

Stantec Consulting Services Inc.

Ian McClain, PLS
Senior Surveyor
Phone: (805) 357-1348
Ian.mcclain@stantec.com

Jim Wilson, PLS
Principal Surveyor
Phone: (805) 308-9157
Jim.Wilson2@stanec.com

Attachments: Terms & Conditions | 2020 Billing Rates
c. File

SCOPE OF WORK

Stantec shall provide the following surveying services for this project as follows:

Control Baseline

- Set a minimum of two stable control point “pairs” at opposite ends of the River Valley in an approximately 2 to 3-mile line in a general North to South orientation. Control points shall be corrosion resistant disks or caps permanently set in stable ground, substantial permanent fixtures or rock outcroppings in areas unlikely to be affected by subsidence. Stantec will meet with and obtain approval from Stetson on the locations selected for these control points. Up to 8 additional monitoring points such as metal caps set in concrete filled pipes, drilled in permanent concrete fixtures such as headwalls, or footings, or reference marks set into the side of utility poles.
- A two-person crew will perform a closed loop level survey over the course of two days, beginning at one of the control point pairs, running through all monitoring points, turning on the second control point pair and running back through all monitoring points to ensure a precise baseline from which to compare future monitoring events. Leveling will be performed with a digital level and adhere to Federal Third Order procedures. Elevations will be referenced to a published datum by GPS observations.
- Download, process, and tabulate survey data into an MS Excel spreadsheet. NOTE – *All elevation references will be shown to the hundredth of a foot (0.01’).*

Monitoring

- When requested, Stantec will provide a level run survey over the course of one day, beginning at one of the control point pairs, observing each monitoring point and ending at the second control point pair.

- Download, process, and tabulate survey data into an MS Excel spreadsheet with delta comparisons to the Control Baseline and any preceding monitoring events.

- Deliverables shall include the MS Excel spreadsheet file, signed and sealed by a California Licensed Land Surveyor, and PDF copies of the spreadsheet. Hard copies available upon request.

SERVICES NOT INCLUDED

All other services not specifically listed herein are excluded.

ASSUMPTIONS

Our estimate and scope are based on the following assumptions:

- Stetson Engineers will provide direction and approval of stable control points selected to be outside the subsidence area.
- Regular Monitoring Events will occur on a frequency of 6, 12 or 24 months.

PROPOSED FEE AND METHOD OF PAYMENT

Our proposed services will be performed on a fixed fee basis and shall be billed monthly as a percentage complete of our services. Materials (Reimbursable Expenses) are not included in the fixed fee. "Materials" include all reimbursable expenses, such as photocopies, postage, shipping/delivery, plots, prints, maps/documents and outside consultant fees. Our fee for the services described herein will be as follows:

WMA Control Baseline ………………………………………………… **$10,500**

WMA Monitoring ………………………………………………...………**$4,500***

CMA Control Baseline ………………………………………………… **$10,500**

CMA Monitoring ………………………………………………...………**$4,500***

*-Subject to annual fee increases per our billing rates in effect.

TIME OF PERFORMANCE

Based on our understanding of the scope of work, a Control Baseline will be completed within 15 business days of authorization, and Regular Monitoring Event will be completed within 10 business days upon authorization.

Reference: Santa Ynez River Valley Groundwater Basin Subsidence Monitoring

AUTHORIZATION

By signing this proposal, Dudek authorizes Stantec to proceed with the services herein described and the Client acknowledges that it has read and agrees to be bound by the attached Professional Services Terms and Conditions.

This proposal is accepted and agreed on this _____ day of ____________, 2020.

Per: Dudek ____________________________

____________________________________ ____________________________________

Print Name & Title Signature

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Stantec

SCHEDULE OF BILLING RATES – 2020

Billing Level	Hourly Rate	Description
3 4 5	$98 $108 $123	**Junior Level position** ❑ Independently carries out assignments of limited scope using standard procedures, methods and techniques ❑ Assists senior staff in carrying out more advanced procedures ❑ Completed work is reviewed for feasibility and soundness of judgment ❑ Graduate from an appropriate post-secondary program or equivalent ❑ Generally, one to three years' experience
6 7 8	$127 $132 $143	**Fully Qualified Professional Position** ❑ Carries out assignments requiring general familiarity within a broad field of the respective profession ❑ Makes decisions by using a combination of standard methods and techniques ❑ Actively participates in planning to ensure the achievement of objectives ❑ Works independently to interpret information and resolve difficulties ❑ Graduate from an appropriate post-secondary program, with credentials or equivalent ❑ Generally, three to six years' experience
9 10 11	$149 $154 $165	**First Level Supervisor or first complete Level of Specialization** ❑ Provides applied professional knowledge and initiative in planning and coordinating work programs ❑ Adapts established guidelines as necessary to address unusual issues ❑ Decisions accepted as technically accurate, however may on occasion be reviewed for soundness of judgment ❑ Graduate from an appropriate post-secondary program, with credentials or equivalent ❑ Generally, five to nine years' experience
12 13 14	$174 $183 $192	**Highly Specialized Technical Professional or Supervisor of groups of professionals** ❑ Provides multi-discipline knowledge to deliver innovative solutions in related field of expertise ❑ Participates in short and long range planning to ensure the achievement of objectives ❑ Makes responsible decisions on all matters, including policy recommendations, work methods, and financial controls associated with large expenditures ❑ Reviews and evaluates technical work ❑ Graduate from an appropriate post-secondary program, with credentials or equivalent ❑ Generally, ten to fifteen years' experience with extensive, broad experience
15 16 17	$204 $225 $232	**Senior Level Consultant or Management** ❑ Recognized as an authority in a specific field with qualifications of significant value ❑ Provides multi-discipline knowledge to deliver innovative solutions in related field of expertise ❑ Independently conceives programs and problems for investigation ❑ Participates in discussions to ensure the achievement of program and/or project objectives ❑ Makes responsible decisions on expenditures, including large sums or implementation of major programs and/or projects ❑ Graduate from an appropriate post-secondary program, with credentials or equivalent ❑ Generally, more than twelve years' experience with extensive experience
18 19 20 21	$239 $248 $258 $274	**Senior Level Management under review by Vice President or higher** ❑ Recognized as an authority in a specific field with qualifications of significant value ❑ Responsible for long range planning within a specific area of practice or region ❑ Makes decisions which are far reaching and limited only by objectives and policies of the organization ❑ Plans/approves projects requiring significant human resources or capital investment ❑ Graduate from an appropriate post-secondary program, with credentials or equivalent ❑ Generally, fifteen years' experience with extensive professional and management experience

Survey Crews	Crew Size	Regular Rate	Overtime Rate
	1-Person	$185	$225
	2-Person	$275	$380
	3-Person	$375	$510

Expert Witness Services carry a 50% premium on labor. Overtime will be charged at 1.5 times the standard billing rate. All labor rates will be subject to annual increase.

T-2 2020

The following Terms and Conditions are attached to and form part of a proposal for services to be performed by Consultant and together, when the Client authorizes Consultant to proceed with the services, constitute the Agreement. Consultant means the Stantec entity issuing the Proposal.

DESCRIPTION OF WORK: Consultant shall render the services described in the Proposal (hereinafter called the "Services") to the Client.

DESCRIPTION OF CLIENT: The Client confirms and agrees that the Client has authority to enter into this Agreement on its own behalf and on behalf of all parties related to the Client who may have an interest in the Project.

TERMS AND CONDITIONS: No terms, conditions, understandings, or agreements purporting to modify or vary these Terms and Conditions shall be binding unless hereafter made in writing and signed by the Client and Consultant. In the event of any conflict between the Proposal and these Terms and Conditions, these Terms and Conditions shall take precedence. This Agreement supercedes all previous agreements, arrangements or understandings between the parties whether written or oral in connection with or incidental to the Project.

COMPENSATION: Payment is due to Consultant upon receipt of invoice. Failure to make any payment when due is a material breach of this Agreement and will entitle Consultant, at its option, to suspend or terminate this Agreement and the provision of the Services. Interest will accrue on accounts overdue by 30 days at the lesser of 1.5 percent per month (18 percent per annum) or the maximum legal rate of interest. Unless otherwise noted, the fees in this agreement do not include any value added, sales, or other taxes that may be applied by Government on fees for services. Such taxes will be added to all invoices as required.

NOTICES: Each party shall designate a representative who is authorized to act on behalf of that party. All notices, consents, and approvals required to be given hereunder shall be in writing and shall be given to the representatives of each party.

TERMINATION: Either party may terminate the Agreement without cause upon thirty (30) days notice in writing. If either party breaches the Agreement and fails to remedy such breach within seven (7) days of notice to do so by the non-defaulting party, the non-defaulting party may immediately terminate the Agreement. Non-payment by the Client of Consultant's invoices within 30 days of Consultant rendering same is agreed to constitute a material breach and, upon written notice as prescribed above, the duties, obligations and responsibilities of Consultant are terminated. On termination by either party, the Client shall forthwith pay Consultant all fees and charges for the Services provided to the effective date of termination.

ENVIRONMENTAL: Except as specifically described in this Agreement, Consultant's field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater.

PROFESSIONAL RESPONSIBILITY: In performing the Services, Consultant will provide and exercise the standard of care, skill and diligence required by customarily accepted professional practices normally provided in the performance of the Services at the time and the location in which the Services were performed.

INDEMNITY: The Client releases Consultant from any liability and agrees to defend, indemnify and hold Consultant harmless from any and all claims, damages, losses, and/or expenses, direct and indirect, or consequential damages, including but not limited to attorney's fees and charges and court and arbitration costs, arising out of, or claimed to arise out of, the performance of the Services, excepting liability arising from the sole negligence of Consultant.

LIMITATION OF LIABILITY: It is agreed that the total amount of all claims the Client may have against Consultant under this Agreement, including but not limited to claims for negligence, negligent misrepresentation and/or breach of contract, shall be strictly limited to the lesser of professional fees paid to Consultant for the Services or $50,000.00. No claim may be brought against Consultant more than two (2) years after the cause of action arose. As the Client's sole and exclusive remedy under this Agreement any claim, demand or suit shall be directed and/or asserted only against Consultant and not against any of Consultant's employees, officers or directors.

Consultant's liability with respect to any claims arising out of this Agreement shall be absolutely limited to direct damages arising out of the Services and Consultant shall bear no liability whatsoever for any consequential loss, injury or damage incurred by the Client, including but not limited to claims for loss of use, loss of profits and/or loss of markets.

Liability of Consultant shall be further limited to such sum as it would be just and equitable for Consultant to pay having regard to the extent of its responsibility for the loss or damage suffered and on the assumptions that all other consultants and all contractors and sub-contractors shall have provided contractual undertakings on terms no less onerous than those set out in this Agreement to the Client in respect of the carrying out of their obligations and have paid to the Client such proportion of the loss and damage which it would be just and equitable for them to pay having regard to the extent of their responsibility.

DOCUMENTS: All of the documents prepared by or on behalf of Consultant in connection with the Project are instruments of service for the execution of the Project. Consultant retains the property and copyright in these documents, whether the Project is executed or not. These documents may not be used for any other purpose without the prior written consent of Consultant. In the event Consultant's documents are subsequently reused or modified in any material respect without the prior consent of Consultant, the Client agrees to defend, hold harmless and indemnify Consultant from any claims advanced on account of said reuse or modification.

Any document produced by Consultant in relation to the Services is intended for the sole use of Client. The documents may not be relied upon by any other party without the express written consent of Consultant, which may be withheld at Consultant's discretion. Any such consent will provide no greater rights to the third party than those held by the Client under the contract, and will only be authorized pursuant to the conditions of Consultant's standard form reliance letter.

Consultant cannot guarantee the authenticity, integrity or completeness of data files supplied in electronic format ("Electronic Files"). Client shall release, indemnify and hold Consultant, its officers, employees, Consultant's and agents harmless from any claims or damages arising from the use of Electronic Files. Electronic files will not contain stamps or seals, remain the property of Consultant, are not to be used for any purpose other than that for which they were transmitted, and are not to be retransmitted to a third party without Consultant's written consent.

FIELD SERVICES: Consultant shall not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with work on the Project, and shall not be responsible for any contractor's failure to carry out the work in accordance with the contract documents. Consultant shall not be responsible for the acts or omissions of any contractor, subcontractor, any of their agents or employees, or any other persons performing any of the work in connection with the Project. Consultant shall not be the prime contractor or similar under any occupational health and safety legislation.

GOVERNING LAW/COMPLIANCE WITH LAWS: The Agreement shall be governed, construed and enforced in accordance with the laws of the jurisdiction in which the majority of the Services are performed. Consultant shall observe and comply with all applicable laws, continue to provide equal employment opportunity to all qualified persons, and to recruit, hire, train, promote and compensate persons in all jobs without regard to race, color, religion, sex, age, disability or national origin or any other basis prohibited by applicable laws.

DISPUTE RESOLUTION: If requested in writing by either the Client or Consultant, the Client and Consultant shall attempt to resolve any dispute between them arising out of or in connection with this Agreement by entering into structured non-binding negotiations with the assistance of a mediator on a without prejudice basis. The mediator shall be appointed by agreement of the parties. The Parties agree that any actions under this Agreement will be brought in the appropriate court in the jurisdiction of the Governing Law, or elsewhere by mutual agreement. Nothing herein however prevents Consultant from any exercising statutory lien rights or remedies in accordance with legislation where the project site is located.

ASSIGNMENT: The Client shall not, without the prior written consent of Consultant, assign the benefit or in any way transfer the obligations under these Terms and Conditions or any part hereof.

SEVERABILITY: If any term, condition or covenant of the Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of the Agreement shall be binding on the Client and Consultant.

CONTRA PROFERENTEM: The parties agree that in the event this Agreement is subject to interpretation or construction by a third party, such third party shall not construe this Agreement or any part of it against either party as the drafter of this Agreement.

FLORIDA CONTRACTS: PURSUANT TO FLORIDA STATUTES CHAPTER 558.0035 AN INDIVIDUAL EMPLOYEE OR AGENT MAY NOT BE HELD INDIVIDUALLY LIABLE FOR DAMAGES RESULTING FROM NEGLIGENCE.

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Chapter 2 – Basin Setting

Appendix 2c-A:

Stetson Engineers Draft Technical Memorandum,
WMA/CMA Numerical Model Documentation,
Dated May 19, 2021

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STETSON
ENGINEERS INC.

DRAFT TECHNICAL MEMORANDUM

785 Grand Avenue, Suite 202 • Carlsbad, California • 92008
Phone: (760) 730-0701 FAX: (415) 457-1638 Web site: www.stetsonengineers.com

WMA/CMA NUMERICAL MODEL DOCUMENTATION

1.0. INTRODUCTION

A numerical groundwater model was constructed to support the Groundwater Sustainability Plan for the Western Management Area (WMA) and Central Management Area (CMA) of the Santa Ynez River Groundwater Basin (basin) located in Santa Barbara County. The model was developed as a tool for the sustainable management of groundwater resources within the basin. This Technical Memorandum documents the construction and calibration of the WMA/CMA Model.

The areal extents of the WMA/CMA Model (Figure 1) cover about 110 square miles (72,000 acres) from east of Buellton (upstream) to the Pacific Ocean (downstream). Seven groundwater subareas (Figure 2) are represented within the model: CMA Santa Ynez River alluvium, Buellton Upland, WMA Santa Ynez River alluvium, Santa Rita Upland, Lompoc Plain, Lompoc Upland, and Lompoc Terrace).

Two subareas, the Burton Mesa and south Lompoc Terrace, are uplifted marine terraces and not included in the WMA groundwater model because they are disconnected from the principal aquifers in the WMA. Groundwater in these two subareas is perched, and therefore not representative or correlative to the principal groundwater aquifers of the WMA. The water budget for these subareas has been incorporated as recharge for the active cells in the WMA/CMA Model.

2.0. MODEL DEVELOPMENT

The Model was developed based on the antecedent groundwater salinity finite element model in the Lompoc WMA developed by Durbin and others (1997) and was expanded to cover the CMA and additional areas within the WMA. The hydrogeologic framework of the model was built upon the Hydrogeologic Conceptual Model (HCM) developed for the GSP (Stetson, 2020) which include important aspects of geologic and hydrogeologic framework, groundwater movements, sources of recharge and discharge, and water budget components.

The numerical code selected for the WMA/CMA Model is the U. S. Geological Survey (USGS) unstructured grid groundwater flow model, MODFLOW-USG (Panday and others, 2017). Unlike the finite element and finite difference numerical solving approximations, the MODFLOW-USG code solves for three-dimensional saturated groundwater flow based on the control volume finite difference (CVFD) approach. Formulation and solution of the CVFD equations are available in the MODFLOW-USG report

(Panday and others, 2017) and are not repeated in this report. Details of model construction and calibration are discussed in the subsequent sections.

2.1 *MODEL GRID*

The WMA/CMA Model grid system is constructed with uniform rectilinear 4-acre model cells. The unstructured model grid was developed with eight layers to represent the regional hydrostratigraphic system. The thickness and lateral extent of each layer was based on the geologic framework model developed by Geosyntec (2020) and discussed in the HCM developed for the GSP (Stetson, 2020). More detailed layering for the Upper (Layer 3), Middle (Layer 4), and Lower (Layer 5) Aquifers within the Lompoc area were incorporated from the Finite Element Model developed by Durbin and others (1997). The detailed model grid layering and the corresponding geologic framework for each model layer is demonstrated in Figure 3. With an unstructured grid, the outcropping of different geologic units can occur at land surface. Figure 4 shows how the different model layers are ‘exposed’ on the model surface. This is important for distributing areal recharge, surface water (river and tributaries), and evapotranspiration within the model domain.

The different geologic units and aquifers included in each model layer are summarized in Table 1 and shown on Figure 5 through Figure 8. Model layers one (1) through eight (8) represent geologic units including shallow river channel deposits and young alluvium, relatively deeper older alluvium and Orcutt sand, and the deepest Paso Robles and Careaga formations.

TABLE 1 MODEL LAYERS BY GEOLOGIC UNIT AND AQUIFER

MODEL LAYER	MANAGEMENT AREA	GEOLOGIC UNIT	AQUIFER
1	CMA / WMA	Qr, River Gravels	Santa Ynez River Alluvium (CMA, WMA)
2	CMA / WMA	Qa, Younger Alluvium	Santa Ynez River Alluvium (CMA,WMA), Upper Aquifer (WMA)
3	WMA	Qo, Older Alluvium	Upper Aquifer
4	WMA	Qo, Older Alluvium	Upper Aquifer
5	WMA	Qo, Alluvium deep	Upper Aquifer
6	CMA / WMA	Orcutt Sand, and Paso Robles Formation	Buellton Aquifer (CMA), Lower Aquifer (WMA)
7	CMA / WMA	Graciosa Member of the Careaga Formation	Buellton Aquifer (CMA), Lower Aquifer (WMA)
8	CMA / WMA	Cebada Member of the Careaga Formation	Buellton Aquifer (CMA), Lower Aquifer (WMA)

The upper two (2) model layers represent the river gravels and younger alluvium (Figure 5). Model layer 1 simulates the high permeability river channel deposits and the underlying model layer 2 represents the younger alluvium. In both the WMA and CMA, the younger alluvium is a main water bearing formation in the Lompoc Plain. The following three (3) model layers represent the relatively deeper alluvium in the Lompoc plain. Model Layer 3 is thin and transmits insignificant quantities of groundwater, and model layer 4 is mainly clay or non-porous sediment that restricts groundwater flow (Figure 6). Model layer 5 (Figure 7) is the main groundwater source zone beneath the Lompoc Plain, and layer 6 represents the Orcutt Sand, and the Paso Robles formation. The Orcutt Sand and Paso Robles formations are major water-bearing units and are comprised of approximately 1,000 to 3,000 feet of consolidated to unconsolidated gravels, sands, silts, and clays. The bottom two layers represent the Careaga sandstone: Graciosa member (relatively more productive) is represented by Layer 7, and Cebada member (relatively less productive) is represented by Layer 8 (Figure 8). Layer7 and Layer 8 have the same areal extent but represented by different hydraulic properties.

3.0. MODEL PARAMETERS

Aquifer properties vary spatially due to heterogeneous nature of the subsurface materials. Hydrogeologic parameters were assigned to each geologic unit (represented by 8 layers, Table 1) within the model area, and further subdivided into geographic subareas. This results in 35 hydrogeologic parameter zones in the WMA/CMA Model - 9 zones within the CMA and 26 zones within the WMA. A summary of this parameter zone distribution is provided in Table 2 showing the geologic layering and subareas within the Management Areas. The spatial distribution of each zone by subarea is displayed in Figures 5 through Figure 8.

Table 2 Parameter Zones within the Model Domain

Subarea	Hydrogeologic Parameter Zones for Calibration	Management Area	Model Layers (Geologic Units)
CMA SYR Alluvium	1, 7	CMA	1 and 2
CMA Lower Aquifer	19, 25, 31	CMA	6, 7 and 8
Buellton Tributary Alluvium	6	CMA	2
Buellton Upland	18, 24, 30	CMA	6, 7 and 8
WMA SYR Alluvium	5, 12, 23	WMA	1, 2 and 6
Lompoc Plain	2, 8, 13, 15, 16, 20, 26, 32, 34	WMA	1 through 8
Santa Rita Upland	4, 11, 22, 29, 35	WMA	1, 2, 6, 7 and 8
Lompoc Upland	3, 10, 14, 17, 21, 28	WMA	1, 2, 3, 5, 6, 7 and 8
Lompoc Terrace	9, 27, 33	WMA	2, 7 and 8

The Initial aquifer properties (hydraulic conductivity, specific storage and specific yield) assigned to the WMA/CMA Model were obtained from the groundwater salinity model (Durbin and others, 1993), and other limited aquifer test results. Aquifer properties were assigned to the model for each hydrogeologic parameter zone and adjusted within a reasonable range through model calibrations to ensure the model simulated heads respond reasonably close to measured groundwater conditions. The distributions of horizontal and vertical hydraulic conductivity, specific storage, and specific yield within each model layer varies by groundwater subzone as mapped in Figure 5 through Figure 8. Aquifer properties in each Management Area and Model Layer are tabulated below in Table 3 and Table 4.

TABLE 3 WMA/CMA MODEL CALIBRATED HYDRAULIC CONDUCTIVITY (K_{XY} / K_Z, FEET/DAY)

Layer	WMA SYR Alluvium	CMA SYR & Tributary Alluvium	Lompoc Plain	Lompoc Terrace	Lompoc Upland	Santa Rita Upland	Buellton Upland
1	600 / 30	750 / 37.5	600 / 30				
2	360 / 36	360 / 36	55 / 5.5	45 / 4.5	40 / 4	40 / 4	10 / 2
3			35 / 3.5				
4			5 / 0.5				
5			325 / 32.5				
6			55 / 5.5		40 / 4	40 / 4	1.5 / 0.075
7			40 / 4	40 / 4	40 / 4	40 / 4	1.5 / 0.075
8			4 / 0.4	1.5 / 0.15	2.5 / 0.25	1 / 0.1	1 / 0.1

TABLE 4 WMA/CMA MODEL CALIBRATED STORAGE PARAMETERS (SPECIFIC YIELD, SY (UNITLESS) / SPECIFIC STORAGE, S (1/FOOT)

Layer	WMA SYR Alluvium	CMA SYR & Tributary Alluvium	Lompoc Plain	Lompoc Terrace	Lompoc Upland	Santa Rita Upland	Buellton Upland
1	0.25 / 2.5E-05	0.25 / 2.5E-05	0.25 / 2.5E-05				
2	0.2 / 2.0E-05	0.2 / 2.0E-05	0.2 / 2.0E-05	0.2 / 2.0E-05	0.2 / 2.0E-05	0.2 / 2.0E-05	0.2 / 2.0E-05
3			0.15 / 1.5E-05				
4			0.05 / 5.0E-06				
5			0.15 / 1.5E-05				
6			0.1 / 1.0E-05		0.1 / 1.0E-05	0.1 / 1.0E-05	0.1 / 1.0E-05
7			0.15 / 1.5E-05	0.15 / 1.5E-05	0.15 / 1.5E-05	0.15 / 1.5E-05	0.15 / 1.5E-05
8			0.1 / 1.0E-05	0.1 / 1.0E-05	0.1 / 1.0E-05	0.1 / 1.0E-05	0.1 / 1E-05

3.1 *Temporal Discretization*

The WMA/CMA Model simulation period for the SGMA analysis is from Water Year (WY) 1982 to WY 2018. Water years are based on the 12 months from October 1st through September 30th to incorporate the major wet conditions within the same year. The model extends from October 1981 through September 2018 with a total of 444 monthly stress periods (37 years) and simulates the seasonal variations in recharge and discharge. Each stress period is subdivided into six time steps with a constant incremental time-multiplier of 1.12. During model construction, two additional years (24 monthly stress periods) were appended onto the SGMA time series with repeated monthly data from WY 2018 to make the model flexible for extending the analysis as future data become available.

3.2 *Model Boundary Conditions and Initial Groundwater Levels*

Model boundary conditions control the volume of water entering or leaving the model domain. All model cells are considered 'active' when using an unstructured grid. At the lateral and bottom edges of the model there is a 'no flow' condition, *i.e.* no groundwater flow is simulated from, or to, the bedrock surrounding or beneath the simulated aquifers. This assumption is consistent with the hydrogeologic conceptual model, which assumes the surrounding bedrock units are an insignificant source of water to the main groundwater basin.

The prescribed head boundary (also known as time-variant specified-head [Harbaugh et al., 2000]) was defined at model cells to simulate flow along the eastern and western boundaries (Figure 9). The groundwater levels (heads) assigned to the boundary conditions were determined by linear interpolation and extrapolated from measured data from nearby wells[1]. The eastern head-dependent-model-flux boundary is located at the boundary between the CMA and Eastern Management Area (EMA). Measured groundwater levels from monitoring well 6N/31W-17D01 (USBR Node 16) were interpolated at the model cells along the boundary at Layers 2, 6, 7, and 8 to set the time-variant head vales for the CHD MODFLOW Package. Hydrographs are included in Attachment 5 showing the measured and simulated data at this location.

The hydrogeologic conceptual model of the western model boundary at the Pacific Ocean shows a connection to the lagoon or ocean at the river gravels (Qr, model layer 1) or young alluvium (Qal, model layer 2). Lower aquifer sediments (Layers 3 through 8) within the Santa Rita syncline encounter the Monterey formation (Tm) and are not connected to the ocean. Near the lagoon, measured groundwater elevations at monitoring wells 7N/35W-17K20 (surf, old barrier bridge), 7N/35W-18J02 (surf, s. side of lagoon), 7N/35W-21G02 (AFB) were interpolated at the model cells along the lagoon at Layers 1 and 2.

The initial groundwater level heads for the transient simulation were developed using 1981 and early 1982 contour data from historical USGS reports (Hamlin 1985, Berenbrock 1988), and supplemented with measured data. The available groundwater levels were interpolated and assigned to each model cell through

[1] Measured groundwater level data and hydrographs for these wells are posted on sywater.com (DBID 1, 3, 39 and 1113).

kriging methods. The kriged groundwater levels are mapped in Figure 10 and considered to reasonably represent 1981 conditions within the model area.

3.3 *Groundwater Recharge and Discharge*

Water entering the groundwater basin includes recharge from precipitation, stormwater runoff, mountainfront recharge, municipal and irrigation return flow, water exchange between surface water and the aquifer, and subsurface inflows from the adjacent EMA located upstream of the WMA/CMA Model area. Similarly, groundwater leaving the model area includes groundwater withdraws (pumping), evapotranspiration, water exchanges between stream and aquifer, and subsurface outflow to the lagoon and Pacific Ocean.

3.3.1 Groundwater Recharge

Monthly recharge volume was incorporated into the WMA/CMA Model using the MODFLOW Recharge (RCH) package. The specified recharge rates include natural recharge from areal precipitation and mountainfront recharge; and return flow from municipal and agricultural[2] land use. Technical Memoranda written for the GSP Chapters on the Hydrogeologic Conceptual Model (HCM) and Water Budget for the WMA and CMA describe the development of natural recharge using the USGS Basin Characterization Model (Flint and Flint 2017). Monthly data were used for municipal return flow. Distribution of natural recharge and municipal return flow[3] are shown on Figure 11 (upper map).

A summary of annual recharge within the model are provided in Attachment 1 and summarized below in Table 5. The WY 1982 to 2018 average annual natural recharge simulated in the model was 19,680, with 13,090 acre-feet/year occurring within the WMA and 6,590 acre-feet/year occurring within the CMA. Recharge from precipitation ranged from 350 acre-feet in 2015 to 75,760 acre-feet in 1983. Municipal return flow was more constant than natural recharge and averaged 2,120 acre-feet during the model period. In the agricultural areas, irrigation return flow averaged about 17% of the pumped groundwater and net pumping was specified by subtracting the return flow from total pumping.

[2] Agricultural return flows are accounted for by net irrigation pumping.
[3] ibid

TABLE 5 RECHARGE SUMMARY, WMA/CMA MODEL
(WY 1982-2018; 37-YEAR AVERAGE ANNUAL AFY)

RECHARGE COMPONENT	CMA AFY	WMA AFY	TOTAL RECHARGE AFY	MINIMUM AFY	MAXIMUM AFY
NATURAL RECHARGE:					
Precipitation Recharge	3,920	8,720	12,640	2015/ 350	1983/ 75,760
Mountainfront Recharge	1,430	3,490	4,920	2007/ 50	1983/ 14,030
ANTHROPOGENIC RECHARGE:					
Municipal Return Flow	1,240	880	2,120	1982/ 1,530	2004/ 2,470
Agricultural Return Flow[1]	860	4,680	5,540	1984/ 1,190	1997/ 6.085
TOTAL MODELED RECHARGE	6,590	13,090	19,680	2015/ 2,270	1983/ 91,350

1. Agricultural return flow is included in net agricultural pumping.

3.3.2 River and Tributary Streamflow

Santa Ynez River and the major tributaries flow through the WMA/CMA Model area. Quantification of the stream and groundwater exchange is performed using the Streamflow Routing Package (SFR) (Niswonger and Prudic, 2006). Figure 12 shows a schematic of the Santa Ynez River, tributaries, and tributary drainages with a corresponding map view of the modeled surface water features. Data required to quantify the stream and groundwater exchange include the locations of Santa Ynez River and tributaries, assigned stream segment and reach, and for each its specified length, streambed thalweg elevation, and streambed conductance. Additionally, the monthly river flow is specified where the Santa Ynez River enters the WMA/CMA Model area and for all tributaries upstream of the river. The streambed thalweg elevations were assigned and adjusted according to surface elevations derived from 10-meter Digital Elevation Models (DEMs) and comparisons with USGS topographical maps.

The entire Santa Ynez River network is divided into 68 segments and each segment consists of a set of model cells (reach). Details of the Santa Ynez River network are summarized in Attachment 2. Model-simulated stream stage and streamflow were calculated based on the channel hydraulics[4] at USGS gaging stations 11133000 (close to Lompoc Narrows), 11134000 (close to Lompoc H Street), 11129800 (Zaca Creek), and 11128500 (Solvang). The relationships of streamflow and corresponding width and depth at each gaging station are also summarized in Attachment 2. A summary of the annual streamflow entering the eastern model domain for the Santa Ynez River is about 3,500 feet downstream of the Solvang gage. Streamflow input to the model for the Santa Ynez River and all tributaries are tabulated in Attachment 3.

[4] These stream values were similar to channel parameters used in the WMA Lompoc Plain finite element model (Durbin et al, 1993)

TABLE 6 SANTA YNEZ RIVER AND TRIBUTARY STREAMFLOW
WMA/CMA MODEL
(WY 1982-2018; 37-YEAR AVERAGE ANNUAL AFY)

STREAMFLOW INTO MODEL	CMA AFY	WMA AFY	TOTAL STREAMFLOW INTO MODEL DOMAIN[3] AFY	MINIMUM YEAR YEAR / AFY	MAXIMUM YEAR YEAR / AFY
Santa Ynez River	85,780[1]	94,190[2]	85,780[3]	1990/ 630	1998/ 655,820
Nojoqui Creek	3,260		3,260	2015/ 40	1995/ 21,980
Santa Rosa Creek	760		760	mult/ 0	1995/ 5,680
Santa Rita Creek		420	420	mult/ 0	1995/ 3,270
Salsipuedes Creek		9,440	9,440	2015/ 120	1995/ 63,690
San Miguelito Creek		1,310	1,310	2009/ 70	1995/ 9,960
Other Side Tributaries	3,820	3,730	7,550	mixed	mixed
Wastewater		3,790	3,790	2012/ 2,950	2000/ 4,720
Total Surface Water Inflow	93,610	112,870	112,300	1990/ 4,720	1998/ 776,650

Note: all numbers are rounded to the nearest 10 afy, sometimes causing a summation rounding error.
1. Simulated 3,500 feet downstream of USGS Gage 11128500 Solvang.
2. Simulated at USGS Gage 11133000 Narrows.
3 Flow from outside of the WMA/CMA Model domain does not include the 'internal' flow at the USGS Gage 11133000 Narrows.

During model calibration, simulation of the Santa Ynez River streamflow at the Lompoc Narrows was reset to the USGS gaging station 11133000 to remove any potential upstream errors that might have been introduced. The Santa Ynez River segment (stream segment 40) located immediate downgradient of the gaging station 11133000 became a new starting stream segment using the monthly recorded streamflow measurements at the gaging station 11133000 to complete the stream routing process. Both simulated and gaged streamflow are included in Attachment 3. Resetting flow at stream segment 40 was only part of model calibration. For the model simulation of future scenarios, the streamflow at the Lompoc Narrows is a simulated (not gaged) quantity. The comparison of simulated and gaged streamflow will be discussed in Section 4.2 discussing the results of model calibration.

3.3.3 Groundwater Pumping

Groundwater production is primarily pumped for agricultural, municipal, and domestic uses. Groundwater production required for the WMA/CMA Model was compiled from the pumping data obtained from the previous WMA Lompoc Plain finite element model[5] (Durbin et al, 1997) and pumping records obtain from the Santa Barbara County Water Agency. Locations of agricultural, municipal, and

[5] This is also referred to as the "salinity finite element model in the Lompoc WMA developed by Durbin and others (1993)."

domestic wells are shown in Figure 13. An annual summary of the pumping data used in the model for WY 1982 through WY 2018 is provided as Attachment 4. Groundwater pumping was implemented in the WMA/CMA Model using the WEL package with the pumping reduction capability in the event of simulated water levels are approaching the well bottom.

TABLE 7 PRODUCTION WELL SUMMARY
WMA/CMA MODEL

PUMPING WELLS	WMA # WELLS	CMA # WELLS	TOTAL # WELLS
Agriculture/Irrigation	261	130	391
Municipal	18	4	22
Domestic	123	121	244
Total Wells Simulated	402	255	657

TABLE 8 PUMPING SUMMARY, WMA/CMA MODEL
(WY 1982-2018 AVERAGE ANNUAL AFY)

PUMPING TYPE	CMA PUMPING (AFY)	WMA PUMPING (AFY)	TOTAL PUMPING (AFY)
Net Agriculture/Irrigation	4,170	19,570	23,740
Municipal	850	7,000	7,840
Domestic	230	160	390
Total Volume Pumped	5,240	26,730	31,980

Note: all numbers are rounded to the nearest 10 afy, sometimes causing a summation rounding error.
1. Agricultural return flow is included in net agricultural pumping.

3.3.4 Evapotranspiration

Evapotranspiration was simulated in the model to estimate groundwater consumption from naturally occurring phreatophytic (roots tapping into the groundwater table) vegetation. Figure 14 shows the location of model cells simulating phreatophyte water use within the model area. These areas are primarily located along the Santa Ynez River and side tributary riparian areas and at the estuary. Evapotranspiration was assigned to the upper-most layer in the WMA/CMA Model. Groundwater loss through evapotranspiration (ET) within the model area was simulated based on the relationships between the surface elevations, simulated heads, potential ET rates, and root extinction depth using the MODFLOW Evapotranspiration (EVT) package. The ET surface was set to the average elevation within the 4-acre model cell based on land surface from Digital Elevation Models (DEM). The root extinction depth shown in Figure 14 ranges from 25 feet to 54 feet below the average 4-acre model cell land surface elevation. These values were established during model calibration using subarea water budget analysis during the WY 1982 to WY 2018 period estimated to average about 12,000 AFY (Table 9).

Potential ET was estimated using the monthly average precipitation data collected from the California Irrigation Management Information System (CIMIS) during the period between 1983 and 2018. Based on the precipitation collected from the CIMIS, the average annual potential ET for the WMA and CMA are approximately 43.9 inches per year and 51.0 inches per year, respectively. The estimated monthly potential ET for the ET cells in the WMA and CMA areas are provided in Table 9. These ET rates vary monthly with the largest rate occurring during the summer months and the smallest rate occurring in the winter months).

The model calculates the groundwater consumed at the 4-acre model cell based on the simulated depth to water and the parameters assigned to the model cell. The maximum ET loss occurs when the simulated head is at or above the ET surface; on the contrary, the minimum ET loss (equal to zero) occurs when the simulated head drops at or below the root extinction depth.

TABLE 9 ESTIMATED AVERAGE MONTHLY POTENTIAL AND SIMULATED EVAPOTRANSPIRATION

Water Year Month	Western Management Area Potential ET (feet/day)	Central Management Area Potential ET (feet/day)	Simulated WY 1982-2018 Evapotranspiration (acre-feet/year)
October	0.00866	0.00989	845
November	0.00570	0.00629	533
December	0.00444	0.00475	431
January	0.00468	0.00511	469
February	0.00608	0.00672	574
March	0.00922	0.01035	976
April	0.01202	0.01366	1,227
May	0.01551	0.01789	1,610
June	0.01427	0.01707	1,421
July	0.01508	0.01833	1,531
August	0.01355	0.01648	1,358
September	0.01147	0.01353	1,091
		Total Average Annual AFY:	12,067

3.3.5 Groundwater Flow Barriers

Groundwater flow can be completely or partially restrained by geologic features. Figure 15 shows groundwater level measured during well installation near the boundary between the Santa Rita Upland and Buellton Upland. The observed water levels in the Buellton Upland are generally higher than water levels observed in the Santa Rita Upland. The measured data suggest the existence of a partial flow barrier located between the Santa Rita Upland and Buellton Upland due to the sharp differences in groundwater elevations. The characteristic of this partial barrier is uncertain; however, groundwater in the Buellton Upland area appears to also be restricted in the same area. To account for this inferred flow barrier, a line of model cells located between the Santa Rita Upland and Buellton Upland were assigned a relatively low hydraulic conductivity as shown on Figure 15. The hydrogeologic properties of these cells in this area of the model were set to limit groundwater flow -- decrease of five (5) orders of magnitude of the horizontal and vertical hydraulic conductivity (Kx and Kz) and a decrease of two (2) orders of magnitude of specific yield and specific storage (Sy, and Ss). This simulated partial barrier to flow restricts the movement of groundwater between the Buellton Upland and Santa Rita Upland, and maintains the relatively higher groundwater conditions observed in the Buellton Upland. The physical reasons for the hydraulic conductivity contrast between the Santa Rita Upland and Buellton Upland is unknown and will require additional geohydrologic data and investigation to better understand its mechanism.

3.4 *WMA/CMA Model Package Summary*

This section describes the different USGS MODFLOW-USG codes (packages) that were used to construct the unstructured grid model for the WMA/CMA Model. These unstructured grid packages were used to represent the hydrostratigraphic units, model discretization, recharge and discharge water components, and numerical solver. The MODFLOW-USG packages employed in the WMA/CMA Model are tabulated in Table 10 and summarized below.

TABLE 10 MODFLOW-USG PACKAGES USED IN THE WMA/CMA MODEL

MODFLOW-USG PACKAGE		PURPOSE
Basic	BAS	model cell status and initial starting heads
Discretization	DISC	model cell connection, size, and time discretization
Layer-Property Flow	LPF	aquifer properties
Time Varying Constant Head	CHD	specified heads at model domain boundary
Well	WEL	groundwater production
Evapotranspiration	EVT	evapotranspiration process
Recharge	RCH	natural recharge and anthropogenic return flow
Streamflow-Routing	SFR	Santa Ynez River and tributaries flow system
Output Control	OC	model output control
Solver	SMS	Sparse Matrix Solver
Gage	GAGE	output control for streamflow segments
Zone Budget		model post-processing

3.4.1 Basic Package (BAS)

The Basic Package is used to specify the model cell status, and initial water level conditions within the model domain. Because of the MODFLOW-USG's flexibility in model grid design, the WMA/CMA Model was constructed to efficiently represent pinch-outs between merging geologic structures and eliminate the need for inactive model cells when using a rectilinear finite-difference. There is a total of 53,265 active groundwater cells in the model, and includes 1,219 cells representing layer 1, 7,710 cells representing layer 2, 3,035 cells representing layer 3, 1,399 cells representing layer 4, 1,988 cells representing layer 5, 10,910 cells representing layer 6, 13,520 cells representing layer 7, and 13,520 cells representing layer 8. The initial heads employed in the WMA/CMA Model were determined based on historical reports and observed water level data.

3.4.2 Discretization Package (DICU)

The Discretization Package specifies model discretization information to define model geometry, model cell connection, and time stepping throughout the entire simulation period. The model domain was discretized using a constant grid-block size of approximately 4 acres (174240 feet). The entire model area is discretized into eight (8) model layers based on the geological map. Figure 3 through Figure 8 show the discretization of the groundwater domain. The WMA/CMA Model was constructed to simulate hydrologic conditions starting from October 1981 through September 2020 (total of 39 years) with a total of 468 monthly stress periods.

3.4.3 Layer Property Flow Package (LPF)

The Layer Property Flow Package specifies aquifer properties for all model cells and model layer type within the model. Aquifer parameters required by the WMA/CMA Model include horizontal and vertical hydraulic conductivities, specific storage, and specific yield. Aquifer properties assigned to the WMA/CMA Model were adjusted during model calibration. All model layers are assigned to be convertible between confined and unconfined conditions depending the layer thickness and water level conditions.

3.4.4 Well Package (WEL)

The well package simulates groundwater extraction within the model domain. The extraction wells include irrigation, domestic, and municipal wells. The MODFLOW-USG will reduce groundwater pumping rates when the simulated heads approach the specified bottom elevation of the cell, which prevents "dry" model cells from occurring during model computations. The perforated intervals of most wells in the model are unknown. It was therefore necessary to assume that wells extract groundwater primarily from the main water bearing formation represented by model layers 2, 5, 6, and 7. Well extractions were allocated between layers based on the following rule set:

If pumping well is located where:

model layers 1 and 2 are present	100% from layer 2
model layers 2 and 5 are present	40% / 60% from layers 2 and 5
model layers 2 and 6 and/or 7 are present	40% / 60% from layers 2 and 6 and/or 7
model layers 5 and 6 are present	50% / 50% from layers 5 and 6
model layers 2, 5 and 6 are present	20% / 40% / 40% from layers 2, 5, and 6

3.4.5 Time Variant Specified Head Package (CHD)

The CHD package was employed to provide constant head boundaries along the western and eastern perimeter of model boundary and the lagoon area (Figure 10 upper). A constant head value of zero is assigned to model cells in model layers 1 and 2 where model cells located adjacent to the ocean. In order to ensure the other CHD boundary cells can provide reasonable head gradients, the constant heads assigned to the eastern boundary and lagoon cells were determined based on the historical water levels observed in the nearby wells.

3.4.6 Evapotranspiration Package (EVT)

The ET package is used to apply ET rates to each ET cell in the WMA/CMA Model. The pertinent data required in the EVT package includes the potential ET rate, root extinction depth, ET surface elevation, and model simulated head. The MODFLOW-USG calculates the ET extraction over the model top active cells.

3.4.7 Recharge Package (RCH)

The Recharge Package is employed to simulate groundwater recharge as a result of water percolation over the uppermost layer of active model cells. The recharge applied to the WMA/CMA Model is the total precipitation recharge, drainage flow, mountain front flow, and municipal return flow.

3.4.8 Stream Routing Package (SFR)

The SFR Package defines the locations of the Santa Ynez River and all tributaries that will be simulated in the model. Required data for the SFR Package includes Stream location, stream identification, stream length, stream bed elevation and conductance, and streamflow. The SFR provides several options to calculate stream width and depth, the current setup is to calculate the stream width and depth using the channel hydraulics table (Attachment 2).

3.4.9 Gage Package (GAG)

The MODFLOW-USG Gage Package controls streamflow output at any stream cell of interest. The Gage Package in the WMA/CMA Model setup is to generate simulated time series streamflow at the USGS gage stations 11133000, 11134000, 11135000, and 11135250 where observed streamflow data are available for model calibration.

3.4.10 Sparse Matrix Solver Package (SMS)

The Sparse Matrix Solver (SMS) package provide groundwater flow equation solver for the MODFLOW-USG. The SMS package has several solver options and the Newton-Raphson linearization scheme was determined to be the most appropriate solver option for the WMA/CMA Model due to its good convergence and faster simulation time.

3.4.11 Output Control Package (OC)

The Output Control Package of MODFLOW-USG controls how water levels, fluxes and water budget information is saved during a simulation. The Output Control Package was set up to save the simulated groundwater levels (heads), volumetric budget, and cell-by-cell flow at the end of each stress period. The cell-by-cell flow output is used by the post processing Zone Budget program to calculate internal fluxes and subarea water budgets based on model simulated rates.

4.0. MODEL CALIBRATION

Model calibration is the process of iteratively adjusting aquifer parameters and boundary conditions with the intention to ensure the model simulated results match the conditions observed in the field or estimated by other approaches within acceptable errors. Calibration of the transient WMA/CMA Model was performed for the 37-year period from WY 1982-2018 (444 monthly stress periods) through a systematic adjustment of model parameters and comparisons of simulated results with measured data. The aquifer parameter adjustment in the calibration process represents the constant parameter adjustment over each management zone; that is, each model management zone has one constant set of aquifer parameters.

4.1 *GROUNDWATER LEVELS*

Although there are many wells located within the model area, many wells have one or few groundwater level measurements. For calibration purposes, 122 wells with longer-term water level measurements were considered as target wells for model calibration. The locations of the target wells are shown on Figure 16 and tabulated in Attachment 5. These water level measurements are the basis for groundwater level trend analysis and comparison to the model's simulated results. Review of observed water level measurements at these 122 wells indicates water level measurements at some wells may consist of both static and non-static measurements. The non-static measurements were collected either when a well was still pumping, or when the groundwater level was not fully recovered. In addition, some measurements may be considered as outliers when the data deviate significantly from the normal water level range. However, without knowing the exact causes of those abnormal water level measurements, all water measurements are considered and included in the model calibration statistics and comparison hydrographs (Attachment 5).

Calibration statistics are shown on Figure 17 using a scatter plot of observed versus simulated water level, and a histogram (distribution) of the residual differences (measured - simulated) computed for 24,114 groundwater level measurements at the 122 target wells. The closely clustered data around the diagonal match-line shown in the scatter plot illustrates a good fit of the simulated groundwater levels to the observed data, with no trend or bias to the errors. Statistic evaluations of the simulated water levels are also presented in Figure 17. The calculated mean residual is 1.40 feet in the WMA and -0.62 feet in the CMA; with a Standard Deviation (σR) of 10.13 in the WMA and 7.10 feet in the CAM. These statistics indicate that on average, the WMA/CMA Model simulated results are slightly higher than the measured data (0.99 feet) and most of the residuals (differences) are generally less than 9.63 feet throughout the whole model area. The residual of histogram shown on Figure 17 shows a good bell shape distribution (normal distribution). The large discrepancy of -50 feet difference (to the left of the residual distribution) are mostly the differences between the model simulated heads and possible outliers. The statistics shown on Figure 17 suggest a good fit between the simulated and observed heads over the entire model area.

For discussion purposes, measured and model-calculated water levels are plotted for 30 select wells on Figures 18 through Figure 23 (all 122 hydrographs are included as Attachment 5). Hydrographs in the CMA (Figure 18) show close agreement between measured and simulated heads. Most of the simulated water levels were extracted from the main water bearing layers (model layers 2, 5, or 6) except for those wells located in areas where main water bearing formations do not exist or the water bearing formation is thin. Information of township and range, Stetson's database identification number, and the model layer where simulated heads were extracted from the WMA/CMA Model of all 122 target wells are summarized in Attachment 5. Closer comparisons occur in the alluvial areas of the CMA, compared to the relatively sparse data sites available in the Buellton Upland. Figure 19 shows simulated and measured data within the WMA river alluvium and Santa Rita Upland. Similar to the CMA, closer agreement between measured and model-calculated water levels in wells located in the alluvial aquifers compared to wells located in the upland aquifers. The hydrographs in Figure 20 show a very close match between simulated and measured groundwater level data in the Lompoc Plain and eastern edge of the Lompoc Upland – both in wet/dry seasonal trends and absolute values. Figure 21 continues west, showing target wells in the middle Lompoc Plain and along a tributary drainage in the Lompoc Upland. These wells show a very good match along the river, and a good match with distance from the river. Figure 22 and Figure 23 shows target wells in the western Lompoc Plain and near the Pacific coast where simulated groundwater levels are mostly within a few feet to about 10 feet of measured.

Review of the calibration results indicates that some observed measurements are significantly different from the simulated heads (i.e. at well 7N/33W-21N01 well located in the Santa Rita Upland with about 20 ft difference between the simulated and observed heads). These discrepancies may be the cause of large water level changes due to nearby pumping activities while measurements were taken or may be outliers. The larger discrepancies generally occur in the Lompoc Upland, Santa Rita Upland, and Buellton Upland areas where knowledge and water level measurements in those areas are fairly limited.

4.2 *SANTA YNEZ RIVER STREAMFLOW*

The SFR simulated streamflow at the of the USGS gaging stations 11133000, 11134000, 11135000, and 11135250 were also used during calibration of the model. Among these four (4) gaging stations, only the gaging station 11133000 (close to the Lompoc Narrows) has a complete monthly streamflow record between October 1981 and September 2018. Comparison of simulated versus measured streamflow at the

Lompoc Narrows gaging station 11133000 is presented monthly in Figure 24 and annually on Figure 25. The log-scaled scatter diagram (Figure 25) of simulated versus measured streamflow at the USGS gage near the Lompoc Narrows shows an R^2 value of 0.98. Figure 26 shows the limited measured data at USGS gage 11134000 at H Street compared with the simulated values from the WMA/CMA Model, with an R^2 value of 0.99. Figure 27 shows the limited measured data at USGS gage 11135000 at Pine Canyon compared with the simulated values from the WMA/CMA Model, with an R^2 value of 0.99. And Figure 28 shows the limited measured data at USGS gage 11135250 at 13th Street Bridge at VAFB compared with the simulated values from the WMA/CMA Model, with an R^2 value of 0.98.

5.0. Water Budgets

The model calculates a volumetric groundwater budget for each monthly stress period of all inflows and outflows throughout the model domain. Water Budget Technical Memoranda (Stetson, 2021) developed for the GSP give details of water budgets by subareas within the WMA and CMA. Figure 29 shows annual distribution of inflows, outflows, and changes of groundwater in storage simulated by the model from WY 1982 through WY 2018. The variability in natural recharge (inflow to the model) is typical of this semi-arid coastal region of California. Water demand from pumping and phreatophytic vegetation is fairly constant throughout this 37-year period. Groundwater in storage changes in response to the recharge variability, supplying groundwater to water demand during dry conditions (net storage change is negative) and replenishing the aquifer during wet conditions (net storage is positive).

6.0. MODEL SENSITIVITY

An analysis was conducted on the transient calibrated model to assess the sensitivity of the WMA/CMA Model input parameters. The sensitivity analysis results will assist in understanding and addressing uncertainties between the calibrated model and the predictive model. Input model parameters considered in the sensitivity analysis included:

- aquifer properties of horizontal and vertical hydraulic conductivity, specific yield, and specific storage,
- groundwater recharge from precipitation, drainage flow, mountain front flow, and municipal return flow,
- root extinction depth assigned in the Evapotranspiration Package, and
- effectiveness of the groundwater flow barrier located between the Santa Rita Upland and Buellton Upland as discussed in Section 3.3.5.

Evaluations of model changes due to model input parameters were performed by adjusting a single input parameter for each sensitivity run. Simultaneous adjustments of multiple model input parameters were not performed. The WMA/CMA Model's calibration run was used to assess comparative changes with each sensitivity analysis.

Because the change in groundwater elevation is a result of the change in groundwater storage, the goal of the sensitivity analysis is to measure the changes of groundwater storage as a result of adjustments of model input parameters. The significance level is quantified by calculating the change of simulated net groundwater storage between the sensitivity analysis model run and the calibration model run for the simulation period between October 1981 and September 2018. The sensitivity analysis focuses on the adjustments of aquifer properties of horizontal and vertical hydraulic conductivity (Kx and Kz), specific yield (Sy) and specific storage (Ss) and specific yield (Sy), groundwater recharge, root extinction depth, and horizontal hydraulic conductivity of the model flow barrier cells. A total of 18 sensitivity runs were performed. The tested parameters and range of adjustments, and the significance levels quantified for each simulation cases are summarized in Table 11.

Depending on the percentage changes in net groundwater storage with respect to the analyzed parameters, the significance level of the model to the tested parameters are generally classified into:

1) high sensitivity if the percentage change is generally greater than 20%,
2) moderate sensitivity if the percentage change is between 5% and 20%, and
3) low sensitivity if the percentage change is general less than 5%.

Based on the sensitivity classification discussed above, attention will focus on the high sensitivity parameters for future predictive simulations. Results of this analysis show that the WMA/CMA Model is highly sensitive to groundwater recharge and horizontal hydraulic, moderately sensitive to specific yield and root extinction depth, and least sensitive to vertical hydraulic conductivity and specific storage. Although the quantified significance level of the flow barrier located between the Santa Rita Upland and Buellton Upland is low, impacts from the flow barrier remain uncertain and will require further investigations as new geological information becomes available.

TABLE 11 PARAMETER ADJUSTMENTS IN THE WMA/CMA MODEL SENSITIVITY ANALYSIS

ANALYSIS RUN	PARAMETER	PARAMETER ADJUSTMENT	STORAGE CHANGE (AFY)	%[1] CHANGE	SIGNIFICANCE LEVEL
1	Kx	+ 100% in Model Layers 2, 5, 6	4,398	20.05%	High
2	Kx	- 50% in Model Layers 2, 5, 6	3,075	-16.07%	High
3	Kz	+100% in Model Layers 2, 5, 6	3,719	1.52%	Low
4	Kz	-50% in Model Layers 2, 5, 6	3,629	-0.93%	Low
5	Kx	+100% in Model Layers 1, 3, 4, 7, 8	4,777	30.39%	High
6	Kx	-50% in Model Layers 1, 3, 4, 7, 8	2,611	-28.74%	High
7	Kz	+100% in Model Layers 1, 3, 4, 7, 8	3,682	0.50%	Low
8	Kz	-50% in Model Layers 1, 3, 4, 7, 8	3,648	-0.41%	Low
9	Sy	+100% in Model Layers 2, 5, 6	3,917	6.91%	Moderate
10	Sy	-50% in Model Layers 2, 5, 6	3,439	-6.13%	Moderate
11	Ss	+1000% in Model Layers 2, 5, 6	3,735	1.94%	Low
12	Ss	-10% in Model Layers 2, 5, 6	3,655	-0.23%	Low
13	Recharge[2]	150% recharge increase	1,205	-67.10%	High
14	Recharge[2]	50% recharge decrease	6,319	72.48%	High
15	ET depth	150% root extinction depth increase	3,884	6.01%	Moderate
16	ET depth	50% root extinction depth decrease	3,306	-9.77%	Moderate
17	Kx	‘+1000% at flow barrier cells	3,721	1.57%	Low
18	Kx	‘-10% at flow barrier cells	3,659	-0.13%	Low
		Calibration Run	3,664		

Kx = horizontal hydraulic conductivity; Kz = vertical hydraulic conductivity; Sy = specific yield; Ss = specific storage; ET = evapotranspiration
1. % Change in Net Storage =
[Sensitivity Run Net Storage Change – Calibration Run Net Storage Change] / Calibration Run Net Storage Change x 100%
2. Groundwater recharge consists of precipitation, drainage flow, mountain front flow, and municipal return flow.

7.0. Conclusions

The development of the WMA/CMA Model was primarily based on the WMA and CMA HCM (Stetson, 2020). The model was constructed to consist of eight (8) layers and 53,265 active cells to represent the geologic units including shallow river channel deposits and young alluvium, relatively deeper older alluvium and Orcutt sand, and the deepest Paso Robles and Careaga formations to evaluate groundwater conditions, surface water and groundwater communications, and streamflow of the Basin for the period between WY 1982 and WY 2018 (model calibration period). Results of the WMA/CMA Model simulations provide an improved understanding of the Basin’s groundwater conditions related to various stresses that have occurred in the Basin. In addition, the predictive model runs can assist in future management prioritization for the implantation of groundwater sustainability plan.

8.0. MODEL LIMITATIONS

The WMA/CMA Model is a regional groundwater flow model and constructed with simplifying assumptions and limited data. These include,

- Lack of observed groundwater elevations, particularly in the Lompoc Upland, Santa Rita Upland and Buellton Upland areas.
- Although aquifer properties assigned to the WMA/CMA Model are based on the general aquifer characteristics and limited aquifer tests and applied over relatively large areas.
- The evapotranspiration from phreatophytic riparian vegetation is simulated with monthly ET rates that do not vary year by year. This assumption does not address changes in vegetation over time.
- The low hydraulic conductivity cells assumed in areas between the Santa Rita Upland and Buellton Upland (Section 2.5.5) may restrict the westerly groundwater flow from the Buellton Upland to the Santa Rita Upland, mechanics of the flow barrier are not fully understood, consequently, quantification of the subsurface flow between the Santa Rita Upland and the Buellton Upland is estimated.
- The WMA/CMA Model was constructed as a regional groundwater flow model to assess large-scale groundwater conditions in the WMA and CMA. Caution is needed when considering its use for relatively smaller, more localized applications.

9.0. References

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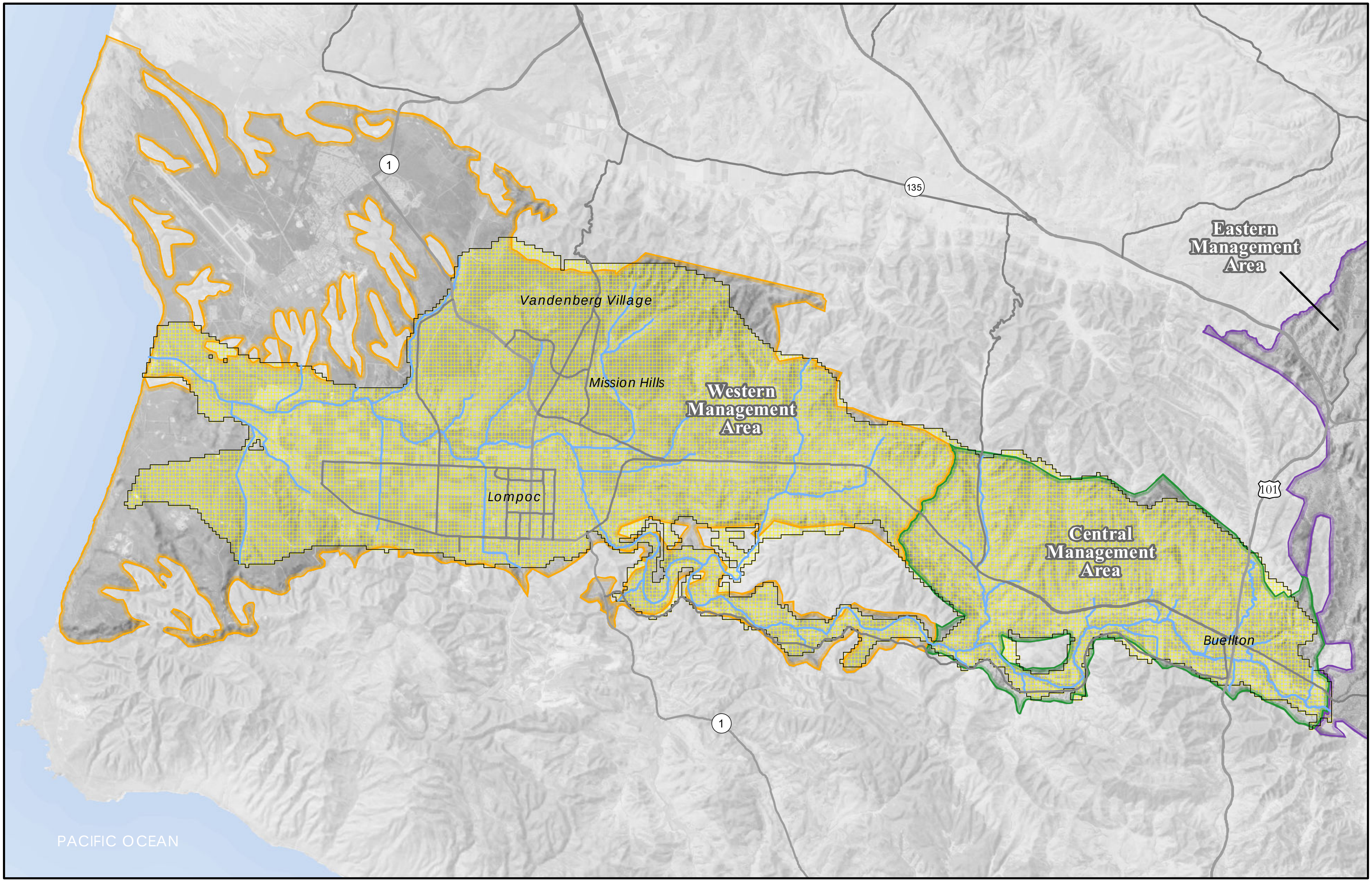
Stetson Engineers, Inc., September 2020. Draft Hydrogeologic Conceptual Model (HCM) Technical Memorandum. Prepared for Western Management Area Groundwater Sustainability Agency.

Figures

WMA/CMA Model Documentation

Document Path: J:\jn2710\SYR_Model_Documentation_Report_overview.mxd



Model Boundary
Model Cell
Western Management Area
Central Management Area
Eastern Management Area

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Model Cells and Areal Extents
WMA/CMA Model

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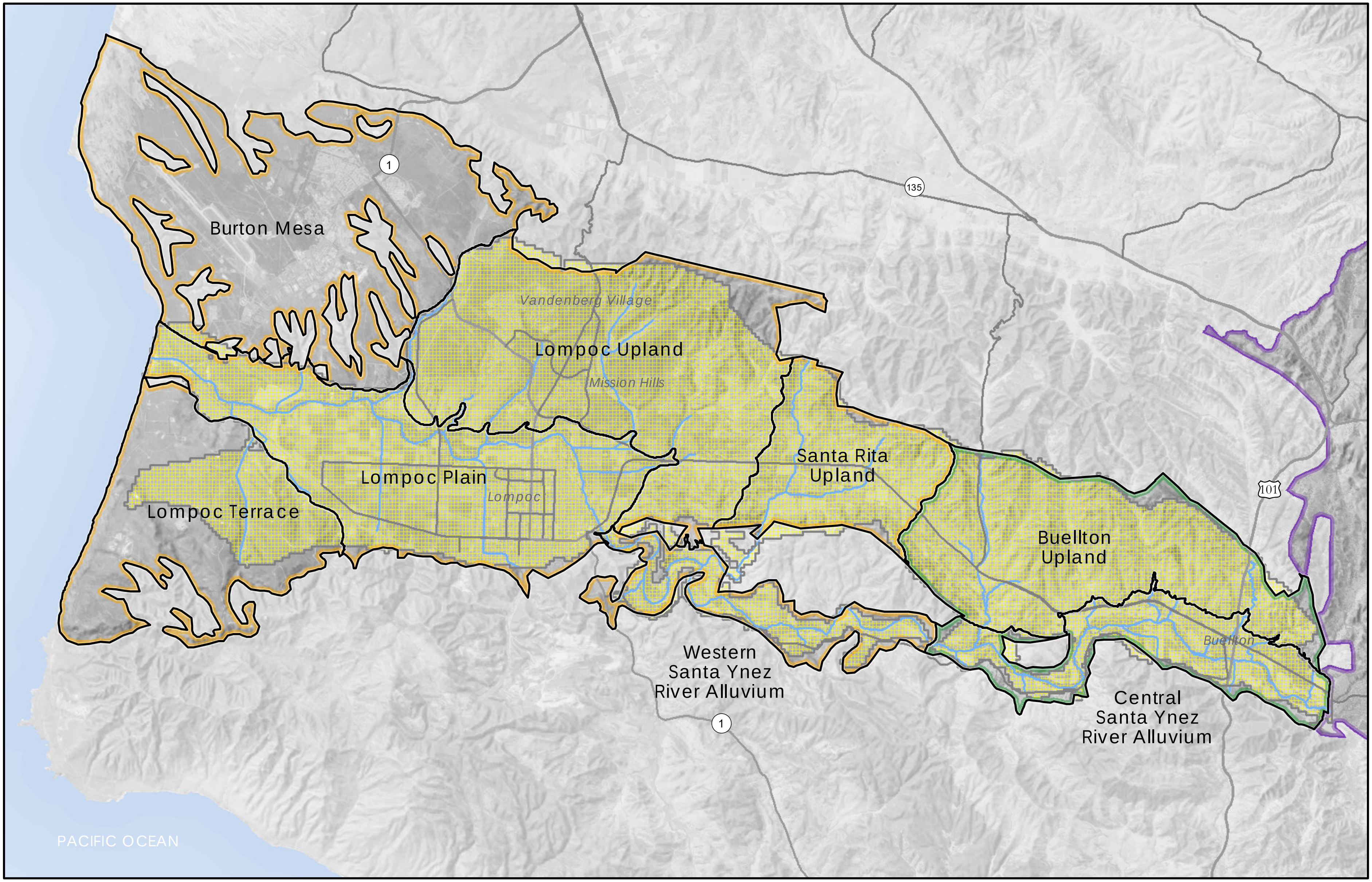
0 2 4 Miles

N

FIGURE 1

Document Path: J:\jn2710\SYR_Model_Documentation_Report_Subareas.mxd



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Model Cell
Subarea Boundary
Model Boundary
Western Management Area
Central Management Area
Eastern Management Area

7 SUBAREAS WITHIN MODEL DOMAIN
WMA/CMA Model

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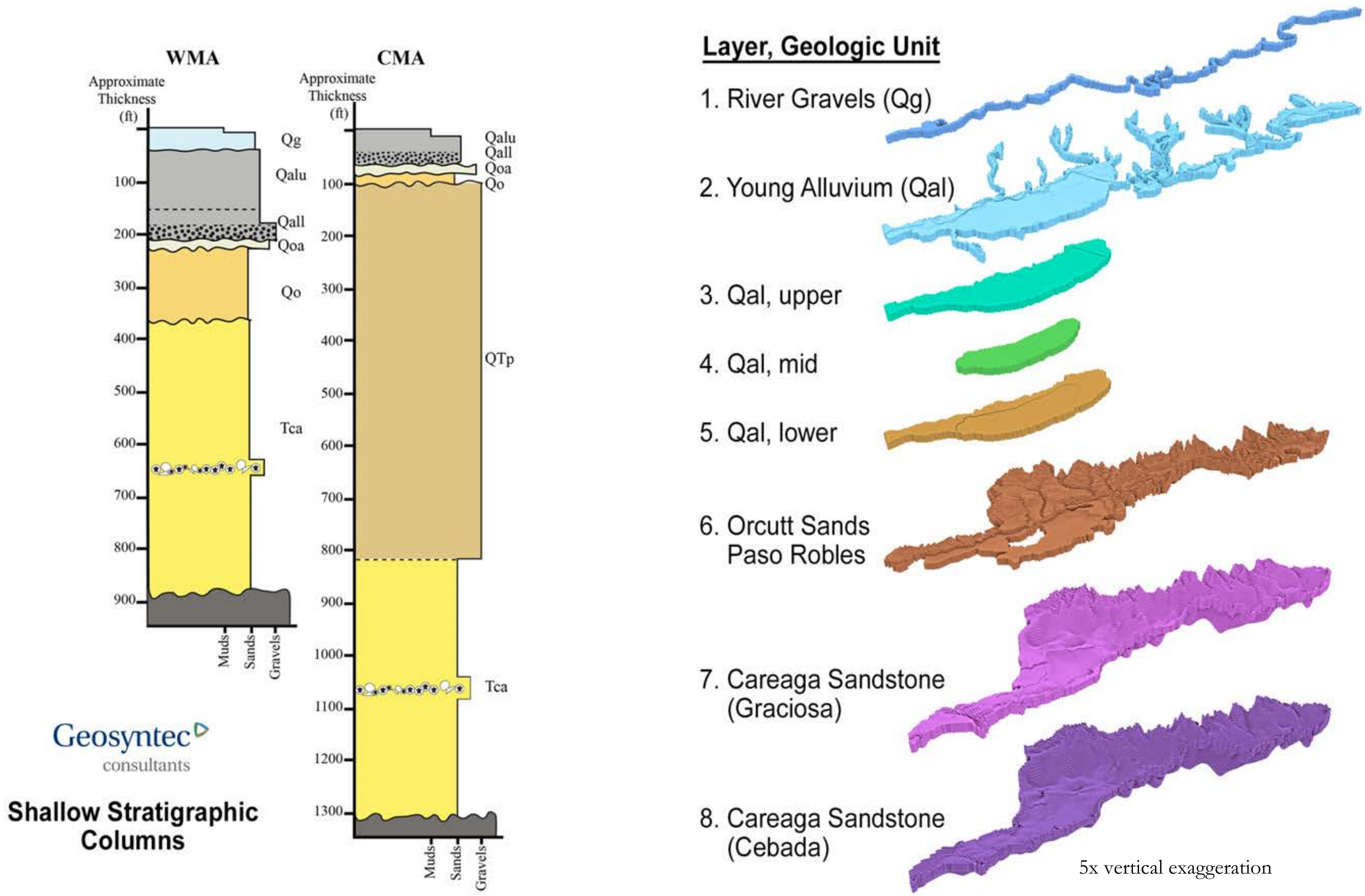
0 2 4 Miles

N

FIGURE 2



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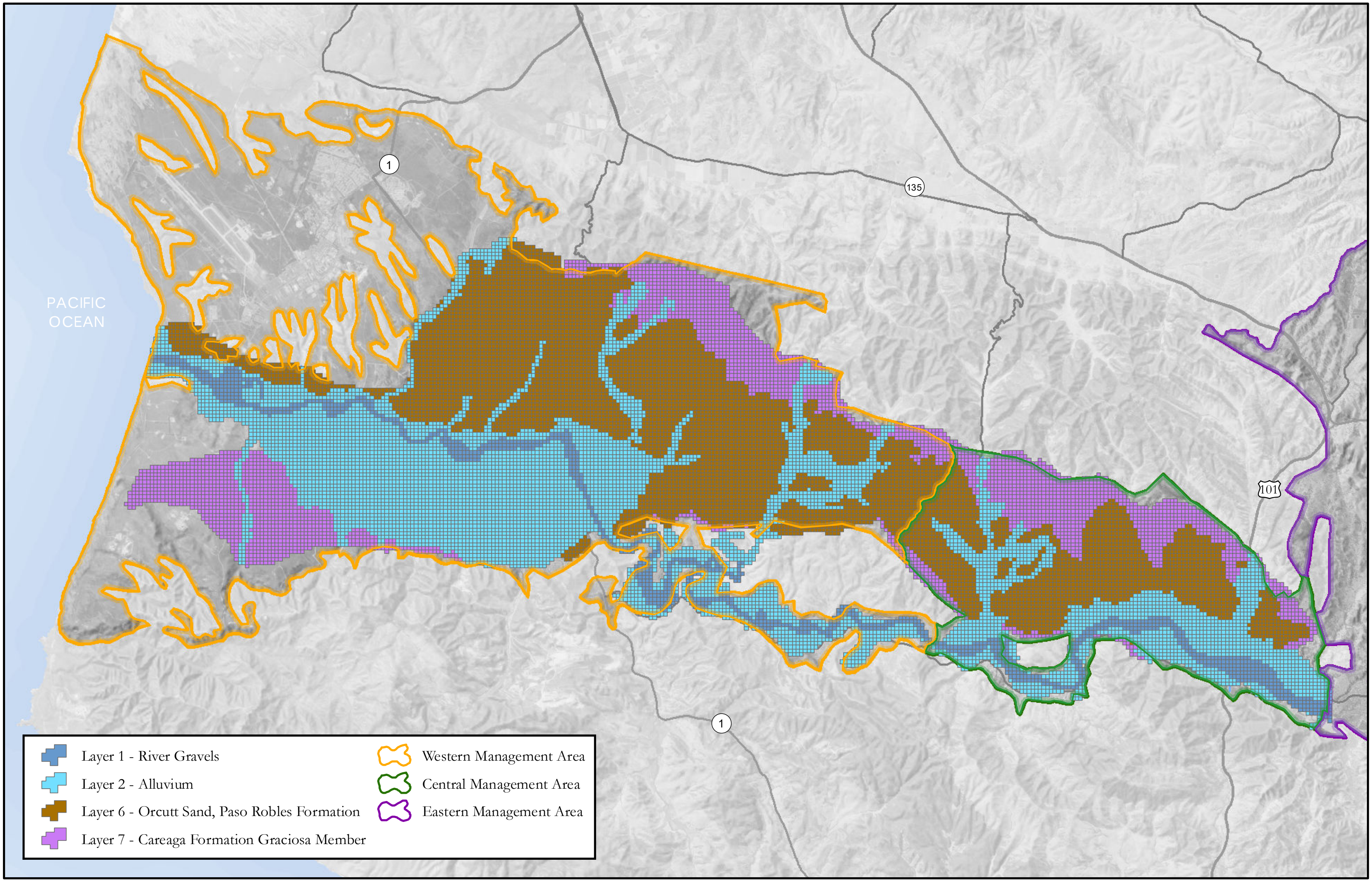
MODEL STRUCTURE AND GEOLOGIC LAYERING
WMA/CMA MODEL

FIGURE 3

Document Path: J:\jn2710\SYR_Model_Documentation_Report_UnstructuredGrid.mxd



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UNSTRUCTURED GRID SHOWING MODEL LAYERS EXPOSED AT LAND SURFACE WMA/CMA MODEL

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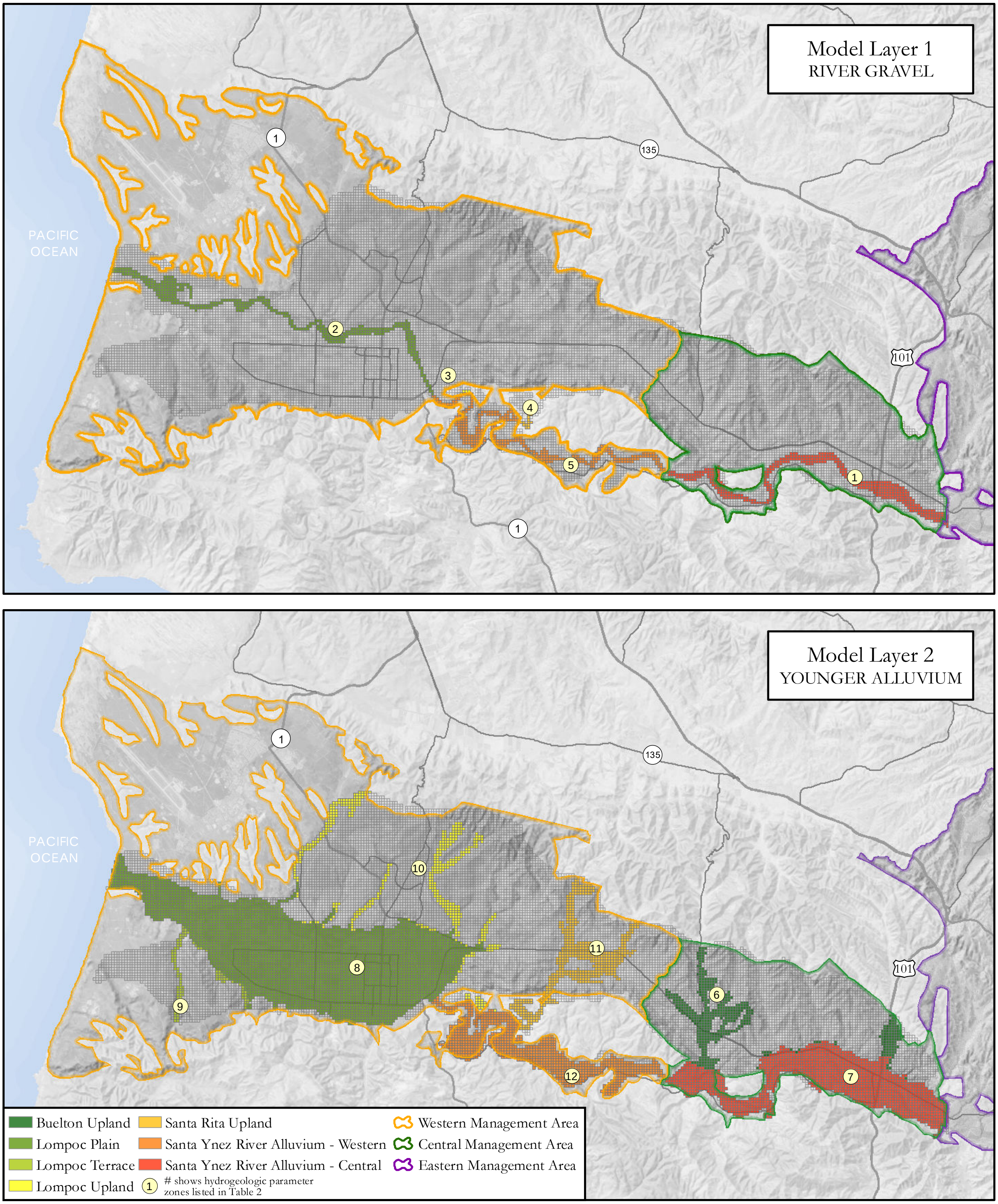
0 2 4 Miles

N

FIGURE 4



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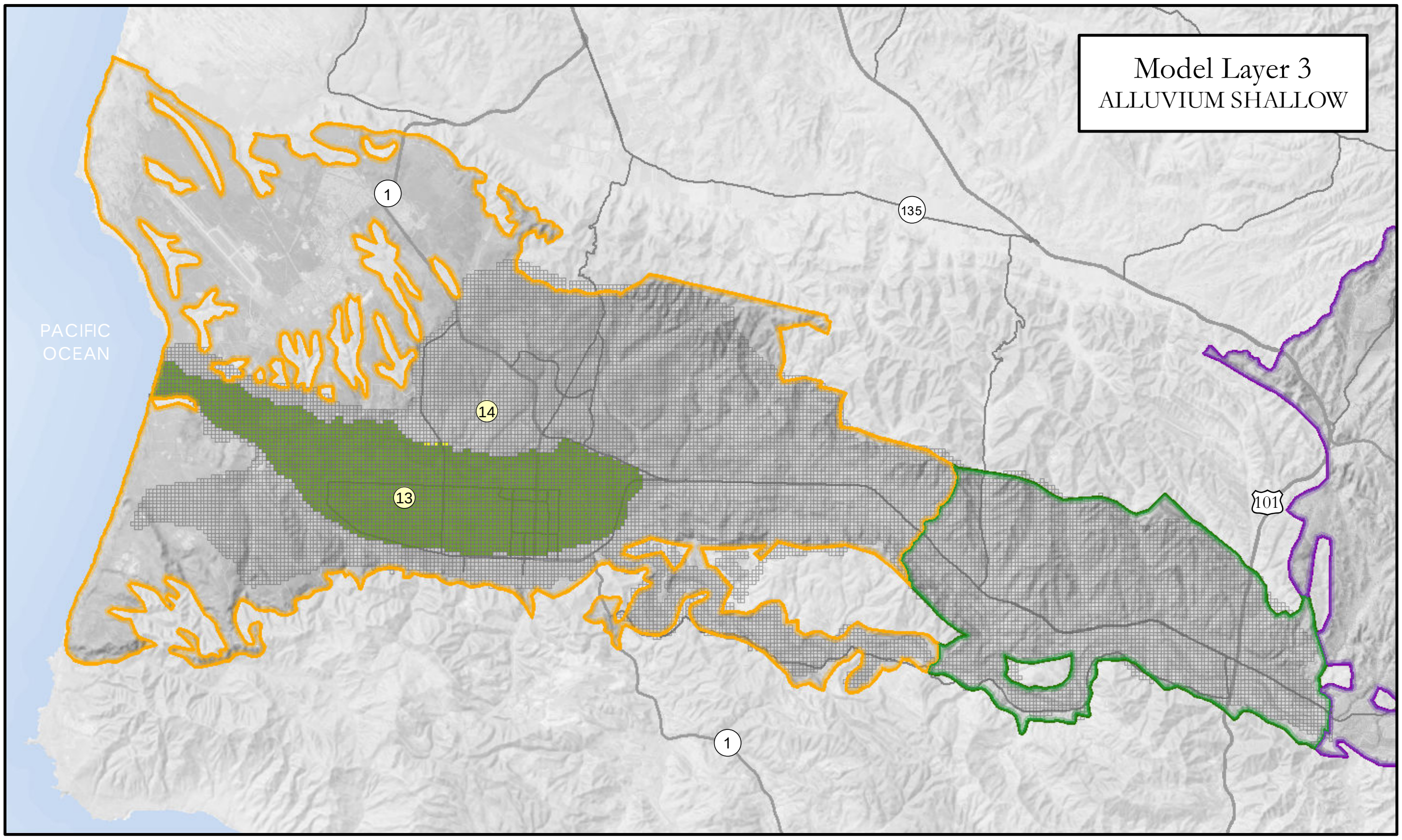
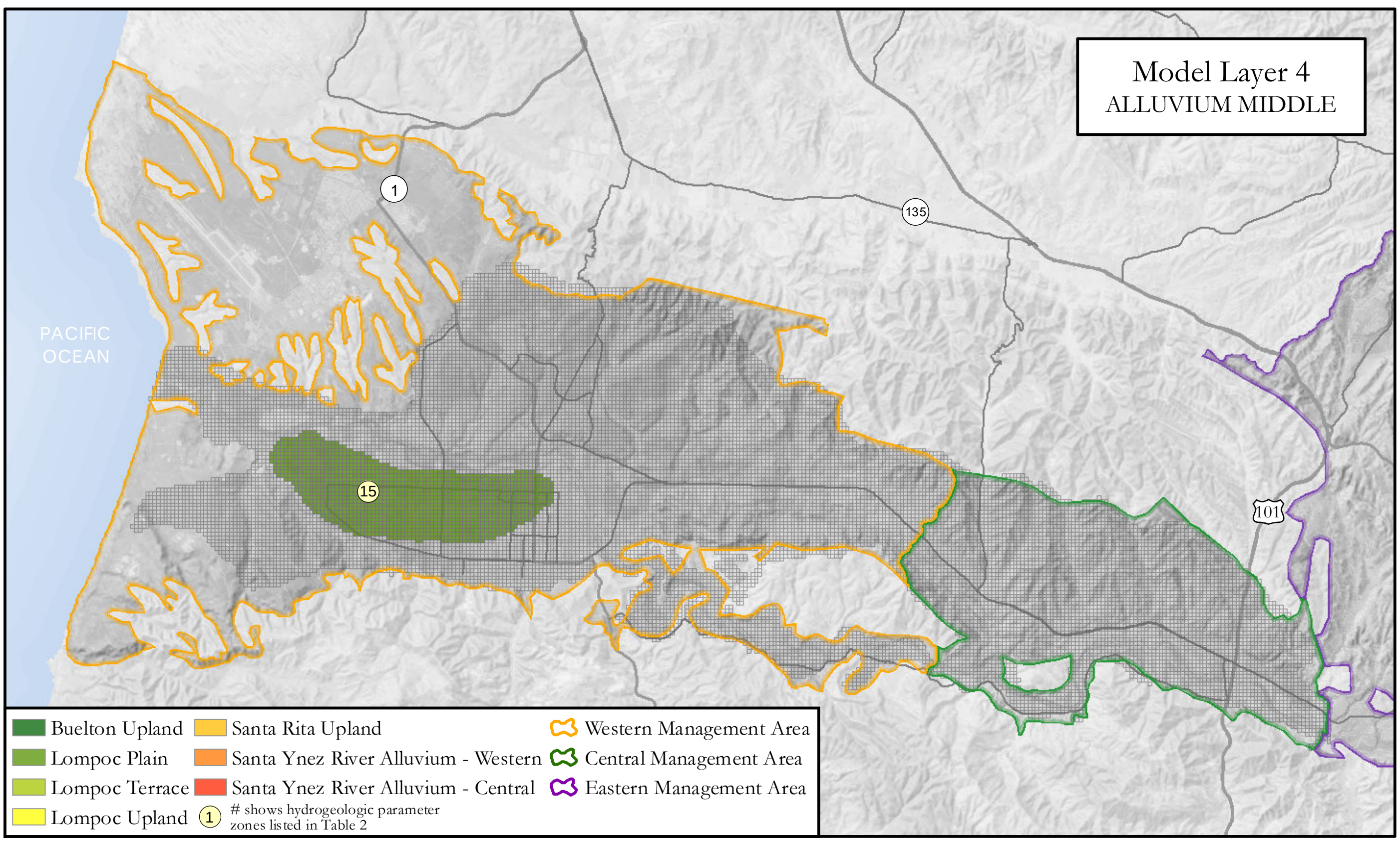
MODEL LAYERS 1 AND 2
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N
0 2 4 Miles

FIGURE 6





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MODEL LAYERS 3 AND 4
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles

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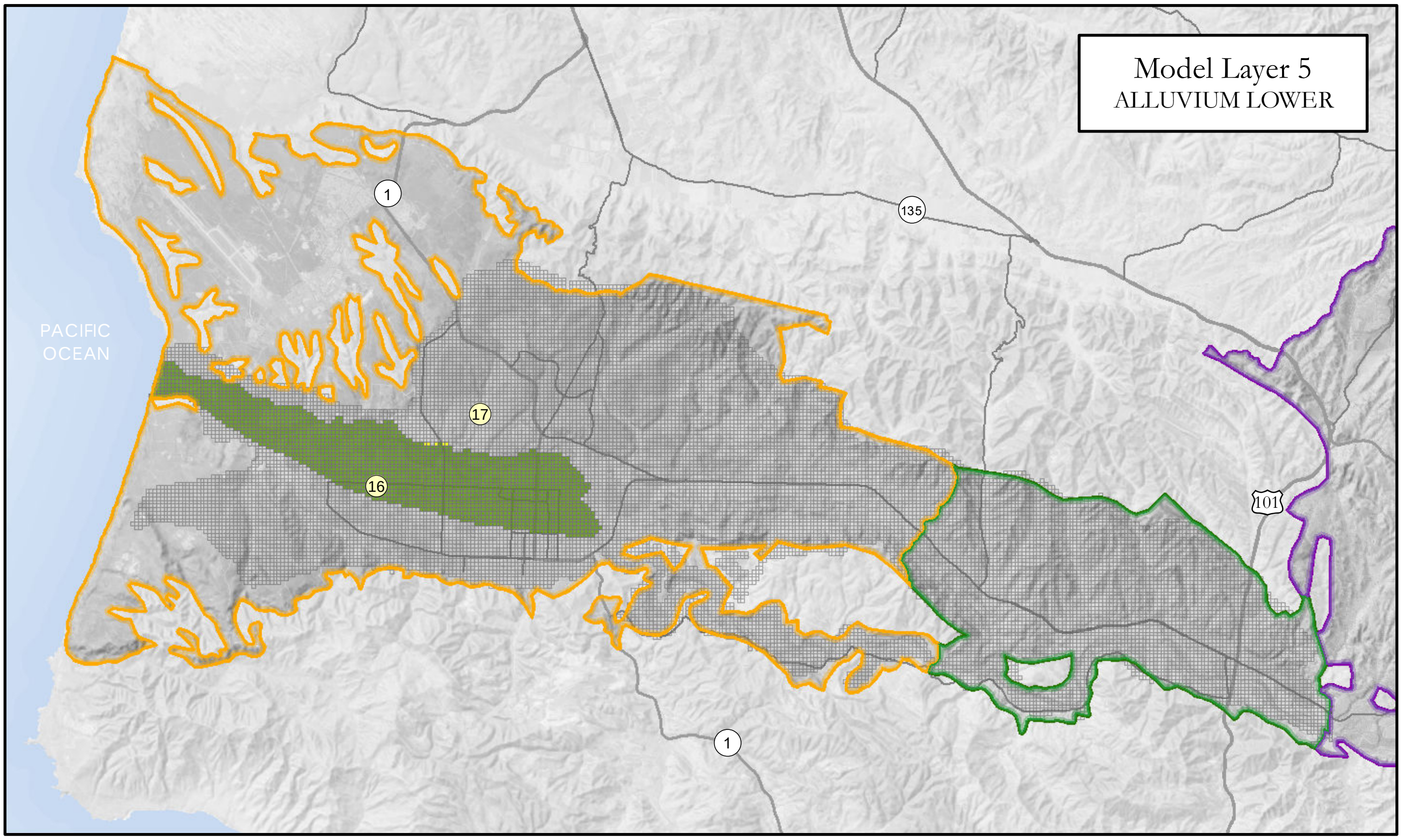
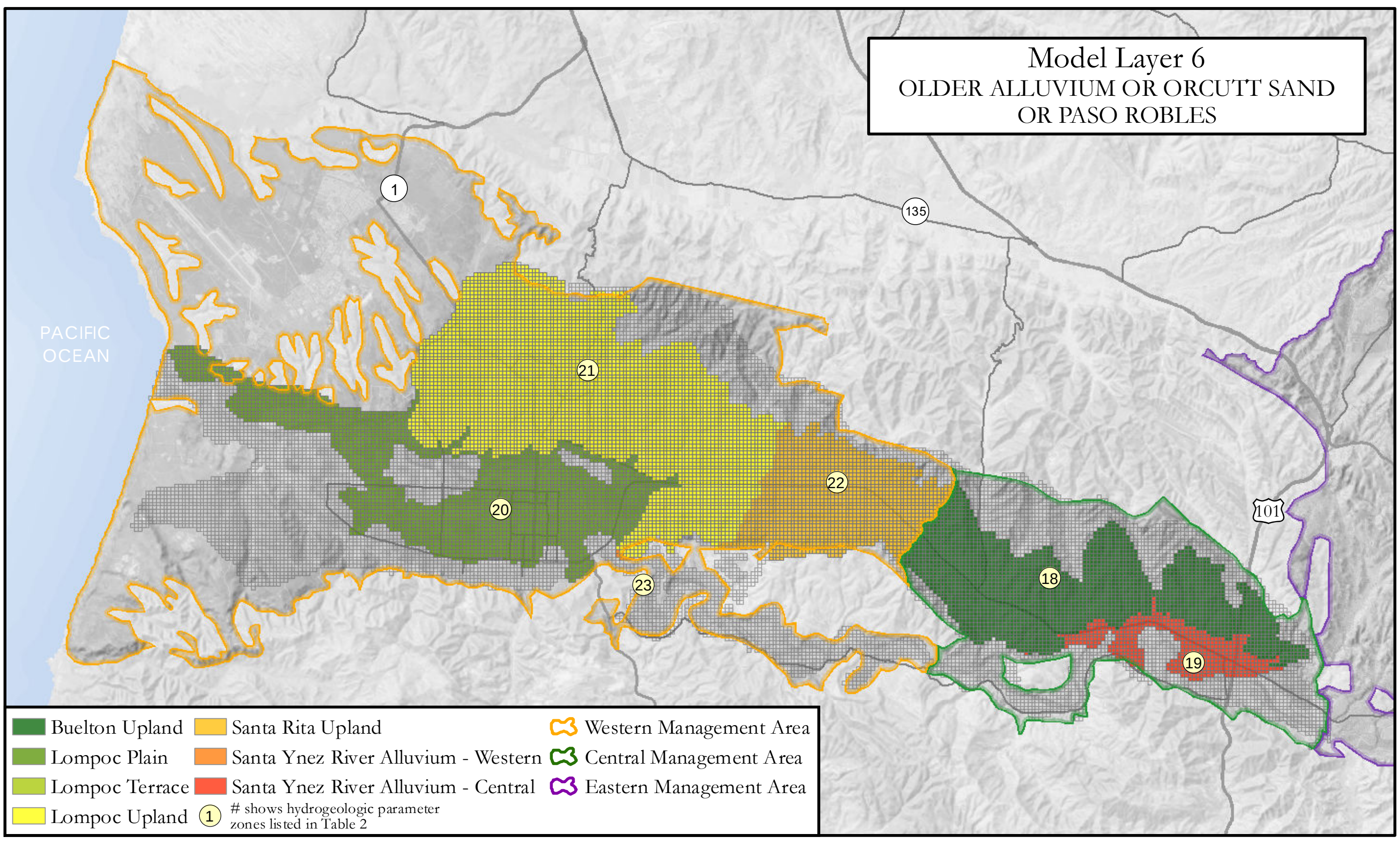
FIGURE 7





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MODEL LAYERS 5 AND 6
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles

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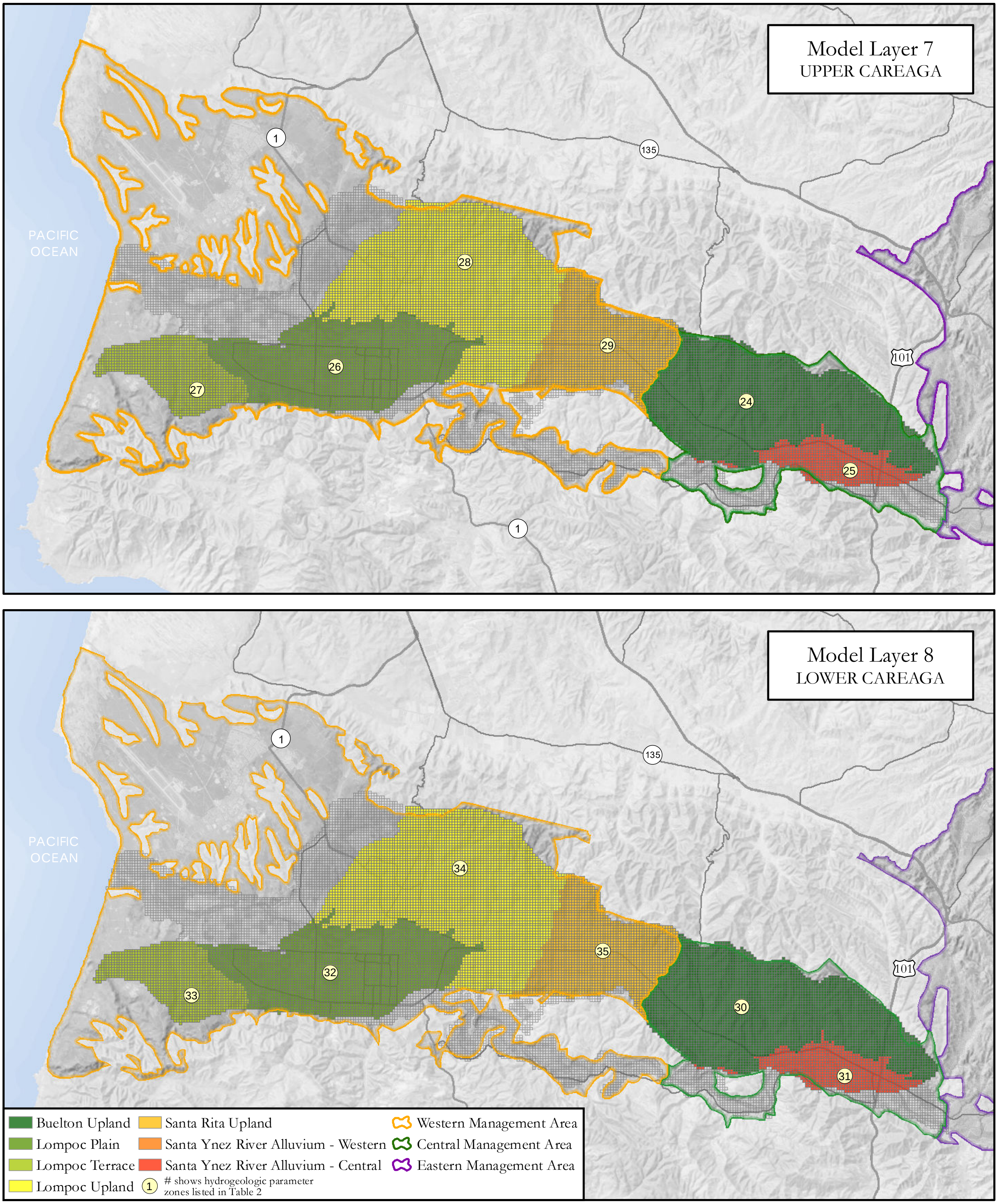

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MODEL LAYERS 7 AND 8
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles

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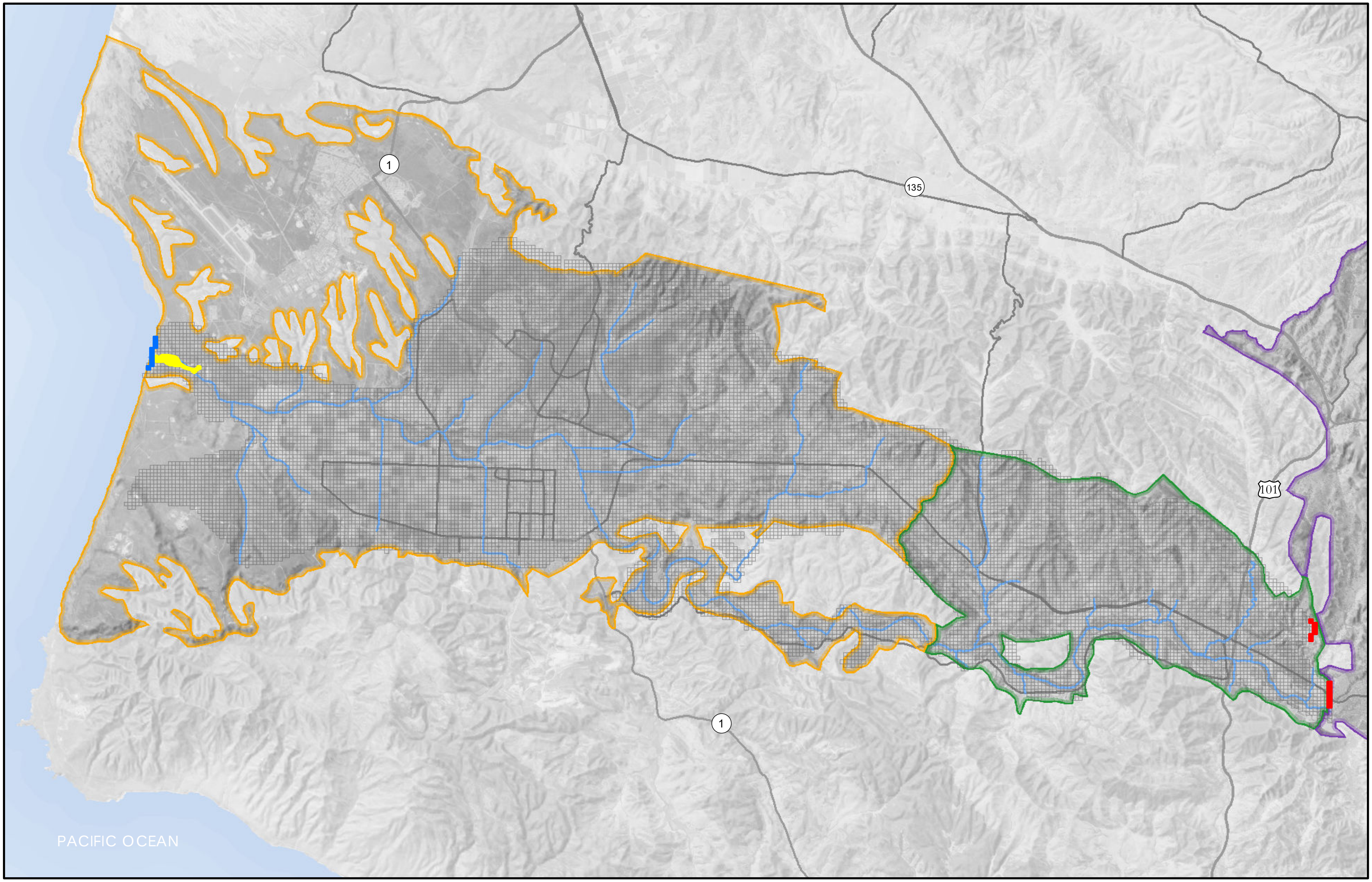

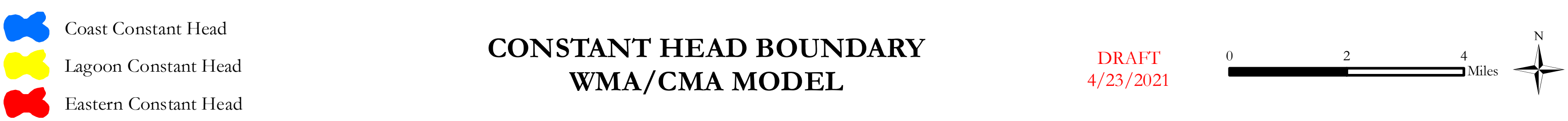

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CONSTANT HEAD BOUNDARY
WMA/CMA MODEL

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FIGURE 9

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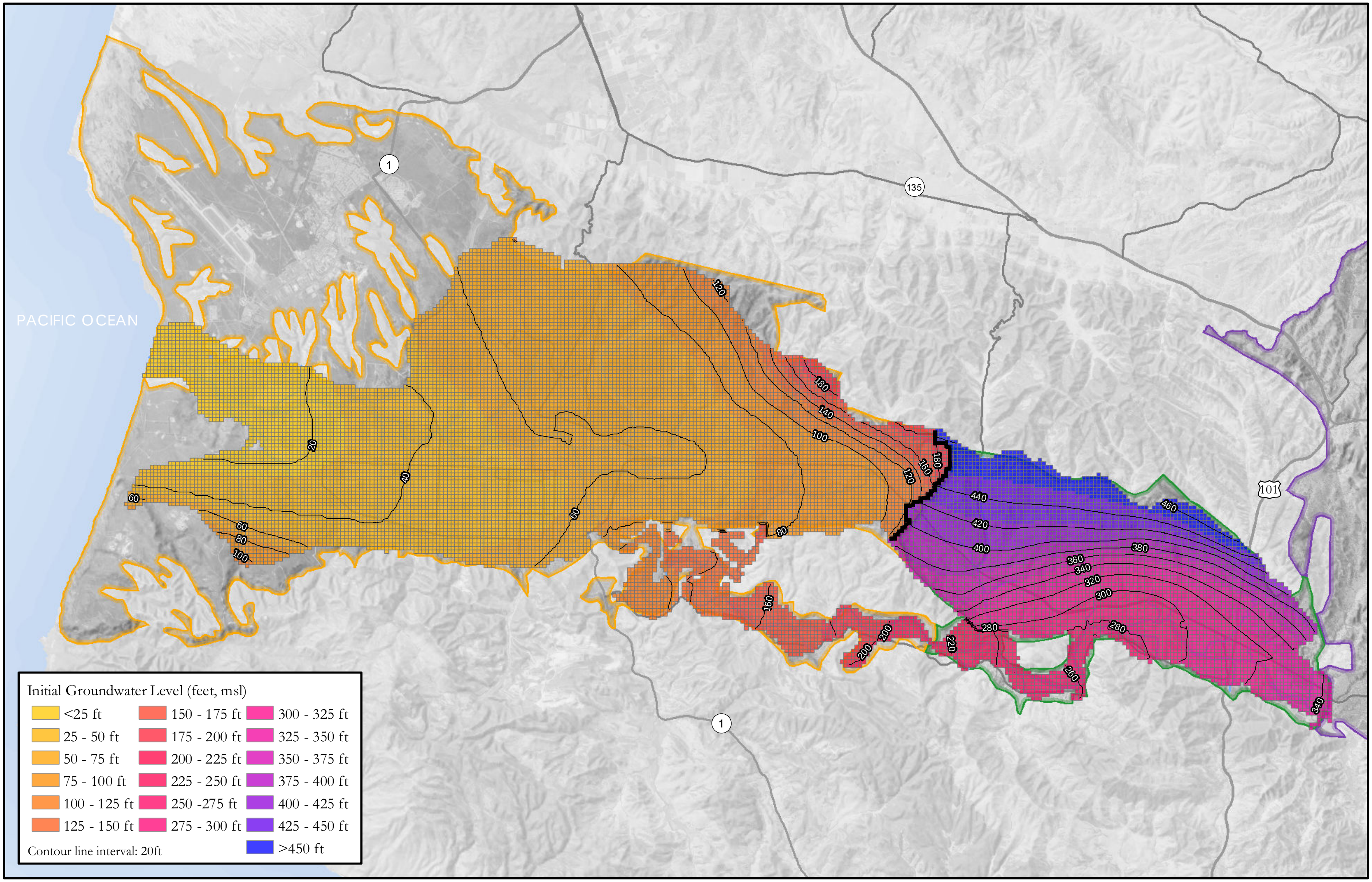

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INITIAL GROUNDWATER LEVELS REPRESENTING OCTOBER 1981 CONDITIONS WMA/CMA MODEL

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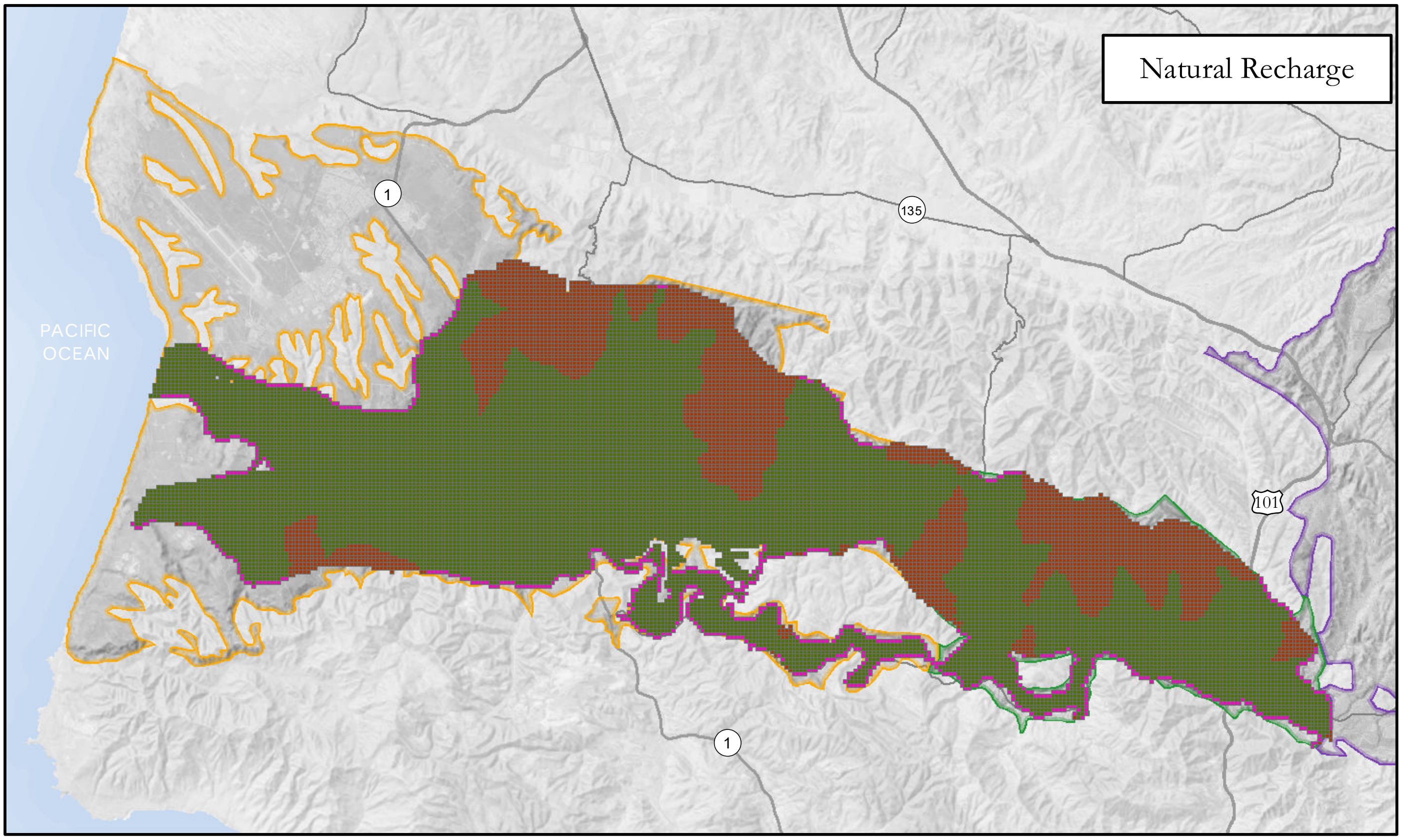
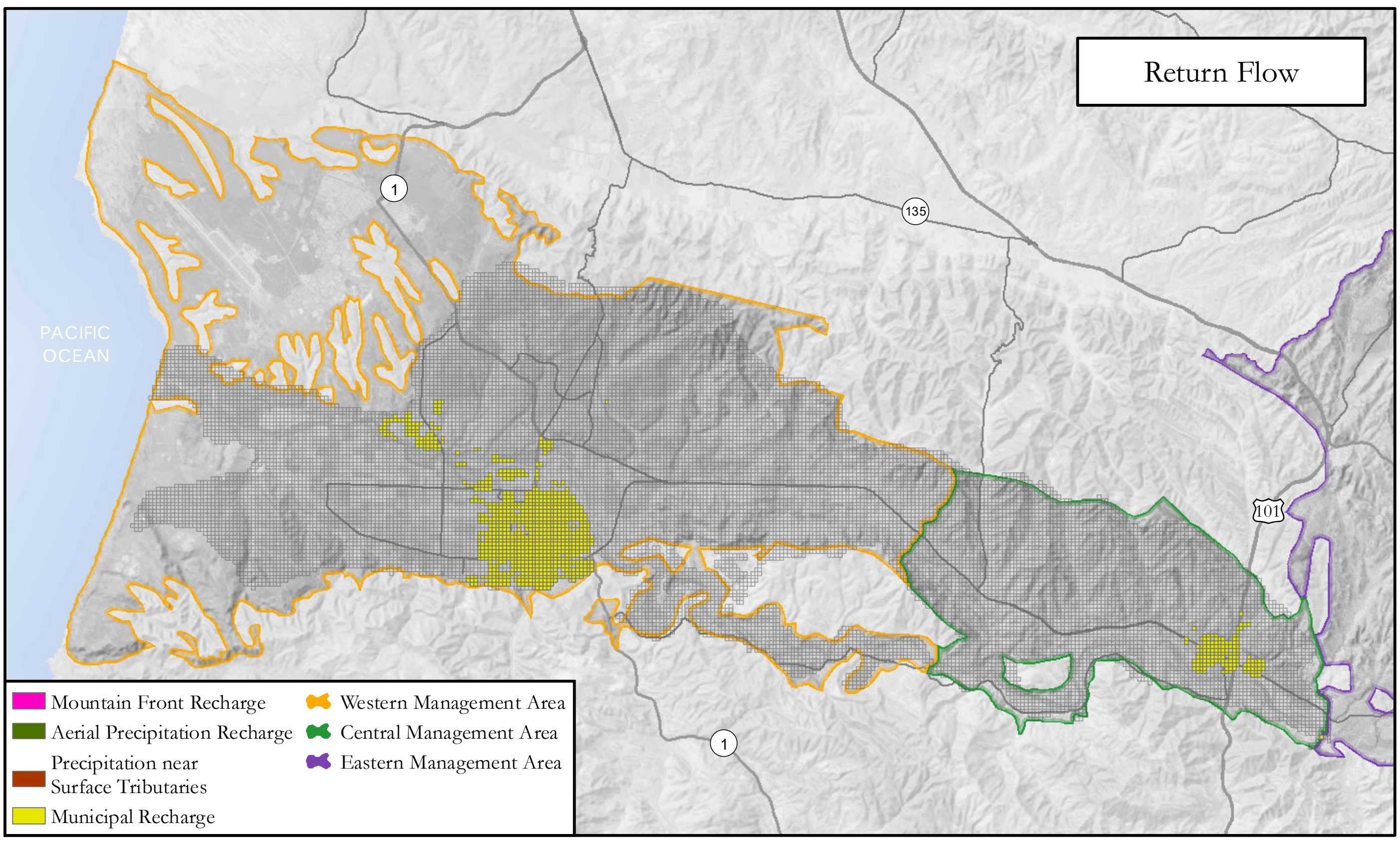
0 2 4 Miles

N

FIGURE 10

FIGURE 11





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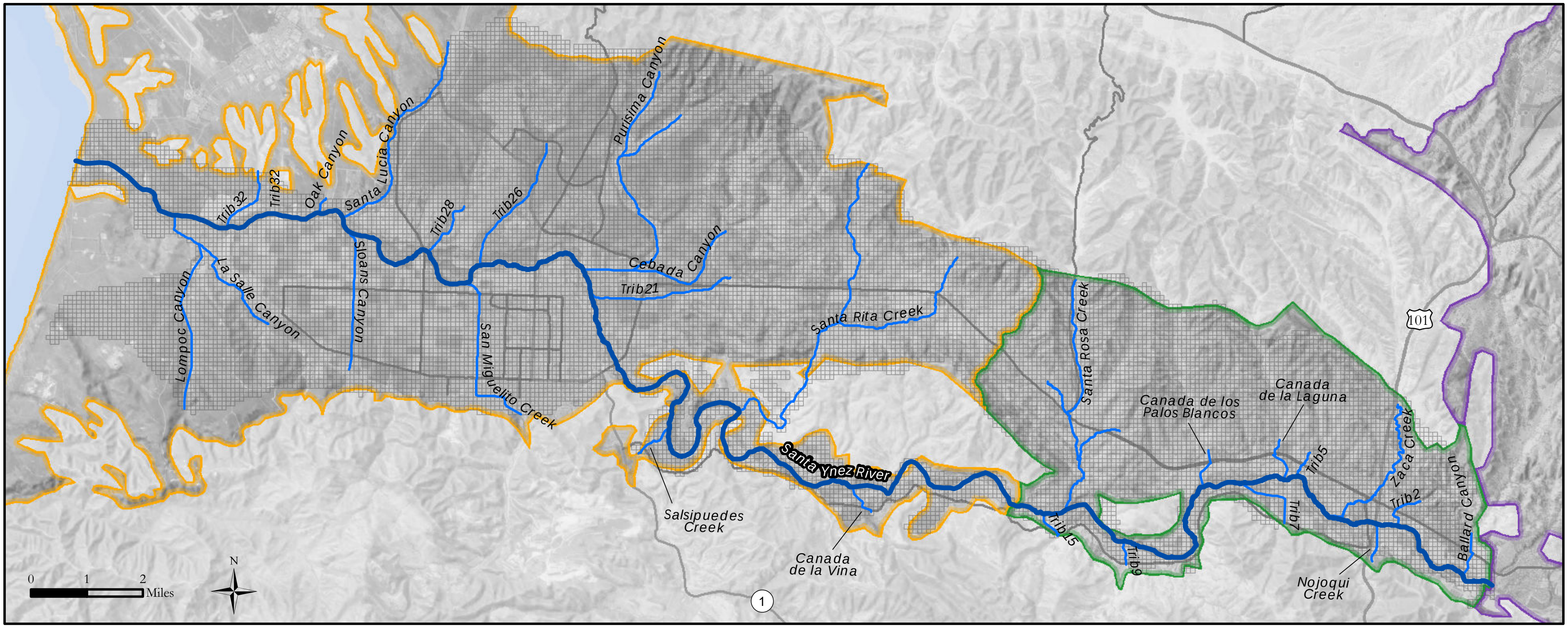
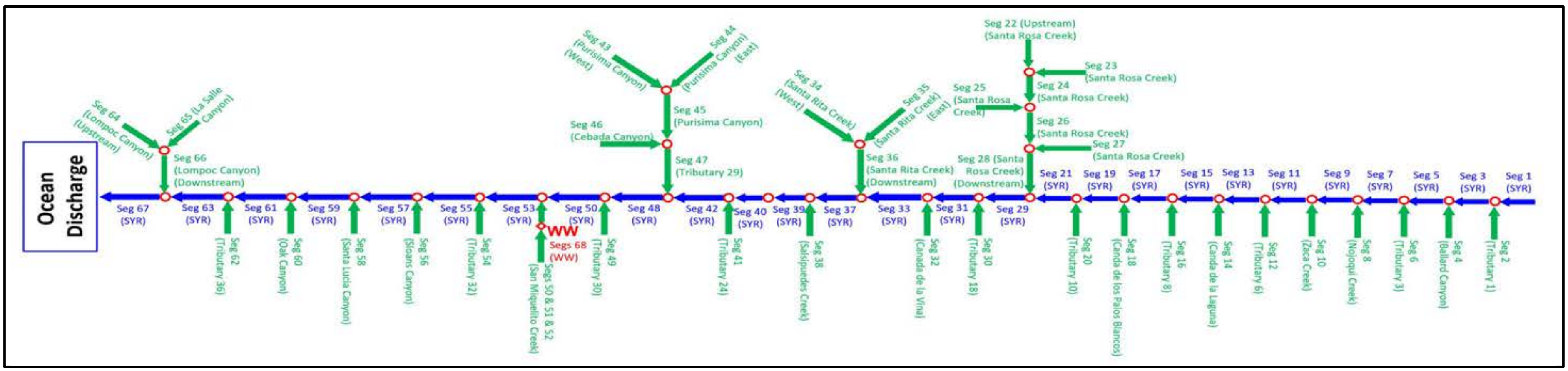
NATURAL RECHARGE AND RETURN FLOW ASSIGNED TO UPPERMOST LAYER WMA/CMA MODEL

N

0 2 4 Miles





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SANTA YNEZ RIVER AND TRIBUTARY SYSTEM SIMULATED IN THE WMA/CMA MODEL

FIGURE 12

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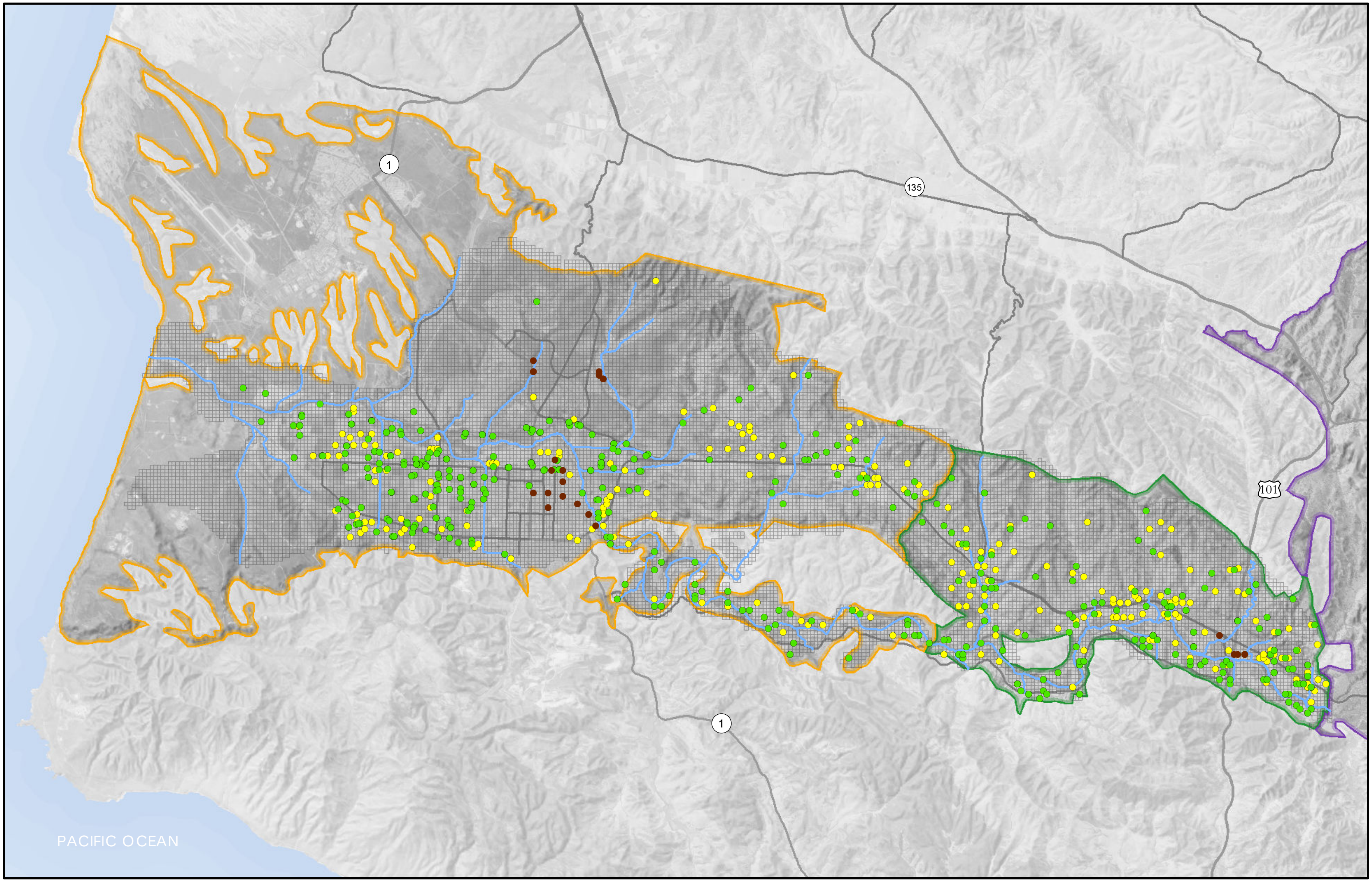

Municipal Well

Agriculture Well

Domestic Well

AGRICULTURAL, MUNICIPAL, AND DOMESTIC WELLS SIMULATED IN THE WMA/CMA MODEL

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0 2 4 Miles

N

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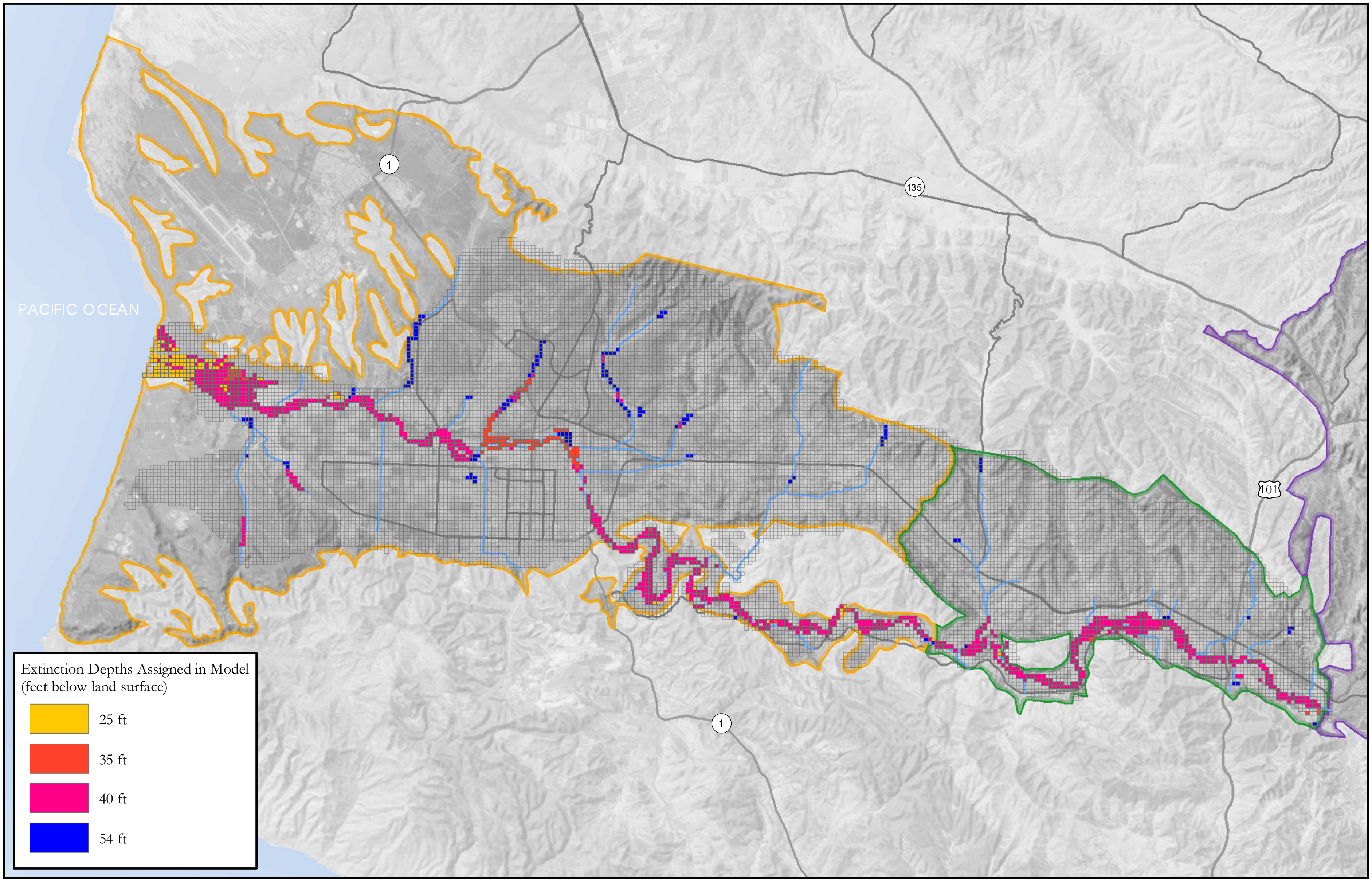
FIGURE 13



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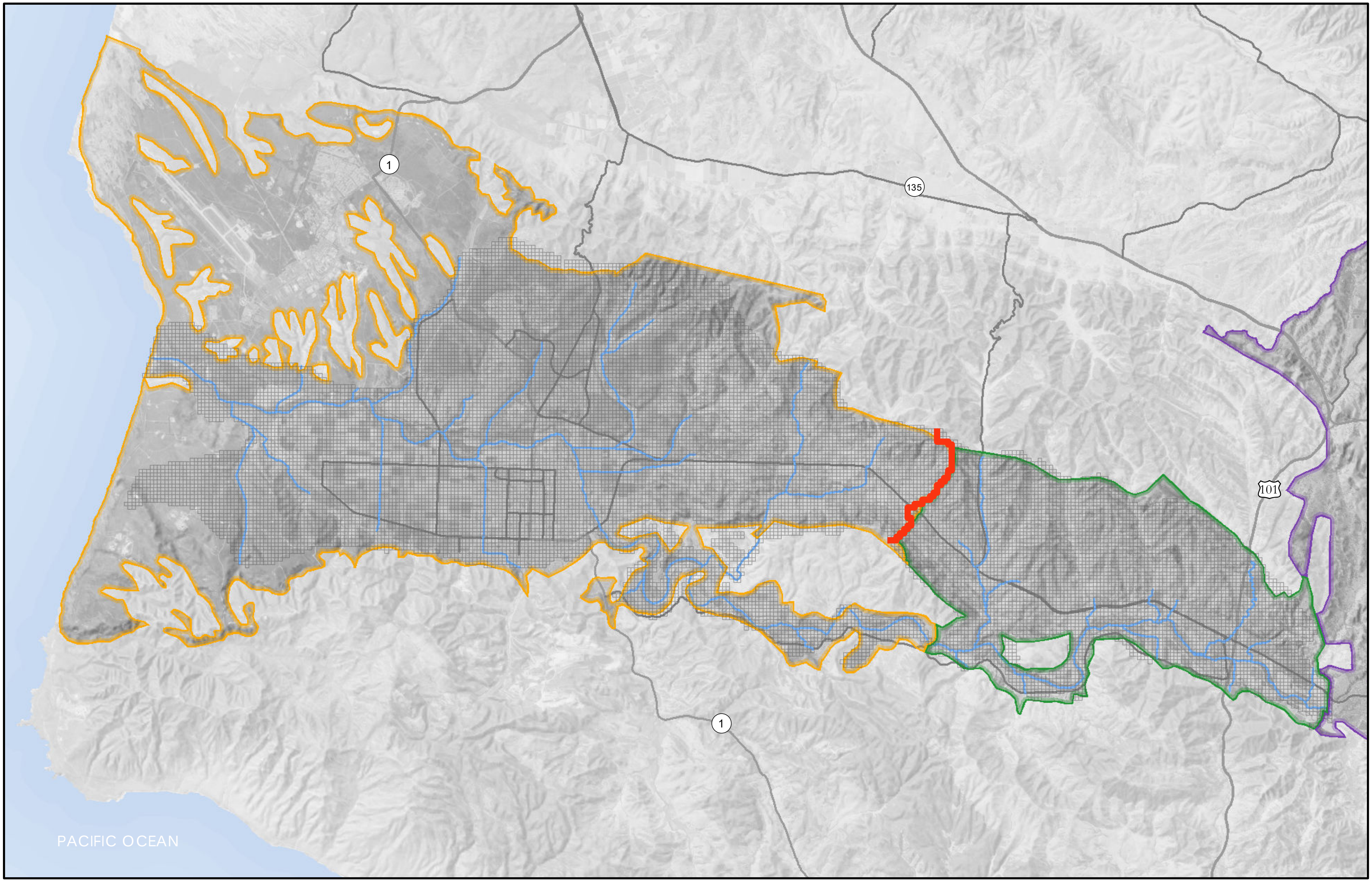
EVAPOTRANSPIRATION
ASSIGNED TO UPPERMOST LAYER IN WMA/CMA MODEL

FIGURE 14



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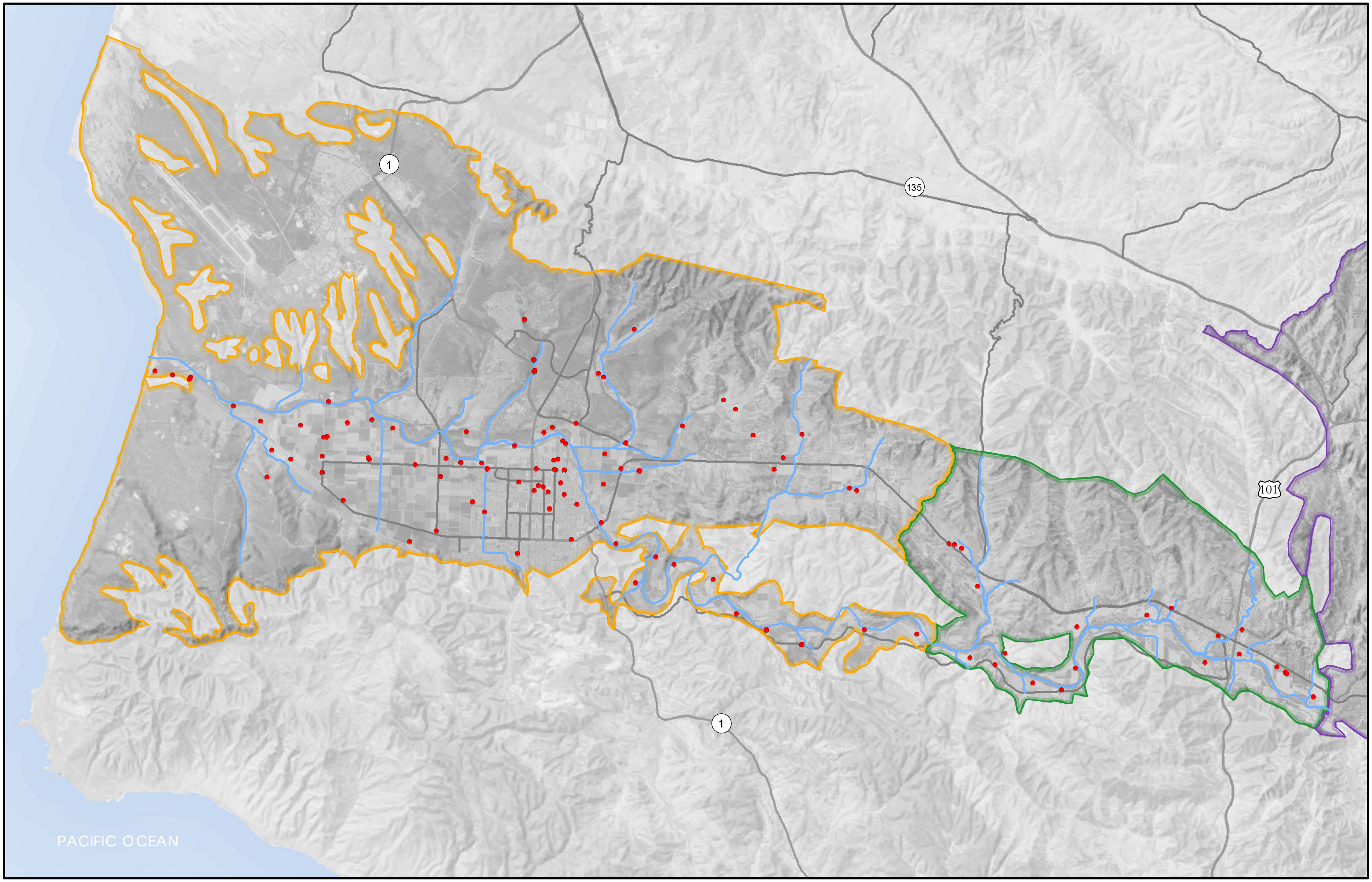
GROUNDWATER FLOW BARRIER BETWEEN BUELTON AND SANTA RITA UPLAND WMA/CMA MODEL

FIGURE 15

Document Path: J:\jn2710\SYR_Model_Documentation_Report_CalWells.mxd



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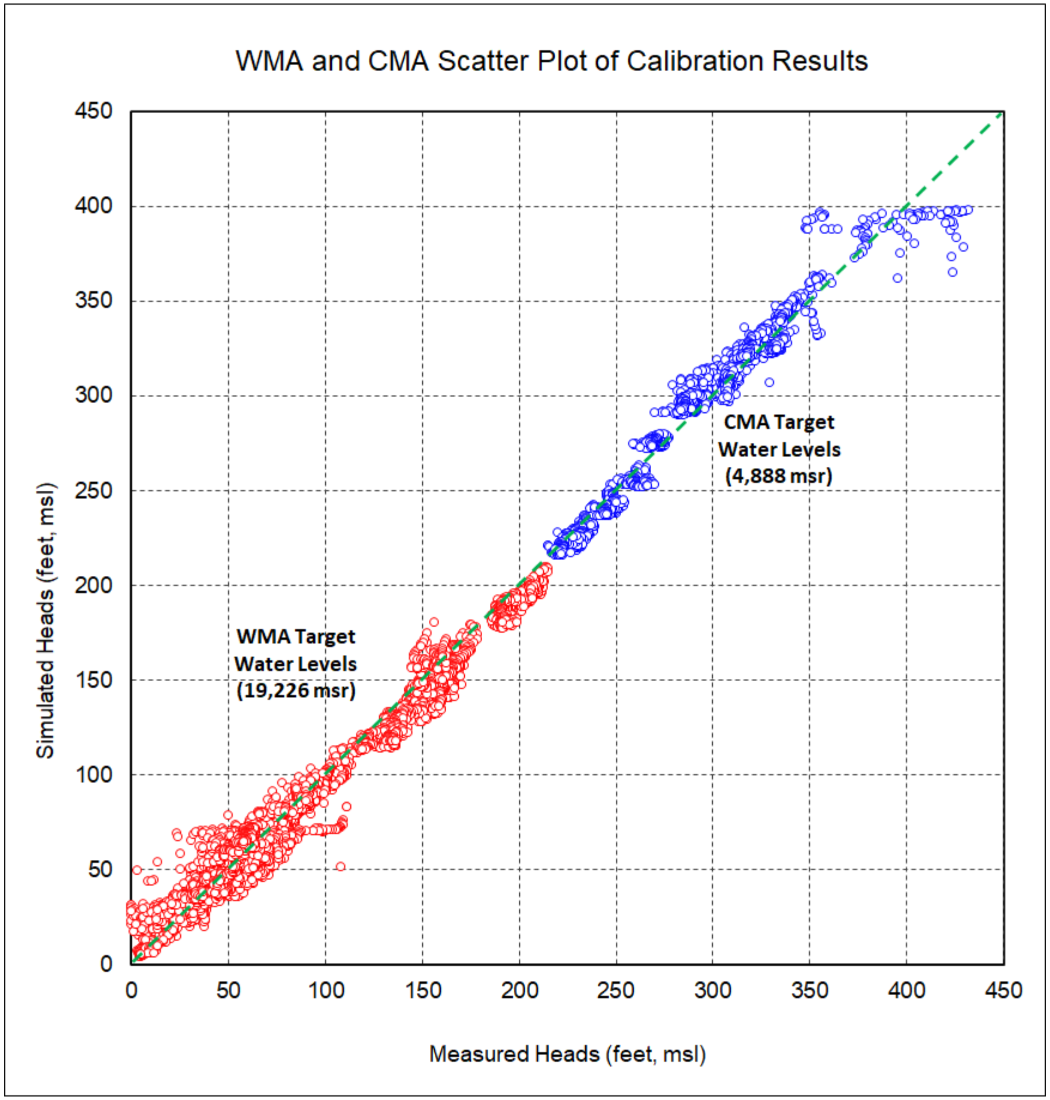
TARGET WELL LOCATION FOR MODEL CALIBRATION
WMA/CMA MODEL

0 2 4 Miles

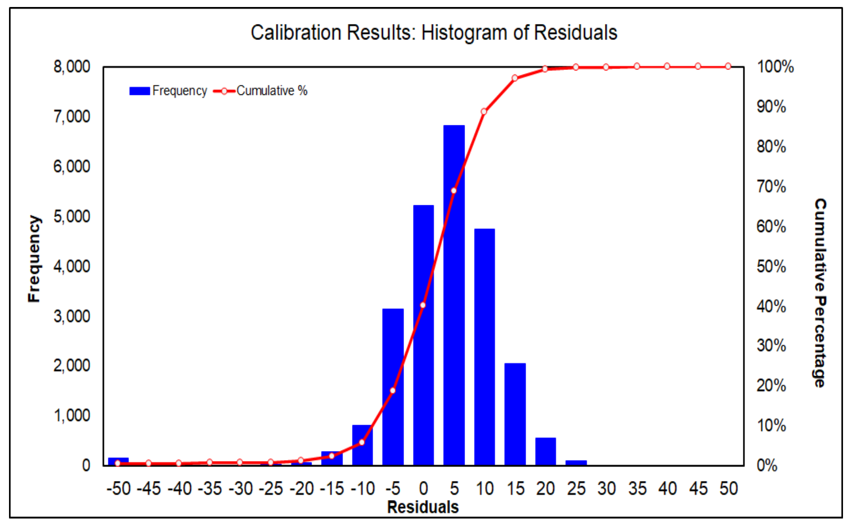
N

FIGURE 16



Residual (msr-sim) Statistics

	ALL	WMA	CMA
Mean	0.99	1.40	-0.62
Standard Error	0.06	0.07	0.10
Median	1.70	2.09	-0.20
Mode	3.00	7.50	-6.50
Standard Deviation	9.63	10.13	7.10
Sample Variance	92.67	102.59	50.40
Kurtosis	22.30	22.92	4.96
Skewness	-3.05	-3.36	0.14
Range	138.26	135.92	102.00
Minimum	-79.56	-79.56	-43.30
Maximum	58.70	56.36	58.70
Sum	23,795	26,827	-3,032
Count	24,114	19,226	4,888
Confidence Level (95.0%)	0.12	0.14	0.20



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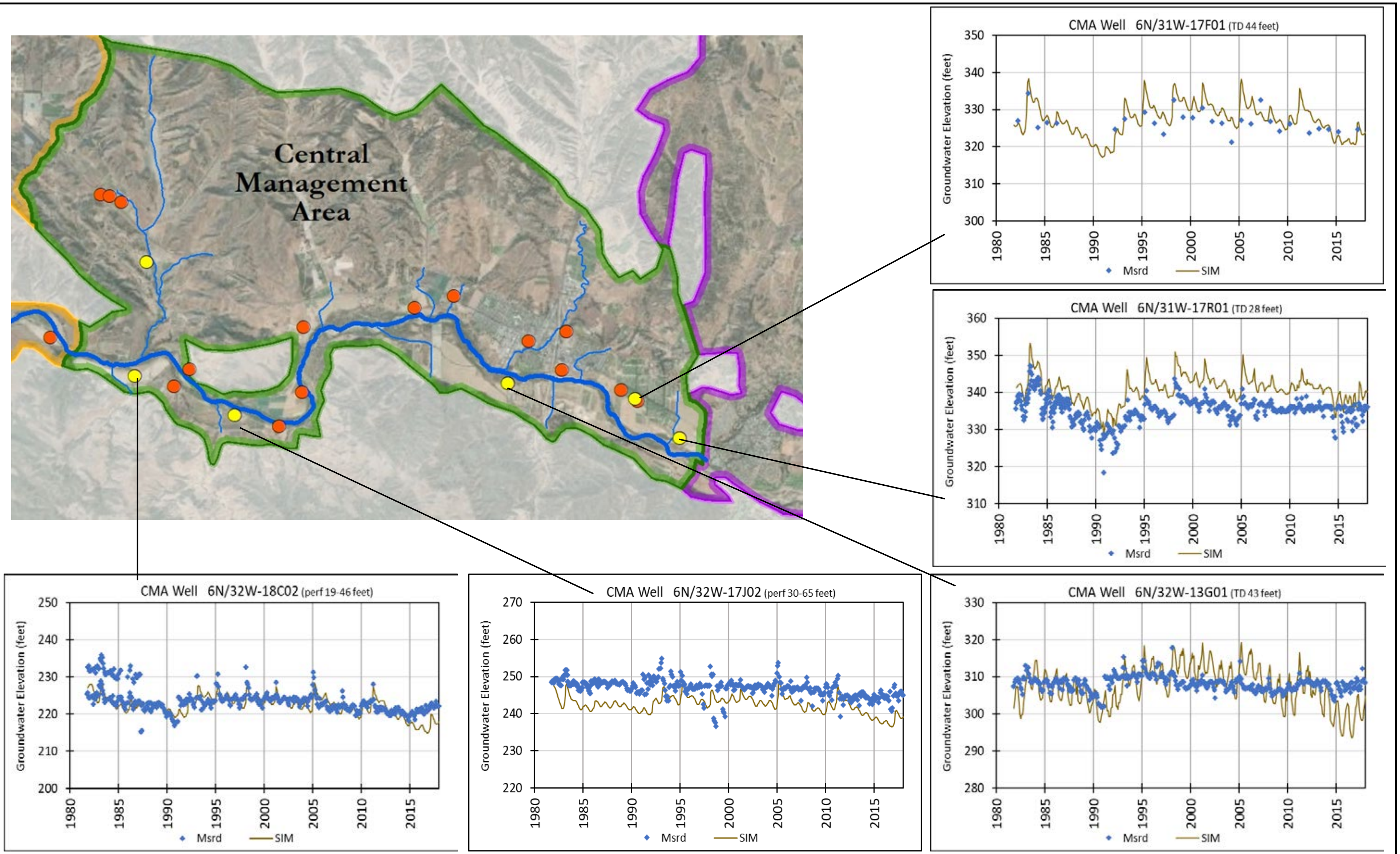
GROUNDWATER LEVEL CALIBRATION STATISTICS
WMA/CMA MODEL

FIGURE 17



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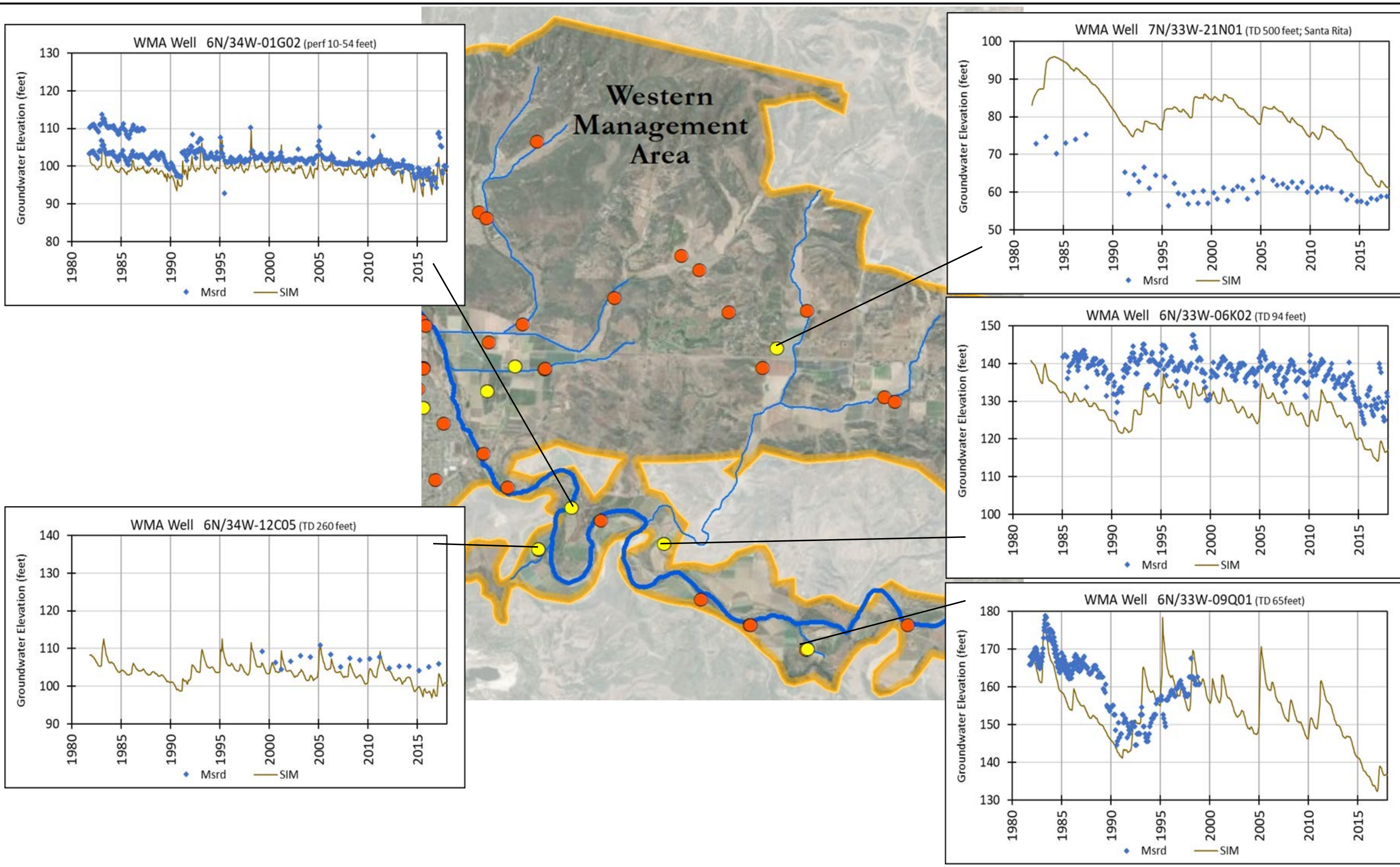
Groundwater Level Calibration
Measured and Simulated Hydrographs (1 of 6)
WMA/CMA Model

FIGURE 18



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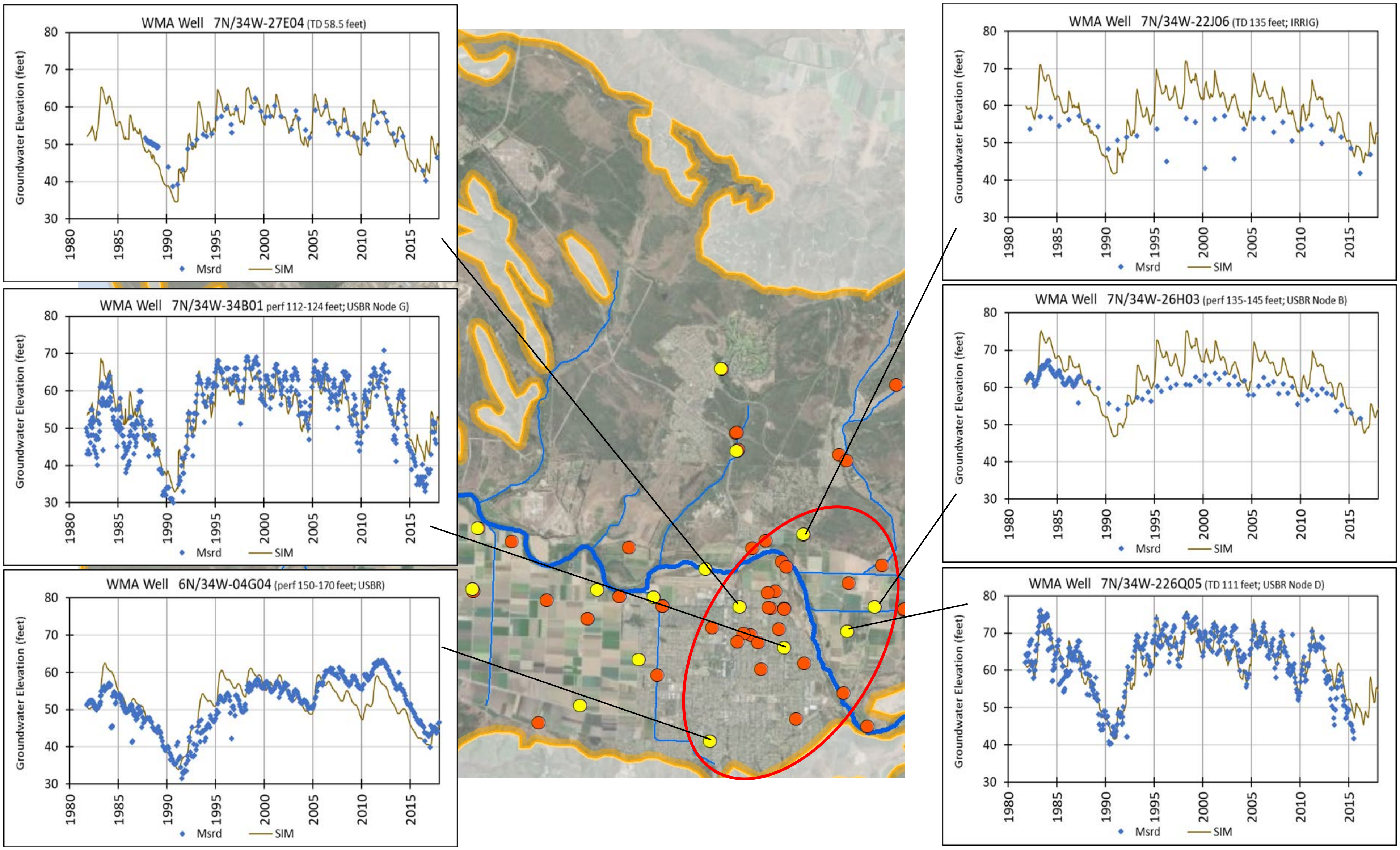
GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (2 OF 6)
WMA/CMA MODEL

FIGURE 19



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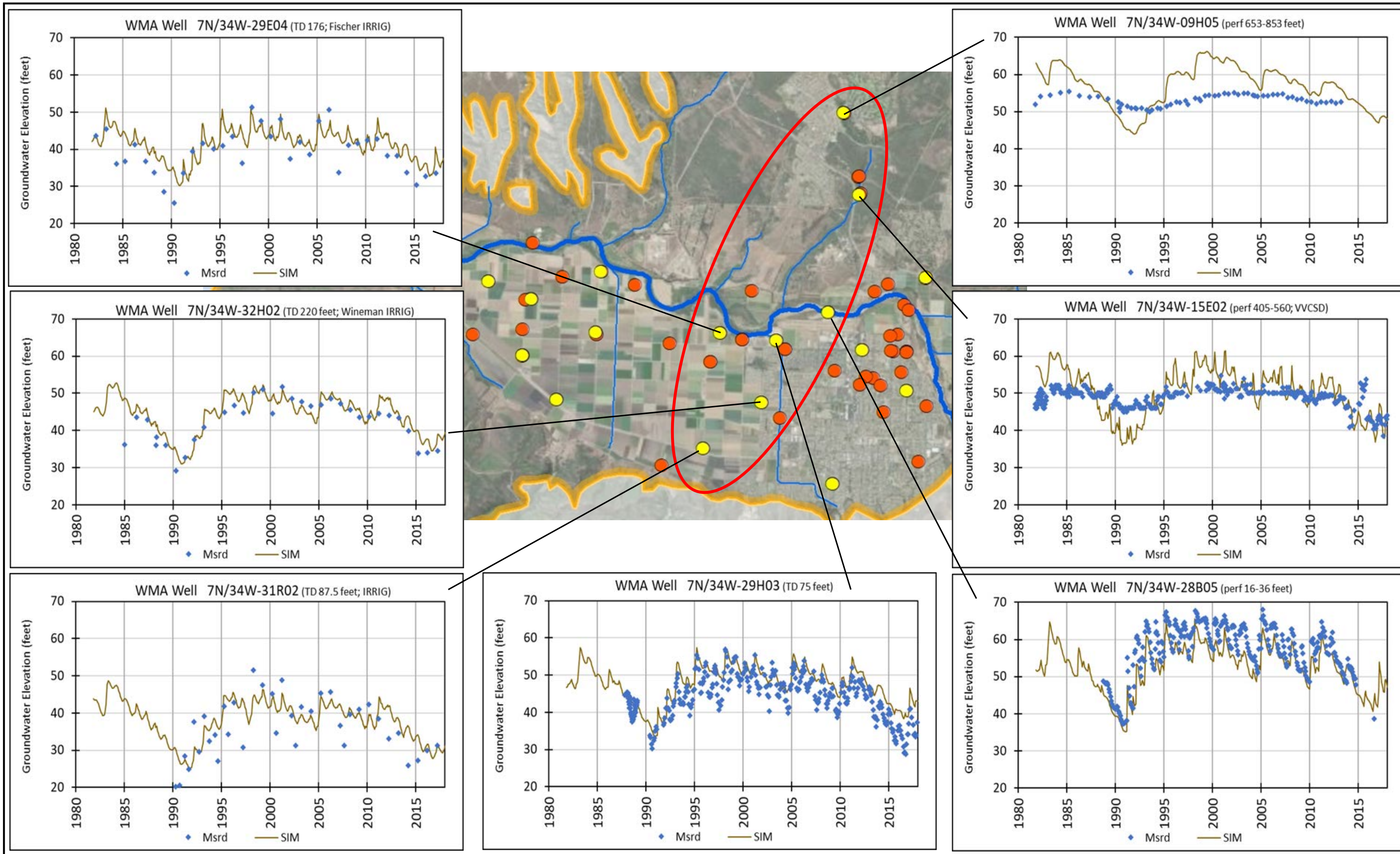
Groundwater Level Calibration
Measured and Simulated Hydrographs (3 of 6)
WMA/CMA Model

FIGURE 20



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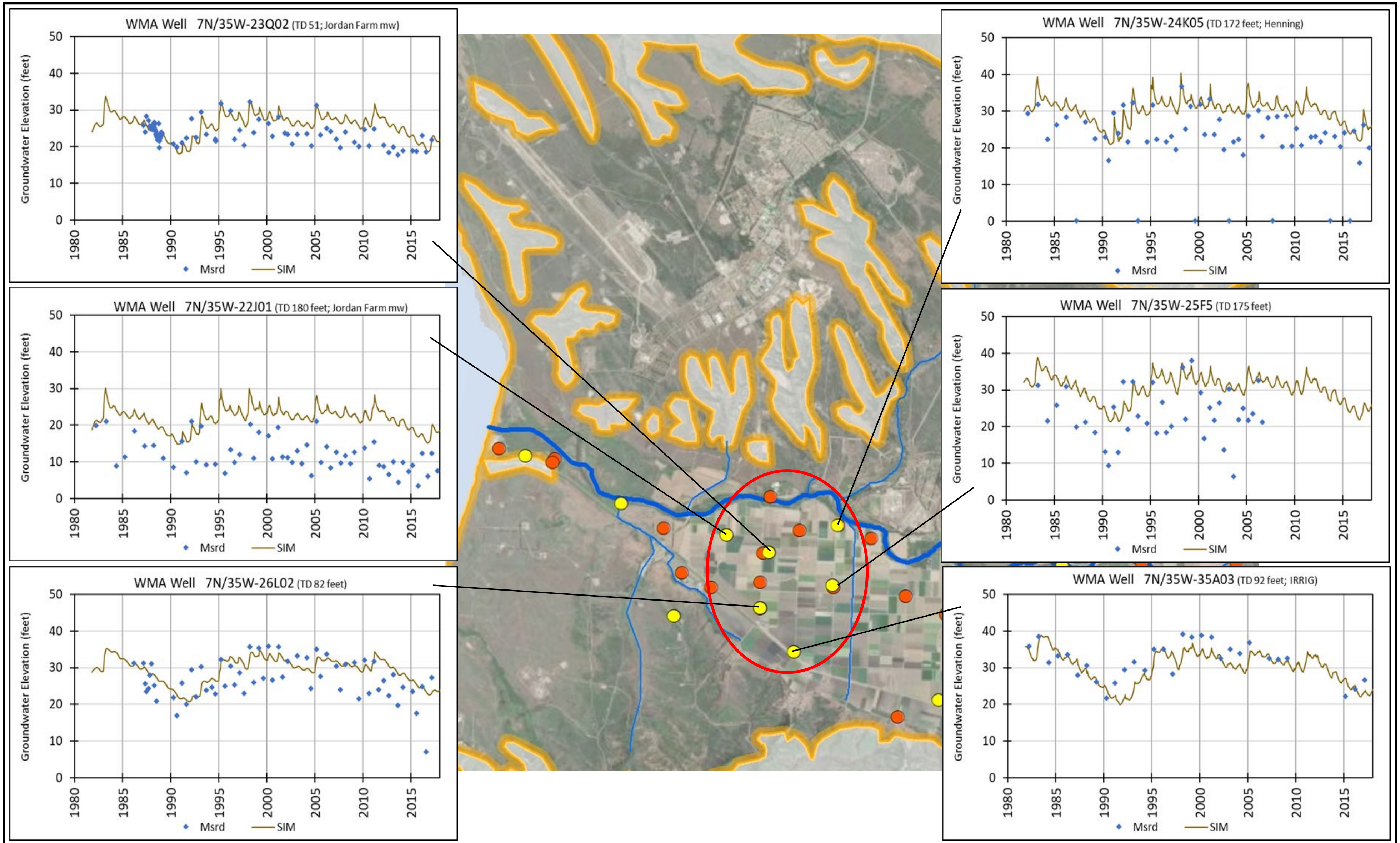
GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (4 OF 6)
WMA/CMA MODEL

FIGURE 21



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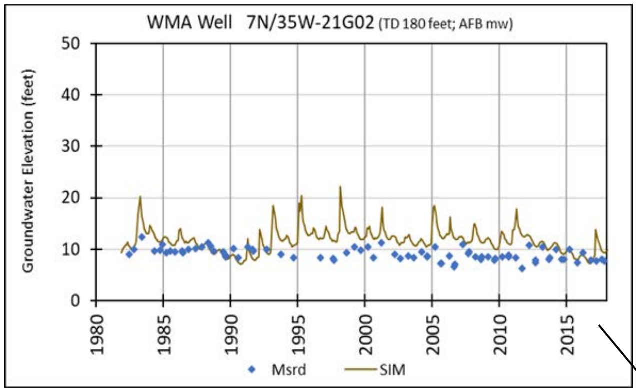
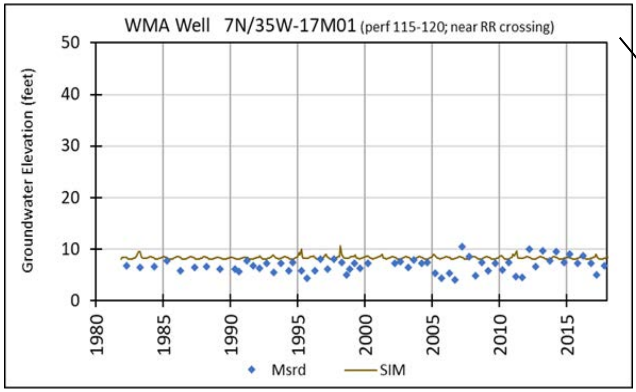
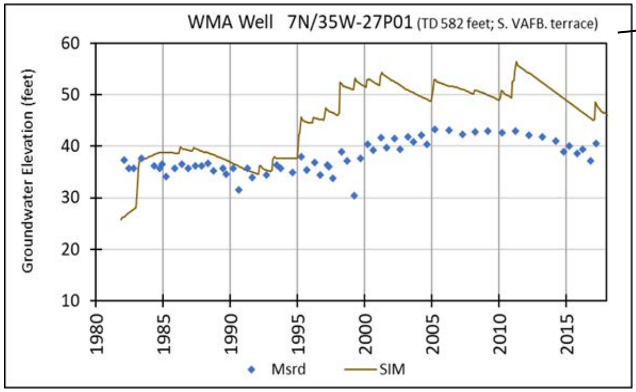
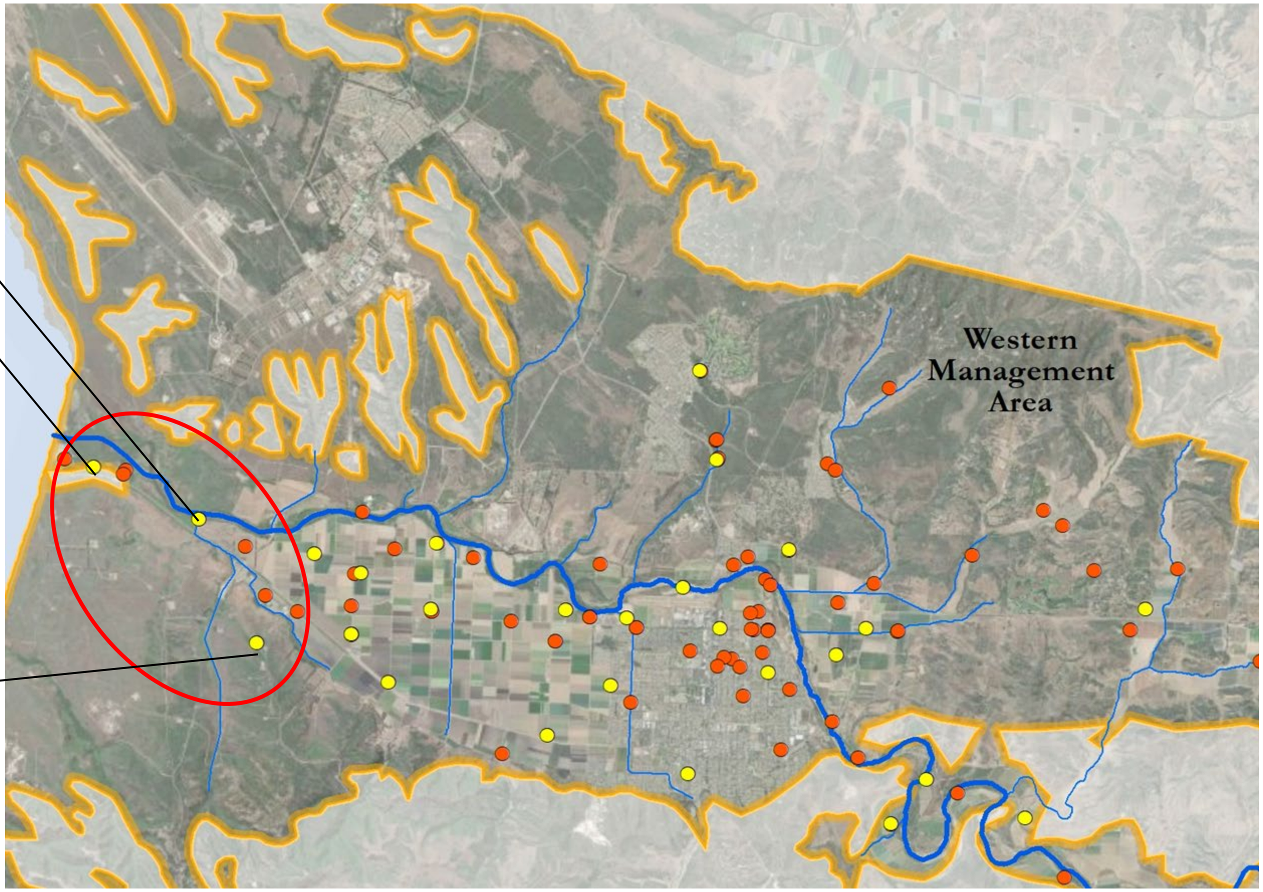
GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (5 OF 6)
WMA/CMA MODEL

FIGURE 22









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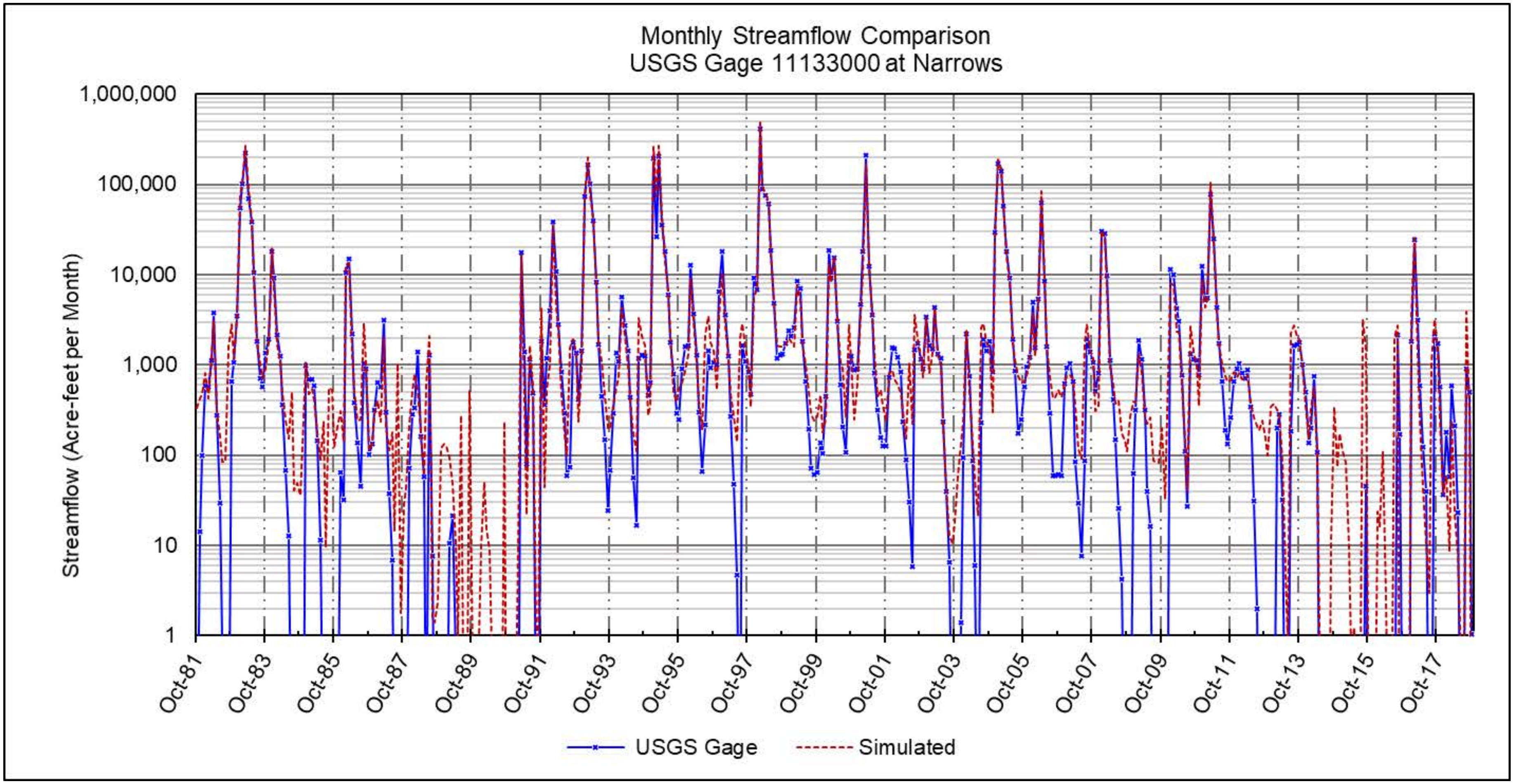
GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (6 OF 6)
WMA/CMA MODEL

FIGURE 23



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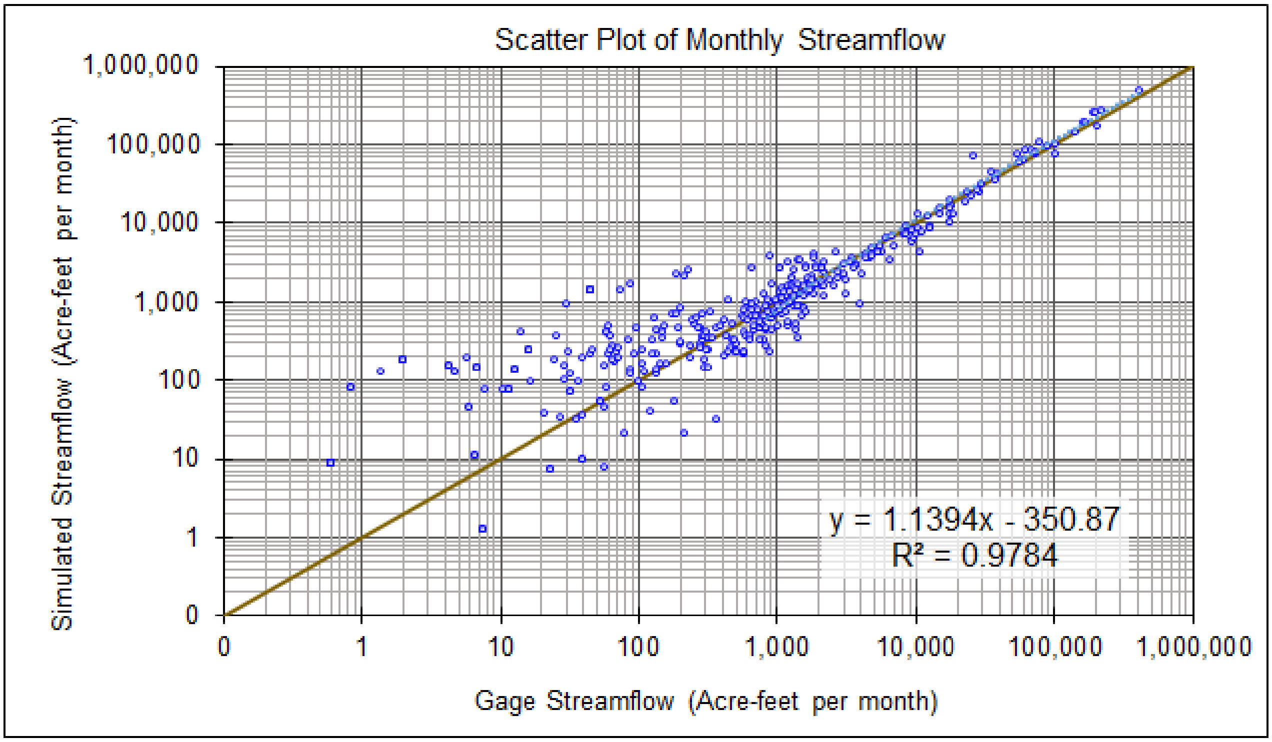
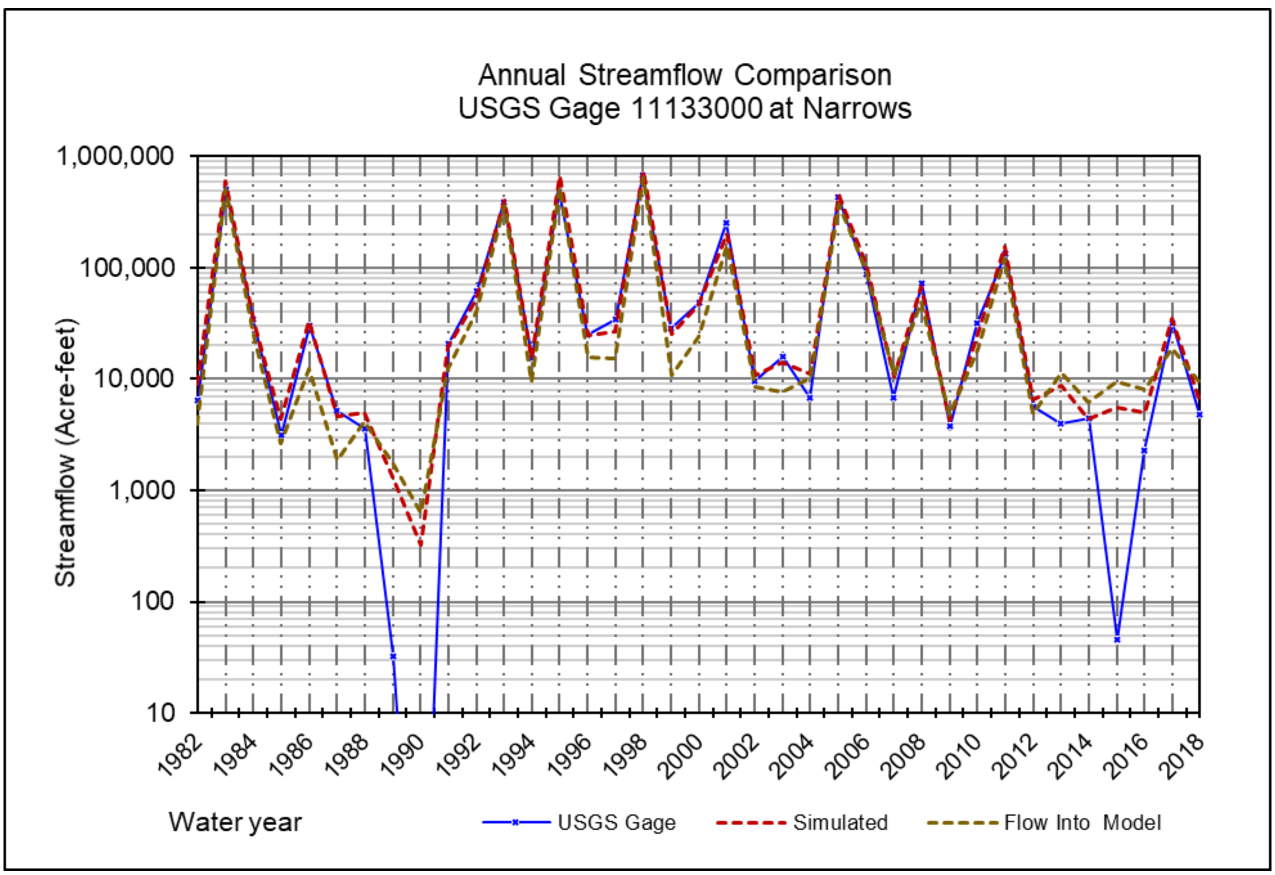
STREAMFLOW CALIBRATION
USGS GAGE 1133000 NARROWS MEASURED AND SIMULATED HYDROGRAPH
WMA/CMA MODEL

FIGURE 24





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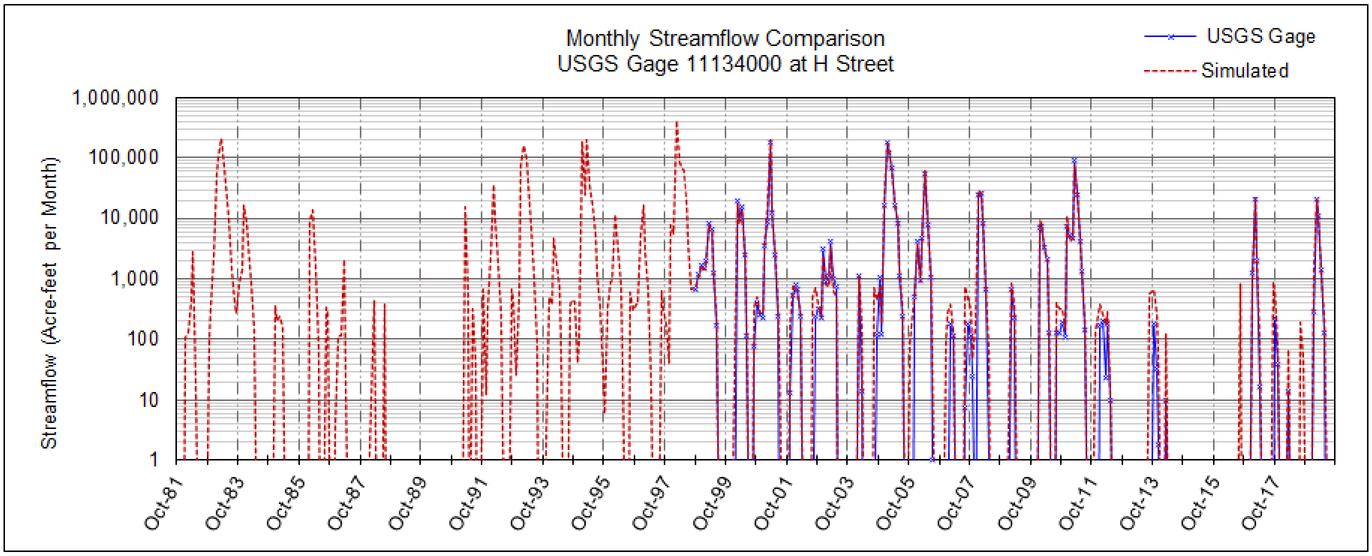
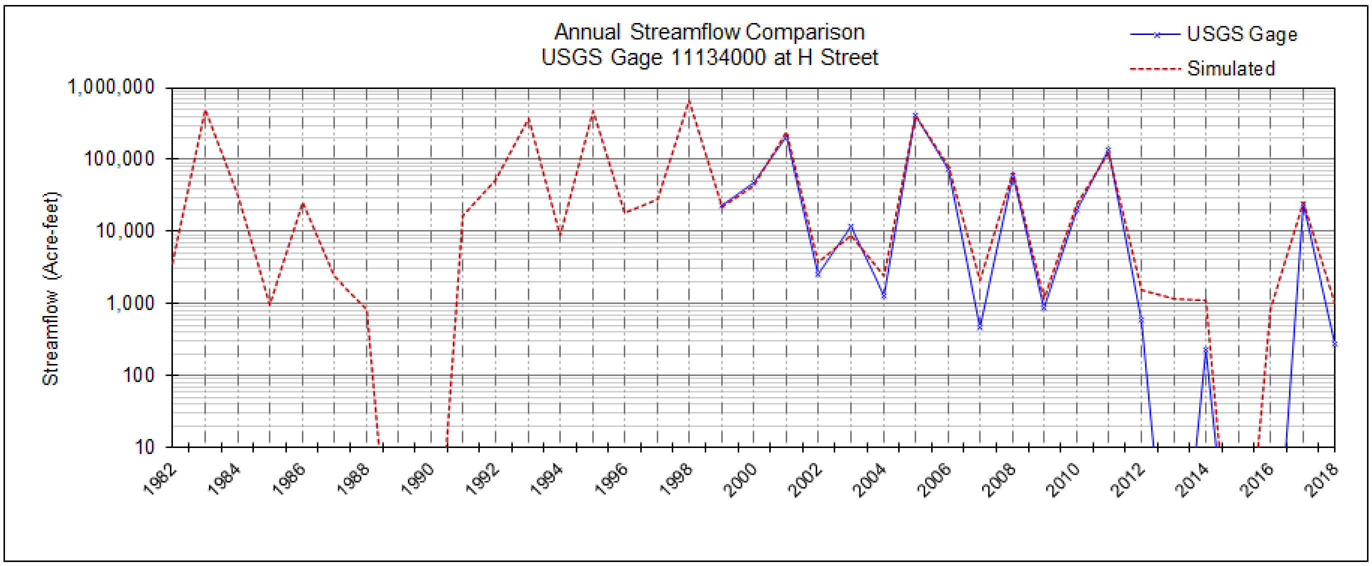
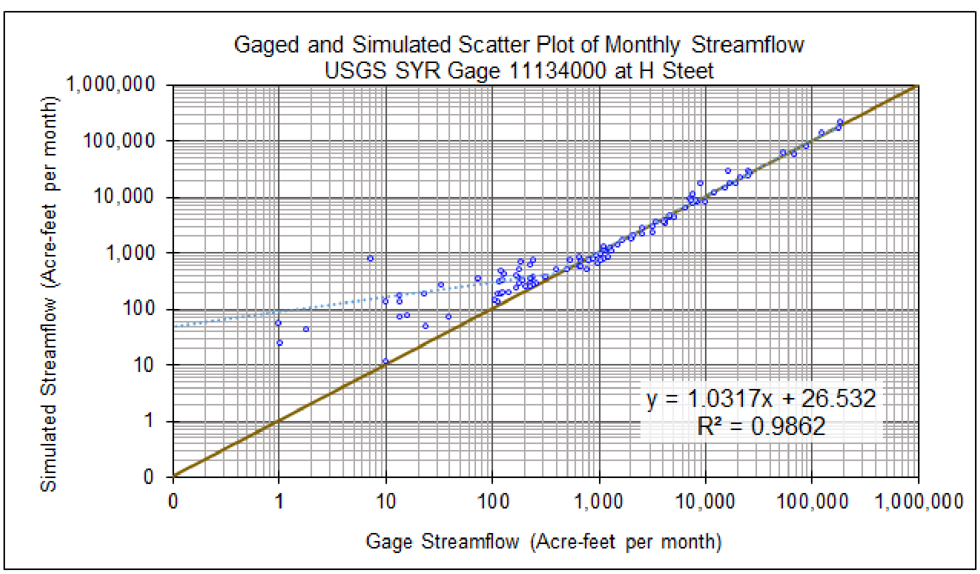
STREAMFLOW CALIBRATION
USGS GAGE 11133000 AT NARROWS
WMA/CMA MODEL

FIGURE 26

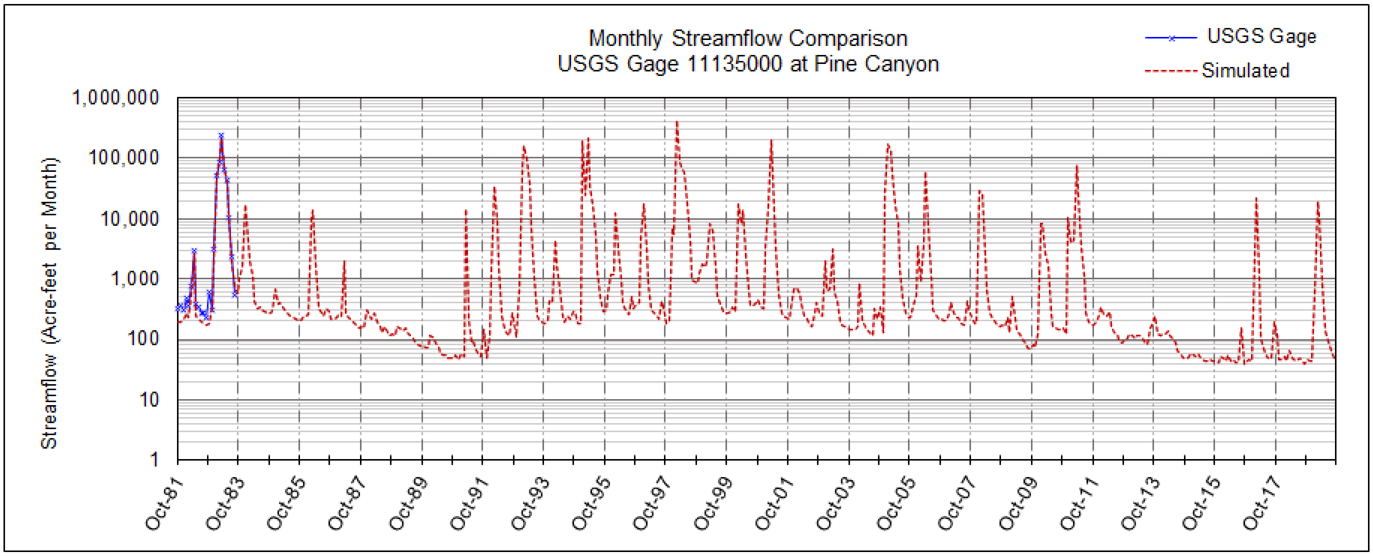


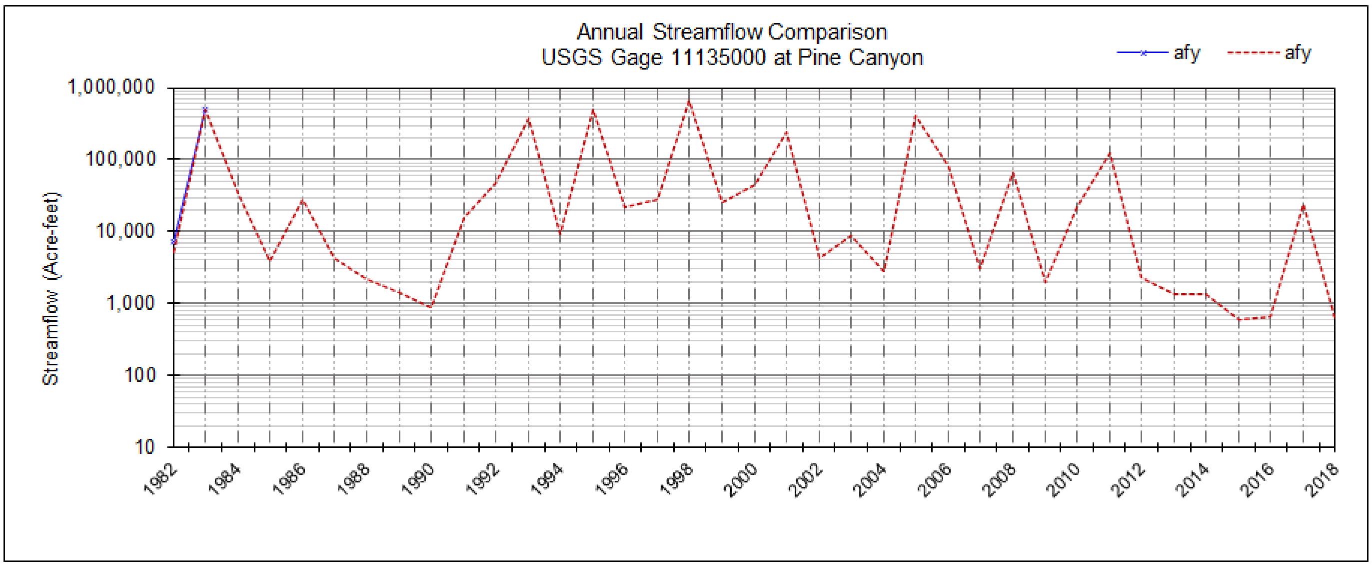


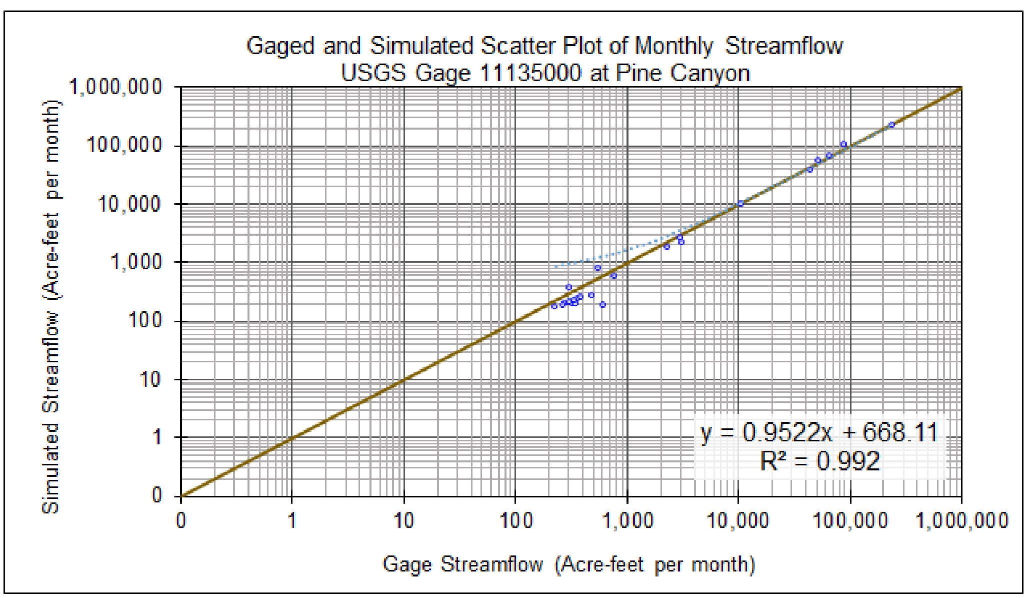


STETSON
ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11134000 AT H Street
WMA/CMA MODEL

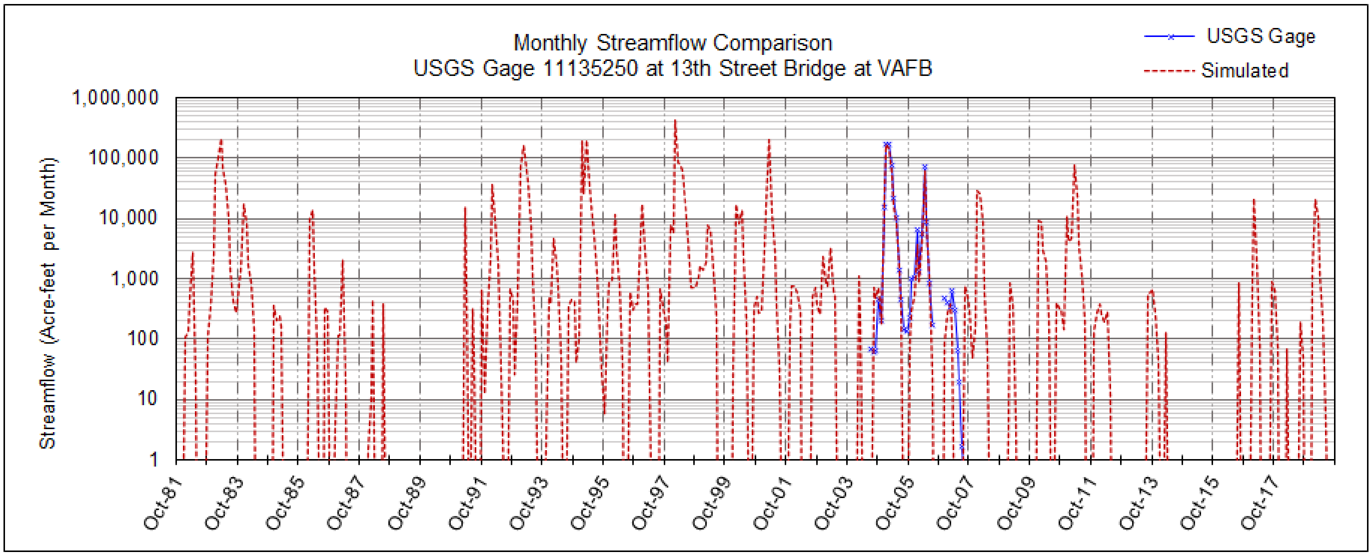


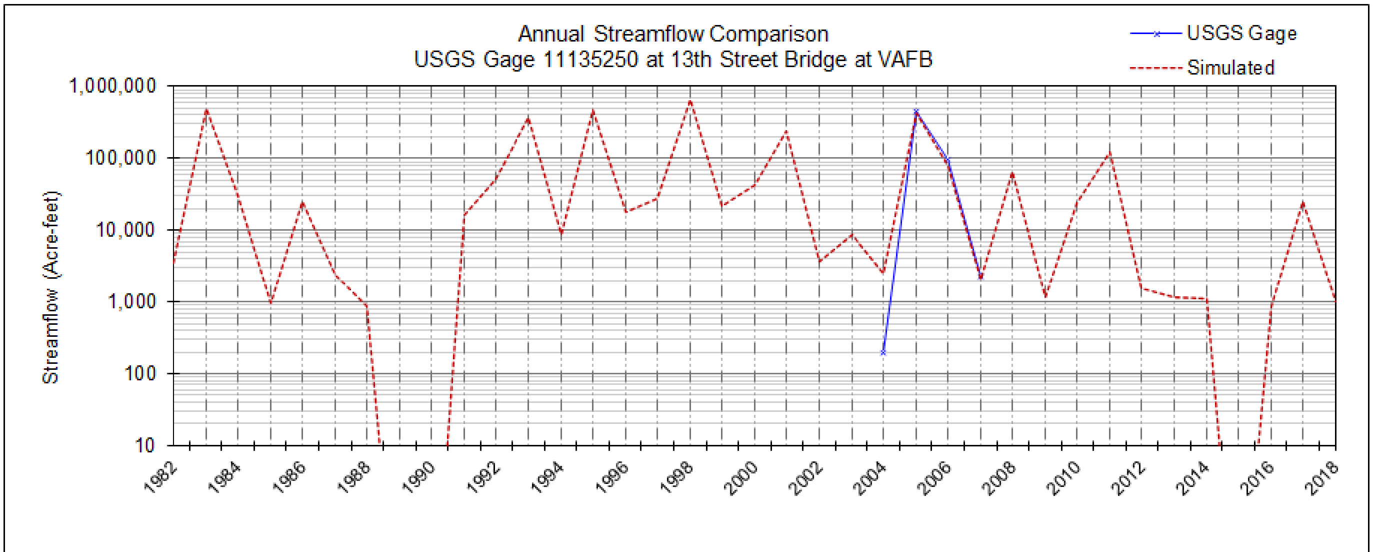


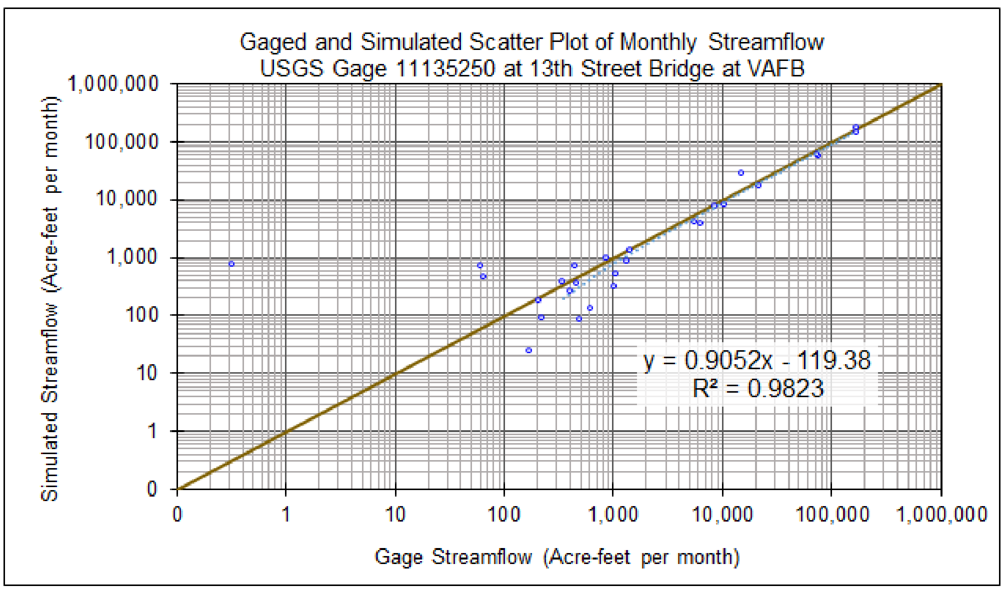


STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11135000 AT Pine Canyon
WMA/CMA MODEL

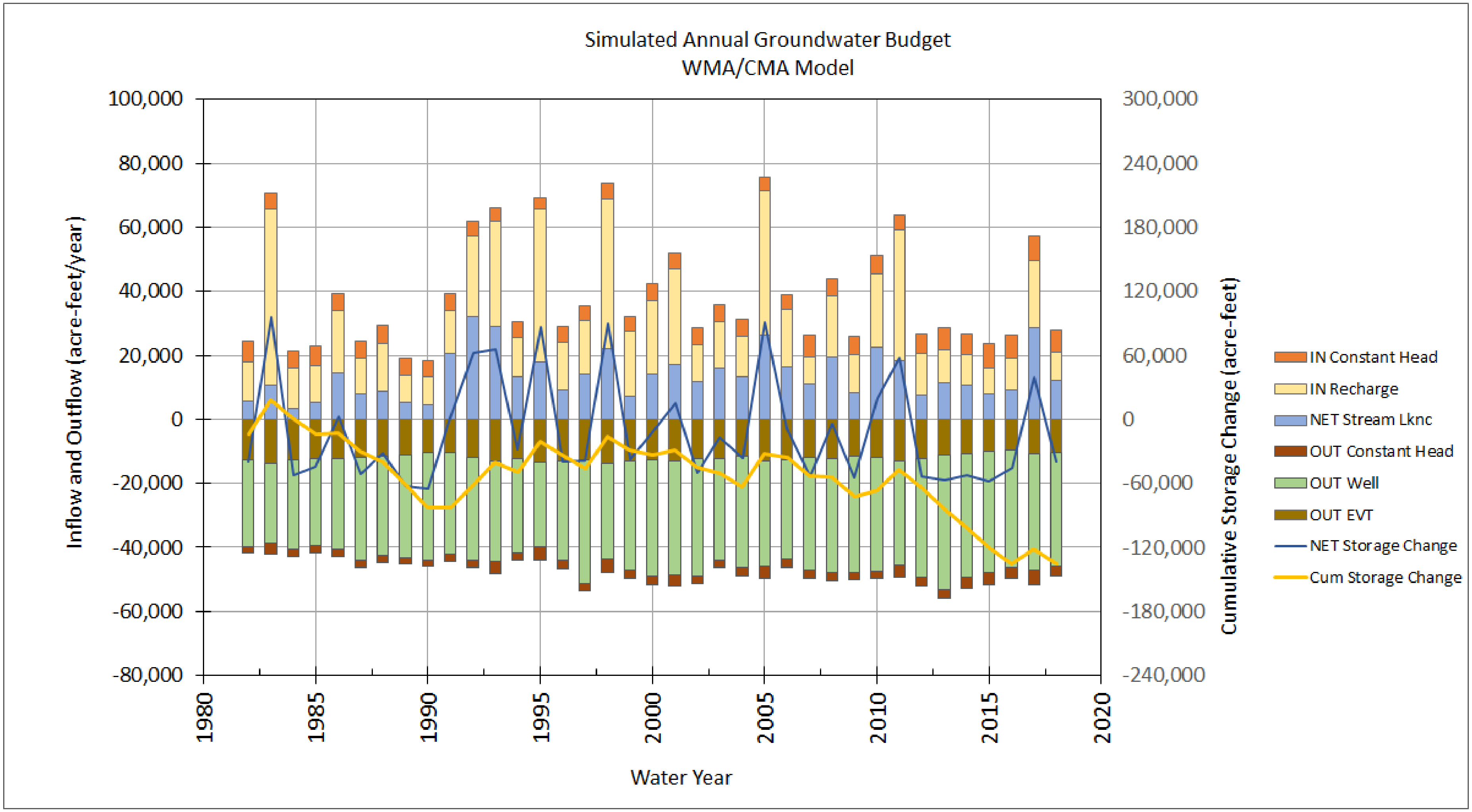






STREAMFLOW CALIBRATION
USGS GAGE 11135250 AT 13th Street Bridge near VAFB
WMA/CMA MODEL

STETSON
ENGINEERS INC.



STETSON ENGINEERS INC.

SIMULATED ANNUAL GROUNDWATER BUDGET HISTORICAL CALIBRATION MODEL RUN, WY 1982 to 2018
WMA/CMA MODEL

FIGURE 29

Attachments

WMA/CMA Model Documentation

Attachment 1
WMA/CMA Model Recharge

Areal Precipitation (acre-feet/year)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total Areal Precip
1982	677	20	494	663	313	947	533	1,539	658	5,842
1983	6,882	177	627	936	3,858	13,317	1,103	2,582	1,208	30,689
1984	307	8	169	214	28	83	400	254	70	1,532
1985	304	8	256	454	49	79	562	636	549	2,896
1986	1,539	39	418	566	757	1,151	2,269	1,561	803	9,103
1987	312	10	247	380	166	735	563	1,471	783	4,666
1988	885	26	550	728	341	314	2,201	1,742	795	7,583
1989	77	1	30	75	11	47	114	758	147	1,261
1990	77	1	61	162	14	43	910	928	262	2,458
1991	847	23	575	825	216	329	2,750	1,886	814	8,266
1992	4,606	111	870	968	1,648	3,393	1,525	2,269	897	16,286
1993	5,423	136	563	815	1,993	5,459	1,331	2,259	972	18,950
1994	602	20	299	440	142	140	1,129	643	464	3,879
1995	6,615	174	456	715	2,717	10,182	1,216	2,886	1,336	26,296
1996	646	17	310	370	429	2,062	963	1,484	732	7,014
1997	962	32	293	430	523	2,576	674	1,615	837	7,940
1998	5,990	142	674	978	2,346	10,278	3,248	3,404	1,445	28,504
1999	1,337	41	431	553	797	3,569	213	2,182	1,043	10,165
2000	2,100	61	404	548	925	3,125	1,371	1,571	852	10,957
2001	4,294	125	678	1,034	1,302	4,305	2,353	2,350	1,024	17,465
2002	126	3	19	26	14	57	576	156	55	1,032
2003	1,333	40	458	623	333	165	1,839	866	608	6,266
2004	623	21	412	551	240	343	1,532	1,118	670	5,511
2005	7,211	201	667	993	2,828	6,497	2,144	2,469	1,142	24,153
2006	1,720	50	518	736	528	891	1,988	1,455	445	8,331
2007	60	1	11	30	10	24	181	186	33	537
2008	1,957	58	558	899	680	1,356	1,912	2,150	924	10,494
2009	291	11	243	417	39	87	2,221	667	409	4,385
2010	2,585	75	649	871	1,047	3,294	1,579	2,520	1,118	13,738
2011	5,940	170	562	854	2,617	9,848	959	2,832	1,297	25,078
2012	302	7	94	137	32	170	1,781	562	16	3,102
2013	145	4	89	157	12	54	1,485	461	60	2,466
2014	105	1	4	6	7	26	1,140	265	0	1,554
2015	117	3	41	73	7	20	1,114	545	0	1,920
2016	211	7	231	252	42	92	2,408	1,007	518	4,768
2017	3,148	84	511	738	1,082	1,921	2,582	2,033	872	12,972
2018	182	4	144	169	18	67	1,567	567	120	2,839
Mean	1,906	52	368	524	760	2,353	1,417	1,456	648	9,484
Median	847	23	412	551	333	735	1,371	1,484	732	7,014
Minimum	60	1	4	6	7	20	114	156	0	537
Maximum	7,211	201	870	1,034	3,858	13,317	3,248	3,404	1,445	30,689

Attachment 1
WMA/CMA Model Recharge

Areal Precipitation near Tributaries (acre-feet/year)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total Precip at Tribs
1982	58	8	27	1,208	125	92	162	1,434	548	3,662
1983	1,024	119	58	2,559	1,945	2,006	1,759	1,865	575	11,910
1984	110	16	58	2,359	206	176	1,014	3,452	1,534	8,926
1985	47	6	46	1,914	97	78	332	2,896	872	6,287
1986	232	38	37	1,698	394	393	882	1,434	378	5,485
1987	58	7	35	1,452	95	82	207	1,299	315	3,549
1988	45	5	21	924	86	70	314	1,414	440	3,319
1989	11	1	40	1,879	20	21	107	1,740	939	4,758
1990	6	1	29	1,532	12	13	449	1,212	667	3,921
1991	19	13	22	496	48	22	209	455	120	1,404
1992	109	24	26	929	191	160	210	447	199	2,295
1993	380	52	47	1,823	707	685	821	1,258	457	6,230
1994	79	12	38	1,423	147	145	509	2,157	681	5,190
1995	916	109	55	2,268	1,676	1,748	1,644	2,004	614	11,034
1996	111	16	44	1,601	201	192	401	1,199	350	4,116
1997	109	22	39	1,523	207	194	299	1,007	181	3,580
1998	577	83	53	2,146	1,113	1,142	1,494	1,416	489	8,513
1999	192	28	45	1,765	329	295	285	1,518	428	4,885
2000	292	45	41	1,751	556	557	969	1,771	467	6,449
2001	240	30	36	1,421	483	463	793	1,124	352	4,943
2002	72	8	49	2,237	144	128	1,675	2,477	1,081	7,872
2003	87	16	33	1,166	160	130	553	1,646	339	4,130
2004	48	7	29	1,038	85	66	340	1,448	309	3,370
2005	755	106	49	2,293	1,423	1,508	1,739	1,959	639	10,470
2006	153	24	36	1,292	263	251	605	1,931	964	5,519
2007	35	4	37	1,968	67	71	681	1,869	860	5,592
2008	105	18	29	1,119	187	170	376	746	239	2,989
2009	33	3	28	1,284	47	45	967	1,763	607	4,778
2010	113	20	28	951	232	213	338	925	251	3,072
2011	315	48	26	1,108	604	606	595	1,141	249	4,692
2012	56	6	40	2,066	107	103	1,751	2,111	1,165	7,405
2013	19	2	32	1,691	36	38	1,397	1,626	841	5,681
2014	12	1	34	1,802	23	25	1,411	1,743	880	5,932
2015	5	1	29	1,544	10	11	592	1,220	792	4,203
2016	9	1	19	1,005	17	18	343	784	195	2,391
2017	105	19	19	649	205	164	351	399	96	2,004
2018	12	1	24	1,258	23	14	593	1,324	716	3,966
Mean	177	25	36	1,544	332	327	734	1,519	563	5,257
Median	87	16	36	1,532	160	145	592	1,434	489	4,778
Minimum	5	1	19	496	10	11	107	399	96	1,404
Maximum	1,024	119	58	2,559	1,945	2,006	1,759	3,452	1,534	11,910

Attachment 1
WMA/CMA Model Recharge

Mountainfront Recharge (acre-feet/year)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total Mountain Front
1982	220	22	13	235	406	270	113	98	128	1,505
1983	1,982	168	7	139	3,864	4,253	622	244	253	11,531
1984	128	10	2	55	91	50	8	15	11	369
1985	57	4	7	89	74	94	26	33	126	511
1986	467	42	6	157	992	856	168	132	176	2,995
1987	97	10	7	110	238	289	52	139	165	1,107
1988	311	31	14	311	551	315	92	105	180	1,911
1989	14	1	0	11	10	37	1	66	27	166
1990	9	0	1	26	12	42	1	81	34	207
1991	202	23	15	468	269	247	36	325	223	1,809
1992	803	60	12	284	1,544	1,309	366	380	225	4,983
1993	1,333	126	8	166	1,902	1,623	327	257	209	5,951
1994	184	22	8	145	246	149	53	42	89	937
1995	1,483	143	4	104	2,575	3,366	443	253	282	8,653
1996	185	17	6	104	406	506	77	170	156	1,626
1997	413	41	8	152	742	898	127	213	212	2,807
1998	1,381	117	6	127	2,229	3,039	367	401	332	7,998
1999	422	41	8	137	831	948	136	213	227	2,964
2000	697	67	7	140	1,119	972	165	114	180	3,462
2001	1,166	127	12	264	1,646	1,447	256	254	241	5,413
2002	18	1	0	5	21	60	1	10	10	126
2003	448	52	10	236	615	287	95	39	160	1,941
2004	224	28	14	263	385	217	62	54	157	1,404
2005	1,886	191	7	153	3,181	2,629	459	212	232	8,950
2006	618	59	13	242	611	277	145	77	94	2,137
2007	6	0	0	3	8	31	1	10	3	63
2008	545	59	11	271	879	698	174	304	225	3,166
2009	97	13	7	205	93	81	7	48	60	612
2010	644	76	15	309	1,152	1,107	194	347	277	4,120
2011	1,630	160	12	281	2,730	3,255	403	353	332	9,156
2012	34	1	0	17	19	110	0	50	0	231
2013	54	7	2	34	35	52	1	32	19	234
2014	8	0	0	0	4	46	0	22	0	82
2015	10	0	0	50	4	37	0	59	0	160
2016	23	1	0	258	25	94	2	125	118	645
2017	728	76	11	392	1,058	1,333	160	352	240	4,350
2018	39	4	2	61	19	51	0	48	6	229
Mean	502	49	7	162	827	840	139	153	146	2,825
Median	224	28	7	145	406	287	92	114	160	1,809
Minimum	6	0	0	0	4	31	0	10	0	63
Maximum	1,982	191	15	468	3,864	4,253	622	401	332	11,531

Attachment 1
WMA/CMA Model Recharge

Municipal Return Flow (acre-feet/year)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total MUN RF
1982	996	1	2	1	-	226	-	308	-	1,534
1983	1,037	1	2	1	-	219	-	298	-	1,558
1984	1,058	2	4	1	-	349	-	393	-	1,807
1985	1,093	2	4	1	-	278	-	438	-	1,816
1986	1,146	3	5	1	-	396	-	404	-	1,955
1987	1,184	3	6	2	-	396	-	397	-	1,989
1988	1,250	3	6	2	-	457	-	455	-	2,173
1989	1,250	3	6	2	-	486	-	483	-	2,230
1990	1,233	3	5	1	-	456	-	464	-	2,162
1991	1,176	2	3	1	-	384	-	415	-	1,981
1992	1,248	2	3	1	-	390	-	427	-	2,070
1993	1,335	2	3	1	-	376	-	427	-	2,144
1994	1,352	2	3	1	-	415	-	428	-	2,202
1995	1,400	2	3	1	-	367	-	390	-	2,163
1996	1,453	2	4	1	-	421	-	438	-	2,320
1997	1,418	2	4	1	-	500	-	496	-	2,420
1998	1,383	2	3	1	-	386	-	421	-	2,194
1999	1,278	2	3	1	-	408	-	483	-	2,175
2000	1,343	2	4	1	-	422	-	539	-	2,312
2001	1,391	2	4	1	-	436	-	533	-	2,369
2002	1,350	3	5	1	-	540	-	500	-	2,399
2003	1,382	3	5	1	-	546	-	477	-	2,415
2004	1,360	4	6	2	-	517	-	582	-	2,471
2005	997	3	5	1	-	467	-	525	-	1,998
2006	1,138	3	6	2	-	501	-	521	-	2,172
2007	1,111	4	6	2	-	527	-	608	-	2,258
2008	1,137	4	6	2	-	557	-	562	-	2,269
2009	1,050	4	7	2	-	503	-	536	-	2,102
2010	1,301	3	5	2	-	458	-	458	-	2,226
2011	1,270	3	5	2	-	462	-	556	-	2,297
2012	1,237	3	6	2	-	498	-	475	-	2,222
2013	1,319	3	5	2	-	477	-	499	-	2,305
2014	1,270	3	6	2	-	421	-	469	-	2,170
2015	1,126	3	5	1	-	350	-	379	-	1,865
2016	1,120	2	3	1	-	366	-	386	-	1,878
2017	1,166	3	5	1	-	329	-	402	-	1,906
2018	1,195	3	5	2	-	377	-	405	-	1,988
Mean	1,231	3	5	1	-	423	-	459	-	2,122
Median	1,248	3	5	1	-	421	-	458	-	2,172
Minimum	996	1	2	1	-	219	-	298	-	1,534
Maximum	1,453	4	7	2	-	557	-	608	-	2,471

Attachment 1

WMA/CMA Model Recharge

Total Simulated Annual Recharge (acre-feet/year)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total Recharge
1982	1,950	51	537	2,107	844	1,535	807	3,379	1,333	12,542
1983	10,925	465	694	3,634	9,668	19,795	3,484	4,988	2,035	55,689
1984	1,603	36	232	2,629	325	658	1,422	4,114	1,615	12,634
1985	1,501	20	313	2,457	220	528	920	4,003	1,547	11,510
1986	3,383	121	467	2,422	2,143	2,795	3,319	3,531	1,357	19,538
1987	1,651	31	295	1,944	499	1,501	822	3,306	1,262	11,310
1988	2,491	66	590	1,965	977	1,157	2,607	3,717	1,415	14,986
1989	1,352	6	76	1,967	41	591	222	3,047	1,113	8,415
1990	1,325	5	96	1,722	38	554	1,361	2,684	963	8,748
1991	2,244	61	616	1,790	533	982	2,996	3,081	1,157	13,460
1992	6,765	196	911	2,182	3,383	5,251	2,101	3,523	1,321	25,634
1993	8,471	316	621	2,805	4,602	8,144	2,479	4,201	1,638	33,275
1994	2,217	56	347	2,009	535	850	1,691	3,270	1,233	12,209
1995	10,414	428	519	3,087	6,968	15,663	3,303	5,532	2,232	48,146
1996	2,395	52	364	2,077	1,036	3,181	1,442	3,292	1,238	15,076
1997	2,901	97	344	2,107	1,471	4,168	1,100	3,330	1,230	16,747
1998	9,330	343	736	3,252	5,687	14,845	5,109	5,642	2,266	47,209
1999	3,229	111	488	2,456	1,958	5,220	634	4,396	1,698	20,189
2000	4,432	175	457	2,440	2,600	5,076	2,505	3,995	1,500	23,180
2001	7,092	284	730	2,720	3,432	6,652	3,403	4,261	1,618	30,190
2002	1,566	15	73	2,269	180	784	2,251	3,143	1,147	11,429
2003	3,250	110	506	2,026	1,108	1,128	2,488	3,029	1,107	14,751
2004	2,255	60	461	1,854	710	1,142	1,934	3,202	1,137	12,755
2005	10,850	501	728	3,440	7,432	11,100	4,342	5,165	2,014	45,572
2006	3,628	136	573	2,272	1,402	1,921	2,738	3,985	1,503	18,158
2007	1,212	9	55	2,002	85	653	864	2,674	896	8,450
2008	3,744	139	604	2,291	1,746	2,782	2,462	3,761	1,388	18,917
2009	1,471	31	285	1,909	179	717	3,195	3,015	1,075	11,876
2010	4,642	174	698	2,133	2,431	5,071	2,112	4,251	1,646	23,157
2011	9,155	381	605	2,245	5,951	14,170	1,957	4,882	1,877	41,224
2012	1,630	18	139	2,221	158	882	3,532	3,198	1,182	12,960
2013	1,536	16	128	1,883	83	621	2,883	2,618	920	10,688
2014	1,396	6	43	1,809	34	518	2,551	2,498	881	9,737
2015	1,259	6	75	1,667	21	418	1,706	2,204	792	8,147
2016	1,363	11	253	1,516	84	569	2,753	2,302	831	9,683
2017	5,146	182	546	1,781	2,345	3,746	3,093	3,185	1,208	21,231
2018	1,429	13	175	1,490	60	509	2,161	2,344	841	9,022
Mean	3,816	128	416	2,232	1,918	3,943	2,290	3,588	1,357	19,688
Median	2,395	61	461	2,107	977	1,501	2,462	3,330	1,262	14,751
Minimum	1,212	5	43	1,490	21	418	222	2,204	792	8,147
Maximum	10,925	501	911	3,634	9,668	19,795	5,109	5,642	2,266	55,689

Attachment 2

WMA/CMA Model Santa Ynez River Network

Stream Segment	Number Reaches	Stream Name
1	4	Santa Ynez River
2	9	Tributary 01
3	11	Santa Ynez River
4	10	Ballard Canyon
5	24	Santa Ynez River
6	13	Tributary 03
7	5	Santa Ynez River
8	7	Nojoqui Creek
9	10	Santa Ynez River
10	44	Zaca Creek
11	19	Santa Ynez River
12	8	Tributary 06
13	3	Santa Ynez River
14	11	Canada de la Laguna
15	10	Santa Ynez River
16	18	Tributary 08
17	11	Santa Ynez River
18	10	Canada de los Palos Blancos
19	44	Santa Ynez River
20	6	Tributary 10
21	22	Santa Ynez River
22	31	Santa Rosa Creek (Upstream)
23	20	Santa Rosa Creek (upper east stream)
24	3	Santa Rosa Creek (between upper east and west streams)
25	13	Santa Rosa Creek (west stream)
26	14	Santa Rosa Creek (between west and lower east streams)
27	15	Santa Rosa Creek (lower east stream)
28	15	Santa Rosa Creek (Downstream)
29	6	Santa Ynez River
30	8	Tributary 18
31	69	Santa Ynez River
32	10	Canada de la Vina
33	59	Santa Ynez River
34	46	Santa Rita Creek (West Upstream)
35	45	Santa Rita Creek (East Upstream)
36	56	Santa Rita Creek (Downstream)
37	36	Santa Ynez River
38	12	Salsipuedes Creek
39	33	Santa Ynez River (Prior to Lompoc Narrows)
40	32	Santa Ynez River (After Lompoc Narrows)
41	36	Tributary 24
42	8	Santa Ynez River
43	20	Purisima Canyon (West Upstream)

WMA/CMA Model Santa Ynez River Network

Stream Segment	Number Reaches	Stream Name
44	23	Purisima Canyon (East Upstream)
45	39	Purisima Canyon (Downstream)
46	37	Cebada Canyon
47	10	Tributary 29
48	35	Santa Ynez River
49	43	Tributary 30
50	6	Santa Ynez River
51	40	San Miguelito Creek
52	2	San Miguelito Creek
53	17	Santa Ynez River
54	16	Tributary 32
55	28	Santa Ynez River
56	34	Sloans Canyon
57	5	Santa Ynez River
58	66	Santa Lucia Canyon
59	8	Santa Ynez River
60	4	Oak Canyon
61	26	Santa Ynez River
62	19	Tributary 36
63	15	Santa Ynez River
64	48	Lompoc Canyon (Upstream)
65	37	La Salle Canyon
66	11	Lompoc Canyon (Downstream)
67	34	Santa Ynez River
68	1	Wastewater

Attachment 2

WMA/CMA Model Stream/Tributary List

Count	Stream Name
1	Santa Ynez River
2	Ballard Canyon
3	Canada de la Laguna
4	Canada de la Vina
5	Canada de los Palos Blancos
6	Cebada Canyon
7	La Salle Canyon
8	Lompoc Canyon
9	Nojoqui Creek
10	Oak Canyon
11	Purisima Canyon
12	Salsipuedes Creek
13	San Miguelito Creek
14	Santa Lucia Canyon
15	Santa Rita Creek
16	Santa Rosa Creek
17	Sloans Canyon
18	Zaca Creek
19	Trib01
20	Trib03
21	Trib06
22	Trib08
23	Trib10
24	Trib18
25	Trib24
26	Trib29
27	Trib30
28	Trib32
29	Trib36

Attachment 2

SFR Summary of Stream Channel Flow / Width / Depth Relationship

			Gage 11133000 Narrows		Gage 11134000 H Street		Below Lompoc WTP		Gage 11128500 Solvang		Gage 11129800 Zaca Creek	
Data Point	Stream flow (cfd)	Stream flow (cfs)	Depth (feet)	Width (feet)	Depth (feet)	Width (feet)	Depth (feet)	Width (feet)	Depth (feet)	Width (feet)	Depth (feet)	Width (feet)
1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	86,300	1	0.3	6.1	0.2	7.1	0.2	7.1	0.1	6.7	0.2	4.0
3	237,000	3	0.4	10.2	0.4	12.0	0.4	12.5	0.1	11.2	0.3	5.6
4	501,000	6	0.5	14.9	0.5	17.8	0.5	18.9	0.2	16.5	0.5	7.2
5	963,000	11	0.7	20.8	0.6	24.9	0.6	27.2	0.4	23.1	0.6	9.0
6	1,770,000	20	0.9	28.2	0.8	34.2	0.8	38.1	0.5	31.6	0.8	11.1
7	3,180,000	37	1.1	37.9	1.0	46.4	1.0	52.7	0.8	42.7	1.0	13.5
8	5,650,000	65	1.4	50.7	1.3	62.6	1.3	72.5	1.2	57.4	1.3	16.5
9	12,960,000	150	2.0	77.0	1.8	96.3	1.8	114.9	1.8	88.1	2.0	21.9
10	21,600,000	250	2.5	99.7	2.3	125.6	2.3	152.6	2.1	100.3	2.8	26.2
11	30,240,000	350	2.8	118.1	2.6	149.6	2.6	183.9	2.3	112.9	3.6	29.4
12	38,880,000	450	3.1	134.1	2.9	170.5	2.9	211.4	2.5	123.3	4.4	32.1
13	60,480,000	700	3.7	167.6	3.5	214.5	3.5	270.2	2.8	144.1	6.5	37.4
14	95,040,000	1,100	4.5	210.5	4.2	271.4	4.2	347.2	3.2	168.9	9.8	43.7
15	129,600,000	1,500	5.1	246.2	4.7	293.5	4.7	412.4	3.6	188.4	13.1	48.7
16	164,160,000	1,900	5.6	277.3	5.2	299.3	5.2	470.3	3.8	204.7	16.4	52.8
17	198,720,000	2,300	6.0	304.9	5.7	305.0	5.7	522.9	4.0	218.9	19.7	56.4
18	233,280,000	2,700	6.5	305.8	6.0	310.8	6.0	571.5	4.3	231.6	20.0	59.7
19	267,840,000	3,100	6.8	306.8	6.4	316.6	6.4	617.1	4.4	243.1	20.0	62.6
20	302,400,000	3,500	7.2	307.7	6.7	322.3	6.7	660.1	4.6	253.7	20.0	65.3
21	336,960,000	3,900	7.5	308.7	7.0	328.1	7.0	700.9	4.8	263.6	20.0	67.8
22	604,800,000	7,000	9.5	316.1	8.9	372.7	8.9	969.8	5.7	323.8	20.0	83.0
23	950,400,000	11,000	11.4	325.7	10.7	430.3	10.7	1246.3	6.5	379.6	20.0	97.0
24	1,296,000,000	15,000	13.0	335.3	12.2	487.9	12.2	1480.4	7.2	423.3	20.0	108.0
25	1,641,600,000	19,000	14.3	344.9	13.4	545.5	13.4	1687.9	7.7	460.0	20.0	117.2
26	1,987,200,000	23,000	15.8	354.5	14.5	603.1	14.5	1876.7	8.2	492.0	20.0	125.2
27	2,332,800,000	27,000	17.0	364.1	15.5	660.7	15.5	2051.4	8.6	520.5	20.0	132.4
28	2,678,400,000	31,000	18.2	373.7	16.4	718.3	16.4	2214.8	9.0	546.5	20.0	138.9
29	3,024,000,000	35,000	19.4	383.3	17.3	775.9	17.3	2369.2	9.3	570.3	20.0	144.8
30	3,369,600,000	39,000	20.6	392.9	18.0	833.5	18.0	2515.8	9.6	592.4	20.0	150.4
31	3,715,200,000	43,000	21.8	402.5	18.8	891.1	18.8	2655.9	9.9	613.1	20.0	155.5
32	4,060,800,000	47,000	23.0	412.1	19.5	948.7	19.5	2790.3	10.2	632.6	20.0	160.4
33	8,640,000,000	100,000	38.9	539.3	26.5	1711.9	26.5	4242.7	12.8	825.0	20.0	208.3

Attachment 3

Santa Ynez River Network Annual Streamflow Summary (afy)

Water Year	Segment 01 SYR	Segment 02 Tributary 01	Segment 04 Ballard Canyon	Segment 06 Tributary 03	Segment 08 Nojoqui Creek	Segment 10 Zaca Creek	Segment 12 Tributary 06	Segment 14 Canada de la Laguna	Segment 16 Tributary 08	Segment 18 Canada (Palos Blancos)
1982	3,916	10	150	30	607	75	0	45	27	60
1983	511,411	222	3,438	810	13,880	2,685	315	1,230	627	1,560
1984	24,874	20	313	60	1,264	150	15	90	57	120
1985	2,677	7	109	15	439	45	0	15	20	30
1986	12,357	62	960	300	3,876	660	105	465	175	570
1987	1,853	10	151	30	608	15	15	45	27	60
1988	4,119	5	83	0	335	75	0	15	15	15
1989	1,758	1	19	0	78	15	0	0	4	0
1990	629	1	12	0	47	0	0	0	2	0
1991	12,406	27	413	195	1,666	630	75	300	75	375
1992	40,179	40	623	225	2,517	1,695	90	345	114	450
1993	364,192	103	1,588	495	6,413	2,475	180	735	290	915
1994	9,405	17	256	60	1,034	45	15	105	47	120
1995	534,400	352	5,444	1,980	21,979	3,825	750	2,955	993	3,675
1996	15,907	22	337	75	1,360	480	30	120	61	165
1997	15,324	33	511	180	2,063	1,275	45	255	93	330
1998	655,816	248	3,840	1,440	15,506	7,875	540	2,145	701	2,655
1999	10,968	37	574	120	2,319	120	60	210	105	255
2000	24,243	65	1,003	255	4,051	375	90	390	183	480
2001	158,070	121	1,866	750	7,533	1,620	270	1,125	340	1,365
2002	8,544	10	154	15	623	0	0	15	28	30
2003	7,726	22	338	90	1,364	15	30	135	62	195
2004	10,147	10	155	45	627	0	15	60	28	75
2005	373,767	200	3,101	885	12,519	2,910	315	1,320	566	1,650
2006	96,528	34	525	135	2,118	330	45	240	96	300
2007	10,885	4	65	0	261	0	0	0	12	0
2008	49,671	53	815	330	3,290	1,335	120	510	149	615
2009	4,753	4	60	0	243	0	0	15	11	15
2010	18,624	29	451	135	1,822	105	45	195	82	255
2011	120,526	91	1,402	435	5,659	840	165	630	256	810
2012	4,862	7	103	0	417	0	0	0	19	0
2013	11,520	2	35	0	140	0	0	0	6	0
2014	6,118	1	23	0	92	0	0	0	4	0
2015	9,518	1	10	0	41	0	0	0	2	0
2016	8,006	1	16	0	65	0	0	0	3	0
2017	18,742	58	904	375	3,652	675	150	585	165	735
2018	9,315	1	22	0	90	0	0	0	4	0
Maximum	655,816	352	5,444	1,980	21,979	7,875	750	2,955	993	3,675
Minimun	629	1	10	0	41	0	0	0	2	0
Average	85,777	52	807	256	3,259	820	94	386	147	483

Attachment 3
Santa Ynez River Network Annual Streamflow Summary (afy)

Water Year	Segment 20 Tributary 10	Segment 22 Santa Rosa Creek	Segment 23 Santa Rosa Creek	Segment 25 Santa Rosa Creek	Segment 27 Santa Rosa Creek	Segment 30 Tributary 18	Segment 32 Canada de la Vina	Segment 34 Santa Rita Creek	Segment 35 Santa Rita Creek	Segment 38 Salsipue-des Creek
1982	144	60	0	15	0	54	30	0	30	1,759
1983	3,301	1,635	315	435	60	1,240	1,020	345	1,005	40,222
1984	301	120	15	30	0	113	75	15	75	3,662
1985	104	30	0	0	0	39	15	0	15	1,272
1986	922	600	105	150	30	346	375	135	360	11,231
1987	145	60	15	15	0	54	45	15	45	1,761
1988	80	15	0	0	0	30	0	0	0	970
1989	19	0	0	0	0	7	0	0	0	226
1990	11	0	0	0	0	4	0	0	0	136
1991	396	390	75	105	15	149	240	75	240	4,829
1992	598	465	90	120	15	225	285	105	285	7,292
1993	1,525	960	165	240	45	573	600	195	570	18,582
1994	246	135	15	30	0	92	75	15	75	2,995
1995	5,227	3,915	720	1,050	180	1,964	2,490	840	2,430	63,690
1996	324	165	15	30	0	122	105	30	105	3,942
1997	491	345	45	90	15	184	210	60	195	5,977
1998	3,688	2,835	525	765	120	1,386	1,785	585	1,755	44,932
1999	551	270	45	75	0	207	165	60	165	6,719
2000	963	510	90	120	15	362	315	90	300	11,739
2001	1,791	1,470	255	390	60	673	915	300	900	21,828
2002	148	30	0	0	0	56	15	0	15	1,805
2003	324	225	30	45	0	122	120	30	105	3,952
2004	149	90	15	15	0	56	60	15	45	1,816
2005	2,977	1,755	315	465	90	1,119	1,125	375	1,095	36,276
2006	504	315	45	75	0	189	195	45	195	6,138
2007	62	0	0	0	0	23	0	0	0	758
2008	782	660	120	165	30	294	405	135	390	9,533
2009	58	15	0	0	0	22	15	0	15	705
2010	433	270	45	60	0	163	150	45	150	5,281
2011	1,346	870	165	210	30	506	525	180	510	16,398
2012	99	15	0	0	0	37	0	0	0	1,209
2013	33	0	0	0	0	12	0	0	0	404
2014	22	0	0	0	0	8	0	0	0	266
2015	10	0	0	0	0	4	0	0	0	118
2016	15	0	0	0	0	6	0	0	0	187
2017	868	765	135	195	30	326	465	165	465	10,582
2018	21	0	0	0	0	8	0	0	0	261
Maximum	5,227	3,915	720	1,050	180	1,964	2,490	840	2,430	63,690
Minimun	10	0	0	0	0	4	0	0	0	118
Average	775	513	91	132	20	291	319	104	312	9,445

Attachment 3
Santa Ynez River Network Annual Streamflow Summary (afy)

Water Year	Segment 40 SYR (After Narrows)	Segment 41 Tributary 24	Segment 43 Purisima Canyon	Segment 44 Purisima Canyon	Segment 46 Cebada Canyon	Segment 49 Tributary 30	Segment 51 San Miguelito Creek	Segment 54 Tributary 32	Segment 56 Sloans Canyon	Segment 58 Santa Lucia Canyon
1982	6,447	0	0	15	60	45	544	0	105	25
1983	503,623	345	180	525	1,740	1,200	5,766	390	2,535	561
1984	34,107	15	15	30	165	90	974	30	240	51
1985	3,101	0	0	0	30	15	687	0	60	18
1986	30,108	135	60	195	645	450	1,476	135	945	157
1987	5,213	15	0	15	75	45	371	15	120	25
1988	3,588	0	0	0	15	15	511	0	30	14
1989	32	0	0	0	0	0	142	0	0	3
1990	0	0	0	0	0	0	162	0	0	2
1991	20,896	75	30	120	420	285	855	90	615	67
1992	62,090	105	45	150	495	330	685	105	750	102
1993	391,526	195	105	315	1,050	735	1,706	210	1,515	259
1994	15,608	15	0	30	135	105	705	30	195	42
1995	485,396	870	420	1,275	4,140	2,910	9,955	945	6,045	888
1996	24,824	30	15	45	180	120	2,141	30	255	55
1997	34,321	75	30	105	360	240	677	75	525	83
1998	681,488	615	315	900	3,015	2,115	6,275	705	4,395	627
1999	28,475	60	15	90	285	210	1,104	60	480	94
2000	48,826	90	60	165	540	390	1,961	105	780	164
2001	250,512	330	150	465	1,560	1,110	1,658	345	2,265	304
2002	9,518	0	0	0	30	15	476	0	60	25
2003	15,730	30	0	60	225	135	622	45	345	55
2004	6,709	15	0	30	90	60	224	15	150	25
2005	431,516	375	195	570	1,875	1,305	2,193	405	2,715	506
2006	87,730	45	30	90	315	225	745	60	465	86
2007	6,863	0	0	0	0	0	135	0	0	11
2008	72,546	135	60	210	705	495	370	150	1,035	133
2009	3,748	0	0	0	15	15	72	0	30	10
2010	31,898	45	30	75	270	195	757	45	405	74
2011	135,292	180	60	270	930	615	2,108	210	1,335	229
2012	5,637	0	0	0	15	0	350	0	15	17
2013	4,035	0	0	0	0	0	165	0	0	6
2014	4,477	0	0	0	0	0	127	0	0	4
2015	45	0	0	0	0	0	100	0	0	2
2016	2,310	0	0	0	0	0	116	0	0	3
2017	31,919	165	75	240	810	585	1,363	180	1,185	148
2018	4,812	0	0	0	0	0	127	0	15	4
Maximum	681,488	870	420	1,275	4,140	2,910	9,955	945	6,045	888
Minimun	0	0	0	0	0	0	72	0	0	2
Average	94,188	107	51	162	546	380	1,308	118	800	132

Attachment 3
Santa Ynez River Network Annual Streamflow Summary (afy)

Water Year	Segment 60 Oak Canyon	Segment 62 Tributary 36	Segment 64 Lompoc Canyon	Segment 65 La Salle Canyon	Segment 68 Waste-water	Total Flow In (w/out flow at Narrows)
1982	68	31	43	0	3,583	11,531
1983	1,552	710	986	180	3,786	606,214
1984	141	65	90	15	3,666	36,954
1985	49	22	31	0	3,968	9,712
1986	433	198	275	60	4,090	43,038
1987	68	31	43	0	4,107	9,898
1988	37	17	24	0	3,944	10,363
1989	9	4	6	0	4,019	6,309
1990	5	2	3	0	3,707	4,725
1991	186	85	118	45	3,616	29,285
1992	281	129	179	45	3,691	62,851
1993	717	328	456	105	3,889	412,425
1994	116	53	73	15	3,725	20,020
1995	2,458	1,125	1,562	465	4,017	695,933
1996	152	70	97	15	4,107	30,706
1997	231	106	147	30	4,120	34,524
1998	1,734	794	1,102	345	4,568	776,646
1999	259	119	165	15	4,652	30,632
2000	453	207	288	60	4,719	55,623
2001	842	386	535	180	4,045	215,818
2002	70	32	44	0	3,824	16,065
2003	152	70	97	15	3,746	20,526
2004	70	32	45	0	3,879	18,059
2005	1,400	641	890	210	3,730	459,834
2006	237	108	151	30	3,744	114,382
2007	29	13	19	0	3,993	16,271
2008	368	168	234	60	3,922	77,447
2009	27	12	17	0	3,395	9,524
2010	204	93	129	30	3,408	34,101
2011	633	290	402	90	3,190	162,094
2012	47	21	30	0	2,946	10,209
2013	16	7	10	0	3,288	15,644
2014	10	5	7	0	3,588	10,274
2015	5	2	3	0	3,334	13,147
2016	7	3	5	0	3,324	11,757
2017	408	187	259	90	3,439	49,172
2018	10	5	6	0	3,338	13,228
Maximum	2,458	1,125	1,562	465	4,719	776,646
Minimun	5	2	3	0	2,946	4,725
Average	364	167	232	57	3,787	112,296

Municipal Pumping (afy)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total MUN
1982	317	416	-	-	-	3,479	-	1,699	-	5,911
1983	293	416	-	-	-	3,588	-	1,631	-	5,929
1984	374	565	-	-	-	4,336	-	1,931	-	7,206
1985	377	532	-	-	-	4,102	-	2,261	-	7,272
1986	469	667	-	-	-	4,946	-	2,099	-	8,181
1987	510	736	-	-	-	4,950	-	2,061	-	8,257
1988	538	682	-	-	-	5,225	-	2,211	-	8,656
1989	574	654	-	-	-	5,501	-	2,276	-	9,006
1990	483	609	-	-	-	5,084	-	2,172	-	8,347
1991	418	446	-	-	-	4,530	-	2,004	-	7,399
1992	354	499	-	-	-	4,617	-	2,069	-	7,539
1993	382	479	-	-	-	4,670	-	2,045	-	7,575
1994	341	549	-	-	-	4,816	-	1,977	-	7,683
1995	356	538	-	-	-	4,650	-	1,870	-	7,414
1996	400	537	-	-	-	5,113	-	2,053	-	8,103
1997	368	543	-	-	-	5,655	-	2,247	-	8,813
1998	70	126	-	-	-	5,229	-	1,958	-	7,383
1999	120	185	-	-	-	5,447	-	2,184	-	7,936
2000	156	237	-	-	-	5,573	-	2,379	-	8,345
2001	221	397	-	-	-	5,100	-	2,293	-	8,011
2002	181	335	-	-	-	5,664	-	2,290	-	8,470
2003	223	380	-	-	-	5,641	-	2,201	-	8,445
2004	334	435	-	-	-	5,569	-	2,531	-	8,868
2005	301	333	-	-	-	5,087	-	2,265	-	7,985
2006	284	312	-	-	-	5,337	-	2,305	-	8,238
2007	217	434	-	-	-	5,556	-	2,669	-	8,876
2008	227	557	-	-	-	5,636	-	2,579	-	8,999
2009	305	695	-	-	-	4,958	-	2,445	-	8,402
2010	332	684	-	-	-	4,706	-	2,187	-	7,908
2011	219	550	-	-	-	4,538	-	2,342	-	7,648
2012	239	399	-	-	-	4,672	-	2,229	-	7,538
2013	389	653	-	-	-	4,934	-	2,362	-	8,338
2014	491	738	-	-	-	4,966	-	2,186	-	8,382
2015	345	731	-	-	-	4,306	-	1,777	-	7,158
2016	271	578	-	-	-	4,380	-	1,757	-	6,986
2017	365	501	-	-	-	4,134	-	1,811	-	6,811
2018	432	592	-	-	-	4,419	-	1,954	-	7,397
Maximum	574	738	-	-	-	5,664	-	2,669	-	9,006
Minimum	70	126	-	-	-	3,479	-	1,631	-	5,911
Average	332	506	-	-	-	4,895	-	2,143	-	7,876

Agricultural Pumping (afy)

Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total AG
1982	2,326	901	147	1,500	2,460	12,541	307	798	-	20,980
1983	2,144	837	138	1,419	2,343	10,945	274	741	-	18,841
1984	2,230	894	155	1,623	2,333	12,037	265	687	-	20,223
1985	1,937	816	154	1,654	2,082	12,153	321	717	-	19,834
1986	1,539	666	131	1,429	1,891	12,441	421	866	-	19,384
1987	1,577	690	138	1,506	1,950	15,672	466	1,121	-	23,121
1988	1,468	649	132	1,448	1,963	14,248	521	969	-	21,398
1989	1,627	718	146	1,598	2,575	14,133	674	938	-	22,409
1990	1,894	805	154	1,665	3,238	14,678	765	1,072	-	24,271
1991	1,686	714	136	1,465	2,915	14,305	704	993	-	22,917
1992	1,574	635	111	1,168	2,751	14,687	587	1,036	-	22,550
1993	1,399	543	89	908	2,658	14,450	512	1,094	-	21,653
1994	1,456	548	84	838	2,648	12,402	690	1,085	-	19,751
1995	1,314	485	71	695	2,571	10,490	718	996	-	17,338
1996	1,372	518	80	798	3,274	13,189	898	1,269	-	21,398
1997	1,513	563	84	828	4,410	17,364	1,258	1,543	-	27,562
1998	1,253	482	77	783	3,446	12,686	881	1,103	-	20,712
1999	1,642	643	107	1,103	3,878	14,467	1,136	1,298	-	24,273
2000	1,778	709	122	1,270	3,899	15,405	1,166	1,304	-	25,653
2001	1,608	681	130	1,400	3,930	15,224	1,051	1,191	-	25,216
2002	1,621	675	125	1,338	4,165	15,565	1,227	1,200	-	25,916
2003	1,625	638	107	1,100	3,824	12,295	1,093	1,028	-	21,709
2004	1,903	763	133	1,390	4,481	13,115	1,123	1,049	-	23,957
2005	1,805	721	125	1,298	3,967	12,661	1,102	897	-	22,576
2006	1,647	654	112	1,160	3,670	11,431	1,170	864	-	20,707
2007	2,027	806	138	1,433	4,477	12,524	1,494	1,029	-	23,927
2008	2,035	866	166	1,793	4,515	12,346	1,639	1,033	-	24,394
2009	1,911	856	177	1,950	4,649	13,183	1,678	1,118	-	25,521
2010	1,794	789	159	1,739	4,509	13,482	1,681	1,056	-	25,209
2011	1,750	738	140	1,501	3,854	12,327	1,596	836	-	22,742
2012	2,091	875	164	1,752	4,554	15,036	1,852	869	-	27,192
2013	2,124	919	181	1,970	5,374	17,251	1,921	1,082	-	30,823
2014	2,025	915	192	2,122	4,996	14,444	1,867	1,032	-	27,594
2015	2,136	955	197	2,175	5,182	14,791	2,024	925	-	28,386
2016	2,143	923	181	1,963	5,199	14,244	2,014	845	-	27,512
2017	2,155	926	181	1,957	5,388	14,002	1,901	788	-	27,297
2018	2,173	890	161	1,700	5,345	13,289	1,876	744	-	26,176
Maximum	2,326	955	197	2,175	5,388	17,364	2,024	1,543	-	30,823
Minimum	1,253	482	71	695	1,891	10,490	265	687	-	17,338
Average	1,792	741	136	1,444	3,658	13,662	1,105	1,006	-	23,544

Domestic Pumping (afy)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total DOM
1982	10	8	1	51	7	68	21	25	-	190
1983	12	9	1	50	8	72	24	26	-	202
1984	12	9	1	71	4	77	32	23	-	230
1985	12	8	1	65	6	79	42	25	-	238
1986	13	9	1	67	8	68	48	40	-	255
1987	14	10	1	58	10	54	48	43	-	239
1988	22	15	1	60	9	44	47	44	-	243
1989	16	12	1	65	9	49	29	41	-	223
1990	11	9	2	69	13	40	44	40	-	230
1991	18	14	3	67	19	42	44	39	-	247
1992	13	11	4	71	17	47	39	33	-	233
1993	31	15	3	59	17	51	44	32	-	251
1994	45	20	3	51	21	43	45	32	-	259
1995	53	26	3	53	25	40	49	34	-	284
1996	58	30	3	54	25	35	53	33	-	291
1997	61	32	4	54	25	40	55	31	-	301
1998	60	32	4	83	25	27	45	32	-	307
1999	58	28	4	141	24	30	45	43	-	373
2000	46	22	4	172	21	27	46	47	-	386
2001	50	23	4	164	25	27	56	42	-	391
2002	55	23	5	175	33	24	68	39	-	421
2003	56	26	5	184	34	27	60	38	-	431
2004	59	28	5	199	33	26	61	38	-	450
2005	95	29	5	192	32	31	61	41	-	486
2006	108	31	7	202	31	32	63	42	-	515
2007	107	33	6	223	36	32	76	49	-	563
2008	109	33	6	256	37	31	82	53	-	608
2009	112	34	6	234	36	38	86	58	-	605
2010	114	35	5	198	36	40	83	50	-	561
2011	111	34	5	196	38	41	83	49	-	557
2012	109	35	4	191	34	36	80	41	-	530
2013	101	37	5	186	34	33	80	45	-	521
2014	111	46	6	206	40	37	81	49	-	575
2015	107	41	6	208	53	40	72	46	-	573
2016	97	32	5	190	48	33	62	42	-	509
2017	94	32	5	201	38	33	61	40	-	505
2018	108	38	5	198	34	37	72	33	-	526
Maximum	114	46	7	256	53	79	86	58	-	608
Minimum	10	8	1	50	4	24	21	23	-	190
Average	61	25	4	134	26	41	56	39	-	387

Total Annual Pumping (afy)										
Water Year	CMA SYR Alluvium	CMA Lower Aquifer	Buellton Tributary	Buellton Upland	WMA SYR Alluvium	Lompoc Plain	Santa Rita Upland	Lompoc Upland	Lompoc Terrace	Total Pumping
1982	2,652	1,325	148	1,551	2,468	16,088	328	2,521	-	27,081
1983	2,449	1,262	139	1,470	2,350	14,605	298	2,398	-	24,972
1984	2,616	1,468	156	1,694	2,337	16,450	297	2,640	-	27,659
1985	2,327	1,356	155	1,719	2,088	16,333	363	3,003	-	27,344
1986	2,021	1,342	133	1,496	1,899	17,455	469	3,006	-	27,820
1987	2,102	1,436	139	1,565	1,960	20,676	514	3,225	-	31,617
1988	2,028	1,346	133	1,509	1,971	19,517	568	3,225	-	30,297
1989	2,217	1,384	147	1,663	2,584	19,684	703	3,256	-	31,639
1990	2,388	1,423	157	1,735	3,251	19,802	809	3,284	-	32,848
1991	2,123	1,174	139	1,532	2,934	18,877	748	3,036	-	30,563
1992	1,941	1,144	115	1,239	2,768	19,350	626	3,138	-	30,322
1993	1,811	1,037	92	967	2,675	19,172	556	3,170	-	29,480
1994	1,841	1,116	87	889	2,669	17,261	735	3,095	-	27,693
1995	1,723	1,048	74	748	2,596	15,179	767	2,900	-	25,037
1996	1,831	1,085	83	852	3,298	18,337	951	3,355	-	29,792
1997	1,941	1,138	88	882	4,435	23,058	1,313	3,821	-	36,676
1998	1,383	639	81	867	3,472	17,942	926	3,094	-	28,403
1999	1,819	856	111	1,244	3,902	19,944	1,181	3,524	-	32,582
2000	1,980	968	126	1,441	3,920	21,006	1,212	3,731	-	34,383
2001	1,880	1,101	134	1,564	3,956	20,351	1,107	3,526	-	33,618
2002	1,857	1,034	130	1,513	4,198	21,253	1,295	3,528	-	34,806
2003	1,904	1,044	111	1,284	3,859	17,962	1,153	3,267	-	30,585
2004	2,296	1,227	138	1,589	4,515	18,710	1,184	3,618	-	33,276
2005	2,200	1,083	130	1,490	3,999	17,779	1,163	3,203	-	31,047
2006	2,038	996	119	1,362	3,700	16,801	1,233	3,210	-	29,459
2007	2,352	1,273	144	1,656	4,513	18,111	1,570	3,747	-	33,366
2008	2,371	1,456	172	2,050	4,552	18,013	1,721	3,666	-	34,001
2009	2,328	1,585	183	2,184	4,685	18,178	1,764	3,621	-	34,528
2010	2,240	1,508	164	1,937	4,545	18,228	1,764	3,292	-	33,678
2011	2,080	1,321	145	1,698	3,892	16,906	1,679	3,227	-	30,948
2012	2,438	1,308	168	1,942	4,588	19,745	1,932	3,138	-	35,260
2013	2,615	1,609	186	2,156	5,408	22,218	2,002	3,488	-	39,682
2014	2,627	1,699	197	2,328	5,036	19,448	1,948	3,267	-	36,551
2015	2,587	1,728	203	2,384	5,236	19,136	2,096	2,748	-	36,117
2016	2,510	1,534	186	2,153	5,247	18,657	2,076	2,644	-	35,007
2017	2,615	1,458	186	2,158	5,426	18,168	1,962	2,639	-	34,612
2018	2,713	1,520	166	1,898	5,378	17,745	1,948	2,731	-	34,099
Maximum	2,713	1,728	203	2,384	5,426	23,058	2,096	3,821	-	39,682
Minimum	1,383	639	74	748	1,899	14,605	297	2,398	-	24,972
Average	2,185	1,271	140	1,579	3,684	18,598	1,161	3,189	-	31,807

Model Calibration Attachment 5

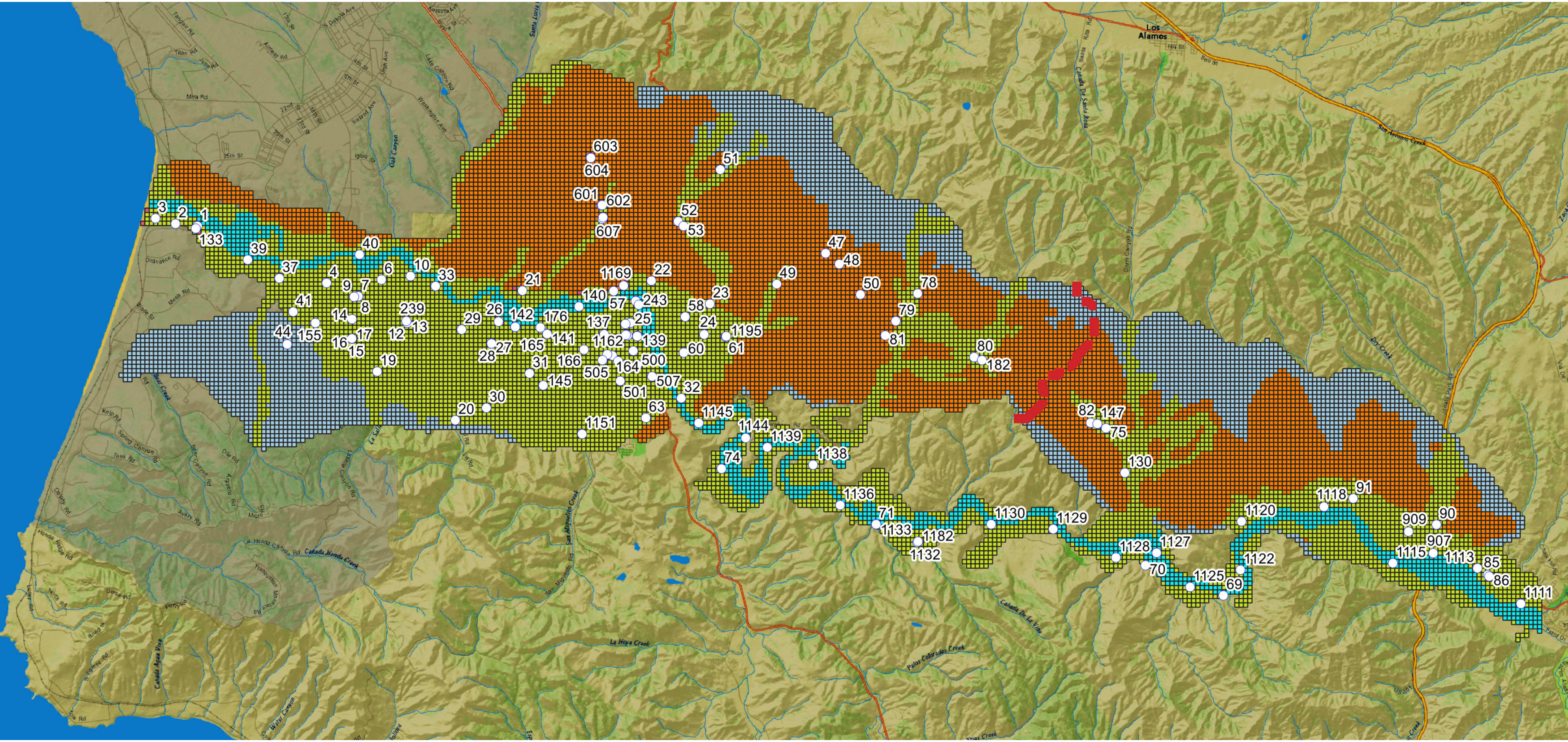
WMA/CMA Model Documentation

Calibration Target Well Name, Database ID, Extracted Head Layer, and Subarea Location

Well Number	Well Name	Seteson Database ID	Extracted Head Layer	Model Subarea
52	7N-32W-31M1	75	7	Central Management Area
57	7N-33W-36J1	82	7	Central Management Area
62	6N-32W-06K01	130	7	Central Management Area
70	7N-33W-36J02	147	7	Central Management Area
48	6N-32W-16P3	69	2	Santa Ynez River - Central Managemetn Area
49	6N-32W-18H1	70	2	Santa Ynez River - Central Managemetn Area
58	6N-31W-17F1	85	2	Santa Ynez River - Central Managemetn Area
59	6N-31W-17F3	86	2	Santa Ynez River - Central Managemetn Area
60	6N-31W-7F1	90	7	Santa Ynez River - Central Managemetn Area
61	6N-32W-2Q1	91	7	Santa Ynez River - Central Managemetn Area
97	Buellton_Well_07	907	7	Santa Ynez River - Central Managemetn Area
98	Buellton_Well_09	909	7	Santa Ynez River - Central Managemetn Area
99	USBR_Node_17	1111	2	Santa Ynez River - Central Managemetn Area
100	USBR_Node_16	1113	2	Santa Ynez River - Central Managemetn Area
101	USBR_Node_15	1115	7	Santa Ynez River - Central Managemetn Area
102	USBR_Node_15	1118	7	Santa Ynez River - Central Managemetn Area
103	USBR_Node_14	1120	2	Santa Ynez River - Central Managemetn Area
104	USBR_Node_13	1122	2	Santa Ynez River - Central Managemetn Area
105	USBR_Node_12	1125	2	Santa Ynez River - Central Managemetn Area
106	USBR_Node_11	1127	2	Santa Ynez River - Central Managemetn Area
107	USBR_Node_10	1128	2	Santa Ynez River - Central Managemetn Area
1	7N-35W-17K20	1	5	Western Estuary Area
2	7N-35W-17M1	2	5	Western Estuary Area
3	7N-35W-18J2	3	5	Western Estuary Area
63	7N-35W-17Q06	133	5	Western Estuary Area
35	7N-35W-27P1	44	7	Lompoc Terrace Area
50	6N-33W-8J3	71	2	Santa Ynez River - Western Managemetn Area
51	6N-34W-12C5	74	2	Santa Ynez River - Western Managemetn Area
108	USBR_Node_9	1129	2	Santa Ynez River - Western Managemetn Area
109	USBR_Node_8	1130	2	Santa Ynez River - Western Managemetn Area
110	USBR_Node_7	1132	2	Santa Ynez River - Western Managemetn Area
111	USBR_Node_6	1133	2	Santa Ynez River - Western Managemetn Area
112	USBR_Node_5	1136	2	Santa Ynez River - Western Managemetn Area
113	USBR_Node_4	1138	2	Santa Ynez River - Western Managemetn Area
114	USBR_Node_3	1139	2	Santa Ynez River - Western Managemetn Area
115	USBR_Node_2	1144	2	Santa Ynez River - Western Managemetn Area
116	USBR_Node_1	1145	2	Santa Ynez River - Western Managemetn Area
120	USBR_Node_7	1182	2	Santa Ynez River - Western Managemetn Area
36	7N-33W-17M1	47	6	Lompoc Upland Area
37	7N-33W-17N2	48	6	Lompoc Upland Area
38	7N-33W-19D1	49	7	Lompoc Upland Area
39	7N-33W-20G1R	50	7	Lompoc Upland Area
40	7N-34W-12E1	51	7	Lompoc Upland Area
41	7N-34W-14F4	52	7	Lompoc Upland Area
42	7N-34W-14L1	53	7	Lompoc Upland Area
90	VVCSD_1A	601	6	Lompoc Upland Area
91	VVCSD_1B	602	7	Lompoc Upland Area

Well Number	Well Name	Seteson Database ID	Extracted Head Layer	Model Subarea
92	VVCSD_2	603	7	Lompoc Upland Area
93	VVCSD_2A	604	7	Lompoc Upland Area
94	VVCSD_3	606	7	Lompoc Upland Area
95	VVCSD_3A	607	7	Lompoc Upland Area
96	VVCSD_3B	608	7	Lompoc Upland Area
4	7N-35W-22J1	4	5	Lompoc Plain Area
5	7N-35W-23J5	6	5	Lompoc Plain Area
6	7N-35W-23Q2	7	5	Lompoc Plain Area
7	7N-35W-23Q3	8	5	Lompoc Plain Area
8	7N-35W-23Q4	9	5	Lompoc Plain Area
9	7N-35W-24K5	10	5	Lompoc Plain Area
10	7N-35W-25F6	12	5	Lompoc Plain Area
11	7N-35W-25F7	13	5	Lompoc Plain Area
31	7N-35W-22M1	37	5	Lompoc Plain Area
32	7N-35W-21G2	39	5	Lompoc Plain Area
33	7N-35W-23B2	40	5	Lompoc Plain Area
34	7N-35W-27F1	41	2	Lompoc Plain Area
81	7N-35W-25F5	239	5	Lompoc Plain Area
12	7N-35W-26F4	14	7	Lompoc Plain Area
13	7N-35W-26L1	15	7	Lompoc Plain Area
14	7N-35W-26L2	16	7	Lompoc Plain Area
15	7N-35W-26L4	17	7	Lompoc Plain Area
16	7N-35W-35A3	19	7	Lompoc Plain Area
71	7N-35W-27H01	155	7	Lompoc Plain Area
17	6N-34W-6C4	20	7	Lompoc Plain Area
18	7N-34W-20K4	21	7	Lompoc Plain Area
19	7N-34W-22J6	22	7	Lompoc Plain Area
20	7N-34W-24N1	23	7	Lompoc Plain Area
21	7N-34W-26H3	24	7	Lompoc Plain Area
22	7N-34W-27G6	25	7	Lompoc Plain Area
23	7N-34W-29E4	26	7	Lompoc Plain Area
24	7N-34W-29N6	27	7	Lompoc Plain Area
25	7N-34W-29N7	28	7	Lompoc Plain Area
26	7N-34W-30L10	29	7	Lompoc Plain Area
27	7N-34W-31R2	30	7	Lompoc Plain Area
28	7N-34W-32H2	31	7	Lompoc Plain Area
29	7N-34W-35K9	32	2	Lompoc Plain Area
30	7N-35W-24J4	33	5	Lompoc Plain Area
43	7N-34W-22M6	57	7	Lompoc Plain Area
44	7N-34W-26B4	58	7	Lompoc Plain Area
45	7N-34W-26Q5	60	7	Lompoc Plain Area
46	7N-34W-25F3	61	7	Lompoc Plain Area
47	7N-34W-34R1	63	6	Lompoc Plain Area
64	7N-34W-27E04	137	7	Lompoc Plain Area
65	7N-34W-27K05	139	7	Lompoc Plain Area
66	7N-34W-28B05	140	7	Lompoc Plain Area
67	7N-34W-28M02	141	7	Lompoc Plain Area
68	7N-34W-29F01	142	7	Lompoc Plain Area

Well Number	Well Name	Seteson Database ID	Extracted Head Layer	Model Subarea
69	7N-34W-33E05	145	7	Lompoc Plain Area
72	7N-34W-27P06	164	7	Lompoc Plain Area
73	7N-34W-28M01	165	7	Lompoc Plain Area
74	7N-34W-28Q01	166	7	Lompoc Plain Area
75	7N-34W-29F02	167	7	Lompoc Plain Area
76	7N-34W-27K04	170	7	Lompoc Plain Area
77	7N-34W-27K06	171	7	Lompoc Plain Area
78	7N-34W-27N06	172	7	Lompoc Plain Area
79	7N-34W-29H03	176	7	Lompoc Plain Area
80	7N-34W-22Q08	178	7	Lompoc Plain Area
82	7N-34W-22Q7	243	7	Lompoc Plain Area
83	Lompoc_1	500	7	Lompoc Plain Area
84	Lompoc_2	501	7	Lompoc Plain Area
85	Lompoc_3A	503	7	Lompoc Plain Area
86	Lompoc_4	504	7	Lompoc Plain Area
87	Lompoc_5	505	7	Lompoc Plain Area
88	Lompoc_7	507	7	Lompoc Plain Area
89	Lompoc_8	508	7	Lompoc Plain Area
117	USBR_Node_F	1151	7	Lompoc Plain Area
118	USBR_Node_C	1162	7	Lompoc Plain Area
119	USBR_Node_A	1169	7	Lompoc Plain Area
121	USBR_Node_C	1193	7	Lompoc Plain Area
122	USBR_Node_E	1195	7	Lompoc Plain Area
53	7N-33W-21G2	78	7	Santa Rita Upland Area
54	7N-33W-21N1	79	7	Santa Rita Upland Area
55	7N-33W-27G1	80	7	Santa Rita Upland Area
56	7N-33W-28D3	81	7	Santa Rita Upland Area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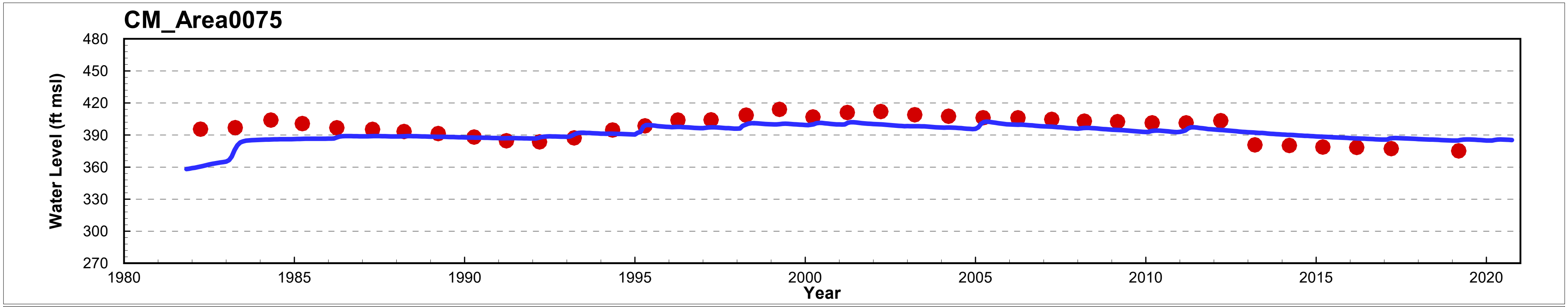
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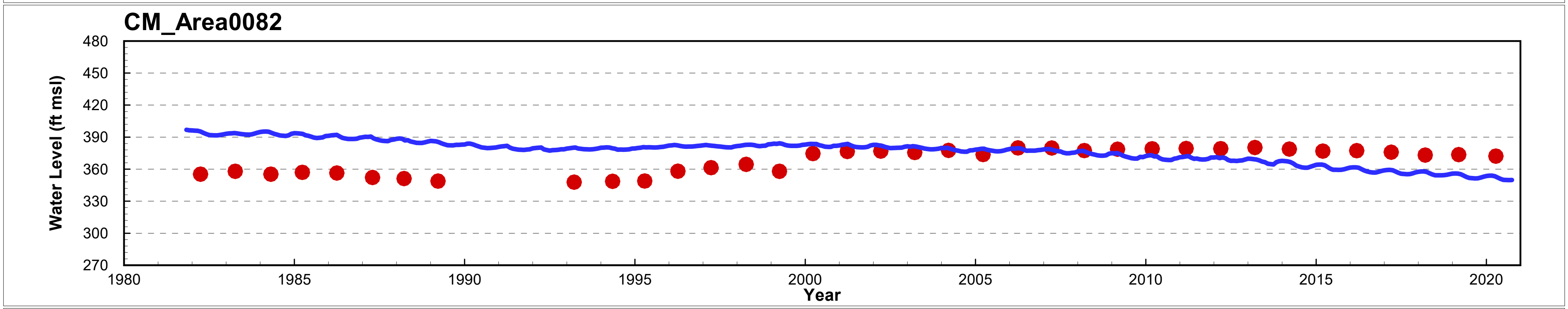
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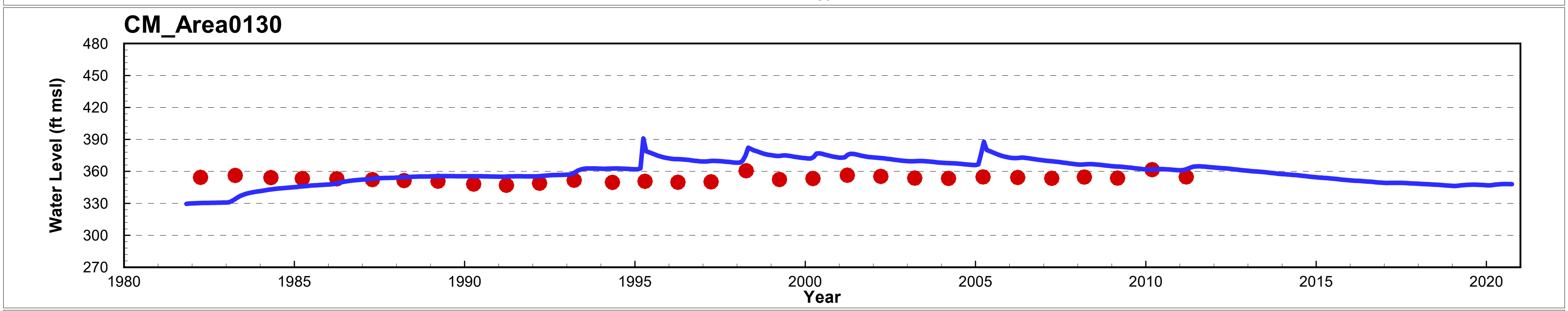
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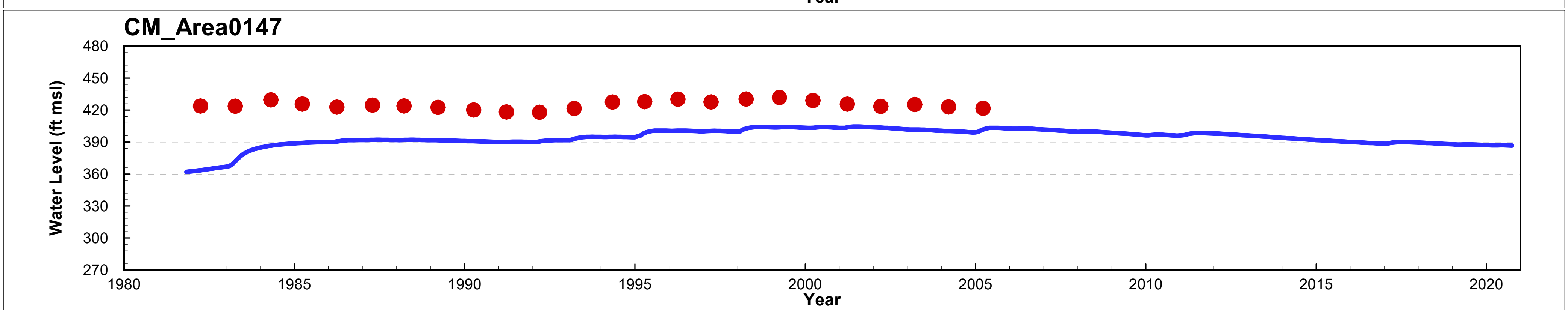
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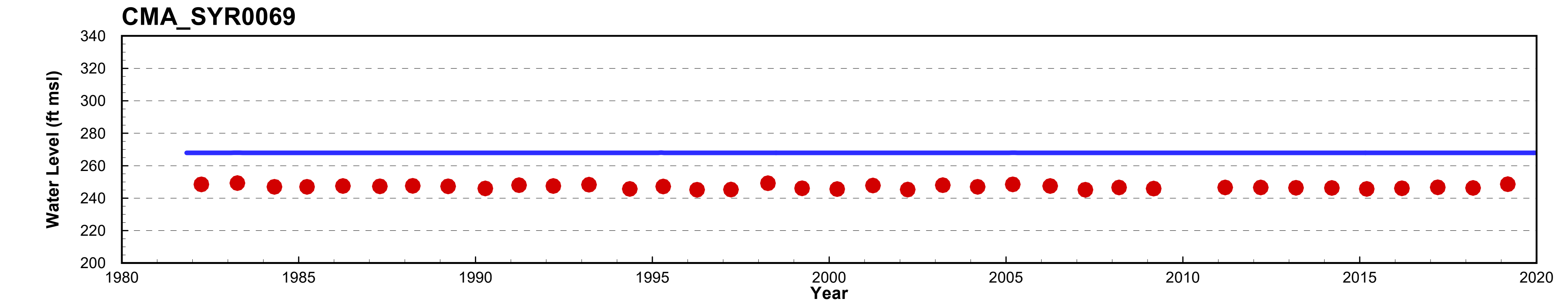
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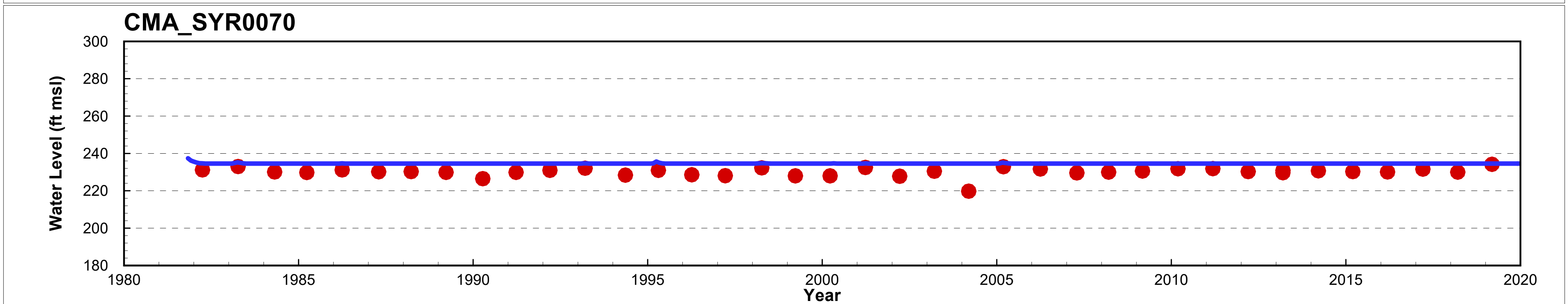
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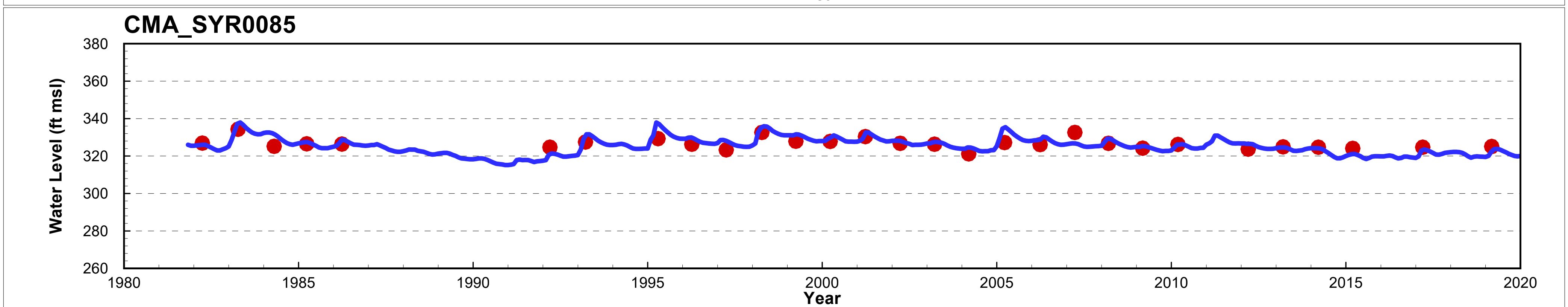
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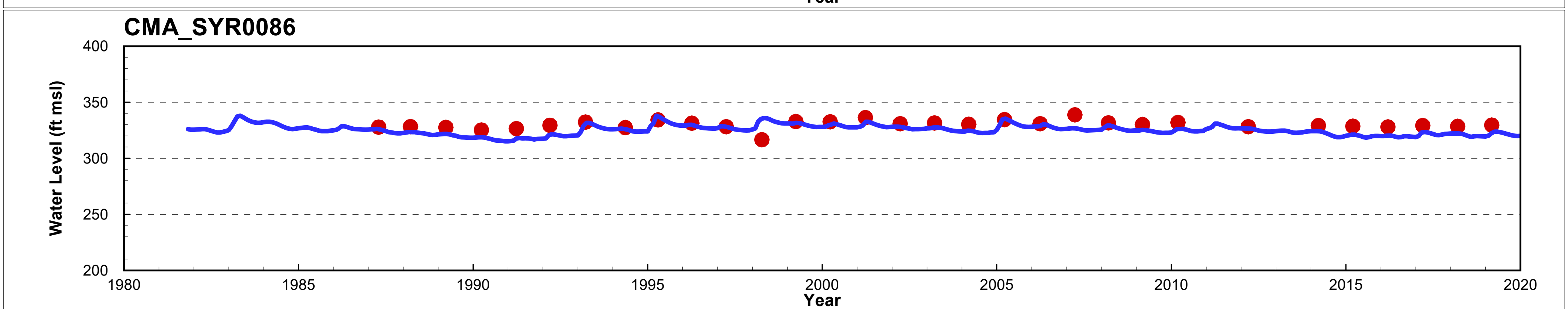
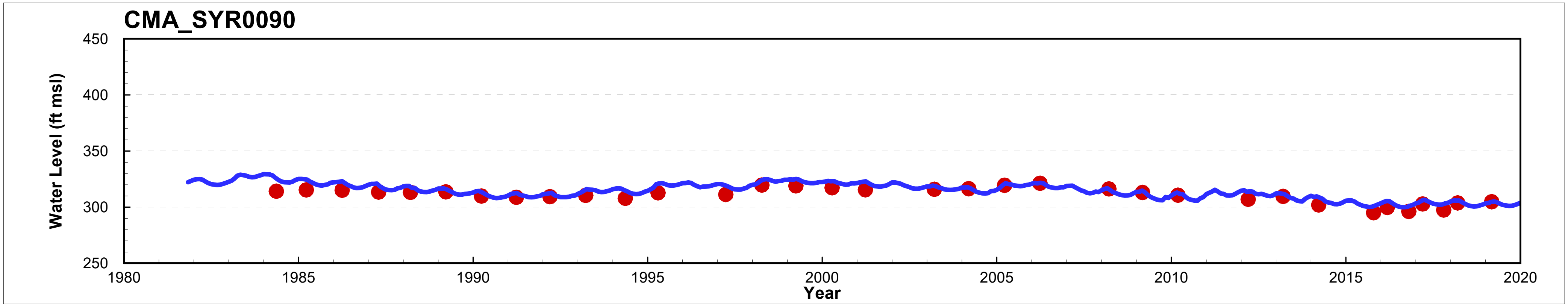
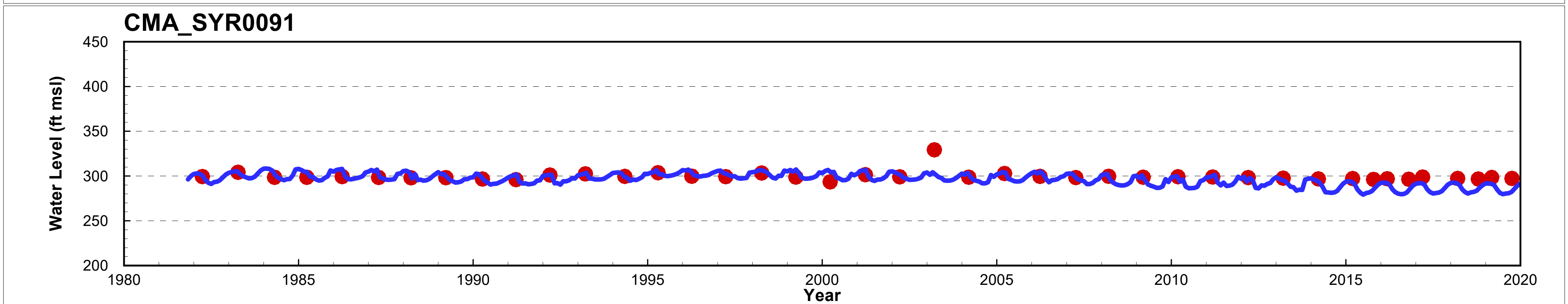
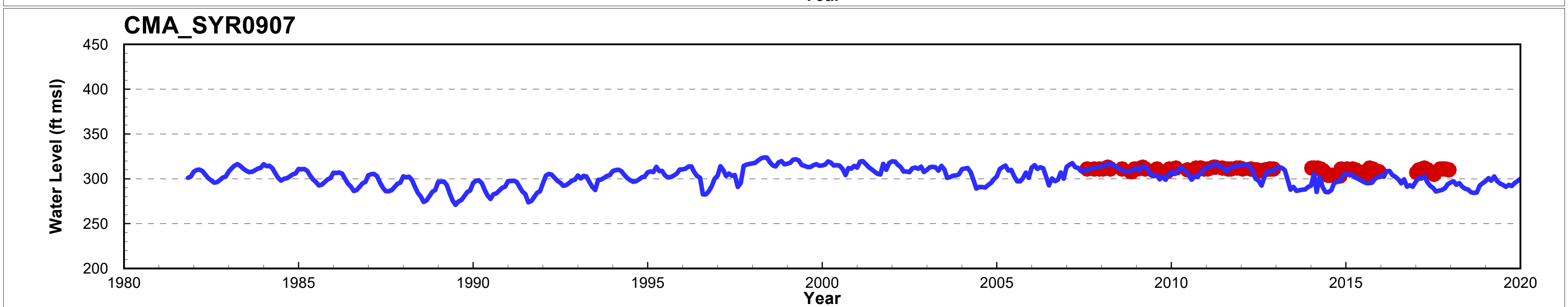
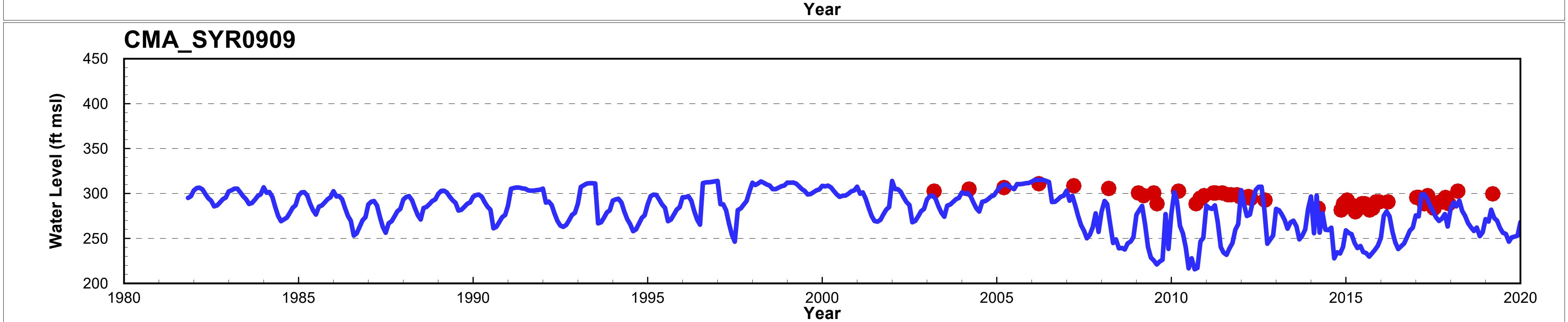
260
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


CMA_SYR0086
Water Level (ft msl)
400
350
300
250
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

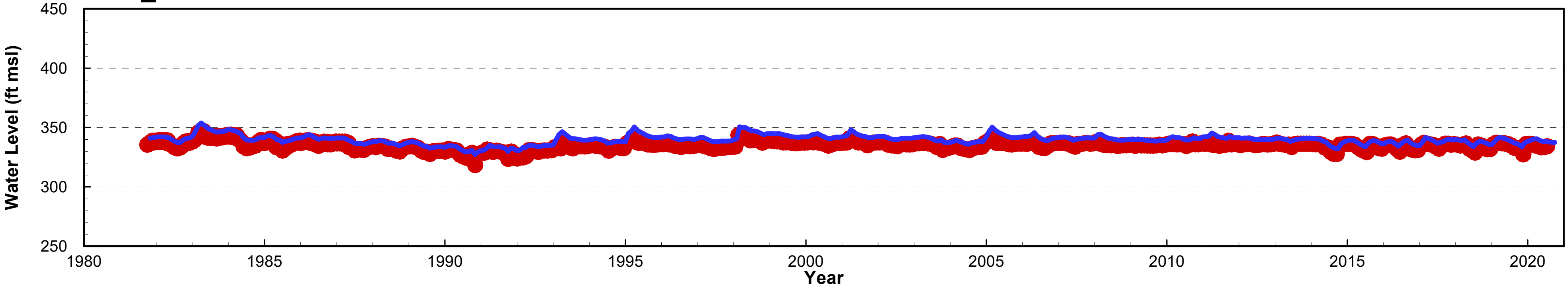

CMA_SYR0090
Water Level (ft msl)
450
400
350
300
250
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


CMA_SYR0091
Water Level (ft msl)
450
400
350
300
250
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

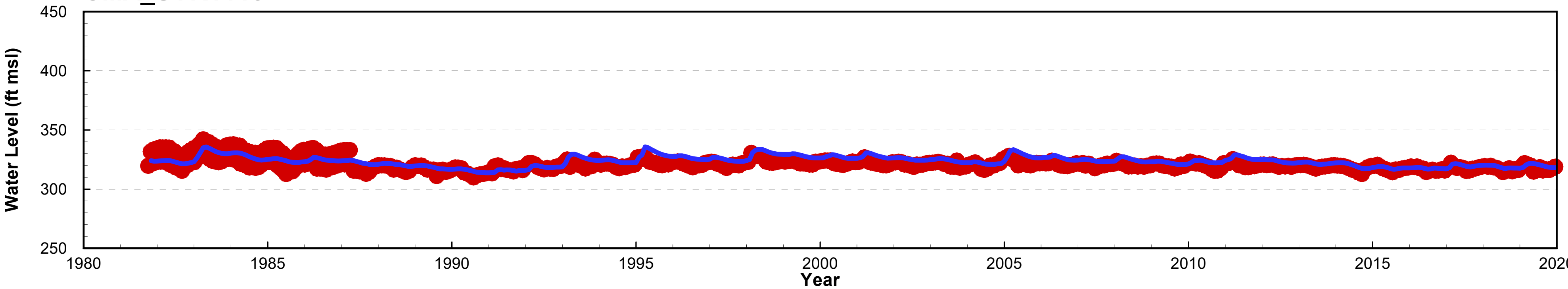

CMA_SYR0907
Water Level (ft msl)
450
400
350
300
250
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


CMA_SYR0909
Water Level (ft msl)
450
400
350
300
250
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

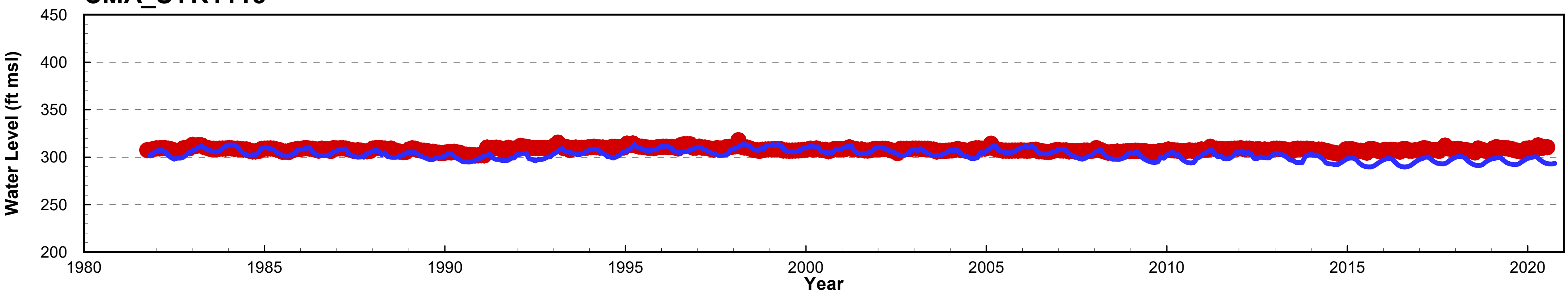
CMA_SYR1111



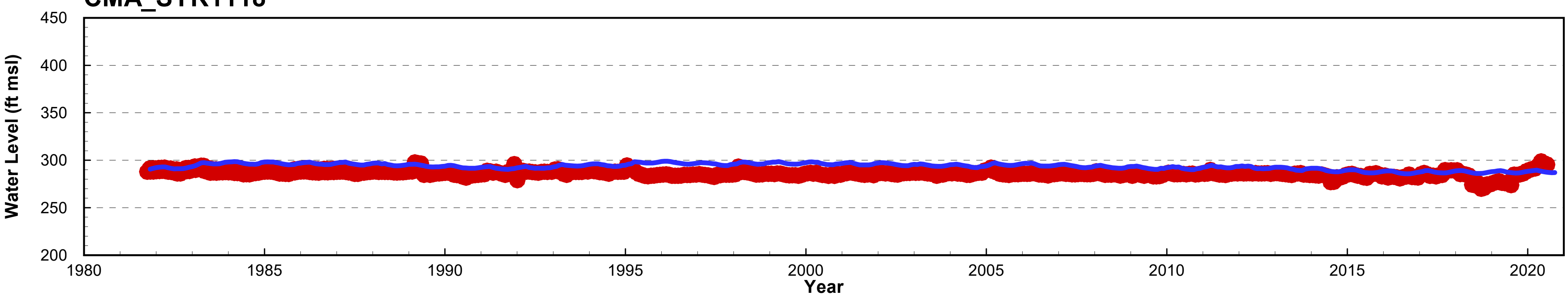
CMA_SYR1113



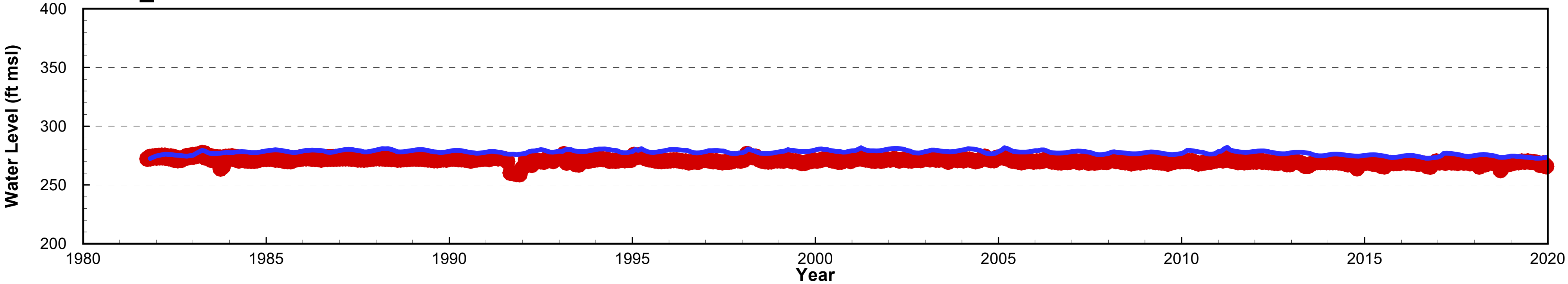
CMA_SYR1115



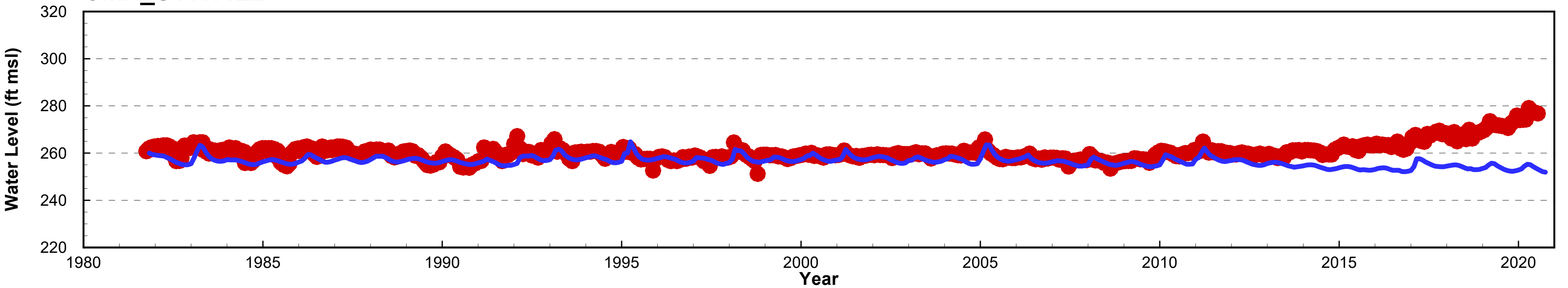
CMA_SYR1118



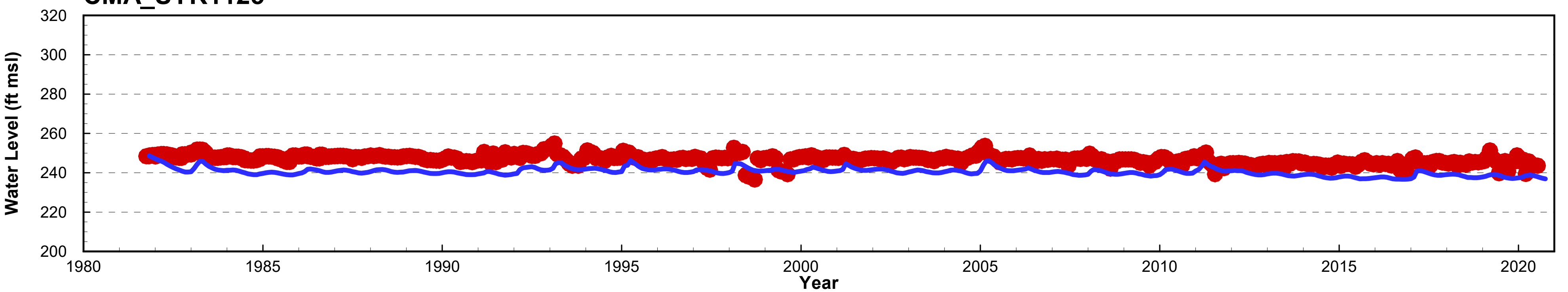
CMA_SYR1120



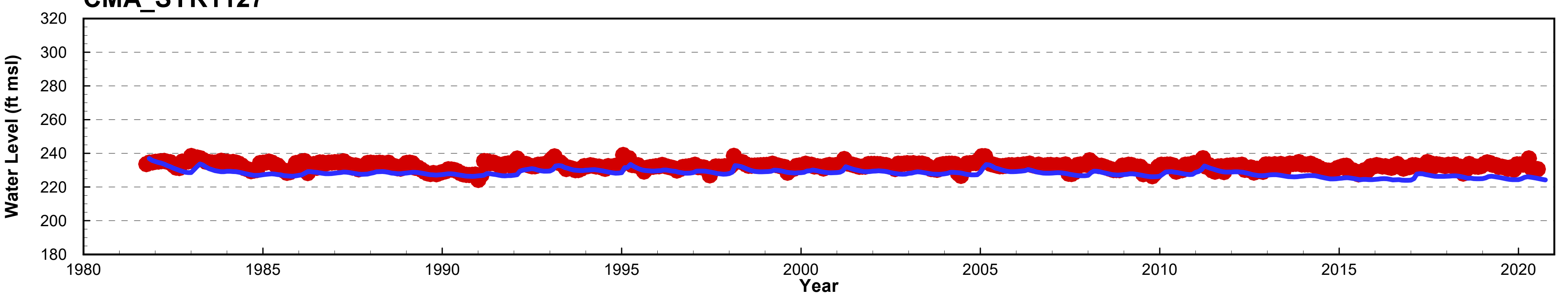
CMA_SYR1122

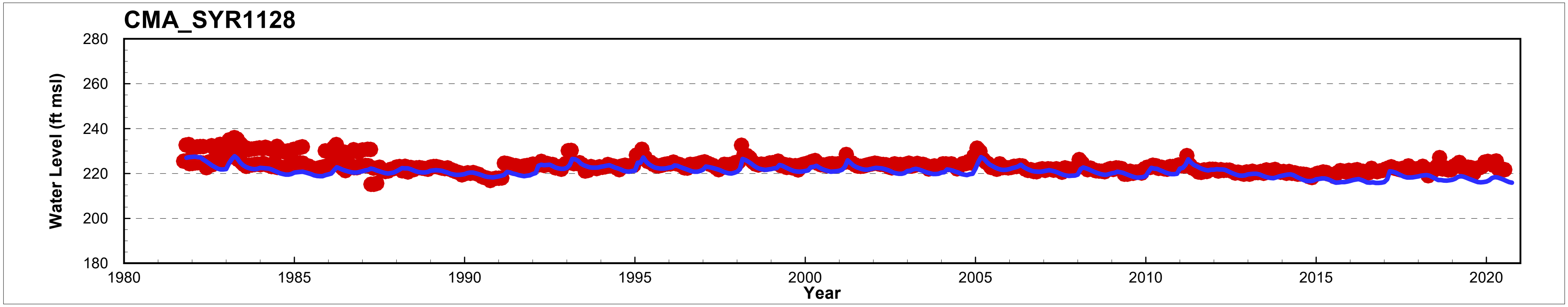


CMA_SYR1125



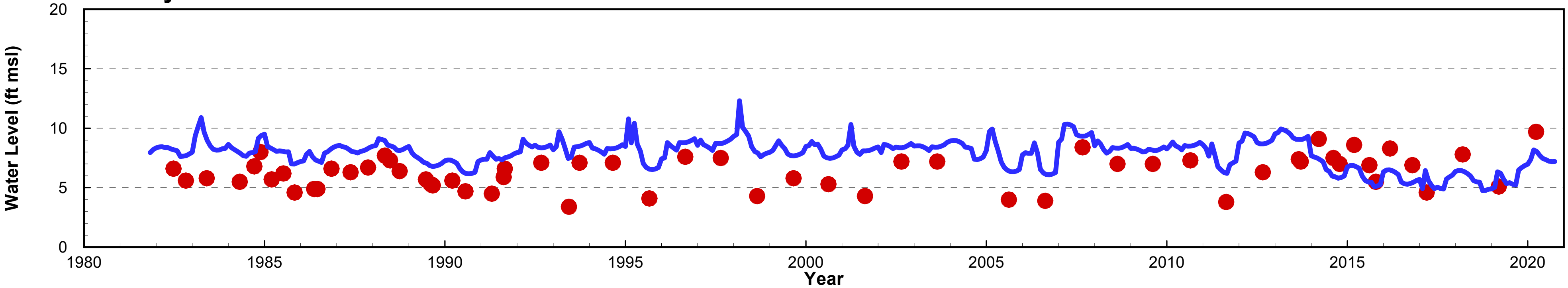
CMA_SYR1127



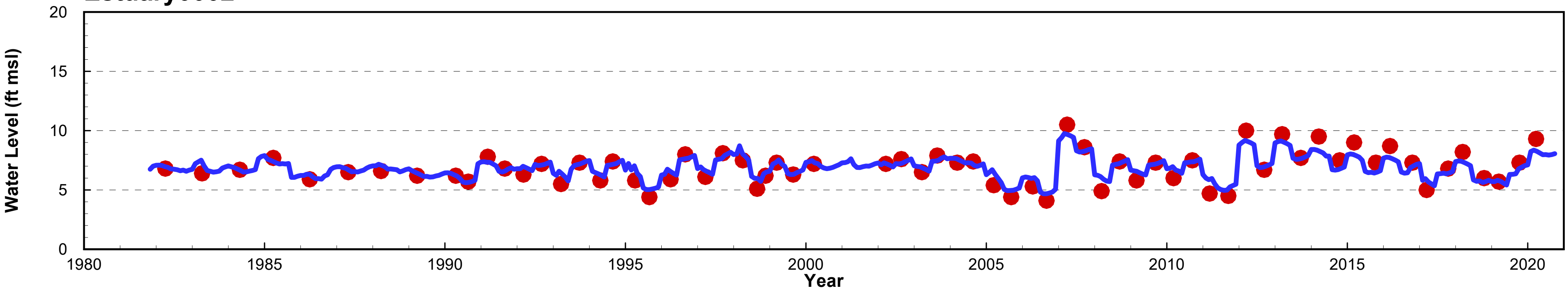


CMA_SYR1128
Water Level (ft msl)
280
260
240
220
200
180
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

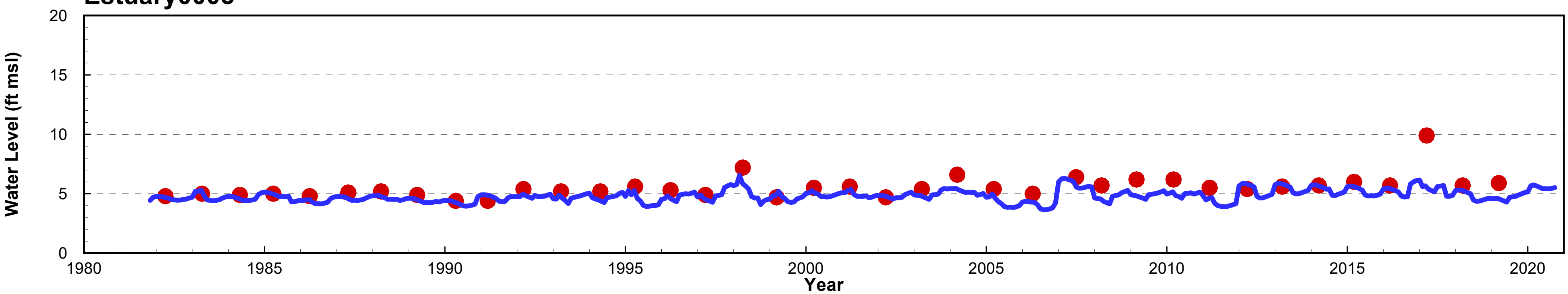
Estuary0001



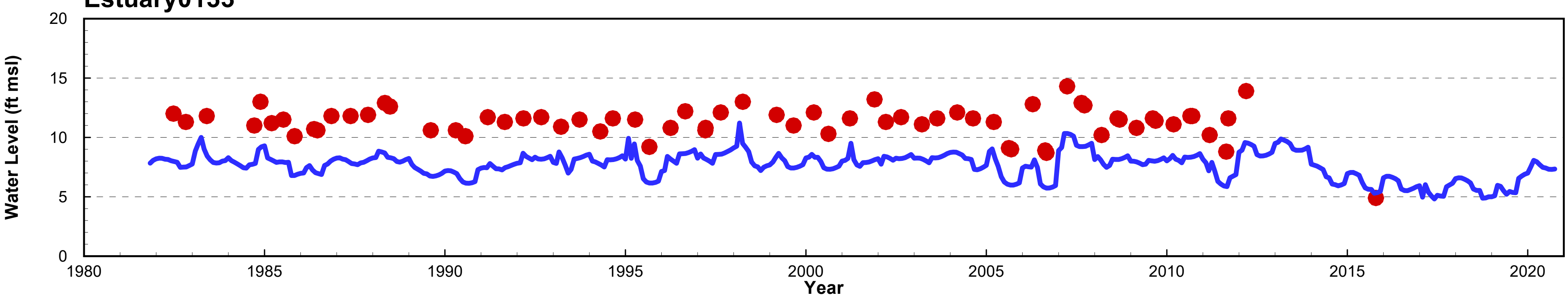
Estuary0002

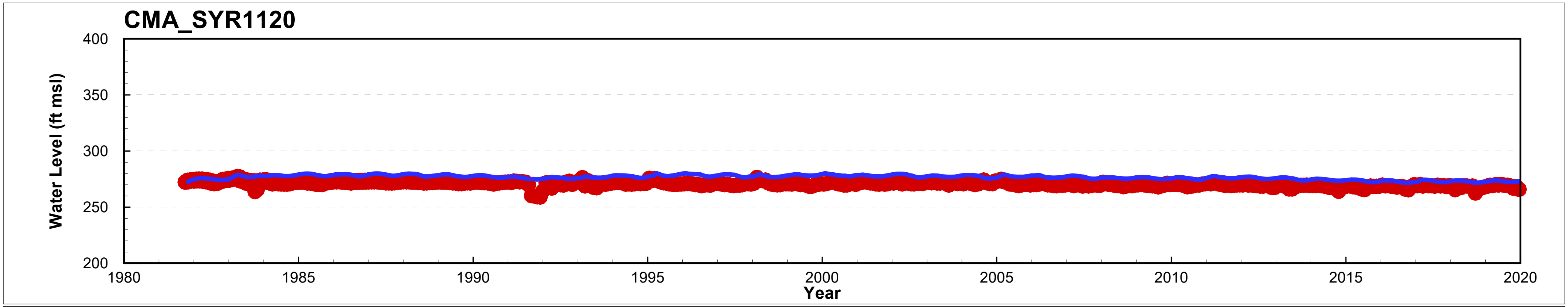


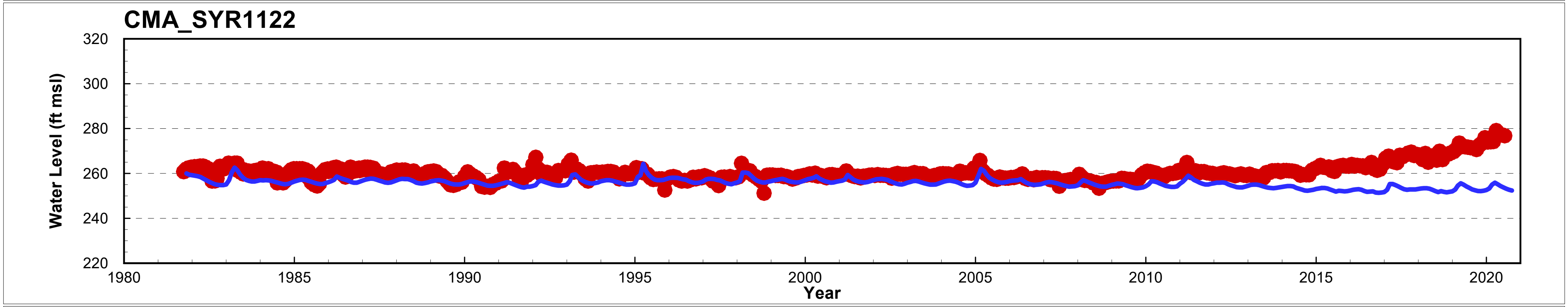
Estuary0003

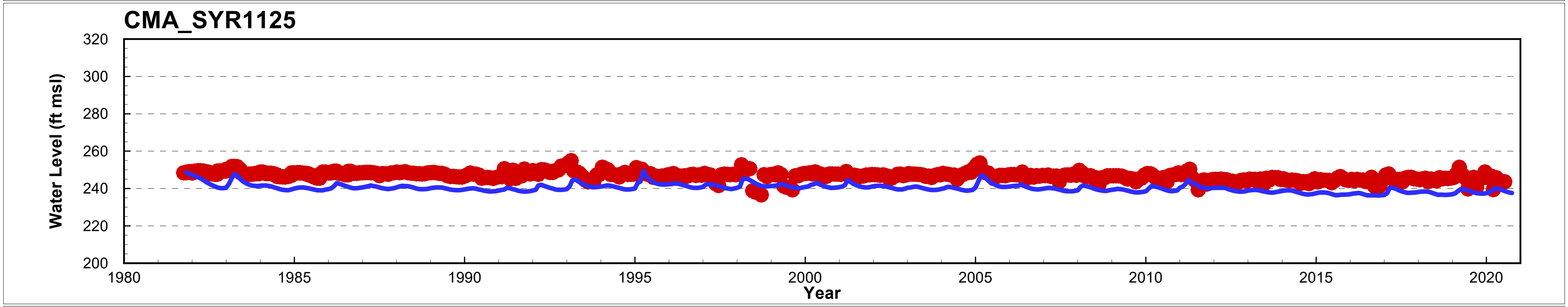


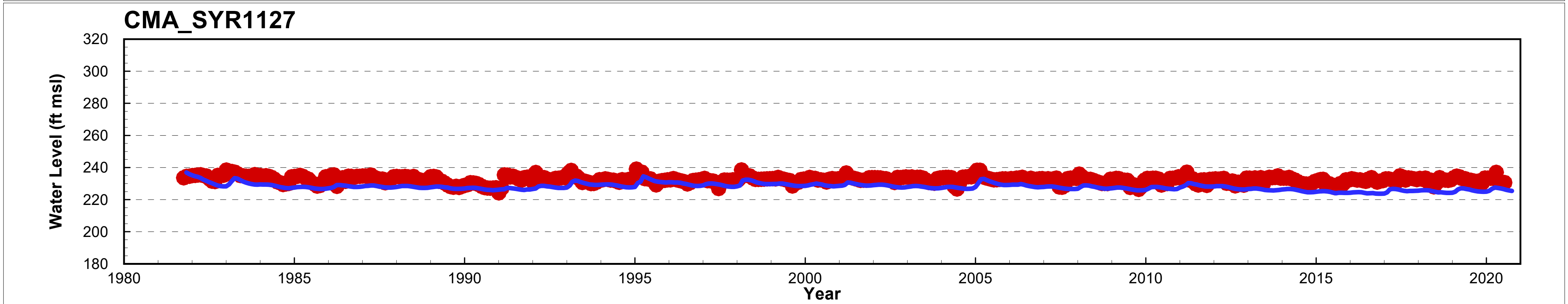
Estuary0133

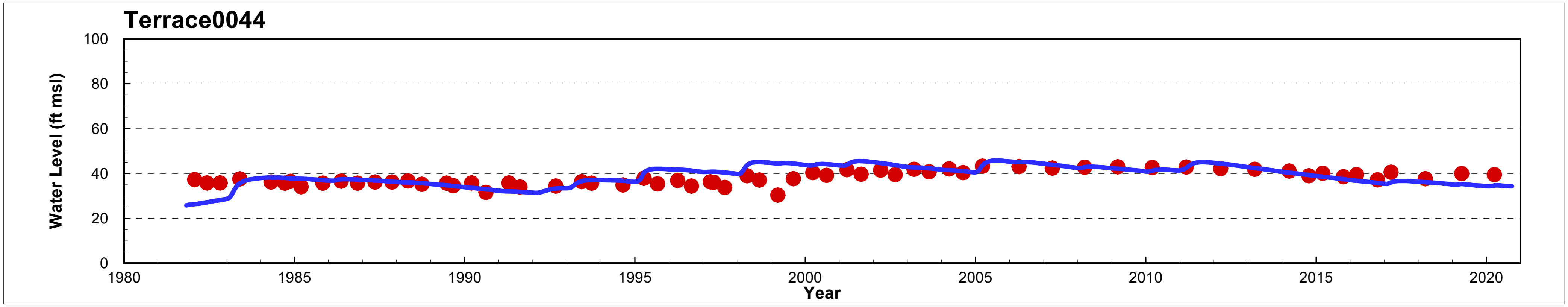


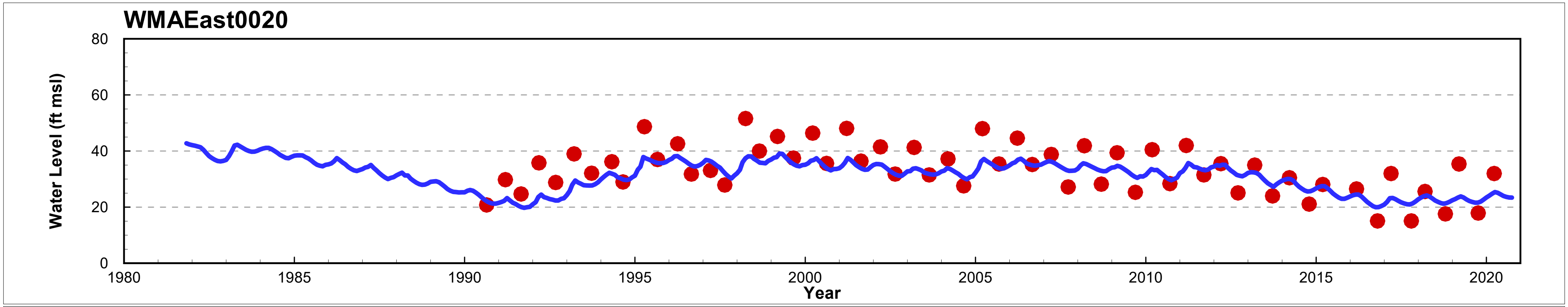

CMA_SYR1120
Water Level (ft msl)
400
350
300
250
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

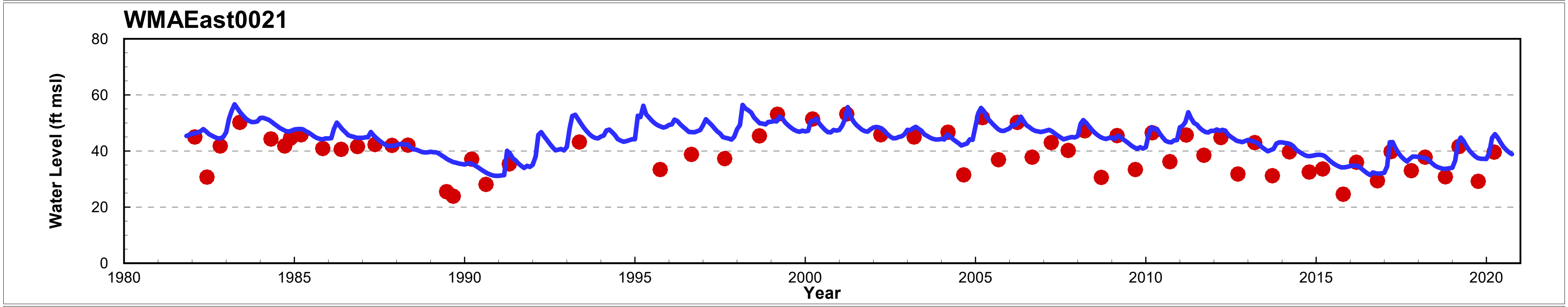

CMA_SYR1122
Water Level (ft msl)
320
300
280
260
240
220
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

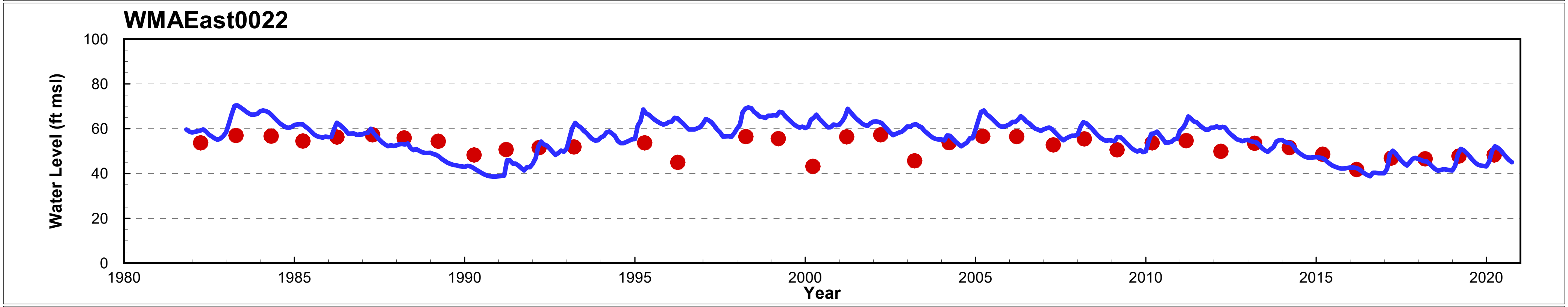

CMA_SYR1125
Water Level (ft msl)
320
300
280
260
240
220
200
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

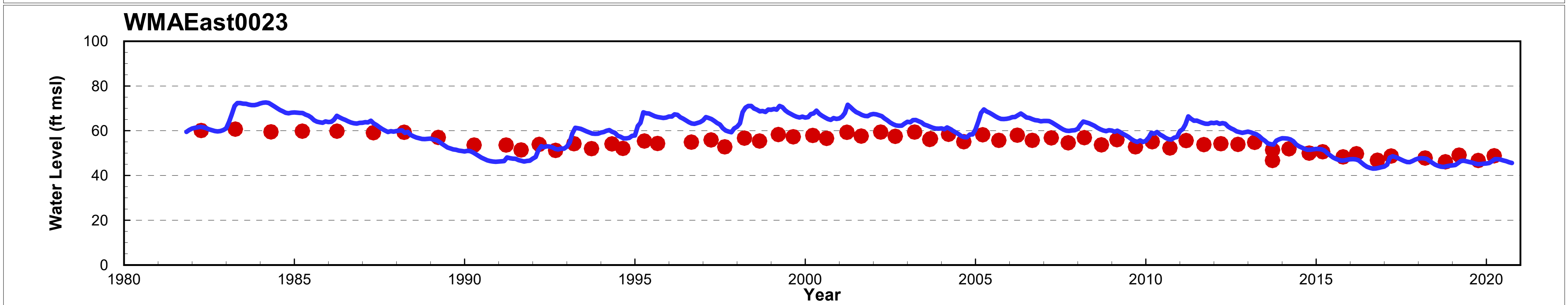

CMA_SYR1127
Water Level (ft msl)
320
300
280
260
240
220
200
180
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

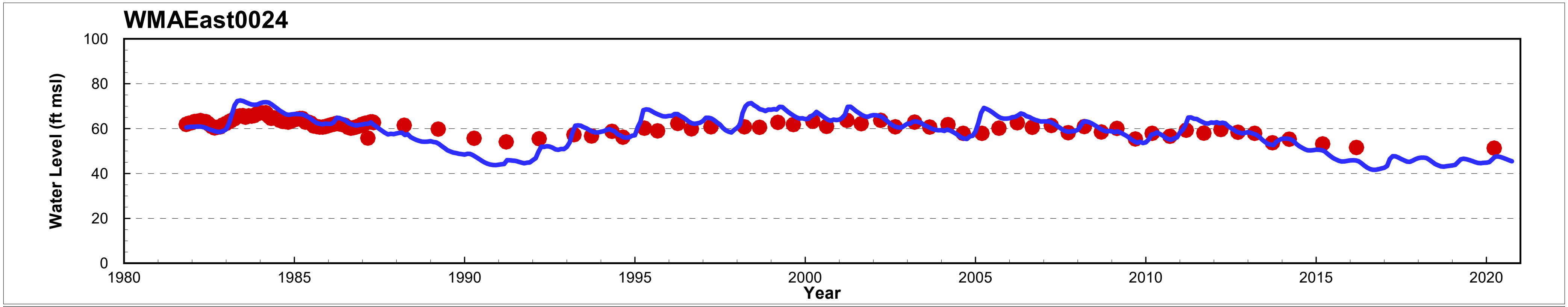

Terrace0044
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0020
Water Level (ft msl)
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

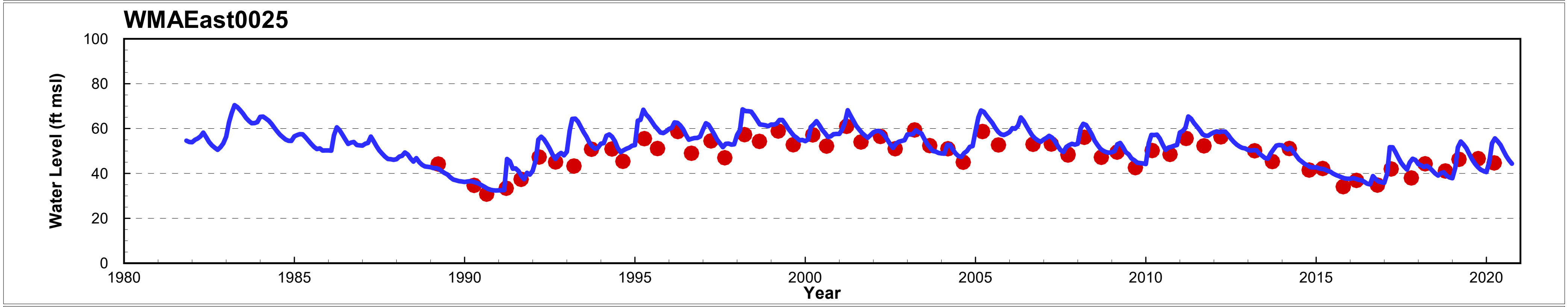

WMAEast0021
Water Level (ft msl)
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0022
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

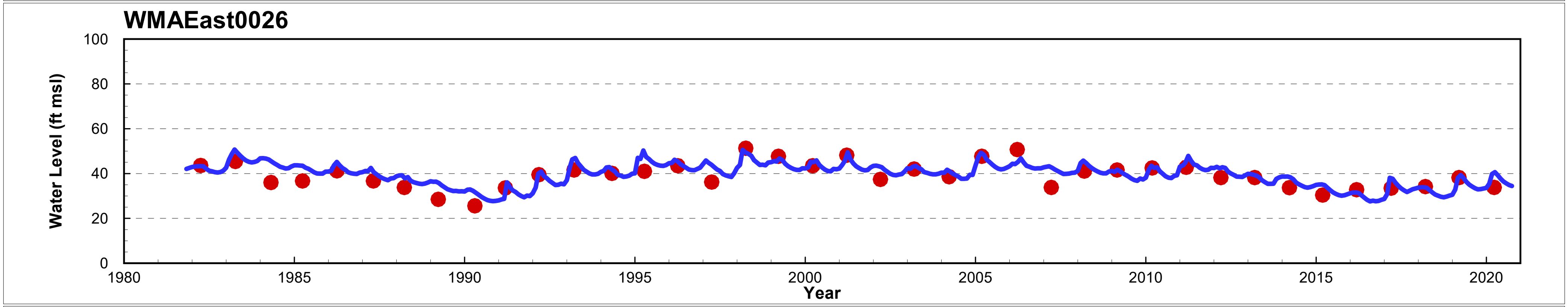

WMAEast0023
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



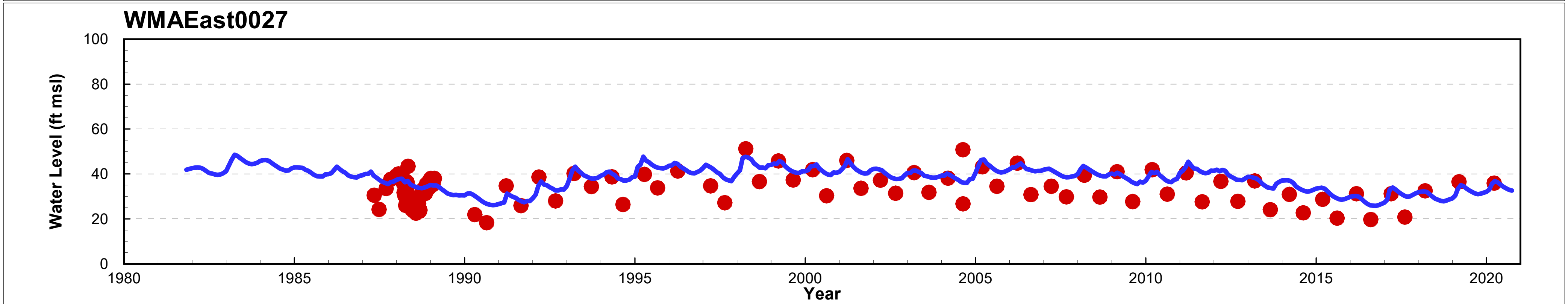
WMAEast0024
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



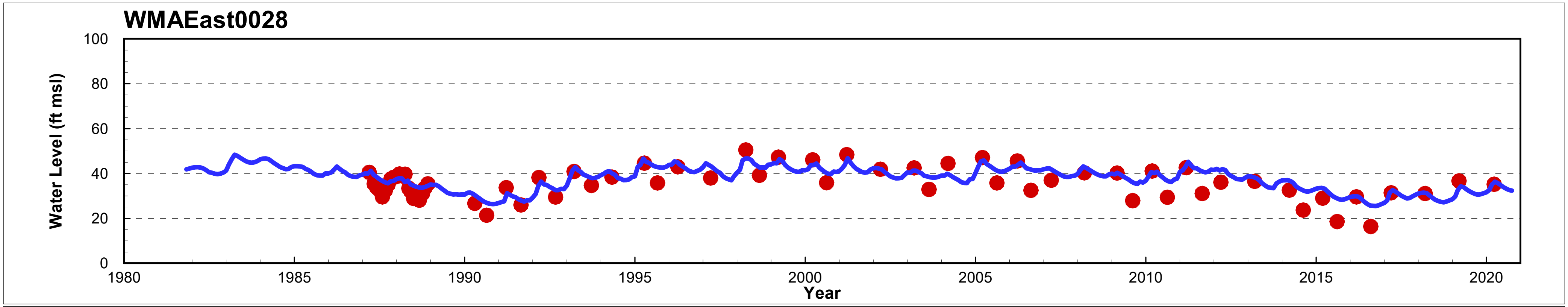
WMAEast0025
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

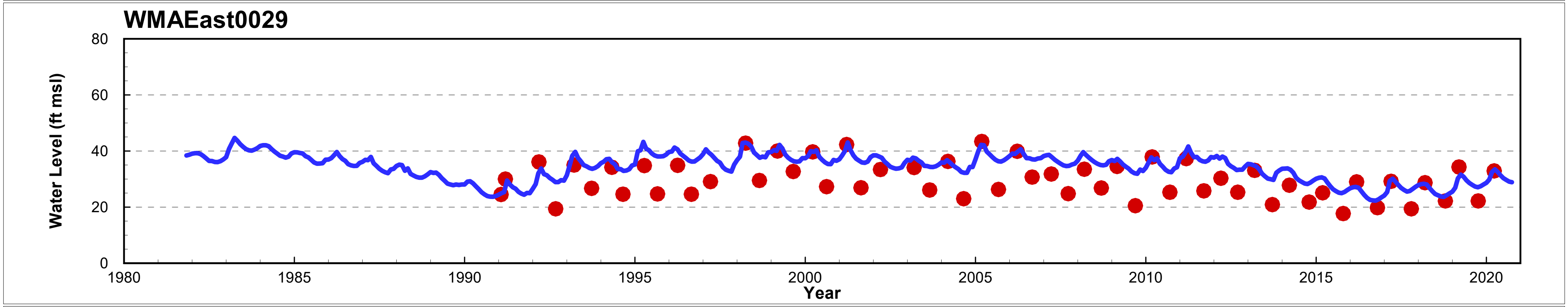


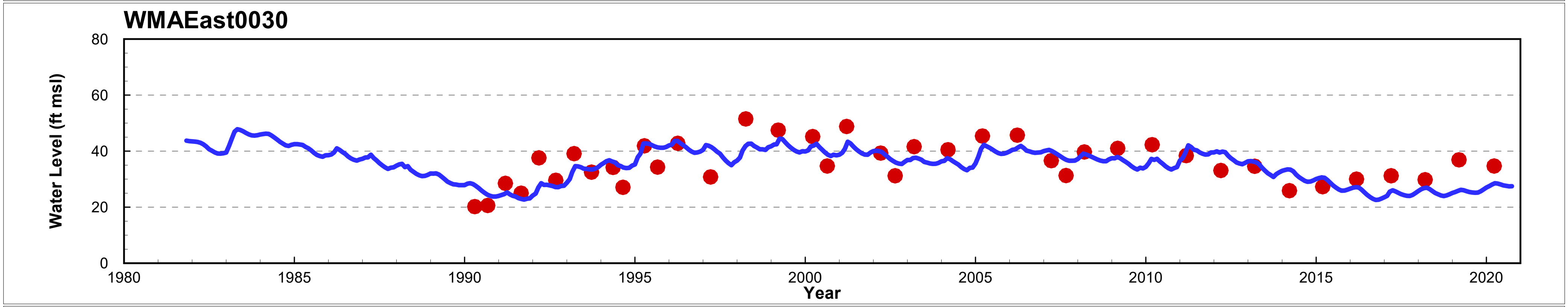
WMAEast0026
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

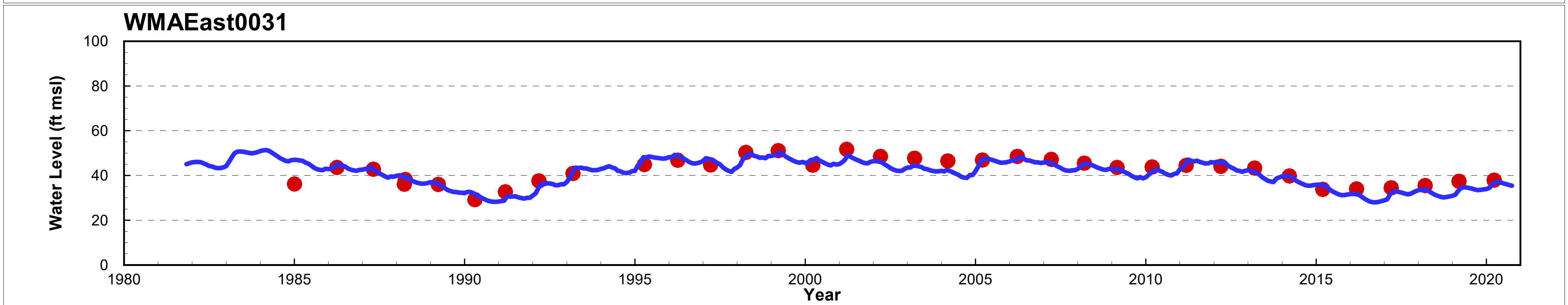


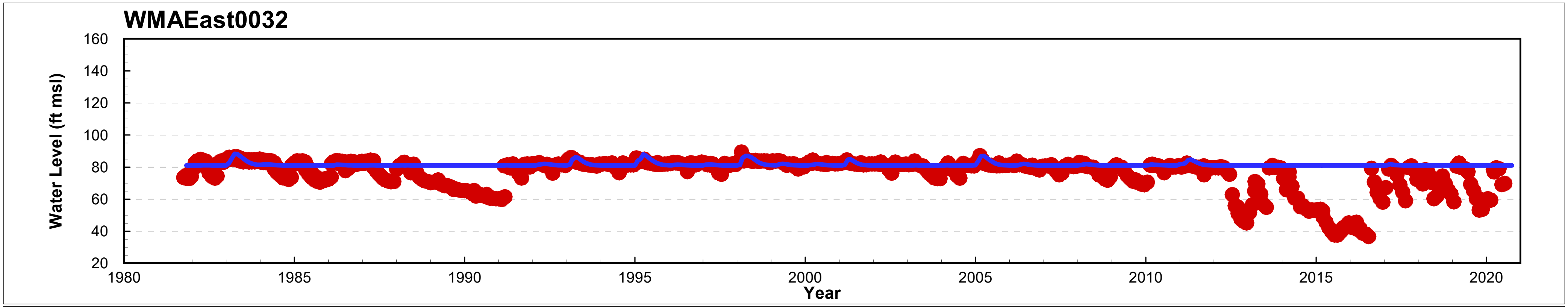
WMAEast0027
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

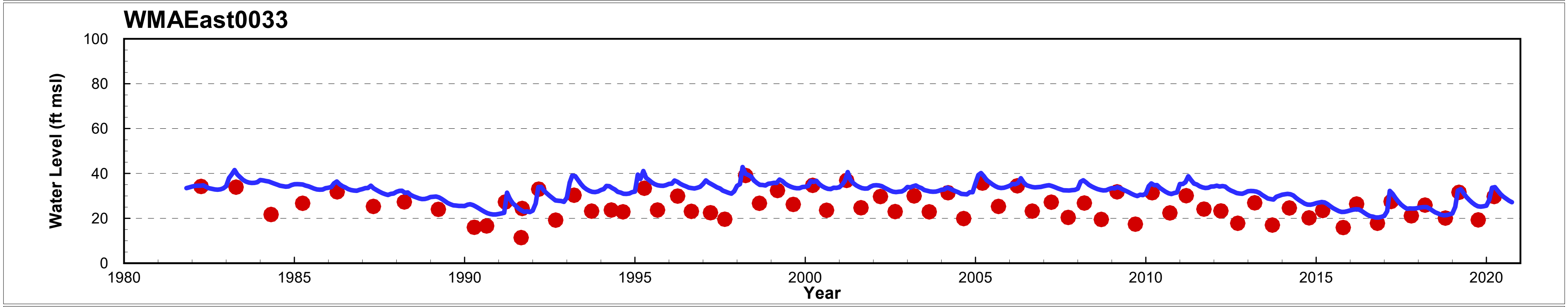

WMAEast0028
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

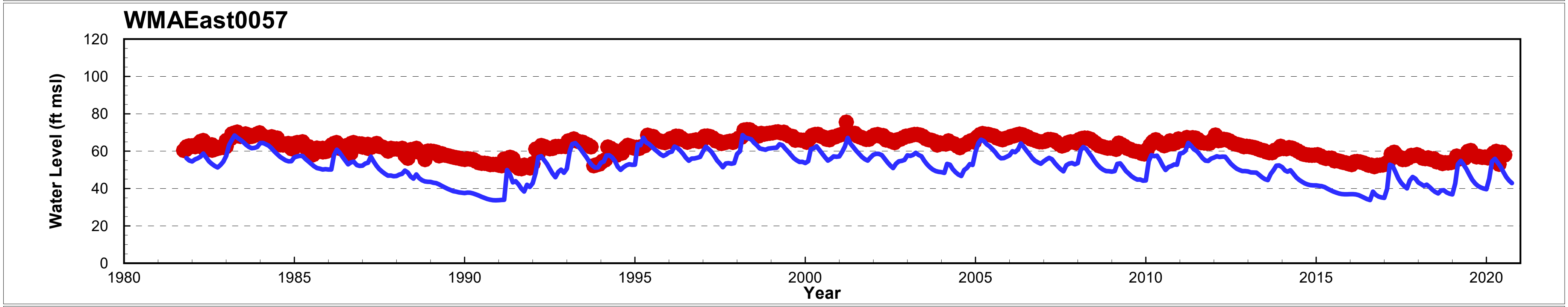

WMAEast0029
Water Level (ft msl)
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

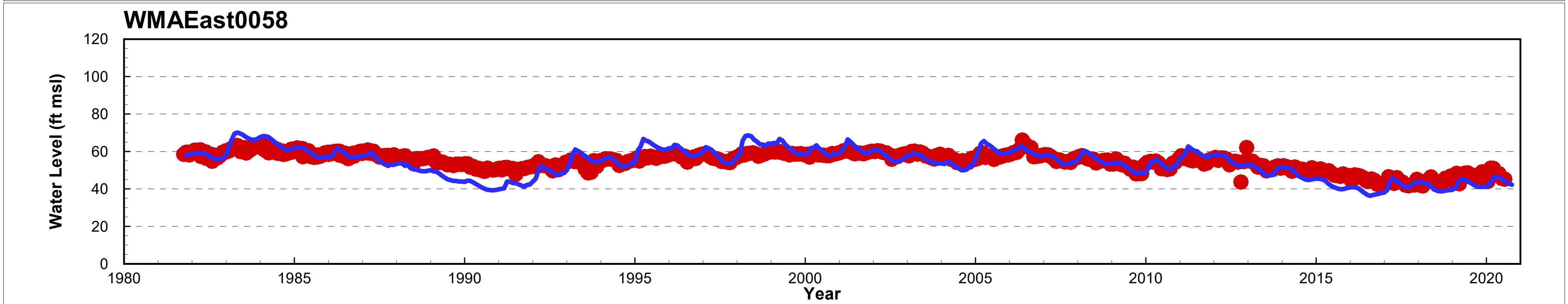

WMAEast0030
Water Level (ft msl)
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0031
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

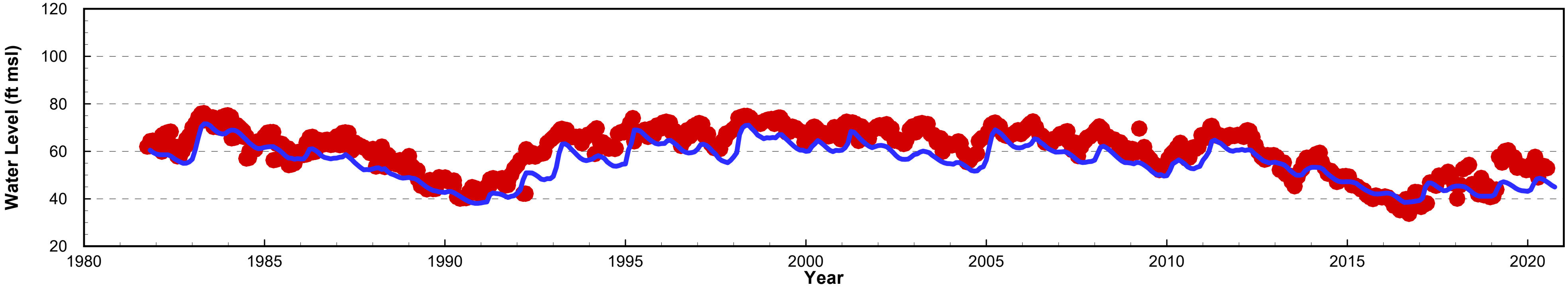

WMAEast0032
Water Level (ft msl)
160
140
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0033
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

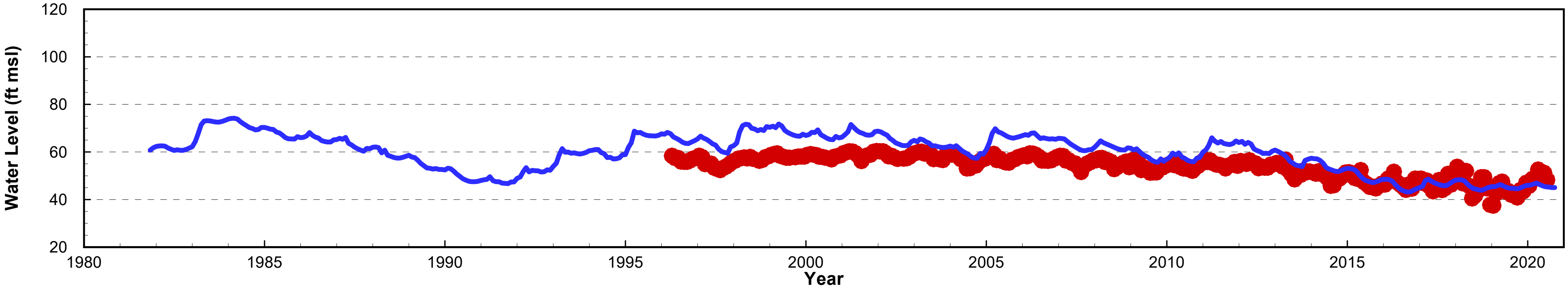

WMAEast0057
Water Level (ft msl)
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0058
Water Level (ft msl)
120
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

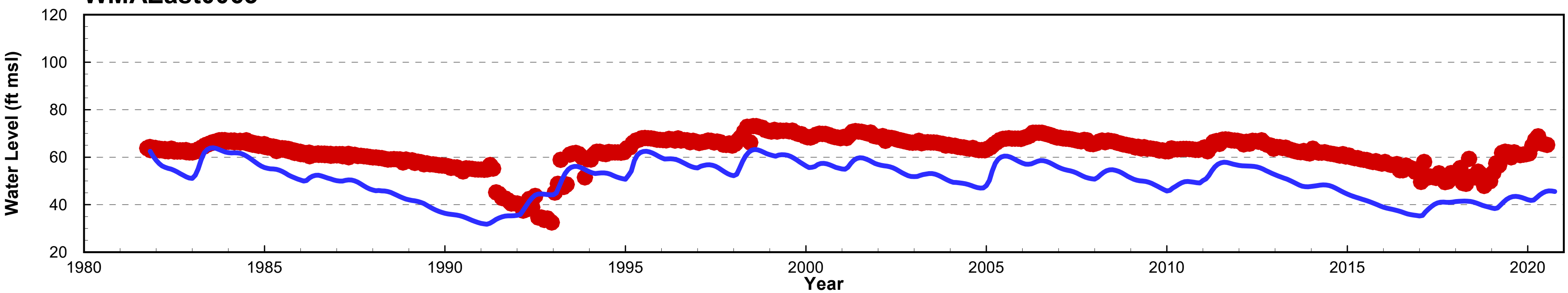
WMAEast0060



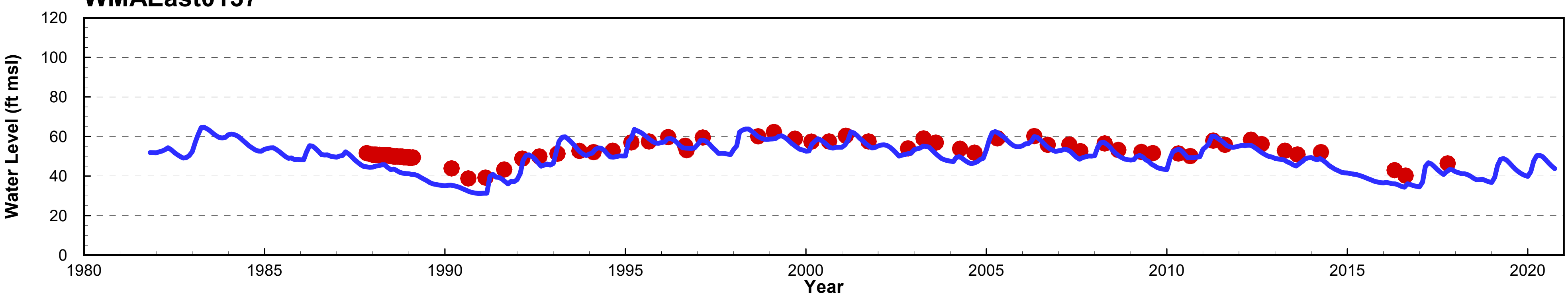
WMAEast0061

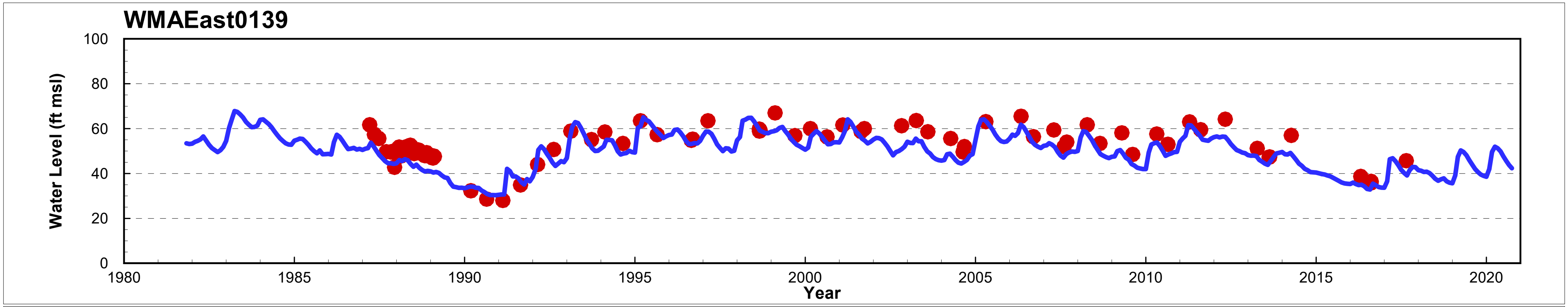


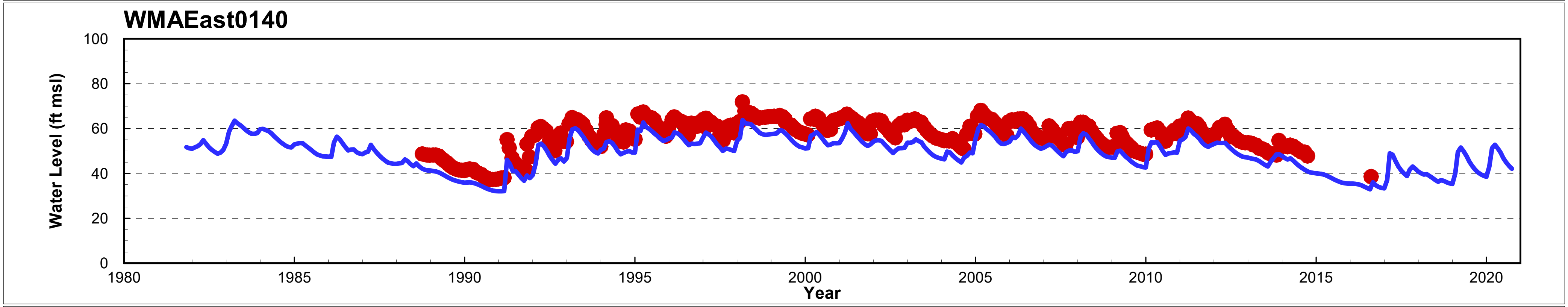
WMAEast0063

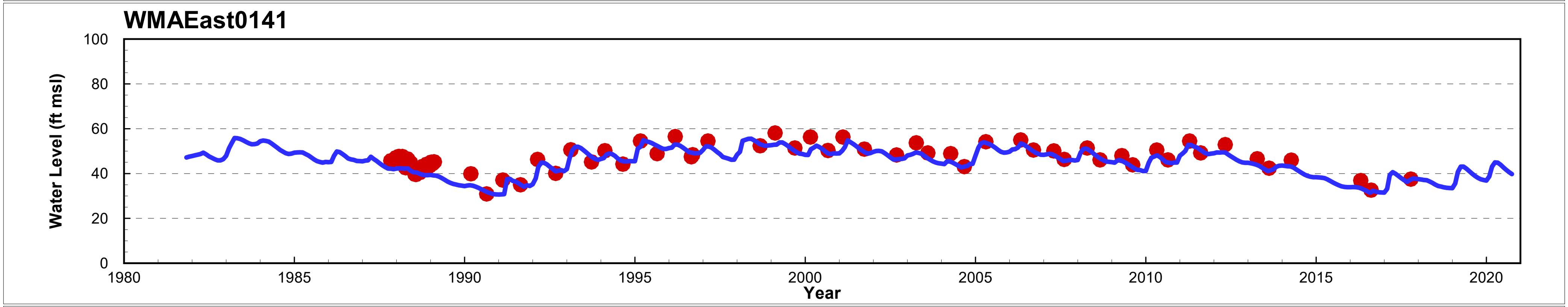


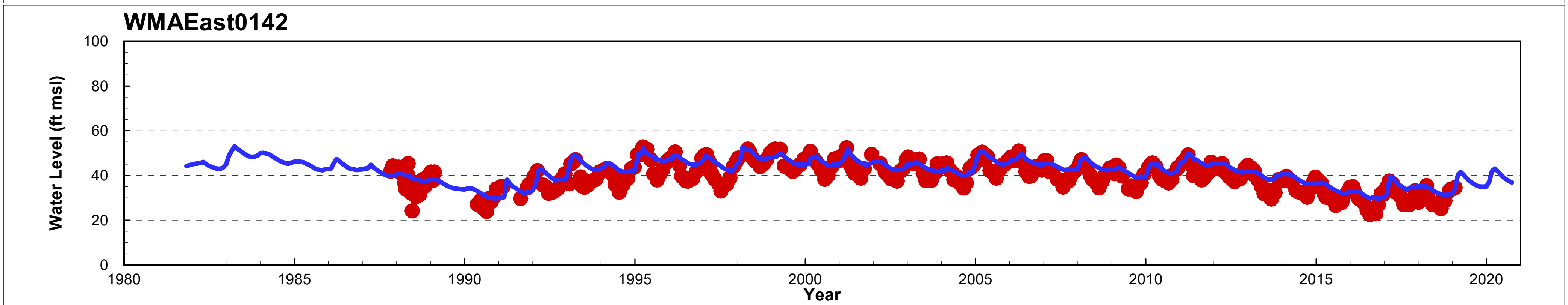
WMAEast0137

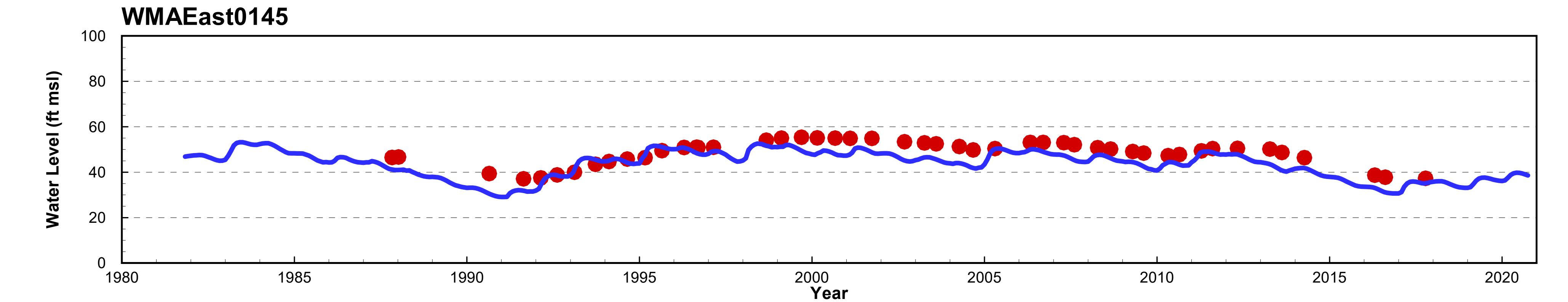


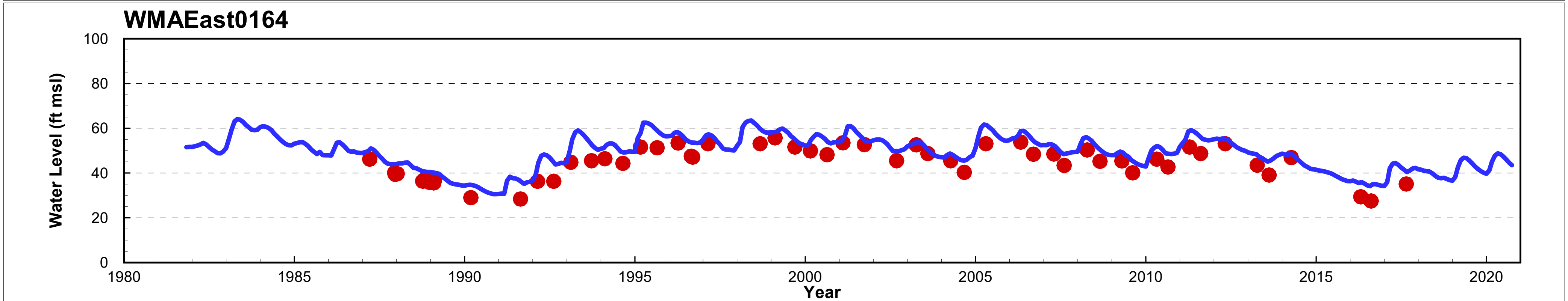

WMAEast0139
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

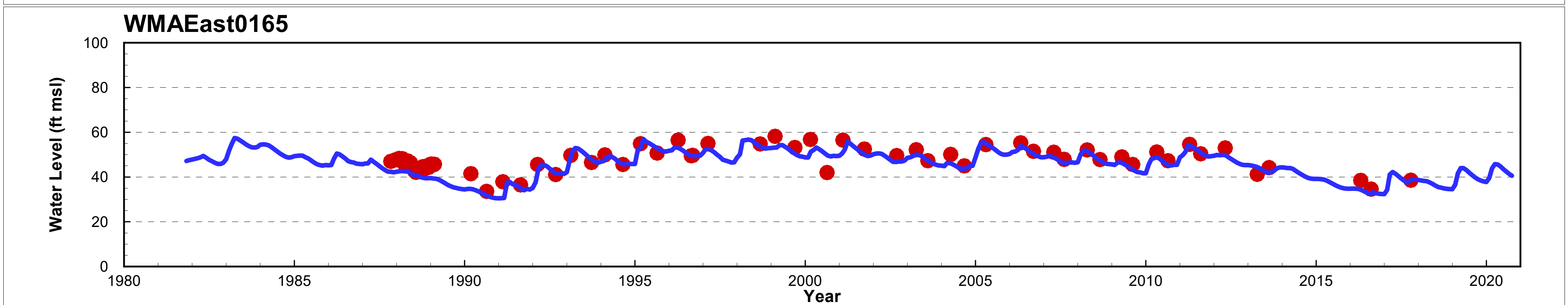

WMAEast0140
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

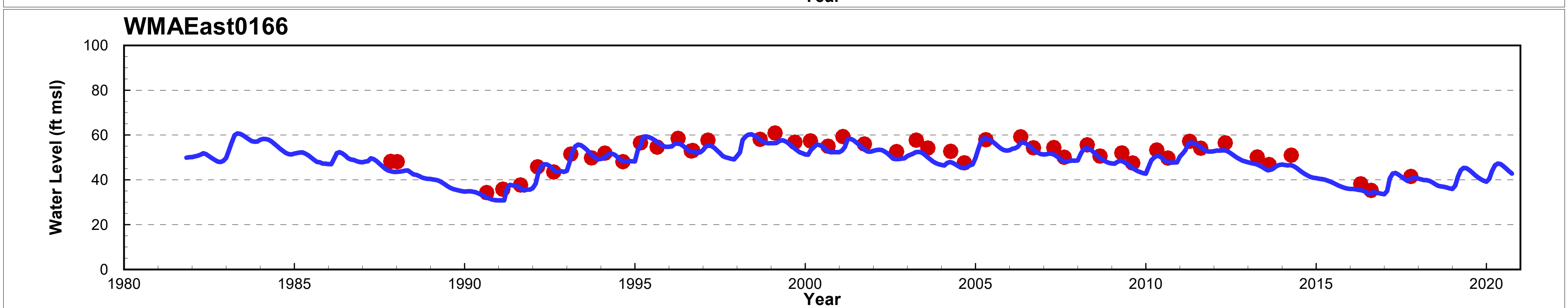

WMAEast0141
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

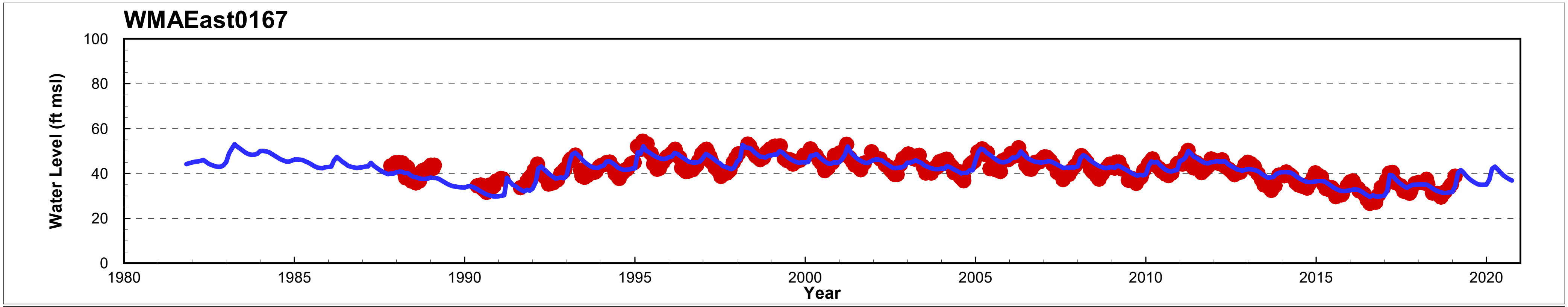

WMAEast0142
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0145
Water Level (ft msl)
Year
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020

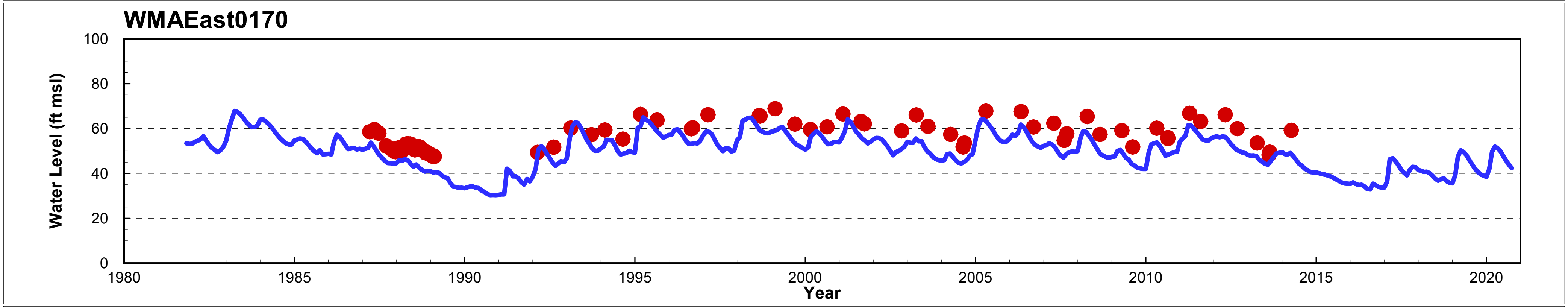

WMAEast0164
Water Level (ft msl)
Year
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020


WMAEast0165
Water Level (ft msl)
Year
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020

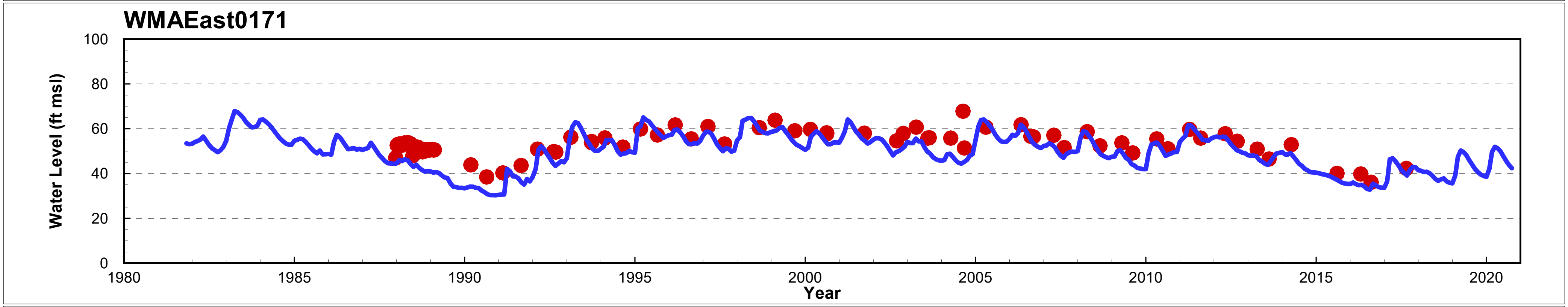

WMAEast0166
Water Level (ft msl)
Year
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020



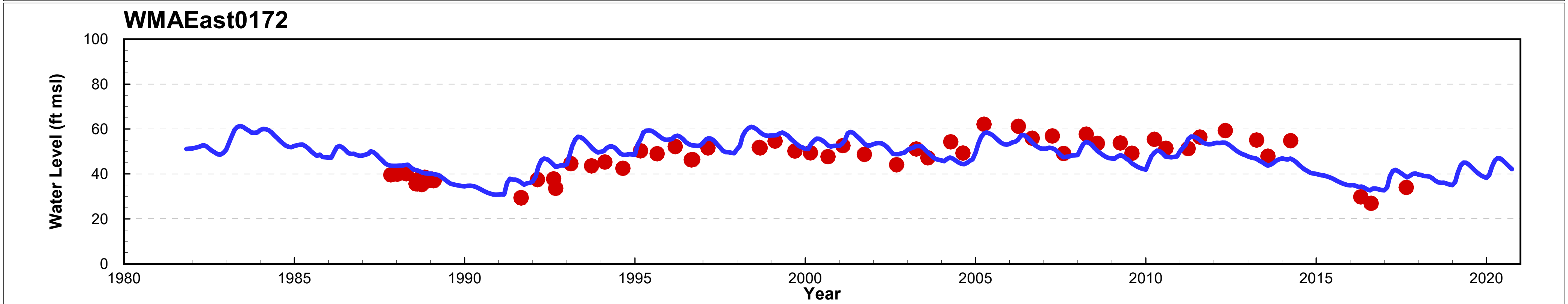
WMAEast0167
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMAEast0170
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMAEast0171
Water Level (ft msl)
0
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMAEast0172
Water Level (ft msl)
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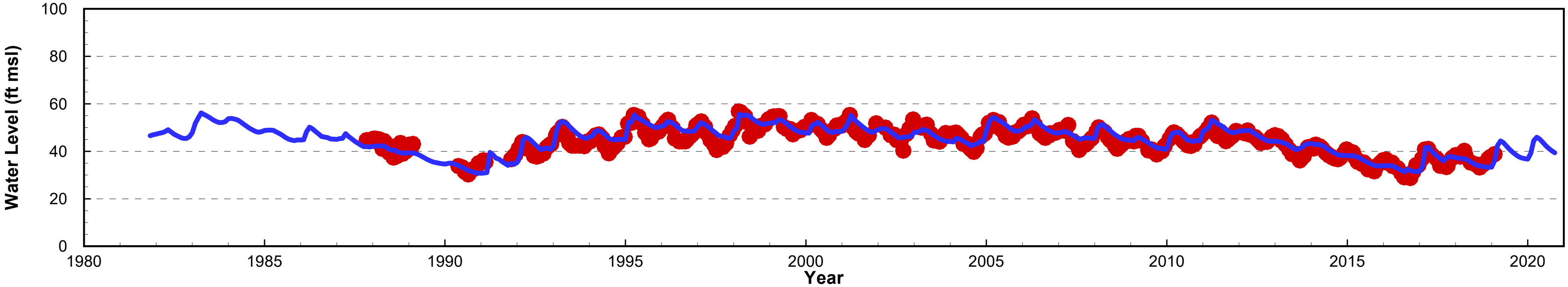
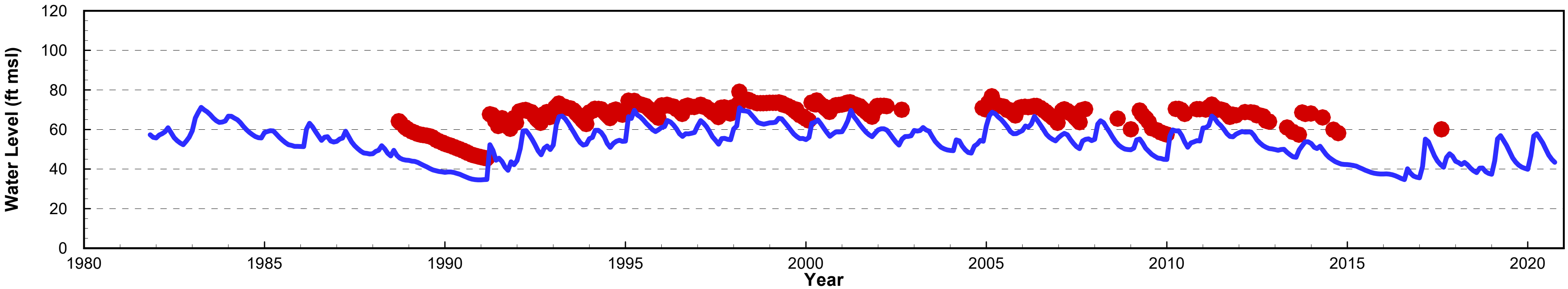
20
40
60
80
100
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

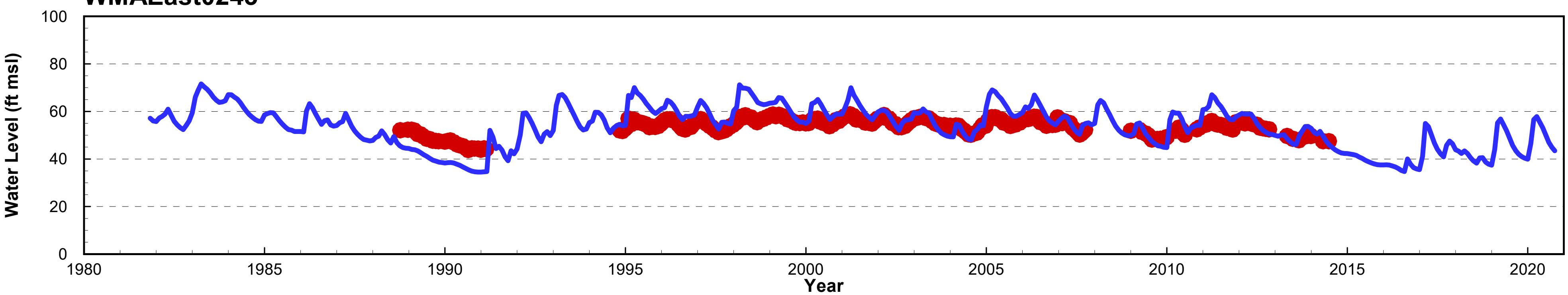
WMAEast0176



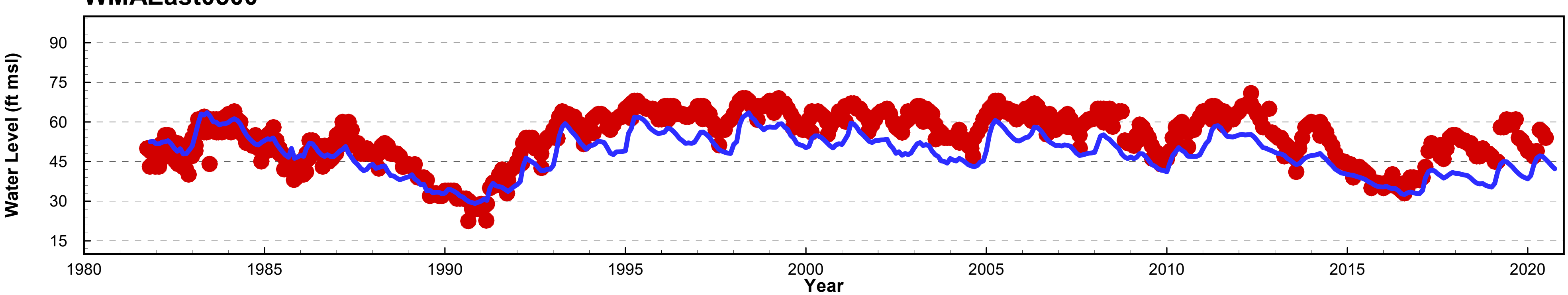
WMAEast0178

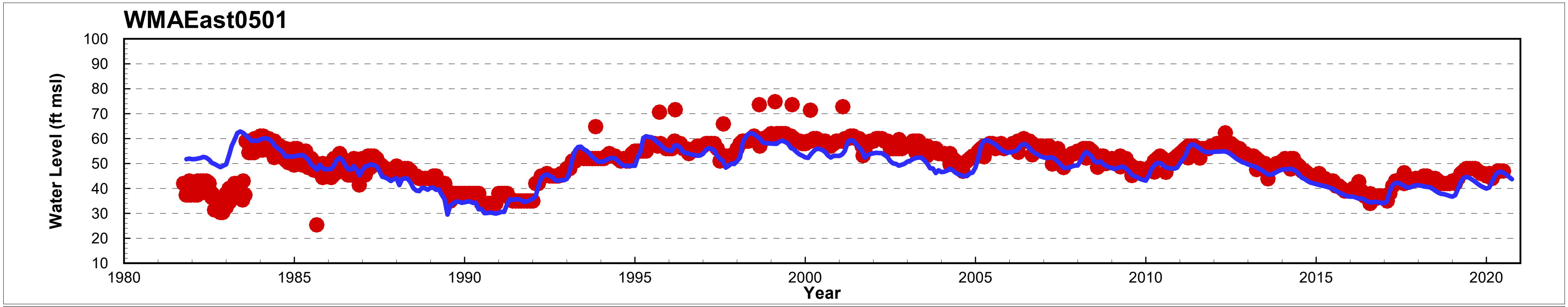


WMAEast0243



WMAEast0500




WMAEast0501
Water Level (ft msl)
100
90
80
70
60
50
40
30
20
10
1980
1985
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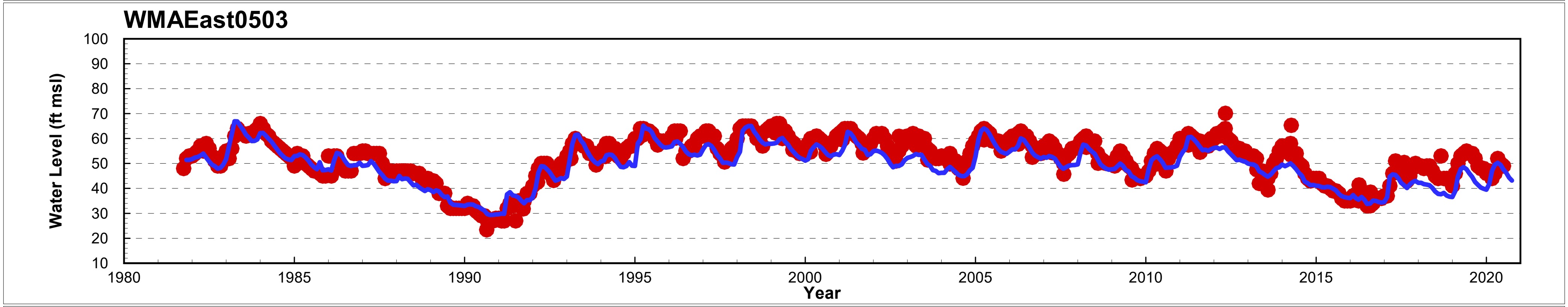
2005
2010
2015
2020
Year


WMAEast0503
Water Level (ft msl)
100
90
80
70
60
50
40
30
20
10
1980
1985
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1995
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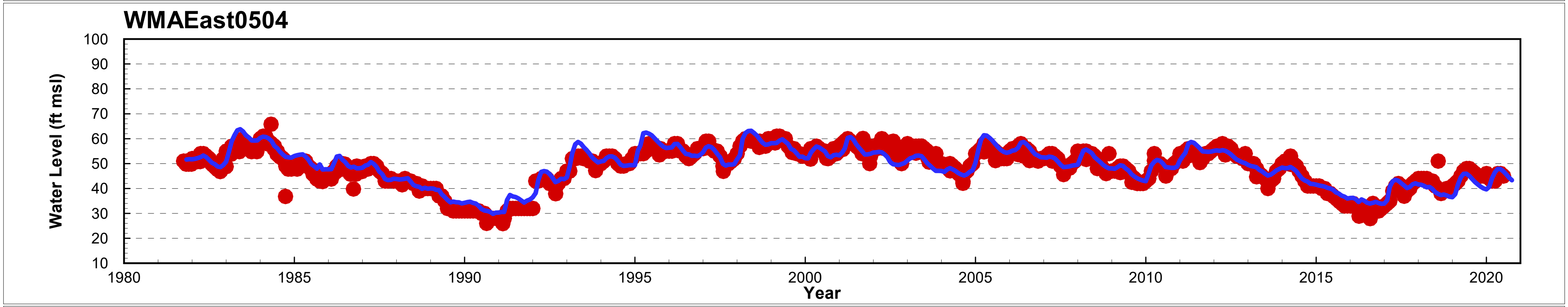
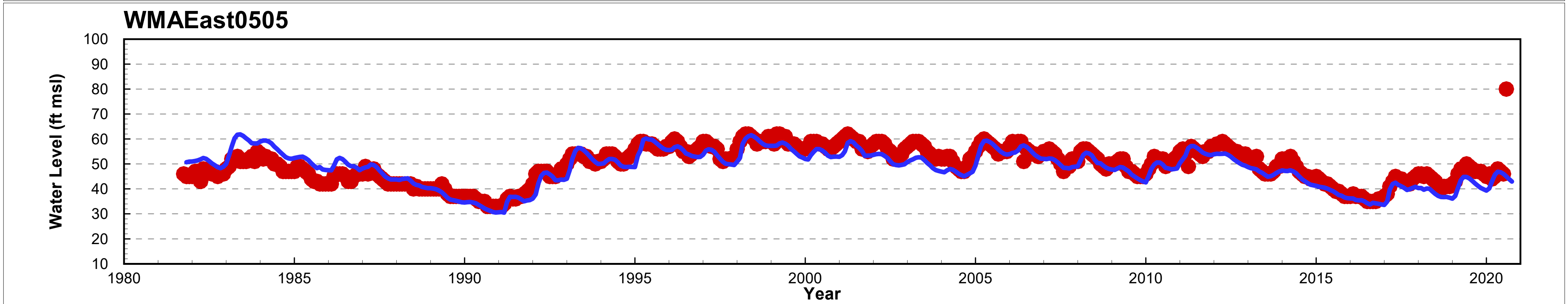
2005
2010
2015
2020
Year


WMAEast0504
Water Level (ft msl)
100
90
80
70
60
50
40
30
20
10
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0505
Water Level (ft msl)
100
90
80
70
60
50
40
30
20
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1980
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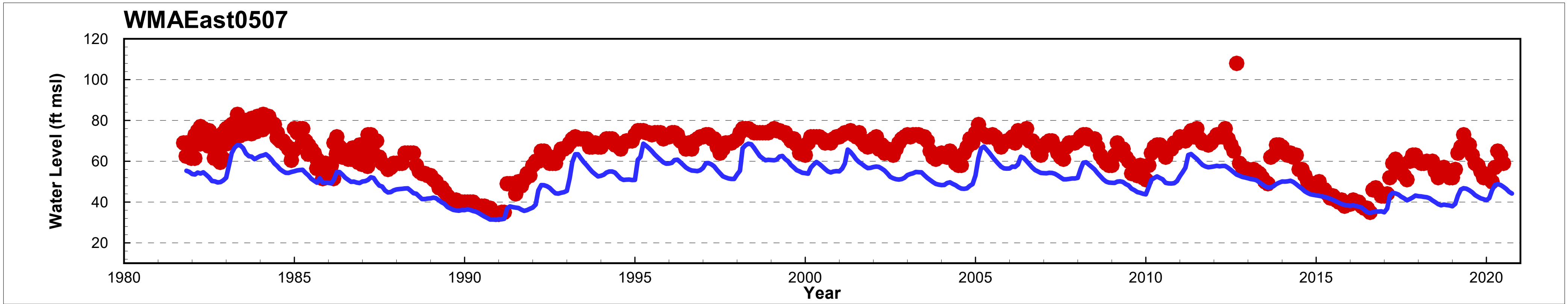
2010
2015
2020
Year


WMAEast0507
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
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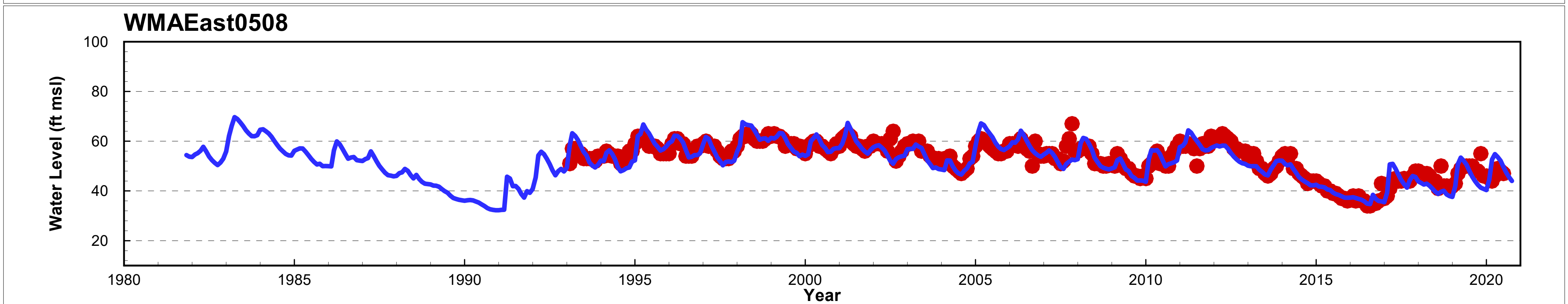
2005
2010
2015
2020
Year


WMAEast0508
Water Level (ft msl)
100
80
60
40
20
1980
1985
1990
1995
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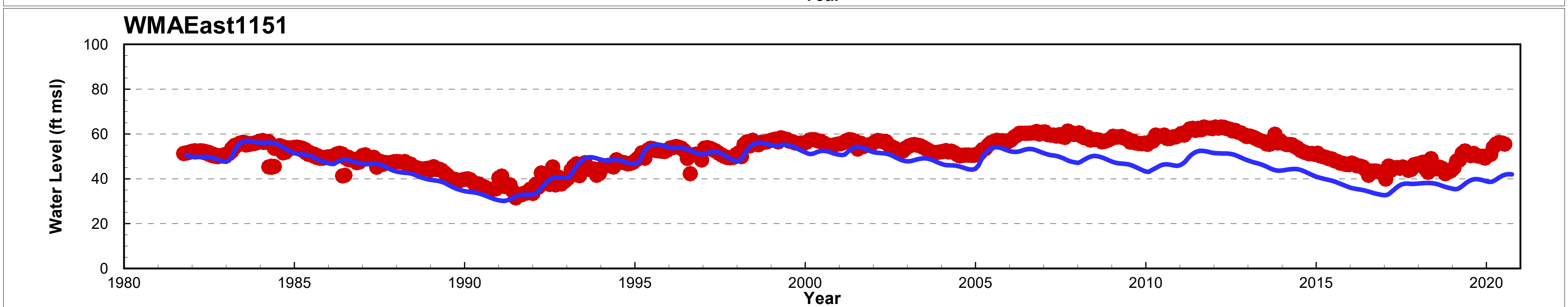
2010
2015
2020
Year


WMAEast1151
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
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2010
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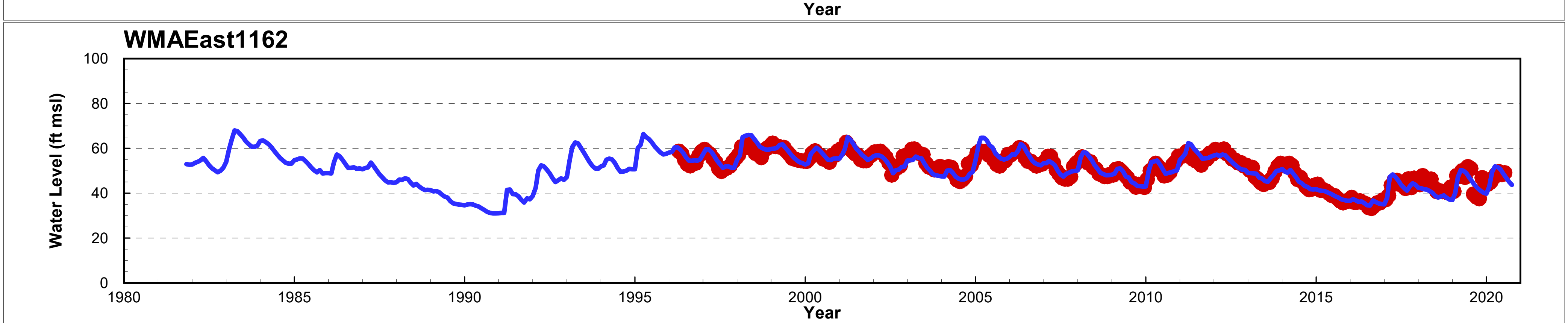
2020
Year


WMAEast1162
Water Level (ft msl)
100
80
60
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20
0
1980
1985
1990
1995
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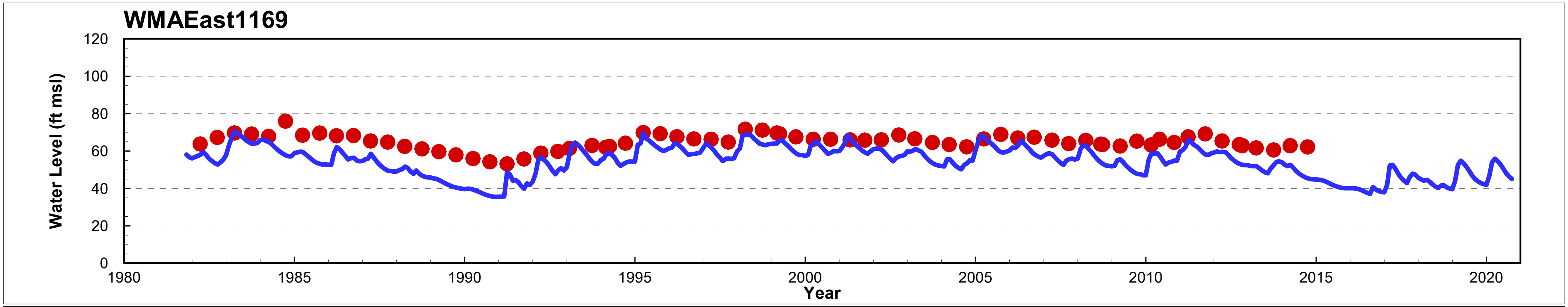
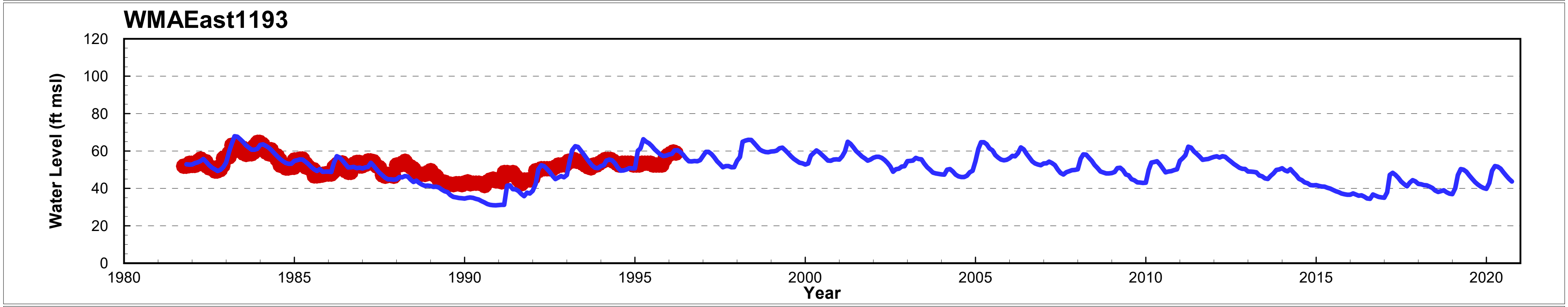
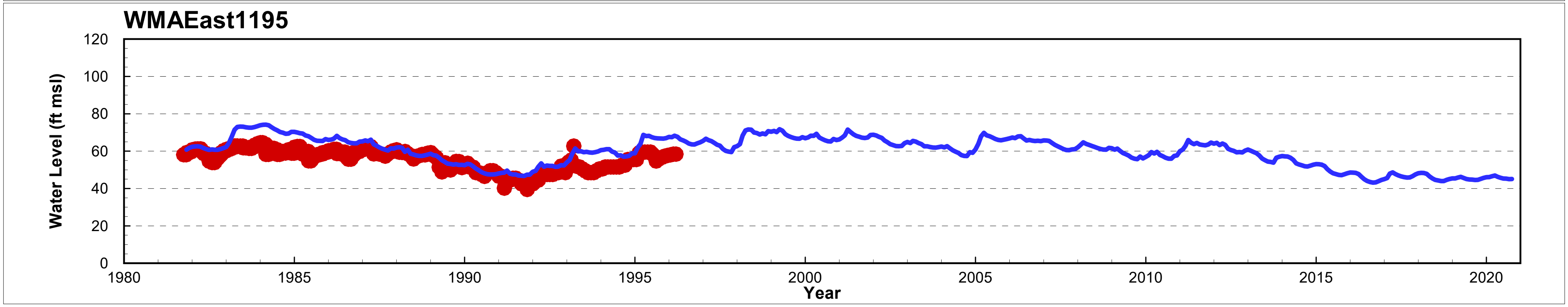
2010
2015
2020
Year



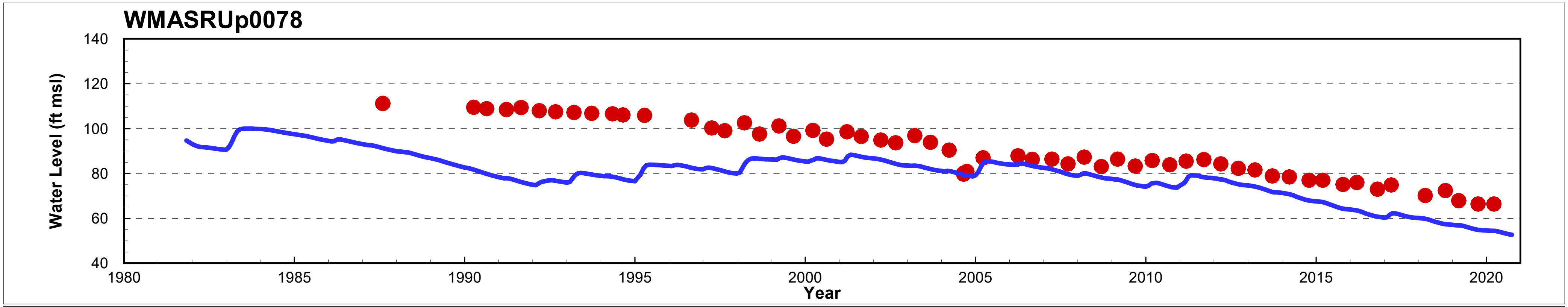
WMAEast1169
Water Level (ft msl)
0
20
40
60
80
100
120
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

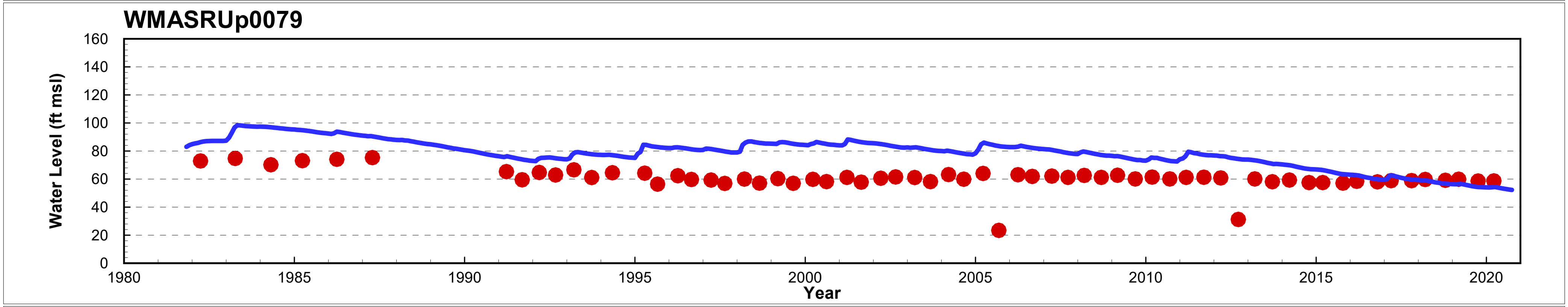


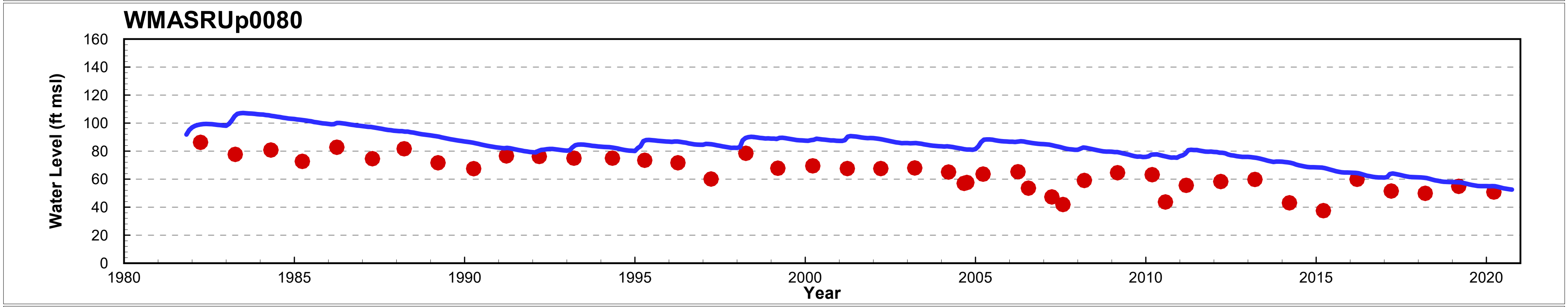
WMAEast1193
Water Level (ft msl)
0
20
40
60
80
100
120
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

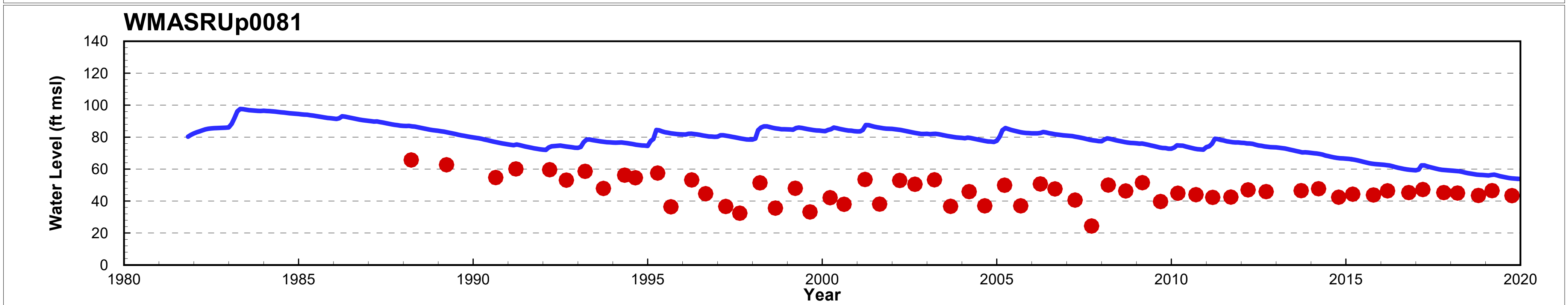


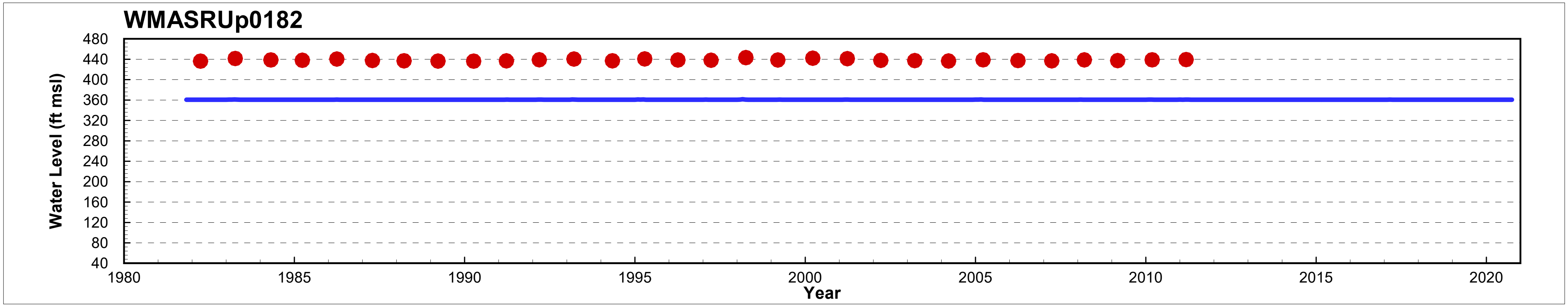
WMAEast1195
Water Level (ft msl)
0
20
40
60
80
100
120
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

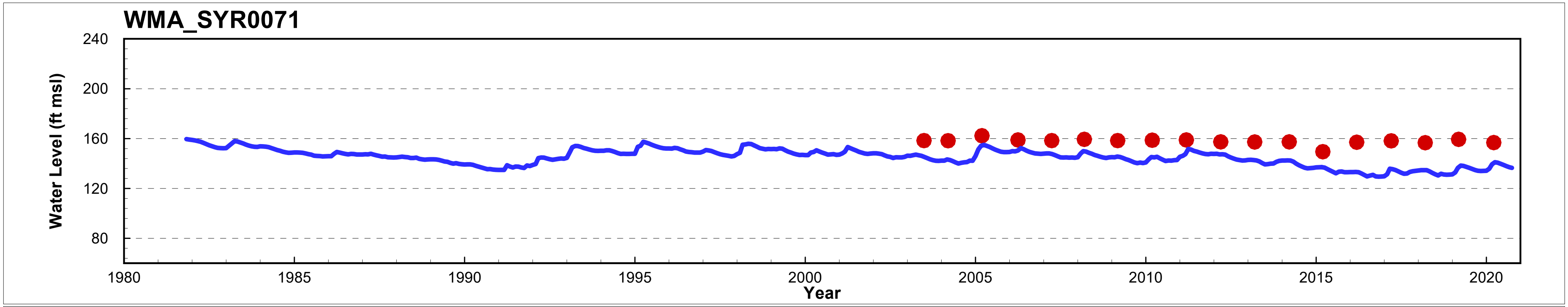

WMASRUp0078
Water Level (ft msl)
Year

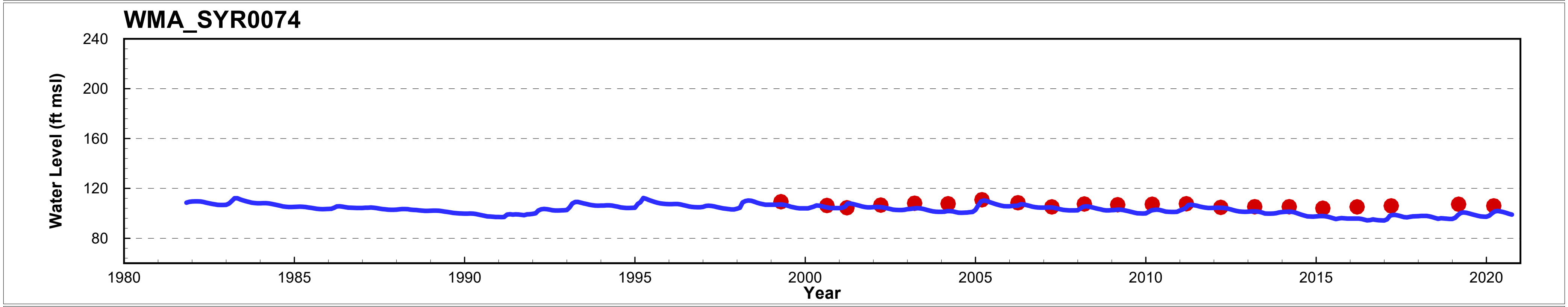

WMASRUp0079
Water Level (ft msl)
Year

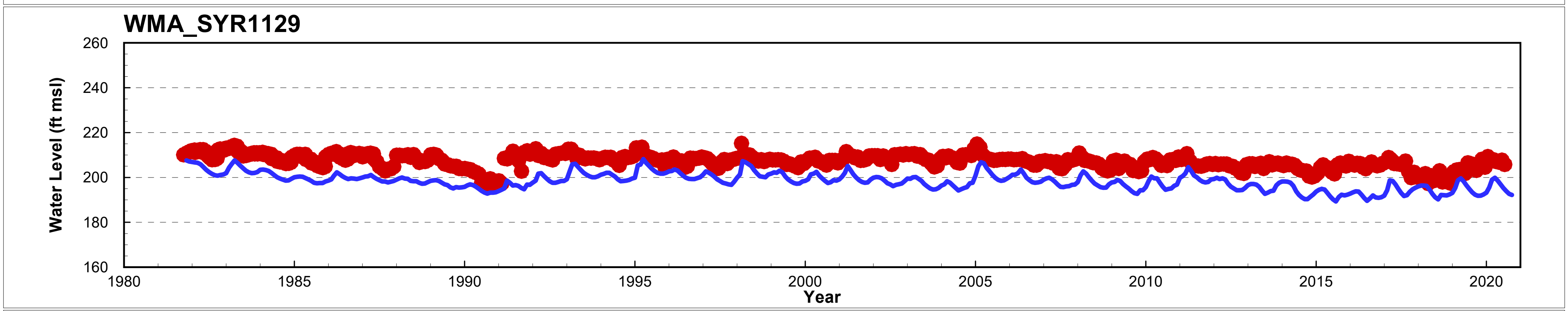

WMASRUp0080
Water Level (ft msl)
Year

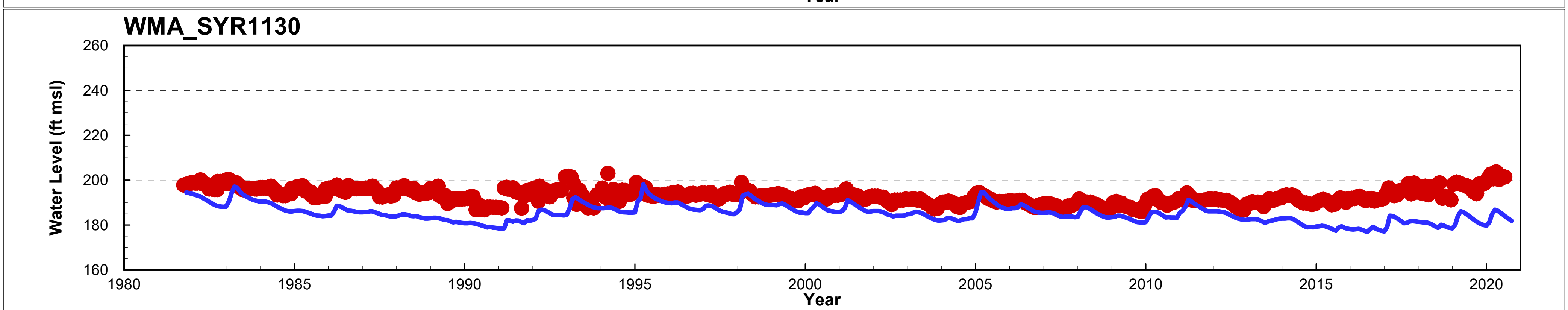

WMASRUp0081
Water Level (ft msl)
Year

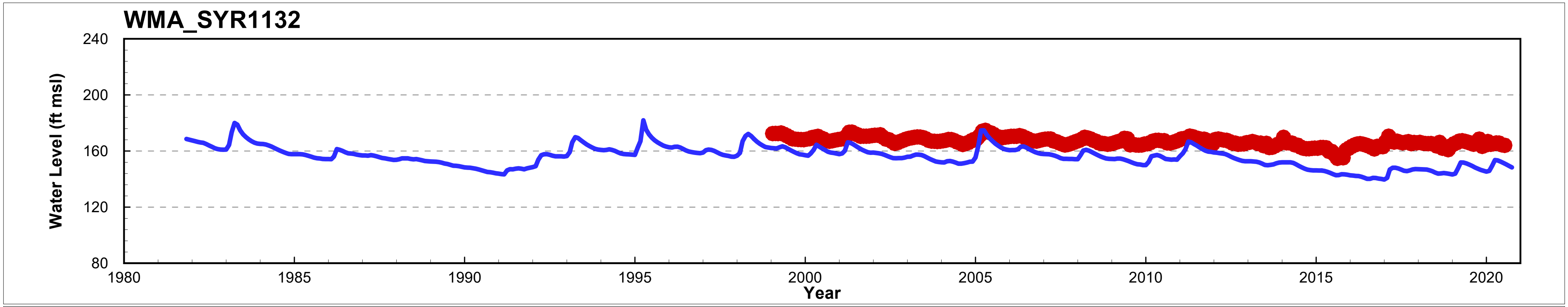

WMASRUp0182
Water Level (ft msl)
480
440
400
360
320
280
240
200
160
120
80
40
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

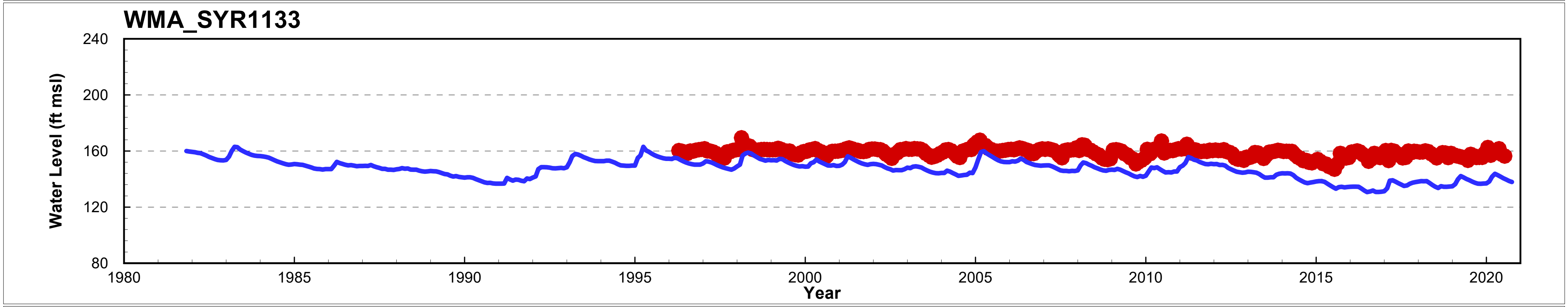

WMA_SYR0071
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

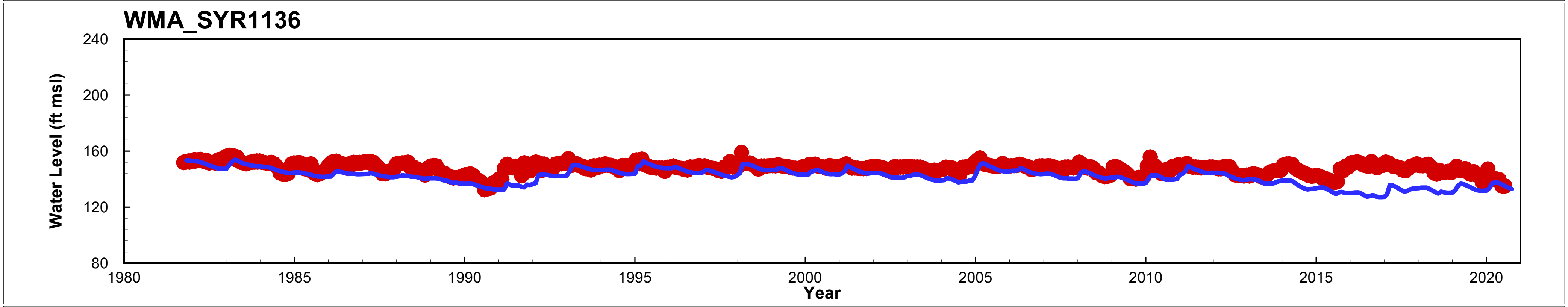

WMA_SYR0074
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

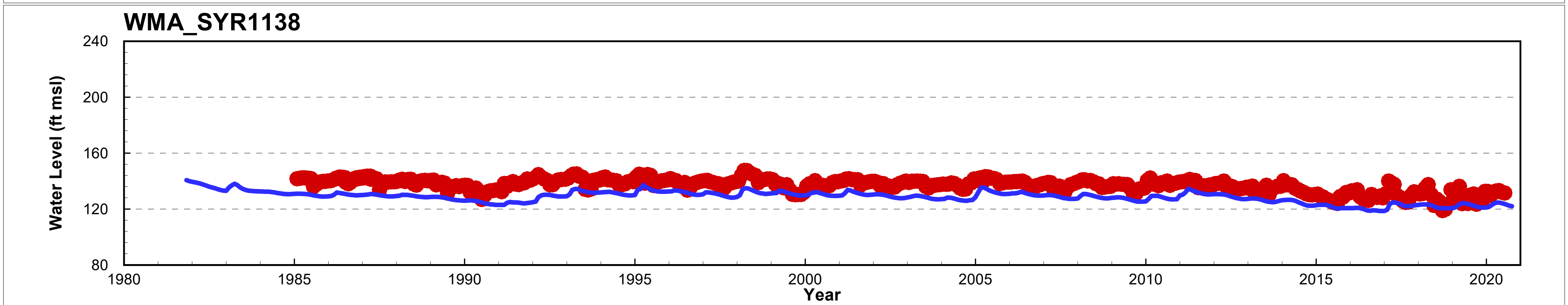

WMA_SYR1129
Water Level (ft msl)
260
240
220
200
180
160
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

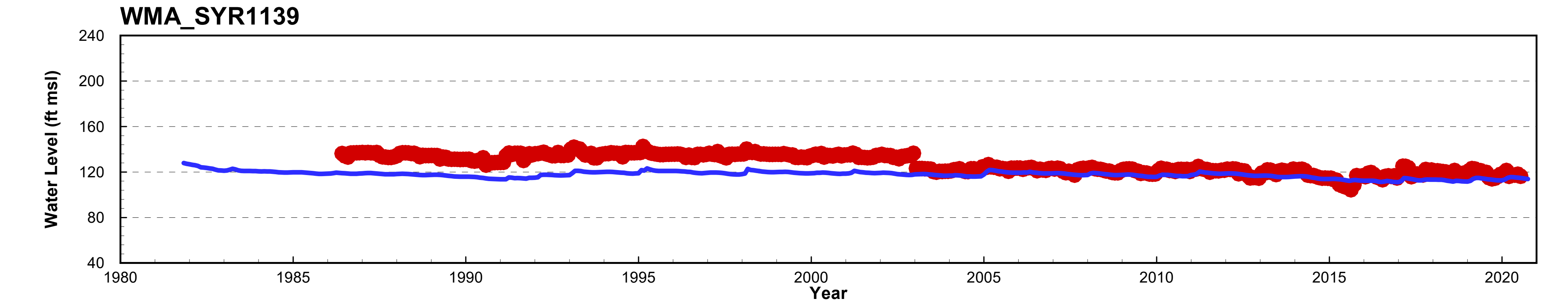

WMA_SYR1130
Water Level (ft msl)
260
240
220
200
180
160
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_SYR1132
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

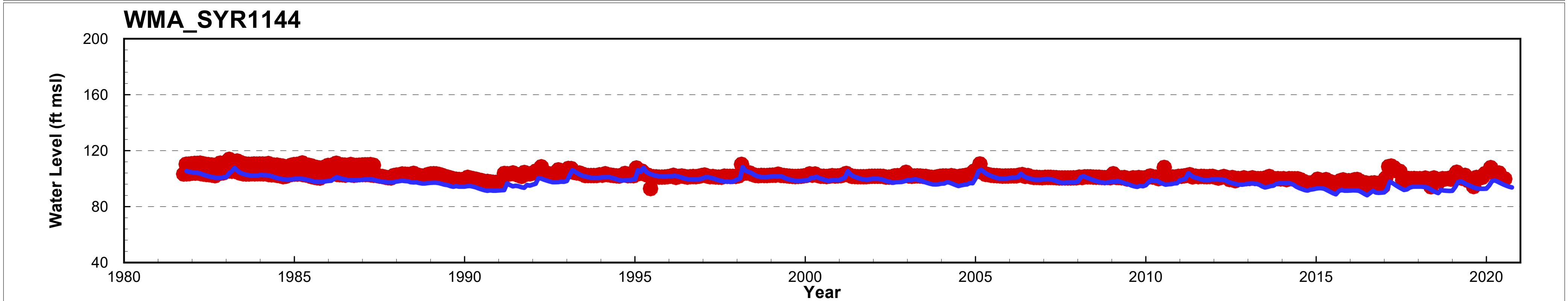

WMA_SYR1133
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_SYR1136
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

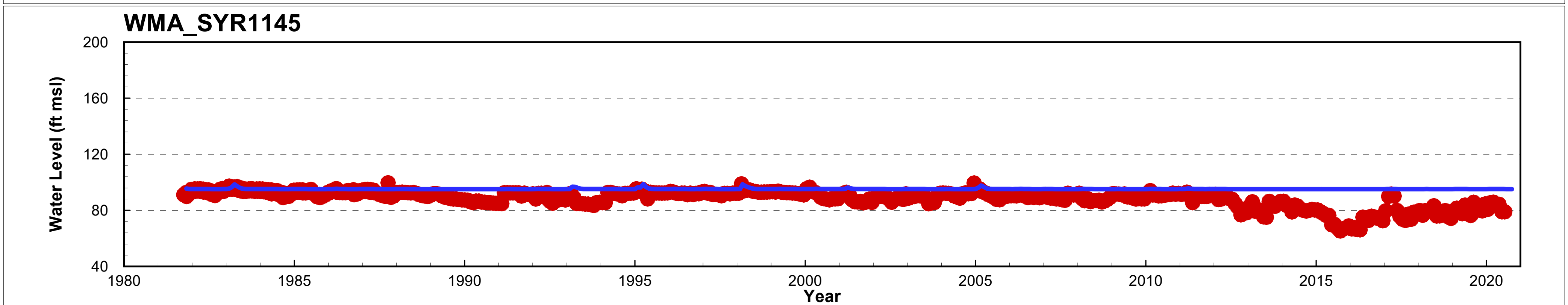

WMA_SYR1138
Water Level (ft msl)
240
200
160
120
80
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



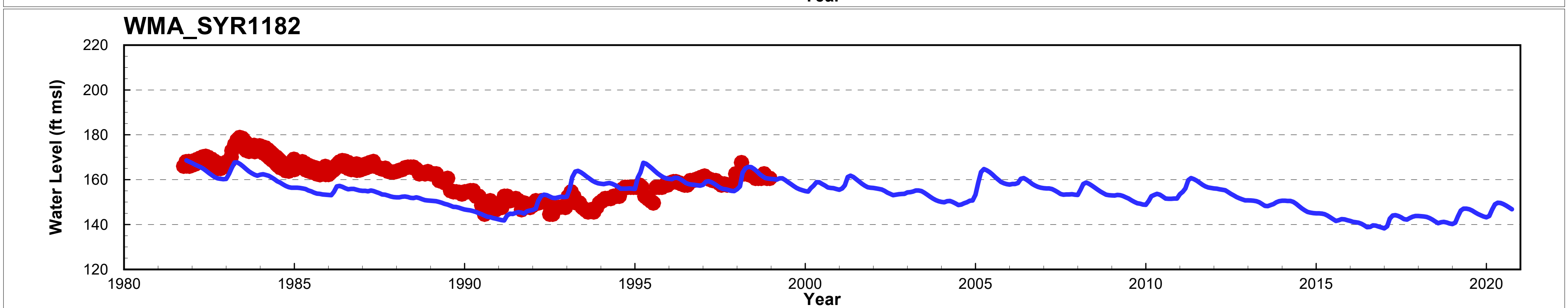
WMA_SYR1139
Water Level (ft msl)
240
200
160
120
80
40
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



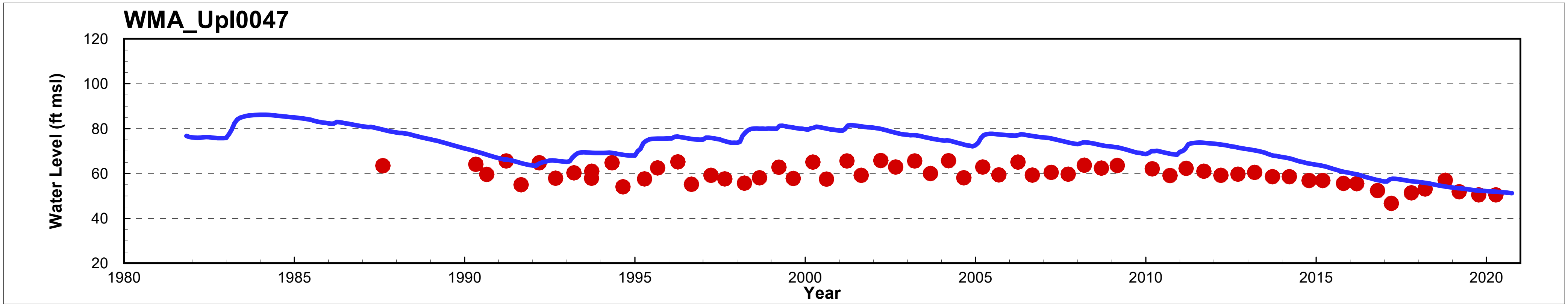
WMA_SYR1144
Water Level (ft msl)
200
160
120
80
40
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMA_SYR1145
Water Level (ft msl)
200
160
120
80
40
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMA_SYR1182
Water Level (ft msl)
220
200
180
160
140
120
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_Upl0047
Water Level (ft msl)
Year
120
100
80
60
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1985
1990
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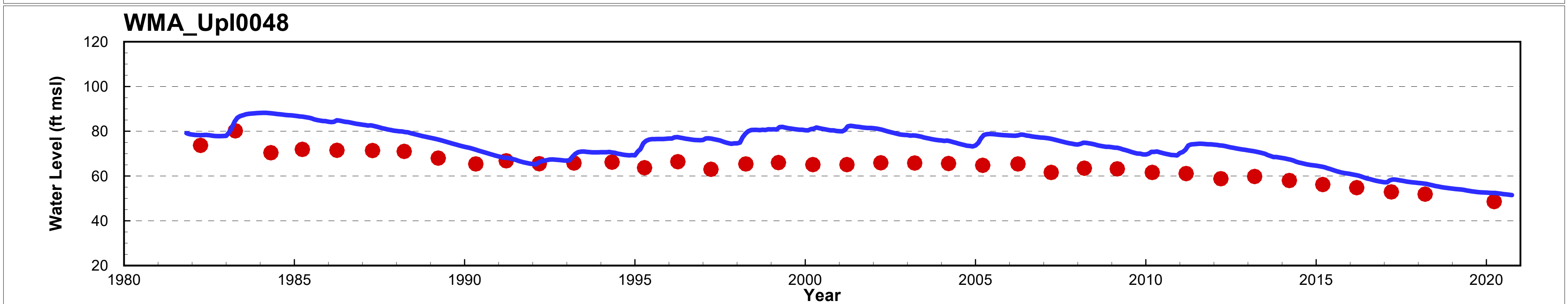
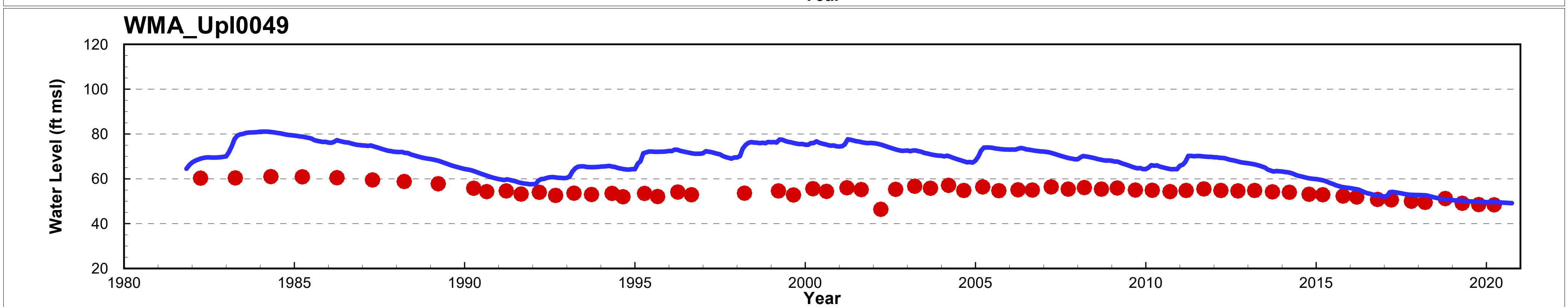
2005
2010
2015
2020


WMA_Upl0048
Water Level (ft msl)
Year
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
2020


WMA_Upl0049
Water Level (ft msl)
Year
120
100
80
60
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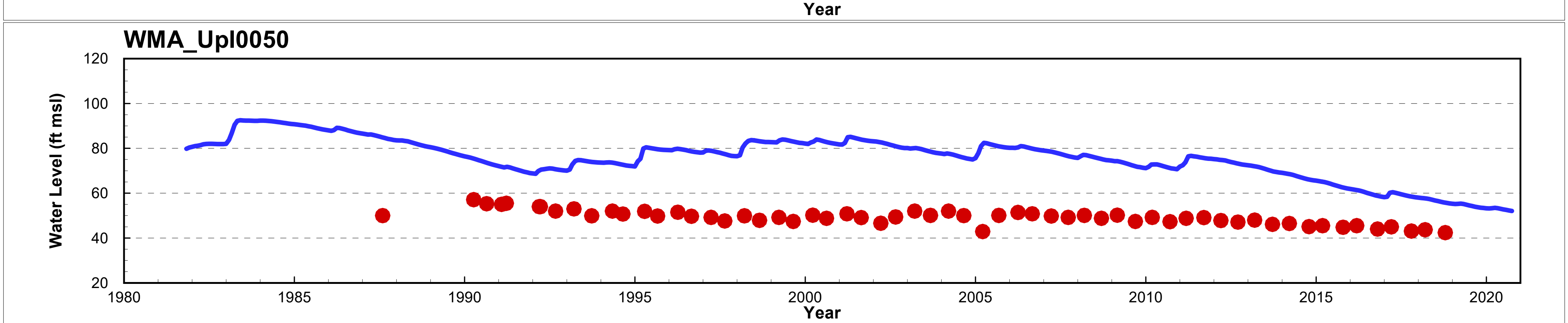
1980
1985
1990
1995
2000
2005
2010
2015
2020


WMA_Upl0050
Water Level (ft msl)
Year
120
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1985
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2005
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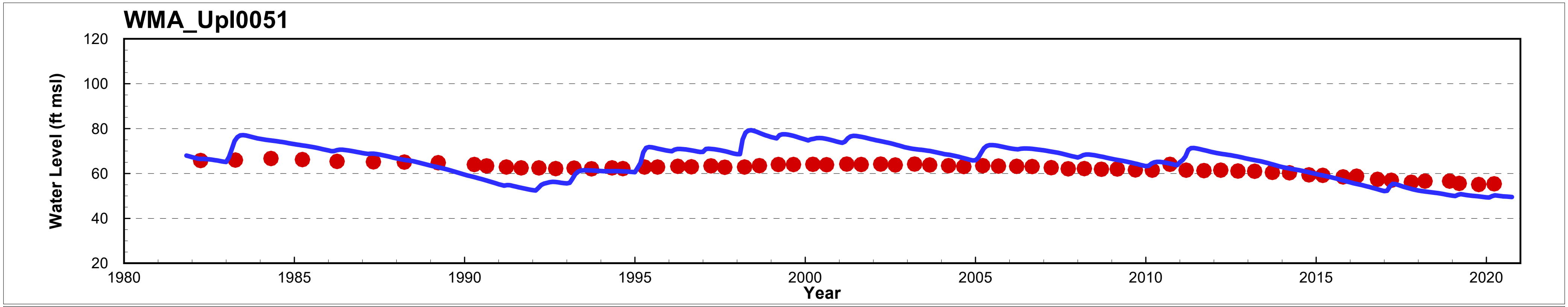
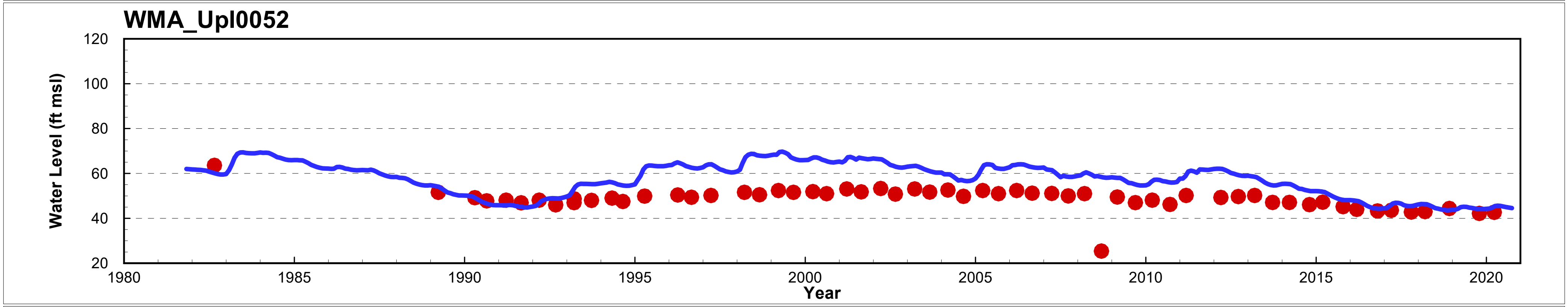
2015
2020


WMA_Upl0051
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_Upl0052
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
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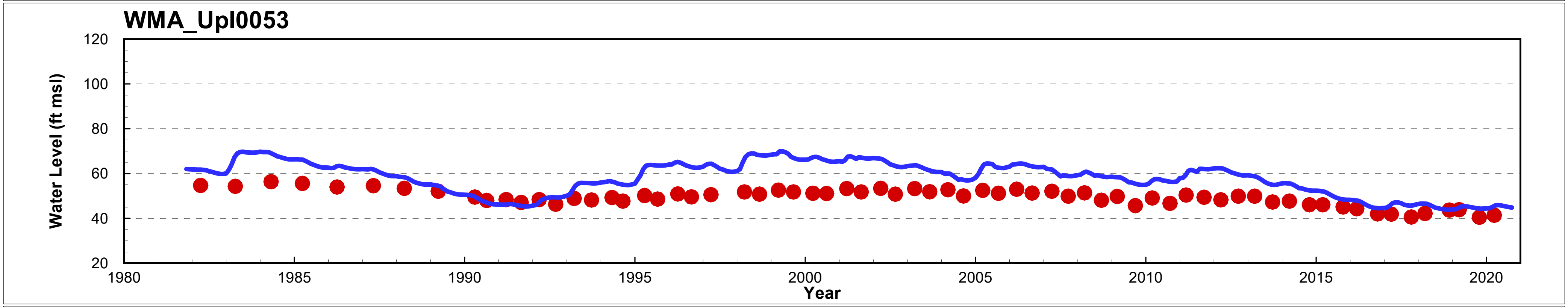
2005
2010
2015
2020
Year


WMA_Upl0053
Water Level (ft msl)
120
100
80
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40
20
1980
1985
1990
1995
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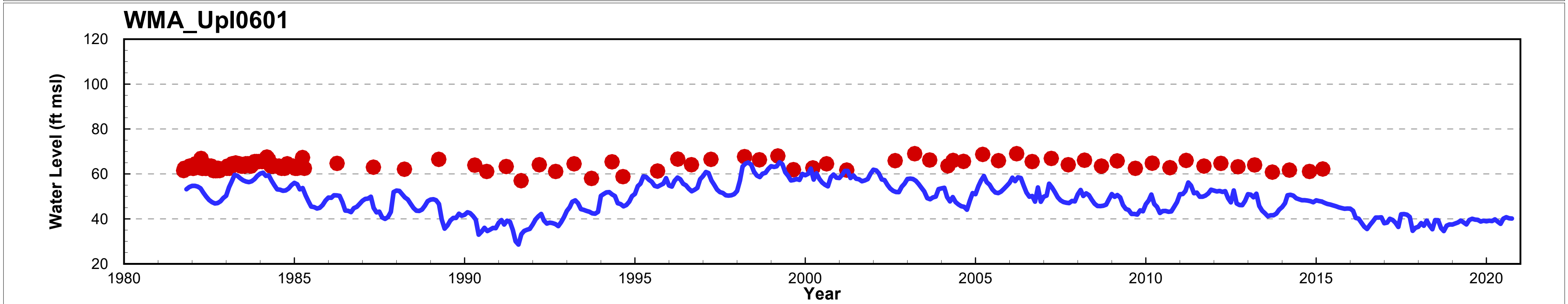
2005
2010
2015
2020
Year


WMA_Upl0601
Water Level (ft msl)
120
100
80
60
40
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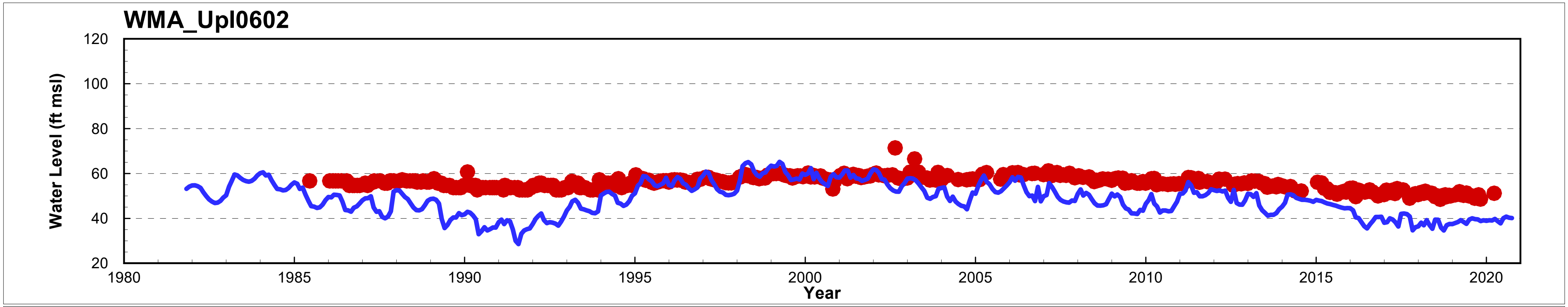
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



WMA_Upl0602
Water Level (ft msl)
120
100
80
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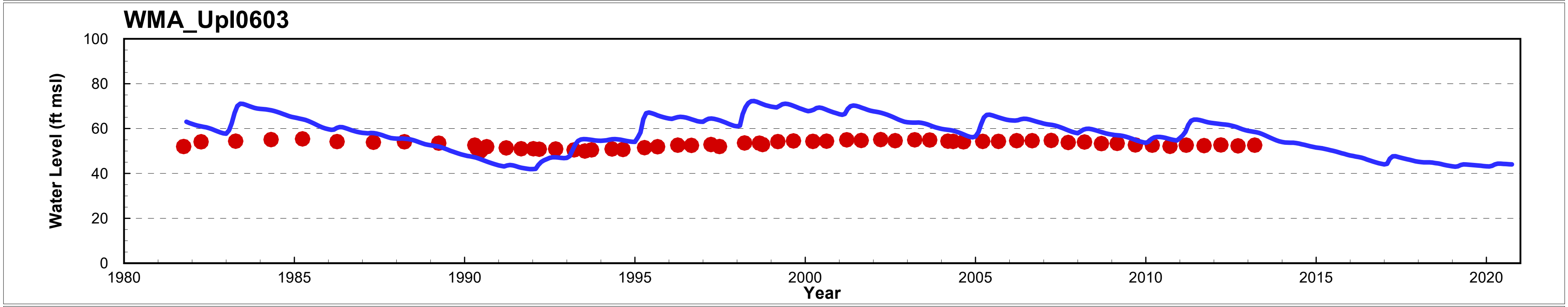
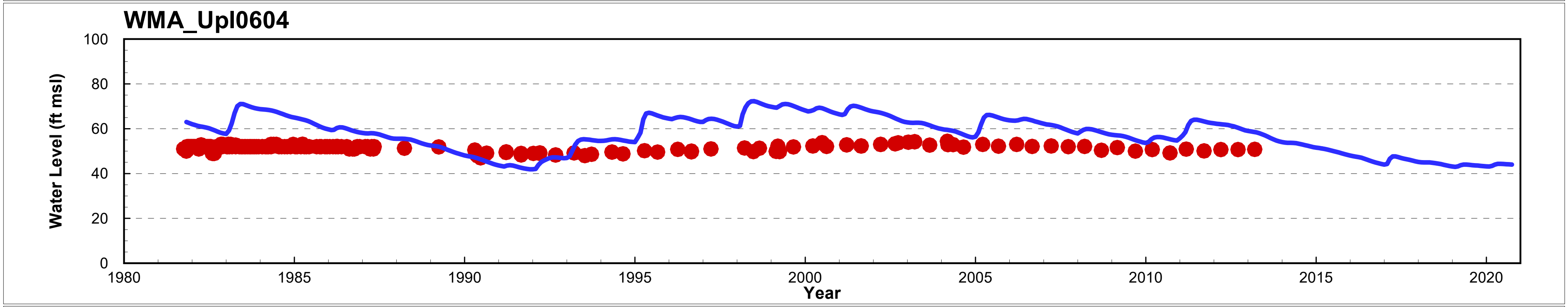
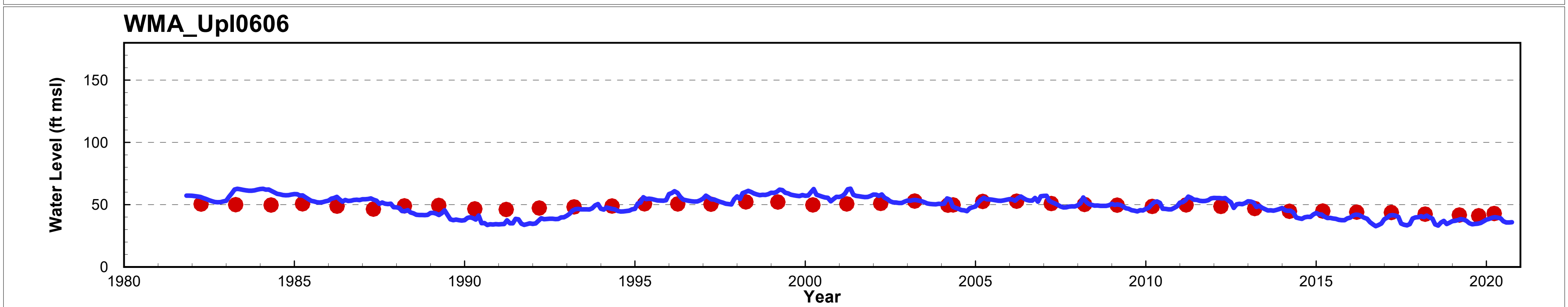
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year



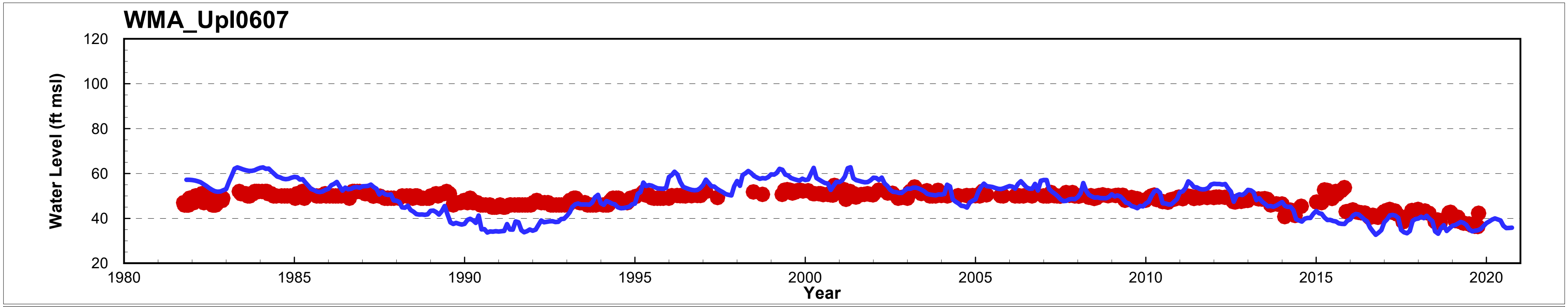
WMA_Upl0603
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

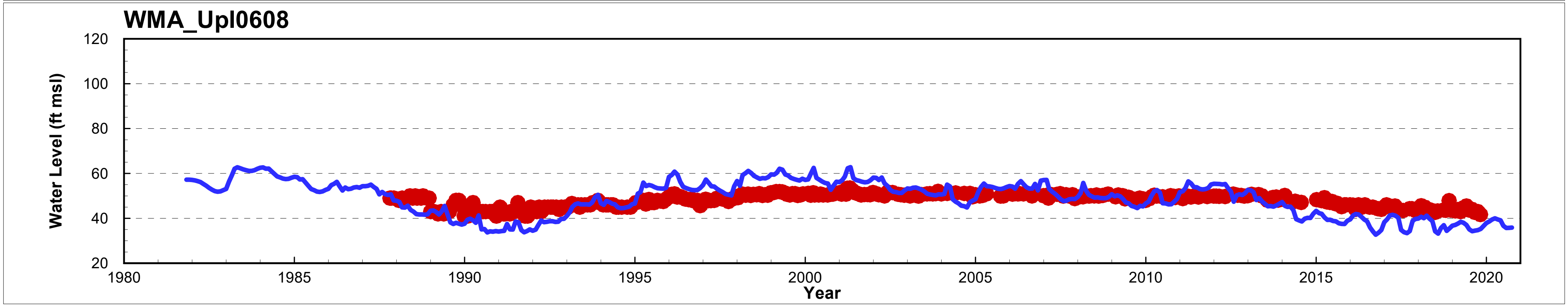


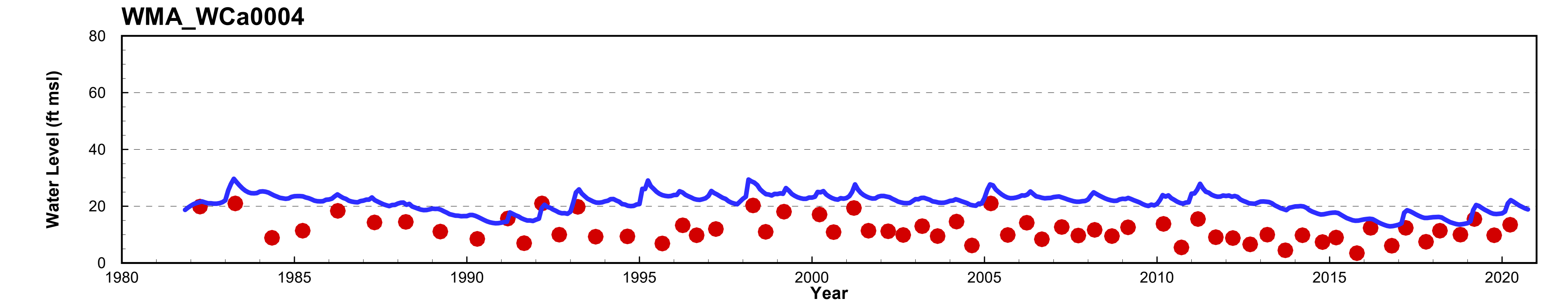
WMA_Upl0604
Water Level (ft msl)
100
80
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

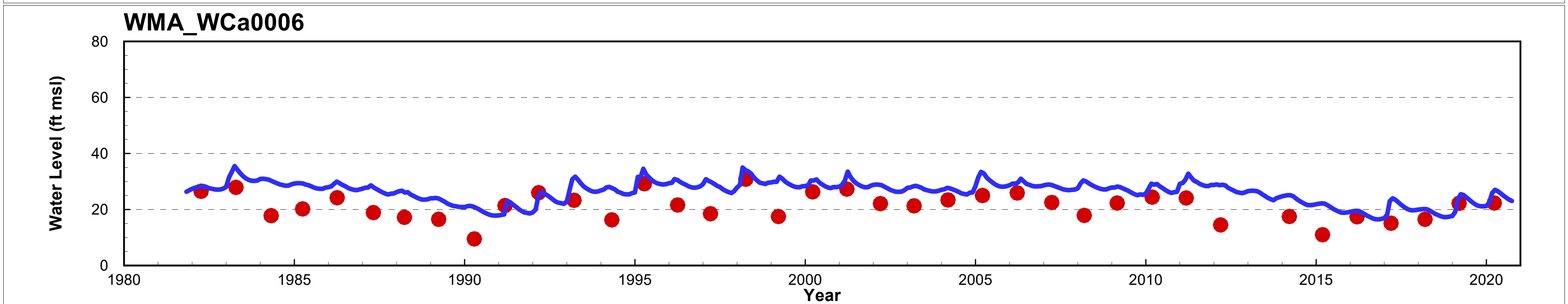


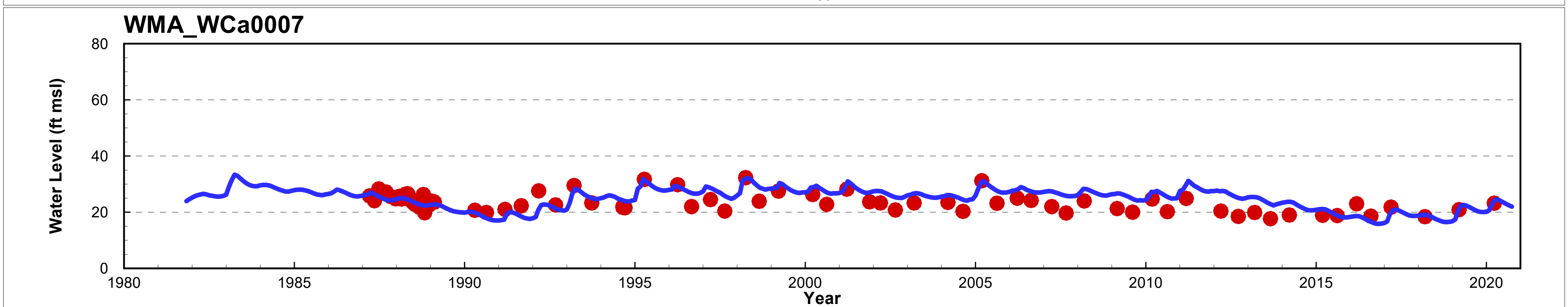
WMA_Upl0606
Water Level (ft msl)
150
100
50
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_Upl0607
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_Upl0608
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMA_WCa0004
Water Level (ft msl)
Year
0
20
40
60
80
1980
1985
1990
1995
2000
2005
2010
2015
2020


WMA_WCa0006
Water Level (ft msl)
Year
0
20
40
60
80
1980
1985
1990
1995
2000
2005
2010
2015
2020


WMA_WCa0007
Water Level (ft msl)
Year
0
20
40
60
80
1980
1985
1990
1995
2000
2005
2010
2015
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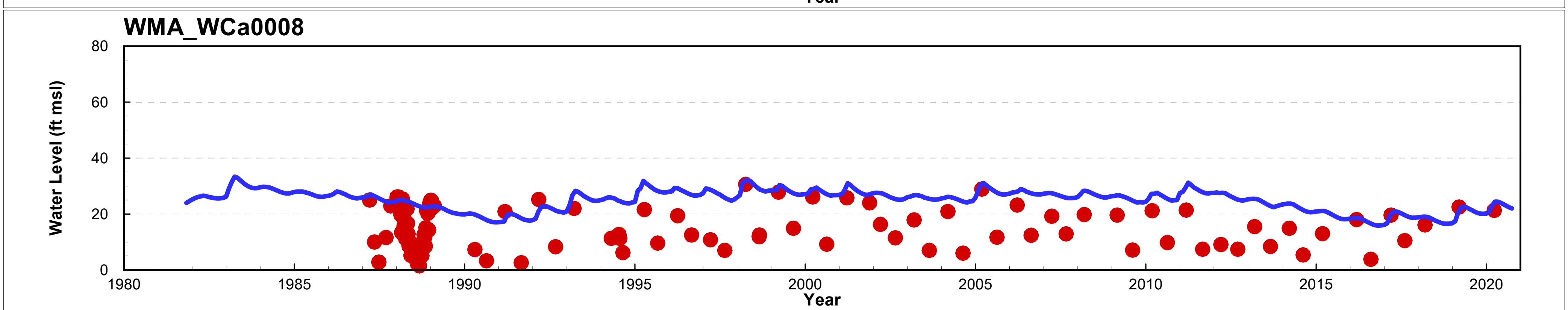
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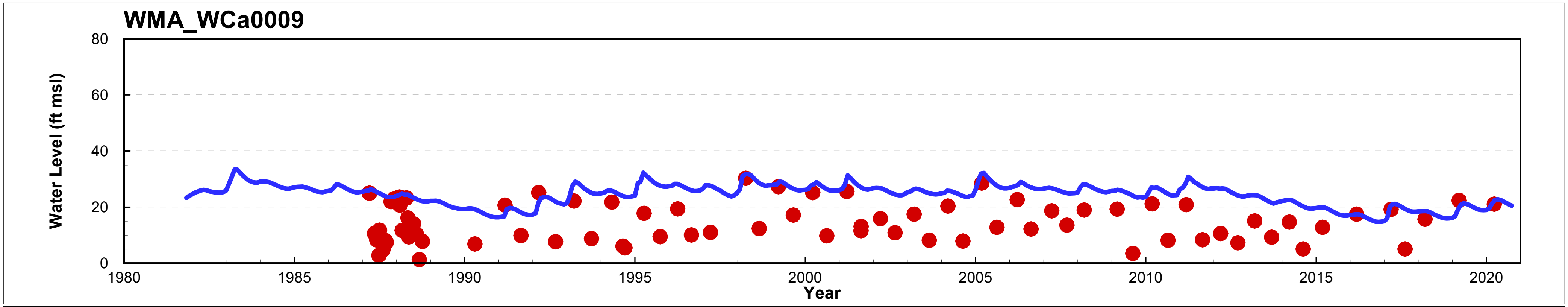
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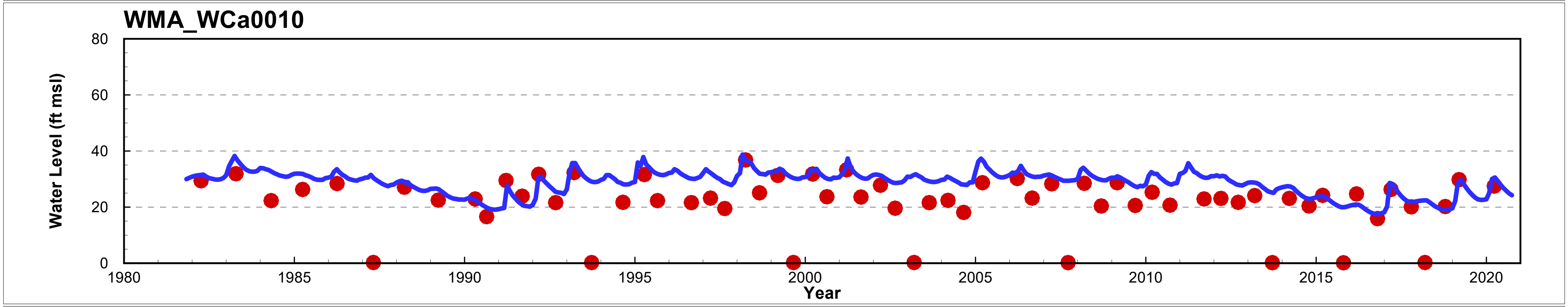
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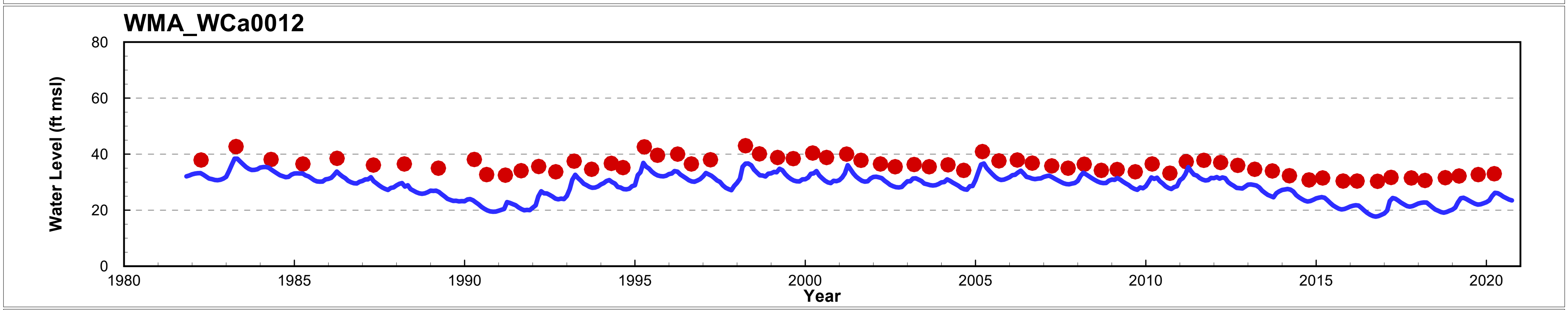
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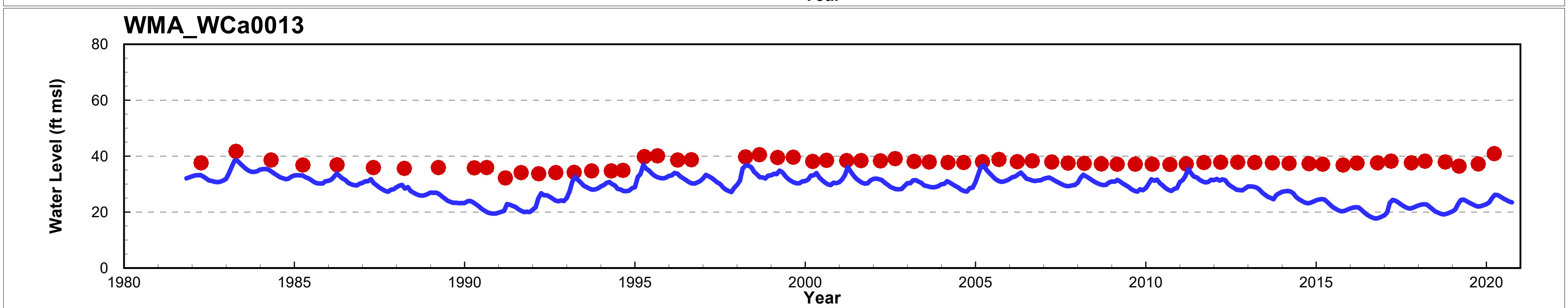
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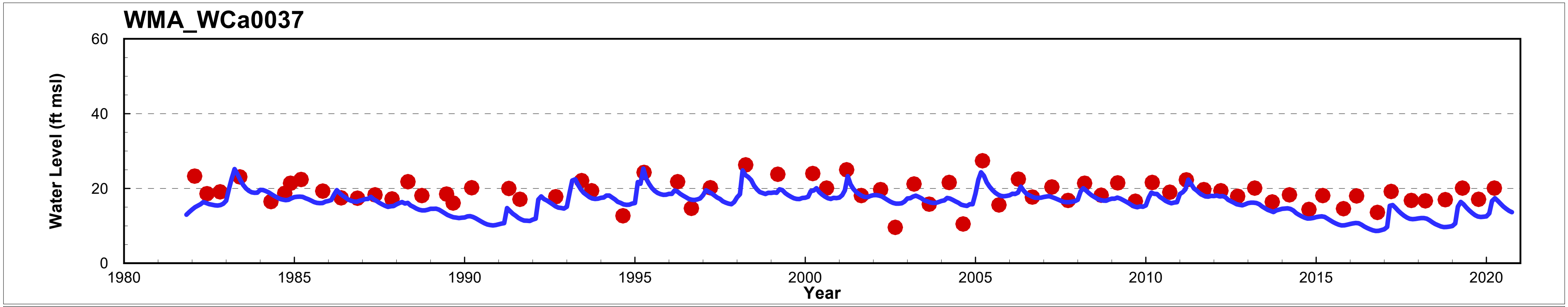
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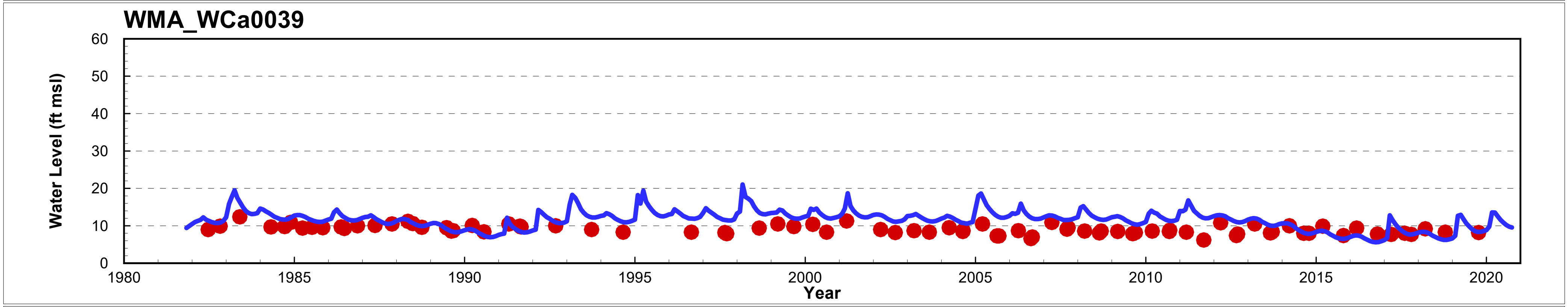
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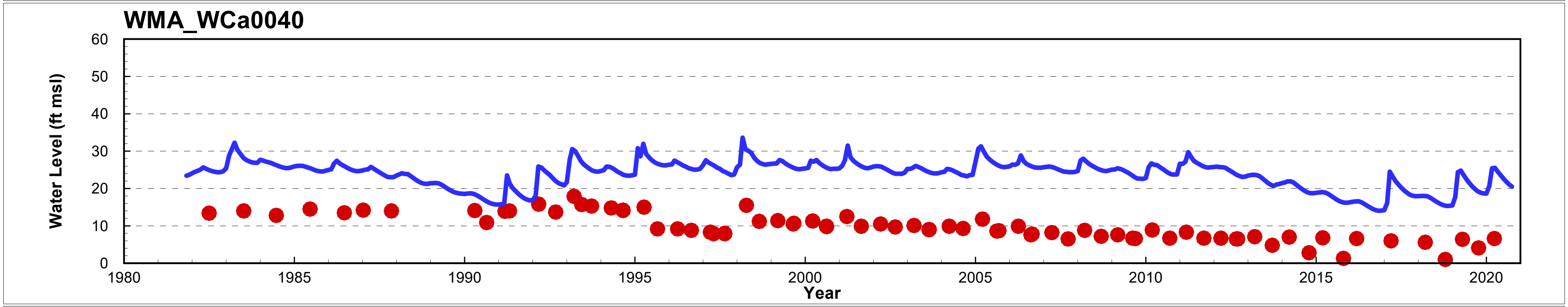
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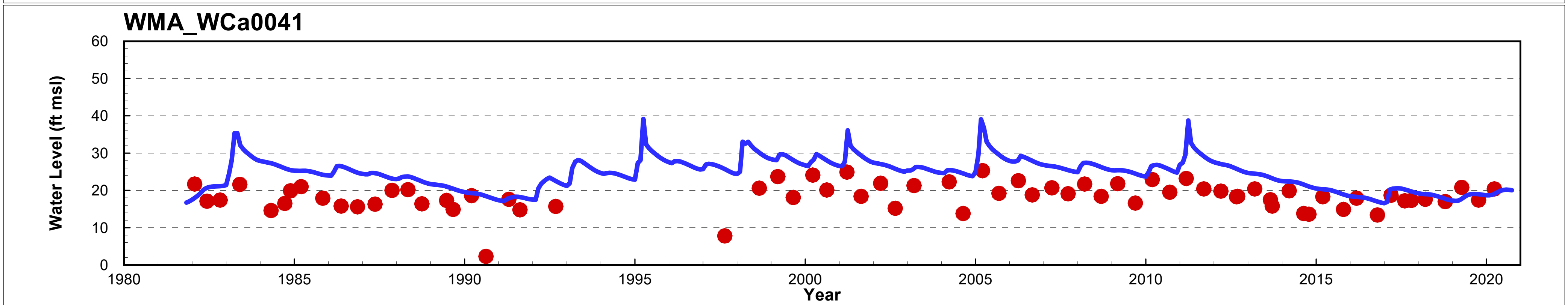
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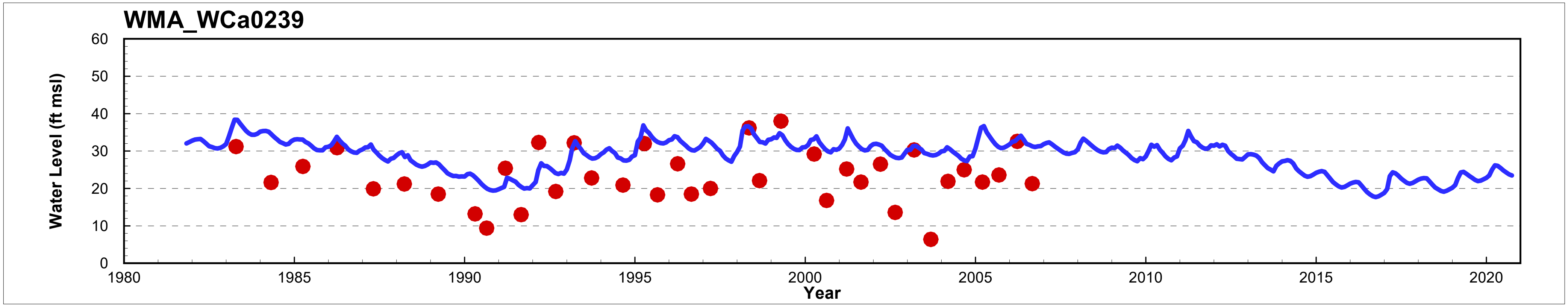

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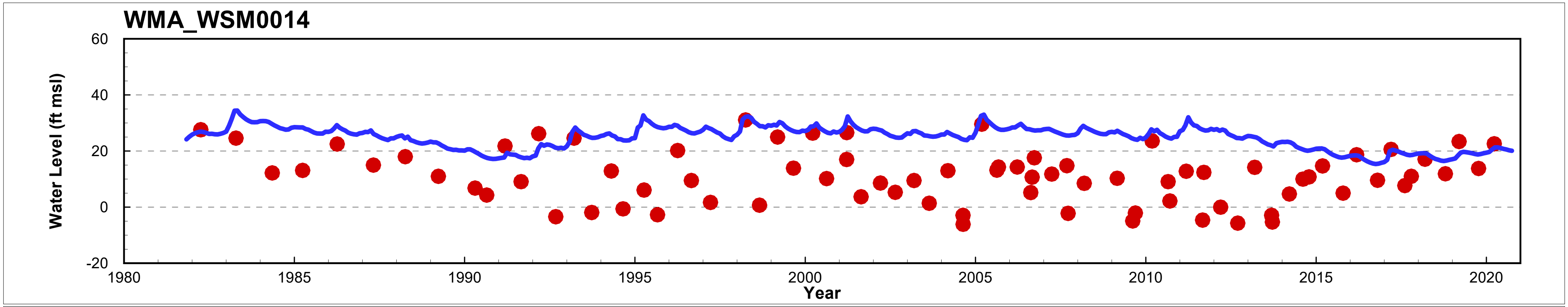
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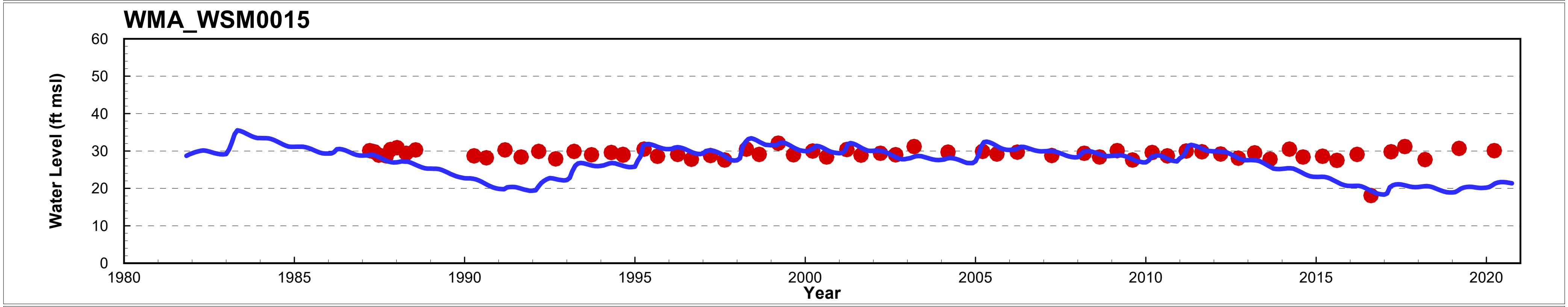
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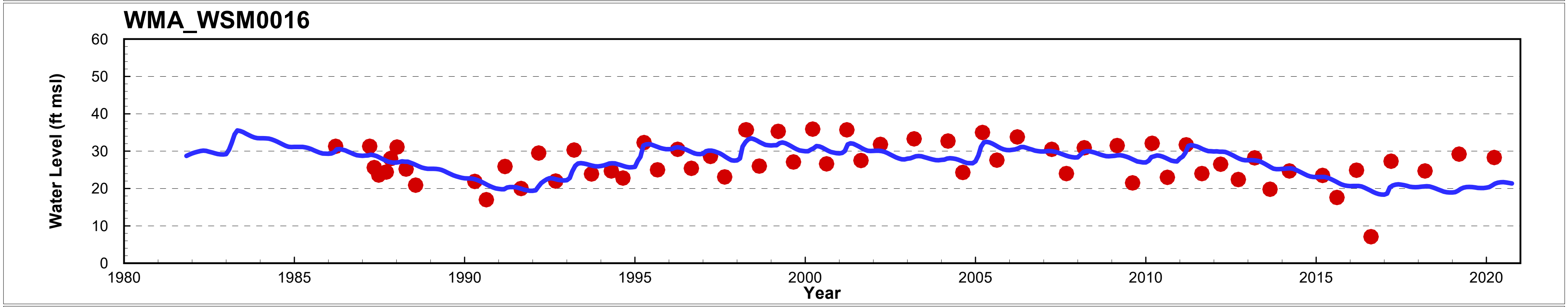
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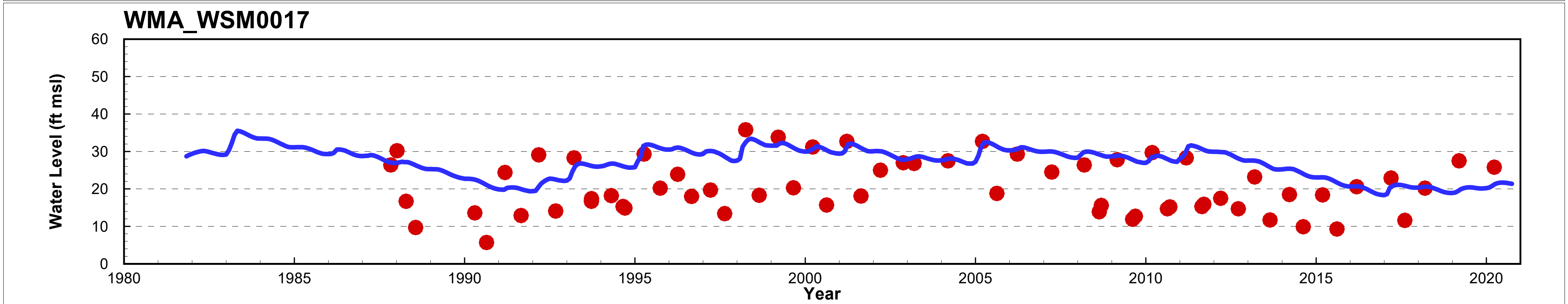
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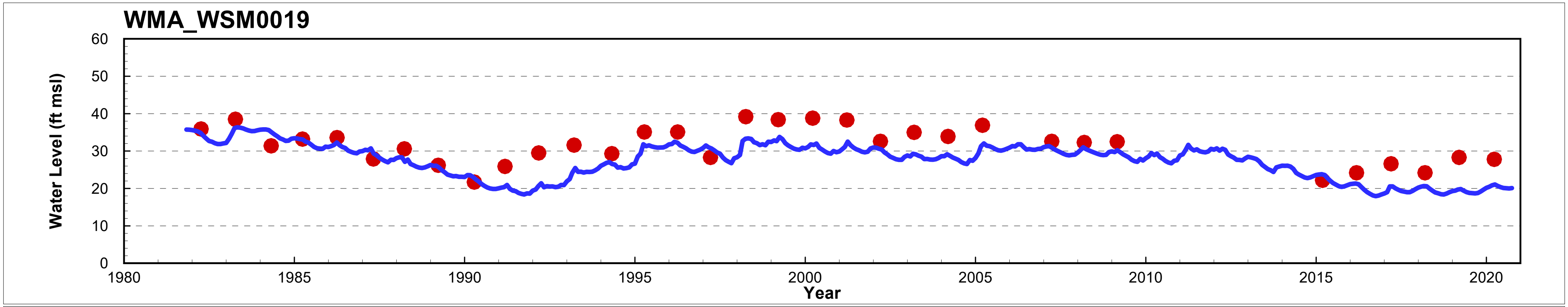
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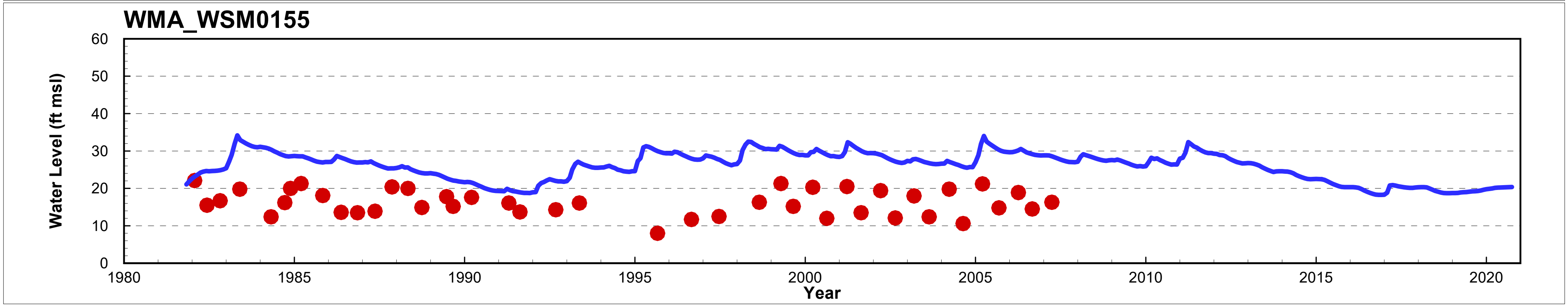
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Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3a-A:

California Statewide Groundwater Elevation Monitoring (CASGEM) Program Procedures for Monitoring Entity Reporting, Dated December 2010

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California Statewide Groundwater Elevation Monitoring (CASGEM) Program

Procedures for Monitoring Entity Reporting

December 2010

Department of Water Resources (DWR) will use the internet as the primary communication tool to notify interested parties and groundwater Monitoring Entities of the status of the CASGEM program on an ongoing basis. Information will be posted at the following website: http://www.water.ca.gov/groundwater/casgem

In addition to the above-referenced website, DWR will distribute information via email. In order to be placed on the CASGEM contact list, please register your contact information at the following website: http://www.water.ca.gov/groundwater/casgem/register/

For questions about the Reporting Procedures, or other technical issues, please contact:

DWR Headquarters
Mary Scruggs
901 P Street
Sacramento, CA 95814
(916) 654-1324
mscruggs@water.ca.gov

Northern Region Office
Kelly Staton
2440 Main Street
Red Bluff, CA 96080
530-529-7344
staton@water.ca.gov

North Central Region Office
Chris Bonds
3500 Industrial Avenue
West Sacramento, CA 95691
(916) 376-9657
cbonds@water.ca.gov

South Central Region Office
Dane Mathis
3374 Shields Avenue
Fresno, CA 93726
(559) 230-3354
dmathis@water.ca.gov

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Tim Ross
770 Fairmont Avenue
Suite 102
Glendale, CA 91203
(818) 500-1645 x278
tross@water.ca.gov

Table of Contents

Introduction to CASGEM Program

In November 2009 Part 2.11 (Groundwater Monitoring) was added to Division 6 of the Water Code by Senate Bill 6 (7th Extraordinary Session) (SB 6), a copy of which is included in the Appendix. (All statutory references in this document are to the Water Code.) The new law directs that groundwater elevations in all basins and subbasins in California be regularly and systematically monitored, preferably by local entities, with the goal of demonstrating seasonal and long-term trends in groundwater elevations. The Department of Water Resources (DWR) is directed to make the resulting information readily and widely available.

DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program in accordance with SB 6 to establish a permanent, locally-managed system to monitor groundwater elevation in California's alluvial groundwater basins and subbasins identified in DWR Bulletin 118. The CASGEM program will rely and build on the many, established local long-term groundwater monitoring and management programs. DWR's role is to coordinate information collected locally through the CASGEM program and to maintain the collected groundwater elevation data in a readily and widely available public database. DWR will also continue measuring its current network of groundwater monitoring wells as funding allows.

The goals of the CASGEM program are to:

- Establish procedures for notification and data reporting by prospective Monitoring Entities (this document)
- Verify local Monitoring Entities in accordance with the Water Code
- Develop an interface for local entities to enter data into a database compatible with DWR's Water Data Library
- Maintain the database and make it easily accessible to the public and local entities for use in water supply planning and management

If no local entities volunteer to monitor groundwater elevations in a basin or part of a basin, DWR may be required to develop a monitoring program for that part. If DWR takes over monitoring of a basin, certain entities in the basin may not be eligible for water grants or loans administered by the state.

During August and September 2010, DWR held 10 workshops throughout the state in cooperation with Association of California Water Agencies (ACWA) to introduce the CASGEM program and explain the purpose and process of the program to local agencies and stakeholders. A copy of the DWR presentation is available on the CASGEM website (http://www.water.ca.gov/groundwater/casgem). A summary of

Frequently Asked Questions (FAQs), primarily from the workshops, is provided in on the CASGEM website.

DWR's main role is to administer the CASGEM program through providing public outreach; creating and maintaining the CASGEM website and online data submittal system; and, supporting local entities through the process of becoming a Monitoring Entity and preparing Monitoring Plans. DWR will use the CASGEM website to provide up-to-date information on the program. The website will also be the access point for the online notification and data submittal systems.

Staff from the DWR regional offices will be available to assist potential Monitoring Entities with the online notification submittal process. After receiving notification from prospective Monitoring Entities, DWR will review them for completeness, verify the authority of the applying entity under Section 10927, and check for overlapping monitoring areas. DWR will advise each party on the status of their notification within three months of submittal and will work with entities to address any deficiencies in their submittals.

DWR encourages local agencies and groups to collaborate to determine who will serve as the Monitoring Entity for the area. However, if more than one party seeks to become the Monitoring Entity for the same area and overlapping monitoring area issues cannot be resolved locally, DWR will make a final determination of the Monitoring Entity for the area. DWR's determinations will consider the order in which entities are identified in Section 10927 and other factors as described in the Water Code.

DWR will post the selection of each Monitoring Entity and its monitoring area on the CASGEM website and will notify each Monitoring Entity in writing. A map-based interface will be available for users to identify the Monitoring Entity for each basin in the state.

DWR will prepare the first status report on the CASGEM program for the Governor and Legislature by January 1, 2012. In this initial report, DWR will report on the extent of groundwater elevation monitoring within each basin. This report will include a statewide prioritization of basins based on water supply, water demand, and other factors identified in Section 10933. DWR will explore options for basins without identified monitoring, with a focus on identifying options for local monitoring. Future status reports on the CASGEM program will be prepared by DWR in years ending in 5 or 0.

PURPOSE OF MONITORING ENTITY REPORTING PROCEDURES

The purpose of these procedures is to introduce the CASGEM program and its components as the framework for implementing SB 6, with particular emphasis on the initial step of establishing Monitoring Entities for each Bulletin 118 basin in the state.

A summary of the requirements of local entities to comply with the CASGEM program is presented in Table 1.

Table 1. Quick Guide for Local Entities

- Determine whether you qualify as a potential Monitoring Entity (see "Requirements to become Monitoring Entity" on pages 9-13)
- Identify the basins within your area (see Bulletin 118)
- Collaborate with other local entities to identify and choose the prospective Monitoring Entity (or Entities) for your area
- Submit Monitoring Entity notification to DWR through CASGEM website (http://www.water.ca.gov/groundwater/casgem) on or before January 1, 2011
- DWR will review the notification and advise the prospective Monitoring Entity of the status of the notification within 3 months of submittal
- Work with staff of the DWR regional office to address any deficiencies in the submittal
- If more than one party seeks to become the Monitoring Entity for the same area, work with staff of the DWR regional office to resolve
- Check the CASGEM website for a listing of the selected Monitoring Entities
- Develop and submit a Monitoring Plan to DWR through the CASGEM website
- Staff from the DWR regional office are available to assist with the Monitoring Plan and to recommend changes
- Submit monitoring data to DWR through the CASGEM website on or before January 1, 2012

CASGEM SCHEDULE

<table>
<tr><th colspan="2">CASGEM Schedule</th><th colspan="2">DWR Activities</th><th>Local Entity Activities</th></tr>
<tr><td rowspan="3">2010</td><td>July-September</td><td colspan="2">ACWA/DWR Workshops</td><td rowspan="2">Collaborate to identify prospective Monitoring Entities</td></tr>
<tr><td rowspan="2">October-December</td><td colspan="2">•Draft Procedures and Guidelines
•Solicit Comments
•Finalize Procedures and Guidelines</td></tr>
<tr><td colspan="2">Notification System ready online</td><td>Prospective Monitoring Entities submit notifications to DWR</td></tr>
<tr><td rowspan="5">2011</td><td>January 1, 2011</td><td rowspan="4">Review and designation of Monitoring Entities</td><td rowspan="4">Review Monitoring Plans and provide recommendations</td><td>Monitoring Entity notifications due to DWR on or before 1/1/2011</td></tr>
<tr><td>January-March</td><td rowspan="2">Monitoring Entities develop and submit Monitoring Plans to DWR</td></tr>
<tr><td>April-June</td></tr>
<tr><td>July-September</td><td rowspan="2">Groundwater elevation monitoring begins and continues</td></tr>
<tr><td>October-December</td><td colspan="2">Preparation of first CASGEM status report</td></tr>
<tr><td>2012</td><td>January 1, 2012</td><td colspan="2">DWR submits first CASGEM status report to Governor and Legislature</td><td>First CASGEM data submittals due to DWR on or before 1/1/2012</td></tr>
</table>

A timetable for implementing the CASGEM schedule is shown above.

Monitoring Entities

The CASGEM program establishes the framework for collaboration between local monitoring parties and DWR to collect groundwater elevation data throughout the state's 515 basins as defined in Bulletin 118. A Monitoring Entity is a local agency or group that voluntarily takes responsibility for conducting or coordinating groundwater elevation monitoring and reporting for all or part of a groundwater basin.

To determine if you are within a Bulletin 118 basin, please refer to maps and descriptions in Bulletin 118, available online at: http://www.water.ca.gov/groundwater/bulletin118/gwbasin_maps_descriptions.cfm. Geographic Information System (GIS) shapefiles of the basins are also available at this website. DWR can assist in identifying other potential local monitoring parties in each basin.

Roles and Responsibilities of Monitoring Entities

Through the CASGEM program, local entities with appropriate authority may notify DWR of their intent to be a Monitoring Entity. Monitoring Entities will have specific responsibilities, including:

- Coordinate with DWR to establish a Monitoring Plan
- Conduct or coordinate the regular and systematic monitoring of groundwater elevations as specified in the Monitoring Plan
- Submit monitoring data to DWR in a timely manner

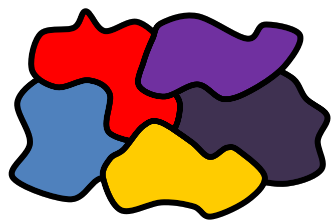
A Monitoring Entity can perform monitoring for any number of basins or portions thereof, but no area can have more than one Monitoring Entity. While the Monitoring Entity is responsible for compiling the data and submitting it to DWR for a particular area, the actual measurements can be taken by any number of agencies that would work under the direction of the Monitoring Entity. (Cooperating agencies would submit data to the Monitoring Entity, not to DWR.) Thus, assuming there are no overlapping areas or gaps in basin coverage for a given area, there are three possible basic scenarios, illustrated in Figure 1:

- A single Monitoring Entity that collects and reports groundwater elevation data for the entire basin (Scenario A);
- Multiple Monitoring Entities that collect and report groundwater elevation data for their portion of the basin (Scenario B); or

- An umbrella Monitoring Entity that coordinates and reports groundwater elevation data collected by multiple agencies within the basin (Scenario C).

Scenario A. One Monitoring Entity collects and reports data for entire basin

**Scenario B.
One basin, several Monitoring Entities collecting and submitting data**



**Scenario C.
One basin, one Monitoring Entity coordinating and submitting data collected by several agencies**

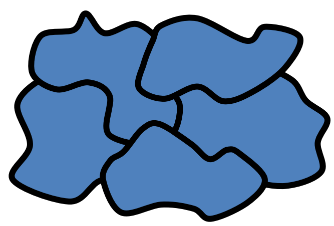


Figure 1. Illustration of possible Monitoring Entity scenarios for a monitored basin.

DWR currently monitors water elevations in about 4,000 wells statewide and cooperates with local and federal agencies to monitor roughly an additional 6,000 wells. DWR plans to continue monitoring groundwater elevations, contingent upon available funding. In some basins DWR currently does most, if not all, of the water-elevation monitoring. In these basins, a local entity still needs to notify DWR of their intent to become the Monitoring Entity. The Monitoring Entity must determine which DWR wells will be included in their CASGEM monitoring network. As long as DWR continues its monitoring program, the department will transmit its groundwater elevation data to the CASGEM system. However, if DWR is unable to continue monitoring for any reason, the Monitoring Entity will be required to re-evaluate its monitoring network to determine which wells to retain in its monitoring network.

REQUIREMENTS TO BECOME MONITORING ENTITY

Section 10927 of the Water Code defines the types of entities that may assume responsibility for monitoring and reporting groundwater elevations as part of the CASGEM program.

A summary list of eligible entities, in order of priority, and notification requirements for each entity is provided below:

1. A **watermaster or water management engineer** appointed by a court or pursuant to statute to administer a final judgment determining rights to groundwater [Section 10927(a)].
   Notification Requirements:
   - Name of Agency
   - Agency Contact Name
   - Address
   - Telephone Number
   - Email Address
   - Any other relevant contact information
   - Authority (as listed in Section 10927)
   - Name and number of basin to be monitored (from Bulletin 118)
   - Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
   - Statement that the entity will comply with the requirements of Water Code Part 2.11
   - Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

2. A **groundwater management agency** with statutory authority to manage groundwater pursuant to its principal act that is monitoring groundwater elevations in all or a part of a groundwater basin on or before January 1, 2010 [Section 10927(b)(1)].
   Notification Requirements:
   - Name of Agency
   - Agency Contact Name
   - Address
   - Telephone Number
   - Email Address
   - Any other relevant contact information
   - Authority (as listed in Section 10927)

- Name and number of basin to be monitored (from Bulletin 118)
- Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
- Statement that the entity will comply with the requirements of Water Code Part 2.11
- Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

3. A **water replenishment district** established pursuant to Water Code Division 18 (commencing with Section 60000). This part does not expand or otherwise affect the authority of a water replenishment district relating to monitoring elevations [Section 10927(b)(2)].

   Notification Requirements:

   - Name of Agency
   - Agency Contact Name
   - Address
   - Telephone Number
   - Email Address
   - Any other relevant contact information
   - Authority (as listed in Section 10927)
   - Name and number of basin to be monitored (from Bulletin 118)
   - Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
   - Statement that the entity will comply with the requirements of Water Code Part 2.11
   - Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

4. A **local agency that is managing all or part of a groundwater basin pursuant to Water Code Part 2.75** (commencing with Section 10750) and that was monitoring groundwater elevations in all or part of a groundwater basin on or before January 1, 2010, or a local agency or county that is managing all or part of a groundwater basin pursuant to any other legally enforceable groundwater management plan with provisions that are substantively similar to those described in that part and that was monitoring groundwater elevations in all or a part of a groundwater basin on or before January 1, 2010 [Section 10927(c)].

Notification Requirements:

- Name of Agency
- Agency Contact Name
- Address
- Telephone Number
- Email Address
- Any other relevant contact information
- Authority (as listed in Section 10927)
- Name and number of basin to be monitored (from Bulletin 118)
- Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
- Statement that the entity will comply with the requirements of Water Code Part 2.11
- Copy of current groundwater management plan
- Statement describing the ability or qualifications of the entity to conduct the groundwater monitoring functions required
- Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

5. A **local agency that is managing all or part of a groundwater basin pursuant to an integrated regional water management plan** prepared pursuant to Water Code Part 2.2 (commencing with Section 10530) that includes a groundwater management component that complies with the requirements of Section 10753.7 [Section 10927(d)].

   Notification Requirements:

   - Name of Agency
   - Agency Contact Name
   - Address
   - Telephone Number
   - Email Address
   - Any other relevant contact information
   - Authority (as listed in Section 10927)
   - Name and number of basin to be monitored (from Bulletin 118)
   - Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
   - Statement that the entity will comply with the requirements of Water Code Part 2.11
   - Copy of current groundwater component of integrated regional water management plan
   - Statement describing the ability or qualifications of the entity to conduct the groundwater monitoring functions required

- Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

6. A **county** that is not managing all or a part of a groundwater basin pursuant to a legally enforceable groundwater management plan with provisions that are substantively similar to those described in Water Code Part 2.75 (commencing with Section 10750) [Section 10927(e)].
   Notification Requirements:
   - Name of County
   - County Contact Name
   - Address
   - Telephone Number
   - Email Address
   - Any other relevant contact information
   - Authority (as listed in Section 10927)
   - Name and number of basin to be monitored (from Bulletin 118)
   - Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
   - Statement that the entity will comply with the requirements of Water Code Part 2.11
   - Statement describing the ability or qualifications of the entity to conduct the groundwater monitoring functions required
   - Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

7. A **voluntary cooperative groundwater monitoring association** formed pursuant to Section 10935 [Section 10927(f)]. As described in the Water Code Section 10935, the voluntary associations may be established by contract, a joint powers agreement, a memorandum of agreement, or other form of agreement deemed acceptable by DWR, so long as it contains: the names of the participants; the boundaries of the area covered by the agreement; the name or names of the parties responsible for meeting the requirements; the method of recovering the costs associated with meeting the requirements; and other provisions that may be required by DWR. Entities seeking to form a voluntary association should notify DWR, which will work cooperatively with the interested parties to facilitate the formation of the association.

Notification Requirements:

- Name of Association
- Association Contact Name
- Address
- Telephone Number
- Email Address
- Any other relevant contact information
- Authority (as listed in Section 10927)
- Name and number of basin to be monitored (from Bulletin 118)
- Map and shapefile showing area to be monitored (Shapefiles do not need to be submitted by the initial January 1, 2011 notification date; Regional Offices can provide assistance to potential Monitoring Entities with shapefiles.)
- Statement that the entity will comply with the requirements of Water Code Part 2.11
- Statement describing the ability or qualifications of the entity to conduct the groundwater monitoring functions required
- Statement of intent to meet the association formation requirements described in Section 10935
- Additional information deemed necessary by DWR to identify monitoring area or qualifications of the Monitoring Entity

Local agencies are encouraged to coordinate among themselves to determine the proposed Monitoring Entity or Entities that best suits their area. The resulting interested entity (or entities) should notify DWR of its intent to become a groundwater Monitoring Entity for one or more basins, or portions thereof by the January 1, 2011 deadline. Certain basic information is required for notification, including contact information and additional details depending on the authority of the entity desiring to monitor groundwater (Section 10928), as listed above. This notification information will be submitted to DWR using an online system that will be available by mid-December 2010.

MONITORING PLANS

Monitoring Entities will each develop a Monitoring Plan that includes the following sections: Monitoring Sites and Timing, Field Methods, and Data Reporting. Monitoring Plans should be completed and submitted to DWR by summer 2011. Staff from the DWR regional offices will be available to assist Monitoring Entities with the development of Monitoring Plans, if needed. In determining what information should be reported to DWR, the department will defer to existing monitoring programs if those programs result in information that demonstrates seasonal (annual high and low groundwater elevations) and long-term trends in groundwater elevations. Staff from the DWR regional offices will assist Monitoring Entities to address any gaps in basin coverage (see below) and other monitoring issues and may make recommendations for the location of additional wells. However, the department has no authority to require a Monitoring Entity to install additional wells unless funds are provided for that purpose. Once a Monitoring Plan is established with DWR, Monitoring Entities should notify DWR of any changes to the plan.

Key Components of Monitoring Plans

Submit to DWR by summer 2011

- Monitoring Sites and Timing
  - Well Network Design
  - Selected wells (current)
  - Planned (future) wells
  - Frequency to capture seasonal highs and lows
  - Map and shapefile of monitoring area and well locations

Field Methods for groundwater monitoring

- Methods for measuring
  - Reference Point
  - Static water level
  - Depth to water
  - Standardized form for data collection

Data Reporting

- Online data submittal, minimum July & January each year

DATA GAPS

A data gap refers to a basin or portion of a basin that is not included in any of the Monitoring Plans submitted to DWR. This is essentially an area that lacks the density of monitoring wells that would allow seasonal and long-term trends in groundwater elevations to be determined for the basin, subbasin, or a portion thereof. Among the 515 basins defined by Bulletin 118, data gaps may exist for a variety of reasons, including a lack of suitable monitoring wells, lack of groundwater use, access issues, and jurisdictional issues, among others.

If no local entity is able and/or willing to fill a data gap, the department may be required to perform groundwater monitoring functions. If DWR performs this monitoring, local agencies and the county that have the authority under Section 10927 to monitor the area of the data gap would be potentially ineligible for a water grant or loan awarded or administered by the state. The Monitoring Entity or entities with the authority to monitor the area of the data gap should provide detailed information regarding the nature of and reason for the data gap so that DWR may include such information in the prioritization of groundwater basins and subbasins as appropriate.

Agencies and counties that are eligible to be designated Monitoring Entities but choose not participate in the CASGEM program will not lose their state water grant and loan eligibility if their entire service area qualifies as a disadvantaged community (Water Code Section 10933.7(b)). It will be the responsibility of the local agency or county applying for a state water grant or loan to demonstrate their disadvantaged community status at the time they are applying for the grant or loan.

Monitoring Sites and Timing

The Monitoring Plan will identify the wells to be monitored and the frequency with which they will be monitored. The Monitoring Plan should explain how proposed monitoring will be sufficient to demonstrate the seasonal and long-term groundwater elevation trends in the monitored area. The density of monitoring locations will depend on the complexity of the basin.

Because of security concerns, the California Department of Public Health (DPH) routinely limits the disclosure of detailed public water supply well location information. Pursuant to Water Code Section 10931, the DWR is required to collaborate with DPH to ensure that the information reported to the CASGEM program will not result in the inappropriate disclosure of information of concern to DPH. At this time, DWR has reached no agreement with DPH regarding the appropriate treatment of public water supply well data. As a result, CASGEM does not currently plan to use such well information in its database.

The Monitoring Plan should contain a table identifying the wells to be monitored and the timing of that monitoring. Because the law specifies that information should demonstrate seasonal and long-term trends in groundwater elevations, at a minimum monitoring should be conducted at each location for the yearly high and low for the basin. The yearly high and low groundwater elevations typically occur in spring and fall, but this may vary from basin to basin. It is very important that the timing of all the measurements in the basin is coordinated. Rationale for selection of the timing (seasonal highs and lows) should be included in the Monitoring Plan.

The information on the monitoring sites and timing to be submitted in the online system should include:

- Well identification number
- State well number
- Location (decimal latitude and longitude, North American Datum (NAD) 83)
- Reference point elevation (feet, North American Vertical Datum (NAVD) 88)
- Land surface datum (feet, NAVD88)
- Map and shapefile with monitoring locations, Bulletin 118 groundwater basin boundary, and boundary of monitoring area
- Frequency and timing of measurements

Field Methods

The consistent and documented collection of groundwater elevation data is important for ensuring that the data can be used across the state, regardless of the Monitoring Entity. The field methods should meet a common set of basic requirements; however, the methods do not have to be exactly the same. Many entities already have in place monitoring efforts that are successful in meeting local needs and that can meet the needs for this program, either as-is or with the incorporation of individual components. The CASGEM program wishes to maintain, to the greatest extent possible, the procedures of high-quality local groundwater elevation monitoring programs, so long as they meet the overall program goals and policies. Of particular concern are the following basic requirements:

- Method(s) to establish the Reference Point, including step-by-step instructions
- Method(s) to ensure static groundwater elevation
- Method(s) to measure depth to water, including step-by-step instructions
- Method(s) and form(s) for recording measurements

It is the responsibility of each Monitoring Entity to develop and implement monitoring protocols that are appropriate to local groundwater basin conditions, protect the water quality of its monitoring wells, and maintain the quality of the data that it submits to the CASGEM Program. DWR has developed field guidelines (Department of Water Resources Groundwater Elevation Monitoring Guidelines) based on a review of existing field methods from DWR and other organizations, which is available on the CASGEM website. Monitoring Entities are welcome to refer to these guidelines when developing field methods for their own Monitoring Plans. However, the DWR guidelines are for internal use in the event that the Department is required to perform groundwater monitoring functions pursuant to Section 10933.5 and are not binding on any other agency. The core of the CASGEM program will rely and build on the many, established local long-term groundwater monitoring and management programs. The department will defer to existing monitoring programs that result in information that demonstrates seasonal and long-term trends in groundwater elevations.

Data Reporting

DWR will develop an online data submittal system for Monitoring Entities to submit their groundwater elevation data. Several methods of submitting data will be available, such as direct online data entry, or upload of data files for batch entry. Initial groundwater elevation data should be submitted to DWR by January 1, 2012. Thereafter, data should be submitted as soon as possible after collection, but no later than January 1st and July 1st of each year, at the minimum. Historical data can also be submitted via the DWR data system to aid in data interpretation. All submitted data will be available to the public, except for confidential data.

Each groundwater elevation data measurement submitted to the online system should include:

- Well identification number
- Measurement date
- Reference point and land surface elevation
- Depth to water
- Method of measuring water depth
- Measurement quality codes

The Monitoring Entity information, well information, and groundwater elevation information is to be provided by the Monitoring Entity. Items labeled as required must be submitted to DWR to report groundwater elevations. Items labeled as recommended should be submitted to DWR if they are available, as they assist in fully evaluating the quality of measurements. DWR will provide standard form(s) for Monitoring Entities to submit groundwater elevation data online. However, if Monitoring Entities cannot use the standard form(s) or provide the data elements listed below, DWR will work cooperatively with Monitoring Entities to develop alternate methods of submitting data.

Entity Information

All entities assuming groundwater monitoring functions as delineated in Section 10927 (a)-(f) are required to submit the following information:

- Monitoring Entity's name, address, telephone number, contact person name and email address, and any other relevant contact information (Section 10928 (a) (1), 10928 (b) (1))
- Name, address, telephone number, email address and any other relevant contact information for entities collecting data that is submitted by a designated submitting entity (Monitoring Entity)
- Groundwater basins being monitored
  - Identify entire basins monitored
  - Identify partial basins monitored

Well Information

The following information about each well is required for the CASGEM online system:

- Unique well identification number. Agencies may use an existing State Well Number, an existing local well designation, or develop their own identification name, using the following protocol:
    - Agency name, abbreviation, or acronym followed by a sequential number (e.g., SGA 01)
    - Groundwater basin – followed by a sequential number (e.g., Llagas 03)
    - Geographic name – followed by a sequential number (e.g., Yolo 12)
    - Well names should be 15 characters long or less
    - Avoid using owner/business names or specific locational information for privacy and security
- Decimal latitude/longitude coordinates of well, using horizontal datum NAD83, and the method of determining coordinates (Actual coordinates are preferred; however, Monitoring Entities may submit approximate locations, as needed, to protect the privacy of well owners. For example, to protect the privacy of a well owner, a Monitoring Entity may submit well coordinate locations that are only within 1000-feet of the actual well location.)
- Groundwater basin or sub-basin
- Reference point elevation of the well (feet) using NAVD88 vertical datum
- Elevation of land surface datum at the well (feet) using NAVD88 vertical datum
- Use of well (e.g., dedicated monitoring, irrigation, domestic, etc)
- Well completion type (e.g. single well, nested, or multi-completion wells)
- Depth of screened interval(s) and total well depth of well, if available (feet)
- Well Completion Report number (DWR Form 188), if available

The following information about each well is recommended for the CASGEM online system:

- State Well Number – assigned by DWR in most cases
- Method by which land surface elevation was determined (for example, topographic map, GPS, etc.)
- Written description of location of well, including distance from nearby landmarks and location of reference point in relation to well appurtenances (DWR Form 429)
- Well information comments

Groundwater Elevation Information

The following information for each groundwater elevation measurement is required for the CASGEM online system:

- Well identification number (see Well Information, above)
- Measurement date
- Reference point elevation of the well (feet) using NAVD88 vertical datum
- Elevation of land surface datum at the well (feet) using NAVD88 vertical datum
- Depth to water below reference point (feet) (unless no measurement was taken)
- Method of measuring water depth
- Measurement Quality Codes

    - If no measurement is taken, a specified “no measurement” code, must be recorded. Standard codes will be provided by the online system. If a measurement is taken, a “no measurement” code is not recorded.)
    - If the quality of a measurement is uncertain, a “questionable measurement” code can be recorded. Standard codes will be provided by the online system. If no measurement is taken, a “questionable measurement” code is not recorded.)
- Measuring agency identification

The following information for each groundwater elevation measurement is recommended for the CASGEM online system:

- Measurement time (PST/PDT with military time/24 hour format)
- Comments about measurement, if applicable

Groundwater elevation data shall be submitted electronically to DWR’s online system. DWR will develop electronic data transmittal (EDT) alternatives and data standards to permit bulk data transfer and assist Monitoring Entities in EDT reporting to DWR. As stated above, if Monitoring Entities cannot use the standard form(s) or provide the necessary groundwater elevation data elements, DWR will work cooperatively with Monitoring Entities to develop alternate methods of submitting data.

The CASGEM online data submittal system will be compatible with the Water Data Library (WDL) (http://www.water.ca.gov/waterdatalibrary/), DWR’s existing groundwater elevation database. The CASGEM system will include data reporting options similar to those in WDL, such as hydrographs, seasonal contour data, and data downloads. The combined accessibility of the WDL and the CASGEM system will be a significant resource for local agencies in making sound groundwater management decisions.

References

California Departement of Water Resources. (2003). *California's Groundwater, Bulletin 118-03.*

California Department of Water Resources. (2009). *California Water Plan Update 2009, Bulletin 160-09.*

APPENDIX – SENATE BILL 6 (7TH EXTRAORDINARY SESSION) - GROUNDWATER MONITORING

Senate Bill No. 6

CHAPTER 1

An act to add Part 2.11 (commencing with Section 10920) to Division 6 of, and to repeal and add Section 12924 of, the Water Code, relating to groundwater.

[Approved by Governor November 6, 2009. Filed with Secretary of State November 6, 2009.]

Legislative Counsel's Digest

SB 6, Steinberg. Groundwater.

(1) Existing law authorizes a local agency whose service area includes a groundwater basin that is not subject to groundwater management to adopt and implement a groundwater management plan pursuant to certain provisions of law. Existing law requires a groundwater management plan to include certain components to qualify as a plan for the purposes of those provisions, including a provision that establishes funding requirements for the construction of certain groundwater projects.

This bill would establish a groundwater monitoring program pursuant to which specified entities, in accordance with prescribed procedures, may propose to be designated by the Department of Water Resources as groundwater monitoring entities, as defined, for the purposes of monitoring and reporting with regard to groundwater elevations in all or part of a basin or subbasin, as defined. The bill would require the department to work cooperatively with each monitoring entity to determine the manner in which groundwater elevation information should be reported to the department. The bill would authorize the department to make recommendations for improving an existing monitoring program, and to require additional monitoring wells under certain circumstances. Under certain circumstances, the department would be required to perform groundwater monitoring functions. In that event, prescribed entities with authority to assume groundwater monitoring functions with regard to a basin or subbasin for which the department has assumed those functions would not be eligible for a water grant or loan awarded or administered by the state.

(2) Existing law requires the department to conduct an investigation of the state's groundwater basins and to report its findings to the Governor and the Legislature not later than January 1, 1980.

This bill would repeal that provision. The department would be required to conduct an investigation of the state's groundwater basins and to report its findings to the Governor and the Legislature not later than January 1, 2012, and thereafter in years ending in 5 or 0.

(3) The bill would take effect only if SB 1 and SB 7 of the 2009–10 7th Extraordinary Session of the Legislature are enacted and become effective.

The people of the State of California do enact as follows:

SECTION 1. Part 2.11 (commencing with Section 10920) is added to Division 6 of the Water Code, to read:

PART 2.11. GROUNDWATER MONITORING

Chapter 1. General Provisions

10920. (a) It is the intent of the Legislature that on or before January 1, 2012, groundwater elevations in all groundwater basins and subbasins be regularly and systematically monitored locally and that the resulting groundwater information be made readily and widely available.

(b) It is further the intent of the Legislature that the department continue to maintain its current network of monitoring wells, including groundwater elevation and groundwater quality monitoring wells, and that the department continue to coordinate monitoring with local entities.

10921. This part does not require the monitoring of groundwater elevations in an area that is not within a basin or subbasin.

10922. This part does not expand or otherwise affect the powers or duties of the department relating to groundwater beyond those expressly granted by this part.

Chapter 2. Definitions

10925. Unless the context otherwise requires, the definitions set forth in this section govern the construction of this part.

(a) “Basin” or “subbasin” means a groundwater basin or subbasin identified and defined in the department’s Bulletin No. 118.

(b) “Bulletin No. 118” means the department’s report entitled “California’s Groundwater: Bulletin 118” updated in 2003, or as it may be subsequently updated or revised in accordance with Section 12924.

(c) “Monitoring entity” means a party conducting or coordinating the monitoring of groundwater elevations pursuant to this part.

(d) “Monitoring functions” and “groundwater monitoring functions” means the monitoring of groundwater elevations, the reporting of those elevations to the department, and other related actions required by this part.

(e) “Monitoring groundwater elevations” means monitoring groundwater elevations, coordinating the monitoring of groundwater elevations, or both.

(f) “Voluntary cooperative groundwater monitoring association” means an association formed for the purposes of monitoring groundwater elevations pursuant to Section 10935.

Chapter 3. Groundwater Monitoring Program

10927. Any of the following entities may assume responsibility for monitoring and reporting groundwater elevations in all or a part of a basin or subbasin in accordance with this part:

(a) A watermaster or water management engineer appointed by a court or pursuant to statute to administer a final judgment determining rights to groundwater.

(b) (1) A groundwater management agency with statutory authority to manage groundwater pursuant to its principal act that is monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010.

(2) A water replenishment district established pursuant to Division 18 (commencing with Section 60000). This part does not expand or otherwise affect the authority of a water replenishment district relating to monitoring groundwater elevations.

(c) A local agency that is managing all or part of a groundwater basin or subbasin pursuant to Part 2.75 (commencing with Section 10750) and that was monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010, or a local agency or county that is managing all or part of a groundwater basin or subbasin pursuant to any other legally enforceable groundwater management plan with provisions that are substantively similar to those described in that part and that was monitoring groundwater elevations in all or a part of a groundwater basin or subbasin on or before January 1, 2010.

(d) A local agency that is managing all or part of a groundwater basin or subbasin pursuant to an integrated regional water management plan prepared pursuant to Part 2.2 (commencing with Section 10530) that includes a groundwater management component that complies with the requirements of Section 10753.7.

(e) A county that is not managing all or a part of a groundwater basin or subbasin pursuant to a legally enforceable groundwater management plan with provisions that are substantively similar to those described in Part 2.75 (commencing with Section 10750).

(f) A voluntary cooperative groundwater monitoring association formed pursuant to Section 10935.

10928. (a) Any entity described in subdivision (a) or (b) of Section 10927 that seeks to assume groundwater monitoring functions in accordance with this part shall notify the department, in writing, on or before January 1, 2011. The notification shall include all of the following information:

(1) The entity's name, address, telephone number, and any other relevant contact information.

(2) The specific authority described in Section 10927 pursuant to which the entity qualifies to assume the groundwater monitoring functions.

(3) A map showing the area for which the entity is requesting to perform the groundwater monitoring functions.

(4) A statement that the entity will comply with all of the requirements of this part.

(b) Any entity described in subdivision (c), (d), (e), or (f) of Section 10927 that seeks to assume groundwater monitoring functions in accordance with this part shall notify the department, in writing, by January 1, 2011. The information provided in the notification shall include all of the following:

(1) The entity's name, address, telephone number, and any other relevant contact information.

(2) The specific authority described in Section 10927 pursuant to which the entity qualifies to assume the groundwater monitoring functions.

(3) For entities that seek to qualify pursuant to subdivision (c) or (d) of Section 10927, the notification shall also include a copy of the current groundwater management plan or the groundwater component of the integrated regional water management plan, as appropriate.

(4) For entities that seek to qualify pursuant to subdivision (f) of Section 10927, the notification shall include a statement of intention to meet the requirements of Section 10935.

(5) A map showing the area for which the entity is proposing to perform the groundwater monitoring functions.

(6) A statement that the entity will comply with all of the requirements of this part.

(7) A statement describing the ability and qualifications of the entity to conduct the groundwater monitoring functions required by this part.
(c) The department may request additional information that it deems necessary for the purposes of determining the area that is proposed to be monitored or the qualifications of the entity to perform the groundwater monitoring functions.

10929. (a) (1) The department shall review all notifications received pursuant to Section 10928.

(2) Upon the receipt of a notification pursuant to subdivision (a) of Section 10928, the department shall verify that the notifying entity has the appropriate authority under subdivision (a) or (b) of Section 10927.

(3) Upon the receipt of a notification pursuant to subdivision (b) of Section 10928, the department shall do both of the following:

(A) Verify that each notification is complete.

(B) Assess the qualifications of the notifying party.

(b) If the department has questions about the completeness or accuracy of a notification, or the qualifications of a party, the department shall contact the party to resolve any deficiencies. If the department is unable to resolve the deficiencies, the department shall notify the party in writing that the notification will not be considered further until the deficiencies are corrected.

(c) If the department determines that more than one party seeks to become the monitoring entity for the same portion of a basin or subbasin, the department shall consult with the interested parties to determine which party will perform the monitoring functions. In determining which party will perform the monitoring functions under this part, the department shall follow the order in which entities are identified in Section 10927.

(d) The department shall advise each party on the status of its notification within three months of receiving the notification.

10930. Upon completion of each review pursuant to Section 10929, the department shall do both of the following if it determines that a party will perform monitoring functions under this part:

(a) Notify the party in writing that it is a monitoring entity and the specific portion of the basin or subbasin for which it shall assume groundwater monitoring functions.

(b) Post on the department's Internet Web site information that identifies the monitoring entity and the portion of the basin or subbasin for which the monitoring entity will be responsible.

10931. (a) The department shall work cooperatively with each monitoring entity to determine the manner in which groundwater elevation information should be reported to the department pursuant to this part. In determining what information should be reported to the department, the department shall defer to existing monitoring programs if those programs result in information that demonstrates seasonal and long-term trends in groundwater elevations. The department shall collaborate with the State Department of Public Health to ensure that the information reported to the department will not result in the inappropriate disclosure of the physical address or geographical location of drinking water sources, storage facilities, pumping operational data, or treatment facilities.

(b) (1) For the purposes of this part, the department may recommend improvements to an existing monitoring program, including recommendations for additional monitoring wells.

(2) The department may not require additional monitoring wells unless funds are provided for that purpose.

10932. Monitoring entities shall commence monitoring and reporting groundwater elevations pursuant to this part on or before January 1, 2012.

10933. (a) On or before January 1, 2012, the department shall commence to identify the extent of monitoring of groundwater elevations that is being undertaken within each basin and subbasin.

(b) The department shall prioritize groundwater basins and subbasins for the purpose of implementing this section. In prioritizing the basins and subbasins, the department shall, to the extent data are available, consider all of the following:

(1) The population overlying the basin or subbasin.

(2) The rate of current and projected growth of the population overlying the basin or subbasin.

(3) The number of public supply wells that draw from the basin or subbasin.

(4) The total number of wells that draw from the basin or subbasin.

(5) The irrigated acreage overlying the basin or subbasin.

(6) The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.

(7) Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.

(8) Any other information determined to be relevant by the department.

(c) If the department determines that all or part of a basin or subbasin is not being monitored pursuant to this part, the department shall do all of the following:

(1) Attempt to contact all well owners within the area not being monitored.

(2) Determine if there is an interest in establishing any of the following:

(A) A groundwater management plan pursuant to Part 2.75 (commencing with Section 10750).

(B) An integrated regional water management plan pursuant to Part 2.2 (commencing with Section 10530) that includes a groundwater management component that complies with the requirements of Section 10753.7.

(C) A voluntary groundwater monitoring association pursuant to Section 10935.

(d) If the department determines that there is sufficient interest in establishing a plan or association described in paragraph (2) of subdivision (c), or if the county agrees to perform the groundwater monitoring functions in accordance with this part, the department shall work cooperatively with the interested parties to comply with the requirements of this part within two years.

(e) If the department determines, with regard to a basin or subbasin, that there is insufficient interest in establishing a plan or association described in paragraph (2) of subdivision (c), and if the county decides not to perform the groundwater monitoring and reporting functions of this part, the department shall do all of the following:

(1) Identify any existing monitoring wells that overlie the basin or subbasin that are owned or operated by the department or any other state or federal agency.

(2) Determine whether the monitoring wells identified pursuant to paragraph (1) provide sufficient information to demonstrate seasonal and long-term trends in groundwater elevations.

(3) If the department determines that the monitoring wells identified pursuant to paragraph (1) provide sufficient information to demonstrate seasonal and long-term trends in groundwater elevations, the department shall not perform groundwater monitoring functions pursuant to Section 10934.

(4) If the department determines that the monitoring wells identified pursuant to paragraph (1) provide insufficient information to demonstrate seasonal and long-term trends in groundwater elevations, and the State Mining and Geology Board concurs with

that determination, the department shall perform groundwater monitoring functions pursuant to Section 10934.[1]

10933.5. (a) Consistent with Section 10933, the department shall perform the groundwater monitoring functions for those portions of a basin or subbasin for which no monitoring entity has agreed to perform the groundwater monitoring functions.

(b) Upon determining that it is required to perform groundwater monitoring functions, the department shall notify both of the following entities that it is forming the groundwater monitoring district:

(1) Each well owner within the affected area.

(2) Each county that contains all or a part of the affected area.

(c) The department shall not assess a fee or charge to recover the costs for carrying out its power and duties under this part.

(d) The department may establish regulations to implement this section.

10933.7. (a) If the department is required to perform groundwater monitoring functions pursuant to Section 10933.5, the county and the entities described in subdivisions (a) to (d), inclusive, of Section 10927 shall not be eligible for a water grant or loan awarded or administered by the state.

(b) Notwithstanding subdivision (a), the department shall determine that an entity described in subdivision (a) is eligible for a water grant or loan under the circumstances described in subdivision (a) if the entity has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

10934. (a) For purposes of this part, neither any entity described in Section 10927, nor the department, shall have the authority to do either of the following:

(1) To enter private property without the consent of the property owner.

[1] The reference in Section 10933(e)(4) to Section 10934 has been amended by Stats. 2010, Ch. 328, sec. 237 (S.B. 1330). The new reference will be to Section 10933.5.

(2) To require a private property owner to submit groundwater monitoring information to the entity.

(b) This section does not apply to a county or an entity described in subdivisions (a) to (d), inclusive, of Section 10927 that assumed responsibility for monitoring and reporting groundwater elevations prior to the effective date of this part.

10935. (a) A voluntary cooperative groundwater monitoring association may be formed for the purposes of monitoring groundwater elevations in accordance with this part. The association may be established by contract, a joint powers agreement, a memorandum of agreement, or other form of agreement deemed acceptable by the department.

(b) Upon notification to the department by one or more entities that seek to form a voluntary cooperative groundwater monitoring association, the department shall work cooperatively with the interested parties to facilitate the formation of the association.

(c) The contract or agreement shall include all of the following:

(1) The names of the participants.

(2) The boundaries of the area covered by the agreement.

(3) The name or names of the parties responsible for meeting the requirements of this part.

(4) The method of recovering the costs associated with meeting the requirements of this part.

(5) Other provisions that may be required by the department.

10936. Costs incurred by the department pursuant to this chapter may be funded from unallocated bond revenues pursuant to paragraph (12) of subdivision (a) of Section 75027 of the Public Resources Code, to the extent those funds are available for those purposes.

SEC. 2. Section 12924 of the Water Code is repealed.

SEC. 3. Section 12924 is added to the Water Code, to read:

12924. (a) The department, in conjunction with other public agencies, shall conduct an investigation of the state's groundwater basins. The department shall identify the state's groundwater basins on the basis of geological and hydrological conditions and consideration of political boundary lines whenever practical. The department shall also investigate existing general patterns of groundwater pumping and groundwater recharge within those basins to the extent necessary to identify basins that are subject to critical conditions of overdraft.

(b) The department shall report its findings to the Governor and the Legislature not later than January 1, 2012, and thereafter in years ending in 5 or 0.

SEC. 4. This act shall take effect only if Senate Bill 1 and Senate Bill 7 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

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Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-A:

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

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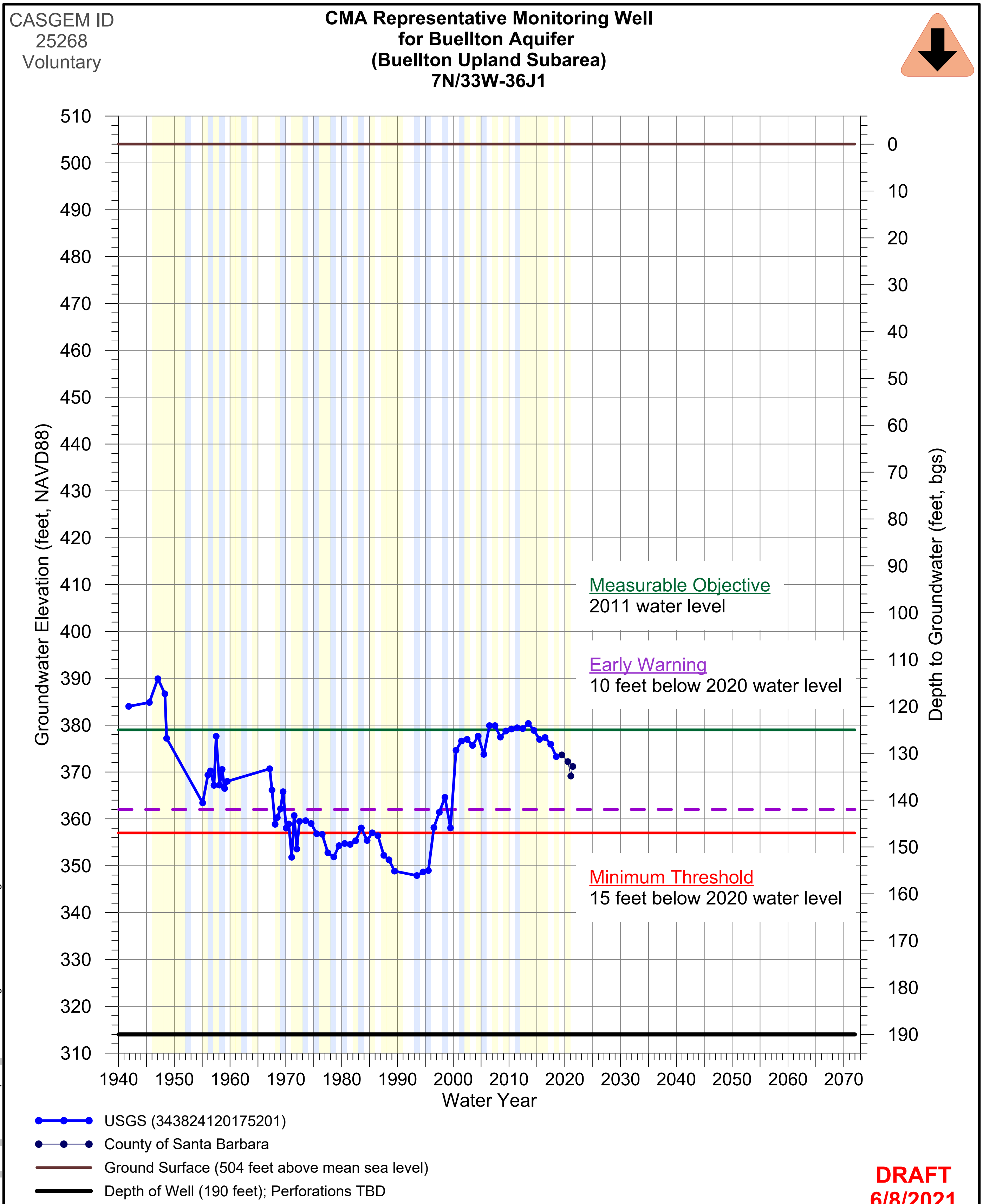
APPENDIX 3B-A: GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING CHRONIC DECLINE IN GROUNDWATER LEVELS

This appendix includes historical hydrographs 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.

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



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6/8/2021

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STETSON ENGINEERS INC.

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

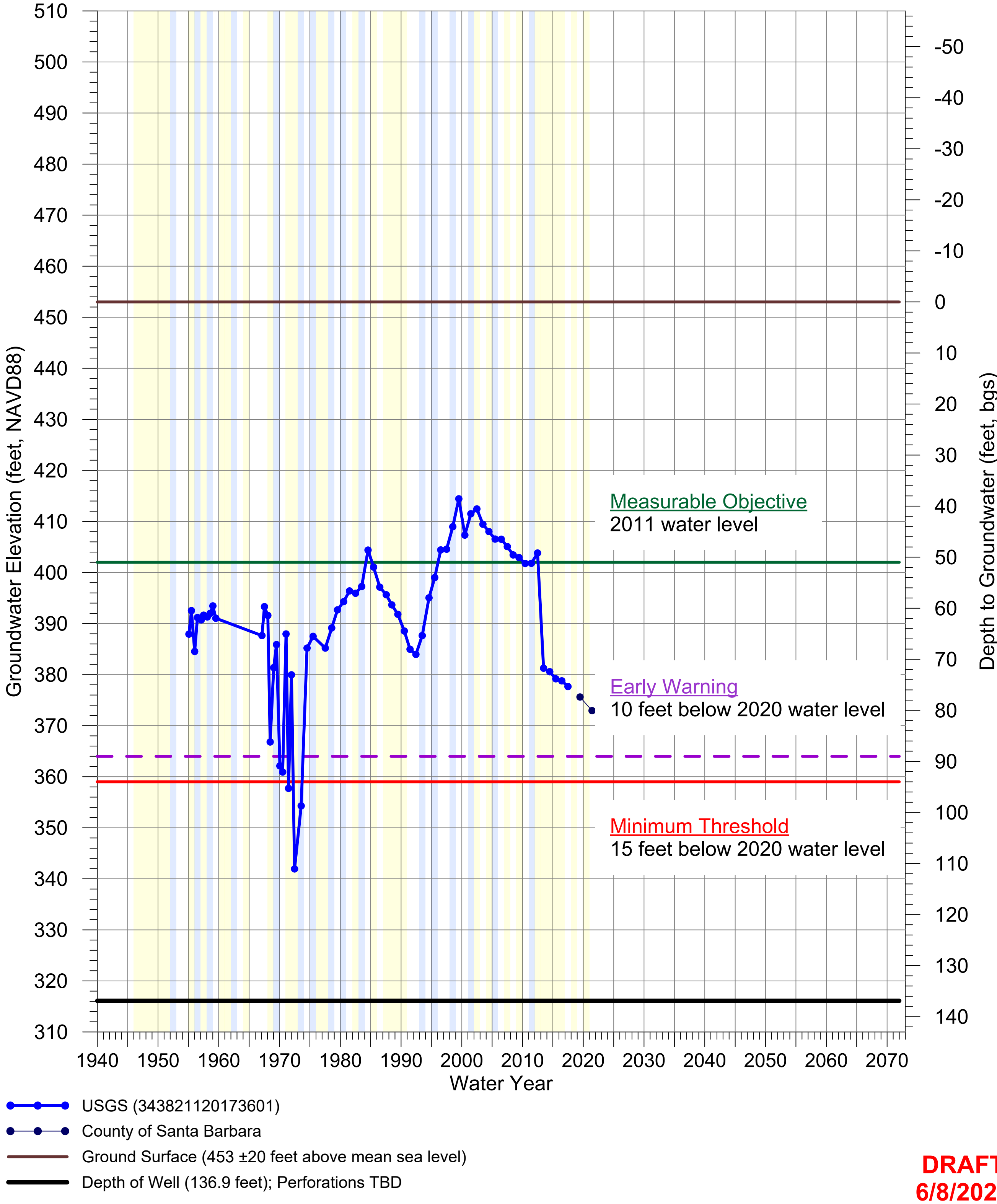
REPRESENTATIVE MONITORING WELL
Buellton Aquifer - Buellton Upland

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE A1-02

CASGEM ID
23681
Voluntary

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



DRAFT
6/8/2021

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STETSON ENGINEERS INC.

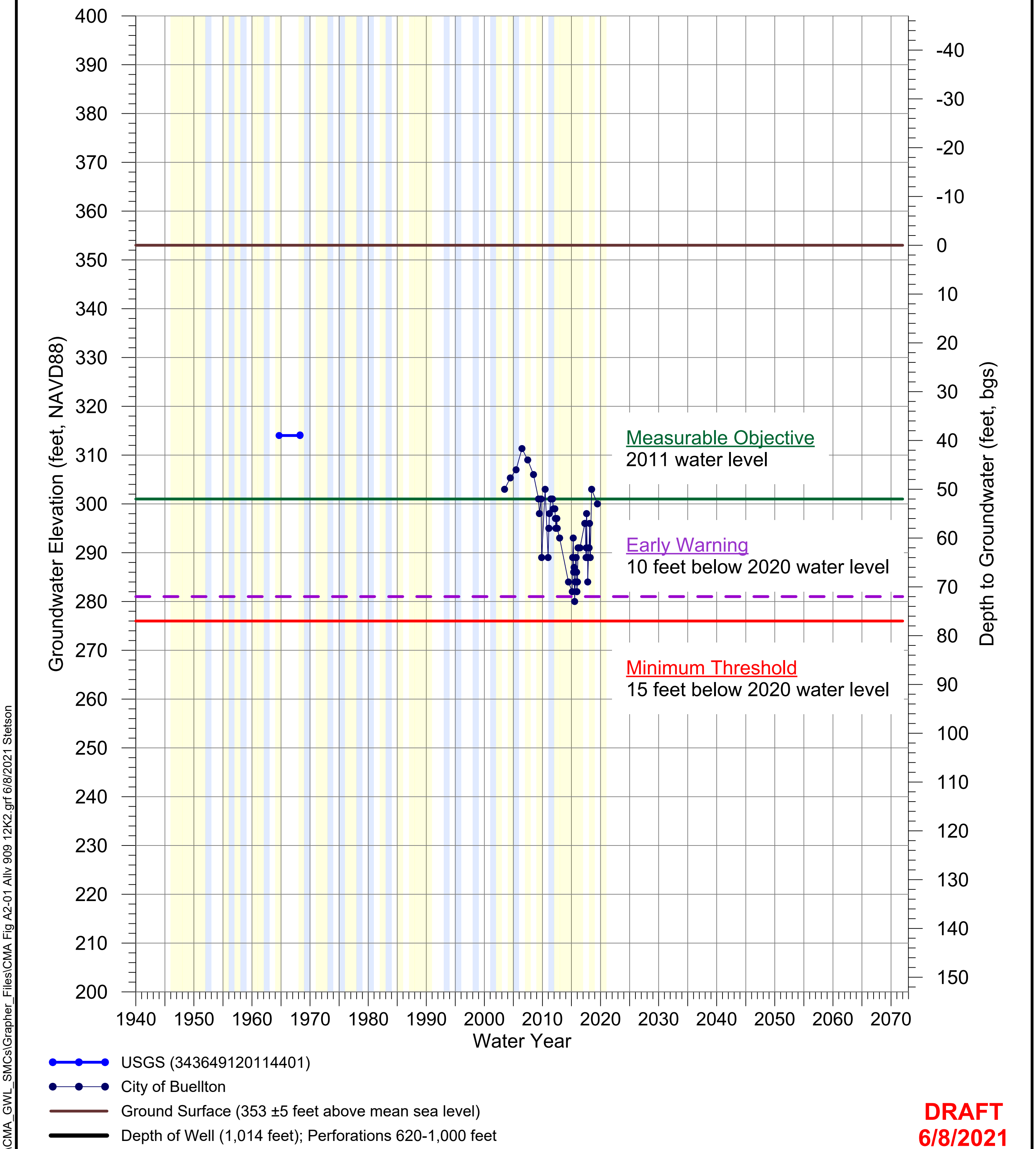
CMA
Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Buellton Aquifer - Buellton Upland

Water Year Type (1942-2020)
- 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



DRAFT 6/8/2021

STETSON ENGINEERS INC.

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

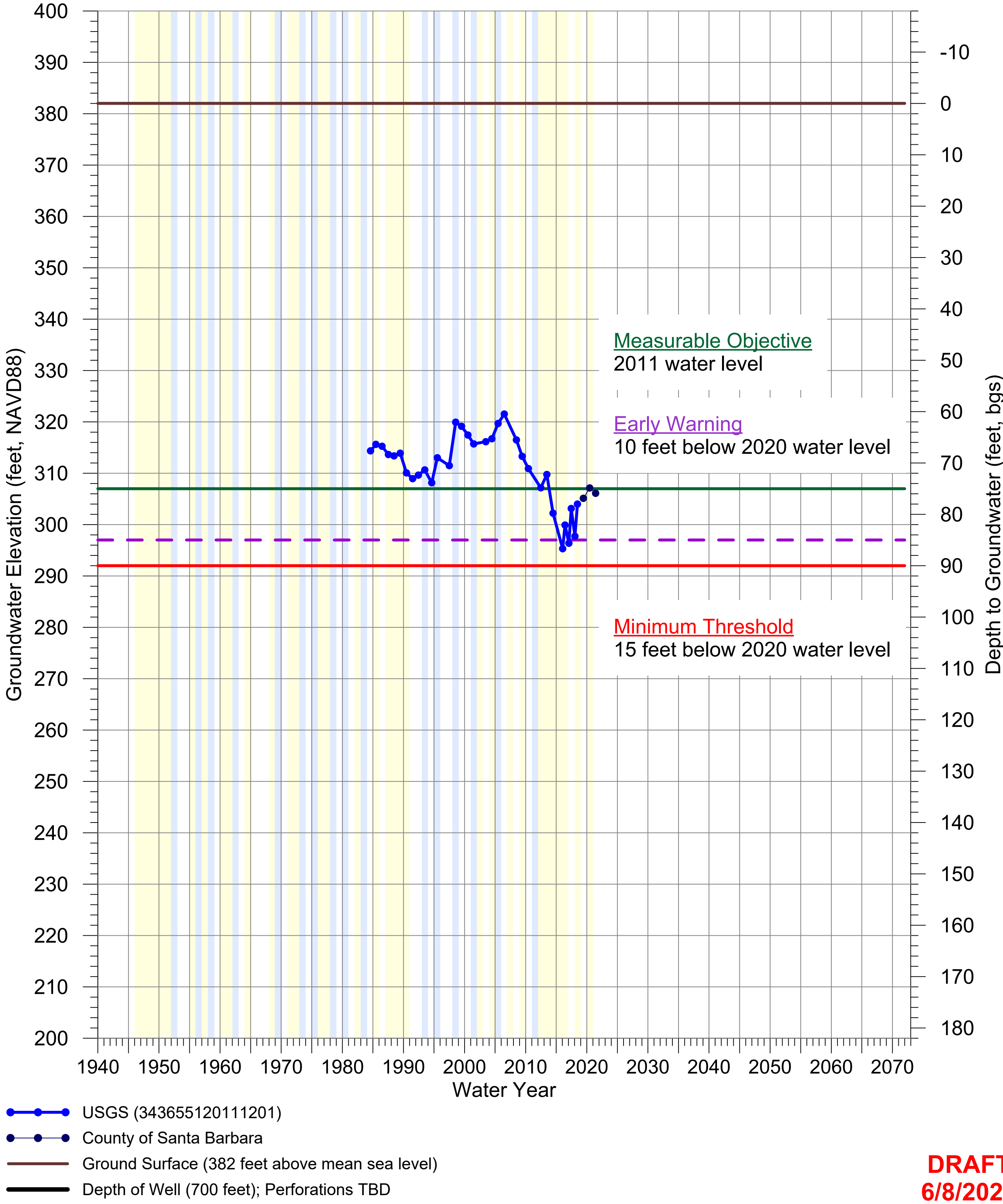
REPRESENTATIVE MONITORING WELL
Buellton Aquifer
Santa Ynez River Alluvium

Water Year Type (1942-2020)
- 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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6/8/2021

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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 (1942-2020)

Wet
Above/Below Normal
Dry / Critically Dry

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Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-B:

Stetson Engineers Draft Technical Memorandum
Sustainable Management Criteria:
CMA Groundwater Decline Analysis,
Dated May 17, 2021

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DRAFT TECHNICAL MEMORANDUM

STETSON ENGINEERS INC.

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TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: milesm@stetsonengineers.com

TO:	GSA Agency Staff CMA Committee	DATE:	May 17, 2021
FROM:	SGMA Technical Committee, Stetson Engineers	JOB NO:	2711 - Santa Ynez SGMA;SMCs

RE: **DRAFT** Sustainable Management Criteria: CMA Groundwater Decline Analysis

INTRODUCTION

The Sustainable Groundwater Management Act (SGMA) requires the establishment of management criteria for each of the six sustainability indicators. Avoiding "adverse impacts to beneficial uses and users of groundwater"[1] is the primary concern for each of the indicators. These sustainability indicators are the undesirable results of lowering groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence from groundwater withdrawal, and surface water depletion. The goal of this document is a technical basis for management criteria related to the undesirable result of lowering of groundwater levels.

The analysis is a comparison of the well perforation or screened intervals[2] to groundwater levels to identify potential impacts if the groundwater level generally were lowered. **Figure 1** is an illustration of this analysis. When well perforations become partially unsaturated, well pump efficiency significantly decreases. Fully unsaturated well perforations are dry holes which will no longer yield any water for productive use.

While it is acknowledged that marginally adverse impacts occur to uses when groundwater levels are lowered by any amount due to increased energy expense related to lifting water a greater distance, a complete no-impact is an infeasible standard.

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[1] 23 CCR §354.38. (e)(1)

[2] Based on well completion reports, most wells in the Santa Ynez River Valley Groundwater basin are constructed with designed well screens rather than using shaped charges to install perforations in existing casing. The term perforation is used in this memorandum to encompasses all portions of the well casing that is open to allow water to flow in from the aquifer or surrounding geologic units.

Placement of well perforation depth, and well design more broadly, is due to a number of factors. Including the location of aquifers, the water quality in a particular aquifer, assumptions about future water level fluctuations and decline rates, and cost of well construction. Pumping from particular aquifers may also fall under different regulatory programs, and drive placement of perorations in a particular aquifer.

CA Household Water Supply Shortage Reporting System

The State of California Department of Water Resources (DWR) has a reporting website (https://mydrywatersupply.water.ca.gov/) for individuals not served by a public water system experiencing problems with their water supply, i.e. Domestic water users. This has information compiled from 2013 through present (2021). During this time period there were no household water supply shortages reported for the Santa Ynez River Valley Groundwater Basin.

Methods

The Santa Ynez River Valley Groundwater Basin has varying natural topography and depth to water throughout the Central Management Area (CMA) of this analysis. To assess the impact of groundwater level decline, the perforation intervals were compared against historical reference groundwater level elevations. As shown in Figure 1, the three-dimensional location of the perforations was determined, relative to the reference water levels. Reference historical water levels were used as this allows a comparison across the entire basin which takes into account the varying topography.

The vertical distance that the groundwater level would have to decline, was then determined on a per well basis. Finally, this information was aggregated to help inform groundwater elevation targets are part of the monitoring network.

Source of Well Perforations and Well Locations

As described in Hydrogeologic Conceptual Model (Stetson, 2020), well logs were collected throughout the analysis area consisting of the Western and Central Management Areas of the Santa Ynez River Valley Groundwater basin for development of the 3D Geologic Model (GeoSyntec, 2020). Information from the logs, including the locations of any perforations, screens, or louvers (perforations) were compiled. As part of this effort, the three-dimensional location (latitude, longitude, and land surface elevation) of these wells was determined as best as possible, identifying the locations of these perforations in three-dimensional space. For this analysis, only wells with known perforation intervals were included. As part of developing this particular analysis an additional step included an additional review to ensure that all of the wells from GSA Committee Member Agencies (City of Buellton in the CMA) were explicitly included. **Figure 2** is a map showing the location and distribution of wells that met these criteria.

Land surface elevations for this analysis were (re)sampled from the USGS 1-meter digital elevation model (DEM) based on the latitude and longitude coordinates.

The well list was further refined to wells that are part of the "Buellton Aquifer." This means all wells in the Buellton Upland[3], and in the "Santa Ynez River Alluvium" with the perforations below the top of the Careaga or Paso Robles as determined by sampling from the 3D Geologic Model. Wells that were outside of the CMA boundary were excluded.

In addition, the primary use of each well as Agricultural, Municipal, or Domestic was estimated. Wells where this could not be determined, or has multiple primary uses, were lumped into the "other" category. **Table 1** lists the count of each well type resulting from this analysis.

Table 1. Count of Wells in the Central Management Agency (CMA) by water use category from the dataset used in this analysis. Locations of wells are shown in Figure 2.

Well Use	Buellton Aquifer	SYR Aquifer	CMA Total
Agriculture	32	13	46
Municipal	3	3	6
Domestic	70	17	87
Other	32	16	47
Total	137	49	186

[3] In the 2020 Draft CMA HCM, the Buellton Upland was divided into an Upper Aquifer (relatively perched area for the wells in the alluvium and Orcutt), and Lower Aquifer (Careaga and Paso Robles), which was based on scattered historical water levels (such as well completion reports) that indicated some perched conditions.

These counts are slightly higher than what the Santa Ynez River Water Conservation District (SYRWCD) well registry (Stetson, 2021), which had 108 wells registered in 2020, and 111 in 2021 in the comparable Zone D.

Status of wells as being actively used or inactively used has not been compiled at this time, and doing so on short notice would be relatively costly. Collecting and compiling this status information is identified as a potential follow-up recommendation for future studies.

REFERENCE SPRING 2019 GROUNDWATER ELEVATION DATA SOURCE

As of writing (May 2021) the most recent groundwater high contours are for Spring 2019 which were developed as part of the Groundwater Conditions reports for the Central Management Area (Stetson, 2021a). As described in that report these contours were based on groundwater elevations collected by the County of Santa Barbara, the United States Bureau of Reclamation, as well as the GSA committee agencies. Contours were interpolated from these measurements taking into account topography, and other historical measurements in the area. Groundwater surface elevations were interpolated from the shown contours, and estimated for the wells with known perforations.

As shown in the Groundwater Conditions report, for the CMA there are portions of the Buellton Uplands where spring 2020 water level measurements collected were not sufficient to reliably estimate the groundwater level elevations to develop reliable contours. For this analysis, the elevations were interpolated into these areas, however this is an area of increased uncertainty in this analysis.

RESULTS

Several figures were produced from this analysis:

Figure 3 shows the depth from 2020 spring water levels to the top of well perforations for all of the wells in the analysis. This is likely where well performance is expected to significantly decline. In addition to the total wells, the count of wells for each category are shown (percentage is based on total number wells). Wells are binned into 1-foot increments.

Figure 4 shows the same data as Figure 3, but focuses in on the top 100 feet.

Figure 5 shows depth from 2020 spring water levels to the top of well perforations by well water use type. Percentages shown here are based on the particular category of well, rather than relatively to all of the wells. Count of each well is included with each. Wells are binned into 5-foot increments, and the top 50 feet is shown. This is similar to the Eastern Management Area (EMA) team presentation of a similar analysis.

Figure 6 shows depth from 2020 spring water levels to the top of well perforations and depth to the base of the well perforations for all wells. When water levels drop below the base of well perforations the well is entirely dry. Wells are binned into 1-foot increments, and the top 100 feet is shown.

Figure 7 is the same as Figure 6, but only for the 32 agricultural wells.

Figure 8 is the same as Figure 4, but only for the 3 municipal wells.

Figure 9 is the same as Figure 4, but only for the 70 domestic wells.

Figure 10 is the same as Figure 4, but only for the 32 other wells. These are wells where the use was unclear. This could include singular intended use not recorded on well log, used for observation only, or other purpose such as cathodic protection.

Initial Discussion

One finding of this analysis is that current, spring 2020 groundwater levels show some impact to existing wells. Partially this could be explained that the well logs are for all wells that have some well log that were drilled over all time, and so the current status of a particular well is unclear. Wells may have been destroyed or otherwise rendered inactive.

An earlier analysis looked at Active and Inactive wells registered to the SYRWCD in Zone D. This found that over the recent period (2005-2021), 12% to 15.5% of all of the registered wells were listed as inactive. While the SYRWCD well registry is for a significantly smaller number of wells (111 in 2021), these two results may help explain each-other.

Future Recommendations

Recommendation is that as part of future work is that the GSP reach out to the Santa Ynez River Water Conservation District (SYRWCD) which has regulatory power within the WMA and CMA regarding well pumping, and maintains a well registry. Recommendations to improve future versions of this analysis:

1. New wells drilled or otherwise entered into the well registry should provide the SYRWCD GPS coordinate locations of their locations to an accuracy of within 20 feet.

2. New wells drilled or otherwise entered into the well registry should provide the SYRWCD information about their construction including the depths of the well perforations, and total borehole depths.

3. The SYRWCD to adopt a plan to collect this information from current well registry participants with a goal to have all of this data collected over a 10-year period for all production wells within the WMA and CMA.

4. Improved groundwater level coverage of the area for improved water level contours.

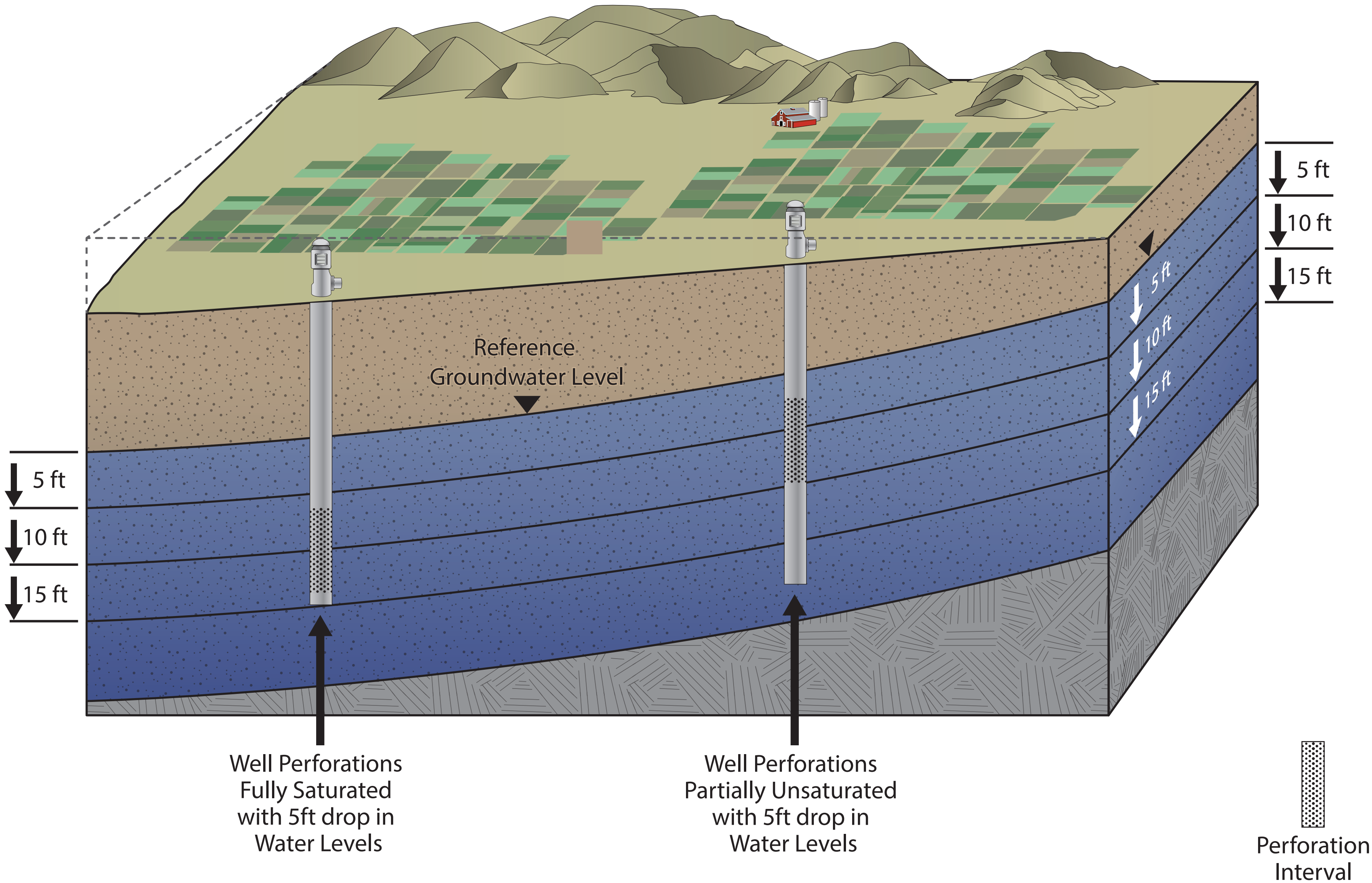
REFERENCES

Geosyntec (2020) DRAFT Regional Geology and 3D Geologic Model for the Santa Ynez River Valley Groundwater Basin. Santa Ynez Sustainable Groundwater Management Act Draft Documents.

Stetson (2021a) DRAFT Central Management Area Groundwater Conditions.

Stetson (2021b) Forty-Third Annual Engineering and Survey Report On Water Supply Conditions Of The Santa Ynez River Water Conservation District 2020-2021.

Stetson (2020) DRAFT Central Management Area Hydrogeologic Conceptual Model~~.~~..



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Analysis of Groundwater Level Decline
Effects on Wells

FIGURE 1

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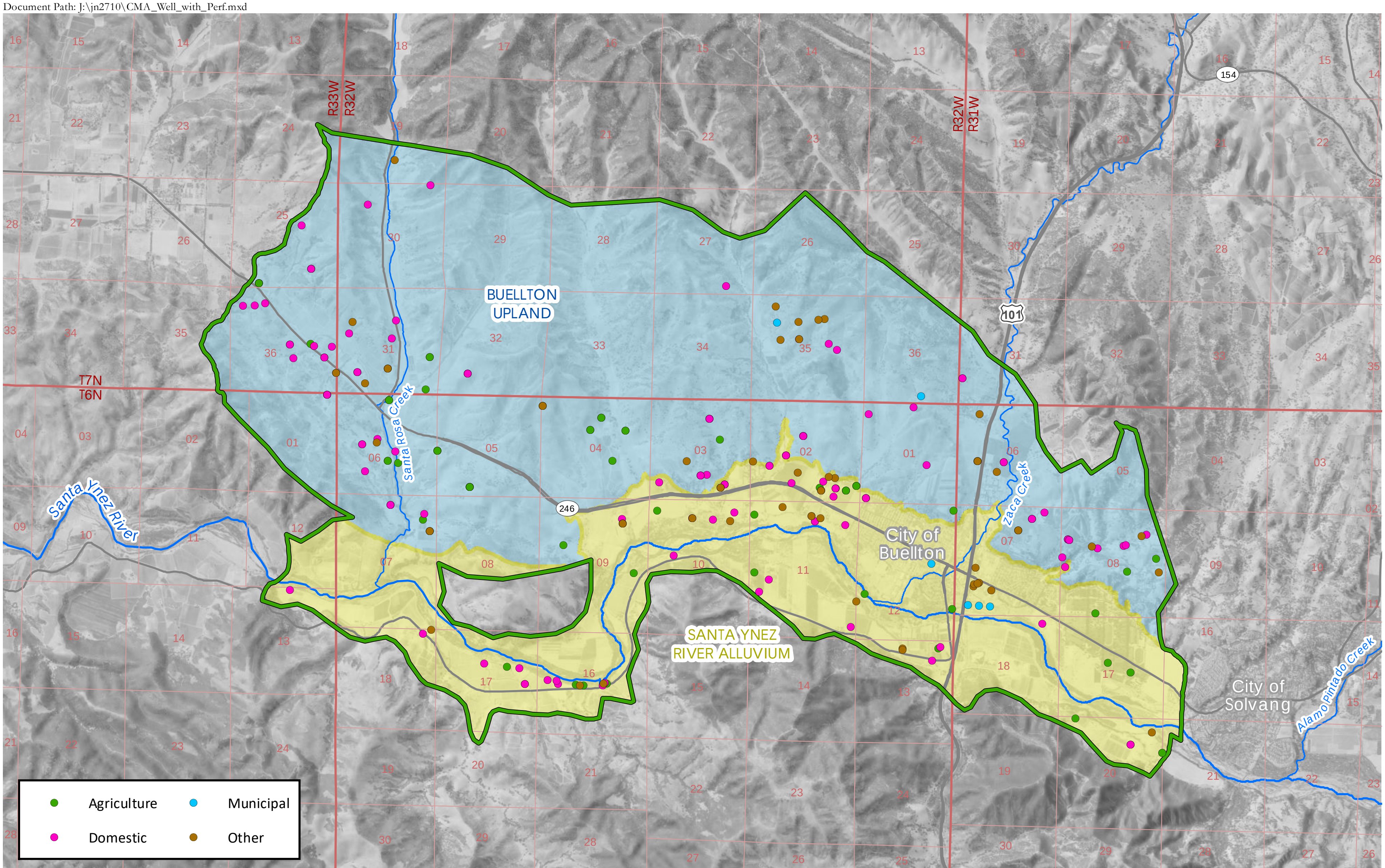

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CMA

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Central Management Area
Groundwater Sustainability Agency

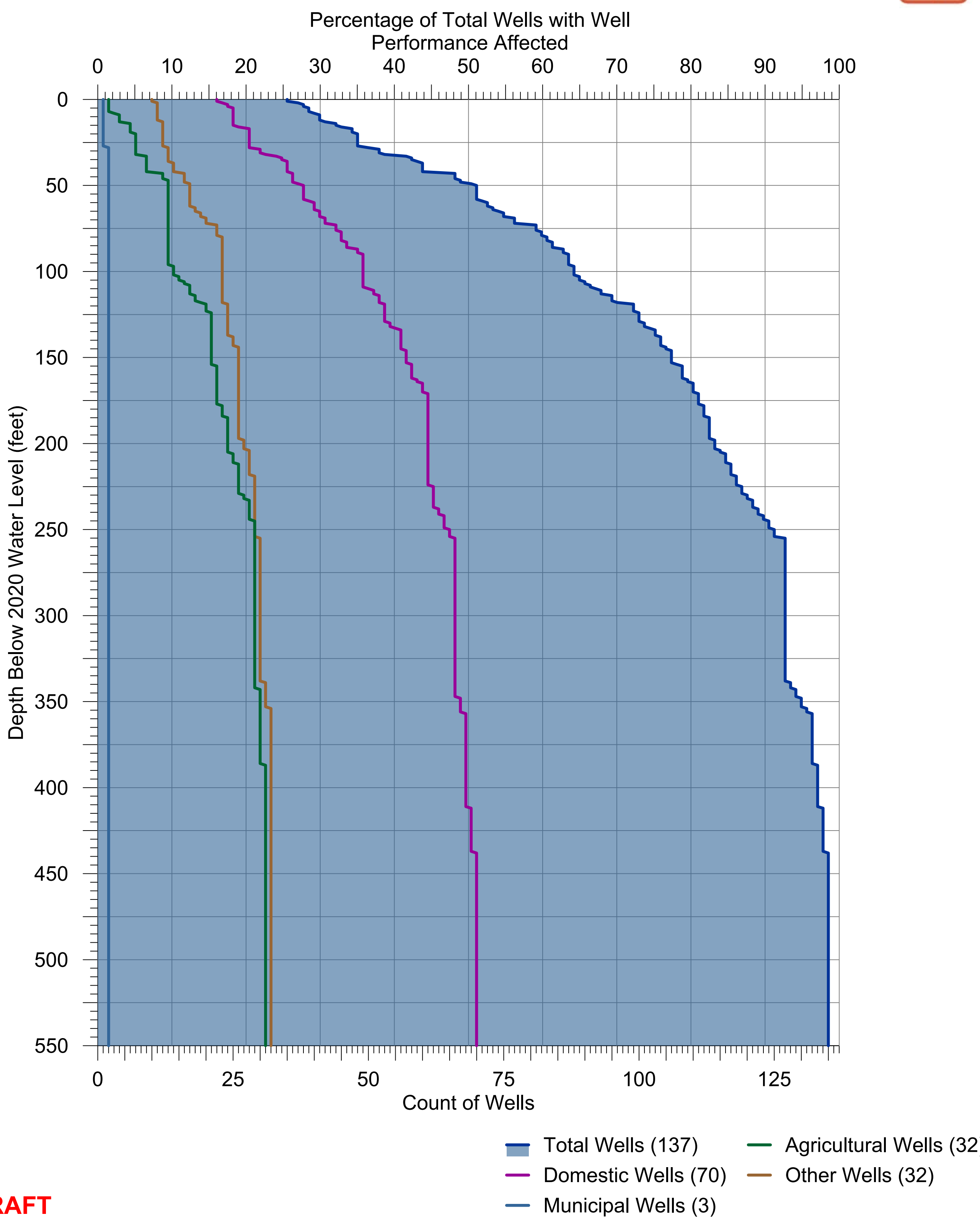
Groundwater Level Decline
Perforation Analysis Well Locations

0 0.5 1 Miles

N

FIGURE 2

FIGURE 3



Other = Well use not recorded on well log or used for observation/ cathodic protection only.

DRAFT
5/18/2021

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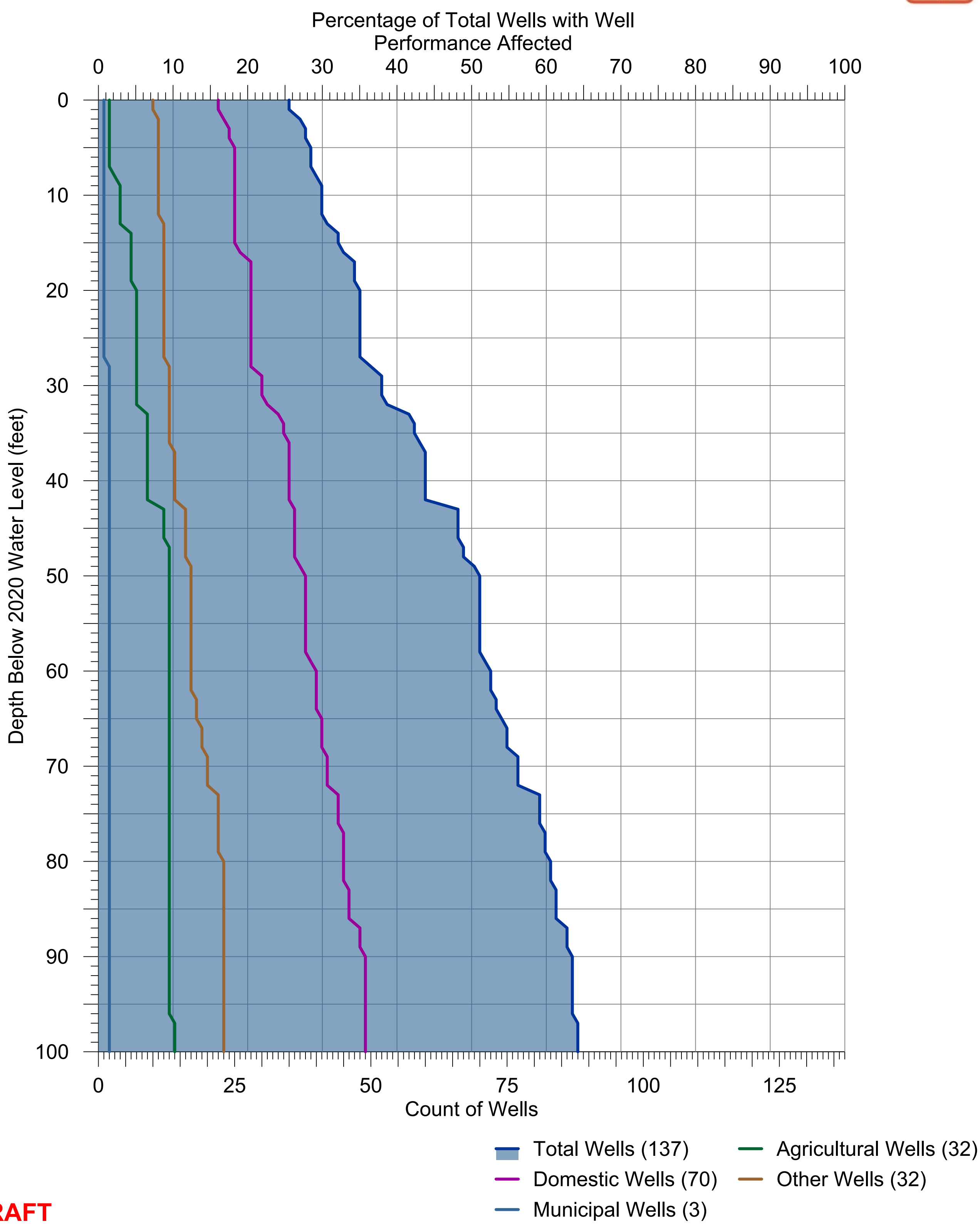
WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH



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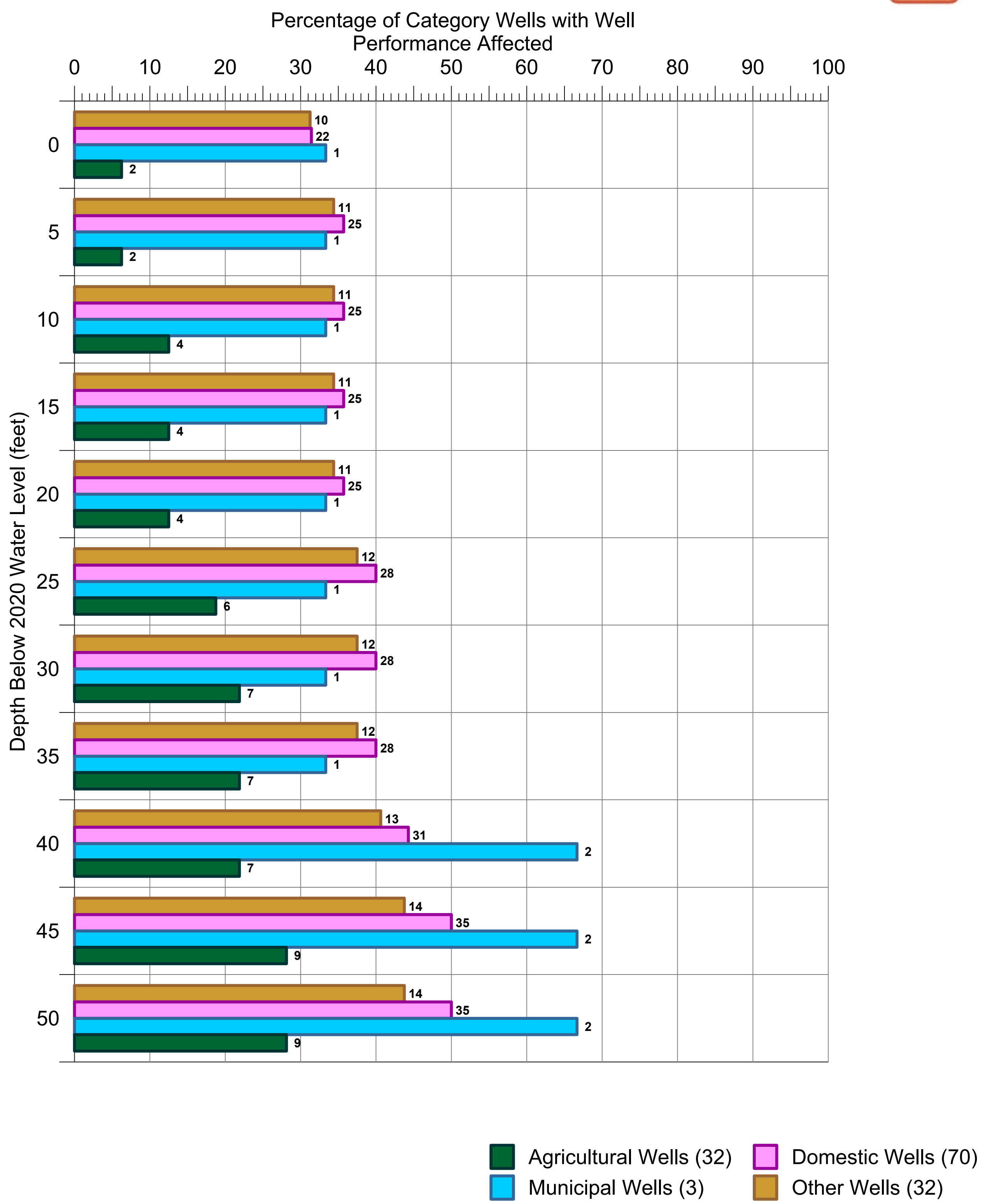
WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)



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Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

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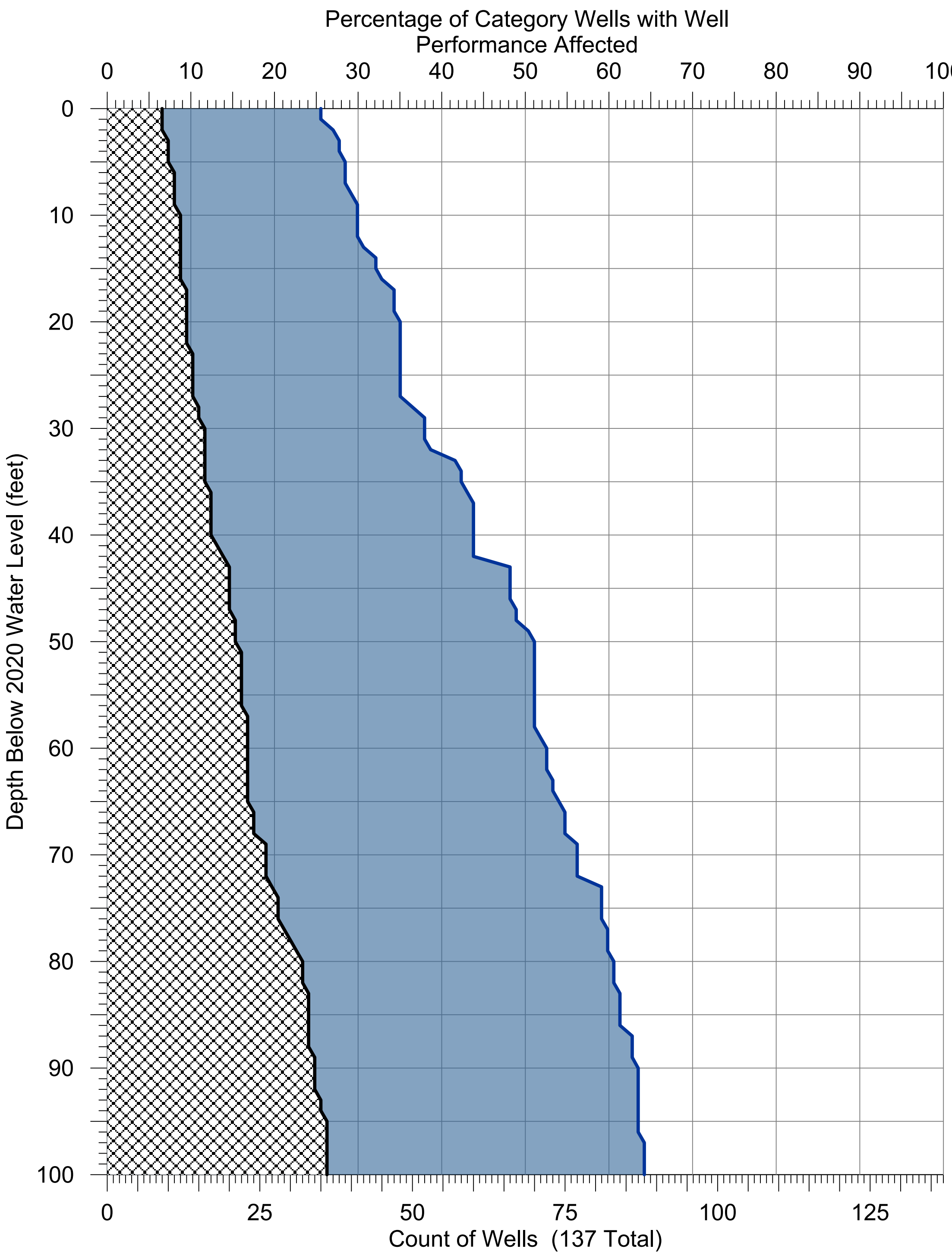
FIGURE 6



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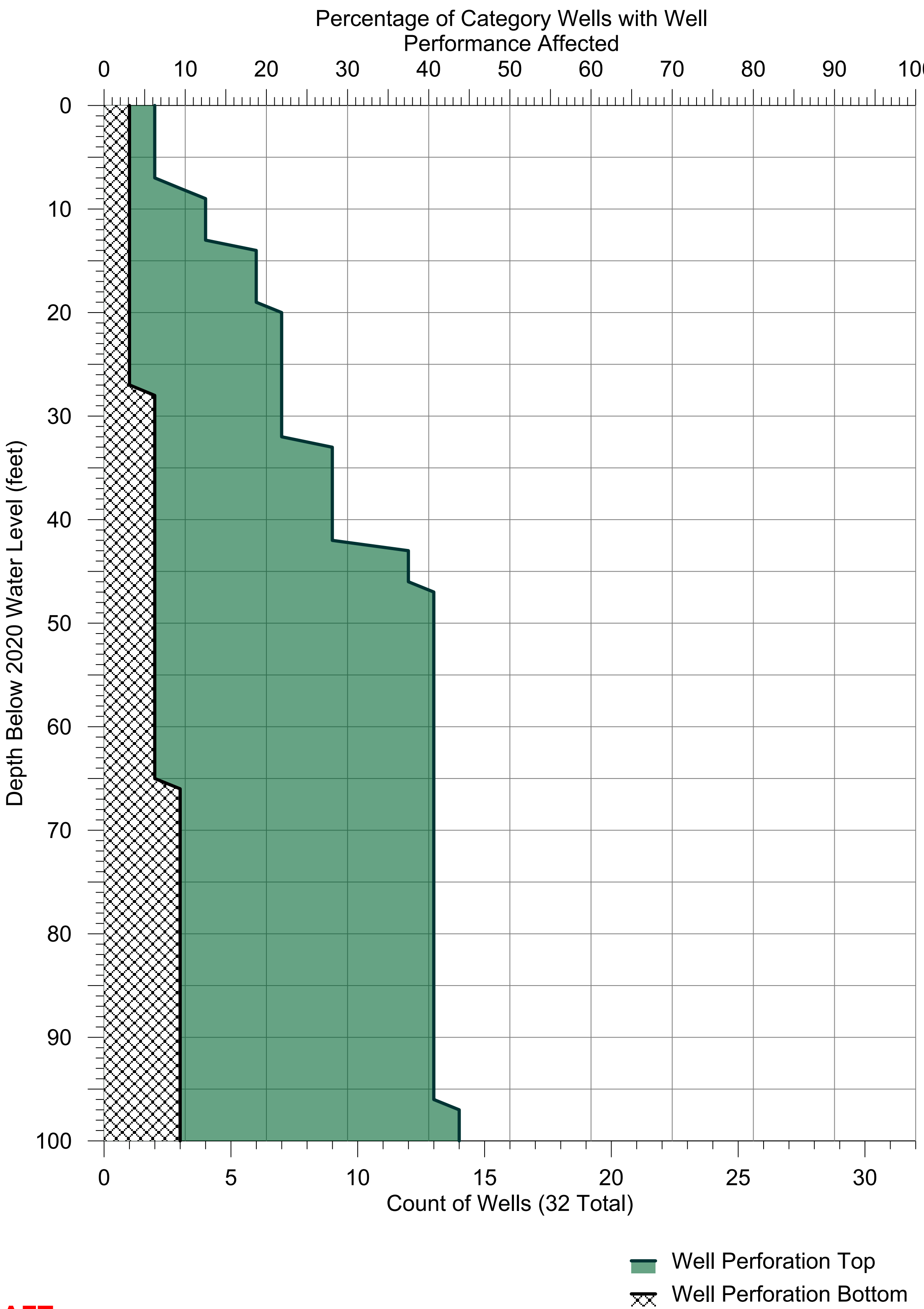
ALL WELLS
WELL PERFORATIONS RELATIVE TO
BUELLTON AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

FIGURE 7



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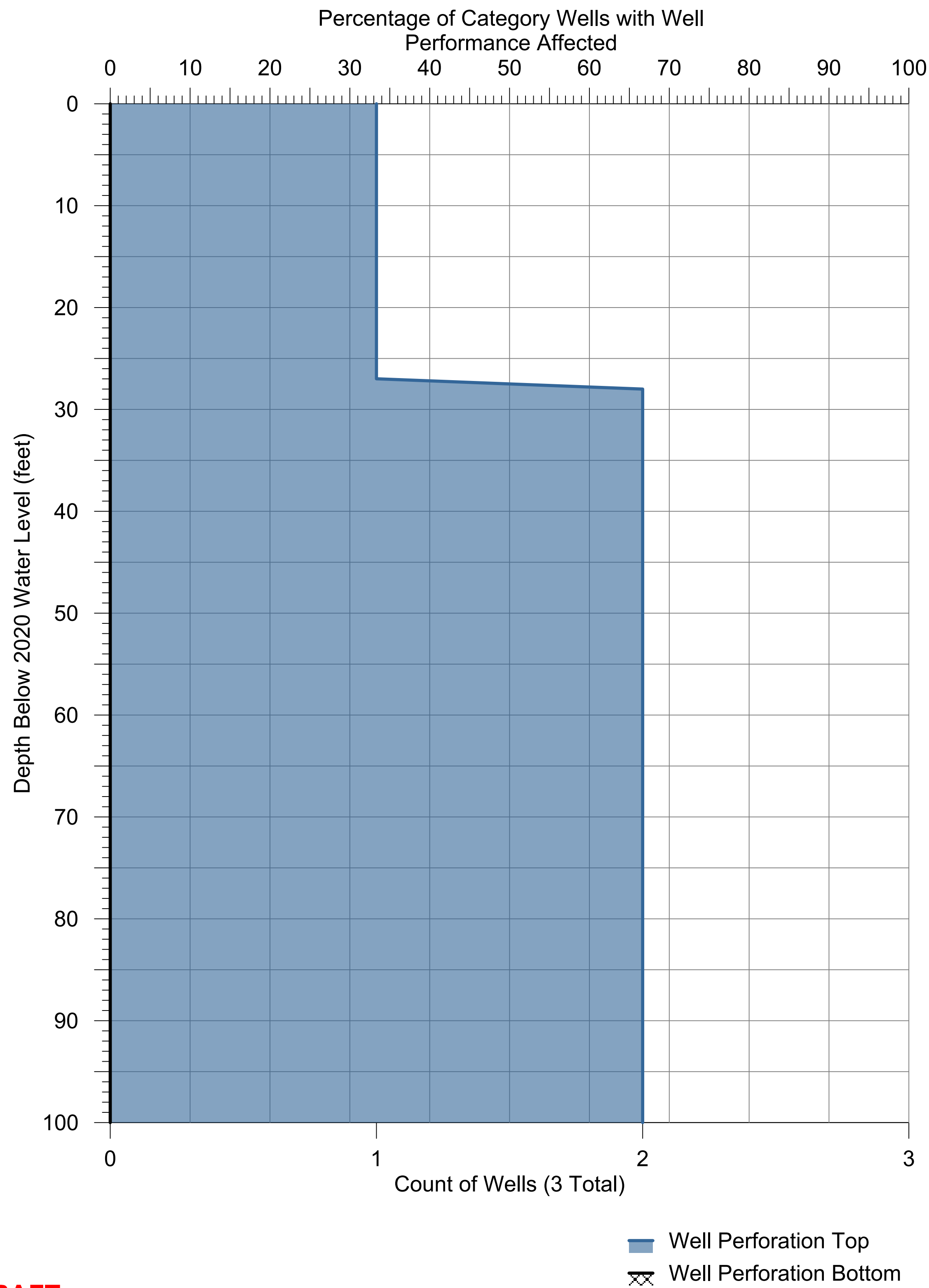
AGRICULTURE WELLS
WELL PERFORATIONS RELATIVE TO
BUELLTON AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

FIGURE 8



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MUNICIPAL WELLS
WELL PERFORATIONS RELATIVE TO
BUELLTON AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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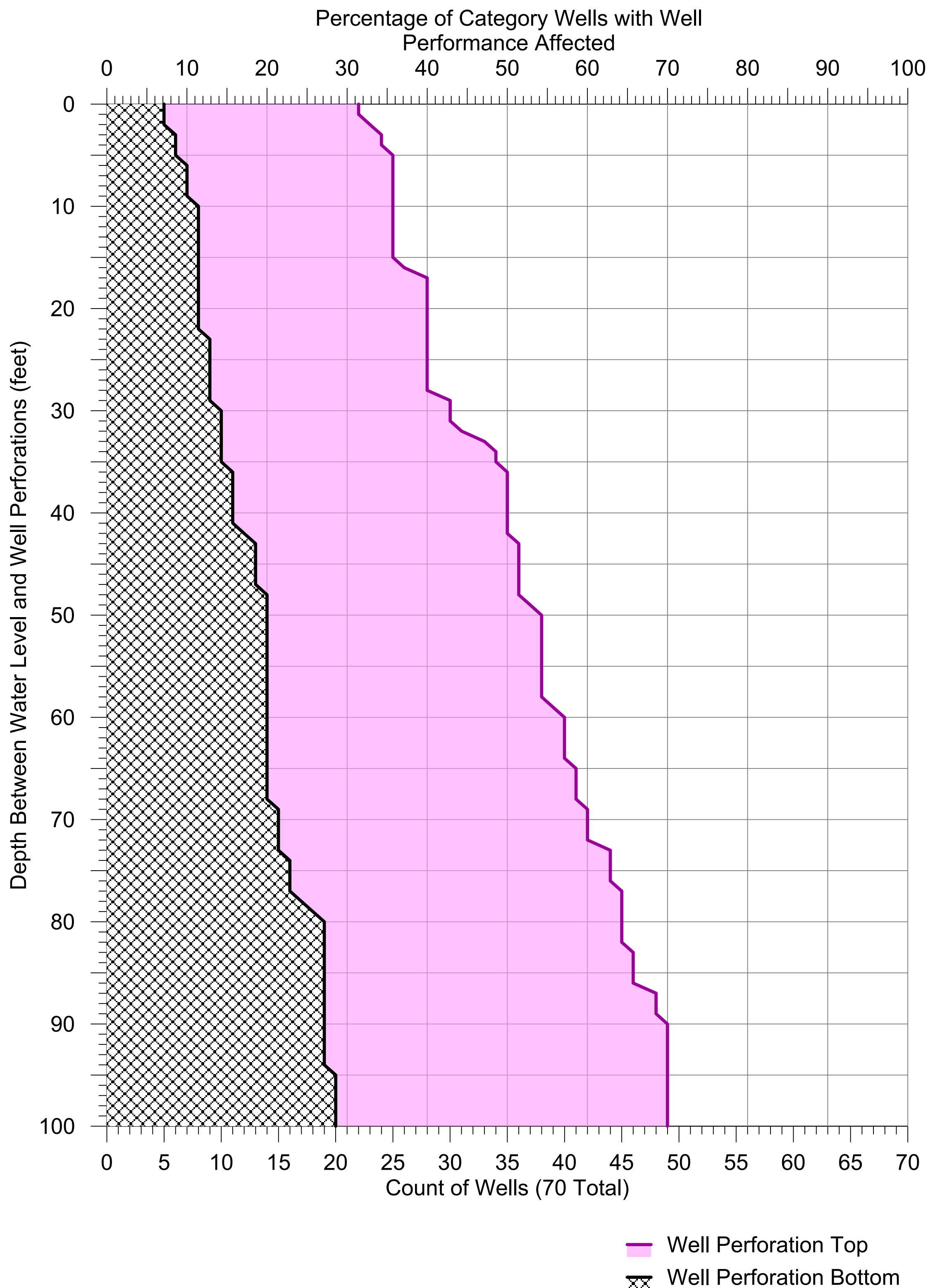
FIGURE 9



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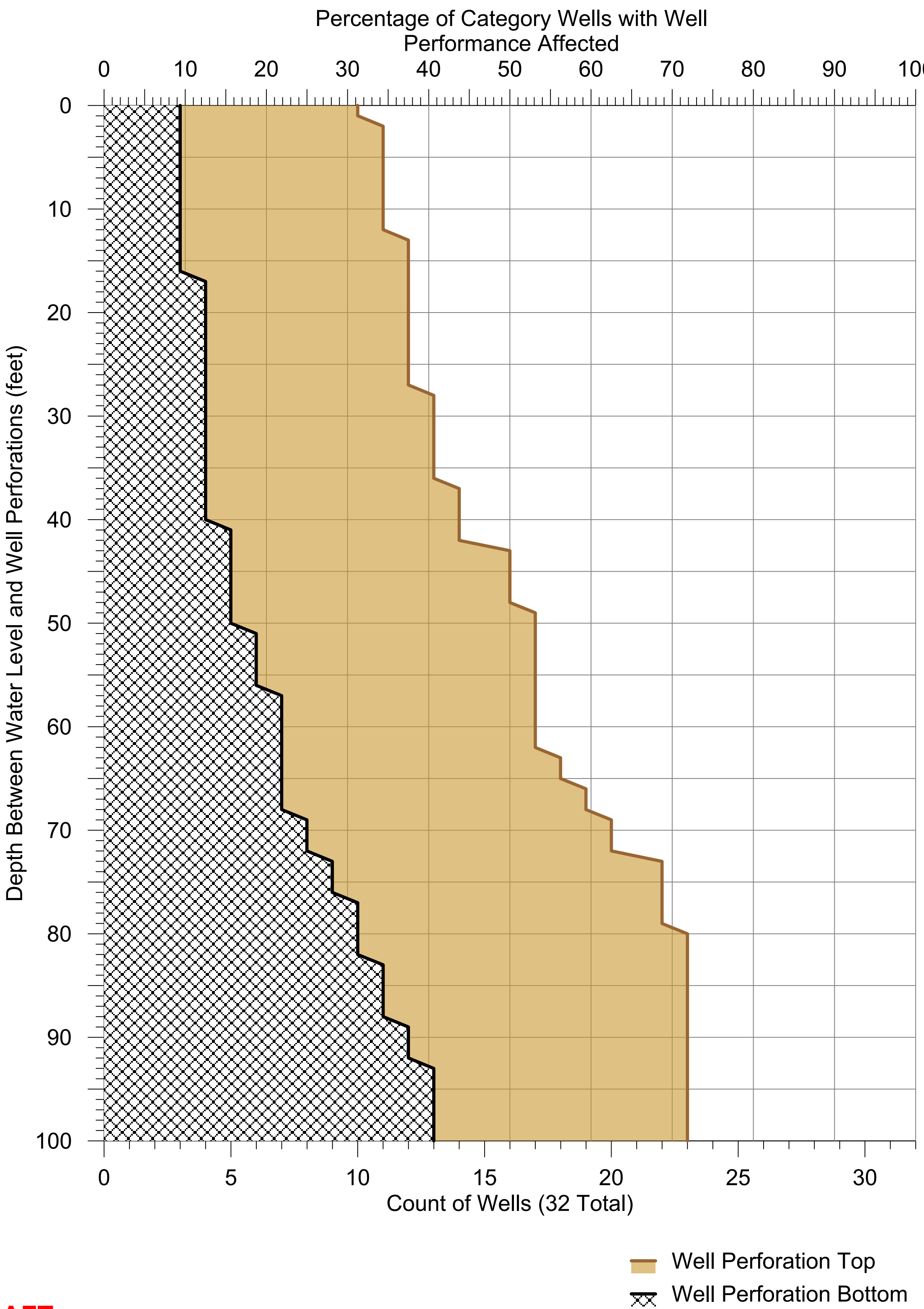
DOMESTIC WELLS
WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)



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Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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OTHER WELLS / UNKNOWN TYPE WELL PERFORATIONS RELATIVE TO BUELLTON AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-C:

Time Series Graphs for Assessing Degraded Groundwater Quality, Central Management Area

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APPENDIX 3B-C: TIME SERIES GRAPHS FOR ASSESSING DEGRADED GROUNDWATER QUALITY

This appendix includes concentration time series graphs of groundwater quality for the representative wells in the monitoring network for degraded water quality as well as the established sustainable management criteria of the measurable objective, early warning, and minimum threshold. Organization is first by constituent, then by subarea, and then west to east within each subarea. The following constituents are included in this appendix:

- Salinity as Total Dissolved Solids (TDS)
- Chloride (Cl)
- Sulfate (SO_4)
- Sodium (Na)
- Nitrate as Nitrogen (NO_3 as N) with logarithmic scale

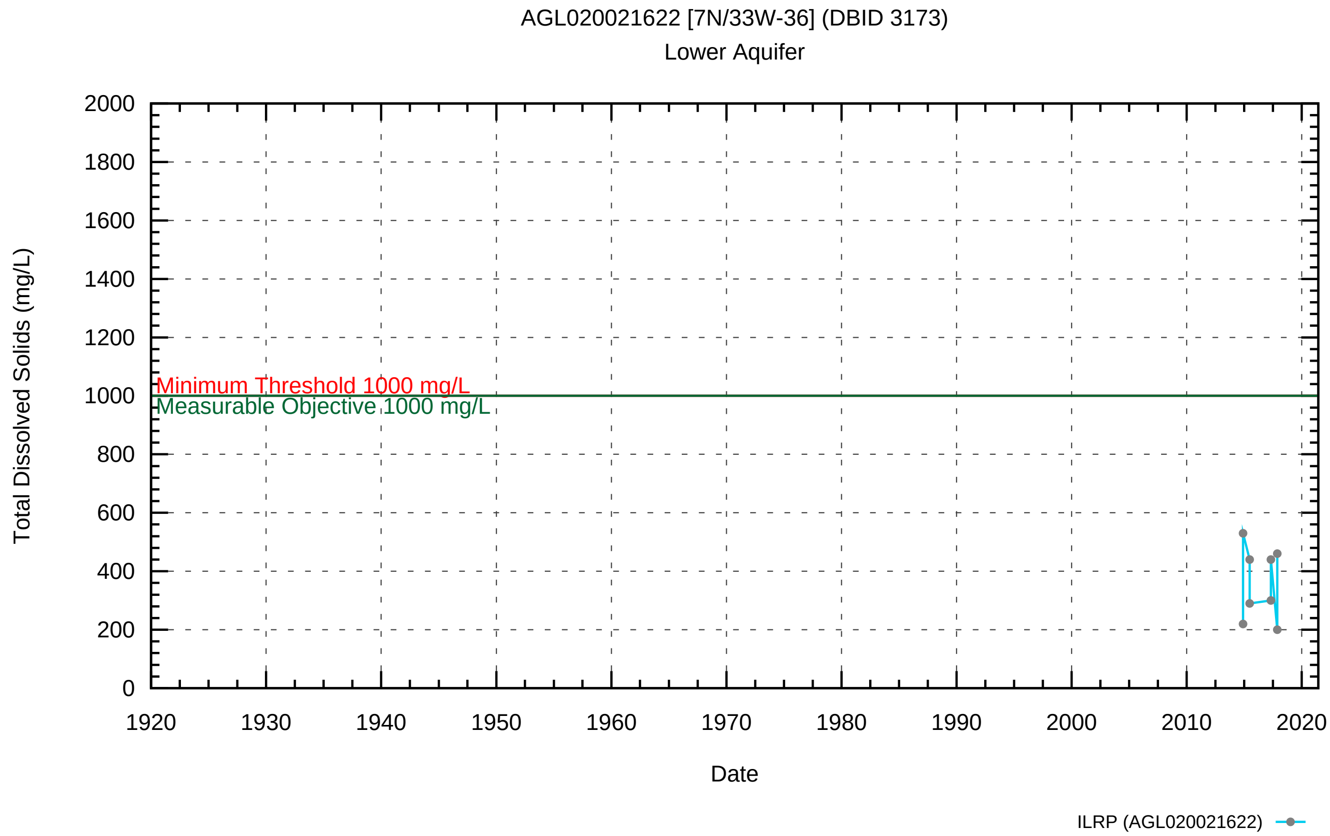
Null values are not plotted. Particular wells may not have historical measuments for all constituents.

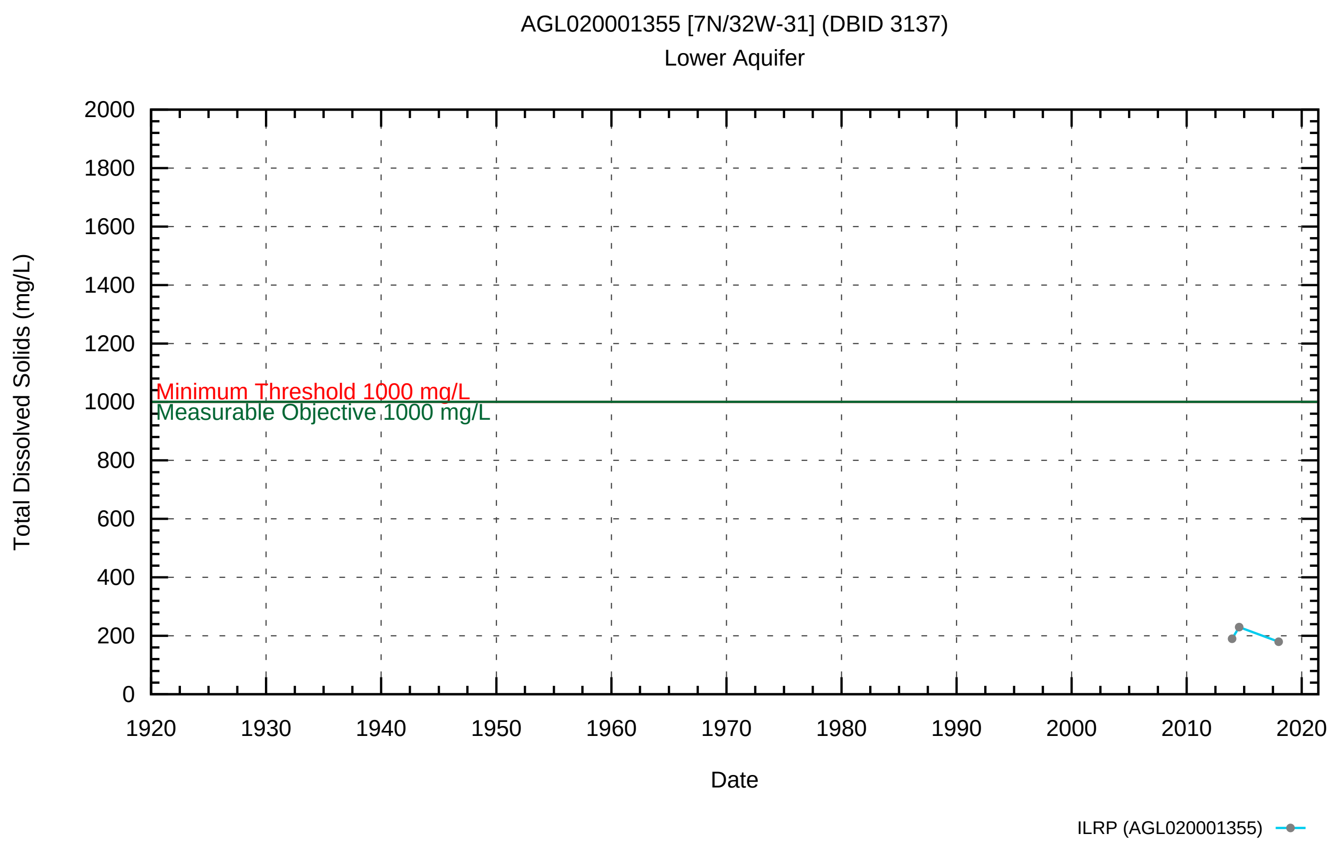
For Nitrate a logarithmic scale is used. Reporting source of value is shown. Values of Nitrate as Nitrate were converted to their Nitrogen composition. Values of Nitrate and Nitrite as Nitrogen (NO_3+NO_2 as N) are also included on graphs.

LIST OF ACRONYMS AND ABBREVIATIONS

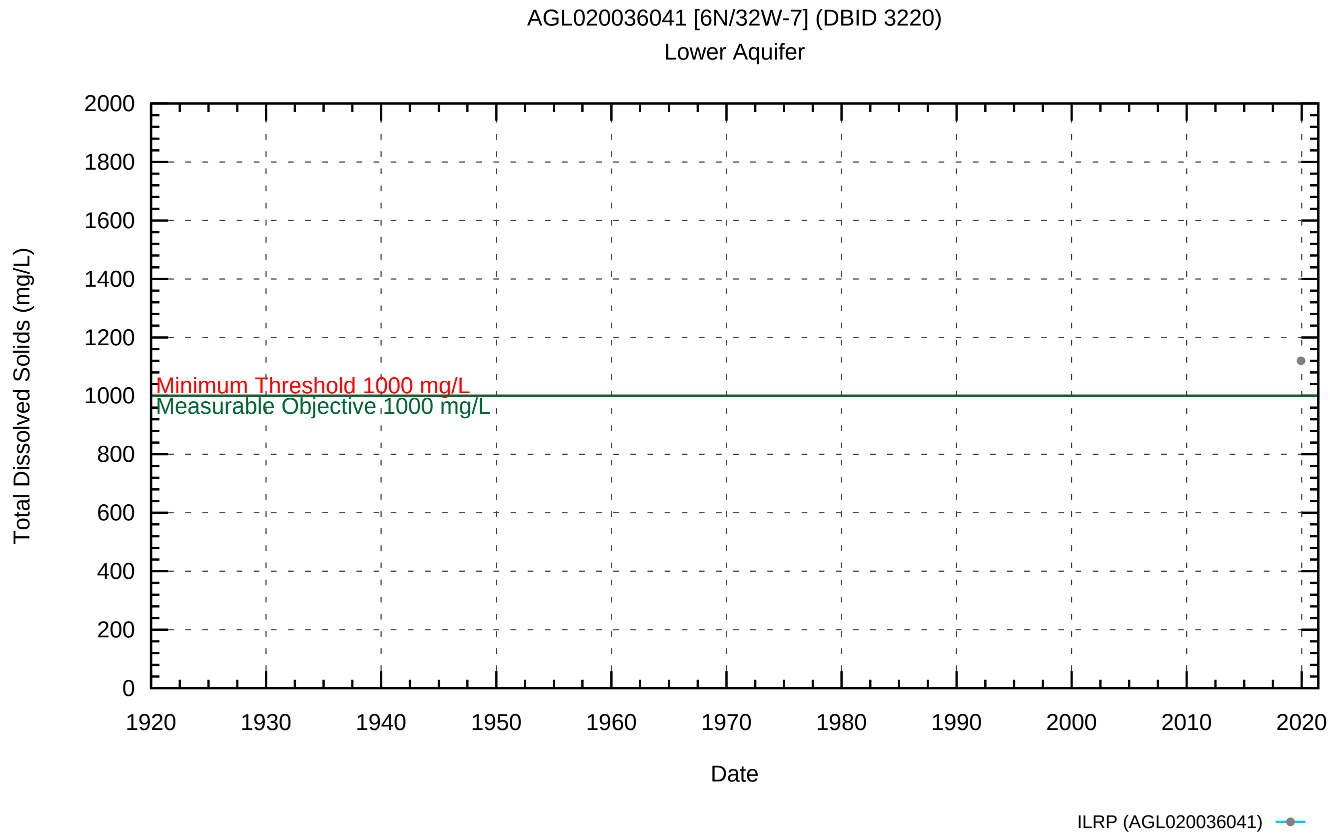
BGS	below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
CMA	Central Management Area
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level

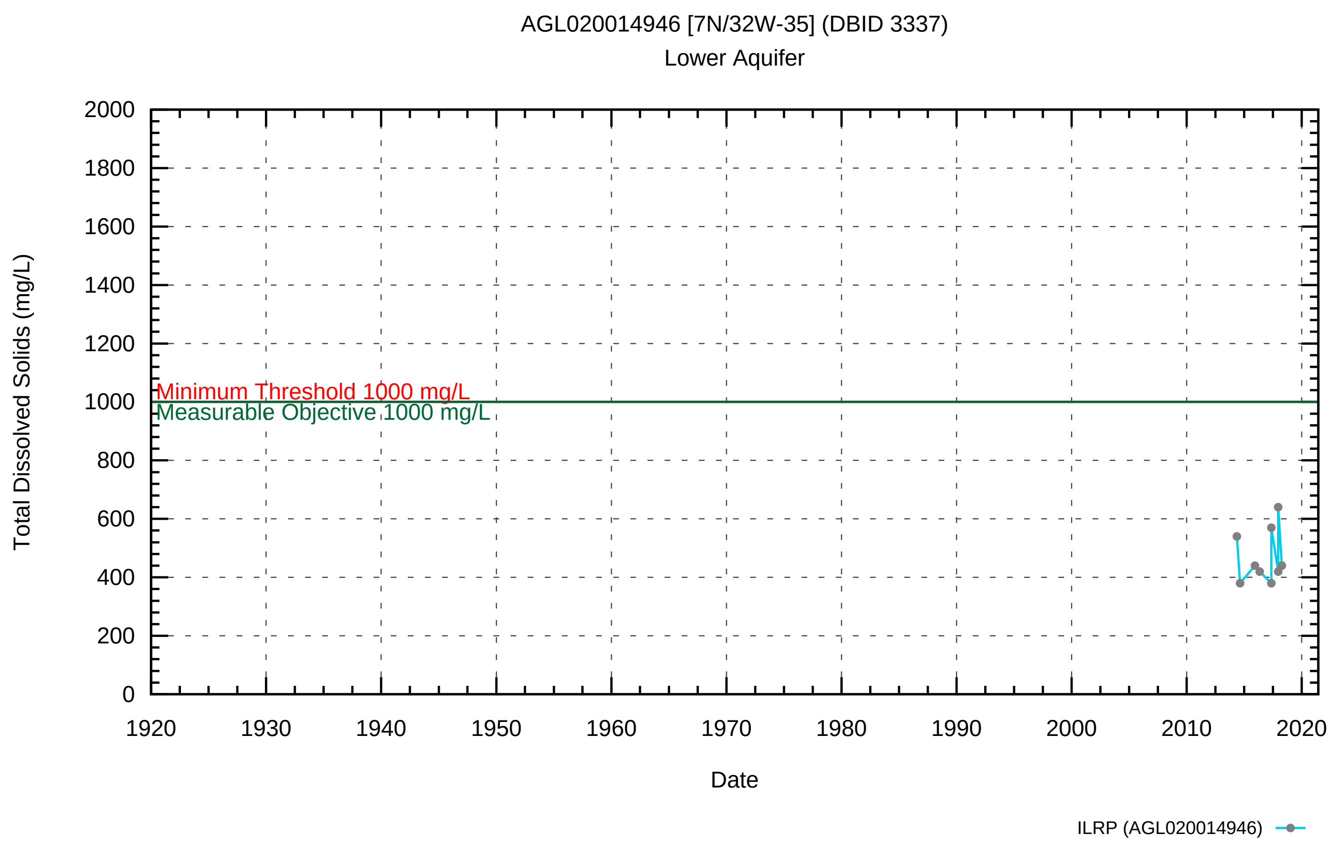
CMA: Buellton Uplands - Total Dissolved Solids



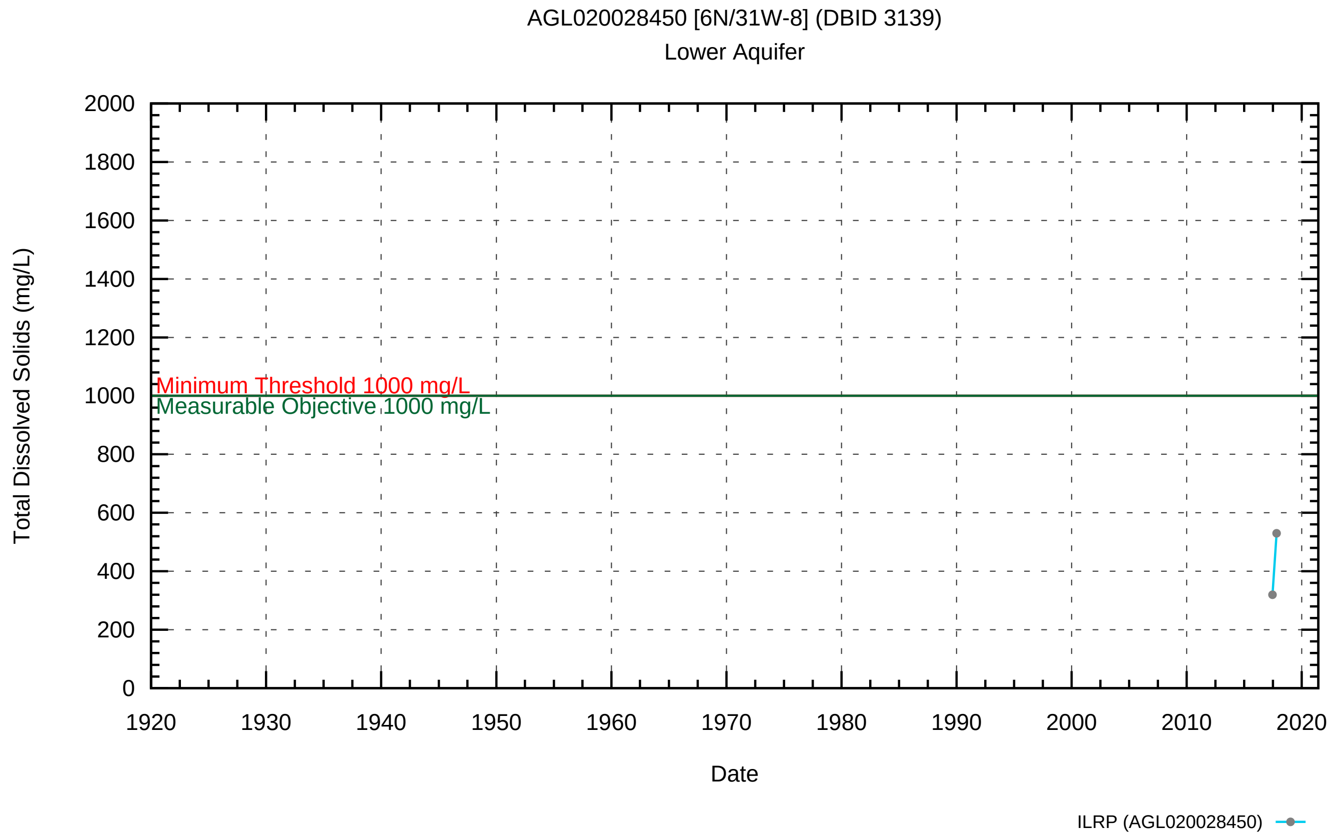


CMA: Buellton Uplands - Total Dissolved Solids

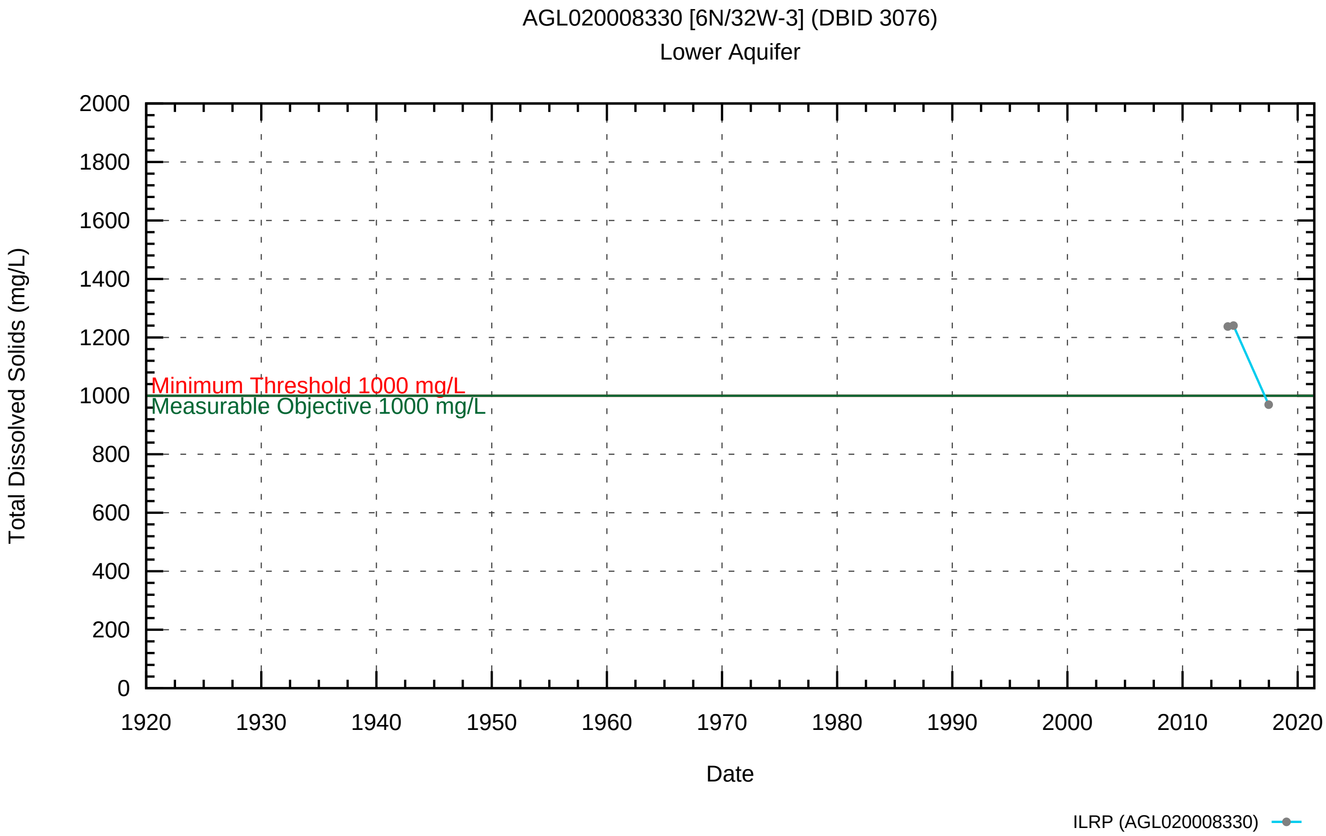


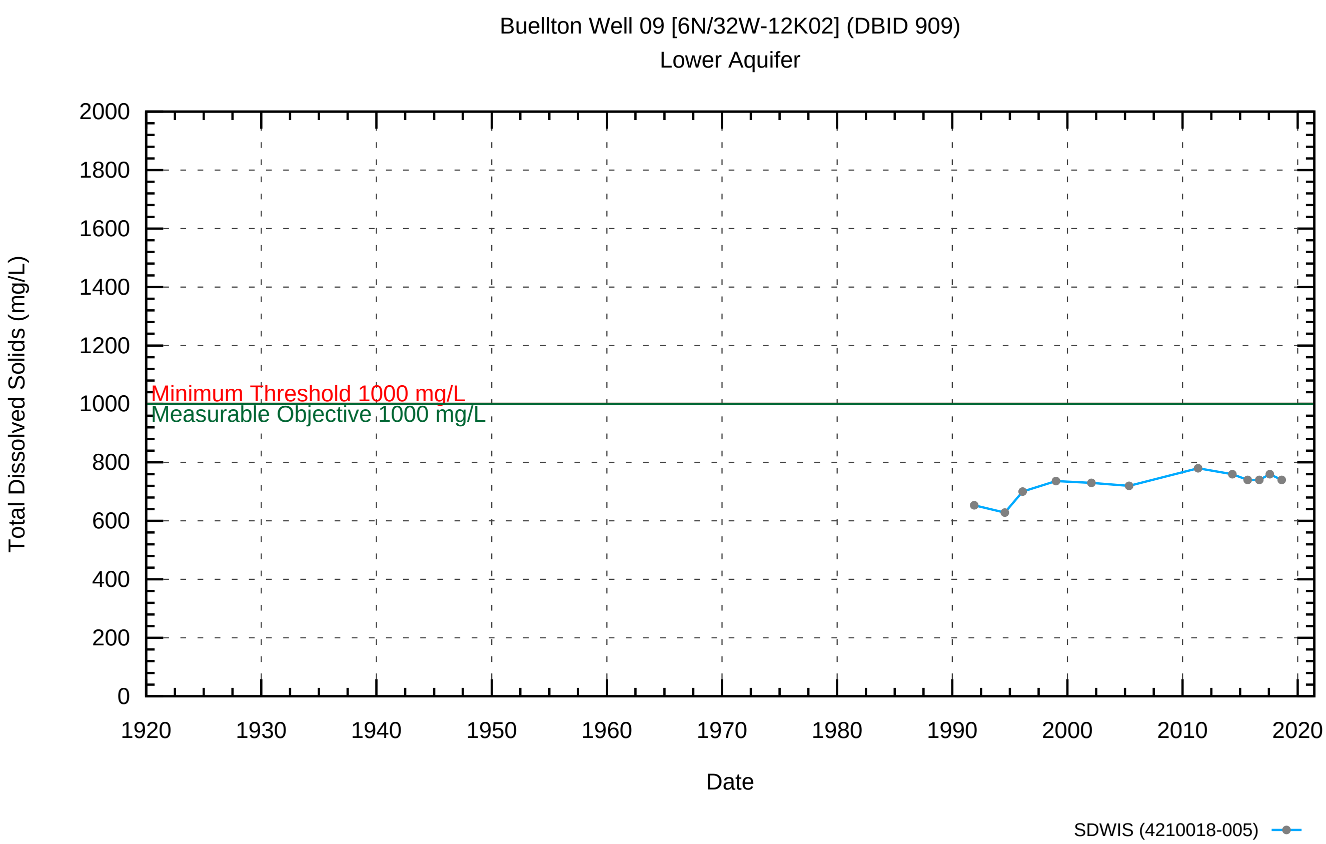


CMA: Buellton Uplands - Total Dissolved Solids



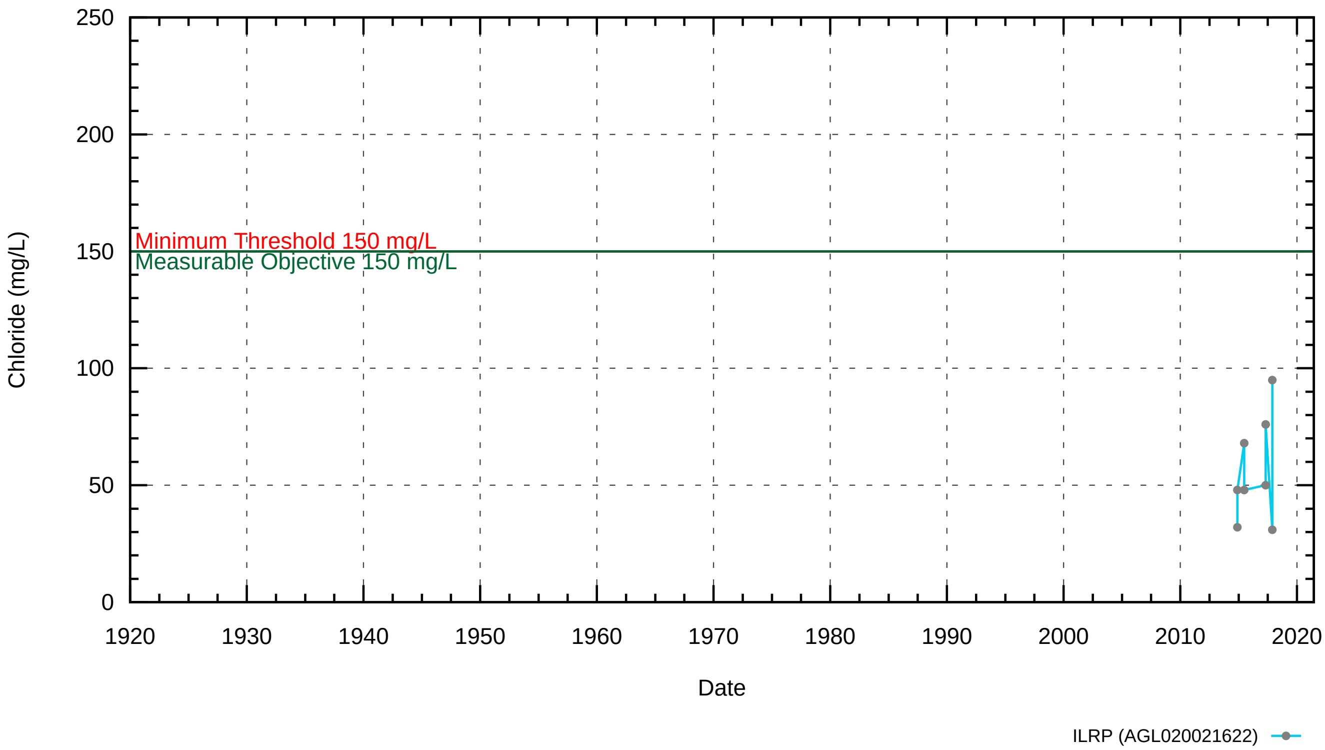
CMA: Santa Ynez River - Total Dissolved Solids



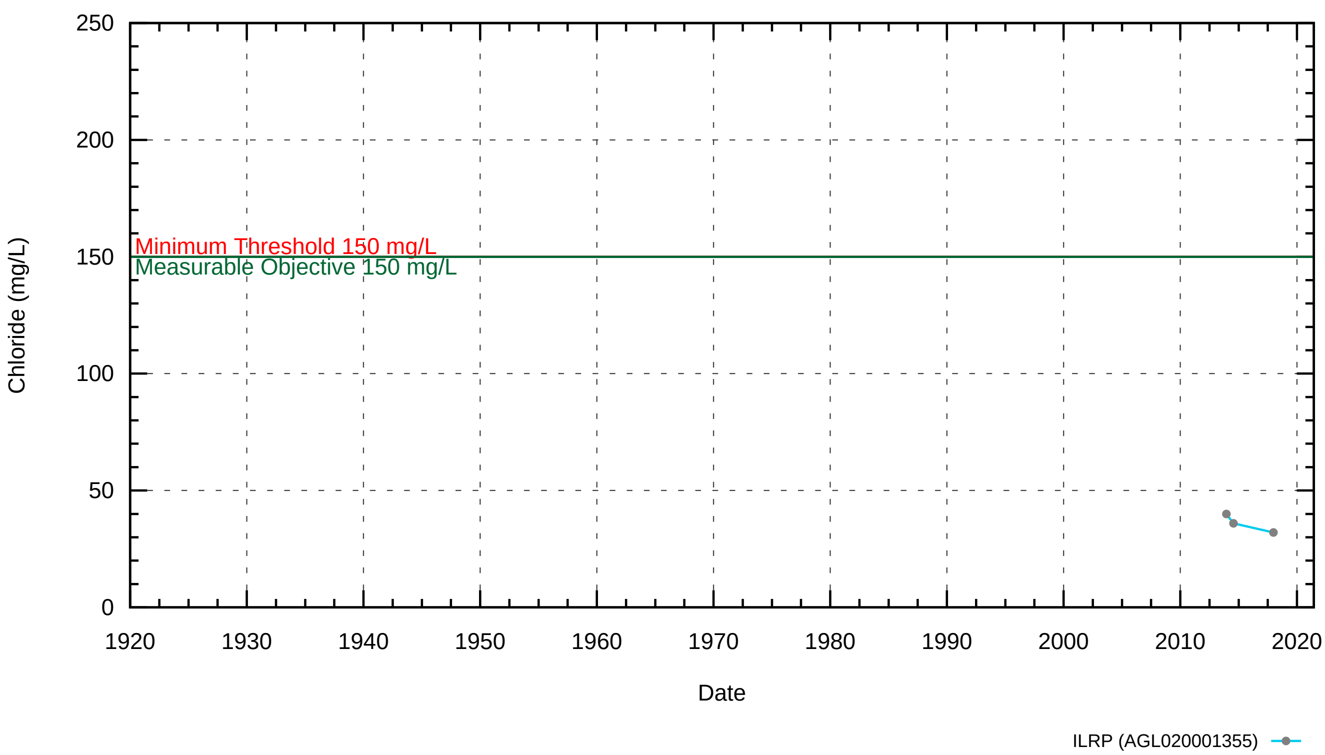


CMA: Buellton Uplands - Chloride

AGL020021622 [7N/33W-36] (DBID 3173)
Lower Aquifer

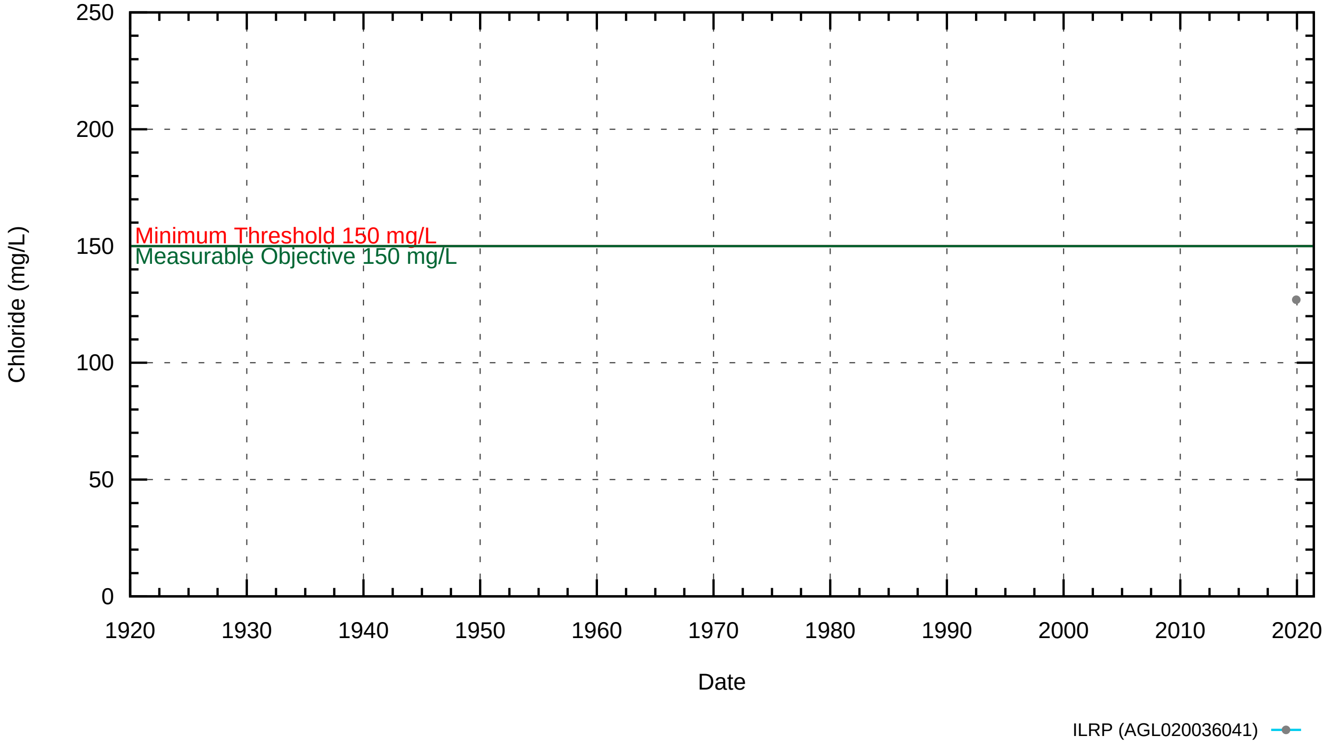


AGL020001355 [7N/32W-31] (DBID 3137)
Lower Aquifer

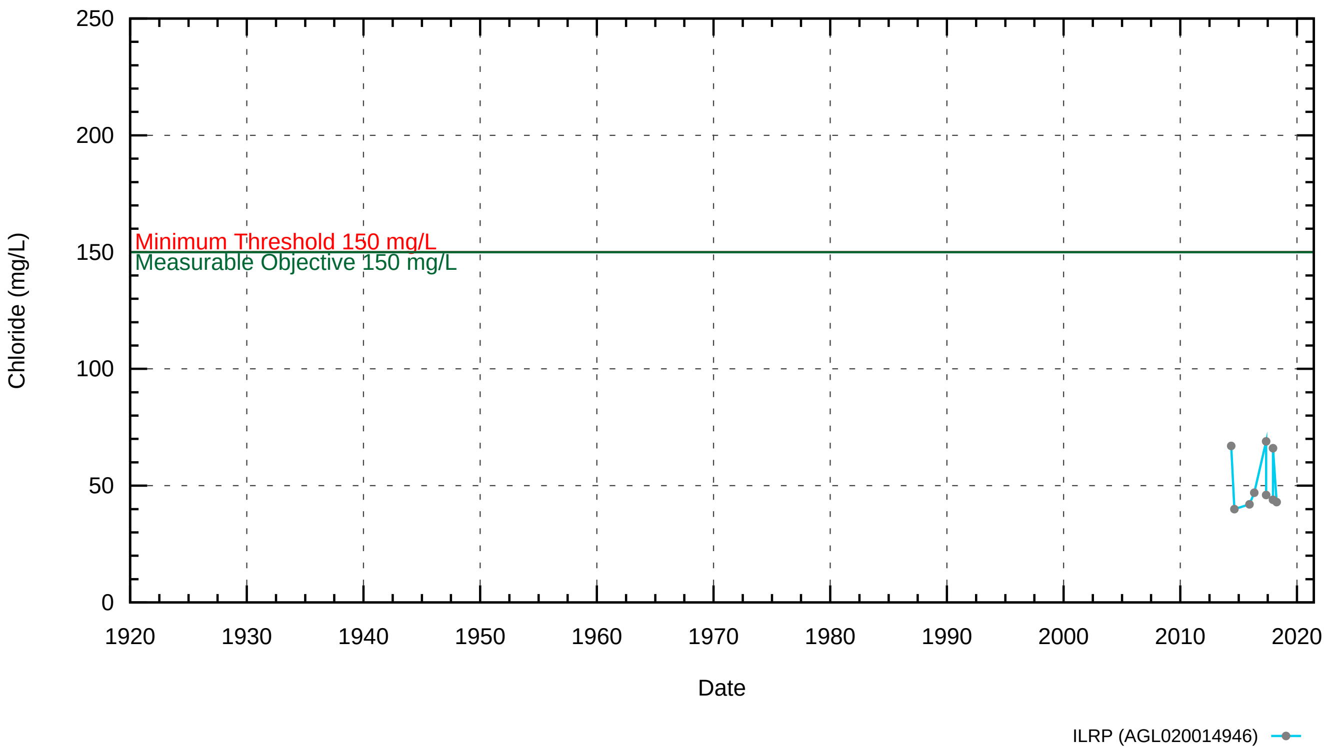


CMA: Buellton Uplands - Chloride

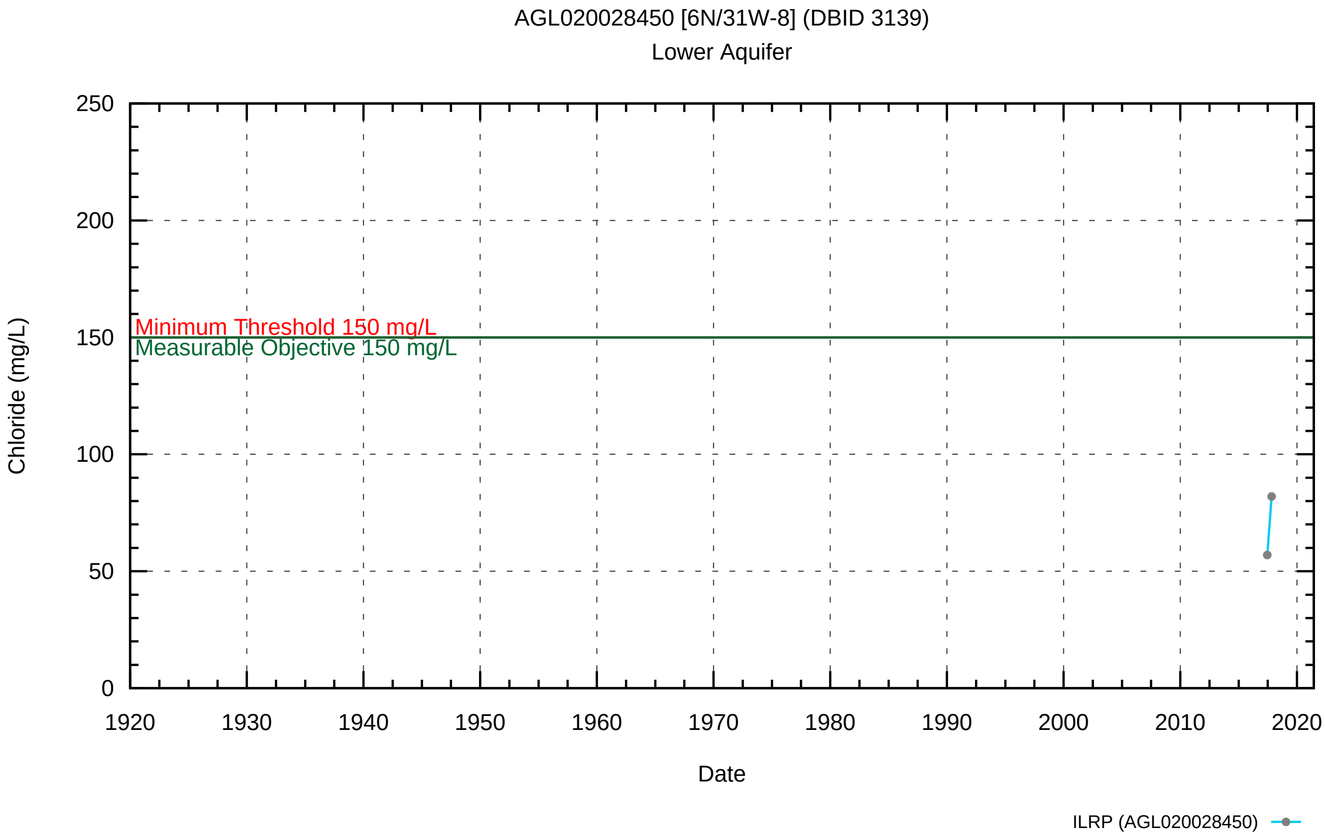
AGL020036041 [6N/32W-7] (DBID 3220)
Lower Aquifer



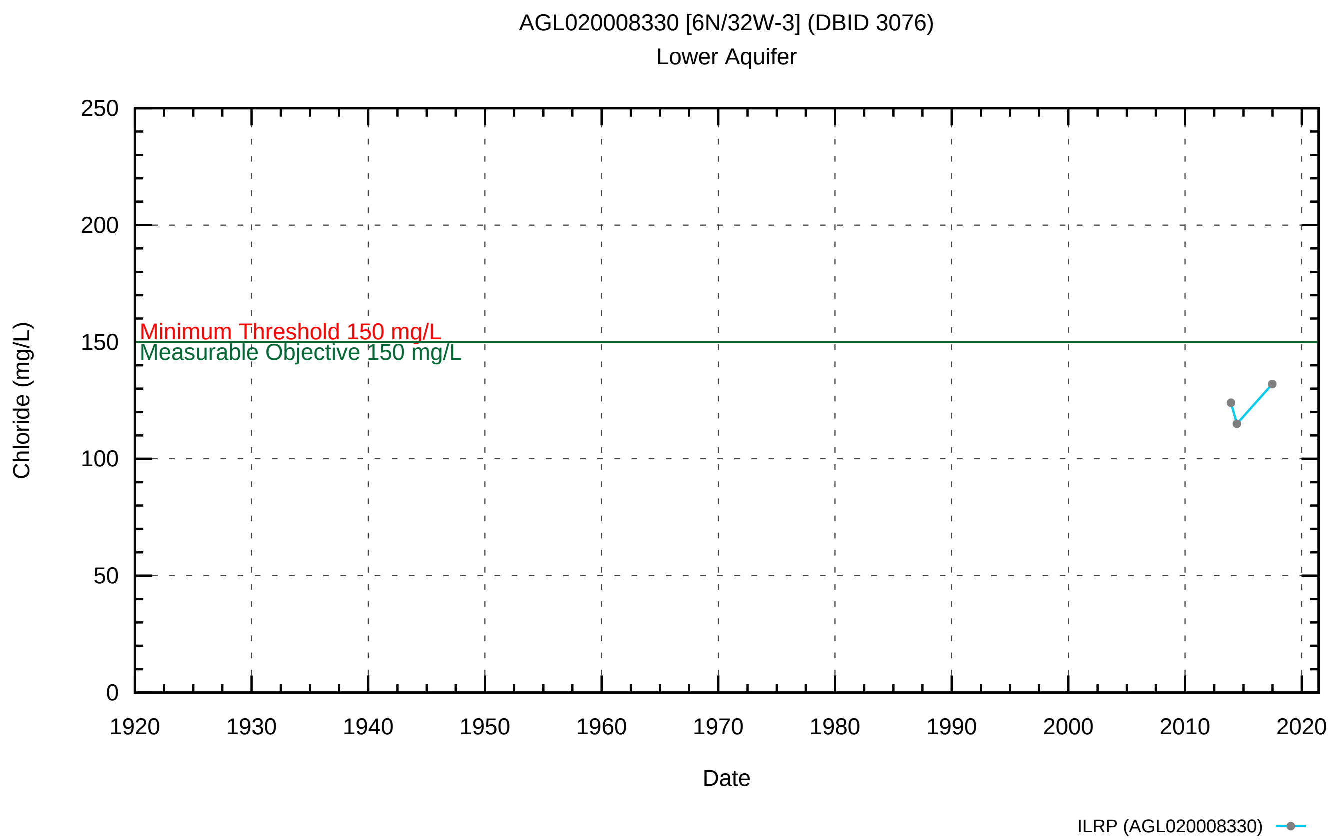
AGL020014946 [7N/32W-35] (DBID 3337)
Lower Aquifer

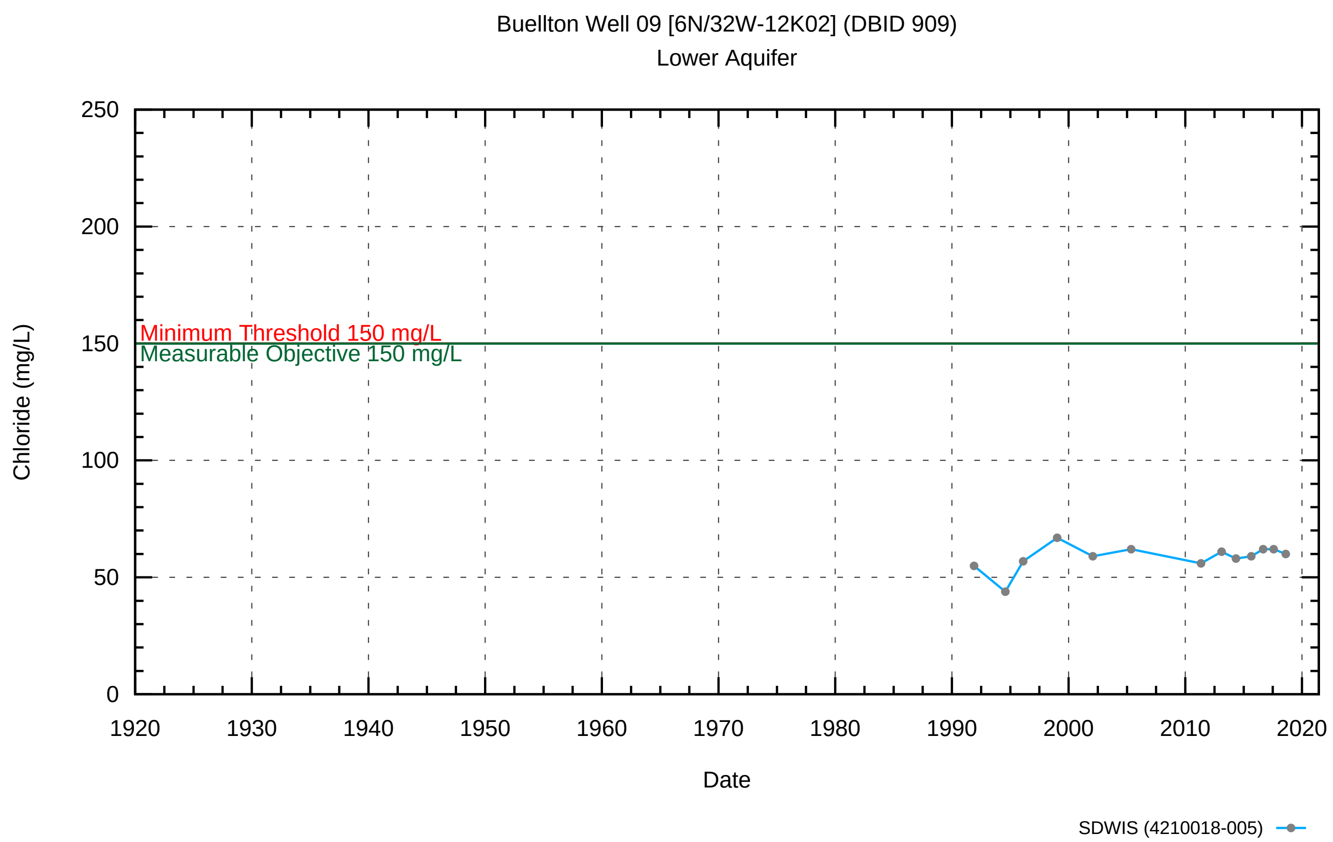


CMA: Buellton Uplands - Chloride

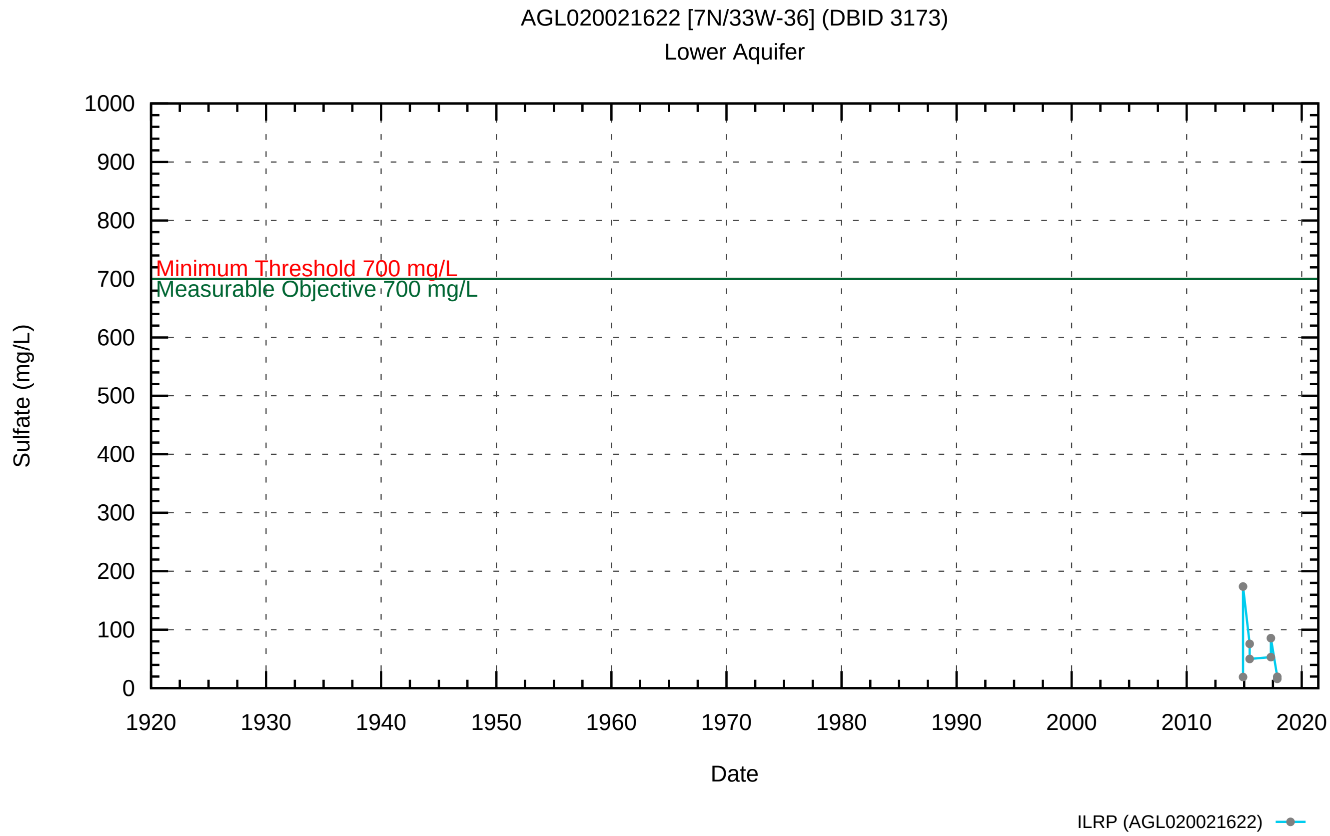


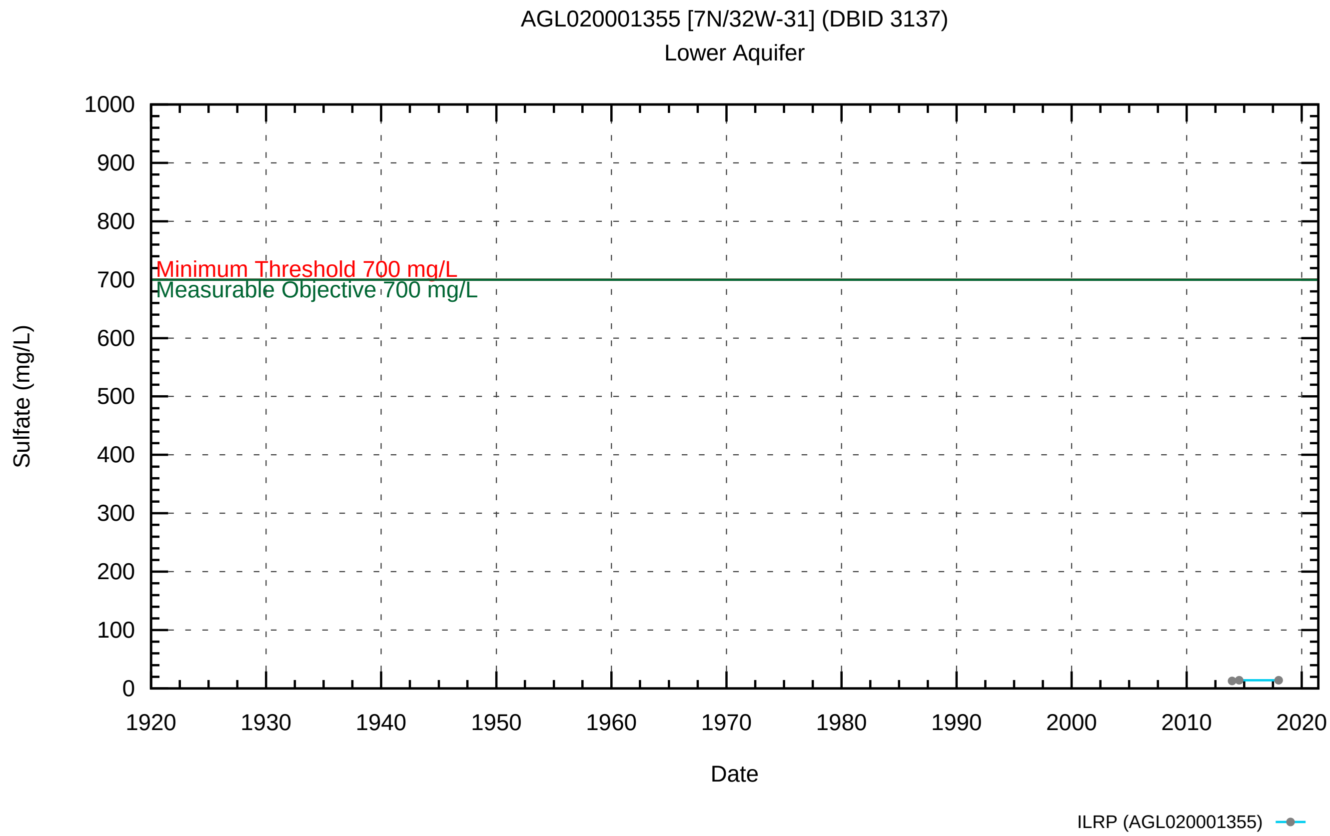
CMA: Santa Ynez River - Chloride





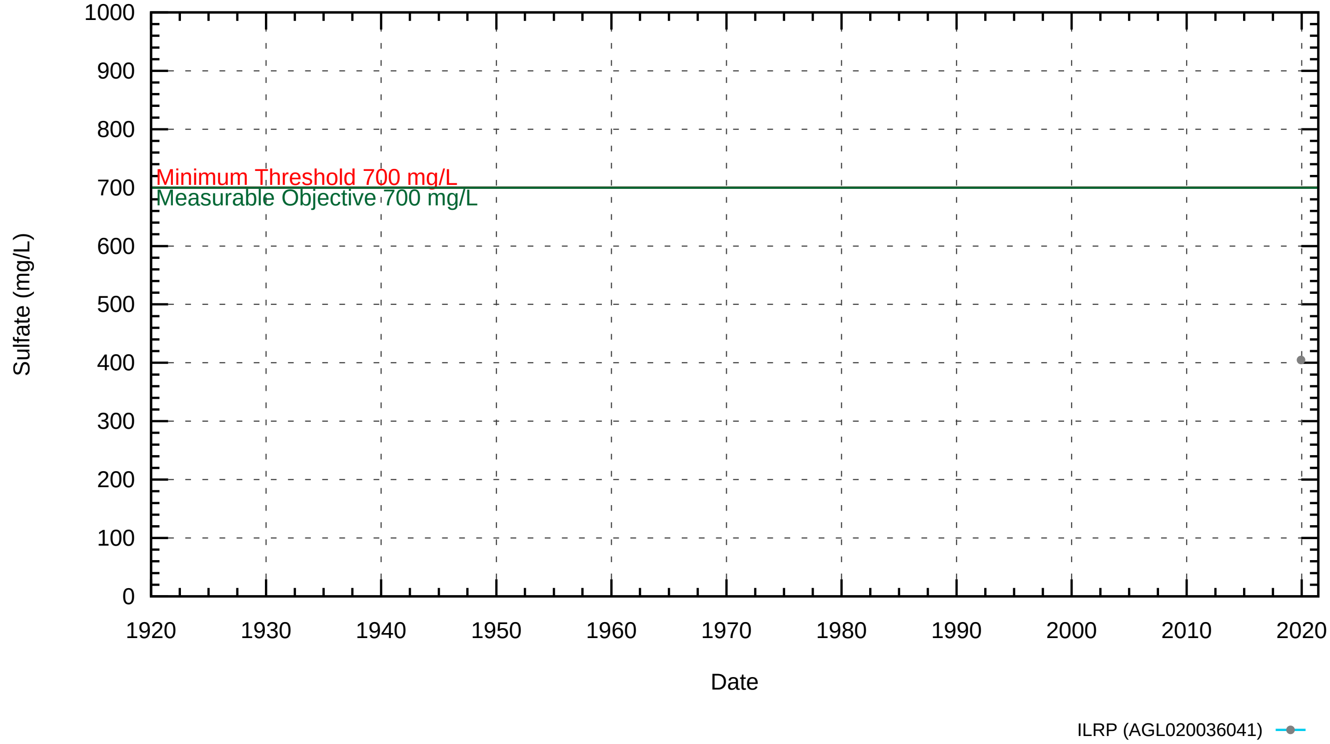
CMA: Buellton Uplands - Sulfate



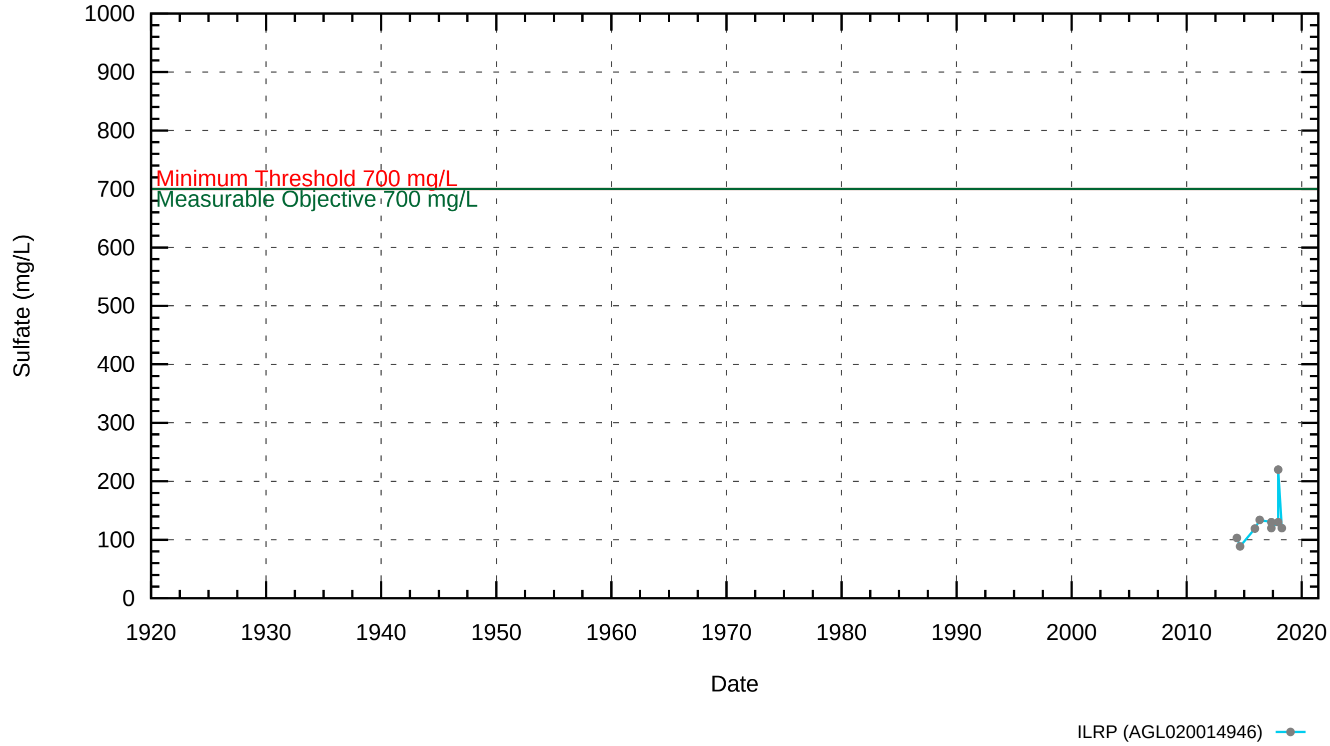


CMA: Buellton Uplands - Sulfate

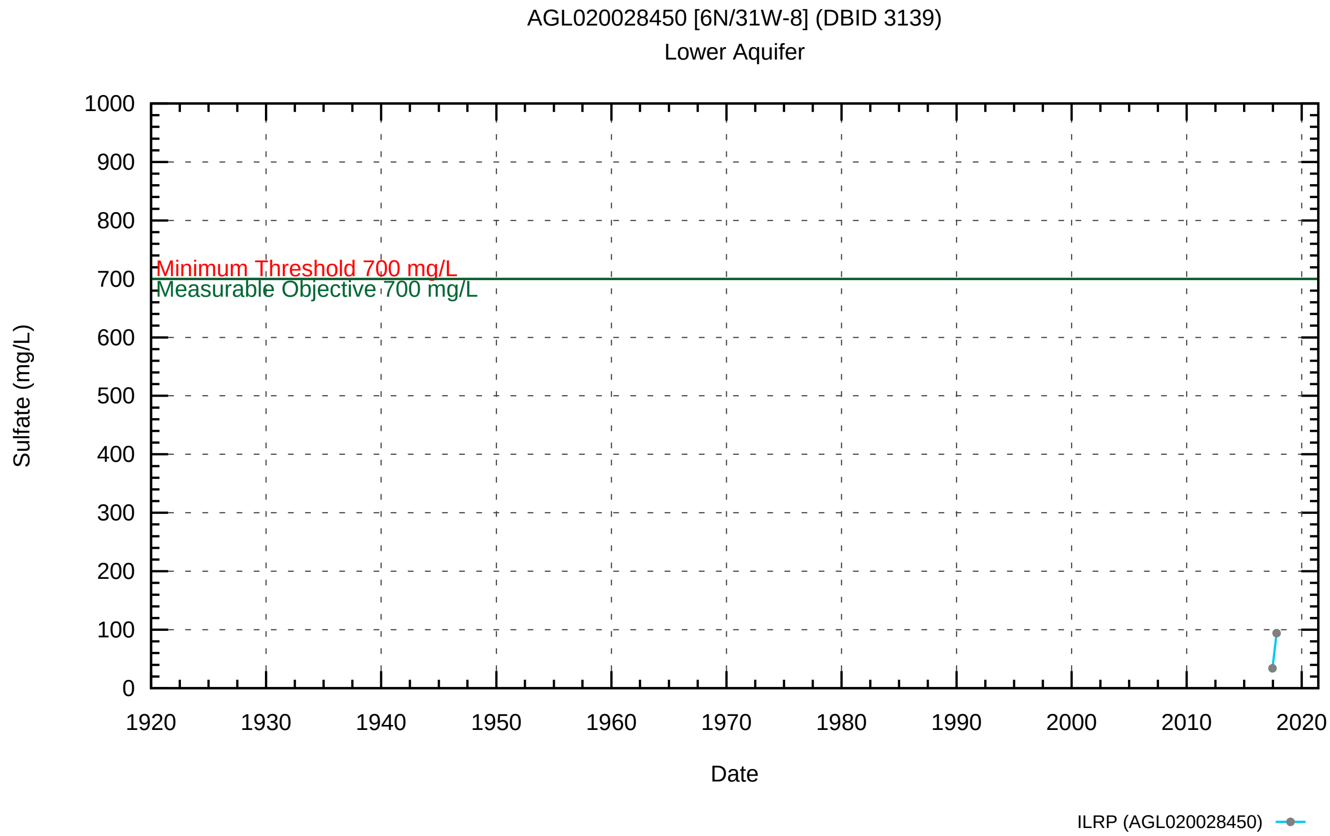
AGL020036041 [6N/32W-7] (DBID 3220)
Lower Aquifer



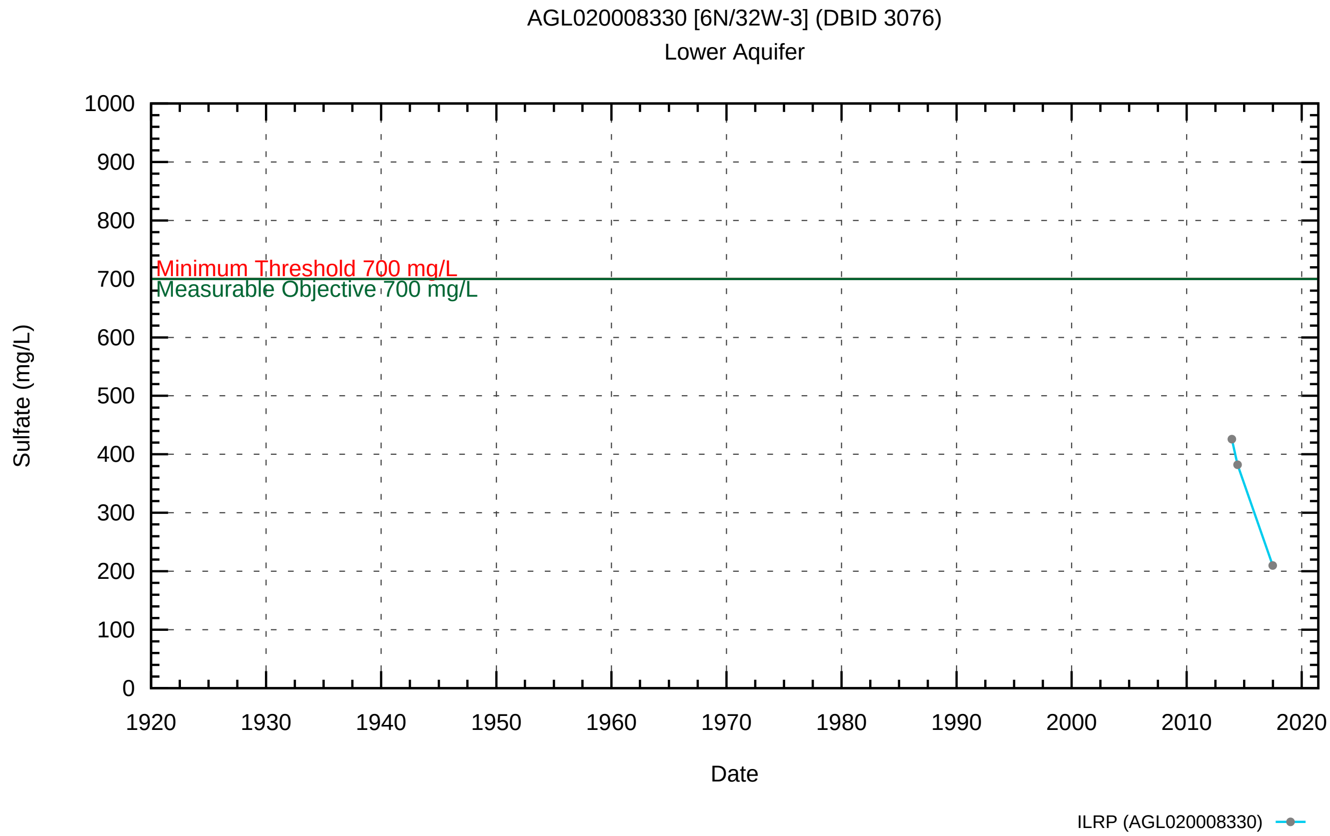
AGL020014946 [7N/32W-35] (DBID 3337)
Lower Aquifer

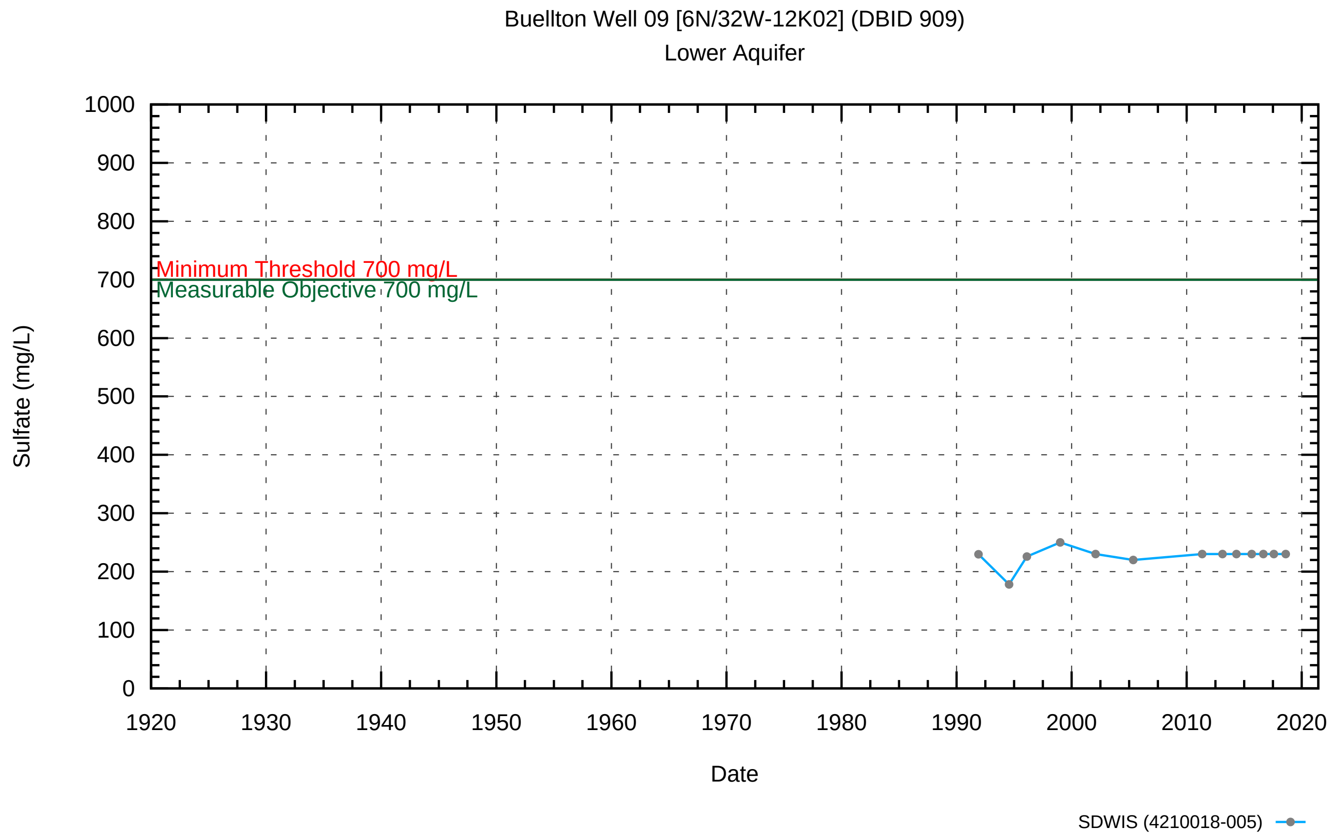


CMA: Buellton Uplands - Sulfate

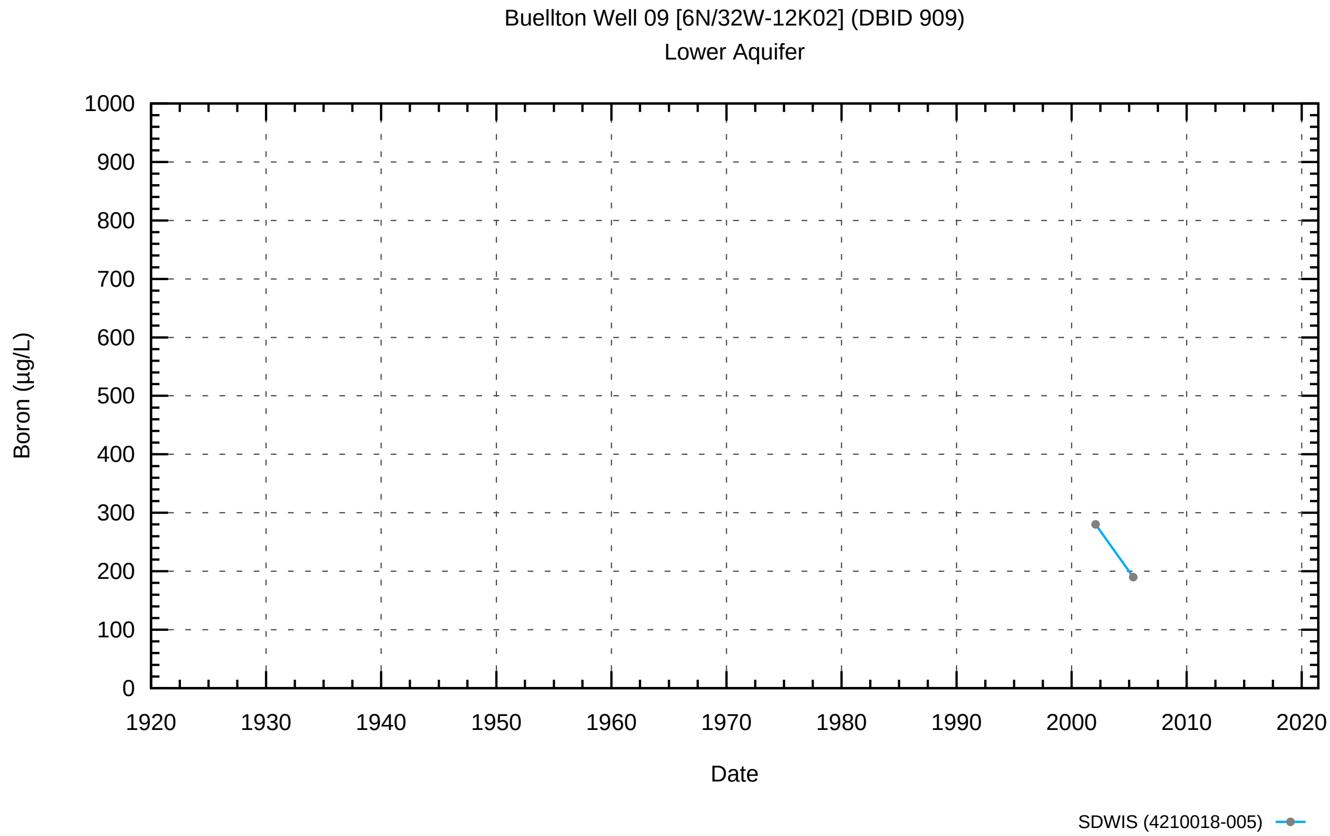


CMA: Santa Ynez River - Sulfate

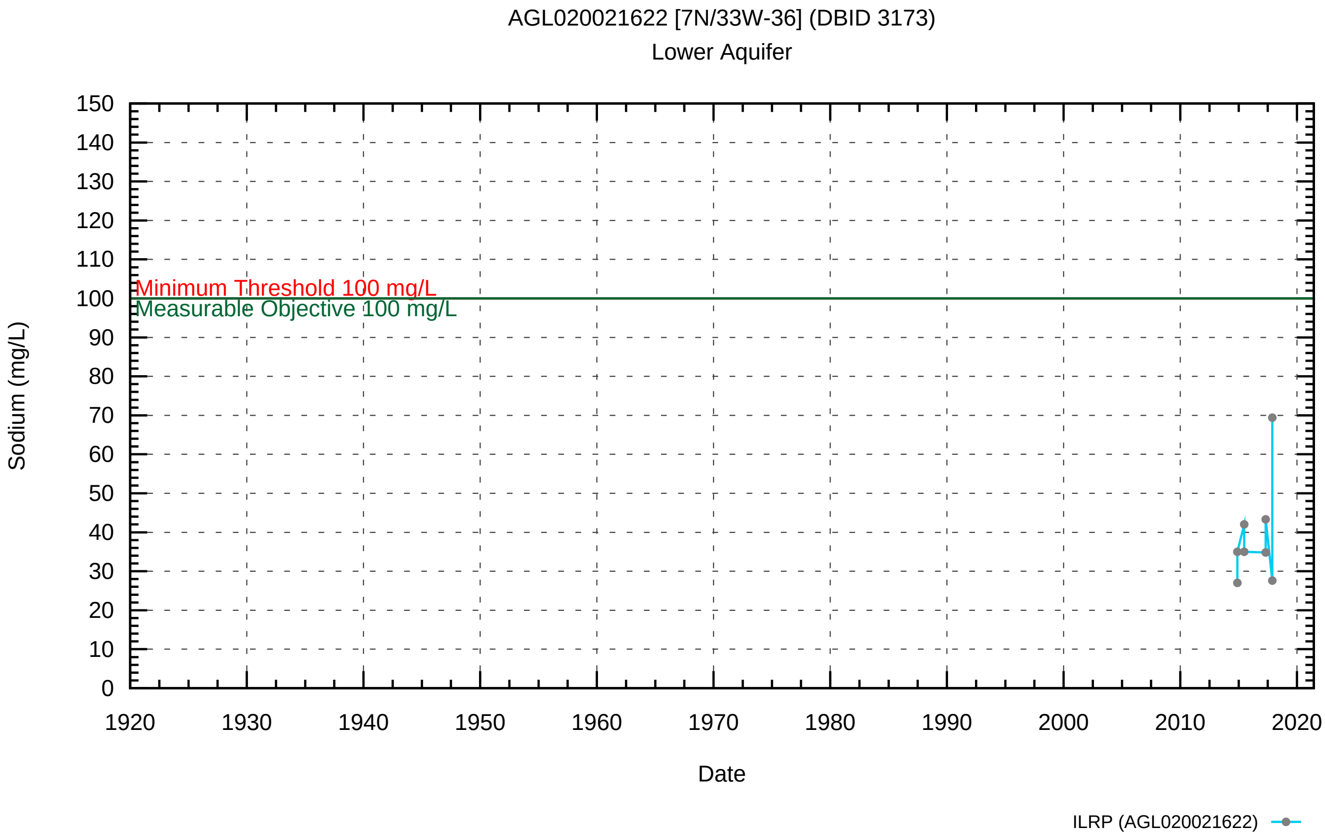


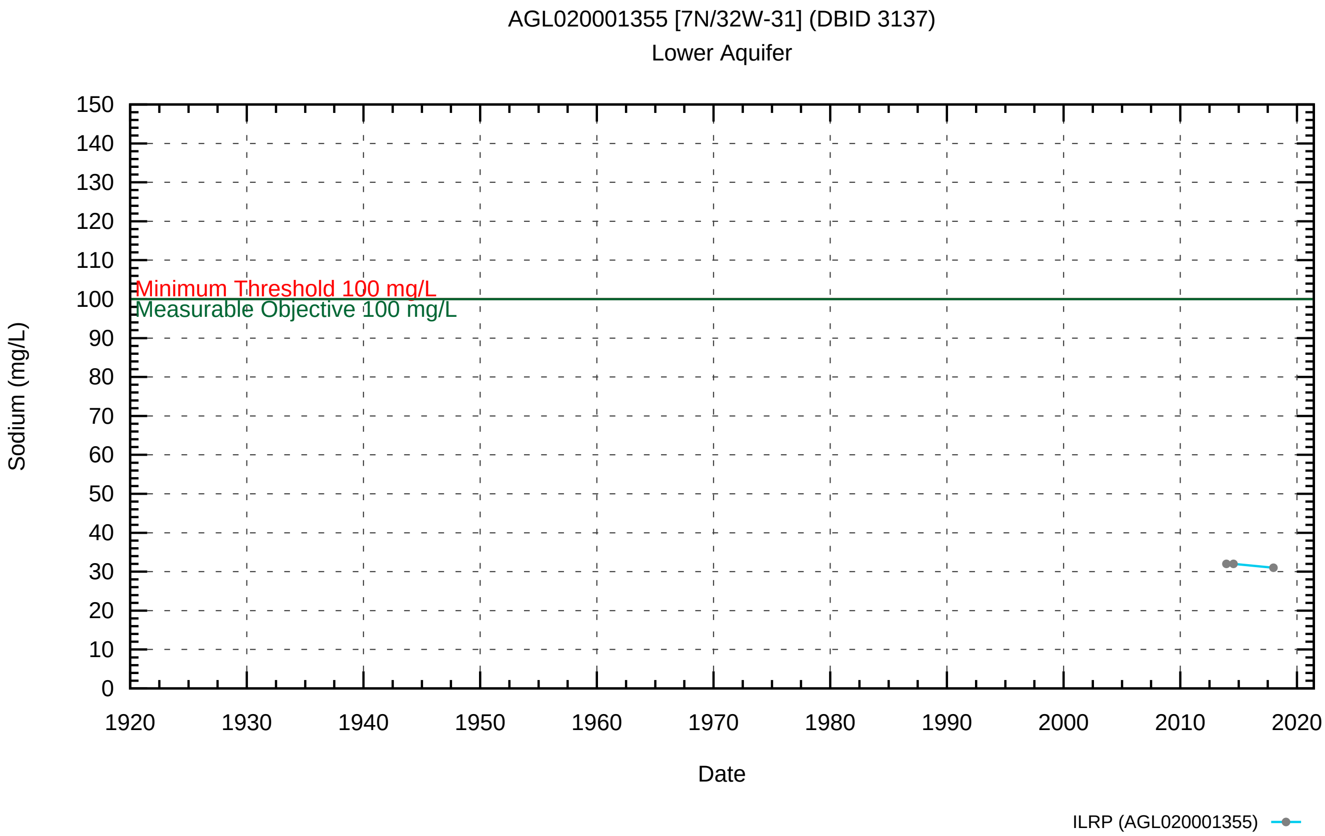


CMA: Santa Ynez River - Boron

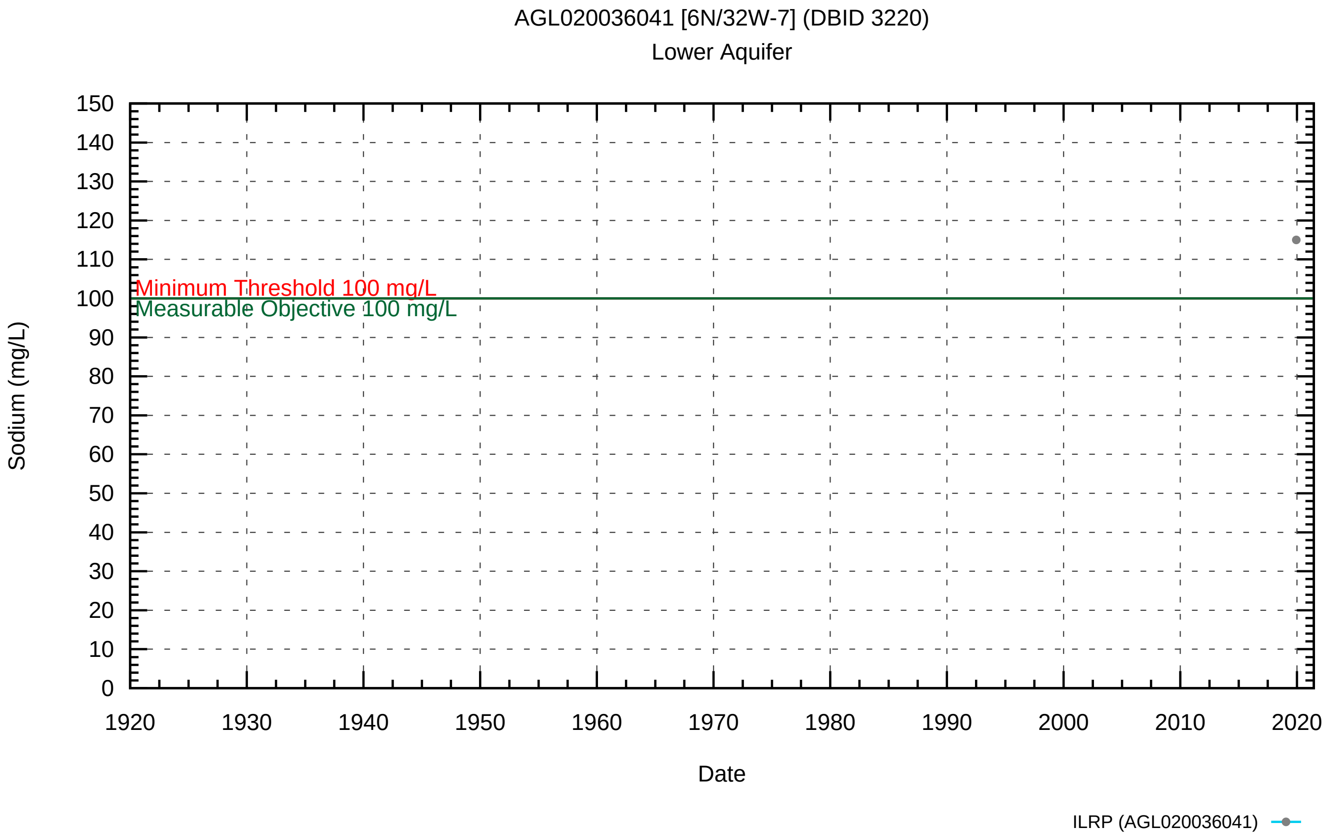


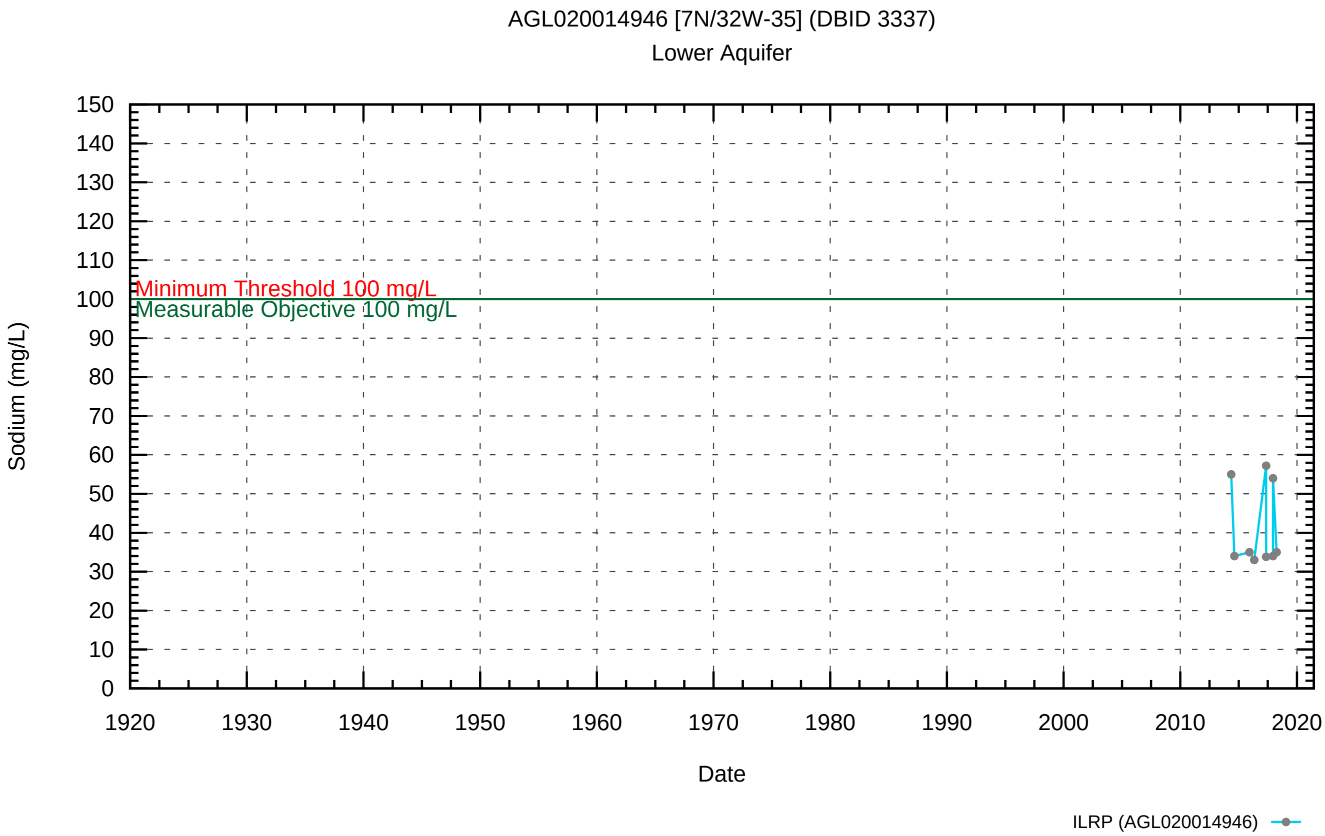
CMA: Buellton Uplands - Sodium



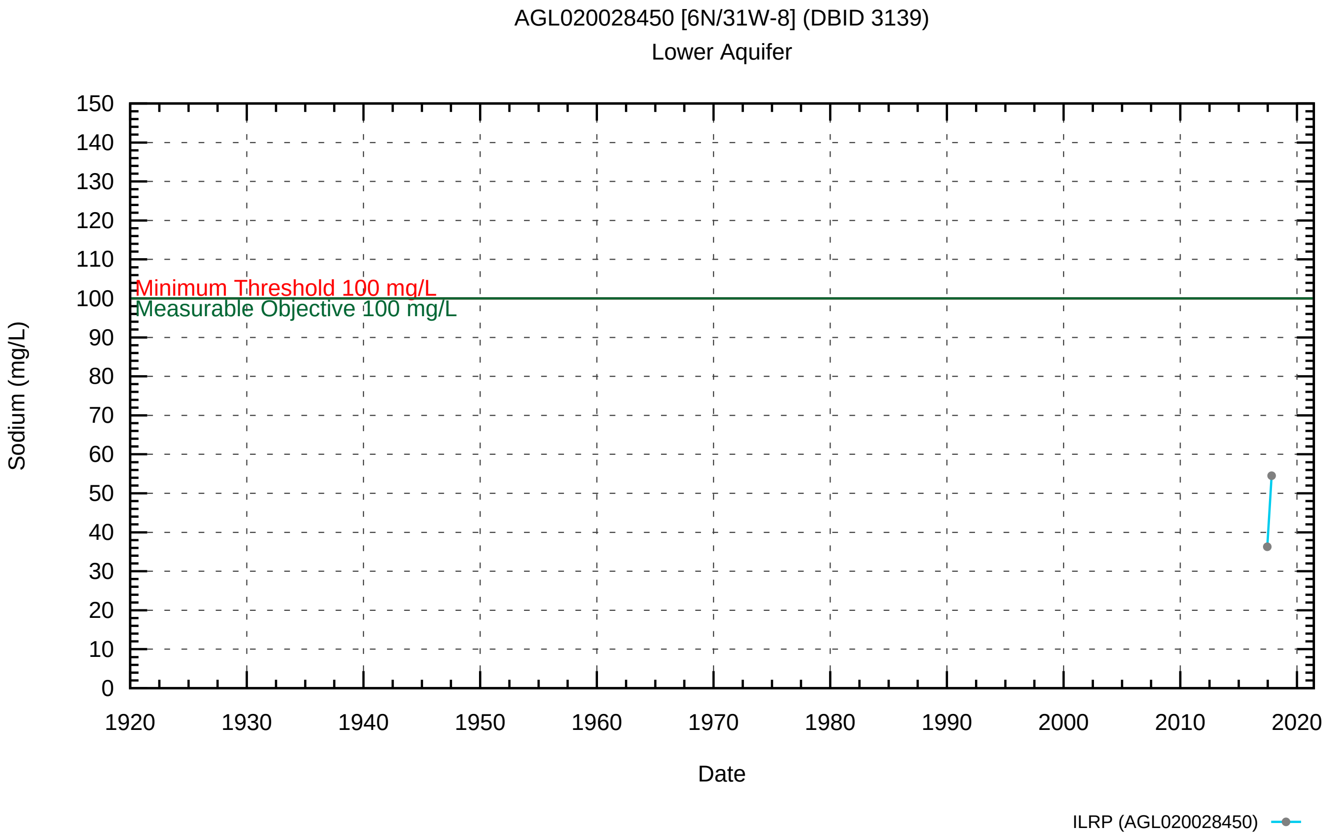


CMA: Buellton Uplands - Sodium

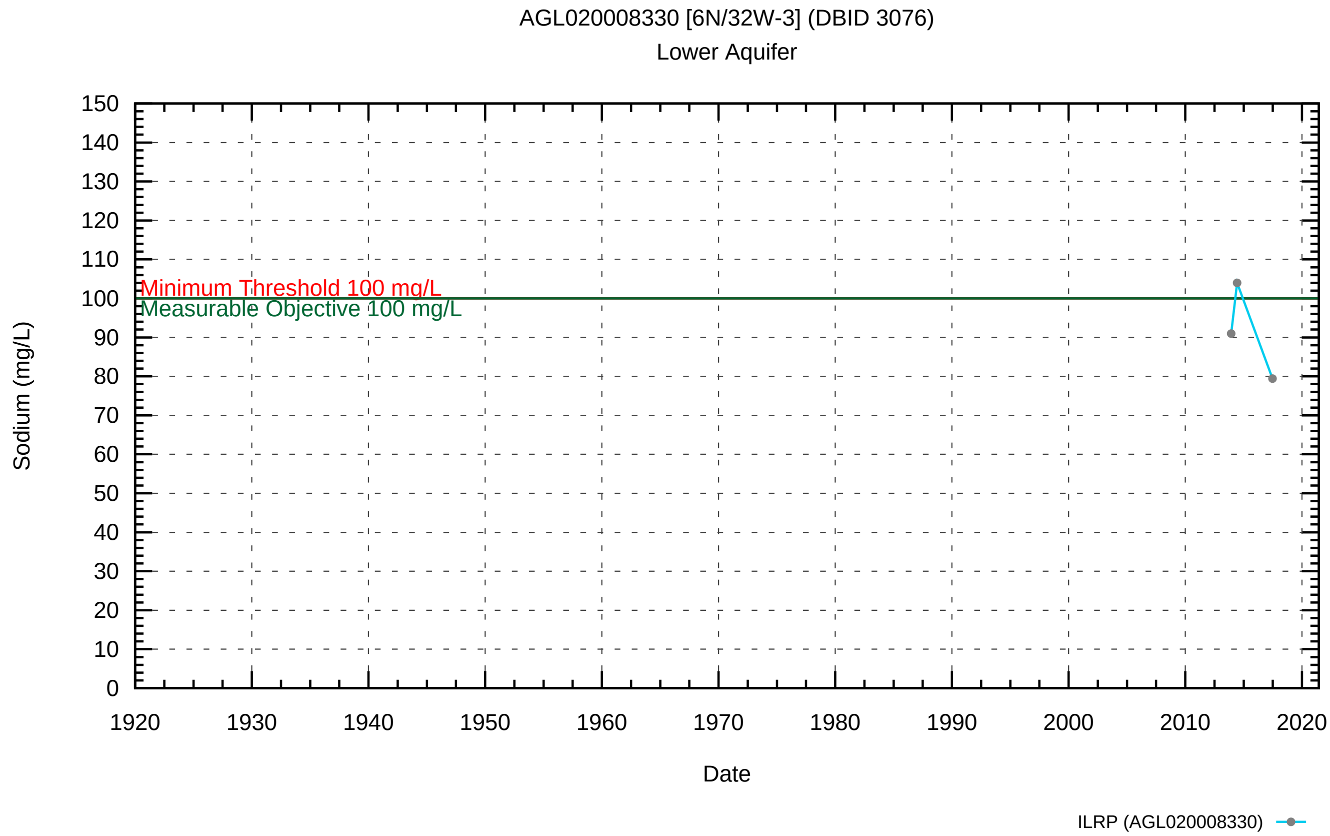


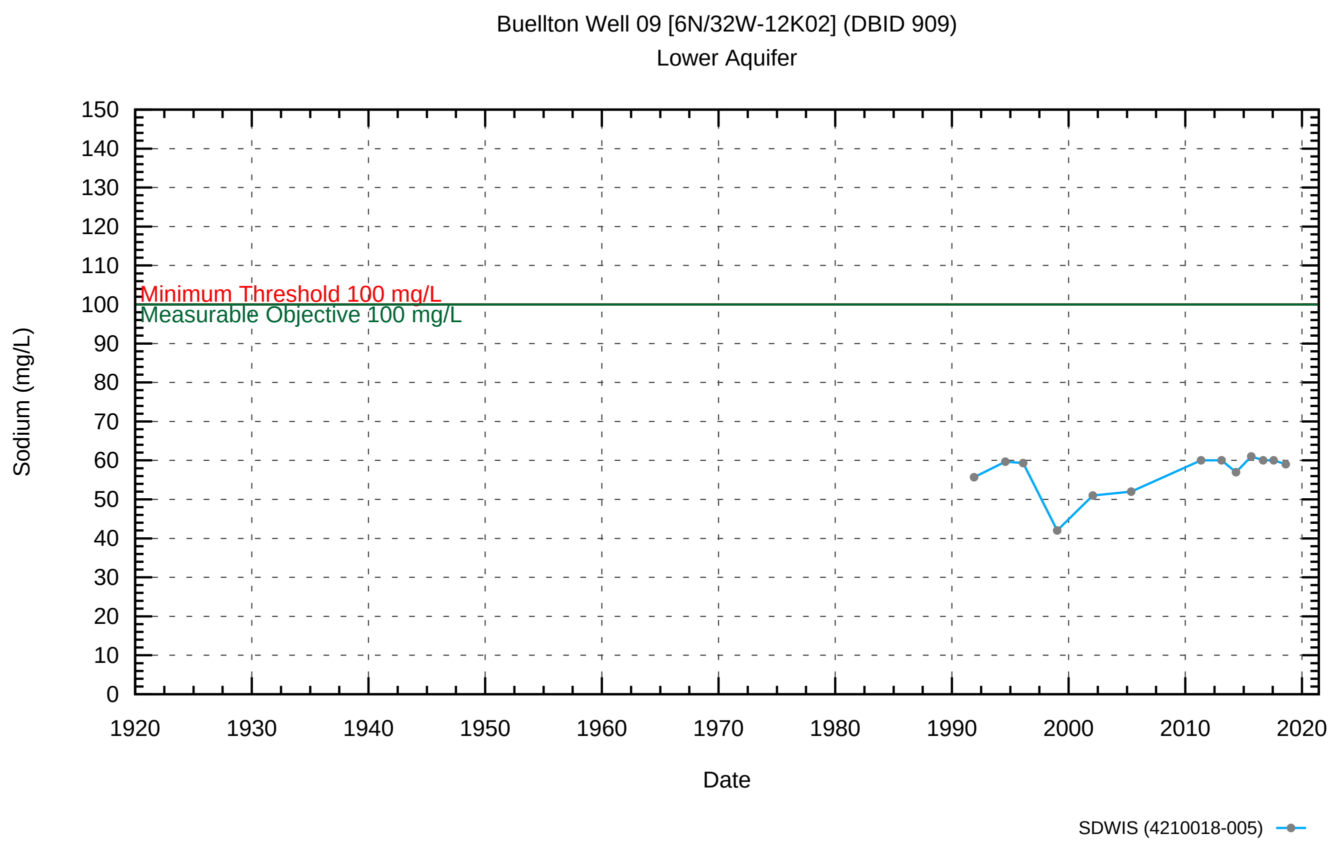


CMA: Buellton Uplands - Sodium

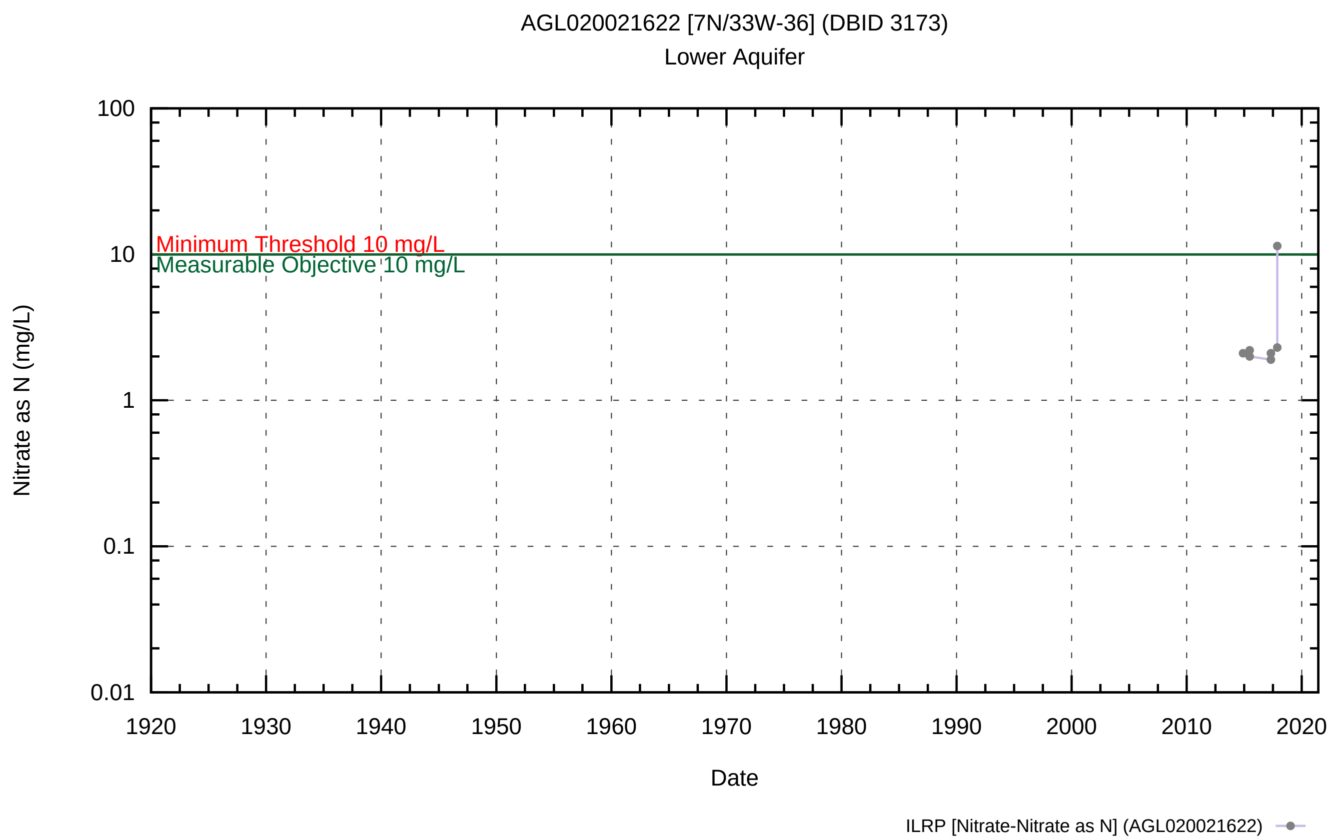


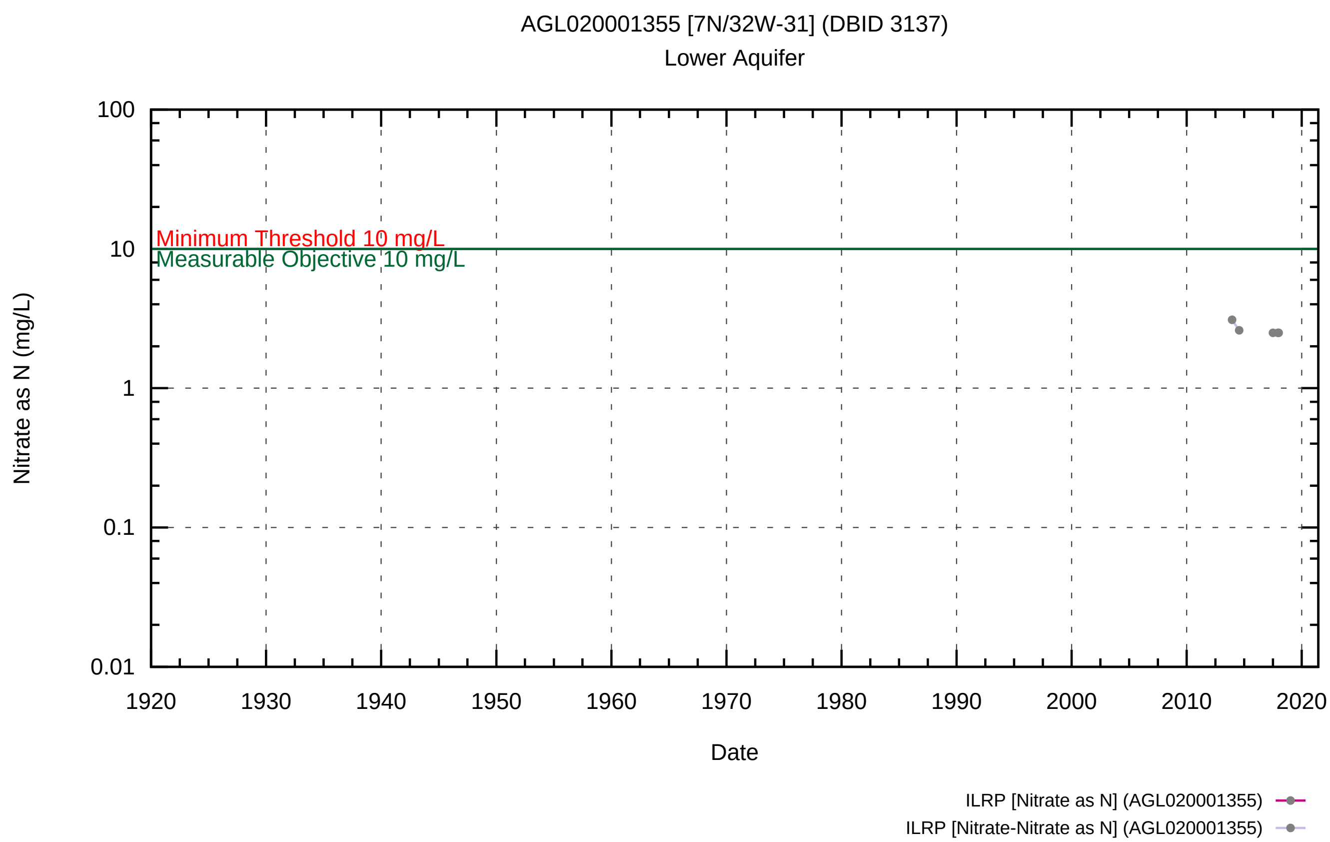
CMA: Santa Ynez River - Sodium



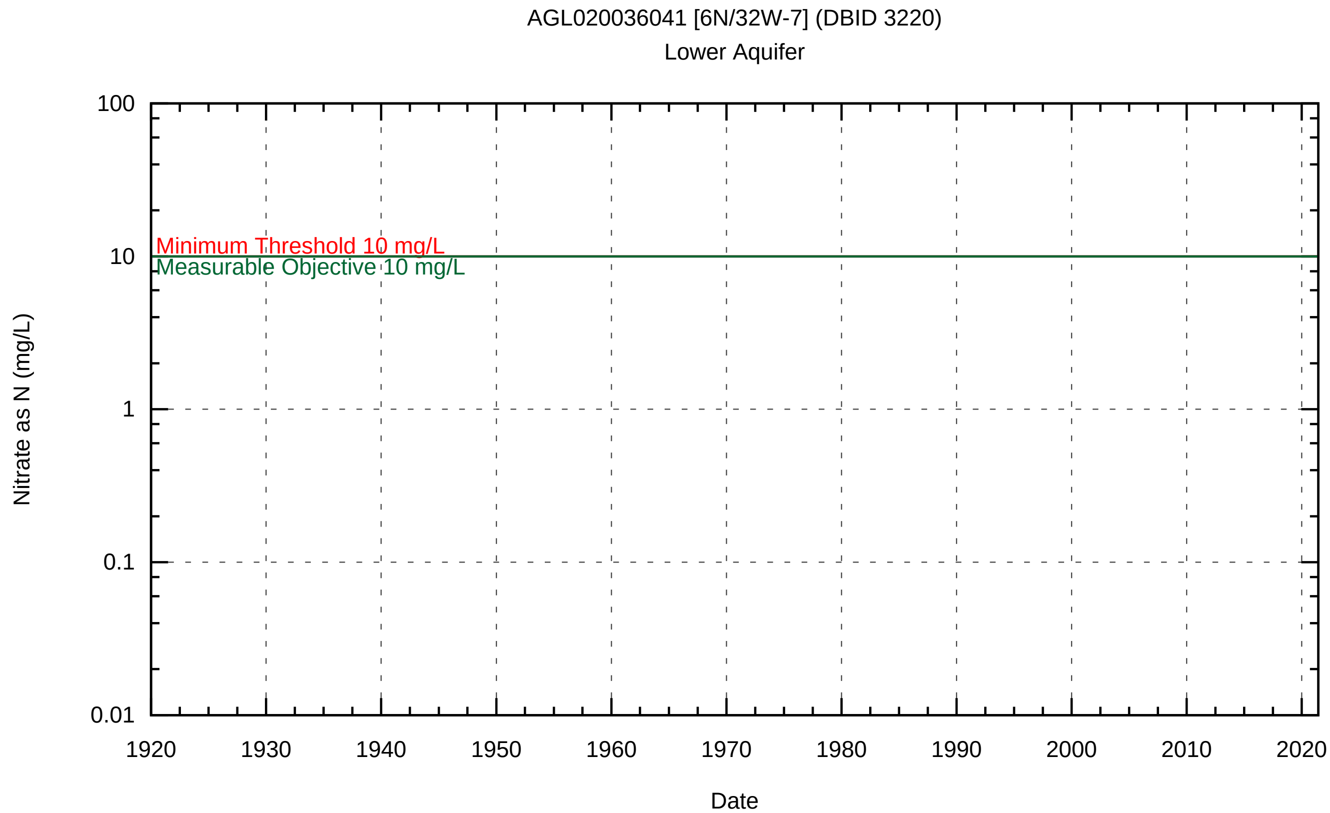


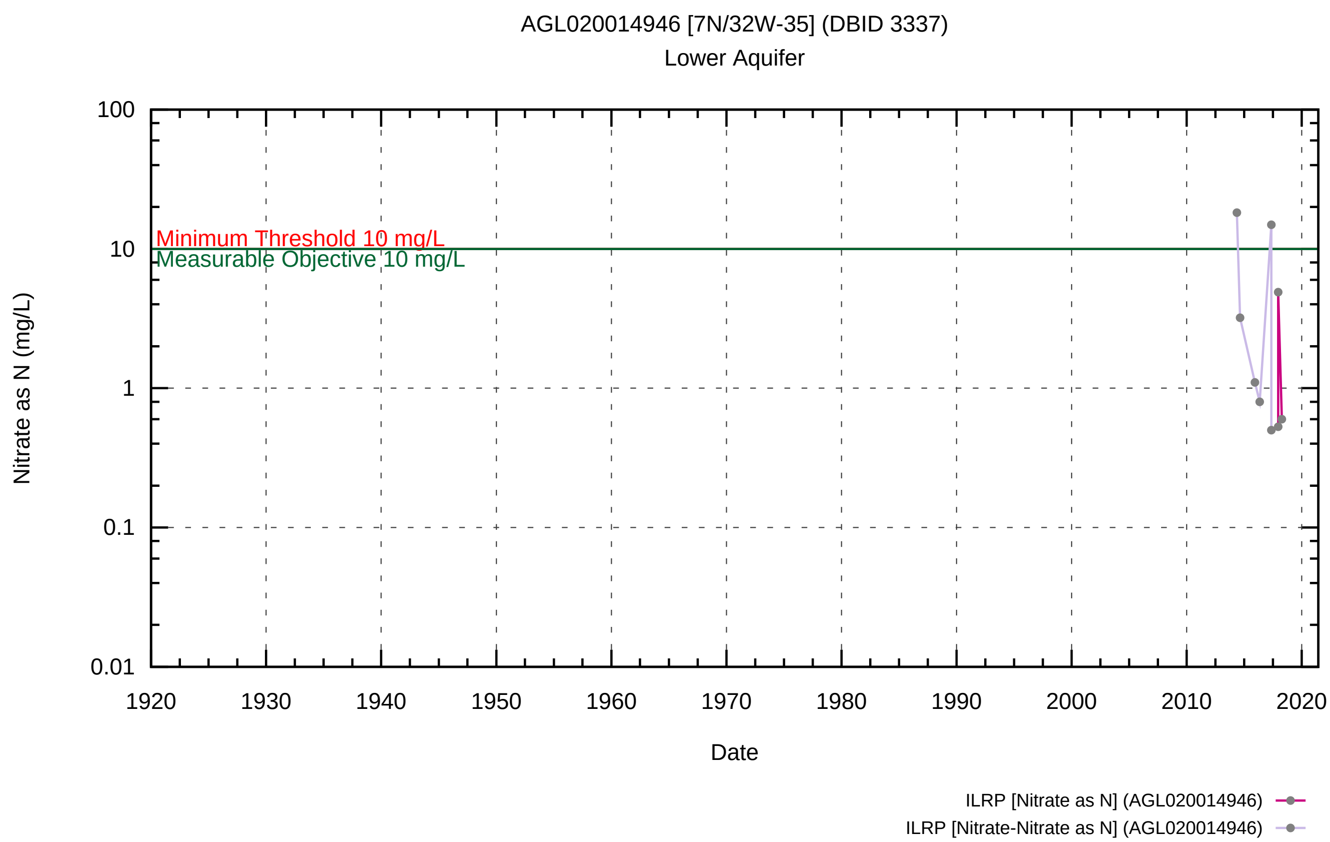
CMA: Buellton Uplands - Nitrate



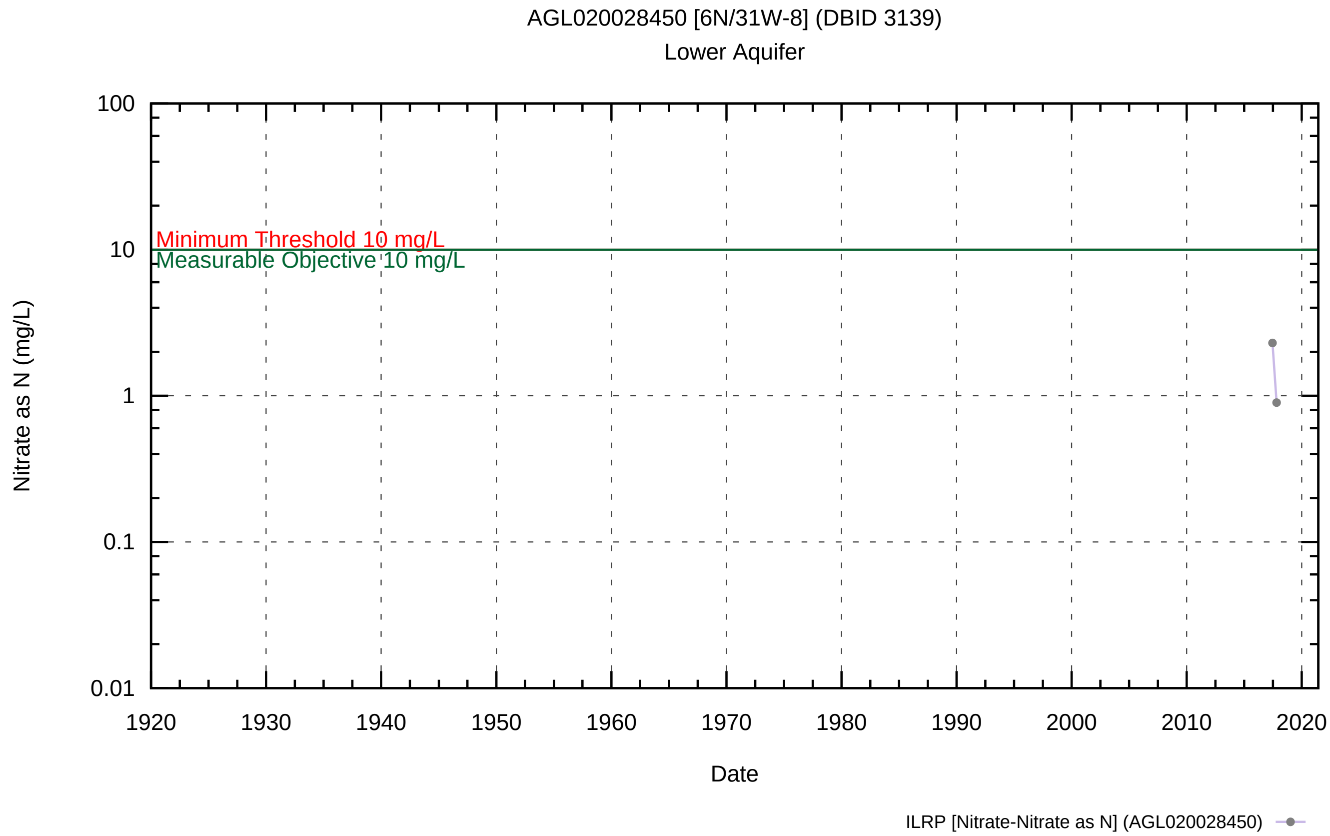


CMA: Buellton Uplands - Nitrate

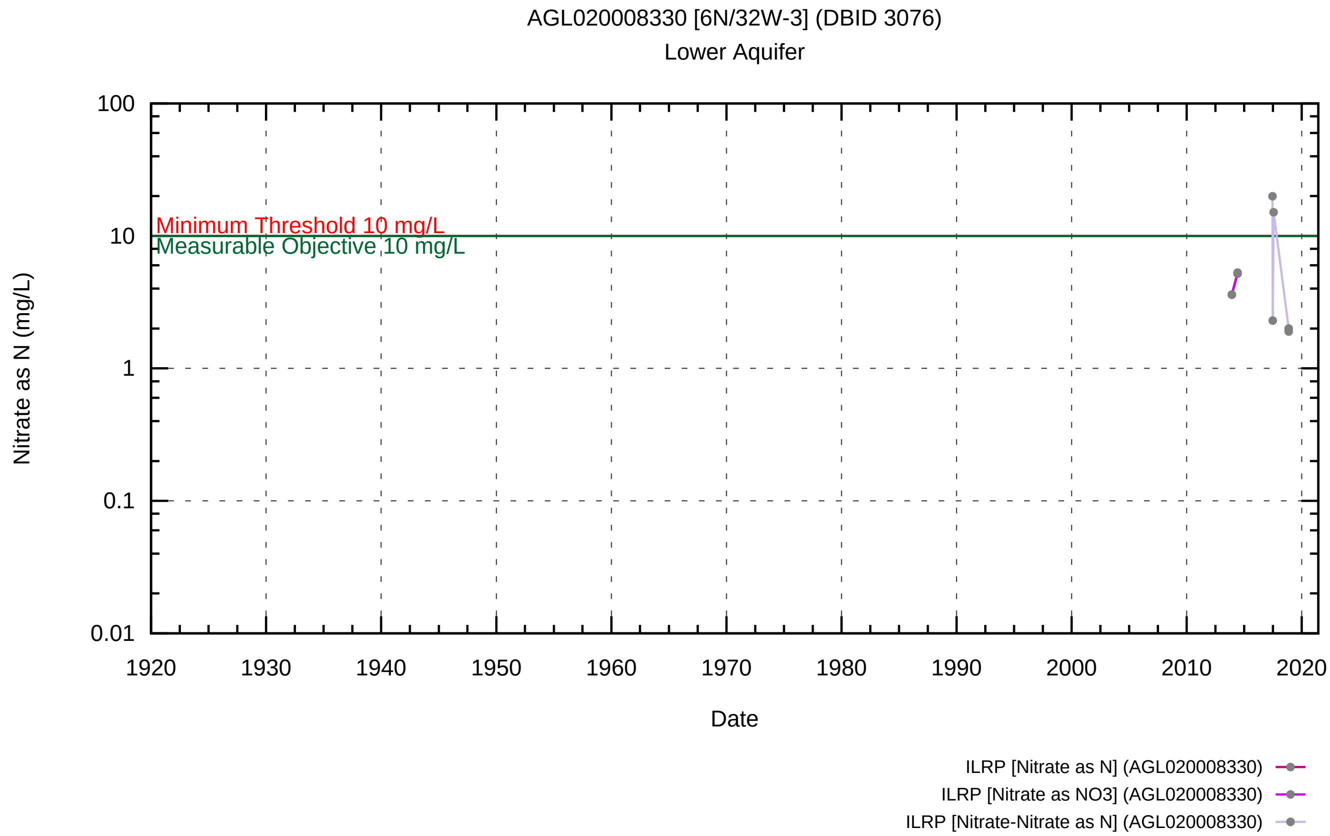


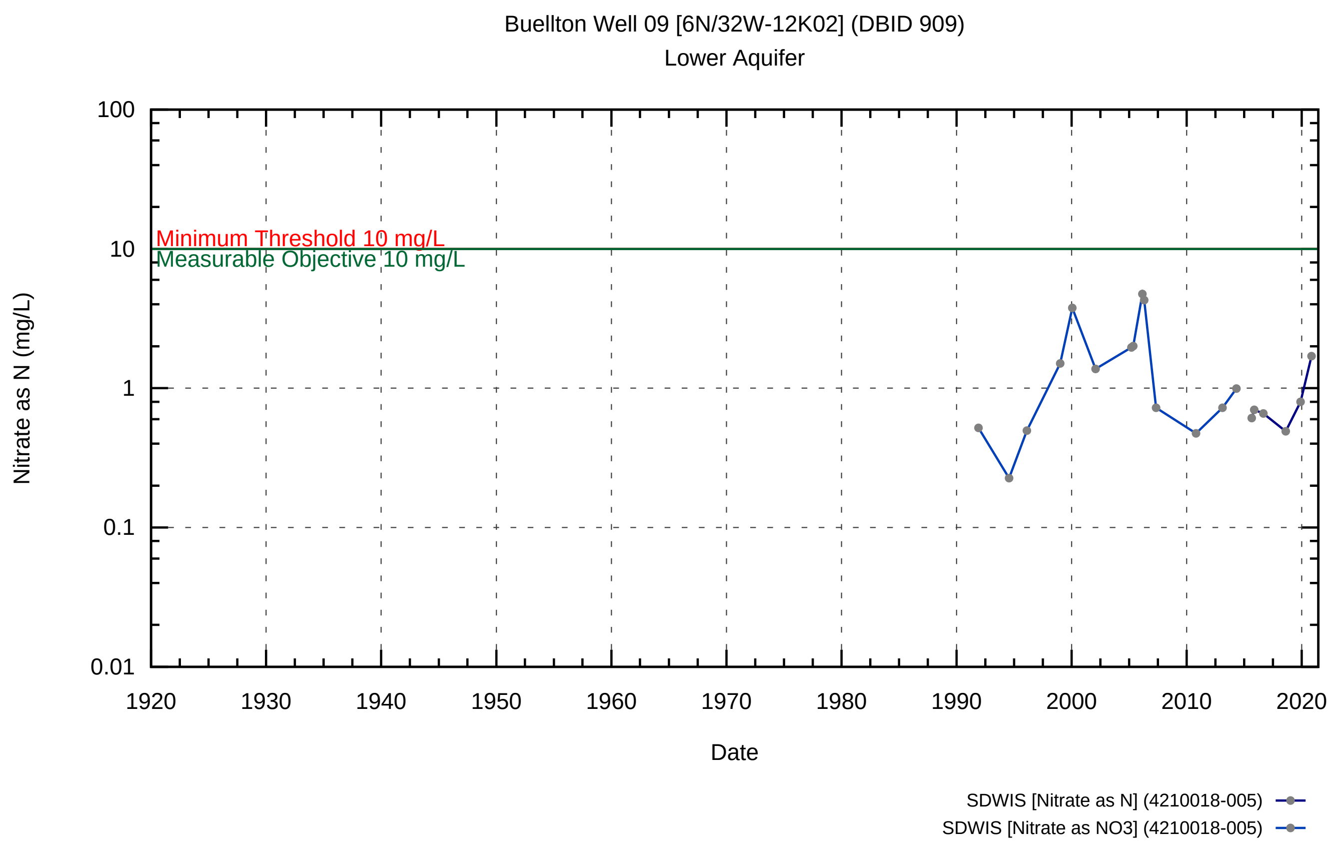


CMA: Buellton Uplands - Nitrate



CMA: Santa Ynez River - Nitrate





Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-D:

Stetson Engineers Groundwater Level Hydrographs for Assessing Surface Water Depletion, Cental Management Area

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APPENDIX 3B-D:

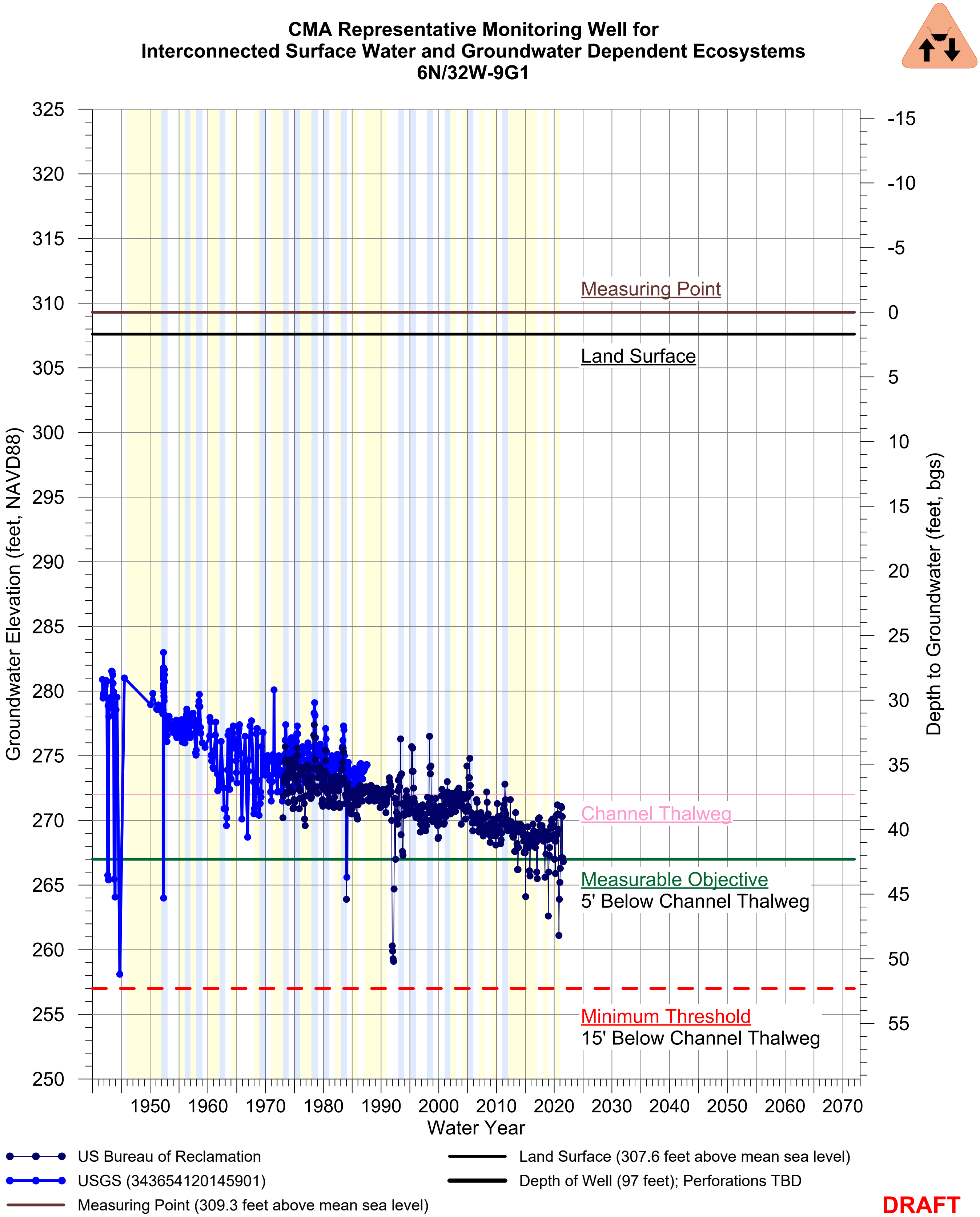
GROUNDWATER LEVEL HYDROGRAPHS FOR ASSESSING SURFACE WATER DEPLETION

This appendix includes historical hydrographs 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.

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 D-01



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8/27/2021

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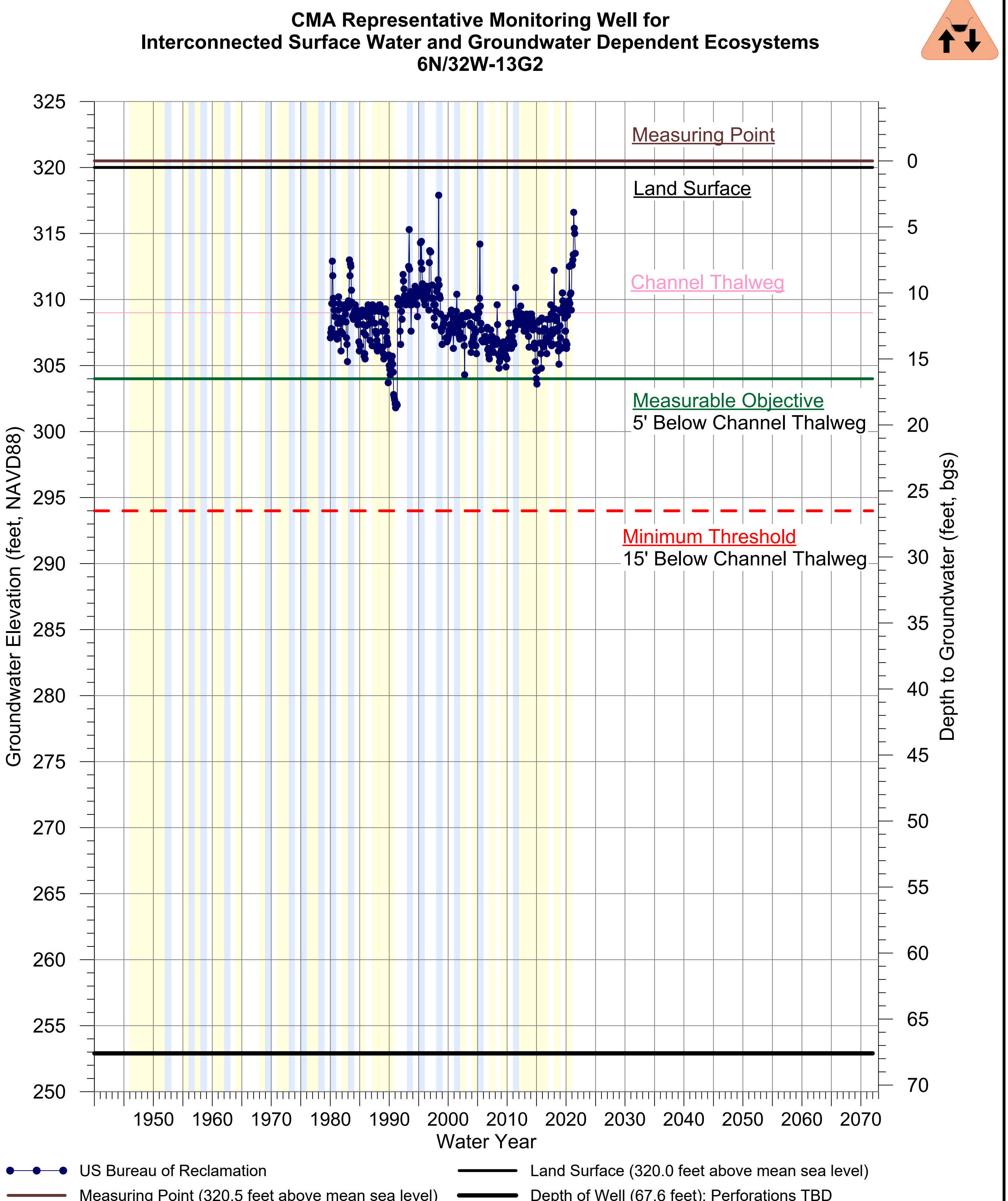
STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE D-02



DRAFT
8/27/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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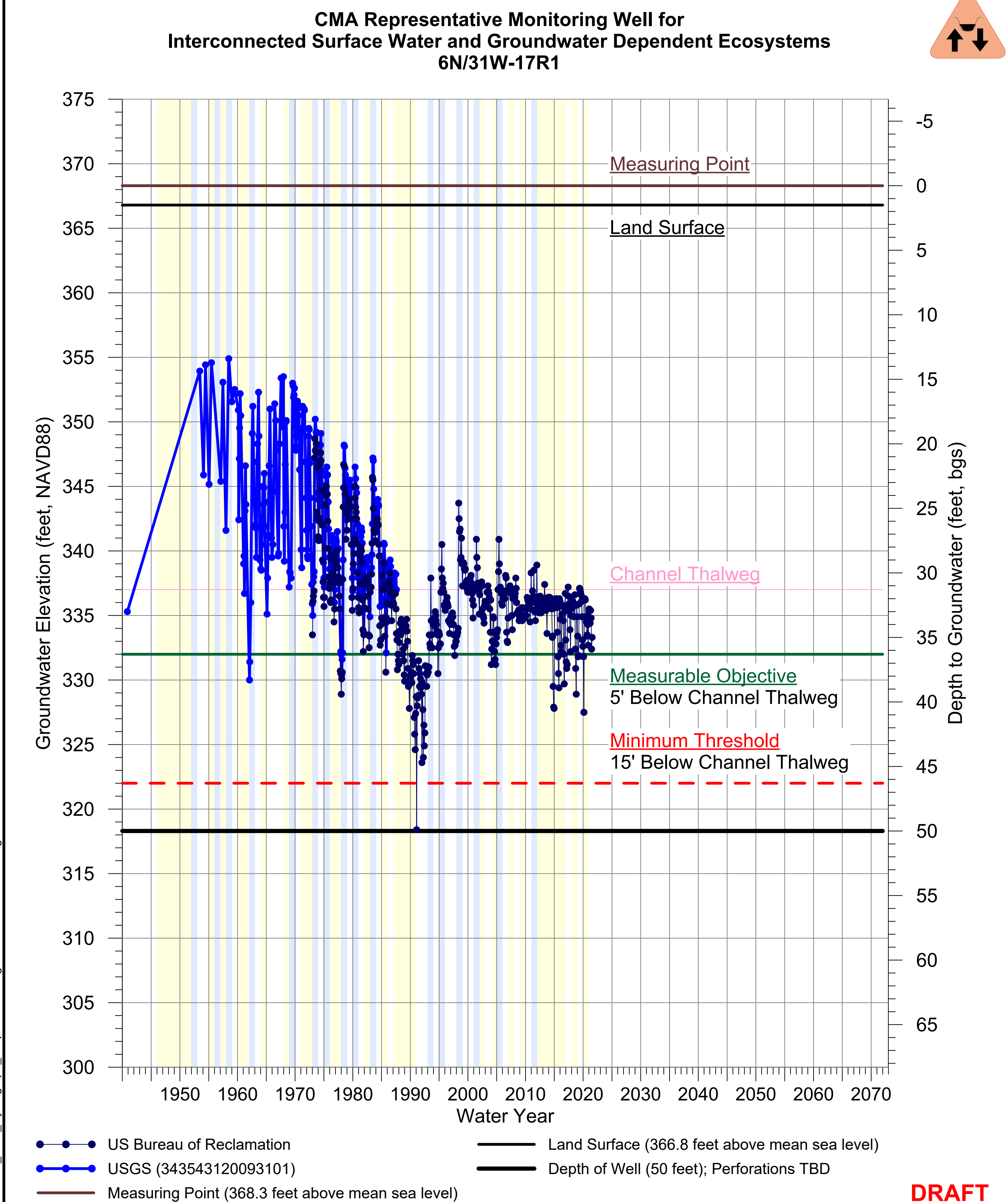
FIGURE D-03



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STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

Public Comments

Appendix PC-A:

Public Comments

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APPENDIX PC-A:
PUBLIC COMMENTS

Under the SGMA regulations the GSP “shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties” which includes “Comments regarding the Plan received by the Agency and a summary of any responses by the Agency” (23 CCR § 354(c)). The required summary of comments and responses is Section 1c.1-5 of the report.

Enclosed within this appendix is a listing of comments and concerns provided on the Public Draft GSP posted September 11, 2021 as well as specific responses. All comments, including on draft documents, are made available on the CMA GSP Communication Website:

https://www.santaynezwater.org/central-gsa

As described in Section 1c, the Agency (the CMA GSA) solicited public comments on draft documents as the plan was developed, as well as on the Public Draft GSP. Request for comments included outreach to specific identified stakeholder groups, the Citizens Advisory Group (CAG), newsletters released through multiple channels, press releases, and development and implementation of a communications website.

Comments and public feedback were considered throughout the development of the Plan. Comments on draft documents by stakeholder technical consultants identified additional supporting data that was included in this Plan. Specific comments by State and Federal wildlife agencies resulted in additional clarification about principal aquifer extents, additional discussion of SWRCB Order WR 2019-0148, limits to GSA authority and expanded discussion of wildlife beneficial use including existing biological opinions and wildlife monitoring programs. Comments from advocacy organizations resulted in the addition of figures and tables to better characterize the constituents served by the GSP.

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Public Comments

Appendix PC-B:

Central Management Area Groundwater Sustainability Plan Public Draft Comments and Responses

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Unique ID	Name	Page Number	Comment	Date/ Time	Response
2131	Joseph Hughes	N/A	Attached letter received by email on 9/21/21.	9/22/2021 13:15	Thank you for your comments.
2132	Joseph Hughes (Santa Ynez Water Group)		Landowner RepresentationThere is no exclusive agricultural landowner representation on any of the GSAs' governing committees. Each committee is composed of representatives from governmental agencies with non-agricultural constituencies. For example, the Western Management Area GSA Committee is made up of (1) Santa Ynez River Water Conservation District; (2) the County of Santa Barbara; (3) the City of Lompoc; (4) Mission Hills Community Services District; and (5) Vandenberg Village Community Services District. Both the Central Management Area GSA Committee and the Eastern Management Area GSA Committee are similar. This does not represent the entirety of the water users and interests in the Basin and excludes any direct representation from the agricultural community. Thus, at the outset, the make-up of the GSAs was flawed. The only avenue your GSAs allowed agricultural landowners to voice their unique opinions or concerns is through the Citizens Advisory Groups. But, just as the name suggests, those groups are only advisory, are weighted toward non-agricultural interests, and carry no decision-making authority. Put simply, agricultural landowners have been intentionally disenfranchised from the decision-making. We are aware that the GSAs are exploring a potential reorganization of their governance structure. Whether that reorganization results in each GSA remaining as three separate GSAs or forming a single coordinated GSA, it is likely that each GSA will revisit or draft new organizational documents. When doing so, we ask that each GSA include a voting director position for an agricultural landowner representative on each decision-making body formed or otherwise reorganized.	2021-09-22	The agricultural community has been engaged throughout the GSP development process and has provided written and verbal comments on sections of the GSP, participated in GSA committee meetings, and participated in CAG meetings. Agricultural landowners have not been disenfranchised from decision-making. Two of the public agencies on the GSAs' governing committees, the County of Santa Barbara and Santa Ynez River Water Conservation District, are elected in part by agricultural landowners. Several of the elected board members also are in fact agricultural landowners. The GSA has made specific outreach to the agricultural community throughout the development of the GSP, and this is in part documented in Section 1c. Future governance and membership of the GSA will be considered after the GSP is submitted to DWR.
2133	Joseph Hughes (Santa Ynez Water Group)		2. Implementation of Projects and Management Actions We are also concerned with the projects and management actions identified by the GSAs in the draft GSPs. While we understand that many of the GSAs' respective Group 1 projects and management actions focus primarily on monitoring and reporting efforts, all other projects single out and discriminate against agricultural landowners. The burden of sustainability is therefore placed solely on the backs of agricultural landowners. Funding for these projects and management actions mirrors that problem. We are aware that the GSAs are considering a groundwater extraction fee, assessment, or other property-related fee to fund the GSAs' projects and management actions. As those considerations continue, we encourage the GSAs to pursue the most equitable option in levying that financial burden. Agricultural landowners should not be unfairly targeted with projects and management actions, and then be forced to pay for their development and implementation.	2021-09-22	The important issue of funding of implementation measures will be worked on by the GSAs early in 2022 following submission of the Plan. The CMA GSA encourages the agricultural landowners to stay engaged and provide feedback during this process. Targeted outreach meetings and technical workshops, in addition to regularly scheduled CMA GSA meetings, will be held periodically to inform all groundwater pumpers and other stakeholders about the details of the proposed Groundwater Pumping Fee Program. Groundwater pumpers and interested stakeholders will have the opportunity at these meetings to learn about the programs as well as the opportunity to provide input and comments on how the pumping fee program may be implemented in the CMA. There is no plan to single out or discriminate against agricultural landowners through the implementation of projects or otherwise. Current water use is 71% "Agricultural Water," 3% "Special Irrigation Water," and 26% "Other Water." Additionally "Other water" users have already adopted water efficiency programs to reduce water use, resulting in "Other water" use in 2019 26% less than it was in 1995. The GSA hopes to avoid conditions where Group 3 projects and management actions would be required, and will pursue the equitable options available, as well as considering the key importance of agriculture to the local community.
2134	Joseph Hughes (Santa Ynez Water Group)		3. Consideration of Overlying Groundwater RightsOur last concern underlies all that the GSAs are doing. None of the GSAs have considered the effects their actions will have on overlying groundwater rights of agricultural landowners. This omission is evident in the draft GSPs as the GSAs focus exclusively on the interests of municipal groundwater users. This violates the mandates of SGMA requiring your GSAs to consider the interests of all beneficial uses and users of groundwater. Specifically, Water Code section 10723.2 provides, in part: "The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to, all of the following:(a) Holders of overlying groundwater rights, including: (1) Agricultural users, including farmers, ranchers, and dairy professionals.." Our hope is that the GSAs expand their focus and discharge their duty to consider all interests in the Basin as required by SGMA. We understand the complexities of the issues and the challenges in developing a GSP. Our desire is a successful GSP, and to be part of the process. But we cannot do that if the GSAs intentionally disenfranchise agricultural landowners and their senior overlying rights in the Basin. Please have the attorney advising the GSAs on these issues contact me so that we can discuss how best to resolve our concerns.	2021-09-22	.The DRAFT GSA specifically states (1b.1-3 Legal Authority): "In accordance with CWC Section 10720.5 (b) 'Nothing in this part, or in any groundwater management plan adopted pursuant to this, part determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights.' Accordingly, this GSP does not determine or alter such surface water or groundwater rights."The GSA specifically engaged with Agricultural users throughout the GSP development process. This engagement included the items described in Section 1c (Notes and Communication). In addition to this effort, many of the members of the GSA member agency board members are farmers.
2135	Leonard Fleckenstein		1. When referring to "data gaps" for monitoring the Buellton Aquifer, the Plan needs to say those gaps are so spatially large that the groundwater level monitoring network is inadequate and insufficient. This statement is not only true, but also it will bolster the justification for the Plan's action items related to adding monitoring wells. Here are some specific suggested edits: - Page ES-9; top paragraph; change "could" to "should" in "….where the network could be improved".	10/10/2021 2:58:00 PM	Additional text was added in Section 3a.3 to clarify the extent of the data gap for monitoring water levels. The density of wells measuring water levels is currently sufficient according to the Best Management Practices (BMPs) document for SGMA (DWR, December 2016). For basins like the CMA that pump between 1,000 and 10,000 AFY, the BMPs recommend two wells per 100 square miles. The CMA

Unique ID	Name	Page Number	Comment	Date/ Time	Response
			- P. ES-15: Implementation Group 2: Should emphasize the necessity of adding a monitoring well in the Upland. - Per page 2a-16 says there is a need to "develop a more extensive groundwater level database for the Buellton Upland". This database improvement should be identified as a necessity in order to have a "more extensive database". - Page 2a-42: Yes! This paragraph does a good job of clearly identifying the data gap and what needs to be done. - If Figure 3a.3-1 is compared with the text below Table 3a.3-2 on page 3a-19, the text is misleading. With only 4 wells to monitor the Aquifer, and with 2 of those wells on the extreme western end of the CMA, and the other 2 wells located rather far in the eastern portion of the CMA, there is a clear lack of sufficient monitoring wells for covering the vast majority of the Aquifer's area. This insufficiency is striking when the map of GW level wells is compared with the map of water quality wells. As noted on page 3a-20, the water quality monitoring wells do indeed "provide adequate spatial distribution". The text on page 3a-19 should be revised to say there is not sufficient spatial distribution of the wells to be used for GW level monitoring. - Page 3b-32: Given the lack of monitoring wells within the Buellton Aquifer, I question the accuracy of the statement that "the groundwater monitoring program for the Buellton Aquifer will provide adequate data to assess the measurable objective for chronic lowering of groundwater levels." Because "existing monitoring wells will be used…..until additional wells are added", the existing wells are too few in number and too spatially separated to provide adequate data.		currently has four wells per 30 square miles. The GSA would like to improve the monitoring network in the future.
2136	Leonard Fleckenstein		2. The Plan should more clearly call out the need to assess not only the location but also the interconnectivity, if any, between the Buellton Aquifer and the Alluvial subflow east of the Buellton Bend.- Page ES-5, final paragraph: What is the actual "data gap" that is mentioned? Is it only "the extent that the Buellton Aquifer underlies the SY River and alluvial subflow" as is stated? I believe it also should include the extent to which there is inter-connectivity between the Aquifer and the subflow.- Page ES-15: Implementation Group 2: The Plan should include a proposed action to better determine interconnectivity of aquifer and river subflow.- Page 2a-15 states that "a precise understanding of the Buellton aquifer underneath the SYR is undetermined." And also says "Additional geophysical AEM data collected within the CMA will be able to fill in more details and validate the geologic structure of the Buellton Aquifer in the SYRA subarea". Thus, the GSP should have an action item to obtain the needed data and conduct an analysis.- Page 2a-37: Paragraph 2 says "…the streamflow loses water to the ground water aquifers of the Santa Ynez River alluvium subarea". This statement is confusing because it refers to "groundwater aquifers of the alluvium" (my empahais added). Please clarify! - If the paragraph 2 above is actually some surface/alluvial flows can help recharge the Buellton Aquifer, then that point needs to be made in several other places in this Plan.- Page 2b-7 final sentence and page 2b-8 top sentence: Does the downward gradient (from the alluvium to the underlying aquifer) mean that subflow water in the alluvium can (and does) enter the Buellton Aquifer?- Page 2b-35: Section 2b.6-2 says "there is no interconnected surface water in the CMA". However, the previous sentence seems to say there is a "data gap" regarding the extent of connectivity of the Buellton Aquifer and the river's alluvial subflows. Given this data gap, the text shouldn't say there is no connectivity, but should say the connectivity east of the Buellton Bend is uncertain at this time due to lack of data.- Page 3a-21 at the bottom says "Surface Water Depletion monitoring network will include"…. "use of groundwater level monitoring as presented in Figure 3a.3-3 as a proxy to evaluate potential Surface Water Depletions". However, those existing monitoring wells (several of which are west of the Buellton Bend where there is no underlying Aquifer) must be drawing from the alluvial subflow and not from the groundwater aquifer. So, the proposed network won't be using "groundwater level monitoring … as a proxy", it will be using subflow level monitoring as a proxy. The text should be revised to be clear on this point.	10/10/2021 14:58	This additional text has been added: "Due to this data gap of the extent of the Buellton Aquifer underneath the underflow deposits east of the Buellton Bend, the quantity and timing of water flowing from the Buellton Aquifer to the underflow deposits of the Santa Ynez River and indirectly to the surface flow is a data gap. Because the flow from the Buellton Aquifer would have to go through the underflow deposits before reaching the river and flows are regulated by the SWRCB, the potential effect of groundwater pumping on surface flow relative to pre-2015 conditions is expected to be minimal." For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer that underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. The text on Page 2a-37 has been updated to clarify that the streamflow infiltrates to the underflow deposits that are part of the known and definite channel which is part of surface water, not groundwater administered under SGMA. The text in Section 2b and 3a has also been corrected.
2137	Leonard Fleckenstein		3. Having to wait for 2 consecutive non-drought years in order to trigger any action could be waiting too long, especially if the rainfall pattern of the past decade continues through the next decade. Another triggering level should be established if groundwater levels fall to a certain depth for a certain length of time under drought conditions. - Page ES-11: The need to rely on data from 2 consecutive non-drought years is shown in small print in the table on page ES-11, but it also should be clearly stated in the text. - if we experience only drought years in the next decade (or alternating drought and normal/wet years), then minimum threshold levels won't be triggered. Thus, groundwater levels could plummet, and yet no mitigating actions will be taken. These facts should be clearly stated in the Exec Summary and elsewhere. - Pages ES-13 and ES-14: These pages should clearly state that the undesirable results thresholds will only be triggered based on monitoring data from 2 consecutive non-drought years.	10/10/2021 14:58	Comment noted. If future droughts occur longer than historical patterns or projected future water budget, then the GSA will have to revise and update the minimum thresholds and sustainable yield estimate. Due to an imbalance in future water budget, current Projects and Management Actions will reduce demands in the CMA to maintain water levels above the current minimum thresholds. The criteria of two consecutive non-drought years is utilized to screen out actions based on short-term drought cycles and manage within a long-term hydrologically balanced period.
2138	Leonard Fleckenstein		4. The Plan should call for a stream gage on the SY River within the CMA, preferably east of the Buellton Bend.- Page ES-8: The final paragraph should specifically say there are no stream gages within the CMA on any streams nor on the river. - Page ES-15: Implementation Group 2: Add an action to install stream gages on at least the river and perhaps also on a stream in the CMA.- Page 1d-18: The section on streamflow monitoring should state that there is no streamflow monitoring currently taking place in the CMA. - Figure 2b.6-1: It's extremely difficult to distinguish the active gage symbol from inactive gage symbols. A reader could easily, but mistakenly, assume there are active gages within the CMA. A different symbol or color should be used for either the active or inactive gages.- Page 2b-33: The text should state that all gages within the CMA	10/10/2021 14:58	There are already existing USGS gages on the inflows into the CMA. There is a USGS gage nearby in the WMA, in order to reduce costs, it is recommended at this time to set up a plan to measure flows at the western boundary of the CMA for a period of one year in order to develop a relationship between the flows at the boundary and at the gage downstream in the WMA (the Lompoc Narrows Gage). Please see additional text in Section 2b.

Unique ID	Name	Page Number	Comment	Date/ Time	Response
			boundaries are inactive, including 3 on the river, 1 on Zaca creek and 1 on Nojoqui Creek. - Page 3a-22 incorrectly states that the surface water depletion monitoring network will include: "continued use of stream gage data from within the CMA….". However, there is no stream gage within the CMA (per Fig 2b.6-1). The text is incorrect and needs to be revised. Also, the Plan should recommend installing at least one or more gages within the CMA, at least on the SY River.- Page 3b-6, As noted in my comments above, in addition to the data gaps identified in this section, there is also a data gap for stream flows because of the lack of any stream gage within the CMA's boundaries. A program should be initiated to install stream gages and to monitor them. - Page 5a-4: Per my previous comments, a surface water gage should be proposed for installation on the SYR within the CMA.		
2139	Leonard Fleckenstein		5. The Plan should commit to more and better public outreach for implementing "Management Actions" and for future plans and related studies or findings (such as AEM results).	10/10/2021 14:58	Comment noted. The GSA is always looking for specific suggestions to improve outreach. The outreach has been conducted and will continue during implementation in accordance with the Communication and Engagement Plan (Appendix 1c-A) and SGMA regulations. Ongoing communication will be conducted using the public website SantaYnezWater.org to post data, reports and meetings, all of which will promote successful public involvement to guide the future activities within the GSA.
2140	Judi Stauffer	N/A	1. It seems to me that at least two to three (2-3) more directors need to be added to the agency's decision-making board. I suggest someone representing a local water agency (e.g. Bobcat Springs Mutual Water Company), representation from the agriculture sector, and someone representing the conservation community. 2. As I understand the documents, the aquifer in central portion of the SYV River Valley Groundwater Basin is presently considered "in balance." What threshold of change will a trigger a signal that the aquifer is moving "out of balance" so measures can be taken (e.g. reduce usage to increase water storage)?3. Since riparian areas in the SYV River Valley Groundwater Basin are considered surface water dependent, until groundwater and alluvium interconnectedness is established it seems premature to monitor surface water.4. Since the City of Buellton continues to grow, add hotel and other tourism services, and flirts with expanding its sphere of influence (and eventually its city limits) and SB County continues to approve more cannabis grows, will water availability and storage capacity trigger enforceable constraints on both the City and County in this regard?	10/18/2021 16:14	1. The GSAs in the Santa Ynez Basin are working on a future governance structure for the GSAs. Meetings to discuss future governance are open to the public and there will be opportunities for the public to participate. 2. Minimum thresholds are discussed in Section 3B. Current groundwater level thresholds are 15 feet below 2020 groundwater levels. 3. Surface water flow measurements are currently a data gap which will be addressed by the installation of a new surface water gauge. 4. Early triggers were established for Group 2 Projects and Management Actions which include supplemental conditions on new wells.
2141	Nancy Emerson	N/A	This is a General Comment regarding the specific comments to be entered by WE Watch. There may be a problem in linking the two as the form only allows either General or Specific Comments, not both at the same time. WE Watch is a Santa Ynez Valley environmental/land use organization with members in both the Central and the Eastern Management Areas. We have provided separate comments for each Area's plans and will insert them in each plan with page notation. This will be done today.Thank you. Nancy Emerson	10/20/2021 11:23	Thank you for your comments. Please see responses to each comments below.
2142	Nancy Emerson	1-Jan	WE Watch Comments. Central Management Area GSA Plan Nancy Emerson, President & Nick DiCroce, Water Issues Group, ChairpersonThe almost 1,000 page Plan (which includes the Executive Summary, and seven sections with appendices, tables, and figures) is a thorough, detailed examination of the Central Management Area GSA Plan, which ties into the potential statewide plan to achieve groundwater sustainability. The Plan has been carefully constructed and appears to be detailed enough to be able to be utilized for the implementation of local and statewide groundwater sustainability. WE Watch recommends that, even though the State has allowed 20 years to achieve necessary sustainability after development of an approved Groundwater Sustainability Plan, our local implementation period be no more than 10 years, and preferably 5 years. This will be easier for the Central Management Area since its current groundwater situation is evaluated as sustainable. That status could change rapidly if drought years persist, temperatures rise, population growth increases, and open space converts to housing or the type of agriculture which overuses water.Groundwater is the primary source of water in the Santa Ynez Valley because the amount of State Water is so unreliable from year to year and the amount of water available from the Santa Ynez River is so small, especially in times of drought. How climate change will affect the Valley is uncertain and we need to be prepared to deal with a worst-case scenario both short-term (5-10 years) and long-term (20 years and beyond). In a 2018 landmark report on California water solutions, Environmental Water Caucus first Strategic Goal indicates that groundwater management needs to be overhauled. A new sustainable groundwater management approach that allows 20 years for implementation is unreasonable, and it would never have been contemplated in this report and put off for such a long period. http://www.ewccalifornia.org/reports/CWSN3rdEdition.pdf[1]	10/20/2021 11:33	Thank you for the comments. SGMA requires that the GSA develop and implement groundwater sustainability plans to avoid undesirable results and mitigate overdraft within 20 years. The work to achieve the Basin's Sustainability goal will start as soon as the plans are submitted in January 2022. SGMA provides for accountability through the annual reports and adaptive management through updates to the GSP every 5 years.
2143	Nancy Emerson	5a-1	Section 5a.2 Monitoring Network Data Gaps. The plan needs to say gaps are so spatially large that the groundwater level monitoring network is inadequate and insufficient. This will assist the justification for the Plan action items related to adding monitoring wells. (pg. 5a-1)	10/20/2021 11:33	Additional text was added in Section 3a.3-1-2 to clarify the extent of the data gap for monitoring water levels. The density of wells measuring water levels is currently sufficient according to the Best Management Practices (BMPs) document for SGMA (DWR, December 2016). For basins like the CMA that pump between 1,000 and 10,000 AFY, the BMPs recommended to have 2 wells per 100 square miles. The CMA currently has four wells per 30 square miles.
2144	Nancy Emerson	51-13	Section 5A. Plan Implementation. 5a.5. Reporting & Plan Updates. Changes will need to be made to the 5-Year Plan Assessment to consider the 5-Year Plan as the final implementation date, at least for the Group 1 Action Items. If necessary,	10/20/2021 11:33	Please see edits in Section 5a.5-2 Five-Year Plan Assessment regarding schedule for implementing Group 1 Action items.

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			the implementation date beyond the 5-Year limit can be adjusted by one-year increments, but in no case should the implementation date go beyond a 10-yearperiod from the start of implementation. The time period beyond the 5-Year period will depend on the overall groundwater condition of agencies in a particular area. (pg. 5a-13)		
2145	Nancy Emerson	5a-13	Section 5a.5-1 and 5a.5-2. Reporting and Plan Updates. In addition to communication with the State, ongoing communication with groundwater users and the entire community is needed if the Plan is to be implemented successfully and the public reassured about the long-term sustainability of the groundwater on which our lives in the Valley depend. This means not only the GSA, but individual agencies being asked to help by keeping their users informed about the plan and its implementation. (pgs. 5a-13)	10/20/2021 11:33	Please see edits in Section 5A.5 Reporting and Plan Updates regarding continuing the ongoing communication with the entire community.
2146	Nancy Emerson	5c-1	Section 5C. Plan Funding. WE Watch urges that the action priority be to get a governance structure in place and funded and commitments to implement the plan. (pg.5c-1)	10/20/2021 11:33	The governance structure and funding mechanisms will be discussed by the GSAs during public meetings and there will be opportunities for the public to participate.
2147	Leonard Fleckenstein	1	Page 2a-15 and the 3 cross section figures: Figure A-A' shows the alluvium (Qal) being on top of the Aquifer (Paso QTp and Careaga Tca), but the text says the Aquifer is separated from the SYR and subterranean alluvial deposits except west of the Buellton Bend. - In contrast, page 2a-41 seems to say the opposite; it has a good description basically saying that the entire River upstream of the Lompoc Narrows is underlain by bedrock except for section from the EMA/CMA boundary to the Buellton Bend. This section includes "Paso Robles and Careaga Sand" …. "beneath the Santa Ynez River alluvial deposits." Page 2a-19 , top paragraph. Typo with freestanding "i". P. 2a-25; SY River and Tributaries: 1st, paragraph, Final sentence should be edited because the tunnels take water not only to cities (SB and Goleta) but also to Montecito, which is not a city. Jameson Reservoir and Doulton tunnel are owned and operated by the Montecito Water District. P. 2a-26; paragraph 2; Wouldn't the tributary that has the eastern most confluence with the SY River be Nojoqui Creek rather than Zaca Creek? I think of Nojoqui Creek as being east of Hwy101 and Zaca Creek as being west of Hwy 101. P. 2a-34: para 1; final sentence; change "with no permit issued for 13 parcels" to with no permits yet issued as of August 2021 for 13 parcels. P. 2a-41 mentions "additional geophysical AEM data" (in paragraph 2) and "The AEM geophysics study" (in paragraph 3) but the text should be clear on the status of the data and the study, or say that the study is a recommended action (if that is the case).	10/10/2021 14:58	Thank you for your comments. The GSP has been revised accordingly.
2148	Leonard Fleckenstein	1	Page 2b-7: Seasonal High text: What are the units of measure for the hydrographs, e.g., # of feet to reach groundwater level? Or the elevation level above sea level? The units should be indicated in the text and on the maps (Figures 2b.1-1 and 1-2). Page 2b-8 re Evaluation of Seasonal High and Low: When the text says "groundwater elevations measured in Fall 2019 are lower than those measured in Spring 2020", I believe that means the recorded number is higher, i.e., the depth to groundwater is a larger number in the fall than in the spring. Perhaps this point should be made clear, because it can be confusing for a general public reader who may be thinking of depth to water rather than elevation - - or vice versa. Figure 2b.6-3: The drawn line boundary of the Buellton Aquifer (near Buellton Bend) is very helpful in this Figure. It should be similarly shown on some other maps, especially Figures 2a.2-1, and/or -2, -3, and -4.	10/10/2021 14:58	Figures 2b.1-1 and 1-2 are based on groundwater elevation in feet above sea level, and text was added to clarify. The boundary of the Buellton Aquifer was added to Figures 2a.2-1 through 4.
2149	Leonard Fleckenstein	1	Fig 2c.1-1 shows (and is titled as) the HCM for the Western MA, not the CMA; and it even includes the Lompoc Reclamation Plant. This graphic should be replaced by the HCM graphic in the PowerPoint slides which shows a wastewater plant but doesn't label it as the Lompoc Plant. Alternatively, since one HCM is being used for both the WMA and the CMA, this Figure could be re-titled and the drawing re-labeled so the Lompoc RWRP becomes simply "Wastewater Recharge" since wastewater recharge happens in Buellton too. Page 2c-21. Says "Santa Rita Upland (CMA) and Buellton Upland (WMA)…". Shouldn't those CMA & WMA designations be switched? Figure 2c.2-1: For inflows, are any "river alluvium inflows" actually visible on this chart? I can't see any. - Isn't this chart incorrectly showing Imported SWP water prior to 1997?- why is the Imported SWP shown as a consistent dark line? Shouldn't there be great variability over time?- is the Net Percolation color actually visible on the chart? I see only SY River and alluvium colors.Page 2c-42: While Figures 2c.3-1A&B are excellent in giving annual averages, there should be another figure to show the data from page 2c-42, i.e., the net decline of 10,880 AF over the total years of the current water budget period of 2011-2018.	10/10/2021 14:58	Figure 2c.1-1 has been revised based on the CMA, and page 2c-21 has been corrected. For the other additional information requested please refer to Table 2c.2-3 and Figure 2c.2-5.

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2150	Leonard Fleckenstein	8-Jan	Page ES-1: Paragraph 1 says "Basin" means the entire S- Y- R- V- G- Basin, and then says "….current Basin conditions are sustainable…..". How is it sustainable if in the CMA we need to avoid continual loss of 200 AF (or more) per year? Page ES-1: Perhaps change "Physical and political complexities…." to "Physical, political, and water management complexities….". Page ES-2, bottom paragraph, line 4: Change "Upland which are" to Upland which is" Page ES-3, paragraph 2, line 4: After "imported water" delete the word "primarily"; after Project, insert the word "only". Page ES-7, paragraph 2 says surface water inflows were 32,040 AF/year; and the outflows were also 32,040. Is that correct? Page ES-8, paragraph 2; should indicate the number of wells being monitored in the CMA by USGS, SBCWA, and the City, i.e., 3 separate numbers.	10/10/2021 14:58	Sustainability in the CMA is based on absence of undesirable results (see Section 3b.2). Please see edit on page ES-3. Surface water inflows and outflows estimates are correct and include inflows and outflows from the underflow deposits. Details on well monitoring are provided in Section 3a.
2151	Leonard Fleckenstein	1	Page 1c-5: The heading is incorrectly numbered. Should be a "c" not a "d" in 1d.1-5 Public comments.Page 1d-7. A new paragraph should be added at the end of this section to say that although the Buellton Upland and the Alluvium are distinct subareas of the CMA, the Buellton aquifer underlies the Buellton Upland and underlies part of the Alluvium subarea east of the Buellton Bend.Section 1d.4-2: This section on "Management Plans" should be put into the Appendices....1d.5.: ………"Regulatory Programs"………………. should be in the Appendices… 1d.6………….."Land Use Considerations"………………………………in the Appendices.	10/10/2021 14:58	Please see edit on page 1d-7 correcting these typos.
2152	Leonard Fleckenstein	1	Page 3a-14: The 2nd bullet point regarding CCWA deliveries is irrelevant to this issue. Although the SWP data is appropriately part of the water budget, the amount of SWP water delivered in the CMA (i.e., to the City of Buellton) doesn't help to "estimate current surface water conditions within the CMA". If you have data to show a relationship between SWP deliveries and surface water conditions, then please present it here. However, I doubt that any such relationship exists, partly because poor surface water conditions due to drought often mean low SWP deliveries due to drought in Northern CA. Page 3b-3; final paragraph says: "Water levels and GW in storage in the SYR Alluvium fluctuate in response to water rights and environmental regulations." No! Better to say: Alluvium storage fluctuates in response to: precipitation, river flow (including releases from Cachuma), water diversions from the river, pumping from the alluvium, surface evaporation, and phreatophyte ET. Then you could add that water rights and environmental regulations influence water releases, diversions, and pumping. - Also, the sentence is using the term "groundwater in storage" for the alluvium! ! Page 3b-3, final paragraph: Insert data between "groundwater elevation" and "is needed".	10/10/2021 14:58	Please see edit on page 3a-14 that puts SWP deliveries in the category of basin fluxes, and page 3b-3 that deletes sentence on groundwater and Santa Ynez River alluvium.
2153	Leonard Fleckenstein	1	Table 4a.1-2: For "Supplemental Imported Water", I contend that the "estimated benefit" would be Low, not Low to Medium. The text later in the chapter actually identifies why, i.e.: cost of SWP water would be very high; SWP water is often unavailable when it is most needed during drought years; banking the water somewhere else would add to the cost; etc. Also, I believe Buellton residents won't want to substitute aquifer water with more expensive SWP water. Retaining this action item in the Plan is fine, but the "benefit/cost" would be low.Table 4a.2-1: Change spelling of "Tired" to Tiered. Page 4a.-35: Since "Group 4" actions seem to be out-of-the-box thinking, how about adding a regional seawater desalination plant to the list? A desal plant on Vandenberg SFB could pump water in a new pipeline along CCWA's pipeline route. Page 5a-1, table: The Group 1 PMAs should be included in this table, either individually or as a line item, e.g., "Group 1 PMAs", with a "Task" to start implementing them in WY2023.Page 5a-3: Final paragraph quotes a cost for 2 new monitoring wells. Why not quote a cost for only 1 well, which at least would be more affordable? - - even if 2 wells are sought. Also, this kind of project might be ideal for a future grant from the State or the Feds. This project should be included in the County's IRWM Plan.	10/10/2021 14:58	Comments noted. Please see edit on page Table 4a.2-1 (typo fixed). On page 4a-35, a regional seawater desalinization plant was added to Group 4. For Table 5a-1, the PMAs were added to the implementation table. The Supplemental Imported Water project was kept with low to medium benefits until more financing options for long-term water supply solutions (i.e., taking advantage of SWP water during wet periods) is evaluated.
2159	Ngodoo Atume		Hello, I am writing on behalf of Audubon California, Clean Water Action, Clean Water Fund, Local Government Commission, The Nature Conservancy, and Union of Concerned Scientists with the attached comments on the draft Groundwater Sustainability Plan for this basin. We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss our evaluation as you finalize your Plan for submittal to DWR. Feel free to contact us at ngos.sgma@gmail.com for more information or to schedule a conversation.Sincerely,Ngodoo Atume, Water Policy Analyst, Clean Water Action/Clean Water Fund	10/25/2021 10:37	As part of developing this GSP, the GSA considered, reviewed, and cited documents prepared by signatories to this letter.
2160	Ngodoo Atume (TNC et. al.)		Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be insufficient under SGMA. We highlight the following findings: 1. Beneficial uses and users are not sufficiently considered in GSP development.	10/25/2021 10:37	Beneficial uses and users were sufficiently analyzed, which is why the minimum thresholds set in the CMA are conservative and protective of all groundwater users,

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			a. Human Right to Water considerations are not sufficiently incorporated. b. Public trust resources are not sufficiently considered. c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users are not sufficiently analyzed.		including the ISWs and GDEs for the SYR, with thresholds set 15-feet below 2020 water levels for the Buellton Aquifer.
2161	Ngodoo Atume (TNC et. al.)		2. Climate change is not sufficiently considered.	10/25/2021 10:37	The DWR guidance for climate change was used for preparation of the water budgets for the Plan as described in Section 2c. The climate change forecasts can be revised in the 5-year update of the GSP. As climate science further develops, it will be important to use the data that reflect the current understanding and best available science at the time of future GSP updates.
2162	Ngodoo Atume (TNC et. al.)		3. Data gaps are not sufficiently identified and the GSP does not have a plan to eliminate them.	10/25/2021 10:37	Plans are included in the GSP to address data gaps with aerial geophysical survey analysis, adding additional monitoring wells for water level data, and taking additional surface water flow measurements of the outflow from the CMA. In addition, an update to well registration with required metering or appropriate alternative will greatly improve the groundwater pumping database.
2163	Ngodoo Atume (TNC et. al.)		4. Projects and Management Actions do not sufficiently consider potential impacts or benefits to beneficial uses and users.	10/25/2021 10:37	The PMAs do state and consider all beneficial uses and users. The ongoing implementation of PMA's in Group 1, including groundwater pumping demand reductions up to 900 AFY through the Water Conservation and the Well Meter and Groundwater Extraction Fee Programs, will maintain the current groundwater conditions and maintain the sustainability of the Basin by balancing the projected future Water Budget deficits. SGMA provides for accountability through the annual reports/ monitoring and flexibility through the 5-year GSP update process.
2164	Ngodoo Atume (TNC et. al.)		<u>Disadvantaged Communities and Drinking Water Users</u> The identification of Disadvantaged Communities (DACs) and drinking water users is insufficient. **Recommendations** ● Map the locations of DACs within the CMA. The DWR DAC mapping tool can be used for this purpose. ● Identify the sources of drinking water for DAC members, including an estimate of how many people rely on groundwater (e.g., domestic wells, state small water systems, and public water systems).	10/25/2021 10:37	Definition of a Disadvantaged Community (DAC) provided by DWR is a geographical designation, as such it does not provide a 1:1 mapping to population numbers, as residents living in the area maybe above the income target, and other residents outside of a DAC also may be below the income targets.
2165	Ngodoo Atume (TNC et. al.)		While the plan provides a density map of domestic wells in the CMA, the GSP fails to provide depth of these wells (such as minimum well depth, average well depth, or depth range. **Recommendations**: Include a map showing domestic well locations and average well depth across the CMA.	10/25/2021 10:37	Information on well depth was already addressed in the Draft GSP at length in Appendix 3b-B, specifically identified by water use type including for domestic wells.
2166	Ngodoo Atume (TNC et. al.)		Our letter provides a review of the identification and consideration of federally recognized tribes (Data source: SGMA Data viewer) within the GSP from non-tribal members and NGOs. Based on the likely incomplete information available to our organizations for this review, we recommend that the GSA utilize the California Department of Water Resources' "Engagement with Tribal Governments" Guidance Document (https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents) to comprehensively address these important beneficial users in their GSP.	10/25/2021 10:37	As part of stakeholder identification, we reviewed Indian Tribes and identified that there were none located within the CMA. The only Federal Tribe in the Basin is the "Santa Ynez Band of Chumash Mission Indians of the Santa Ynez Reservation" is located in the EMA. Text added to Table 1c.1-1 footnote to clarify this.
2167	Ngodoo Atume (TNC et. al.)		The identification of Interconnected Surface Waters (ISWs) is insufficient, due to lack of supporting information provided for the ISW analysis.....While few water rights in the CMA may have "underflow" permits or licenses, the GSP has failed to substantiate the assertion that the shallow aquifer - in its entirety - is classified and managed as "underflow" by the SWRCB. We are generally concerned that the GSP is grossly extrapolating the existence of "underflow" in the shallow alluvium across the entire basin from a limited number of "underflow" points of diversions within the basin that are actually being managed by SWRCB. If the SWRCB is not managing the entire shallow aquifer as "underflow" and the beneficial users of groundwater and surface water reliant on it - this water is actually groundwater and is instead subject to SGMA regulations. **Recommendations:** ● Provide a map showing all the stream reaches in the CMA, with reaches clearly labeled as interconnected (gaining/losing) or disconnected. Consider any segments with data gaps as potential ISWs and clearly mark them as such on maps provided in the GSP. ● Substantiate the assertion that the shallow aquifer - in its entirety - is classified and managed as "underflow" by the SWRCB. Discuss SWRCB Order WR 2019-0148 and explain how it relates to the definition of ISW in the CMA. Cite relevant sections of the order, maps, and cross-sections.	10/25/2021 10:37	The ISWs and GDEs are shown on Figures 2b.6-3 and 3a.3-3. A new appendix document has been added to the GSP (Appendix 1d-B) which further documents the hydrogeological basis for characterization of the water within the Santa Ynez River Alluvium above the Lompoc Narrows as a subterranean stream, which occurs in a known and definite channel, and is also referred to as underflow or subflow. For purposes of SGMA, groundwater does not include subsurface "water that flows in known and definite channels...." As explained in said document, subsurface water within the Santa Ynez River Alluvium is not groundwater as defined by SGMA.
2168	Ngodoo Atume (TNC et. al.)		The GSP focuses on the phrase "completely depleted," without acknowledging the phrase "at any point." "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be crucial for surface water flow and supporting environmental users of groundwater and surface water. Using seasonal groundwater elevation data over multiple water year types is an essential component of identifying ISWs. **Recommendations**: ● Provide depth-to-groundwater contour maps using the best practices presented in Attachment D, to aid in the determination of ISWs. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a digital elevation model (DEM) to estimate depth to groundwater contours across the landscape. This will provide accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. ● Use seasonal data over multiple water year types to capture the	10/25/2021 10:37	The "Best Management Practices" mentioned are not from Department of Water Resources.Surface water flows and underflow act in response to operation of Lake Cachuma reservoir. Recognizing this SWRCB has managed underflow along the river since at least 1973. The GSA in its formation has not asserted a conflicting jurisdiction. This is discussed at length in Chapter 1.Groundwater elevation contours were provided in the Groundwater Conditions section (2b.1) of the report. 23 CCR §351(o) requires both (surface water is not completely depleted) and (hydraulically connected at any point). This may include a temporal component as mentioned.As described in the Groundwater Conditions (2b.2), conditions from

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			variability in environmental conditions inherent in California's climate, when mapping ISWs. We recommend the 10-year pre-SGMA baseline period of 2005 to 2015. ● Reconcile ISW data gaps with specific measures (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP.		period of record (1942-2020) at the USGS Salsipuedes Gage were reviewed in terms of natural water supply. The water budget Table 2c.1-1 has a more detailed breakdown using for the years 1982 through 2018. As shown in Minimum River flows (Table 2b.6-1) 2005-2015 was no flow / dry most years. We found other time periods were better than 2005-2015 for representing conditions for the basin.
2169	Ngodoo Atume (TNC et. al.)		In Section 3b.2-6 (Interconnected Surface and Groundwater – Undesirable Results), the GSP states (p. 3b-22): "The Santa Ynez River is the predominant interconnected surface water and groundwater system Santa Ynez River Valley Basin Central Management Area Draft GSP in the CMA and extends from the EMA to the WMA (Figure 3b.2-3)." This figure is missing from the GSP, however.	10/25/2021 10:37	Typo has been corrected to "Figure 3a.3-3".
2170	Ngodoo Atume (TNC et. al.)		The identification of Groundwater Dependent Ecosystems (GDEs) is insufficient. The GSP took initial steps to identify and map GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset). However, we found that some mapped features in the NC dataset were improperly disregarded, as described below. NC dataset polygons were incorrectly removed If depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems. However, description of the groundwater data used for the 30-foot threshold analysis is not provided in the GSP text. If it is the fall 2019 and spring 2020 data described in Section 2b.1-2 (Groundwater Elevation Contour Maps), then this data does not provide sufficient seasonal and temporal variability and it is after the 2015 SGMA benchmark date. **Recommendations**: ● Use depth-to-groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. We recommend that a pre-SGMA baseline period (10 years from 2005 to 2015) be established to characterize groundwater conditions over multiple water year types. Refer to Attachment D of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. ● Refer to Attachment B for more information on TNC's plant rooting depth database. Deeper thresholds are necessary for plants that have reported maximum root depths that exceed the averaged 30-ft threshold, such as valley oak (Quercus lobata). We recommend that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to-groundwater threshold of 80 feet should be used instead of the 30-ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources. ● Provide depth-to-groundwater contour maps, noting the best practices presented in Attachment D. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a digital elevation model (DEM) to estimate depth-to-groundwater contours across the landscape. ● If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons as "Potential GDEs" in the GSP until data gaps are reconciled in the monitoring network. ● Include an inventory of the flora and fauna present within the CMA's GDEs (see Attachment C of this letter for a list of freshwater species located in the CMA).	10/25/2021 10:37	Available historical groundwater data, including over different seasons, was evaluated for the determination of interconnected surface water reaches and groundwater dependent ecosystems. In the CMA, the groundwater in the Buellton Aquifer is not in direct contact with the Santa Ynez River surface flow because of the underflow deposits which are treated as part of the surface water system regulated by the SWRCB. Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. The text on Page 2a-37 has been updated to clarify that the streamflow infiltrates to the underflow deposits that are part of the known and definite channel which is part of surface water, not groundwater administered under SGMA.
2171	Ngodoo Atume (TNC et. al.)		NC dataset polygons were incorrectly removed from riparian areas of the Santa Ynez River if identified as being "underflow" and managed by the SWRCB. However, as stated above under the ISW section of this letter, the GSP has failed to substantiate the assertion that the shallow aquifer - in its entirety - is classified and managed as "underflow" by the SWRCB, nor has the GSP provided a sufficient explanation of how the SWRCB Order relates to groundwater management in the CMA. Recommendations: Show the extent of the shallow aquifer that is classified and managed as "underflow" by the SWRCB. For example, include a map and description of extraction points and whether they source "underflow" or "groundwater" from the shallow alluvium. Discuss SWRCB Order WR 2019-0148 and explain how it relates to SGMA and the definition of ISW in the CMA. Cite relevant sections of the order, maps, and cross-sections.	10/25/2021 10:37	A new appendix document has been added to the GSP (Appendix 1d-B) which further documents the hydrogeological basis for characterization of the water within the Santa Ynez River Alluvium above the Lompoc Narrows to Cachuma Reservoir as a subterranean stream in more detail. As substantiated in detail in said document, the Santa Ynez River Alluvium occurs in a known and definite channel, and is also referred to as underflow or subflow.
2172	Ngodoo Atume (TNC et. al.)		Native vegetation and managed wetlands are water use sectors that are required to be included in the water budget. The integration of native vegetation into the water budget 2 3 is sufficient. We commend the GSA for including the groundwater demands of this ecosystem in the historical, current and projected water budgets.	10/25/2021 10:37	Your comment has been received and is appreciated.
2173	Ngodoo Atume (TNC et. al.)		State whether or not there are managed wetlands in the CMA. If there are, ensure that their groundwater demands are included as separate line items in the historical, current, and projected water budgets.	10/25/2021 10:37	There are no "managed wetlands" in CMA. Clarifying text was added to section 2a.4 "Uses and Users of Groundwater in the Central Management Area".
2174	Ngodoo Atume (TNC et. al.)		Stakeholder engagement during GSP development is insufficient. SGMA's requirement for public notice and engagement of stakeholders is not fully met by the description in the Public Outreach and Engagement Plan (Appendix 1c-C).4 We note the following deficiencies with the overall stakeholder engagement process: **Recommendations**: ● Include a more detailed and robust Public Outreach and Engagement Plan that describes active and targeted outreach to engage DAC members, domestic well owners, and environmental stakeholders throughout the GSP development and implementation phases. Refer to Attachment B for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.	10/25/2021 10:37	Section 1c (and appendices) describes how the plan was implemented including copies of newsletters mailed to every water user in the plan area. Some specific post GSP submittal outreach and engagement activities are mentioned in Chapter 4 and Chapter 5 tied to specific implementation or project and management activities. The draft Public Outreach and Engagement Plan OEP was presented to the public

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			● Utilize DWR's tribal engagement guidance to comprehensively address all tribal beneficial users in the basin within the GSP.6		for comment on July 29, 2019 through November 29, 2019 for a total of 123 days. These comments were then incorporated into the current document.
2175	Ngodoo Atume (TNC et. al.)		Despite this well impact analysis, the GSP does not sufficiently describe whether minimum thresholds will avoid significant and unreasonable loss of drinking water to domestic well users in those 30% domestic wells predicted to be affected, especially given the absence of a well mitigation plan in the GSP. In addition, the GSP does not sufficiently describe or analyze direct or indirect impacts on DACs when defining undesirable results, nor does it describe how the groundwater level minimum thresholds will avoid significant and unreasonable impacts to DACs and domestic well users beyond 2015 and be consistent with Human Right to Water policy. **Recommendations**: Chronic Lowering of Groundwater Levels ● Describe direct and indirect impacts on drinking water users and DACs when describing undesirable results and defining minimum thresholds for chronic lowering of groundwater levels.	10/25/2021 10:37	The well impact analysis was used by the GSA to set minimum thresholds and measurable objectives to avoid undesirable results. As described in Section 3b.3-1 and 3b.4-1of the Plan the analysis was conducted over several months. There were several public meetings to set the MTs and MOs with the input of the GSA and public in protection of all well users, which includes DACs. The minimum thresholds set in the CMA are conservative and protective of all groundwater users, including the DACs. MTs were set 15-feet below 2020 water levels for the Buellton Aquifer. The well registration program described in Section 5a.3-1 will include domestic municipal and agricultural wells. The registration information will help the GSA implement the GSP and manage groundwater in the CMA. A drinking water well impact mitigation program is not required by SGMA and is considered unnecessary at this time. The GSA will address undesirable results experienced by domestic wells owners if necessary.
2176	Ngodoo Atume (TNC et. al.)		The GSP does not compare the WQOs with MCLs to ensure the most protective values are chosen as minimum thresholds. The GSP only includes a very general discussion of impacts to drinking water users when defining undesirable results and evaluating the impacts of proposed minimum thresholds. The GSP does not, however, mention or discuss direct and indirect impacts on DACs when defining undesirable results for degraded water quality, nor does it evaluate the cumulative or indirect impacts of proposed minimum thresholds on DACs. **Recommendations**: Degraded Water Quality ● Describe direct and indirect impacts on drinking water users and DACs when defining undesirable results for degraded water quality. For specific guidance on how to consider these users, refer to "Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act."10 ● Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on DACS and drinking water users. ● Provide a table in the GSP that compares WQOs to MCLs for all COCs. Ensure that the most protective value is chosen for the minimum threshold.	10/25/2021 10:37	The method presented in Section 3b.2-4, 3-4, and 4-4 include the rationale for the setting of minimum thresholds and measurable objectives to avoid undesirable results (including the degradation of water quality) in compliance with the SGMA regulations. The analysis presented is protective of all uses and users in the CMA, including agricultural, municipal wells, and domestic wells. The protection of drinking water users is based on public drinking water standards, and is regulated by the RWQCB and DDW outside of the SGMA context. The only DACs in the CMA are within the City of Buellton and are served water by the City of Buellton. The City's water supply is protective of DACs within its boundaries.
2177	Ngodoo Atume (TNC et. al.)		The GSP only considers GDEs with respect to the depletion of interconnected surface water sustainability indicator, but not the chronic lowering of groundwater levels sustainability indicator. No analysis or discussion is provided in the GSP that describes impacts on GDEs or establishes SMC for GDEs that are directly dependent on groundwater. This is problematic because without identifying potential impacts on GDEs, minimum thresholds may compromise these environmental beneficial users. Since GDEs may be present in areas of the CMA that are not adjacent to ISW (see our comments in the GDE section of this letter), they must be considered when developing SMC for chronic lowering of groundwater levels. **Recommendations**: ● Define chronic lowering of groundwater SMC directly for environmental beneficial users of groundwater. When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact on GDEs. Undesirable results to environmental users occur when 'significant and unreasonable' effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the CMA. Defining undesirable results is the crucial first step before the minimum thresholds can be determined.	10/25/2021 10:37	Chapter 3 presents minimum thresholds for groundwater levels that are protective of identified GDEs including from chronic lowering of groundwater levels. Primarily conditions that affect GDEs are controlled by surface water releases out of the Lake Cachuma reservoir, which is under the jurisdiction of SWRCB. This jurisdiction includes underflow of the Santa Ynez River as explained at Appendix 1d-B.
2178	Ngodoo Atume (TNC et. al.)		For depletions of interconnected surface water, the GSP does not describe undesirable results to beneficial users of surface water, other than to say (p. 3b-23): "Surface water releases through the Cachuma Reservoir to the CMA are managed by SWRCB under Order WR 2019-0148. The lowering of groundwater levels below historical lows in the Upper Aquifer potentially impacts habitat and ecosystem health along the Santa Ynez River." The GSP continues (p. 3b-24): "Using groundwater levels adjacent to the Santa Ynez River, undesirable results associated with a depletion of interconnected surface water and groundwater will be quantified by measuring groundwater elevations semi-annually at three representative monitoring points located adjacent to the Santa Ynez River (Figure 3b.2-3) and maintaining water levels above historical low groundwater levels. Significant and undesirable results are defined as groundwater elevations that drop to 15 feet below channel thalweg elevations in two out of the three representative monitoring wells for two consecutive non-drought years (Section 3b.3-6)." However, no analysis or discussion is presented to describe how the SMC will affect GDEs, or the impact of these minimum thresholds on GDEs in the CMA. Furthermore, the GSP makes no attempt to evaluate the impacts of the proposed minimum threshold on environmental beneficial users of surface water. The GSP does not explain how the chosen minimum thresholds and measurable objectives avoid significant and unreasonable effects on surface water beneficial users in the CMA, such as increased mortality and inability to perform key life processes (e.g.,reproduction, migration). **Recommendations**: ● When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in the	10/25/2021 10:37	Additional text has been added on potential effects on the beneficial uses and users of interconnected surface water and groundwater dependent ecosystems that may occur from undesirable results. In the CMA, the groundwater in the Buellton Aquifer is not in direct contact with the Santa Ynez River surface flow because of the underflow deposits which are treated as part of the surface water system. Additional text has been added on the quantity and timing of water from the Buellton Aquifer to the Santa Ynez River Alluvium. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to map the contact between t the Buellton Aquifer and the Santa Ynez River Alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits.

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			CMA are reached.13 The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts on environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP. These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law.6,14 ● When establishing SMC for the basin, consider that the SGMA statute [Water Code §10727.4(l)] specifically calls out that GSPs shall include "impacts on groundwater dependent ecosystems".		The text on Page 2a-37 has been updated to clarify that the streamflow infiltrates to the underflow deposits that are part of the known and definite channel which does not contain groundwater as defined by SGMA.
2179	Ngodoo Atume (TNC et. al.)		The integration of climate change into the projected water budget is insufficient. **Recommendations:** ● Integrate climate change, including extremely wet and dry scenarios, into all elements of the projected water budget to form the basis for development of sustainable management criteria and projects and management actions. ● Incorporate climate change into surface water flow inputs, including imported water, for the projected water budget. ● Estimate sustainable yield based on the projected water budget with climate change incorporated. ● Incorporate climate change scenarios into projects and management actions.	10/25/2021 10:37	The DWR guidance for climate change was used for preparation of the water budgets for the Plan as described in Section 2c. This includes the forecasted local streamflow, which is projected to increase slightly by 0.5% in 2030 and 3.8% in 2070 under the Central Tendency climate change scenario, and the imported State Project supplies based on DWRs 2019 SWP Delivery Capability Report. It is anticipated that climate change will be described in each annual report and evaluated as part of the GSP update process every five years.
2180	Ngodoo Atume (TNC et. al.)		The consideration of beneficial users when establishing monitoring networks is insufficient, due to lack of specific plans to increase the Representative Monitoring Wells (RMWs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs in the CMA. **Recommendation**s: ● Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, GDEs, and ISWs to clearly identify which beneficial users are not adequately being monitored spatially and at depth. ● Increase the number of RMWs in the shallow aquifer across the CMA as needed to adequately monitor all groundwater condition indicators across the CMA and at appropriate depths for all beneficial users. Prioritize proximity to DACs, domestic wells, GDEs, and ISWs when identifying new RMWs. ● Describe biological monitoring that can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the CMA.	10/25/2021 10:37	The Representative Monitoring Well network for both water levels and water quality uses more wells than is recommended for monitoring of undesirable results in the CMA. For example, the density of wells measuring water levels is currently sufficient according to the Best Management Practices (BMPs) document for SGMA (DWR, December 2016). For basins like the CMA that pump between 1,000 and 10,000 AFY, the BMPs recommended to have 2 wells per 100 square miles. The CMA currently has four wells per 30 square miles. Plans are included in the GSP to address data gaps with aerial geophysical survey analysis, adding additional monitoring wells for water level data, and taking additional surface water flow measurements of the outflow from the CMA. In addition, an update to well registration with required metering or appropriate alternative will greatly improve the groundwater pumping database.
2181	Ngodoo Atume (TNC et. al.)		The consideration of beneficial users when developing projects and management actions is insufficient, due to the failure to completely identify benefits or impacts of identified projects and management actions, including water quality impacts, to key beneficial users of groundwater such as GDEs, aquatic habitats, surface water users, DACs, and drinking water users. Therefore, potential project and management actions may not protect these beneficial users. Groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for all beneficial users. Recommendations: ● For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program. ● For DACs and domestic well owners, include a discussion of whether potential impacts to water quality from projects and management actions could occur and how the GSA plans to mitigate such impacts. ● The GSP discusses Project Management Action No. 4: Increase Stormwater Recharge. Note that recharge ponds, reservoirs, and facilities for managed aquifer recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For further guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the "Multi-Benefit Recharge Project Methodology Guidance Document".18 ● Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.	10/25/2021 10:37	The ongoing implementation of PMA's in Group 1, including groundwater pumping demand reductions up to 900 AFY through the Water Conservation and the Well Meter and Groundwater Extraction Fee Programs, will maintain the current groundwater conditions and maintain the sustainability of the Basin by balancing the projected future Water Budget deficits (up to 600 AFY). If the projects and management actions required for maintaining sustainability in Group 1 PMAs either fails to be implemented or does not achieve expected results, the Annual Pumping Allocation (PMA No. 7) can be implemented. The Annual Pumping Allocation plan addresses any uncertainties in the climate change projections. Additional text has been added in Section 4a.2-1-2 to clarify benefits and protections for beneficial users, including DEs, aquatic habitats, surface water users, DACs, and drinking water users. Additional text has also been in added in Section 4a.2-4 on the multi-benefits for stormwater recharge projects. The well registration program described in Section 5a.3-1 will include domestic wells including wells owned by DACs, if present. This information will help the GSA understand whether undesirable results are being experienced by domestic well owners. A drinking water well impact mitigation program is not required by SGMA and is considered unnecessary at this time. The GSA will address undesirable results experienced by domestic wells owners if necessary.
2182	Joseph Hughes	N/A	Please see attached file for comments regarding entire draft GSP.	10/26/2021 14:10	Thank you for your comment. Specific items are addressed below.
2183	Joseph Hughes, Santa Ynez Water Group		As previously expressed to the GSA, a primary concern of our members continues to be the GSA's failure to adequately consider the interests of agricultural landowners holding overlying groundwater rights and the effects of the GSA's actions on those landowners. This is evident in the draft GSP's proposed projects and management actions and associated financing structure. For example, the draft GSP estimates a 15 to 20 percent increase in water use by the City of Buellton, a municipal entity within the Central Management Area holding appropriative groundwater rights. (Draft GSP, 2c.4-1-2.) The draft GSP identifies projects and management actions that may be implemented in response to these projected increases in demand. (Draft GSP, Section 4A.1.) However, throughout Section 4A.1, the draft GSP suggests that the costs associated with these projects and management actions will be borne by all groundwater users. Consequently, the GSA is requiring agricultural	10/26/2021 14:10	The DRAFT GSP specifically states (1b.1-3 Legal Authority): "In accordance with CWC Section 10720.5 (b) 'Nothing in this part, or in any groundwater management plan adopted pursuant to this, part determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights.' Accordingly, this GSP does not determine or alter such surface water or groundwater rights." Current water use in the Basin is 71% "Agricultural Water," 3% "Special Irrigation Water," and 26% "Other Water." Additionally, "Other water" users have already adopted water efficiency programs to cut water use, resulting in "Other water" use in 2019 is 26% less than it was in 1995. Costs for PMAs have not been determined but will be in the future by the

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			landowners holding senior overlying groundwater rights to pay for the increased pumping of groundwater users holding junior appropriative groundwater rights. This approach is neither equitable nor reflective of groundwater law.		GSA at public meetings. There will be opportunities for public participation and input.
2184	Joseph Hughes, Santa Ynez Water Group		Additionally, there are several issues within the Sustainable Management Criteria (SMC) chapter of the draft GSP. First, the minimum thresholds (MT) associated with the Chronic Lowering of Groundwater SMC are arbitrary and lacking in sufficient support. This is likely the result of the flawed methodology used in developing these MTs. Further, the Degraded Water Quality SMC is too broad in scope. This SMC should only consider those effects associated with groundwater pumping or other GSP implementation activities, not the adverse effects of wastewater treatment facilities or other like sources.	10/26/2021 14:10	Comment noted. The methodology and results of this analysis were discussed with stakeholders and ultimately accepted by the GSA Committee as the basis for establishing undesirable results and minimum thresholds.
2185	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		o Chronic Lowering of Groundwater Levels – The logic behind the minimum thresholds is questionable and the minimum thresholds themselves appear arbitrary. The GSP concludes that well operational issues that may be associated with groundwater levels below the top of well screens are indicative of significant and unreasonable depletion of supply. First, well operational issues are not a depletion of supply in of themselves; rather they are infrastructure issues that can be remedied through well redevelopment, well replacement, or backup wells, which could be implemented as GSP projects. It is suggested that depletion of supply not be viewed as well issues that can be remedied; rather, depletion of supply is more appropriately characterized as the inability to produce adequate water because the water isn't there.	10/26/2021 14:10	Comment noted. The methodology and results of this analysis were discussed with stakeholders and ultimately accepted by the GSA Committee as the basis for establishing undesirable results and minimum thresholds. The well screen rationale also utilizes a factor of safety as decided by the CMA GSA Committee. Both reasons (well screen and proximity to historical water levels) are important.
2186	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		Second, the "well impact analysis" provides clear evidence contrary to the GSP conclusions. Approximately 26% of the wells in the CMA had groundwater levels below top of screen in 2020, yet the GSP states that no reported undesirable results associated with chronic lowering of groundwater levels have occurred (see p. 3b-9). If the premise is that groundwater levels below top of screen causes significant and unreasonable effects, then why haven't numerous instances of significant and unreasonable effects been reported already? Moreover, the number of wells with groundwater levels below the top screen at minimum threshold groundwater elevations is not materially different than the number of wells at 2020 groundwater levels. (0% more municipal wells, 6.3% more agricultural wells, and 4.3% more domestic wells). There is no justification for why the small increase in the number of wells with groundwater levels below top of screen results causes the CMA to cross the line into the realm of significant and unreasonable effects. No specific, demonstrable effects that are not occurring at 2020 levels, but are expected to occur at the minimum threshold levels are identified. Lastly, it is noted that the "well impact analysis" shows that the number of impacted wells would be exactly the same if the minimum threshold were set 5 feet lower (i.e., 20 feet below 2020 levels versus 15 feet below 2020 levels). No justification is provided for why undesirable results would be expected at the shallower groundwater level (15 feet below 2020 levels) even through the number of wells impacted is the same if the minimum threshold were to be set at 20 feet below 2020 levels. For these reasons, the minimum thresholds appear arbitrary	10/26/2021 14:10	Comment noted. The methodology and results of this analysis were discussed with stakeholders and ultimately accepted by the GSA Committee as the basis for establishing undesirable results and minimum thresholds. The well screen rationale also utilizes a factor of safety as decided by the CMA GSA Committee. Both reasons (well screen and proximity to historical water levels) are important.
2187	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		It is noted that there is nothing that has or would prevent any well owner from drilling deeper wells. It is unfair to restrict the use of the groundwater resource and/or charge fees to benefit specific beneficial users who have not made the same level of investment to access the groundwater resource as others. If the GSP is to keep groundwater levels high enough to prevent well issues for those who have not fully invested in infrastructure to access the resource during droughts, then those users should fund the management actions necessary to do so, particularly in the case of the City of Buellton whose appropriative groundwater rights are junior to the overlying landowners.	10/26/2021 14:10	The important issue of funding of implementation measures will be worked on early in 2022 following submission of the GSP.
2188	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		Page 3b-17 states that adverse water quality conditions could be related to wastewater treatment and other sources. The CMA GSA should only be responsible for addressing degradation of groundwater quality caused by pumping and/or GSP implementation. There is a concern that the GSP does not caveat the minimum threshold to this effect. The minimum thresholds should only apply if the CMA GSA determines that water quality degradation is being caused by pumping or GSP implementation.	10/26/2021 14:10	Please see added text in 3b.2-4 Degradation of Water Quality – Undesirable Results that the responsibility of the CMA GSA is only for effects due to groundwater pumping or GSP implementation.
2189	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		The GSP could be improved by explaining how the GSA will differentiate between changes in concentrations caused by groundwater pumping or GSA activities versus other mechanisms.	10/26/2021 14:10	Please see added text in 3b.2-4 Degradation of Water Quality – Undesirable Results that the responsibility of the CMA GSA is only for effects due to groundwater pumping or GSP implementation.
2190	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		o Overarching Comment: GSP projects and management actions will be funded through grants and fees to be levied for groundwater pumping, which appears to include overlying pumpers. Because overlying landowners' groundwater rights are senior to the City of Buellton's appropriative rights, SYWG believes consideration should be given to requiring the City to fund actions necessary to achieve the sustainable yield before levying fees on overlying groundwater users for project or management actions.	10/26/2021 14:10	The important issue of funding of implementation measures will be worked on early in 2022 following submission of the GSP.

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2191	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		o Supplemental Imported Water Program (Section 4a.2-3) The purchase of supplemental State Water Project water would be funded through fees, which appears to include overlying pumpers. Because overlying landowners' groundwater rights are senior to the appropriative rights held by the City of Buellton, SYWG believes consideration should be given to requiring the City to pay for the supplemental water purchases to achieve the sustainable yield.	10/26/2021 14:10	The important issue of funding of implementation measures will be worked on early in 2022 following submission of the GSP.
2192	Bryan Bondy (via letter from Joseph Hughes, Santa Ynez Water Group)		o Increase Stormwater Recharge (Section 4a.2-4): While the projects described in this section may increase recharge to the CMA, it should be made clear that a primary purpose of the projects is to achieve compliance with Municipal Separate Storm Sewer System permit requirements for storm water quality. Presumably, the City of Buellton would be required to complete these projects regardless of SGMA or take other actions to comply with permit requirements. Therefore, overlying pumpers should not be forced to subsidize the City's efforts to comply with stormwater regulations by including and funding these projects through the GSP. It is acknowledged that the projects may have a groundwater recharge benefit. However, SYWG believes it is appropriate for the City to provide the recharge benefits through these projects at their cost because there is an identified deficit in the CMA water balance and the City's groundwater rights are junior to the landowners overlying groundwater rights.	10/26/2021 14:10	The important issue of funding of implementation measures will be worked on early in 2022 following submission of the GSP.
2193	Steve Slack (CDFW)	2b-35	Comment #1: Section 2b.6-2 Interconnected Surface Water for the Santa Ynez River Issue: The Draft GSP does not provide enough evidence to conclude there is no interconnected surface water in the CMA. The CMA-Groundwater Conditions Technical Memo (CMA-GC), (page 27) and the Draft GSP (page 2b-35) states, "Because the underflow of the Santa Ynez River is considered part of the surface water flowing in a known and definite channel, there is no interconnected surface water in the CMA. The Santa Ynez River surface water and underflows are managed by the SWRCB for the reach of the Santa Ynez River in the CMA and will not be managed under SGMA by the CMA GSA. Diversions from the Santa Ynez River Alluvium are subject to SWRCB regulation which considers it the same as surface water diversions. As described in the HCM (Section 2a), the Santa Ynez River Alluvium is recharged from the surface water of the river". Page 13 of the CMA-Hydrologic Conceptual Model Technical Memo (CMA-HCM) identifies two principal aquifers for the management area. The Upper Aquifer is described as consisting of the river gravels and younger alluvium along the Santa Ynez River, and the Lower Aquifer is defined as consisting of the Paso Robles and Careaga Formations of the Buellton Upland. As per SGMA regulations, a principal aquifer refers to an aquifer or system of aquifers that stores, transmits, and yields significant or economic quantities of groundwater to wells or surface water (23 CCR 351(aa)). The CMA-HCM identifies the river gravels and younger alluvium along the Santa Ynez River as being part of Upper Principal Aquifer system within the CMA. The CMA-HCM further indicates on page 17 that the Santa Ynez River is in direct contact with major bodies of water-bearing deposits near Buellton and Lompoc subarea where it crosses the two ends of the Santa Rita syncline. The CMA-HCM additionally states on page 17 that many of the wells within the Santa Ynez River Alluvium subarea are shallow, and a precise understanding of the Lower Aquifer underneath the Santa Ynez River is poorly understood in the HCM. CDFW acknowledges there are locations within the CMA where the Santa Ynez River is situated within consolidated non-water bearing formations. However, there are portions of the Santa Ynez River with the potential to be in communication with the water-bearing formations of the principal aquifers, and as such additional characterization is required to support the findings of the GSP.The CMA-GC provides groundwater contour elevation maps (Figures 1-1 and 1-2) that indicate the direction of groundwater flow for spring 2020 and fall 2019 events for both the Upper Aquifer and the Lower Aquifer. Interpretation of the data set provided indicates a direction/gradient of groundwater flow from the Buellton Uplands towards the Santa Ynez River, which more than likely provides recharge to the Santa Ynez River via the aquifers. Page 21 of the CMA-HCM states, Areas with high recharge are dominant in the Buellton Uplands west of Highway 101 to Santa Rosa Creek on the Southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Formation in the Buellton Uplands and to the river gravels along the Santa Ynez River. The provided information substantiates the idea that the Santa Ynez River is not completely within a known and definite channel and that there are portions of the river that are interconnected with groundwater within the CMA.	10/26/2021 14:46	The comment focuses partially on earlier draft sections that precede submission of the draft Plan, which has been considerably revised in the public draft version of the GSP. The upper aquifer in the CMA has now been identified more clearly as the underflow of the Santa Ynez River. A new appendix document has been added to the GSP (Appendix 1d-B) which discusses in more detail the legal status of the Santa Ynez River Alluvium above the Lompoc Narrows to Cachuma Reservoir as a subterranean stream, which occurs in a known and definite channel, and is also referred to as underflow or subflow, and is not groundwater as defined by SGMA. The identification of reaches that are interconnected surface water has been added to Figures 2b.6-3 and 3a.3-3. Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. Additional data gaps are planned to be addressed by adding additional monitoring wells for water level data and taking additional surface water flow measurements of the outflow from the CMA. In addition, an update to well registration with required metering or appropriate alternative will greatly improve the groundwater pumping database.
2194	Steve Slack (CDFW)	2b-35	As a final discussion, analysis of hydrographs included in the CMA-GC appendix provides additional data as to the potential interconnection between groundwater levels within the principal aquifers and the underflow beneath the Santa Ynez River. Several hydrographs within the appendix (i.e., State Well # 6N/31W-18G01, 6N/31W-17D01, and 6N/31W-17F1) provide basic well construction data (e.g., well depth), land surface elevation, groundwater elevations, and depth to water data. The wells listed above are located near the City of Buellton near the Santa Ynez River and close in proximity to each other. However, well location points were not labeled on the provided map and had to be located using provided Township, Range, and Section data. The construction depth for the wells as indicated on the hydrographs indicate depths of 464 feet, 112 feet, and 44 feet and are all designated as being within the Upper Principal Aquifer. The SYR-GSA groundwater elevations data set for each hydrograph indicate very similar groundwater levels when taking into consideration changes in land surface elevations. CDFW acknowledges that a particular well construction can have an effect on recorded water levels, however,	10/26/2021 14:46	Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. Additional data gaps are planned to be addressed by adding additional monitoring wells for water level data and taking additional surface water flow measurements of the outflow from the CMA. In addition, an update to well registration with

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			because of the similarities in groundwater levels in each of these wells, combined with their associated depths, additional analysis is needed to determine the vertical gradient between aquifer assemblages within the Upper Principal Aquifer system and potential connection with the Santa Ynez River. **Recommendation #1**: CDFW recommends analyzing well data from additional wells to provide a more complete review of well information and lithologic data to better characterize the depths and occurrence of the water bearing strata within the CMA, specifically along the Santa Ynez River channel. CDFW recognizes that the CMA has identified existing data gaps within the CMA-HCM and CMA GC; however, where information is not available, the CMA-GSA needs to identify a proposed plan to obtain this information.		required metering or appropriate alternative will greatly improve the groundwater pumping database.
2195	Steve Slack (CDFW)	2c-8	Comment #2: Section 2c.1-3 Surface Water and the Santa Ynez River Alluvium Issue: The Draft GSP does not provide enough information to conclude that surface waters do not affect groundwater levels. Page 2c-8 of the Draft GSP states, In addition, as discussed in the HCM (Section 2a.3), the Santa Ynez River Alluvium is part of the subflow of the river, which is regulated by SWRCB. Because subflow is considered surface water and not groundwater, the Santa Ynez River Alluvium would not be classified as a principal aquifer or managed by a GSP under SGMA. Therefore, the Santa Ynez River Alluvium is considered part of the underflow of the Santa Ynez River and is treated as part of the surface water in the historical, current, and projected water budgets. Page 28 of the CMA-GC states, Diversions from the Upper Aquifer of the Santa Ynez River Alluvium are subject to SWRCB which considers it the same as surface water. As described in the HCM, the Upper Aquifer is recharged from the surface water of the river. The CMA-HCM states that during downstream water right releases, water infiltrates and recharges the alluvium in Zone A (CMA-HCM, Pg. 23). This is another example of a location that has interconnected surface waters based on groundwater recharge during downstream water right releases. CDFW believes this occurs during natural flows at various seasons throughout the year. CDFW agrees that the Upper Aquifer is recharged from the surface water of the river but is unclear on the basis for the conclusion that the diversions from the Upper Aquifer should be regulated in the same manner as surface water. The CMA-HCM also states that groundwater in the CMA discharges to the Santa Ynez River when the groundwater elevation is higher than the stream channel thalweg. Groundwater discharge to the river will occur during wet winter and spring months. However, during the summer and dry winter months, the streamflow loses water to the groundwater aquifers of the Santa Ynez alluvium subarea (CMA-HCM, p. 27). This is another example of an interconnected surface water that SYR-GSA describes in their CMA-HCM but failed to identify and analyze in the CMA-GC.	10/26/2021 14:46	The comment focuses partially on earlier draft sections that precede submission of the draft Plan, which has been considerably revised in the public draft version of the Plan. The upper aquifer in the CMA has now been identified more clearly as the underflow of the Santa Ynez River. A new appendix document has been added to the GSP (Appendix 1d-B) which further documents the hydrogeological basis for characterization of the water within the Santa Ynez River Alluvium above the Lompoc Narrows to Cachuma Reservoir as a subterranean stream, which occurs in a known and definite channel, and is also referred to as underflow or subflow, and is not groundwater as defined by SGMA.
2196	Steve Slack (CDFW)	2c-8	**Recommendation #2(a)**: CDFW recommends the Final GSP provide justification, based on specific provisions of SGMA, for the conclusion that the Upper Aquifer should not be classified as a principal aquifer or managed by a GSP under SGMA. CDFW believes the GSA must sustainably manage groundwater resources in the Upper Aquifer, in part because it supports GDEs. Furthermore, portions of the Upper Aquifer are interconnected with surface water and is currently identified as a principal aquifer under Department of Water Resources Bulletin 118 (DWR 2020). The communities within the CMA heavily rely on surface and subsurface diversions from the Upper Aquifer. According to the CMA-GC, Lower Aquifer groundwater pumping may not be occurring in the deeper aquifer (or it is unknown). Use of this Lower Aquifer water may become more appealing and economically viable in the future if groundwater pumping practices change. Thus, analyzing the Upper Aquifer as interconnected with surface water is consistent with the sustainability goals of SGMA. Furthermore, identifying and appropriately considering GDEs in the CMA that rely on the Upper Aquifer should be completed irrespective of the amount of pumping in both aquifers so that future impacts on GDEs due to new production can be avoided. CDFW urges the SYR-GSA to identify and consider all GDEs within the CMA per Code of Regulations, Title 23 354.16(g). **Recommendation #2(b)**: CDFW strongly urges the SYR-GSA to map, identify, and analyze depletions of interconnected surface waters and areas with the potential for depletion of interconnected surface waters per Code of Regulations, Title 23 354.16(f).	10/26/2021 14:46	A new appendix document has been added to the GSP (Appendix 1d-B) which further documents the hydrogeological basis for characterization of the water within the Santa Ynez River Alluvium above the Lompoc Narrows to Cachuma Reservoir as a subterranean stream, which occurs in a known and definite channel, and is also referred to as underflow or subflow, and is not groundwater as defined by SGMA. The identification of reaches that are interconnected surface water has been added to Figures 2b.6-3 and 3a.3-3.
2197	Steve Slack (CDFW)	2b-35	Comment #3: Section 2b.6-3 Interconnected Surface Water for Tributaries to the Santa Ynez River Issue: CDFW disagrees with the Draft GSP conclusion that the tributaries within the CMA do not meet SGMA definition of interconnected surface waters simply because they do not receive measurable flow at all times of year. Page 30 of the CMA-GC and page 2b-35 of the Draft GSP states, All tributaries within the CMA (Figure 2b.6-1) are ephemeral. As shown on Figure 2b.6-2, Zaca Creek, the largest CMA tributary, has no measurable flow during half of the period of record. Most flow occurs in wet and above normal years between February to March, with no flow between June to November. This indicates these tributaries are completely depleted during part of the year and do not meet the SGMA definition for interconnected surface water. As shown in the HCM (HCM Figure 2a.5-2) there are no identified springs associated with these tributaries.Groundwater-dependent habitats, including interconnected surface waters, are particularly susceptible to changes in the depth of the groundwater. Lowered water tables that drop beneath the root zones can cut off phreatophyte vegetation from water resources, stressing or ultimately converting vegetated terrestrial habitat. Induced infiltration attributable to groundwater pumping can reverse hydraulic gradients and may cause streams to stop flowing. The frequency and duration of exposure to lowered groundwater tables and low-flow or no-flow conditions caused by groundwater pumping, as well as habitat and species resilience, will dictate vulnerability to changes in groundwater elevation. For example, some species rely on perennial instream flow, and any interruption to flow can risk species survival. Under SGMA, a GSP is required to avoid unreasonable adverse impacts on beneficial uses of interconnected surface waters, defined as surface water that is	10/26/2021 14:46	The depth to the groundwater table in the upland tributary areas is greater than 30 feet. These tributaries are considered ephemeral. This means that rainwater runoff percolates into the underlying Buellton Aquifer, which consists of the Paso Robles Formation or Careaga Sand in these areas. For inflow from Zaca Creek, there is an existing USGS gage which documents that even in wet years, the surface flow from Zaca Creek before even entering the CMA dries up by May. The majority of Zaca Creek inflow infiltrates into the upstream EMA. This flow occurs as unsaturated flow and so a continuous saturated zone between the base of the tributary and the underlying aquifer does not exist and are disconnected from the water table, except in the lower reaches of some tributaries where the underlying aquifer discharges to surface water. This can potentially occur in Santa Rosa Creek. This is where the interconnection between surface water and groundwater occurs in the CMA and where GDEs (ecosystem supported by groundwater) are potentially present. This distal area of the tributary near the confluence of Santa Rosa Creek and Santa Ynez River has been identified as a data

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			hydraulically connected at any point by a continuous saturated zone to the underlying aquifer, and the overlying surface water is not completely depleted. (Water Code 10721(x)(6) and 10727.2(b); 23 CCR 351(o).) The SYR-GSA has not provided adequate support for its conclusion that lack of measurable flow within the tributaries means the tributaries are completely depleted Ã¢Â€Â under this definition. Even assuming the tributaries are completely depleted during part of the year, there is no requirement within SGMA or its implementing regulations that surface waters have measurable surface flows at all times of the year to qualify as an interconnected surface water. To the extent that the tributaries are hydraulically connected and not completely depleted at any time of the year, they qualify as interconnected surface waters and warrant appropriate consideration in the final GSP, including the goal to avoid depletions causing significant and unreasonable adverse impacts on beneficial uses. The interconnected surface water narrative also lacks specific estimations of the quantity and timing of streamflow depletions as required by California Code of Regulations, Title 23 354.16(f). **Recommendation #3(a)**: CDFW recommends a more careful review of existing information on surface water-groundwater interconnectivity and recommends the CMA-GSA clarify methods used to categorize losing streams as disconnected. Additionally, CDFW recommends the CMA-GSA identify the estimated quantity and timing of streamflow depletions in the subbasin. If this information is not available, identify a proposed plan to estimate these values. **Recommendation #3(b)**: CDFW recommends a more detailed evaluation of what is happening beneath the ground to cause this section of Zaca Creek to have low or no flow during parts of the year. The cause for the groundwater elevation fluctuations should be investigated further. Impacts caused by changes in groundwater elevation should be considered in the evaluation of groundwater management effects on GDEs and interconnected surface waters.		gap which will be resolved with obtaining additional groundwater level data in this area. Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. Additional data gaps are planned to be addressed by adding additional monitoring wells for water level data and taking additional surface water flow measurements of the outflow from the CMA.
2199	Steve Slack (CDFW)	2a-34	**Comment #4**: Section 2a.4-2-1 Emerging Agricultural Crops: Cannabis Cultivation (Cannabis Priority Watershed)Issue: CDFW is concerned that cannabis groundwater use is not being fully accounted for when evaluating this SGMA area. Ignoring the growth potential of this industry, could result in a lack of groundwater management accountability. Page 2a-34 of the Draft GSP states that Santa Ynez River Valley is not identified as a Cannabis Priority Watershed with a high concentration of cannabis cultivation. CDFW has identified, in region, the Santa Ynez River Valley as a high priority watershed. Most projects distributed throughout this SGMA area are clustered within the San Miguelito Creek-Santa Ynez River, Nojoqui Creek, Santa Rosa Creek-Santa Ynez River, Salsipuedes Creek, Santa Rita Valley and Canada De La Vina-Santa Ynez River HUC 12 watersheds. This includes San Miguelito Creek, Salsipuedes Creek, and Santa Ynez River (critical southern steelhead streams) as well as Nojoqui Creek and Santa Rosa River, and the SYR tributaries (Dagit et. al 2020). The projects range from cultivation of 1-50 acres within the approximate 52 notifications the Department has received with the main source of water coming from groundwater wells. CDFW expects this type of trend to continue in the future. Groundwater and interconnected surface water are critical resources that do not recognize artificial boundaries. Since the implementation of legal cannabis cultivation, CDFW has received multiple applications within the Santa Ynez River Valley, especially in the HUC 12 watersheds listed above. Some of the cannabis grows can range from 1-50 acres, with multiple licenses on a property (resulting in several acres of cultivation) that are dependent on depths within the alluvium. Surface flows (and surface diversions) are regulated in large degree from dam releases, which emphasizes the large roll groundwater wells have in cannabis cultivation. Santa Ynez has sensitive, natural communities consisting of Oak woodlands, grasslands, sage scrub, chaparral, and riparian woodland habitats along the Santa Ynez River and SYR tributaries. According to the California Natural Diversity Database (CNDDB), the Santa Ynez River Valley provides habitat that supports several sensitive species (some listed as endangered or threatened) throughout their life cycles, including southwestern willow flycatcher (Empidonax traillii extimus), least Bell vireo (Vireo bellii pusillus), red-legged frog (Rana draytonii), and seaside bird beak (Cordylanthus rigidus ssp. littoralis) (CDFW. 2019). Habitats that support these species also consist of phreatophytes and other vegetation communities that are dependent on shallow aquifers that support surface water in each of these systems. Phreatophytic vegetation is a critical contributor to nesting and foraging habitat, forage for a wide range of species and can be affected by sensitive depth to groundwater threshold impacts (Naumburg et.al. 2005) and (Froend et. al. 2010). This sensitivity to groundwater level thresholds means that localized pumping and recharge actions altering groundwater levels can impact the health and extent of phreatophyte vegetation health. Both decreasing (drying out) or increasing (drowning) groundwater elevation has the potential to stress phreatophytes depending on the plant species, groundwater elevation and duration (e.g., short term wetness/dryness versus prolonged wetness/dryness).	10/26/2021 14:46	The designation of "Cannabis Priority Watershed" is from SWRCB in coordination with the CDFW, and is currently (November 2021) posted by the SWRCB on their website and does not include the Santa Ynez River Valley Watershed. We have added a footnote citation to make this source clearer. Within the scope of the GSP, the primary concern with regards to cannabis is expansion of water use for agriculture. At the request of the GSA, we reviewed the special topic of legal cannabis cultivation primarily to see if this has resulted in an expansion of agricultural land use. We found that as of August 2021, most applications for cannabis cultivation permits were for land that already used for agricultural purposes. Historical illegal cannabis cultivation is often associated with illegal agricultural practices including illegal appropriation of public lands and water quality concerns related to misuse of pesticides, herbicides, and overuse of fertilizers. However we are not aware of similar issues with regulated legal cannabis, which is under stricter scrutiny and regulation than other agriculture. The GSA will include in the SGMA Annual Reports updates of the number and status of cannabis cultivation permits.
2200	Steve Slack (CDFW)	2a-34	Groundwater and interconnected surface water depletion is a major concern for fish and wildlife beneficial users in the Santa Ynez River Valley. Designating this area as a High Priority Cannabis Watershed requires groundwater to be monitored and sustainably managed for the benefit of all beneficial users, including groundwater dependent vegetated communities and interconnected surface waters that are necessary to support riparian and aquatic habitat, and the sensitive species therein such as southern steelhead. Decreased stream flow may contribute to direct mortality if fish eggs are exposed, covered with silt, or left without sufficient oxygenated water. Water degraded in temperature or chemical composition can displace or limit fish populations. **Recommendation #4**: CDFW recommends the CMA-GSP monitor the Santa Ynez River	10/26/2021 14:46	Document was edited to clarify that this designation is from the SWRCB, in conjunction with the CDFW, which as of (November 2021) has not designated the Santa Ynez River Valley Watershed and posted this on their website. If CDFW recommends the Santa Ynez River Valley be classified as a Cannabis High Priority Watershed this is something that though with the SWRCB. As described, many of the GSA member agencies have enacted ordinances that specifically further control cannabis cultivation.The GSA will continue to monitor overall water use for

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			Valley as a Cannabis High Priority Watershed. This High priority captures the documented impacts within the groundwater basin and the shifting groundwater consumption rates, as influenced by legalization of cannabis [Water Code 10933.(b)(7,8)]. Based on the number of Departmental applications for legal cultivation, there is documented significant demand and potential adverse impacts to beneficial users of groundwater. The cannabis market growth is expected to increase almost ten times during an eight-year span (Fortune Business Insights 2021). North America is expected to lead the world cannabis market. Santa Barbara County recently approved a zoning permit for 87 acres of outdoor cannabis cultivation.		agricultural use and impacts on Santa Ynez River flow, of which cannabis is an emerging component.
2201	Steve Slack (CDFW)	2a-35	Comment #5: Section 2a.4-2-1 Emerging Agricultural Crops: Cannabis Cultivation Issue #5.1: Without the designation of the Santa Ynez River Valley as a Cannabis High Priority Watershed, evaluation of cannabis crop water usage may be overlooked throughout the Santa Ynez River Valley Groundwater Basin, especially within the Santa Ynez Alluvium, an area that, as stated on page 2b-35, will not be managed under SGMA by the CMA-GSA. Page 2a-35 of the Draft GSP states all cannabis applications in the CMA are for parcels that in 2016 were used for agriculture. This indicates primarily a change of crop type, rather than an expansion. Cannabis cultivation is a water intensive crop that can have a significant impact to environmental beneficial users of groundwater. Cannabis groundwater wells provide water for the irrigation of water-intensive cannabis cultivation (assuming six gallons of water per day per plant) (Bauer S. 2015). Just within the Santa Ynez Alluvium, CDFW has received approximately 26 cannabis projects. These projects range from cultivation of 3.5 - 50.0 acres with water supplied from groundwater wells. Many of the wells for the cannabis notifications within Santa Ynez Valley are shallow wells located within or immediately adjacent to tributary streams and the SYR. CDFW is concerned that without management of the Santa Ynez Alluvium under SGMA by the CMA-GSA, significant and unreasonable surface water depletions may occur, compromising groundwater dependent ecosystems within and along the streams. **Recommendation #5.1(a)**: CDFW recommends a more careful review of the existing information on cannabis cultivation within the Santa Ynez Alluvium and recommends the information be considered when evaluating groundwater management. As indicated on page 2a-23, Areas with high recharge are dominant in the Buellton Upland west of Highway 101 to Santa Rosa Creek on the southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Sand Formation in the Buellton Upland and to the river gravels along the Santa Ynez River. The majority reliance on groundwater for cannabis crops irrigation, and the likely interconnected nature of the SYR suggests that such uses (individually or cumulatively) should be considered when evaluating cannabis impacts in the Santa Ynez Alluvium. Recommendation #5.1(b): CDFW recommends the Santa Ynez River Valley be classified as a Cannabis High Priority Watershed. **Issue #5.2**: The majority reliance on groundwater for cannabis crops irrigation, and the likely interconnected nature of the Santa Ynez River suggests that such uses (individually or cumulatively) should be considered when evaluating cannabis impacts in the Santa Ynez alluvium. As indicated on page 2a-23, Areas with high recharge are dominant in the Buellton Upland west of Highway 101 to Santa Rosa Creek on the southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Sand Formation in the Buellton Upland and to the river gravels along the Santa Ynez River. **Recommendation #5.2**: CDFW recommends a more careful review of the existing information on cannabis cultivation within the Santa Ynez alluvium and recommends the information be considered when evaluating groundwater management.	10/26/2021 14:46	These and additional concerns were why the GSA reviewed specifically cannabis cultivation (ref. Section 2a.4-2-1), although other crops can have significant water demand. Alluvial areas of the Santa Ynez alluvium is managed by the SWRCB as river underflow the same as surface flows of the Santa Ynez River. As matter of statewide policy, cannabis cultivation in alluvial streams is subjected additional requirements under SWRCB regulations. RE Rec. #5.1(a): At this time we consider the existing analysis as sufficient for the purposes of a GSP. RE Rec. #5.1(b): This is designated by SWRCB in conjunction with CDFW.
2202	Steve Slack (CDFW)	2b-37	Comment #6: Section 2b.6-4 Groundwater Dependent Ecosystems in the Central Management Area Issue: The potential GDEs were assessed into three categories based on their relationship to the aquifer but it is unclear if they were categorized any further. It is also unclear and unknown if there are any GDEs in the Draft GSP that will be protected and monitored into the future. Page 2b-37 of the Draft GSP states that These were assessed into three categories based on the relationship to the aquifer (Figure 2b.6-3). If depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems (Rohde et al. 2018), the potential GDE was identified as unlikely to be affected by groundwater management (Category C on Figure 2b.6-3). Riparian areas of the Santa Ynez River were identified as being managed by the SWRCB as part of Santa Ynez River surface and subflow (Category B on Figure 2b.6-3). The remaining area consists of GDEs likely related to groundwater levels (Category A on Figure 2b.6-3). Part of the Category B area that overlies the Buellton Aquifer may have some influence from the Buellton Aquifer water levels. This area is grouped with the Category A to form the potential GDEs. Table 2b.6-2 below summarizes the land areas involved. Table 2b.6-2 Potential CMA Groundwater Dependent Ecosystem Categorization Potential GDE Category Ecosystem DescriptionAcresPercentageAPotential GDE Associated with a Principal Aquifer110.6%BRiparian vegetation not subject to SGMA122370.5%CUnlikely to be Affected by Groundwater Management50128.9% Potential GDE Category B over Buellton Aquifer80746.5%Total1,735100%The potential GDEs were assessed into three categories based on their relationship to aquifers, but it is unclear if they were categorized any further. It is also unclear and unknown if there are any GDEs in the Draft GSP that will be protected and monitored into the future. Pursuant to SGMA, the GSP to be developed by CMA-GSA must identify and consider impacts to all GDEs in the basin, including flowing waters and refugia supporting southern steelhead. The final GSP must also avoid depletions of interconnected surface waters that have significant and unreasonable adverse impacts on beneficial uses of the surface water. Specific, surface water flows needed to support southern steelhead life stages at different times of year are as	10/26/2021 14:46	Regarding Recommendations 6a and 6b, the GSP identifies Interconnected Surface Water (ISWs) and Groundwater Dependent Ecosystems (GDEs) as occurring along the Santa Ynez River from the CMA boundary with the EMA to the Buellton Bend (Figures 2b.6-3 and 3a.3-3) and at the confluence of Santa Rosa Creek and the Santa Ynez River. The GSP discusses the major factors that affect ISWs and GDEs, including precipitation, upstream surface flows and Cachuma Reservoir releases. For ISWs, the undesirable result is no more surface water depletion and lowering of groundwater levels due to groundwater extraction than prior to 2015. For GDEs, the undesirable result is lowering of the water level in the underflow deposits 15-feet below the channel thalweg. In the CMA, impacts to ISWs and GDEs from pumping in the Buellton Aquifer are partially buffered by the existence of alluvial underflow deposits. The minimum thresholds for water levels in the Buellton Aquifer to protect all beneficial users, including both ISWs and GDEs has been set conservatively with thresholds set 15-feet below 2020 water levels for wells in the Buellton Aquifer. Additionally, to avoid undesirable results to GDEs located in the underflow, minimum thresholds for well located in the underflow alluvium have been set 15-feet below the channel thalweg.

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			follows: 1) from October through June for river-estuary-Ocean connectivity needed for passage; 2)from January through May for adult migration, spawning and incubation; 3)from January through June for juvenile migration; and, 4)year-round for expression of juvenile life history. CDFW is also concerned that groundwater pumping in the face of climate change and human disturbance will lead to dryer stream reaches incapable of supporting suitable riparian habitat for sensitive species that occupy GDEs, such as least Bell vireo (Vireo bellii pusilus) and southwestern willow flycatcher (Empidonax traillii extimus). These federally and State-listed species need dense willow thickets and understory vegetation for both nesting and breeding purposes. **Recommendation #6(a)**: CDFW recommends the CMA-GSA evaluate potential effects on each GDE unit based on at least four criteria, such as: 1)groundwater dependence; 2)ecological value (high, moderate, low); 3)ecological condition (good, fair, poor) using Normalized Difference Vegetation Index/ Normalized Difference Moisture Index data; and, 4)susceptibility to changing groundwater conditions (high, moderate, low) based on available hydrologic data, climate change projections and GDE susceptibility classifications using a baseline range to consider future changes in groundwater conditions. **Recommendation #6(b)**: To ensure meaningful consideration of GDEs as required under SGMA, CDFW recommends the SYR-GSA provide a biological assessment identifying species known to occur within the GDEs presented in Figure 5-2, including southern steelhead, least Bell vireo, and southwestern willow flycatcher. Given the uncertain status of the species and their dependency on GDEs, the CMA-GC must accurately assess drought conditions when water availability will be lower and groundwater extraction might be high. **Recommendation #6(c)**: CDFW recommends the CMA-GSA include, at a minimum, the GDEs identified within the Basin in the final GSP. The CMA-GSA has not provided enough data to conclude that the Lower Aquifer groundwater pumping definitively does not affect GDEs within the Basin. If the CMA-GSA reaches that conclusion in the future, then then Sustainable Management Criteria for GDEs would no longer be needed. CDFW strongly disagrees with entirely excluding GDEs present in the Basin without enough data to conclude GDEs are not impacted by groundwater pumping. **Recommendation #6(d)**: CDFW recommends the CMA-GSA identify potential impacts to fish and wildlife beneficial uses, caused by depletions of groundwater. Furthermore, the evaluation should consider species water needs for all life history stages when defining undesirable results and setting minimum thresholds required by SGMA. Different fish and wildlife species have different water needs. Understanding the timing of water availability with respect to species needs across all life history phases will allow groundwater planners to better account for groundwater management impacts to fish and wildlife species and users of groundwater and interconnected surface waters.		Regarding Recommendation 6c, additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits. Additional data gaps are planned to be addressed by adding additional monitoring wells for water level data and taking additional surface water flow measurements of the outflow from the CMA. In addition, an update to well registration with required metering or appropriate alternative will greatly improve the groundwater pumping database. Regarding Recommendation 6d, additional text has been added on potential effects on the beneficial uses and users of interconnected surface water and groundwater dependent ecosystems that may occur from undesirable results. In the CMA, the groundwater in the Buellton Aquifer is not in direct contact with the Santa Ynez River surface flow because of the underflow deposits which are part of the surface water system.
2204	Steve Slack (CDFW)	1	GENERAL COMMENTS AND RECOMMENDATIONS Comment #7: Sensitive Species and Habitats Issue: Many sensitive species and habitats in the Santa Ynez CMA comprise of GDEs, the natural communities that rely on groundwater to sustain all or a portion of their water needs. Some of the special-status species in the Santa Ynez River watershed that rely on surface water supported and supplemented by groundwater include the federally endangered southern steelhead; southwestern pond turtle (Actinemys pallida), a CDFW species of special concern (SSC) and U.S. Forest Service sensitive species; California red-legged frog (Rana draytonil), a CDFW SSC and ESA-listed species; western spadefoot toad (Spea hammondii), a CDFW SSC and Bureau of Land Management sensitive species; and California tiger salamander (Ambystoma californiense), an ESA-listed and California Endangered Species Act (CESA)-listed species. Southern California Coast Steelhead {Oncorhynchus mykiss (O. mykiss) or southern steelhead}, is an endangered species under the Federal Endangered Species Act (ESA). The Santa Ynez River contains important southern steelhead spawning and rearing tributaries. Threats to southern steelhead from groundwater pumping, such as excessively high-water temperatures due to reduced surface flows or groundwater pumping in the spring, summer, and early fall, reduce available juvenile rearing habitat. Low flows in the fall and winter can delay adult passage to critical spawning areas. CDFW is very concerned about the health of the southern steelhead population in the Santa Ynez River. Drought conditions and low flow rates have led CDFW to participate in rescue operations as recently as 2020.Southwestern pond turtle was designated as a California SSC in 1994. Western pond turtles preferred habitat is permanent ponds, lakes, streams, or permanent pools along intermittent streams associated with standing and slow-moving water. A potentially important limiting factor for western pond turtle is the relationship between water level and flow in off-channel water bodies, which can both be affected by groundwater pumping. California red-legged frog is rarely encountered far from perennial water. Tadpoles require water for at least three or four months while completing their aquatic development. Adults eat both aquatic and terrestrial invertebrates, and the tadpoles graze along rocky stream bottoms. Groundwater pumping that impairs streamflow could have negative impacts on California red-legged frog populations. Western spadefoot toad migrates to seasonal vernal pools to reproduce. They will use small puddles of water, such as small pools to breed. California tiger salamander is also restricted to vernal pools and seasonal ponds for reproduction. If groundwater depletion results in reduced streamflow due to interconnected surface waters, the nesting and foraging success of flycatcher, least Bell vireo, and other bird species may be diminished due to the reduced nesting habitat and food availability. The unsustainable use of groundwater can impact the shallow aquifers and interconnected surface waters on which these species and GDEs depend. This may lead to adverse impacts on fish and wildlife and the habitat they need to survive. Determining the effects that groundwater levels have on surface water flows in the CMA would provide an	10/26/2021 14:46	In response to the comments on the draft HCM, we reviewed threatened and endangered species as well as species of special concern. Limited information about habitat tolerances for many species in terms of the primary salts and nutrients, similar to what we have available for human consumption or crop requirements.The CMA is outside of the current and historical range of the Least Bell's Vireo, according to the maps in the USFWS (1988) Draft Recovery Plan. Additionally the California Red-legged Frog (Rana draytonii) is not common in the lower Santa Ynez River watershed.

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			understanding of how the groundwater levels may be associated with the health and abundance of riparian vegetation. Poorly managed groundwater pumping, and surface water flows have the potential to reduce the abundance and quality of riparian vegetation, reducing the amount of shade provided by the vegetation, and ultimately leading to increased water temperatures in the CMA.		
2205	Steve Slack (CDFW)	1	Recommendation #7: CDFW highly recommends the CMA-GSA map out locations where there are interconnected surface waters and document aquatic habitats and other GDEs as required under SGMA. The CMA-GSA should then provide appropriate consideration to those habitats and the sensitive species that rely on them. Fish and wildlife resources should be considered in the water budget. Additionally, shallow groundwater levels near interconnected surface water should be monitored to ensure that groundwater use is not depleting surface water and affecting fish and wildlife resources in the CMA.	10/26/2021 14:46	The maps in the HCM and GC show the location of the riparian habitat, threatened and endangered species, and the likely habitat that is interconnected with groundwater. Buellton Aquifer and underflow alluvial monitoring wells are used to monitor for groundwater dependent ecosystems and surface water depletion.
2206	Steve Slack (CDFW)	1	GENERAL COMMENTS AND RECOMMENDATIONS Comment #8: Draft GSP vs. Final GSP Issue: The CMA-GSA may need to revise the GSP before it is finalized an adopted. Recommendation #8: CDFW recommends the CMA-GSA provide a red-lined version of the final GSP to understand the changes made between the Draft GSP and final GSP. Alternatively, CDFW recommends the GSA provide a summary of changes made and comments addressed by the GSA in preparation of a final GSP. CONCLUSIONCDFW has significant concerns about ISWs for the SYR, and its tributaries, and surface water and the SYR alluvium, interconnected surface water for tributaries to the SYR, cannabis cultivation into the future and CDFW urges the CMA-GSA to plan for and engage in responsible groundwater management that minimizes or avoids these impacts to the maximum extent feasible as required under applicable provisions of SGMA and the Public Trust Doctrine.	10/26/2021 14:46	The CMA will respond to and address these comments in the final Plan. These responses and addressed comments are included in this table in the finalized Plan in coordination with the GSA staff and Committee. These provide the summary of changes that were made between the public draft and finalized Plans.. Regarding the significant concerns about the GSP, the minimum thresholds set in the CMA are conservative and protective of all groundwater users, including the ISWs and GDEs for the SYR, with thresholds set 15-feet below 2020 water levels for the Buellton Aquifer. Plans are included in the GSP to address data gaps on surface water data with establishment of a new surface water gauge near the downstream boundary of the CMA. The ongoing implementation of PMA's in Group 1, will maintain the current groundwater conditions and maintain the sustainability of the Basin by balancing the projected future Water Budget deficits (up to 600 AFY). SGMA provides for accountability through the annual reports/ monitoring and flexibility through the 5-year update process.
2901	CMA CAG		Data gaps: CAG members noted concern about monitoring the Buellton Aquifer	8-Oct-21	Consultant/Staff noted there are four wells in the *Buellton Aquifer*: two on the east are drilled through the Santa Ynez River Alluvium into the *Buellton Aquifer* below. They are 500 feet below the surface; two additional wells are completed on the west and are in the highlands.
2902	CMA CAG		Data gaps: There are a number of places in the document where argument could be made that current monitoring is not adequate, but the document says it is adequate.	8-Oct-21	Additional text was added in Section 3a.3 to clarify the extent of the data gap for monitoring water levels. The density of wells measuring water levels is currently sufficient according to the Best Management Practices (BMPs) document for SGMA (DWR, December 2016). For basins like the CMA that pump between 1,000 and 10,000 AFY, the BMPs recommended to have two wells per 100 square miles. The CMA currently has four wells per 30 square miles. Nonetheless, the number of wells monitoring water levels in the CMA is still identified as a data gap.
2903	CMA CAG		Data gaps: Most of the acreage within the CMA is unmonitored. The argument is stronger for getting more monitoring wells if the document says monitoring is currently inadequate.	8-Oct-21	Consultant/Staff noted more monitoring wells are needed just to be on par with other areas. They acknowledge this is a data gap and it is desirable to add more monitoring wells
2904	CMA CAG		Data gaps: • CAG members suggested a need for a stream gauge within the CMA boundaries – there is one upstream of the CMA and one downstream of the CMA, but none within the CMA boundaries.	8-Oct-21	Consultant/staff noted the gauge at the eastern end is close to the boundary, so it supplies a good estimate of flow in that area. The next gauge is at Lompoc. The groundwater contribution to surface water is minimal. Surface water is affected by releases from Lake Cachuma, flows from tributaries, and pumping by diverters. The surface water is least impacted by groundwater, so it was decided to not put one at the western edge of the CMA
2905	CMA CAG		Surface water (River and River Alluvium) - Ground water interconnectivity, and GDE's: CAG members asked if SGMA has an obligation to keep surface water contribution at current level	8-Oct-21	Consultant/staff responded that 15-feet below the surface of the river in the alluvium is the root level for riparian trees.
2906	CMA CAG		CAG members asked if there is interconnectivity between ground water and the River Alluvium. Pointing to Table 2b.6-2, which shows 11-acres of potential GDE Associated within a Principal Aquifer [*Buellton Aquifer*], 1,223-acres of potential riparian areas not subject to SGMA, 501-acres not likely to be affected by groundwater management, and 807-acres of riparian vegetation that according to the text "may have some influence from the *Buellton Aquifer* water levels"	8-Oct-21	Consultant/staff responded that interconnectivity between ground water and Alluvium was unknown currently. Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits.

Unique ID	Name	Page Number	Comment	Date/ Time	Response
2907	CMA CAG		CAG members asked how the 15-feet below the surface water threshold was derived	8-Oct-21	Consultant/staff responded that they wanted to monitor undesirable results related to flux. Consultants further explained: The surface water of the Santa Ynez River flows on top of the Santa Ynez River Alluvium and within the Santa Ynez River Alluvium. Water flowing in the Santa Ynez River Alluvium is also referred to as the "underflow" and "subflow". Below the Santa Ynez River Alluvium is the Buellton Aquifer. Riparian vegetation has its roots in the first 15- feet of the Santa Ynez River Alluvium. Santa Ynez River Alluvium is between 0 to 150-feet deep.
2908	CMA CAG		CAG members noted that it is not likely observed water level decreases in the *Buellton Aquifer* will affect the surface water or habitat for riparian vegetation. The CAG noted that in the CMA, riparian vegetation is better classified as Surface water Dependent Ecosystems (SDE) rather than Groundwater Depend Ecosystems (GDE).	8-Oct-21	Comment noted. Yes, in the CMA, impacts to Interconnected Surface Water (ISWs) and GDEs from pumping in the Buellton Aquifer are partially buffered by the existence of alluvial underflow deposits. The minimum thresholds for water levels in the Buellton Aquifer to protect all beneficial users, including both ISWs and GDEs has been set conservatively with thresholds set 15-feet below 2020 water levels for wells in the Buellton Aquifer. Additionally, to avoid undesirable results to GDEs located in the underflow, minimum thresholds for well located in the underflow alluvium have been set 15-feet below the channel thalweg.
2909	member of public		A member of the public commented that there should be explicit and strong caveats explaining that riparian vegetation primarily relies on the *Santa Ynez River Alluvium.* There is virtually no way the *Buellton Aquifer* would be a materially contributing cause to riparian vegetation; SGMA was not intended to manage surface water	8-Oct-21	Additional text has been added on the data gap on the quantity and timing of water from the Buellton Aquifer to the underflow deposits of the Santa Ynez River. For the area east of the Buellton Bend, results from the geophysical aerial survey will be analyzed to better map the extent that the Buellton Aquifer underlies the Santa Ynez River alluvium. With the improved mapping of contact between the two formations, the groundwater model will be updated to improve the accuracy of the estimated flow from the groundwater aquifer to the underflow deposits.
2910	CMA CAG		CAG members asked about the trigger of two consecutive non-drought years for Minimum Thresholds, noting there may not be two consecutive non-drought years in the future.	8-Oct-21	Consultant/Staff said these trigger values were most protective but could change, if needed. Further, the sustainable yield will be updated during revisions to the GSP. Sustainable yield refers to the difference between inflow and outflow with no undesirable results. The Consultants will corroborate the model with groundwater levels to refine the budget in the future once the flux between the Buellton Aquifer and the Santa Ynez River alluvium is better defined with the aerial geophysics study.
2911	CMA CAG		CAG members asked when Group 1 Management Actions will begin; who determines timing of metering and amounts of fees; who pays for the meters; given delays experienced by well companies, how long will this take?	8-Oct-21	Consultant/Staff offered that Group 1 Management Actions will begin immediately. Timing of metering and amounts of fees will be determined by GSA. Other basins have left paying for meters up to the owner; Santa Barbara County supervisors are looking at some sort of defrayment of cost; up to $500 or $600 per well; The GSA will have to come up for standards for calibration; must be installed by certified person.
2912	CMA CAG		CAG members suggested that since Surface Water users have to report use to the State using State approved techniques, CMA should allow use of any techniques approved by the State.	8-Oct-21	Consultants/Staff reviewed the GSP timeline: the GSP gets adopted and uploaded in December 2021 and January 2022; then DWR has 2 years to approve it; GSA will continue to meet quarterly with annual reporting; The GSAs need to figure how we are going to fund implementation.
2913	CMA CAG		The CAG discussed how will the Santa Ynez River Water Conservation District will relate to GSA	8-Oct-21	Consultant/Staff said if GSA's want the District to continue supporting SGMA, it will. Consultant/Staff said it is possible the GSA will monitor wells in the Santa Ynez River Alluvium.
2914	CMA CAG		A member of public noted that on other GSA boards there are stakeholder directors, for example, an environmental director and an agriculture director.	8-Oct-21	The CMA GSA thanks the CAG for your feedback and comments. Any changes to the structure of the GSAs for the Santa Ynez River Valley Groundwater Basin will be formulated in the first year of implementation of the GSAs, so please continue to provide your comments and feedback during this process.

Public Comments

Appendix PC-C:

Public Citizen Len F
Dated October 8, 2021

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Len F comments on draft GSP for CMA
Rev. 10-8-21

Main comments/concerns:

1. When referring to "data gaps" for monitoring the Buellton Aquifer, the Plan needs to say those gaps are so spatially large that the groundwater level monitoring network is *inadequate and insufficient*. This statement is not only true, but also it will bolster the justification for the Plan's action items related to adding monitoring wells.
   Here are some specific suggested edits:
   - Page ES-9; top paragraph; change "could" to "should" in "….where the network could be improved".
   - P. ES-15: Implementation Group 2: Should emphasize the *necessity* of adding a monitoring well in the Upland.
   - Per page 2a-16 says there is a need to "develop a more extensive groundwater level database for the Buellton Upland". This database improvement should be identified as a necessity in order to have a "more extensive database".
   - Page 2a-42: Yes! This paragraph does a good job of clearly identifying the data gap and what needs to be done.
   - If Figure 3a.3-1 is compared with the text below Table 3a.3-2 on page 3a-19, the text is misleading. With only 4 wells to monitor the Aquifer, and with 2 of those wells on the extreme western end of the CMA, and the other 2 wells located rather far in the eastern portion of the CMA, there is a clear lack of sufficient monitoring wells for covering the vast majority of the Aquifer's area. This insufficiency is striking when the map of GW level wells is compared with the map of water quality wells. As noted on page 3a-20, the water quality monitoring wells do indeed "provide adequate spatial distribution". The text on page 3a-19 should be revised to say there is *not* sufficient spatial distribution of the wells to be used for GW level monitoring.
   - Page 3b-32: Given the lack of monitoring wells within the Buellton Aquifer, I question the accuracy of the statement that "the groundwater monitoring program for the Buellton Aquifer will provide adequate data to assess the measurable objective for chronic lowering of groundwater levels." Because "existing monitoring wells will be used…..until additional wells are added", the existing wells are too few in number and too spatially separated to provide adequate data.

2. **The Plan should more clearly call out the need to assess not only the location but also the interconnectivity, if any, between the Buellton Aquifer and the Alluvial subflow east of the Buellton Bend**.
   - Page ES-5, final paragraph: What is the actual "data gap" that is mentioned? Is it only "the extent that the Buellton Aquifer underlies the SY River and alluvial subflow" as is stated? I believe it also should include the extent to which there is inter-connectivity between the Aquifer and the subflow.

- Page ES-15: Implementation Group 2: The Plan should include a proposed action to better determine interconnectivity of aquifer and river subflow.
- Page 2a-15 states that "a precise understanding of the Buellton aquifer underneath the SYR is undetermined." And also says "Additional geophysical AEM data collected within the CMA will be able to fill in more details and validate the geologic structure of the Buellton Aquifer in the SYRA subarea". Thus, the GSP should have an action item to obtain the needed data and conduct an analysis.
- Page 2a-37: Paragraph 2 says "…the streamflow loses water to the ground water aquifers of the Santa Ynez River alluvium subarea". This statement is confusing because it refers to "*groundwater aquifers* of the alluvium" (my empahais added). Please clarify!
- If the paragraph 2 above is actually some surface/alluvial flows can help recharge the Buellton Aquifer, then that point needs to be made in several other places in this Plan.
- Page 2b-7 final sentence and page 2b-8 top sentence: Does the downward gradient (from the alluvium to the underlying aquifer) mean that subflow water in the alluvium can (and does) enter the Buellton Aquifer?
- Page 2b-35: Section 2b.6-2 says "there is no interconnected surface water in the CMA". However, the previous sentence seems to say there is a "data gap" regarding the extent of connectivity of the Buellton Aquifer and the river's alluvial subflows. Given this data gap, **the text shouldn't say there is no connectivity, but should say the connectivity east of the Buellton Bend is uncertain at this time due to lack of data**.
- Page 3a-21 at the bottom says "Surface Water Depletion monitoring network will include"…. "use of groundwater level monitoring as presented in Figure 3a.3-3 as a proxy to evaluate potential Surface Water Depletions". However, those existing monitoring wells (several of which are *west* of the Buellton Bend where there is no underlying Aquifer) must be drawing from the alluvial subflow and not from the groundwater aquifer. So, **the proposed network won't be using "groundwater level monitoring … as a proxy", it will be using subflow level monitoring as a proxy**. The text should be revised to be clear on this point.

3. **Having to wait for 2 consecutive non-drought years in order to trigger any action could be waiting too long, especially if the rainfall pattern of the past decade continues through the next decade. Another triggering level should be established if groundwater levels fall to a certain depth for a certain length of time under drought conditions**.
   - Page ES-11: The need to rely on data from 2 consecutive non-drought years is shown in small print in the table on page ES-11, but it also should be clearly stated in the text.
   - if we experience *only* drought years in the next decade (or alternating drought and normal/wet years), then minimum threshold levels won't be triggered. Thus, groundwater levels could plummet, and yet no mitigating actions will be taken. These facts should be clearly stated in the Exec Summary and elsewhere.
   - Pages ES-13 and ES-14: These pages should clearly state that the undesirable results thresholds will only be triggered based on monitoring data from 2 consecutive non-drought years.

4. **The Plan should call for a stream gage on the SY River <u>within the CMA</u>, preferably east of the Buellton Bend**.
   - Page ES-8: The final paragraph should specifically say there are <u>no</u> stream gages within the CMA on any streams nor on the river.
   - Page ES-15: Implementation Group 2: Add an action to install stream gages on at least the river and perhaps also on a stream in the CMA.
   - Page 1d-18: The section on streamflow monitoring should state that there is <u>no</u> streamflow monitoring currently taking place in the CMA.
   - Figure 2b.6-1: It's extremely difficult to distinguish the active gage symbol from inactive gage symbols. A reader could easily, but mistakenly, assume there are active gages within the CMA. A different symbol or color should be used for either the active or inactive gages.
   - Page 2b-33: The text should state that <u>*all*</u> gages within the CMA boundaries are inactive, including 3 on the river, 1 on Zaca creek and 1 on Nojoqui Creek.
   - Page 3a-22 <u>*incorrectly states*</u> that the surface water depletion monitoring network will include: "continued use of stream gage data from within the CMA….". However, there is <u>*no*</u> stream gage within the CMA (per Fig 2b.6-1). The text is incorrect and needs to be revised. Also, the Plan should recommend installing at least one or more gages within the CMA, at least on the SY River.
   - Page 3b-6, As noted in my comments above, in addition to the data gaps identified in this section, there is also a data gap for stream flows because of the lack of any stream gage within the CMA's boundaries. A program should be initiated to install stream gages and to monitor them.
   - Page 5a-4: Per my previous comments, a surface water gage should be proposed for installation on the SYR within the CMA.

5. **The Plan should commit to more and better public outreach for implementing "Management Actions" and for future plans and related studies or findings (such as AEM results)**.

<u>Additional specific comments:</u>

<u>Executive Summary:</u>

Page ES-1: Paragraph 1 says "Basin" means the entire S- Y- R- V- G- Basin, and then says "….current Basin conditions are sustainable…..". How is it sustainable if in the CMA we need to avoid continual loss of 200 AF (or more) per year?

Page ES-1: Perhaps change "Physical and political complexities…." to "Physical, political, and water management complexities….".

Page ES-2, bottom paragraph, line 4: Change "Upland which are" to Upland which is"

Page ES-3, paragraph 2, line 4: After "imported water" delete the word "primarily"; after Project, insert the word "only".

Page ES-7, paragraph 2 says surface water inflows were 32,040 AF/year; and the outflows were also 32,040. Is that correct?

Page ES-8, paragraph 2; should indicate the number of wells being monitored in the CMA by USGS, SBCWA, and the City, i.e., 3 separate numbers.

<u>Chapter 1: Intro and Plan area</u>
Page 1c-5: The heading is incorrectly numbered. Should be a "c" not a "d" in 1d.1-5 Public comments.

Page 1d-7. A new paragraph should be added at the end of this section to say that *although the Buellton Upland and the Alluvium are distinct subareas of the CMA, the Buellton aquifer underlies the Buellton Upland and underlies part of the Alluvium subarea east of the Buellton Bend.*

Section 1d.4-2: This section on "Management Plans" should be put into the Appendices.
...1d.5.: ………"Regulatory Programs"………………. should be in the Appendices
… 1d.6…………."Land Use Considerations"…………………………….in the Appendices.

<u>Chapter 2.</u>
Page 2a-15 and the 3 cross section figures: Figure A-A' shows the alluvium (Qal) being on top of the Aquifer (Paso QTp and Careaga Tca), but the text says the Aquifer is separated from the SYR and subterranean alluvial deposits except west of the Buellton Bend.

- In contrast, page 2a-41 seems to say the opposite; it has a good description basically saying that the entire River upstream of the Lompoc Narrows is underlain by bedrock except for section from the EMA/CMA boundary to the Buellton Bend. This section includes "Paso Robles and Careaga Sand" …. "beneath the Santa Ynez River alluvial deposits."

Page 2a-19 , top paragraph. Typo with freestanding "i".

P. 2a-25; SY River and Tributaries: 1st, paragraph, Final sentence should be edited because the tunnels take water not only to *cities* (SB and Goleta) but also to Montecito, which is not a city. Jameson Reservoir and Doulton tunnel are owned and operated by the Montecito Water District.

P. 2a-26; paragraph 2; Wouldn't the tributary that has the eastern most confluence with the SY River be Nojoqui Creek rather than Zaca Creek? I think of Nojoqui Creek as being east of Hwy101 and Zaca Creek as being west of Hwy 101.

P. 2a-34: para 1; final sentence; change "with no permit issued for 13 parcels" to with no permits **yet** issued **as of August 2021** for 13 parcels.

P. 2a-41 mentions "additional geophysical AEM data" (in paragraph 2) and "The AEM geophysics study" (in paragraph 3) but the text should be clear on the status of the data and the study, or say that the study is a recommended action (if that is the case).

Groundwater Conditions

Page 2b-7: Seasonal High text: What are the units of measure for the hydrographs, e.g., # of feet to reach groundwater level? Or the elevation level above sea level? The units should be indicated in the text and on the maps (Figures 2b.1-1 and 1-2).

Page 2b-8 re Evaluation of Seasonal High and Low: When the text says "groundwater elevations measured in Fall 2019 are lower than those measured in Spring 2020", I believe that means the recorded number is *higher*, i.e., the depth to groundwater is a larger number in the fall than in the spring. Perhaps this point should be made clear, because it can be confusing for a general public reader who may be thinking of depth to water rather than elevation - - or vice versa.

Figure 2b.6-3: The drawn line boundary of the Buellton Aquifer (near Buellton Bend) is very helpful in this Figure. It should be similarly shown on some other maps, especially Figures 2a.2-1, and/or -2, -3, and -4.

Water Budget

Fig 2c.1-1 shows (and is titled as) the HCM for the *Western* MA, not the CMA; and it even includes the *Lompoc* Reclamation Plant. This graphic should be replaced by the HCM graphic in the PowerPoint slides which shows a wastewater plant but doesn't label it as the Lompoc Plant. Alternatively, since one HCM is being used for both the WMA and the CMA, this Figure could be re-titled and the drawing re-labeled so the Lompoc RWRP becomes simply "Wastewater Recharge" since wastewater recharge happens in Buellton too.

Page 2c-21. Says "Santa Rita Upland (CMA) and Buellton Upland (WMA)…". Shouldn't those CMA & WMA designations be switched?

Figure 2c.2-1: For inflows, are any "river alluvium inflows" actually visible on this chart? I can't see any.

- Isn't this chart incorrectly showing Imported SWP water prior to 1997?
- why is the Imported SWP shown as a consistent dark line? Shouldn't there be great variability over time?
- is the Net Percolation color actually visible on the chart? I see only SY River and alluvium colors.

Page 2c-42: While Figures 2c.3-1A&B are excellent in giving annual averages, there should be another figure to show the data from page 2c-42, i.e., the net decline of 10,880 AF over the total years of the current water budget period of 2011-2018.

Monitoring Networks

Page 3a-14: The 2nd bullet point regarding CCWA deliveries is irrelevant to this issue. Although the SWP data is appropriately part of the water budget, the amount of SWP water delivered in the CMA (i.e., to the City of Buellton) doesn't help to "estimate current surface water conditions within the CMA". If you have data to show a relationship between SWP deliveries and surface water conditions, then please present it here. However, I doubt that any such relationship exists, partly because poor surface water conditions due to drought often mean low SWP deliveries due to drought in Northern CA.

Page 3b-3; final paragraph says: "Water levels and GW in storage in the SYR Alluvium fluctuate in response to water rights and environmental regulations." No! Better to say: *Alluvium storage fluctuates in response to: precipitation, river flow (including releases from Cachuma), water diversions from the river, pumping from the alluvium, surface evaporation, and phreatophyte ET.* Then you could add that water rights and environmental regulations influence water releases, diversions, and pumping.

- *Also, the sentence is using the term "groundwater in storage" for the alluvium! !*

Page 3b-3, final paragraph: Insert *data* between "groundwater elevation" and "is needed".

Projects and Actions

Table 4a.1-2: For "Supplemental Imported Water", I contend that the "estimated benefit" would be Low, not *Low to Medium*. The text later in the chapter actually identifies why, i.e.: cost of SWP water would be very high; SWP water is often unavailable when it is most needed during drought years; banking the water somewhere else would add to the cost; etc. Also, I believe Buellton residents won't want to substitute aquifer water with more expensive SWP water. Retaining this action item in the Plan is fine, but the "benefit/cost" would be low.

Table 4a.2-1: Change spelling of "Tired" to Tiered.

Page 4a.-35: Since "Group 4" actions seem to be out-of-the-box thinking, how about adding a regional seawater desalination plant to the list? A desal plant on Vandenberg SFB could pump water in a new pipeline along CCWA's pipeline route.

Page 5a-1, table: The Group 1 PMAs should be included in this table, either individually or as a line item, e.g., "Group 1 PMAs", with a "Task" to start implementing them in WY2023.

Page 5a-3: Final paragraph quotes a cost for 2 new monitoring wells. Why not quote a cost for only 1 well, which at least would be more affordable? - - even if 2 wells are sought. Also, this kind of project might be ideal for a future grant from the State or the Feds. This project should be included in the County's IRWM Plan.

< End >

Public Comments

Appendix PC-D:

Santa Ynez Water Group
Klein DeNatale Goldner Attorneys at Law
Dated September 21, 2021

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September 21, 2021

VIA E-MAIL AND U.S. MAIL

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Re: Sustainable Groundwater Management Act

Gentlemen:

We are counsel for the Santa Ynez Water Group (Group), which is a coalition of farmers and ranchers within the Santa Ynez River Groundwater Basin (Basin). These agricultural landowners formed the Group to protect their overlying rights to groundwater in the Basin. This includes engaging with your three groundwater sustainability agencies (GSA) as you develop and administer your respective groundwater sustainability plans (GSP) under the Sustainable Groundwater Management Act (SGMA).

The Group has been monitoring the activities of the Western Management Area GSA, the Central Management Area GSA, and the Eastern Management Area GSA. We have several concerns regarding the current course of events and the burdens your GSAs apparently intend to place solely on agricultural landowners. The purpose of this letter is to express those concerns and request the ability to participate directly regarding the GSPs and the activities of the GSAs.

1. Landowner Representation

There is no exclusive agricultural landowner representation on any of the GSAs' governing committees. Each committee is composed of representatives from governmental agencies with non-agricultural constituencies. For example, the Western Management Area GSA Committee is made up of (1) Santa Ynez River Water Conservation District; (2) the County of Santa Barbara; (3) the City of Lompoc; (4) Mission Hills Community Services District; and (5) Vandenberg Village Community Services District. Both the Central Management Area GSA Committee and the Eastern Management Area GSA Committee are similar. This does not represent the entirety of the water users and interests in the Basin and excludes any direct representation from the agricultural community. Thus, at the outset, the make-up of the GSAs was flawed.

The only avenue your GSAs allowed agricultural landowners to voice their unique opinions or concerns is through the Citizens Advisory Groups. But, just as the name suggests, those groups are only advisory, are weighted toward non-agricultural interests, and carry no decision-making authority. Put simply, agricultural landowners have been intentionally disenfranchised from the decision-making.

We are aware that the GSAs are exploring a potential reorganization of their governance structure. Whether that reorganization results in each GSA remaining as three separate GSAs or forming a single coordinated GSA, it is likely that each GSA will revisit or draft new organizational documents. When doing so, we ask that each GSA include a voting director position for an agricultural landowner representative on each decision-making body formed or otherwise reorganized.

2. Implementation of Projects and Management Actions

We are also concerned with the projects and management actions identified by the GSAs in the draft GSPs. While we understand that many of the GSAs' respective Group 1 projects and management actions focus primarily on monitoring and reporting efforts, all other projects single out and discriminate against agricultural landowners. The burden of sustainability is therefore placed solely on the backs of agricultural landowners.

Funding for these projects and management actions mirrors that problem. We are aware that the GSAs are considering a groundwater extraction fee, assessment, or other property-related fee to fund the GSAs' projects and management actions. As those considerations continue, we encourage the GSAs to pursue the most equitable option in levying that financial burden. Agricultural landowners should not be unfairly targeted with projects and management actions, and then be forced to pay for their development and implementation.

3. Consideration of Overlying Groundwater Rights

Our last concern underlies all that the GSAs are doing. None of the GSAs have considered the effects their actions will have on overlying groundwater rights of agricultural landowners. This omission is evident in the draft GSPs as the GSAs focus exclusively on the interests of municipal groundwater users. This violates the mandates of SGMA requiring your GSAs to consider the interests of all beneficial uses and users of groundwater. Specifically, Water Code section 10723.2 provides, in part:

> "The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to, all of the following:

(a) Holders of overlying groundwater rights, including:

(1) Agricultural users, including farmers, ranchers, and dairy professionals.

. . ."

Our hope is that the GSAs expand their focus and discharge their duty to consider *all* interests in the Basin as required by SGMA.

We understand the complexities of the issues and the challenges in developing a GSP. Our desire is a successful GSP, and to be part of the process. But we cannot do that if the GSAs intentionally disenfranchise agricultural landowners and their senior overlying rights in the Basin.

Please have the attorney advising the GSAs on these issues contact me so that we can discuss how best to resolve our concerns.

Very truly yours,

Joseph D. Hughes

JDH/sbh

cc via e-mail only: Santa Ynez Water Group
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Public Comments

Appendix PC-E:

Santa Ynez Water Group
Klein DeNatale Goldner Attorneys at Law
Dated October 26, 2021

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Klein · DeNatale · Goldner
ATTORNEYS AT LAW

Joseph D. Hughes 661-328-5217 jhughes@kleinlaw.com

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October 26, 2021

Central Management Area GSA
c/o William Buelow
Santa Ynez River Water Conservation District
3669 Sagunto Street, Suite 101
Santa Ynez, CA 93460

Re: Central Management Area draft GSP Comments

Dear Directors and Staff:

The purpose of this letter is to provide the Central Management Area Groundwater Sustainability Agency (GSA) with the comments of the Santa Ynez Water Group to the GSA's draft groundwater sustainability plan (GSP).

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the GSP. In addition to those comments, we add the following.

As previously expressed to the GSA, a primary concern of our members continues to be the GSA's failure to adequately consider the interests of agricultural landowners holding overlying groundwater rights and the effects of the GSA's actions on those landowners. This is evident in the draft GSP's proposed projects and management actions and associated financing structure.

For example, the draft GSP estimates a 15 to 20 percent increase in water use by the City of Buellton, a municipal entity within the Central Management Area holding appropriative groundwater rights. (Draft GSP, 2c.4-1-2.) The draft GSP identifies projects and management actions that may be implemented in response to these projected increases in demand. (Draft GSP, Section 4A.1.) However, throughout Section 4A.1, the draft GSP suggests that the costs associated with these projects and management actions will be borne by *all* groundwater users. Consequently, the GSA is requiring agricultural landowners holding senior overlying groundwater rights to pay for the increased pumping of groundwater users holding junior appropriative groundwater rights. This approach is neither equitable nor reflective of groundwater law.

Additionally, there are several issues within the Sustainable Management Criteria (SMC) chapter of the draft GSP. First, the minimum thresholds (MT) associated with the Chronic Lowering of Groundwater SMC are arbitrary and lacking in sufficient support. This is likely the result of the flawed methodology used in developing these MTs. Further, the Degraded Water Quality SMC is too broad in scope. This SMC should only consider those effects associated with groundwater pumping or other GSP implementation activities, not the adverse effects of wastewater treatment facilities or other like sources.

While these are only a few examples of our members' concerns, several others are identified in the enclosed memorandum.

We appreciate the significance of the considerations and decisions the GSA must undertake, and we look forward to working with you further regarding these matters. Please feel free to contact us if you have any questions or wish to discuss any of our comments.

Very truly yours,

Joseph D. Hughes

JDH/sbh

Enclosure

BONDY
Groundwater Consulting, Inc.

MEMORANDUM

To: Joe Hughes / KDG

From: Bryan Bondy / BGC *BB*

CC: Doug Circle, SYWG

Date: October 25, 2021

Re: CMA Draft GSP Review

Pursuant to your request, this memorandum presents the material findings from my review of the Draft Groundwater Sustainability Plan (GSP) for the Central Management Area of the Santa Ynez River Valley Groundwater Basin (CMA). Please note that my review focused on the key GSP elements only; not all GSP aspects were reviewed in detail.

- Sustainable Management Criteria:
  - Chronic Lowering of Groundwater Levels – The logic behind the minimum thresholds is questionable and the minimum thresholds themselves appear arbitrary.

    The GSP concludes that well operational issues that may be associated with groundwater levels below the top of well screens are indicative of significant and unreasonable depletion of supply. First, well operational issues are not a depletion of supply in of themselves; rather they are infrastructure issues that can be remedied through well redevelopment, well replacement, or backup wells, which could be implemented as GSP projects. It is suggested that depletion of supply not be viewed as well issues that can be remedied; rather, depletion of supply is more appropriately characterized as the inability to produce adequate water because the water isn't there.

    Second, the "well impact analysis" provides clear evidence contrary to the GSP conclusions. Approximately 26% of the wells in the CMA had groundwater levels below top of screen in 2020, yet the GSP states that no reported undesirable results associated with chronic lowering of groundwater levels have occurred (see p. 3b-9). If the premise is that groundwater levels below top of screen causes significant and unreasonable effects, then why haven't numerous instances of significant and unreasonable effects been reported already? Moreover, the number of wells with groundwater levels below the top screen at minimum threshold groundwater elevations is not materially different than the number of wells at 2020 groundwater levels. (0% more municipal wells, 6.3%

more agricultural wells, and 4.3% more domestic wells). There is no justification for why the small increase in the number of wells with groundwater levels below top of screen results causes the CMA to cross the line into the realm of significant and unreasonable effects. No specific, demonstrable effects that are *not* occurring at 2020 levels, but are expected to occur at the minimum threshold levels are identified. Lastly, it is noted that the "well impact analysis" shows that the number of impacted wells would be *exactly the same* if the minimum threshold were set 5 feet lower (i.e., 20 feet below 2020 levels versus 15 feet below 2020 levels). No justification is provided for why undesirable results would be expected at the shallower groundwater level (15 feet below 2020 levels) even through the number of wells impacted is the same if the minimum threshold were to be set at 20 feet below 2020 levels. For these reasons, the minimum thresholds appear arbitrary.

It is noted that there is nothing that has or would prevent any well owner from drilling deeper wells. It is unfair to restrict the use of the groundwater resource and/or charge fees to benefit specific beneficial users who have not made the same level of investment to access the groundwater resource as others. If the GSP is to keep groundwater levels high enough to prevent well issues for those who have not fully invested in infrastructure to access the resource during droughts, then those users should fund the management actions necessary to do so, particularly in the case of the City of Buellton whose appropriative groundwater rights are junior to the overlying landowners.

- Degraded Water Quality:

  - Page 3b-17 states that adverse water quality conditions could be related to wastewater treatment and other sources. The CMA GSA should only be responsible for addressing degradation of groundwater quality caused by pumping and/or GSP implementation. There is a concern that the GSP does not caveat the minimum threshold to this effect. The minimum thresholds should only apply if the CMA GSA determines that water quality degradation is being caused by pumping or GSP implementation.

  - The GSP could be improved by explaining how the GSA will differentiate between changes in concentrations caused by groundwater pumping or GSA activities versus other mechanisms.

- Projects and Management Actions

  - Overarching Comment: GSP projects and management actions will be funded through grants and fees to be levied for groundwater pumping, which appears to include overlying pumpers. Because overlying landowners' groundwater rights are senior to the City of Buellton's appropriative rights, SYWG believes consideration should be given to requiring the City to fund actions necessary to achieve the sustainable yield before levying fees on overlying groundwater users for project or management actions.

- Supplemental Imported Water Program (Section 4a.2-3): The purchase of supplemental State Water Project water would be funded through fees, which appears to include overlying pumpers. Because overlying landowners' groundwater rights are senior to the appropriative rights held by the City of Buellton, SYWG believes consideration should be given to requiring the City to pay for the supplemental water purchases to achieve the sustainable yield.

- Increase Stormwater Recharge (Section 4a.2-4): While the projects described in this section may increase recharge to the CMA, it should be made clear that a primary purpose of the projects is to achieve compliance with Municipal Separate Storm Sewer System permit requirements for storm water quality. Presumably, the City of Buellton would be required to complete these projects regardless of SGMA or take other actions to comply with permit requirements. Therefore, overlying pumpers should not be forced to subsidize the City's efforts to comply with stormwater regulations by including and funding these projects through the GSP. It is acknowledged that the projects may have a groundwater recharge benefit. However, SYWG believes it is appropriate for the City to provide the recharge benefits through these projects at their cost because there is an identified deficit in the CMA water balance and the City's groundwater rights are junior to the landowners overlying groundwater rights.

Closing

Please contact me if you have any questions regarding this memorandum. The opportunity to assist KDG / SYWG is greatly appreciated.

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Public Comments

Appendix PC-F:

State of California – Natural Resources Agency
Department of Fish and Wildlife
Dated October 26, 2021

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 26, 2021

Via Electronic Mail and Online Submission

Mr. Bill Buelow, P.G.
Groundwater Program Manager
Santa Ynez River Water Conservation District
P.O. Box 719
Santa Ynez, CA 93460
BBuelow@syrwcd.com

Subject: Comments on the Santa Ynez River Valley Groundwater Basin's Central Management Area Draft Groundwater Sustainability Plan

Dear Mr. Bill Buelow:

The California Department of Fish and Wildlife (CDFW) appreciates the opportunity to provide comments on the Santa Ynez River Valley Groundwater Basin's Central Management Area Groundwater Sustainability Agency (CMA-GSA) Draft Groundwater Sustainability Plan (Draft GSP) prepared pursuant to the Sustainable Groundwater Management Act (SGMA).

As trustee agency for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of groundwater sustainability plans (GSPs) under SGMA represents a new era of California groundwater management. CDFW has an interest in the sustainable management of groundwater, as many sensitive ecosystems, species, and public trust resources depend on groundwater and interconnected surface waters (ISWs), including ecosystems on CDFW-owned and managed lands within SGMA-regulated basins.

SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to GSPs:

- GSPs must **consider impacts to groundwater dependent ecosystems** (GDEs) (Water Code § 10727.4(l); see also 23 CCR § 354.16(g));
- GSPs must consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater (Water Code § 10723.2) and GSPs must **identify and consider potential effects on all beneficial uses and users of groundwater** (23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3));
- GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water** (23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b)) and describe monitoring

networks that can identify adverse impacts to beneficial uses of interconnected surface waters (23 CCR § 354.34(c)(6)(D)); and
- GSPs must **account for groundwater extraction for all water use sectors,** including managed wetlands, managed recharge, and native vegetation (23 CCR §§ 351(al) and 354.18(b)(3)).

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to surface waters is also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses. (*Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844; *National Audubon Society v. Superior Court* (1983), 33 Cal. 3d 419.) The GSA has "*an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible*." (*National Audubon Society*, *supra*, 33 Cal. 3d at 446.) Accordingly, groundwater plans should consider potential impacts to and appropriate protections for ISWs and their tributaries, and ISWs that support fisheries, including the level of groundwater contribution to those waters.

Individually and collectively, the SGMA statutes and regulations, and Public Trust Doctrine considerations, necessitate that groundwater planning carefully consider and protect environmental beneficial uses and users of groundwater, including fish and wildlife and their habitats, GDEs, and ISWs.

COMMENT OVERVIEW

CDFW supports ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on CDFW expertise and best available information and science. CDFW understands the Santa Ynez River Valley (3-015) (Basin) is rated as a medium priority basin under SGMA with 15 priority points. The Basin sits isolated from other SGMA Basins with only San Antonio Creek Valley (3-014) adjacent to the north that is also rated as a medium priority basin with 15 priority points. These Santa Ynez River Valley Groundwater Basin has been separated into three management areas. They are the Western Management Area (WMA), Central Management Area (CMA) and the Eastern Management Area (EMA). CDFW offers the following comments and recommendations below to assist CMA-GSA in identifying and evaluating impacts on biological resources including GDEs within the adjacent groundwater basins. Additional suggestions are included for CMA-GSA's consideration during revisions of the Draft GSP.

SPECIFIC COMMENTS AND RECOMMENDATIONS

Comment #1: Section 2b.6-2 Interconnected Surface Water for the Santa Ynez River

Issue: The Draft GSP does not provide enough evidence to conclude "there is no interconnected surface water in the CMA". The CMA-Groundwater Conditions Technical Memo (CMA-GC), (page 27) and the Draft GSP (page 2b-35) states, "*Because the underflow of the Santa Ynez River is considered part of the surface water flowing in a known and definite channel, there is no interconnected surface water in the CMA. The Santa Ynez River surface water and underflows are managed by the SWRCB for the reach of the Santa Ynez River in the CMA and will not be managed under SGMA by the CMA GSA. Diversions from the Santa Ynez River Alluvium are subject to SWRCB regulation which considers it the same as surface water* *diversions. As described in the HCM (Section 2a), the Santa Ynez River Alluvium is recharged from the surface water of the river*".

Page 13 of the CMA-Hydrologic Conceptual Model Technical Memo (CMA-HCM) identifies two principal aquifers for the management area. The Upper Aquifer is described as consisting of the river gravels and younger alluvium along the Santa Ynez River, and the Lower Aquifer is defined as consisting of the Paso Robles and Careaga Formations of the Buellton Upland. As per SGMA regulations, a principal aquifer refers to an aquifer or system of aquifers that stores, transmits, and yields significant or economic quantities of groundwater to wells or surface water (23 CCR § 351(aa)). The CMA-HCM identifies the river gravels and younger alluvium along the Santa Ynez River as being part of Upper Principal Aquifer system within the CMA. The CMA-HCM further indicates on page 17 that the Santa Ynez River is in direct contact with major bodies of water-bearing deposits near Buellton and Lompoc subarea where it crosses the two ends of the Santa Rita syncline. The CMA-HCM additionally states on page 17 that many of the wells within the Santa Ynez River Alluvium subarea are shallow, and a precise understanding of the Lower Aquifer underneath the Santa Ynez River is poorly understood in the HCM. CDFW acknowledges there are locations within the CMA where the Santa Ynez River is situated within consolidated non-water bearing formations. However, there are portions of the Santa Ynez River with the potential to be in communication with the water-bearing formations of the principal aquifers, and as such additional characterization is required to support the findings of the GSP.

The CMA-GC provides groundwater contour elevation maps (Figures 1-1 and 1-2) that indicate the direction of groundwater flow for spring 2020 and fall 2019 events for both the Upper Aquifer and the Lower Aquifer. Interpretation of the data set provided indicates a direction/gradient of groundwater flow from the Buellton Uplands towards the Santa Ynez River, which more than likely provides recharge to the Santa Ynez River via the aquifers. Page 21 of the CMA-HCM states, "*Areas with high recharge are dominant in the Buellton Uplands west of Highway 101 to Santa Rosa Creek on the Southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Formation in the Buellton Uplands and to the river gravels along the Santa Ynez River*". The provided information substantiates the idea that the Santa Ynez River is not completely within a known and definite channel and that there are portions of the river that are interconnected with groundwater within the CMA.

As a final discussion, analysis of hydrographs included in the CMA-GC's appendix provides additional data as to the potential interconnection between groundwater levels within the principal aquifers and the "*underflow*" beneath the Santa Ynez River. Several hydrographs within the appendix (i.e., State Well # 6N/31W-18G01, 6N/31W-17D01, and 6N/31W-17F1) provide basic well construction data (e.g., well depth), land surface elevation, groundwater elevations, and depth to water data. The wells listed above are located near the City of Buellton near the Santa Ynez River and close in proximity to each other. However, well location points were not labeled on the provided map and had to be located using provided Township, Range, and Section data. The construction depth for the wells as indicated on the hydrographs indicate depths of 464 feet, 112 feet, and 44 feet and are all designated as being within the Upper Principal Aquifer. The SYR-GSA's groundwater elevations data set for each hydrograph indicate very similar groundwater levels when taking into consideration changes in land surface elevations. CDFW acknowledges that a particular well construction can have an effect on recorded water levels, however, because of the similarities in groundwater levels in each of these wells, combined with their associated depths, additional analysis is needed to determine the vertical gradient between aquifer assemblages within the Upper Principal Aquifer system and potential connection with the Santa Ynez River.

Recommendation #1: CDFW recommends analyzing well data from additional wells to provide a more complete review of well information and lithologic data to better characterize the depths and occurrence of the water bearing strata within the CMA, specifically along the Santa Ynez River channel. CDFW recognizes that the CMA has identified existing data gaps within the CMA-HCM and CMA GC; however, where information is not available, the CMA-GSA needs to identify a proposed plan to obtain this information.

Comment #2: Section 2c.1-3 Surface Water and the Santa Ynez River Alluvium

Issue: The Draft GSP does not provide enough information to conclude that surface waters do not affect groundwater levels. Page 2c-8 of the Draft GSP states, "*In addition, as discussed in the HCM (Section 2a.3), the Santa Ynez River Alluvium is part of the subflow of the river, which is regulated by SWRCB. Because subflow is considered surface water and not groundwater, the Santa Ynez River Alluvium would not be classified as a principal aquifer or managed by a GSP under SGMA. Therefore, the Santa Ynez River Alluvium is considered part of the underflow of the Santa Ynez River and is treated as part of the surface water in the historical, current, and projected water budgets*".

Page 28 of the CMA-GC states, *"Diversions from the Upper Aquifer of the Santa Ynez River Alluvium are subject to SWRCB which considers it the same as surface water. As described in the HCM, the Upper Aquifer is recharged from the surface water of the river."*

The CMA-HCM states that during downstream water right releases, water infiltrates and recharges the alluvium in Zone A (CMA-HCM, Pg. 23). This is another example of a location that has interconnected surface waters based on groundwater recharge during downstream water right releases. CDFW believes this occurs during natural flows at various seasons throughout the year. CDFW agrees that the Upper Aquifer is recharged from the surface water of the river but is unclear on the basis for the conclusion that the diversions from the Upper Aquifer should be regulated in the same manner as surface water.

The CMA-HCM also states that groundwater in the CMA discharges to the Santa Ynez River when the groundwater elevation is higher than the stream channel thalweg. Groundwater discharge to the river will occur during wet winter and spring months. However, during the summer and dry winter months, the streamflow loses water to the groundwater aquifers of the Santa Ynez alluvium subarea (CMA-HCM, p. 27). This is another example of an interconnected surface water that SYR-GSA describes in their CMA-HCM but failed to identify and analyze in the CMA-GC.

Recommendation #2(a): CDFW recommends the Final GSP provide justification, based on specific provisions of SGMA, for the conclusion that the Upper Aquifer should not be classified as a principal aquifer or managed by a GSP under SGMA. CDFW believes the GSA must sustainably manage groundwater resources in the Upper Aquifer, in part because it supports GDEs. Furthermore, portions of the Upper Aquifer are interconnected with surface water and is currently identified as a principal aquifer under Department of Water Resources Bulletin 118 (DWR 2020). The communities within the CMA heavily rely on surface and subsurface diversions from the Upper Aquifer. According to the CMA-GC, Lower Aquifer groundwater pumping may not be occurring in the deeper aquifer (or it is unknown). Use of this Lower Aquifer water may become more appealing and economically viable in the future if groundwater pumping practices change. Thus, analyzing the Upper Aquifer as interconnected with surface water is consistent with the sustainability goals of SGMA. Furthermore, identifying and appropriately considering GDEs in the CMA that rely on the Upper Aquifer should be completed irrespective of the amount of pumping in both aquifers so that future impacts on GDEs due to new production can be avoided. CDFW urges the SYR-GSA to identify and consider all GDEs within the CMA per Code of Regulations, Title 23 § 354.16(g).

Recommendation #2(b): CDFW strongly urges the SYR-GSA to map, identify, and analyze depletions of interconnected surface waters and areas with the potential for depletion of interconnected surface waters per Code of Regulations, Title 23 § 354.16(f).

Comment #3: Section 2b.6-3 Interconnected Surface Water for Tributaries to the Santa Ynez River

Issue: CDFW disagrees with the Draft GSP conclusion that the tributaries within the CMA do not meet SGMA's definition of interconnected surface waters simply because they do not receive measurable flow at all times of year. Page 30 of the CMA-GC and page 2b-35 of the Draft GSP states, "*All tributaries within the CMA (Figure 2b.6-1) are ephemeral. As shown on Figure 2b.6-2, Zaca Creek, the largest CMA tributary, has no measurable flow during half of the period of record. Most flow occurs in wet and above normal years between February to March, with no flow between June to November. This indicates these tributaries are "completely depleted" during part of the year and do not meet the SGMA definition for interconnected surface water. As shown in the HCM (HCM Figure 2a.5-2) there are no identified springs associated with these tributaries*".

Groundwater-dependent habitats, including interconnected surface waters, are particularly susceptible to changes in the depth of the groundwater. Lowered water tables that drop beneath the root zones can cut off phreatophyte vegetation from water resources, stressing or ultimately converting vegetated terrestrial habitat. Induced infiltration attributable to groundwater pumping can reverse hydraulic gradients and may cause streams to stop flowing. The frequency and duration of exposure to lowered groundwater tables and low-flow or no-flow conditions caused by groundwater pumping, as well as habitat and species resilience, will dictate vulnerability to changes in groundwater elevation. For example, some species rely on perennial instream flow, and any interruption to flow can risk species survival.

Under SGMA, a GSP is required to avoid unreasonable adverse impacts on beneficial uses of interconnected surface waters, defined as "*surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer, and the overlying surface water is not completely depleted.*" (Water Code §§ 10721(x)(6) and 10727.2(b); 23 CCR § 351(o).)

The SYR-GSA has not provided adequate support for its conclusion that lack of measurable flow within the tributaries means the tributaries are "*completely depleted*" under this definition. Even assuming the tributaries are "*completely depleted*" during part of the year, there is no requirement within SGMA or its implementing regulations that surface waters have measurable surface flows at all times of the year to qualify as an interconnected surface water. To the extent that the tributaries are hydraulically connected and not completely depleted at any time of the year, they qualify as interconnected surface waters and warrant appropriate consideration in the final GSP, including the goal to avoid depletions causing significant and unreasonable adverse impacts on beneficial uses.

The interconnected surface water narrative also lacks specific estimations of the quantity and timing of streamflow depletions as required by California Code of Regulations, Title 23 § 354.16(f).

Recommendation #3(a): CDFW recommends a more careful review of existing information on surface water-groundwater interconnectivity and recommends the CMA-GSA clarify methods used to categorize losing streams as disconnected. Additionally, CDFW recommends the CMA-GSA identify the estimated quantity and timing of streamflow depletions in the subbasin. If this information is not available, identify a proposed plan to estimate these values.

Recommendation #3(b): CDFW recommends a more detailed evaluation of what is happening beneath the ground to cause this section of Zaca Creek to have low or no flow during parts of the year. The cause for the groundwater elevation fluctuations should be investigated further. Impacts caused by changes in groundwater elevation should be considered in the evaluation of groundwater management effects on GDEs and interconnected surface waters.

Comment #4: Section 2a.4-2-1 Emerging Agricultural Crops: Cannabis Cultivation (Cannabis Priority Watershed)

Issue: CDFW is concerned that cannabis groundwater use is not being fully accounted for when evaluating this SGMA area. Ignoring the growth potential of this industry, could result in a lack of groundwater management accountability. Page 2a-34 of the Draft GSP states that "*Santa Ynez River Valley is not identified as a Cannabis Priority Watershed with a high concentration of cannabis cultivation.*" CDFW has identified, in region, the Santa Ynez River Valley as a high priority watershed. Most projects distributed throughout this SGMA area are clustered within the San Miguelito Creek-Santa Ynez River, Nojoqui Creek, Santa Rosa Creek-Santa Ynez River, Salsipuedes Creek, Santa Rita Valley and Canada De La Vina-Santa Ynez River HUC 12 watersheds. This includes San Miguelito Creek, Salsipuedes Creek, and Santa Ynez River (critical southern steelhead streams) as well as Nojoqui Creek and Santa Rosa River, and the SYR tributaries (Dagit et. al 2020). The projects range from cultivation of 1-50 acres within the approximate 52 notifications the Department has received with the main source of water coming from groundwater wells. CDFW expects this type of trend to continue in the future.

Groundwater and interconnected surface water are critical resources that do not recognize artificial boundaries. Since the implementation of legal cannabis cultivation, CDFW has received multiple applications within the Santa Ynez River Valley, especially in the HUC 12 watersheds listed above. Some of the cannabis grows can range from 1-50 acres, with multiple licenses on a property (resulting in several acres of cultivation) that are dependent on depths within the alluvium. Surface flows (and surface diversions) are regulated in large degree from dam releases, which emphasizes the large roll groundwater wells have in cannabis cultivation.

Santa Ynez has sensitive, natural communities consisting of Oak woodlands, grasslands, sage scrub, chaparral, and riparian woodland habitats along the Santa Ynez River and SYR tributaries. According to the California Natural Diversity Database (CNDDB), the Santa Ynez River Valley provides habitat that supports several sensitive species (some listed as endangered or threatened) throughout their life cycles, including southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), red-legged frog (*Rana draytonii*), and seaside bird's beak (*Cordylanthus rigidus ssp. littoralis*) (CDFW. 2019). Habitats that support these species also consist of phreatophytes and other vegetation communities that are dependent on shallow aquifers that support surface water in each of these systems. Phreatophytic vegetation is a critical contributor to nesting and foraging habitat, forage for a wide range of species and can be affected by sensitive depth to groundwater threshold impacts (Naumburg et.al. 2005) and (Froend et. al. 2010). This sensitivity to groundwater level thresholds means that localized pumping and recharge actions altering groundwater levels can impact the health and extent of phreatophyte vegetation health. Both decreasing (drying out) or increasing (drowning) groundwater elevation has the potential to stress phreatophytes depending on the plant species, groundwater elevation and duration (e.g., short term wetness/dryness versus prolonged wetness/dryness).

Groundwater and interconnected surface water depletion is a major concern for fish and wildlife beneficial users in the Santa Ynez River Valley. Designating this area as a High Priority Cannabis Watershed requires groundwater to be monitored and sustainably managed for the benefit of all beneficial users, including groundwater dependent vegetated communities and interconnected surface waters that are necessary to support riparian and aquatic habitat, and the sensitive species therein such as southern steelhead. Decreased stream flow may contribute to direct mortality if fish eggs are exposed, covered with silt, or left without sufficient oxygenated water. Water degraded in temperature or chemical composition can displace or limit fish populations.

Recommendation #4: CDFW recommends the CMA-GSP monitor the Santa Ynez River Valley as a Cannabis High Priority Watershed. This High priority captures the documented impacts within the groundwater basin and the shifting groundwater consumption rates, as influenced by legalization of cannabis [Water Code §§ 10933. (b)(7,8)]. Based on the number of Departmental applications for legal cultivation, there is documented significant demand and potential adverse impacts to beneficial users of groundwater. The cannabis market growth is expected to increase almost ten times during an eight-year span (Fortune Business Insights 2021). North America is expected to lead the world cannabis market. Santa Barbara County recently approved a zoning permit for 87 acres of outdoor cannabis cultivation.

Comment #5: Section 2a.4-2-1 Emerging Agricultural Crops: Cannabis Cultivation

Issue #5.1: Without the designation of the Santa Ynez River Valley as a Cannabis High Priority Watershed, evaluation of cannabis crop water usage may be overlooked throughout the Santa Ynez River Valley Groundwater Basin, especially within the Santa Ynez Alluvium, an area that, as stated on page 2b-35, will not be managed under SGMA by the CMA-GSA. Page 2a-35 of the Draft GSP states "*all cannabis applications in the CMA are for parcels that in 2016 were used for agriculture. This indicates primarily a change of crop type, rather than an expansion.*" Cannabis cultivation is a water intensive crop that can have a significant impact to environmental beneficial users of groundwater.

Cannabis groundwater wells provide water for the irrigation of water-intensive cannabis cultivation (assuming six gallons of water per day per plant) (Bauer S. 2015). Just within the Santa Ynez Alluvium, CDFW has received approximately 26 cannabis projects. These projects range from cultivation of 3.5 - 50.0 acres with water supplied from groundwater wells. Many of the wells for the cannabis notifications within Santa Ynez Valley are shallow wells located within or immediately adjacent to tributary streams and the SYR. CDFW is concerned that without management of the Santa Ynez Alluvium under SGMA by the CMA-GSA, significant and unreasonable surface water depletions may occur, compromising groundwater dependent ecosystems within and along the streams.

Recommendation #5.1(a): CDFW recommends a more careful review of the existing information on cannabis cultivation within the Santa Ynez Alluvium and recommends the information be considered when evaluating groundwater management. As indicated on page 2a-23, "*Areas with high recharge are dominant in the Buellton Upland west of Highway 101 to Santa Rosa Creek on the southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Sand Formation in the Buellton Upland and to the river gravels along the Santa Ynez River*." The majority reliance on groundwater for cannabis crops irrigation, and the likely interconnected nature of the SYR suggests that such uses (individually or cumulatively) should be considered when evaluating cannabis impacts in the Santa Ynez Alluvium.

Recommendation #5.1(b): CDFW recommends the Santa Ynez River Valley be classified as a Cannabis High Priority Watershed.

Issue #5.2: The majority reliance on groundwater for cannabis crops irrigation, and the likely interconnected nature of the Santa Ynez River suggests that such uses (individually or cumulatively) should be considered when evaluating cannabis impacts in the Santa Ynez alluvium. As indicated on page 2a-23, "A*reas with high recharge are dominant in the Buellton Upland west of Highway 101 to Santa Rosa Creek on the southern slopes of the Purisima Hills and along the Santa Ynez River. These areas correspond to Careaga Sand Formation in the Buellton Upland and to the river gravels along the Santa Ynez River*."

Recommendation #5.2: CDFW recommends a more careful review of the existing information on cannabis cultivation within the Santa Ynez alluvium and recommends the information be considered when evaluating groundwater management.

Comment #6: Section 2b.6-4 Groundwater Dependent Ecosystems in the Central Management Area

Issue: The potential GDEs were assessed into three categories based on their relationship to the aquifer but it is unclear if they were categorized any further. It is also unclear and unknown if there are any GDEs in the Draft GSP that will be protected and monitored into the future. Page 2b-37 of the Draft GSP states that "*These were assessed into three categories based on the relationship to the aquifer (Figure 2b.6-3). If depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems (Rohde et al. 2018), the potential GDE was identified as unlikely to be affected by groundwater management (Category C on Figure 2b.6-3). Riparian areas of the Santa Ynez River were identified as being managed by the SWRCB as part of Santa Ynez River surface and subflow (Category B on Figure 2b.6-3). The remaining area consists of GDEs likely related to groundwater levels (Category A on Figure 2b.6-3). Part of the Category B area that overlies the Buellton Aquifer may have some influence from the Buellton Aquifer water levels. This area is grouped with the Category A to form the potential GDEs. Table 2b.6-2 below summarizes the land areas involved.*"

Table 2b.6-2 Potential CMA Groundwater Dependent Ecosystem Categorization

Potential GDE Category	Ecosystem Description	Acres	Percentage
A	Potential GDE Associated with a Principal Aquifer	11	0.6%
B	Riparian vegetation not subject to SGMA	1223	70.5%
C	Unlikely to be Affected by Groundwater Management	501	28.9%
Potential GDE	Category B over Buellton Aquifer	807	46.5%
Total		**1,735**	**100%**

The potential GDEs were assessed into three categories based on their relationship to aquifers, but it is unclear if they were categorized any further. It is also unclear and unknown if there are any GDEs in the Draft GSP that will be protected and monitored into the future.

Pursuant to SGMA, the GSP to be developed by CMA-GSA must identify and consider impacts to all GDEs in the basin, including flowing waters and refugia supporting southern steelhead. The final GSP must also avoid depletions of interconnected surface waters that have significant and unreasonable adverse impacts on beneficial uses of the surface water. Specific, surface water flows needed to support southern steelhead life stages at different times of year are as follows:

1) from October through June for river-estuary-Ocean connectivity needed for passage;
2) from January through May for adult migration, spawning and incubation;
3) from January through June for juvenile migration; and,
4) year-round for expression of juvenile life history.

CDFW is also concerned that groundwater pumping in the face of climate change and human disturbance will lead to dryer stream reaches incapable of supporting suitable riparian habitat for sensitive species that occupy GDEs, such as least Bell's vireo (*Vireo bellii pusilus*) and southwestern willow flycatcher (*Empidonax traillii extimus*). These federally and State-listed species need dense willow thickets and understory vegetation for both nesting and breeding purposes.

Recommendation #6(a): CDFW recommends the CMA-GSA evaluate potential effects on each GDE unit based on at least four criteria, such as:

1) groundwater dependence;
2) ecological value (high, moderate, low);
3) ecological condition (good, fair, poor) using Normalized Difference Vegetation Index/ Normalized Difference Moisture Index data; and,
4) susceptibility to changing groundwater conditions (high, moderate, low) based on available hydrologic data, climate change projections and GDE susceptibility classifications using a baseline range to consider future changes in groundwater conditions.

Recommendation #6(b): To ensure meaningful consideration of GDEs as required under SGMA, CDFW recommends the SYR-GSA provide a biological assessment identifying species known to occur within the GDEs presented in Figure 5-2, including southern steelhead, least Bell's vireo, and southwestern willow flycatcher. Given the uncertain status of the species and their dependency on GDEs, the CMA-GC must accurately assess drought conditions when water availability will be lower and groundwater extraction might be high.

Recommendation #6(c): CDFW recommends the CMA-GSA include, at a minimum, the GDEs identified within the Basin in the final GSP. The CMA-GSA has not provided enough data to conclude that the Lower Aquifer groundwater pumping definitively does not affect GDEs within the Basin. If the CMA-GSA reaches that conclusion in the future, then then Sustainable Management Criteria for GDEs would no longer be needed. CDFW strongly disagrees with entirely excluding GDEs present in the Basin without enough data to conclude GDEs are not impacted by groundwater pumping.

Recommendation #6(d): CDFW recommends the CMA-GSA identify potential impacts to fish and wildlife beneficial uses, caused by depletions of groundwater. Furthermore, the evaluation should consider species water needs for all life history stages when defining undesirable results and setting minimum thresholds required by SGMA. Different fish and wildlife species have different water needs. Understanding the timing of water availability with respect to species needs across all life history phases will allow groundwater planners to better account for groundwater management impacts to fish and wildlife species and users of groundwater and interconnected surface waters.

GENERAL COMMENTS AND RECOMMENDATIONS

Comment #7: Sensitive Species and Habitats

Issue: Many sensitive species and habitats in the Santa Ynez CMA comprise of GDEs, the natural communities that rely on groundwater to sustain all or a portion of their water needs. Some of the special-status species in the Santa Ynez River watershed that rely on surface water supported and supplemented by groundwater include the federally endangered southern steelhead; southwestern pond turtle (*Actinemys pallida*), a CDFW species of special concern (SSC) and U.S. Forest Service sensitive species; California red-legged frog (*Rana draytonil*), a CDFW SSC and ESA-listed species; western spadefoot toad (*Spea hammondii*), a CDFW SSC and Bureau of Land Management sensitive species; and California tiger salamander (*Ambystoma californiense*), an ESA-listed and California Endangered Species Act (CESA)-listed species.

Southern California Coast Steelhead {*Oncorhynchus mykiss* (*O. mykiss*) or southern steelhead}, is an endangered species under the Federal Endangered Species Act (ESA). The Santa Ynez River contains important southern steelhead spawning and rearing tributaries. Threats to southern steelhead from groundwater pumping, such as excessively high-water temperatures due to reduced surface flows or groundwater pumping in the spring, summer, and early fall, reduce available juvenile rearing habitat. Low flows in the fall and winter can delay adult passage to critical spawning areas. CDFW is very concerned about the health of the southern steelhead population in the Santa Ynez River. Drought conditions and low flow rates have led CDFW to participate in rescue operations as recently as 2020.

Southwestern pond turtle was designated as a California SSC in 1994. Western pond turtle's preferred habitat is permanent ponds, lakes, streams, or permanent pools along intermittent streams associated with standing and slow-moving water. A potentially important limiting factor for western pond turtle is the relationship between water level and flow in off-channel water bodies, which can both be affected by groundwater pumping.

California red-legged frog is rarely encountered far from perennial water. Tadpoles require water for at least three or four months while completing their aquatic development. Adults eat both aquatic and terrestrial invertebrates, and the tadpoles graze along rocky stream bottoms. Groundwater pumping that impairs streamflow could have negative impacts on California red-legged frog populations. Western spadefoot toad migrates to seasonal vernal pools to reproduce. They will use small puddles of water, such as small pools to breed. California tiger salamander is also restricted to vernal pools and seasonal ponds for reproduction.

If groundwater depletion results in reduced streamflow due to interconnected surface waters, the nesting and foraging success of flycatcher, least Bell's vireo, and other bird species may be diminished due to the reduced nesting habitat and food availability.

The unsustainable use of groundwater can impact the shallow aquifers and interconnected surface waters on which these species and GDEs depend. This may lead to adverse impacts on fish and wildlife and the habitat they need to survive. Determining the effects that groundwater levels have on surface water flows in the CMA would provide an understanding of how the groundwater levels may be associated with the health and abundance of riparian vegetation. Poorly managed groundwater pumping, and surface water flows have the potential to reduce the abundance and quality of riparian vegetation, reducing the amount of shade provided by the vegetation, and ultimately leading to increased water temperatures in the CMA.

Recommendation #7: CDFW highly recommends the CMA-GSA map out locations where there are interconnected surface waters and document aquatic habitats and other GDEs as required under SGMA. The CMA-GSA should then provide appropriate consideration to those habitats and the sensitive species that rely on them. Fish and wildlife resources should be considered in the water budget. Additionally, shallow groundwater levels near interconnected surface water should be monitored to ensure that groundwater use is not depleting surface water and affecting fish and wildlife resources in the CMA.

Comment #8: Draft GSP vs. Final GSP

Issue: The CMA-GSA may need to revise the GSP before it is finalized an adopted.

Recommendation #8: CDFW recommends the CMA-GSA provide a red-lined version of the final GSP to understand the changes made between the Draft GSP and final GSP. Alternatively, CDFW recommends the GSA provide a summary of changes made and comments addressed by the GSA in preparation of a final GSP.

CONCLUSION

CDFW has significant concerns about ISWs for the SYR, and its tributaries, and surface water and the SYR alluvium, interconnected surface water for tributaries to the SYR, cannabis cultivation into the future and CDFW urges the CMA-GSA to plan for and engage in responsible groundwater management that minimizes or avoids these impacts to the maximum extent feasible as required under applicable provisions of SGMA and the Public Trust Doctrine.

In conclusion, the Draft GSP does not comply with all aspects of SGMA statute and regulations, and CDFW deems the Draft GSP inadequate to protect fish and wildlife beneficial users of groundwater for the following reasons:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [CCR § 355.4(b)(1)] (See Comments # 2, 3, 4, 5 and 6);

2. The Draft GSP does not identify reasonable measures and schedules to eliminate data gaps. [CCR § 355.4(b)(2)] (See Comments # 1, 2, 3 and 4);

3. The sustainable management criteria and projects and management actions are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Draft GSP. [CCR § 355.4(b)(3)] (See Comments # 2, 3, 4 and 5);

4. The interests of the beneficial uses that are potentially affected by the use of groundwater in the basin, have not been considered. [CCR § 355.4(b)(4)] (See All Comments).

CDFW appreciates the opportunity to provide comments. Additionally, we appreciate CMA-GSA continued coordination with CDFW while CMA-GSA develops a final GSP. If you have any questions or comments regarding this letter, please contact Steve Slack, Environmental Scientist, at Steven.Slack@wildlife.ca.gov.

Sincerely,

DocuSigned by:

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Erinn Wilson-Olgin
Environmental Program Manager I
South Coast Region

Enclosures (Literature Cited)

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Public Comments

Appendix PC-G:

The Nature Conservancy,
Clean Water Action/Clean Water Fund,
Union of Concerned Scientists, Audubon California,
Local Government Commission
Dated October 26, 2021

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October 26, 2021

Santa Ynez River Valley Basin Central Management Area GSA
P.O. BOX 719
Santa Ynez, CA 93460

Submitted via web: https://portal.santaynezwater.org/comment/new?gsaKey=CMA

Re: Public Comment Letter for Santa Ynez River Valley Central Management Area Draft GSP

Dear Bill Buelow,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Santa Ynez River Valley Basin Central Management Area being prepared under the Sustainable Groundwater Management Act (SGMA). Our organizations are deeply engaged in and committed to the successful implementation of SGMA because we understand that groundwater is critical for the resilience of California's water portfolio, particularly in light of changing climate. Under the requirements of SGMA, Groundwater Sustainability Agencies (GSAs) must consider the interests of all beneficial uses and users of groundwater, such as domestic well owners, environmental users, surface water users, federal government, California Native American tribes and disadvantaged communities (Water Code 10723.2).

As stakeholder representatives for beneficial users of groundwater, our GSP review focuses on how well disadvantaged communities, drinking water users, tribes, climate change, and the environment were addressed in the GSP. While we appreciate that some basins have consulted us directly via focus groups, workshops, and working groups, we are providing public comment letters to all GSAs as a means to engage in the development of 2022 GSPs across the state. Recognizing that GSPs are complicated and resource intensive to develop, the intention of this letter is to provide constructive stakeholder feedback that can improve the GSP prior to submission to the State.

Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be **insufficient** under SGMA. We highlight the following findings:

1. Beneficial uses and users **are not sufficiently** considered in GSP development.
    a. Human Right to Water considerations **are not sufficiently** incorporated.
    b. Public trust resources **are not sufficiently** considered.
    c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users **are not sufficiently** analyzed.
2. Climate change **is not sufficiently** considered.

3. Data gaps **are not sufficiently** identified and the GSP **needs additional plans** to eliminate them.
4. Projects and Management Actions **do not sufficiently consider** potential impacts or benefits to beneficial uses and users.

Our specific comments related to the deficiencies of the Santa Ynez River Valley Central Management Area Draft GSP along with recommendations on how to reconcile them, are provided in detail in **Attachment A.**

Please refer to the enclosed list of attachments for additional technical recommendations:

Attachment A	GSP Specific Comments
Attachment B	SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users
Attachment C	Freshwater species located in the basin
Attachment D	The Nature Conservancy's "Identifying GDEs under SGMA: Best Practices for using the NC Dataset"

Thank you for fully considering our comments as you finalize your GSP.

Best Regards,

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Water Policy Analyst
Clean Water Action/Clean Water Fund

J. Pablo Ortiz-Partida, Ph.D.
Western States Climate and Water Scientist
Union of Concerned Scientists

Samantha Arthur
Working Lands Program Director
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Local Government Commission

E.J. Remson
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The Nature Conservancy

Melissa M. Rohde
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Attachment A

Specific Comments on the Santa Ynez River Valley Basin Central Management Area (CMA) Draft Groundwater Sustainability Plan

1. Consideration of Beneficial Uses and Users in GSP development

Consideration of beneficial uses and users in GSP development is contingent upon adequate identification and engagement of the appropriate stakeholders. The (A) identification, (B) engagement, and (C) consideration of disadvantaged communities, drinking water users, tribes,[1] groundwater dependent ecosystems, streams, wetlands, and freshwater species are essential for ensuring the GSP integrates existing state policies on the Human Right to Water and the Public Trust Doctrine.

A. Identification of Key Beneficial Uses and Users

Disadvantaged Communities and Drinking Water Users

The identification of Disadvantaged Communities (DACs) and drinking water users is **insufficient**. We note the following deficiencies with the identification of these key beneficial users:

- The GSP identifies the City of Buelton as a DAC and describes the size of the population. However, the GSP fails to map the location of the DAC within the CMA.
- While the plan provides a density map of domestic wells in the CMA, the GSP fails to provide depth of these wells (such as minimum well depth, average well depth, or depth range).
- The plan fails to explicitly identify the population dependent on groundwater as their source of drinking water in the CMA.

These missing elements are required for the GSA to fully understand the specific interests and water demands of these beneficial users, and to support the consideration of beneficial users in the development of sustainable management criteria and selection of projects and management actions.

RECOMMENDATIONS
• Map the locations of DACs within the CMA. The DWR DAC mapping tool can be used for this purpose.[2] • Identify the sources of drinking water for DAC members, including an estimate of how many people rely on groundwater (e.g., domestic wells, state small water systems, and public water systems).

[1] Our letter provides a review of the identification and consideration of federally recognized tribes (Data source: SGMA Data viewer) within the GSP from non-tribal members and NGOs. Based on the likely incomplete information available to our organizations for this review, we recommend that the GSA utilize the California Department of Water Resources' "Engagement with Tribal Governments" Guidance Document (https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents) to comprehensively address these important beneficial users in their GSP.

[2] The DWR DAC mapping tool is available online at: https://gis.water.ca.gov/app/dacs/.

- Include a map showing domestic well locations and average well depth across the CMA.

Interconnected Surface Waters

The identification of Interconnected Surface Waters (ISWs) is **insufficient**, due to lack of supporting information provided for the ISW analysis.

The GSP states (p. 2b-35): *"Because the underflow of the Santa Ynez River is considered part of the surface water flowing in a known and definite channel, there is no interconnected surface water in the CMA. The Santa Ynez River surface water and underflows are managed by the SWRCB for the reach of the Santa Ynez River in the CMA and will not be managed under SGMA by the CMA GSA."* The HCM section also states (p. 2a-11): *"The subflow of the Santa Ynez River flowing through the Santa Ynez River alluvium [is] managed by SWRCB pursuant to WR 2019-0148 and other orders and decisions, and is also not a principal aquifer."* However, no further explanation or discussion is provided, such as citations from the SWRCB Order, a map showing the relevant section of the river, or cross-section of the river and shallow alluvium have been permitted, licensed and managed as "underflow" by the SWRCB. According to California's Electronic Water Rights Information Management System (eWRIMS), there appear to be only a handful of water rights permits (5 active and 1 inactive) that fall under "underflow" within the CMA (Figure 1). While few water rights in the CMA may have "underflow" permits or licenses, the GSP has failed to substantiate the assertion that the shallow aquifer - **in its entirety** - is classified and managed as "underflow" by the SWRCB. We are generally concerned that the GSP is grossly extrapolating the existence of "underflow" in the shallow alluvium across the entire basin from a limited number of "underflow" points of diversions within the basin that are actually being managed by SWRCB. If the SWRCB is not managing the entire shallow aquifer as "underflow" and the beneficial users of groundwater and surface water reliant on it - this water is actually groundwater and is instead subject to SGMA regulations.

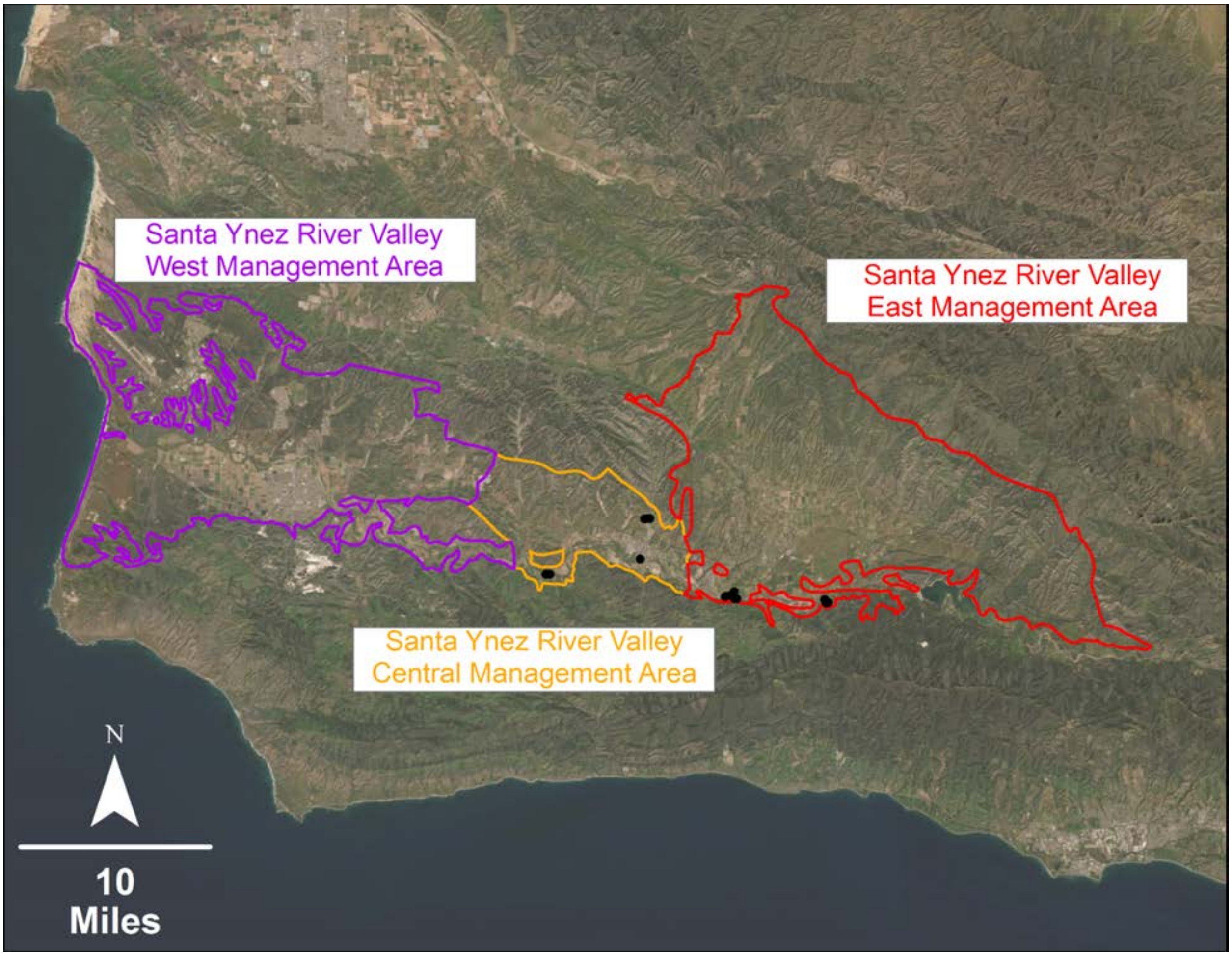

Figure 1. Points of Diversion (black circles) classified as "Santa Ynez River Underflow" within the CMA (orange) and Eastern Management Area (EMA; red). No "underflow" points of diversion were located in the Western Management Area (WMA; purple). Data Source: eWRIMS.

The GSP continues (p. 2b-35): *"All tributaries within the CMA (Figure 2b.6-1) are ephemeral. As shown on Figure 2b.6-2, Zaca Creek, the largest CMA tributary, has no measurable flow during half of the period of record. Most flow occurs in wet and above normal years between February to March, with no flow between June to November. This indicates these tributaries are "completely depleted" during part of the year and do not meet the SGMA definition for interconnected surface water."* The last sentence of this section illustrates a misunderstanding of the SGMA definition of ISW. Note the regulations [23 CCR §351(o)], which are cited in several places in the GSP, define ISW as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". The GSP focuses on the phrase "completely depleted," without acknowledging the phrase "at any point." "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be crucial for surface water flow and supporting environmental users of groundwater and surface water. Using seasonal groundwater elevation data over multiple water year types is an essential component of identifying ISWs.

The ISW section of the GSP does not provide a map or concluding statement regarding which reaches in the CMA are considered interconnected or disconnected. In Section 3b.2-6 (Interconnected Surface and Groundwater – Undesirable Results), the GSP states (p. 3b-22): *"The Santa Ynez River is the predominant interconnected surface water and groundwater system* *in the CMA and extends from the EMA to the WMA (Figure 3b.2-3)."* This figure is missing from the GSP, however.

RECOMMENDATIONS
● Provide a map showing all the stream reaches in the CMA, with reaches clearly labeled as interconnected (gaining/losing) or disconnected. Consider any segments with data gaps as potential ISWs and clearly mark them as such on maps provided in the GSP. ● Substantiate the assertion that the shallow aquifer - **in its entirety** - is classified and managed as "underflow" by the SWRCB. For example, include a map and description of whether "underflow" points of diversion and "groundwater" extraction wells are both extracting from the same shallow alluvium. Discuss SWRCB Order WR 2019-0148 and explain how it relates to the definition of ISW in the CMA. Cite relevant sections of the order, maps, and cross-sections. ● Provide depth-to-groundwater contour maps using the best practices presented in Attachment D, to aid in the determination of ISWs. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a digital elevation model (DEM) to estimate depth to groundwater contours across the landscape. This will provide accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. ● Use seasonal data over multiple water year types to capture the variability in environmental conditions inherent in California's climate, when mapping ISWs. We recommend the 10-year pre-SGMA baseline period of 2005 to 2015. ● Reconcile ISW data gaps with specific measures (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP.

Groundwater Dependent Ecosystems

The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**. The GSP took initial steps to identify and map GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset). However, we found that some mapped features in the NC dataset were improperly disregarded, as described below.

- NC dataset polygons were incorrectly removed If depth to groundwater has historically exceeded the 30-foot depth identified by the Nature Conservancy as representative of groundwater conditions that may sustain common phreatophytes and wetland ecosystems. However, description of the groundwater data used for the 30-foot threshold analysis is not provided in the GSP text. If it is the fall 2019 and spring 2020 data described in Section 2b.1-2 (Groundwater Elevation Contour Maps), then this data does not provide sufficient seasonal and temporal variability and it is after the 2015 SGMA benchmark date.
- NC dataset polygons were incorrectly removed from riparian areas of the Santa Ynez River if identified as being "underflow" and managed by the SWRCB. However, as stated

above under the ISW section of this letter, the GSP has failed to substantiate the assertion that the shallow aquifer - **in its entirety** - is classified and managed as "underflow" by the SWRCB, nor has the GSP provided a sufficient explanation of how the SWRCB Order relates to groundwater management in the CMA.

Table 2a.4-4 lists threatened and endangered species in the CMA, but the GSP does not present a complete inventory of flora and fauna species present in the CMA's GDEs.

RECOMMENDATIONS
● Use depth-to-groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. We recommend that a pre-SGMA baseline period (10 years from 2005 to 2015) be established to characterize groundwater conditions over multiple water year types. Refer to Attachment D of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. ● Refer to Attachment B for more information on TNC's plant rooting depth database. Deeper thresholds are necessary for plants that have reported maximum root depths that exceed the averaged 30-ft threshold, such as valley oak (*Quercus lobata*). We recommend that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to-groundwater threshold of 80 feet should be used instead of the 30-ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources. ● Provide depth-to-groundwater contour maps, noting the best practices presented in Attachment D. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a digital elevation model (DEM) to estimate depth-to-groundwater contours across the landscape. ● If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons as "Potential GDEs" in the GSP until data gaps are reconciled in the monitoring network. ● Include an inventory of the flora and fauna present within the CMA's GDEs (see Attachment C of this letter for a list of freshwater species located in the CMA). ● Show the extent of the shallow aquifer that is classified and managed as "underflow" by the SWRCB. For example, include a map and description of extraction points and whether they source "underflow" or "groundwater" from the shallow alluvium. Discuss SWRCB Order WR 2019-0148 and explain how it relates to SGMA and the definition of ISW in the CMA. Cite relevant sections of the order, maps, and cross-sections.

Native Vegetation and Managed Wetlands
Native vegetation and managed wetlands are water use sectors that are required to be included in the water budget.[3,4] The integration of native vegetation into the water budget is **sufficient**. We commend the GSA for including the groundwater demands of this ecosystem in the historical, current and projected water budgets. Managed wetlands are not mentioned in the GSP, so it is not known whether or not they are present in the CMA.

RECOMMENDATION
• State whether or not there are managed wetlands in the CMA. If there are, ensure that their groundwater demands are included as separate line items in the historical, current, and projected water budgets.

B. Engaging Stakeholders

Stakeholder Engagement during GSP development
Stakeholder engagement during GSP development is **insufficient**. SGMA's requirement for public notice and engagement of stakeholders is not fully met by the description in the Public Outreach and Engagement Plan (Appendix 1c-C).[5]

We note the following deficiencies with the overall stakeholder engagement process:

- The opportunities for public involvement and engagement are described in very general terms and include attending GSA meetings and workshops, reading electronic newsletters, providing input on the draft and final GSP, and a Citizen Advisory Group. There are no specific details provided regarding targeted outreach to DACs, domestic well owners, and environmental stakeholders.

- The Public Outreach and Engagement Plan does not include specific plans for continual engagement during the GSP *implementation* phase with DACs, domestic well owners, and environmental stakeholders.

RECOMMENDATION
• Include a more detailed and robust Public Outreach and Engagement Plan that describes active and targeted outreach to engage DAC members, domestic well owners, and environmental stakeholders throughout the GSP development and implementation phases. Refer to Attachment B for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.

[3] "'Water use sector' refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation." [23 CCR §351(al)]
[4] "The water budget shall quantify the following, either through direct measurements or estimates based on data: (3) Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow." [23 CCR §354.18]
[5] "A communication section of the Plan shall include a requirement that the GSP identify how it encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin." [23 CCR §354.10(d)(3)]

- Utilize DWR's tribal engagement guidance to comprehensively address all tribal beneficial users in the basin within the GSP.[6]

C. Considering Beneficial Uses and Users When Establishing Sustainable Management Criteria and Analyzing Impacts on Beneficial Uses and Users

The consideration of beneficial uses and users when establishing sustainable management criteria (SMC) is **insufficient**. The consideration of potential impacts on all beneficial users of groundwater in the basin are required when defining undesirable results and establishing minimum thresholds.[7,8,9]

Disadvantaged Communities and Drinking Water Users
For chronic lowering of groundwater levels, the GSP presents a well impact analysis to assess the potential impacts of water level decline on domestic wells (Appendix 3b-B), which was used to determine the groundwater level minimum thresholds for the CMA. The GSP states (p. 3b-26): *"The minimum threshold for chronic lowering of groundwater levels in the Buellton Upland Aquifer was chosen by the CMA GSA to be 15 feet below 2020 groundwater levels in half of the RMWs for a period of two consecutive non-drought years. 15 feet below 2020 groundwater elevations is the level at which 30 percent of domestic and municipal wells would begin to entrain air into the screens and is established with consideration of operational flexibility and beneficial use types within the basin (Appendix 3b-B). About 10 percent of agricultural wells would be impacted at this level."* Despite this well impact analysis, the GSP does not sufficiently describe whether minimum thresholds will avoid significant and unreasonable loss of drinking water to domestic well users in those 30% domestic wells predicted to be affected, especially given the absence of a well mitigation plan in the GSP.

In addition, the GSP does not sufficiently describe or analyze direct or indirect impacts on DACs when defining undesirable results, nor does it describe how the groundwater level minimum thresholds will avoid significant and unreasonable impacts to DACs and domestic well users beyond 2015 and be consistent with Human Right to Water policy.[10]

For degraded water quality, the GSP identifies the constituents of concern (COCs) in the CMA as the following: boron, chloride, total dissolved solids (TDS), sulfate, sodium, and nitrate. The minimum threshold for nitrate is set to the maximum contaminant level (MCL) of 10 mg/L for nitrate as nitrogen. The minimum threshold for TDS is set to the secondary maximum contaminant level (SMCL) of 1,000 mg/L. For the other COCs, the minimum threshold concentrations are established at the median Water Quality Objectives (WQOs) established from the Central Coastal Basin Water Quality Control Plan (CCBWQCP). The GSP does not compare the WQOs with MCLs to ensure the most protective values are chosen as minimum thresholds.

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[6] Engagement with Tribal Governments Guidance Document. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Doc-for-SGM-Engagement-with-Tribal-Govt_ay_19.pdf

[7] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results." [23 CCR §354.26(b)(3)]

[8] "The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]

[9] "The description of minimum thresholds shall include [...] how state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the agency shall explain the nature of and the basis for the difference." [23 CCR §354.28(b)(5)]

[10] California Water Code §106.3. Available at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=106.3

The GSP only includes a very general discussion of impacts to drinking water users when defining undesirable results and evaluating the impacts of proposed minimum thresholds. The GSP does not, however, mention or discuss direct and indirect impacts on DACs when defining undesirable results for degraded water quality, nor does it evaluate the cumulative or indirect impacts of proposed minimum thresholds on DACs.

RECOMMENDATIONS

Chronic Lowering of Groundwater Levels

- Describe direct and indirect impacts on drinking water users and DACs when describing undesirable results and defining minimum thresholds for chronic lowering of groundwater levels.

Degraded Water Quality

- Describe direct and indirect impacts on DACS and drinking water users when defining undesirable results for degraded water quality. For specific guidance on how to consider these users, refer to "Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act."[11]

- Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on DACS and drinking water users.

- Provide a table in the GSP that compares WQOs to MCLs for all COCs. Ensure that the most protective value is chosen for the minimum threshold.

<u>**Groundwater Dependent Ecosystems and Interconnected Surface Waters**</u>

The GSP only considers GDEs with respect to the depletion of interconnected surface water sustainability indicator, but not the chronic lowering of groundwater levels sustainability indicator. No analysis or discussion is provided in the GSP that describes impacts on GDEs or establishes SMC for GDEs that are directly dependent on groundwater. This is problematic because without identifying potential impacts on GDEs, minimum thresholds may compromise these environmental beneficial users. Since GDEs may be present in areas of the CMA that are not adjacent to ISW (see our comments in the GDE section of this letter), they must be considered when developing SMC for chronic lowering of groundwater levels.

For depletions of interconnected surface water, the GSP does not describe undesirable results to beneficial users of surface water, other than to say (p. 3b-23): *"Surface water releases through the Cachuma Reservoir to the CMA are managed by SWRCB under Order WR 2019-0148. The lowering of groundwater levels below historical lows in the Upper Aquifer potentially impacts habitat and ecosystem health along the Santa Ynez River."*

The GSP continues (p. 3b-24): *"Using groundwater levels adjacent to the Santa Ynez River, undesirable results associated with a depletion of interconnected surface water and groundwater will be quantified by measuring groundwater elevations semi-annually at three representative monitoring points located adjacent to the Santa Ynez River (Figure 3b.2-3) and maintaining water levels above historical low groundwater levels. Significant and undesirable results are defined as groundwater elevations that drop to 15 feet below channel thalweg elevations in two out of the*

[11] Guide to Protecting Water Quality under the Sustainable Groundwater Management Act
https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858.

three representative monitoring wells for two consecutive non-drought years (Section 3b.3-6)." However, no analysis or discussion is presented to describe how the SMC will affect GDEs, or the impact of these minimum thresholds on GDEs in the CMA. Furthermore, the GSP makes no attempt to evaluate the impacts of the proposed minimum threshold on environmental beneficial users of surface water. The GSP does not explain how the chosen minimum thresholds and measurable objectives avoid significant and unreasonable effects on surface water beneficial users in the CMA, such as increased mortality and inability to perform key life processes (e.g., reproduction, migration).

RECOMMENDATIONS

- Define chronic lowering of groundwater SMC directly for environmental beneficial users of groundwater. When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact on GDEs. Undesirable results to environmental users occur when 'significant and unreasonable' effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the CMA.[12] Defining undesirable results is the crucial first step before the minimum thresholds can be determined.[13]

- When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in the CMA are reached.[14] The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts on environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP. These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law.[6,15]

- When establishing SMC for the basin, please consider that the SGMA statute [Water Code §10727.4(l)] specifically calls out that GSPs shall include "impacts on groundwater dependent ecosystems".

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[12] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results". [23 CCR §354.26(b)(3)]

[13] The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]

[14] "The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results." [23 CCR §354.28(c)(6)]

[15] Rohde MM, Seapy B, Rogers R, Castañeda X, editors. 2019. Critical Species LookBook: A compendium of California's threatened and endangered species for sustainable groundwater management. The Nature Conservancy, San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/Critical_Species_LookBook_91819.pdf

2. Climate Change

The SGMA statute identifies climate change as a significant threat to groundwater resources and one that must be examined and incorporated in the GSPs. The GSP Regulations require integration of climate change into the projected water budget to ensure that projects and management actions sufficiently account for the range of potential climate futures.[16] The effects of climate change will intensify the impacts of water stress on GDEs, making available shallow groundwater resources especially critical to their survival. Condon *et al.* (2020) shows that GDEs are more likely to succumb to water stress and rely more on groundwater during times of drought.[17] When shallow groundwater is unavailable, riparian forests can die off and key life processes (e.g., migration and spawning) for aquatic organisms, such as steelhead, can be impeded.

The integration of climate change into the projected water budget is **insufficient**. The GSP incorporates climate change into the projected water budget using DWR change factors for 2030 and 2070. However, the plan does not consider multiple climate scenarios (e.g., the 2070 extremely wet and extremely dry climate scenarios) in the projected water budget. The GSP should clearly and transparently incorporate the extremely wet and dry scenarios provided by DWR into projected water budgets or select more appropriate extreme scenarios for the CMA. While these extreme scenarios may have a lower likelihood of occurring, their consequences could be significant and their inclusion can help identify important vulnerabilities in the basin's approach to groundwater management.

The GSP incorporates climate change into key inputs (e.g., precipitation and evapotranspiration) of the projected water budget. However, imported water should be adjusted for climate change and clearly incorporated into the surface water flow inputs of the projected water budget. Furthermore, the GSP does not provide a sustainable yield based on the projected water budget with climate change incorporated. If the water budgets are incomplete, including the omission of projected climate change effects on surface water flow inputs, and sustainable yield is not calculated based on climate change projections, then there is increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not adequately include climate change projections may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems, DACs, and domestic well owners.

RECOMMENDATIONS
• Integrate climate change, including extremely wet and dry scenarios, into all elements of the projected water budget to form the basis for development of sustainable management criteria and projects and management actions. • Incorporate climate change into surface water flow inputs, including imported water, for the projected water budget. • Estimate sustainable yield based on the projected water budget with climate change incorporated. • Incorporate climate change scenarios into projects and management actions.

[16] "Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow." [23 CCR §354.18(e)]

[17] Condon et al. 2020. Evapotranspiration depletes groundwater under warming over the contiguous United States. Nature Communications. Available at: https://www.nature.com/articles/s41467-020-14688-0

3. Data Gaps

The consideration of beneficial users when establishing monitoring networks is **insufficient**, due to lack of specific plans to increase the Representative Monitoring Wells (RMWs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs in the CMA.

Figure 3a.3-1 (CMA Monitoring Network and Representative Monitoring Wells for Groundwater Levels and Groundwater Storage) shows insufficient representation of DACs for groundwater elevation monitoring. Figure 3a.3-2 (CMA Monitoring Network and Representative Monitoring Wells for Water Quality) shows insufficient representation of DACs for water quality monitoring. Beneficial users of groundwater may remain unprotected by the GSP without adequate monitoring and identification of data gaps in the shallow aquifer. The Plan therefore fails to meet SGMA's requirements for the monitoring network.[18]

Figure 3a.3-3 (CMA Monitoring Network and Representative Monitoring for Groundwater Dependent Ecosystems) shows RMWs along the length of the Santa Ynez River that adequately cover the area of mapped GDEs. The figure denotes a data gap area near potential GDEs where a piezometric well is proposed.

RECOMMENDATIONS
• Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, GDEs, and ISWs to clearly identify which beneficial users are not adequately being monitored spatially and at depth. • Increase the number of RMWs in the shallow aquifer across the CMA as needed to adequately monitor all groundwater condition indicators across the CMA and at appropriate depths for *all* beneficial users. Prioritize proximity to DACs, domestic wells, GDEs, and ISWs when identifying new RMWs. • Describe biological monitoring that can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the CMA.

4. Addressing Beneficial Users in Projects and Management Actions

The consideration of beneficial users when developing projects and management actions is **insufficient**, due to the failure to completely identify benefits or impacts of identified projects and management actions, including water quality impacts, to key beneficial users of groundwater such as GDEs, aquatic habitats, surface water users, DACs, and drinking water users. Therefore, potential project and management actions may not protect these beneficial users. Groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for *all* beneficial users.

The GSP lists a PMA entitled "Drought Mitigation by Pumping Optimization and Deepen Existing Wells" (p. 4a-35), but the GSP states that it is not a current commitment that the GSA plans to implement. We strongly recommend including specific plans to implement a drinking water well impact mitigation program

[18] "The monitoring network objectives shall be implemented to accomplish the following: [...] (2) Monitor impacts to the beneficial uses or users of groundwater." [23 CCR §354.34(b)(2)]

since the SMC section of the GSP outlines that a significant percentage of domestic wells will be impacted at minimum thresholds.

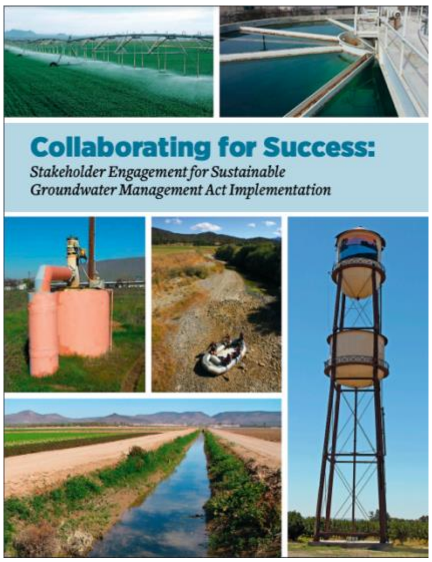
RECOMMENDATIONS
- For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program.   - For DACs and domestic well owners, include a discussion of whether potential impacts to water quality from projects and management actions could occur and how the GSA plans to mitigate such impacts.   - The GSP discusses Project Management Action No. 4: Increase Stormwater Recharge. Note that recharge ponds, reservoirs, and facilities for managed aquifer recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For further guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the “Multi-Benefit Recharge Project Methodology Guidance Document.”[19]   - Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.

[19] The Nature Conservancy. 2021. Multi-Benefit Recharge Project Methodology for Inclusion in Groundwater Sustainability Plans. Sacramento. Available at: https://groundwaterresourcehub.org/sgma-tools/multi-benefit-recharge-project-methodology-guidance/

Attachment B

SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users

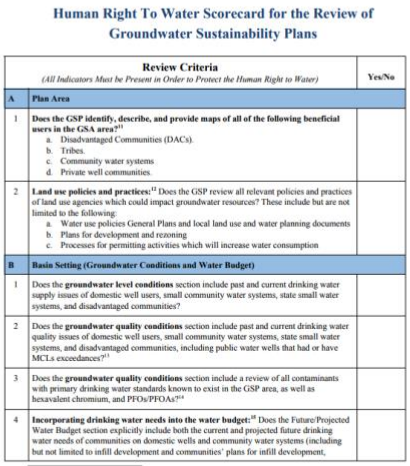
Stakeholder Engagement and Outreach



Clean Water Action, Community Water Center and Union of Concerned Scientists developed a guidance document called Collaborating for success: Stakeholder engagement for Sustainable Groundwater Management Act Implementation. It provides details on how to conduct targeted and broad outreach and engagement during Groundwater Sustainability Plan (GSP) development and implementation. Conducting a targeted outreach involves:

- Developing a robust Stakeholder Communication and Engagement plan that includes outreach at frequented locations (schools, farmers markets, religious settings, events) across the plan area to increase the involvement and participation of disadvantaged communities, drinking water users and the environmental stakeholders.
- Providing translation services during meetings and technical assistance to enable easy participation for non-English speaking stakeholders.
- GSP should adequately describe the process for requesting input from beneficial users and provide details on how input is incorporated into the GSP.

The Human Right to Water

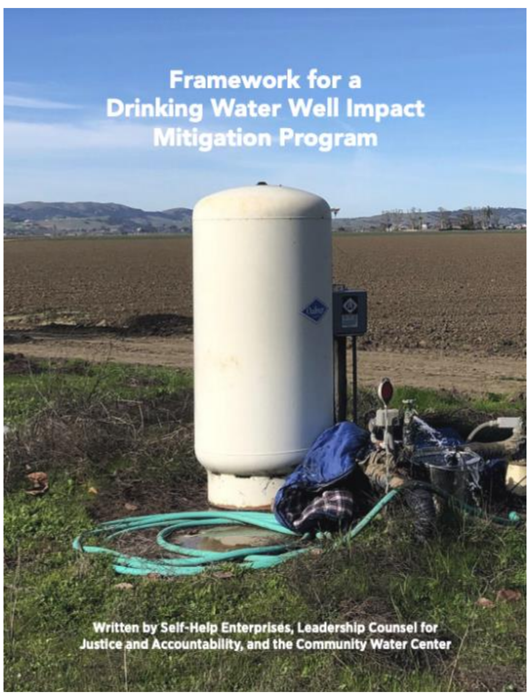


Human Right To Water Scorecard for the Review of Groundwater Sustainability Plans

	Review Criteria *(All Indicators Must be Present in Order to Protect the Human Right to Water)*	Yes/No
A	**Plan Area**	
1	**Does the GSP identify, describe, and provide maps of all of the following beneficial users in the GSA area?**[11] a. Disadvantaged Communities (DACs). b. Tribes. c. Community water systems d. Private well communities.	
2	**Land use policies and practices:**[12] Does the GSP review all relevant policies and practices of land use agencies which could impact groundwater resources? These include but are not limited to the following: a. Water use policies General Plans and local land use and water planning documents b. Plans for development and rezoning c. Processes for permitting activities which will increase water consumption	
B	**Basin Setting (Groundwater Conditions and Water Budget)**	
1	Does the **groundwater level conditions** section include past and current drinking water supply issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities?	
2	Does the **groundwater quality conditions** section include past and current drinking water quality issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities, including public water wells that had or have MCLs exceedances?[13]	
3	Does the **groundwater quality conditions** section include a review of all contaminants with primary drinking water standards known to exist in the GSP area, as well as hexavalent chromium, and PFOs/PFOAs?[14]	
4	**Incorporating drinking water needs into the water budget:**[15] Does the Future/Projected Water Budget section explicitly include both the current and projected future drinking water needs of communities on domestic wells and community water systems (including but not limited to infill development and communities' plans for infill development,	

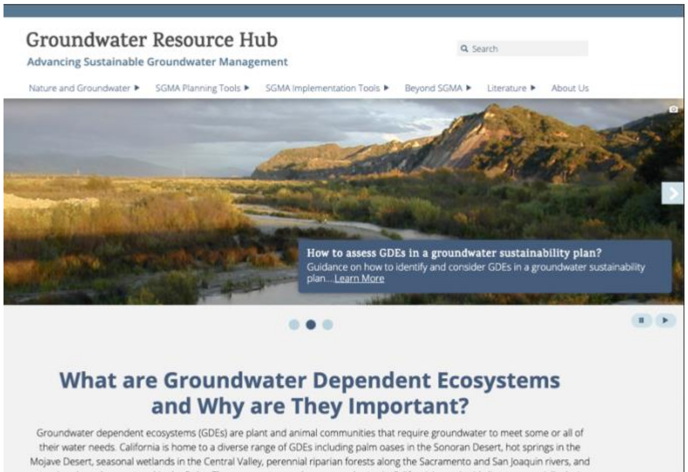
The Human Right to Water Scorecard was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid Groundwater Sustainability Agencies (GSAs) in prioritizing drinking water needs in SGMA. The scorecard identifies elements that must exist in GSPs to adequately protect the Human Right to Drinking water.

Drinking Water Well Impact Mitigation Framework



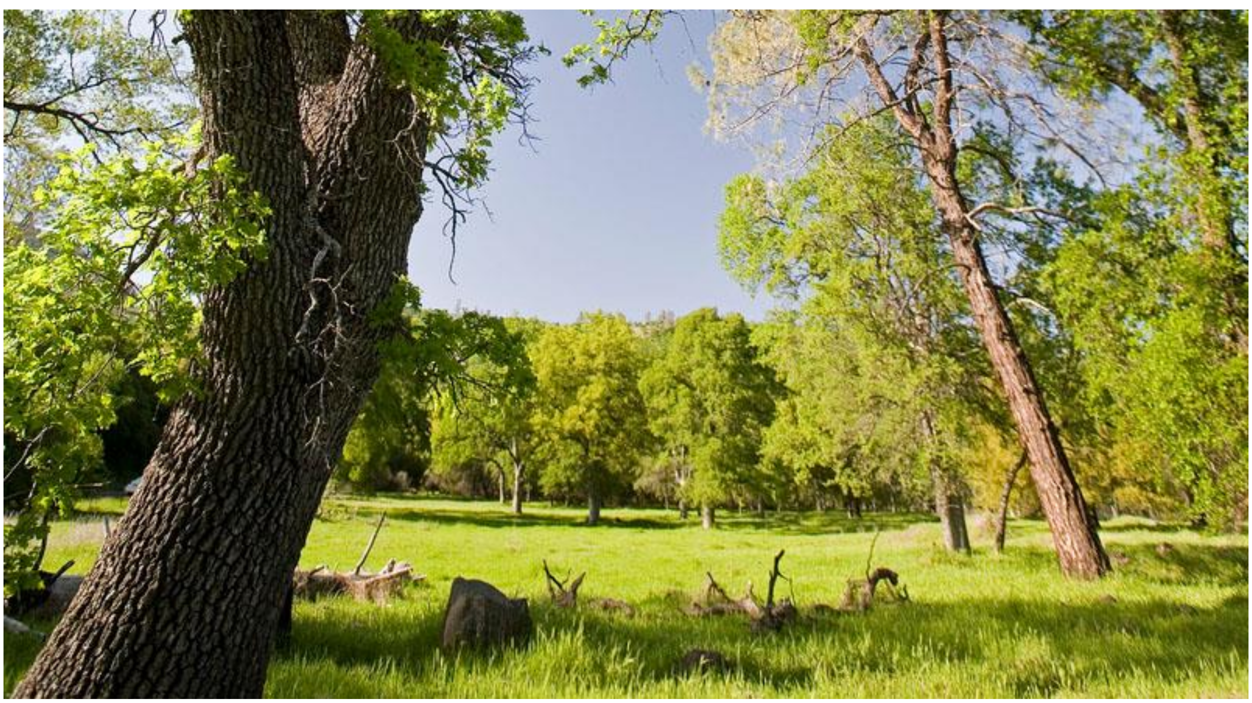
The Drinking Water Well Impact Mitigation Framework was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid GSAs in the development and implementation of their GSPs. The framework provides a clear roadmap for how a GSA can best structure its data gathering, monitoring network and management actions to proactively monitor and protect drinking water wells and mitigate impacts should they occur.

Groundwater Resource Hub



The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Rooting Depth Database



The Plant Rooting Depth Database provides information that can help assess whether groundwater-dependent vegetation are accessing groundwater. Actual rooting depths will depend on the plant species and site-specific conditions, such as soil type and availability of other water sources. Site-specific knowledge of depth to groundwater combined with rooting depths will help provide an understanding of the potential groundwater levels are needed to sustain GDEs.

How to use the database

The maximum rooting depth information in the Plant Rooting Depth Database is useful when verifying whether vegetation in the Natural Communities Commonly Associated with Groundwater (NC Dataset) are connected to groundwater. A 30 ft depth-to-groundwater threshold, which is based on averaged global rooting depth data for phreatophytes[1], is relevant for most plants identified in the NC Dataset since most plants have a max rooting depth of less than 30 feet. However, it is important to note that deeper thresholds are necessary for other plants that have reported maximum root depths that exceed the averaged 30 feet threshold, such as valley oak (*Quercus lobata*), Euphrates poplar (*Populus euphratica*), salt cedar (*Tamarix spp.*), and shadescale (*Atriplex confertifolia*). The Nature Conservancy advises that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to groundwater threshold of 80 feet should be used instead of the 30 ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources.

The Plant Rooting Depth Database is an Excel workbook composed of four worksheets:

1. California phreatophyte rooting depth data (included in the NC Dataset)
2. Global phreatophyte rooting depth data
3. Metadata
4. References

How the database was compiled

The Plant Rooting Depth Database is a compilation of rooting depth information for the groundwater-dependent plant species identified in the NC Dataset. Rooting depth data were compiled from published scientific literature and expert opinion through a crowdsourcing campaign. As more information becomes available, the database of rooting depths will be updated. Please Contact Us if you have additional rooting depth data for California phreatophytes.

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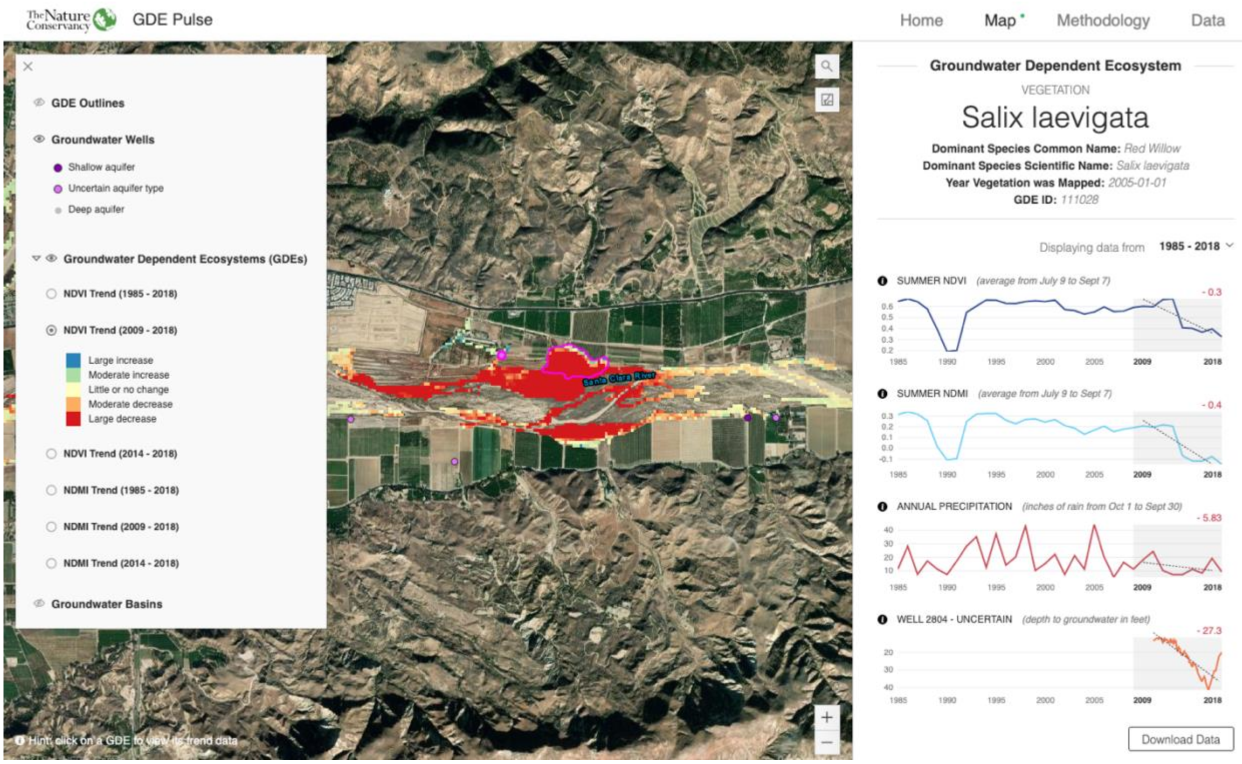
[1] Canadell, J., Jackson, R.B., Ehleringer, J.B. et al. 1996. Maximum rooting depth of vegetation types at the global scale. Oecologia 108, 583–595. https://doi.org/10.1007/BF00329030

GDE Pulse



GDE Pulse is a free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data. Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset. The following datasets are available for downloading:

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

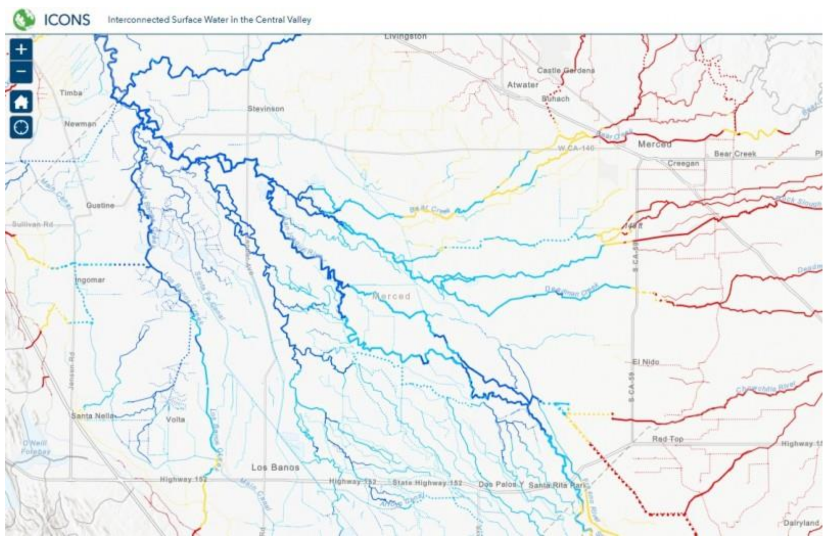
Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

ICONOS Mapper

Interconnected Surface Water in the Central Valley



[ICONS](#) maps the likely presence of interconnected surface water (ISW) in the Central Valley using depth to groundwater data. Using data from 2011-2018, the ISW dataset represents the likely connection between surface water and groundwater for rivers and streams in California's Central Valley. It includes information on the mean, maximum, and minimum depth to groundwater for each stream segment over the years with available data, as well as the likely presence of ISW based on the minimum depth to groundwater. The Nature Conservancy developed this database, with guidance and input from expert academics, consultants, and state agencies.

We developed this dataset using groundwater elevation data available online from the California Department of Water Resources (DWR). DWR only provides this data for the Central Valley. For GSAs outside of the valley, who have groundwater well measurements, we recommend following our methods to determine likely ISW in your region. The Nature Conservancy's ISW dataset should be used as a first step in reviewing ISW and should be supplemented with local or more recent groundwater depth data.

Attachment C

Freshwater Species Located in the Santa Ynez River Valley Subbasin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", Attachment C provides a list of freshwater species located in the Santa Ynez River Valley Subbasin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the basin boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015[1]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[2] as well as on The Nature Conservancy's science website[3].

Scientific Name	Common Name	Legal Protected Status		
		Federal	State	Other
BIRDS				
Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered	
Actitis macularius	Spotted Sandpiper			
Aechmophorus clarkii	Clark's Grebe			
Aechmophorus occidentalis	Western Grebe			
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			
Aythya americana	Redhead		Special Concern	BSSC - Third priority

[1] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 11(7). Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710

[2] California Department of Fish and Wildlife BIOS: https://www.wildlife.ca.gov/data/BIOS

[3] Science for Conservation: https://www.scienceforconservation.org/products/california-freshwater-species-database

Aythya collaris	Ring-necked Duck			
Aythya marila	Greater Scaup			
Aythya valisineria	Canvasback		Special	
Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			
Bucephala clangula	Common Goldeneye			
Butorides virescens	Green Heron			
Calidris alpina	Dunlin			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chlidonias niger	Black Tern		Special Concern	BSSC - Second priority
Chroicocephalus philadelphia	Bonaparte's Gull			
Cistothorus palustris palustris	Marsh Wren			
Cygnus columbianus	Tundra Swan			
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Gelochelidon nilotica vanrossemi	Gull-billed Tern	Bird of Conservation Concern	Special Concern	BSSC - Third priority
Haliaeetus leucocephalus	Bald Eagle	Bird of Conservation Concern	Endangered	
Himantopus mexicanus	Black-necked Stilt			
Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority
Laterallus jamaicensis coturniculus	California Black Rail	Bird of Conservation Concern	Threatened	
Limnodromus scolopaceus	Long-billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus merganser	Common Merganser			
Mergus serrator	Red-breasted Merganser			
Numenius americanus	Long-billed Curlew			

Numenius phaeopus	Whimbrel			
Nycticorax nycticorax	Black-crowned Night-Heron			
Oreothlypis luciae	Lucy's Warbler		Special Concern	BSSC - Third priority
Oxyura jamaicensis	Ruddy Duck			
Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority
Phalacrocorax auritus	Double-crested Cormorant			
Phalaropus tricolor	Wilson's Phalarope			
Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Pluvialis squatarola	Black-bellied Plover			
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Recurvirostra americana	American Avocet			
Riparia riparia	Bank Swallow		Threatened	
Rynchops niger	Black Skimmer			
Setophaga petechia	Yellow Warbler			BSSC - Second priority
Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Tringa solitaria	Solitary Sandpiper			
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEANS				
Branchinecta lynchi	Vernal Pool Fairy Shrimp	Threatened	Special	IUCN - Vulnerable
Americorophium spinicorne				Not on any status lists
Cyprididae fam.	Cyprididae fam.			
Gammarus spp.	Gammarus spp.			
Hyalella spp.	Hyalella spp.			
Neomysis mercedis				Not on any status lists
Ramellogammarus spp.	Ramellogammarus spp.			
FISH				
Eucyclogobius newberryi	Tidewater goby	Endangered	Special Concern	Vulnerable - Moyle 2013
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	Endangered	Endangered	Endangered - Moyle 2013

Oncorhynchus mykiss irideus	Coastal rainbow trout			Least Concern - Moyle 2013
Oncorhynchus mykiss - Southern CA	Southern California steelhead	Endangered	Special Concern	Endangered - Moyle 2013
HERPS				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Ambystoma californiense californiense	California Tiger Salamander	Threatened	Threatened	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Pseudacris cadaverina	California Treefrog			ARSSC
Rana boylii	Foothill Yellow-legged Frog	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Rana draytonii	California Red-legged Frog	Threatened	Special Concern	ARSSC
Spea hammondii	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Taricha torosa	Coast Range Newt		Special Concern	ARSSC
Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC
Thamnophis sirtalis sirtalis	Common Gartersnake			
Anaxyrus boreas halophilus	California Toad			ARSSC
Pseudacris regilla	Northern Pacific Chorus Frog			
Thamnophis atratus atratus	Santa Cruz Gartersnake			Not on any status lists
Thamnophis elegans elegans	Mountain Gartersnake			Not on any status lists
Thamnophis elegans terrestris	Coast Gartersnake			Not on any status lists
Thamnophis sirtalis infernalis	California Red-sided Gartersnake			Not on any status lists
INSECTS & OTHER INVERTS				
Acentrella spp.	Acentrella spp.			
Acilius abbreviatus				Not on any status lists
Agabinus glabrellus				Not on any status lists
Agabus disintegratus				Not on any status lists
Agabus lutosus				Not on any status lists
Agabus spp.	Agabus spp.			
Agapetus spp.	Agapetus spp.			

Ambrysus spp.	Ambrysus spp.			
Anacaena signaticollis				Not on any status lists
Anax junius	Common Green Darner			
Anax spp.	Anax spp.			
Anisitsiellidae fam.	Anisitsiellidae fam.			
Apedilum spp.	Apedilum spp.			
Archilestes grandis	Great Spreadwing			
Argia spp.	Argia spp.			
Argia vivida	Vivid Dancer			
Baetidae fam.	Baetidae fam.			
Baetis adonis	A Mayfly			
Baetis spp.	Baetis spp.			
Belostomatidae fam.	Belostomatidae fam.			
Berosus infuscatus				Not on any status lists
Berosus punctatissimus				Not on any status lists
Caenis bajaensis	A Mayfly			
Caenis spp.	Caenis spp.			
Callibaetis spp.	Callibaetis spp.			
Caudatella spp.	Caudatella spp.			
Centroptilum spp.	Centroptilum spp.			
Chaetarthria magna				Not on any status lists
Chaetarthria punctulata				Not on any status lists
Cheumatopsyche spp.	Cheumatopsyche spp.			
Chironomidae fam.	Chironomidae fam.			
Chironomus anonymus				Not on any status lists
Chironomus spp.	Chironomus spp.			
Coenagrionidae fam.	Coenagrionidae fam.			
Colymbetes strigatus				Not on any status lists
Copelatus glyphicus				Not on any status lists
Cordulegaster dorsalis	Pacific Spiketail			
Corisella spp.	Corisella spp.			
Corixidae fam.	Corixidae fam.			
Cricotopus annulator				Not on any status lists
Cricotopus spp.	Cricotopus spp.			
Cybister ellipticus				Not on any status lists
Cymbiodyta columbiana				Not on any status lists

Cymbiodyta dorsalis				Not on any status lists
Cymbiodyta pacifica				Not on any status lists
Dicrotendipes adnilus				Not on any status lists
Dicrotendipes spp.	Dicrotendipes spp.			
Dytiscidae fam.	Dytiscidae fam.			
Dytiscus marginicollis				Not on any status lists
Enallagma cyathigerum				Not on any status lists
Enallagma praevarum	Arroyo Bluet			
Enallagma spp.	Enallagma spp.			
Enochrus californicus				Not on any status lists
Enochrus carinatus				Not on any status lists
Enochrus cristatus				Not on any status lists
Enochrus cuspidatus				Not on any status lists
Enochrus piceus				Not on any status lists
Enochrus pygmaeus				Not on any status lists
Ephydridae fam.	Ephydridae fam.			
Eubrianax edwardsii				Not on any status lists
Eukiefferiella spp.	Eukiefferiella spp.			
Fallceon quilleri	A Mayfly			
Fallceon spp.	Fallceon spp.			
Helichus spp.	Helichus spp.			
Helichus suturalis				Not on any status lists
Hetaerina americana	American Rubyspot			
Heterocerus mexicanus				Not on any status lists
Hydrobius fuscipes				Not on any status lists
Hydrophilidae fam.	Hydrophilidae fam.			
Hydrophilus triangularis				Not on any status lists
Hydropsyche spp.	Hydropsyche spp.			
Hydropsychidae fam.	Hydropsychidae fam.			
Hydroptila spp.	Hydroptila spp.			
Hydroptilidae fam.	Hydroptilidae fam.			
Ischnura perparva	Western Forktail			
Labrundinia spp.	Labrundinia spp.			
Laccobius spp.	Laccobius spp.			

Laccophilus maculosus				Not on any status lists
Lauterborniella spp.	Lauterborniella spp.			
Libellula saturata	Flame Skimmer			
Limnophyes asquamatus				Not on any status lists
Limnophyes spp.	Limnophyes spp.			
Liodessus obscurellus				Not on any status lists
Microcylloepus spp.	Microcylloepus spp.			
Micropsectra nigripila				Not on any status lists
Micropsectra spp.	Micropsectra spp.			
Nectopsyche spp.	Nectopsyche spp.			
Neoclypeodytes pictodes				Not on any status lists
Neoclypeodytes plicipennis				Not on any status lists
Ochthebius apache				Not on any status lists
Ochthebius discretus				Not on any status lists
Ochthebius puncticollis				Not on any status lists
Ochthebius spp.	Ochthebius spp.			
Optioservus spp.	Optioservus spp.			
Orthocladius appersoni				Not on any status lists
Orthocladius spp.	Orthocladius spp.			
Oxyethira spp.	Oxyethira spp.			
Parametriocnemus spp.	Parametriocnemus spp.			
Paraphaenocladius spp.	Paraphaenocladius spp.			
Paratanytarsus spp.	Paratanytarsus spp.			
Peltodytes callosus				Not on any status lists
Peltodytes spp.	Peltodytes spp.			
Pentaneura spp.	Pentaneura spp.			
Plathemis lydia	Common Whitetail			
Procloeon venosum	A Mayfly			
Pseudochironomus spp.	Pseudochironomus spp.			
Pseudosmittia forcipata				Not on any status lists
Pseudosmittia spp.	Pseudosmittia spp.			
Psychodidae fam.	Psychodidae fam.			
Rhantus anisonychus				Not on any status lists
Rhantus gutticollis				Not on any status lists

Rhantus wallisi				Not on any status lists
Rheotanytarsus spp.	Rheotanytarsus spp.			
Rhionaeschna multicolor	Blue-eyed Darner			
Serratella micheneri	A Mayfly			
Sigara spp.	Sigara spp.			
Simulium spp.	Simulium spp.			
Sperchon spp.	Sperchon spp.			
Sperchontidae fam.	Sperchontidae fam.			
Stictotarsus griseostriatus				Not on any status lists
Stictotarsus spp.	Stictotarsus spp.			
Stictotarsus striatellus				Not on any status lists
Sympetrum illotum	Cardinal Meadowhawk			
Tanytarsus spp.	Tanytarsus spp.			
Tramea lacerata	Black Saddlebags			
Trichocorixa arizonensis				Not on any status lists
Trichocorixa spp.	Trichocorixa spp.			
Tricorythodes spp.	Tricorythodes spp.			
Tropisternus californicus				Not on any status lists
Tropisternus spp.	Tropisternus spp.			
Uvarus subtilis				Not on any status lists
Zaitzevia parvula				Not on any status lists
MAMMALS				
Castor canadensis	American Beaver			Not on any status lists
MOLLUSKS				
Gyraulus vermicularis	Pacific Coast Gyraulus			CS
Physa acuta	Pewter Physa			Not on any status lists
Physa spp.	Physa spp.			
Physella virgata	Protean Physa			CS
Planorbella trivolvis	Marsh Rams-horn			CS
Planorbidae fam.	Planorbidae fam.			
Sphaerium occidentale				Not on any status lists
Sphaerium spp.	Sphaerium spp.			
Vorticifex spp.	Vorticifex spp.			
PLANTS				
Lasthenia glabrata coulteri	Coulter's Goldfields		Special	CRPR - 1B.1
Alnus rhombifolia	White Alder			

Alopecurus carolinianus	Tufted Foxtail			
Alopecurus saccatus	Pacific Foxtail			
Anemopsis californica	Yerba Mansa			
Arundo donax	NA			
Azolla filiculoides	NA			
Baccharis glutinosa	NA			Not on any status lists
Berula erecta	Wild Parsnip			
Bolboschoenus maritimus paludosus	NA			Not on any status lists
Callitriche marginata	Winged Water-starwort			
Carex harfordii	Harford's Sedge			
Carex pellita	Woolly Sedge			
Carex senta	Western Rough Sedge			
Ceratophyllum demersum	Common Hornwort			
Cotula coronopifolia	NA			
Crassula aquatica	Water Pygmyweed			
Downingia cuspidata	Toothed Calicoflower			
Elatine brachysperma	Shortseed Waterwort			
Elatine californica	California Waterwort			
Eleocharis macrostachya	Creeping Spikerush			
Eleocharis montevidensis	Sand Spikerush			
Eleocharis parishii	Parish's Spikerush			
Epilobium campestre	NA			Not on any status lists
Euthamia occidentalis	Western Fragrant Goldenrod			
Helenium puberulum	Rosilla			
Hypericum anagalloides	Tinker's-penny			
Isoetes howellii	NA			
Isolepis cernua	Low Bulrush			
Jaumea carnosa	Fleshy Jaumea			
Juncus effusus effusus	NA			
Juncus falcatus falcatus	Sickle-leaf Rush			
Juncus phaeocephalus phaeocephalus	Brown-head Rush			
Juncus textilis	Basket Rush			

Juncus xiphioides	Iris-leaf Rush			
Lemna minuta	Least Duckweed			
Mimulus guttatus	Common Large Monkeyflower			
Muhlenbergia utilis	Aparejo Grass			
Nasturtium gambelii	NA	Endangered	Threatened	CRPR - 1B.1
Oenanthe sarmentosa	Water-parsley			
Persicaria lapathifolia				Not on any status lists
Phacelia distans	NA			
Plagiobothrys acanthocarpus	Adobe Popcorn-flower			
Plagiobothrys undulatus	NA			Not on any status lists
Plantago elongata elongata	Slender Plantain			
Platanus racemosa	California Sycamore			
Populus trichocarpa	NA			Not on any status lists
Psilocarphus brevissimus brevissimus	Dwarf Woolly-heads			
Psilocarphus tenellus	NA			
Rumex conglomeratus	NA			
Rumex fueginus				Not on any status lists
Rumex salicifolius salicifolius	Willow Dock			
Salix laevigata	Polished Willow			
Salix lasiandra lasiandra				Not on any status lists
Salix lasiolepis lasiolepis	Arroyo Willow			
Samolus parviflorus	NA			Not on any status lists
Schoenoplectus acutus occidentalis	Hardstem Bulrush			
Schoenoplectus californicus	California Bulrush			
Schoenoplectus pungens pungens	NA			
Scirpus microcarpus	Small-fruit Bulrush			
Sinapis alba	NA			
Sparganium eurycarpum eurycarpum				
Stachys chamissonis chamissonis	Coast Hedge-nettle			
Stachys pycnantha	Short-spike Hedge-nettle			

Stuckenia pectinata				Not on any status lists
Triglochin scilloides	NA			Not on any status lists
Typha domingensis	Southern Cattail			
Typha latifolia	Broadleaf Cattail			
Veronica anagallis-aquatica	NA			
Veronica peregrina	NA			
Wolffiella lingulata	Tongue Bogmat			
Zannichellia palustris	Horned Pondweed			

Attachment D

July 2019

IDENTIFYING GDEs UNDER SGMA
Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[1] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[2]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.

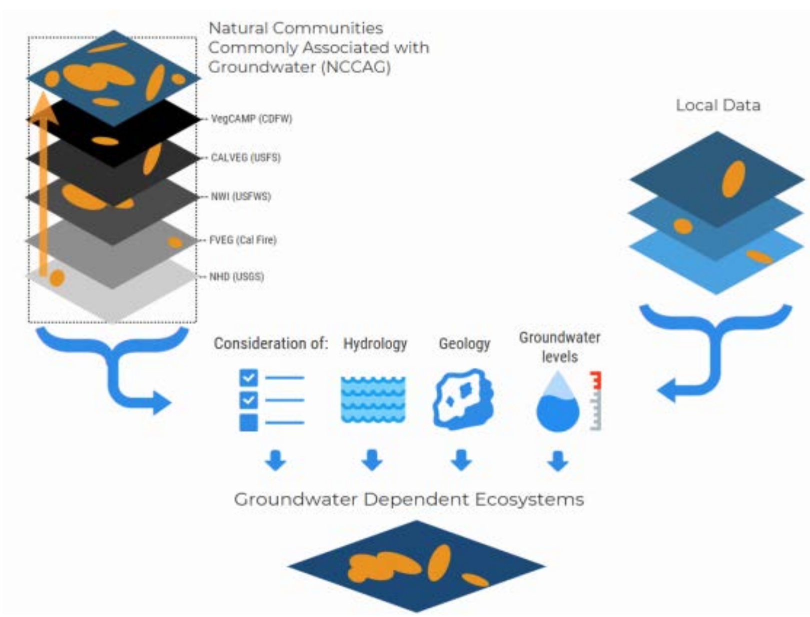


Figure 1. Considerations for GDE identification.
Source: DWR[2]

[1] NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/
[2] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[3]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[4] on the Groundwater Resource Hub[5], a website dedicated to GDEs.

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

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[3] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf
[4] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/
[5] The Groundwater Resource Hub: www.GroundwaterResourceHub.org

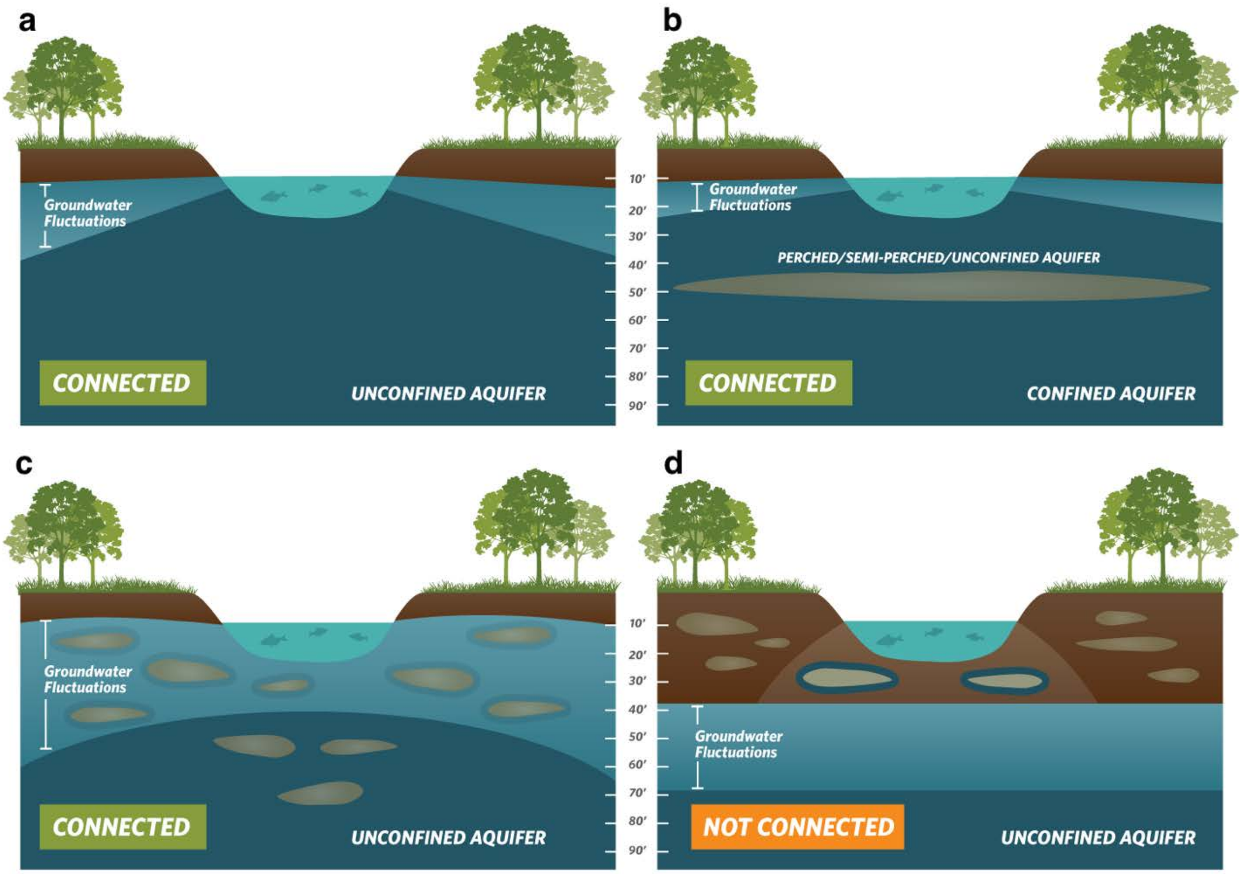

Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. (b) Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. Bottom: (c) Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. (d) Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[6] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[7] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[8] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[9]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

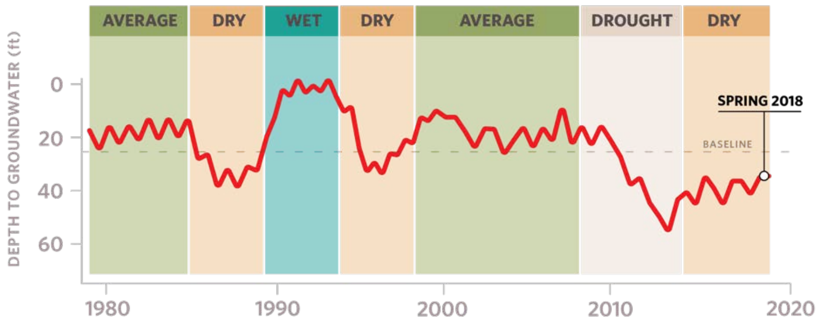

Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

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[6] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[7] Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]

[8] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs[4]).

[9] SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[10], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

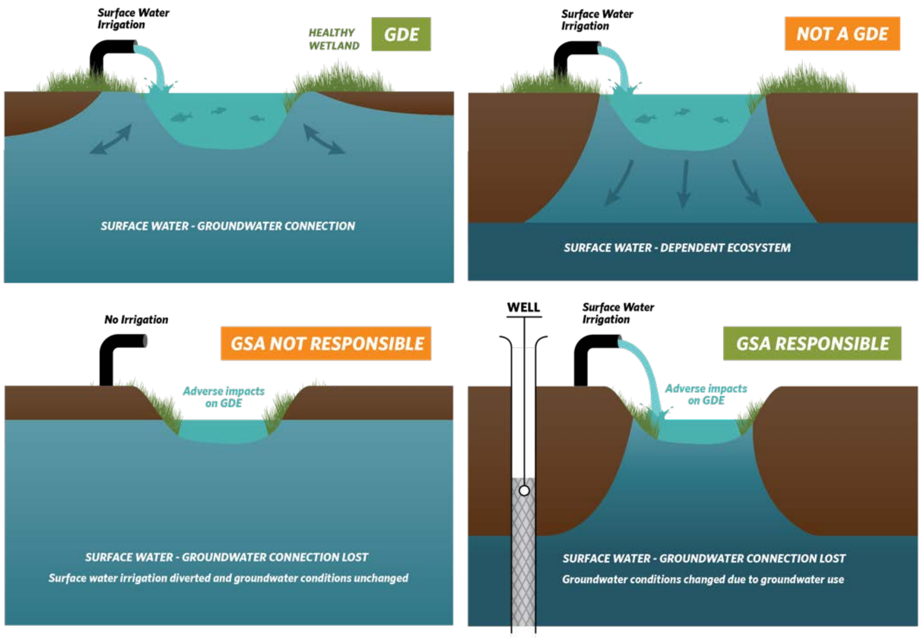

Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. (Right) Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. Bottom: (Left) An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. (Right) Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

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[10] For a list of environmental beneficial users of surface water by basin, visit: https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

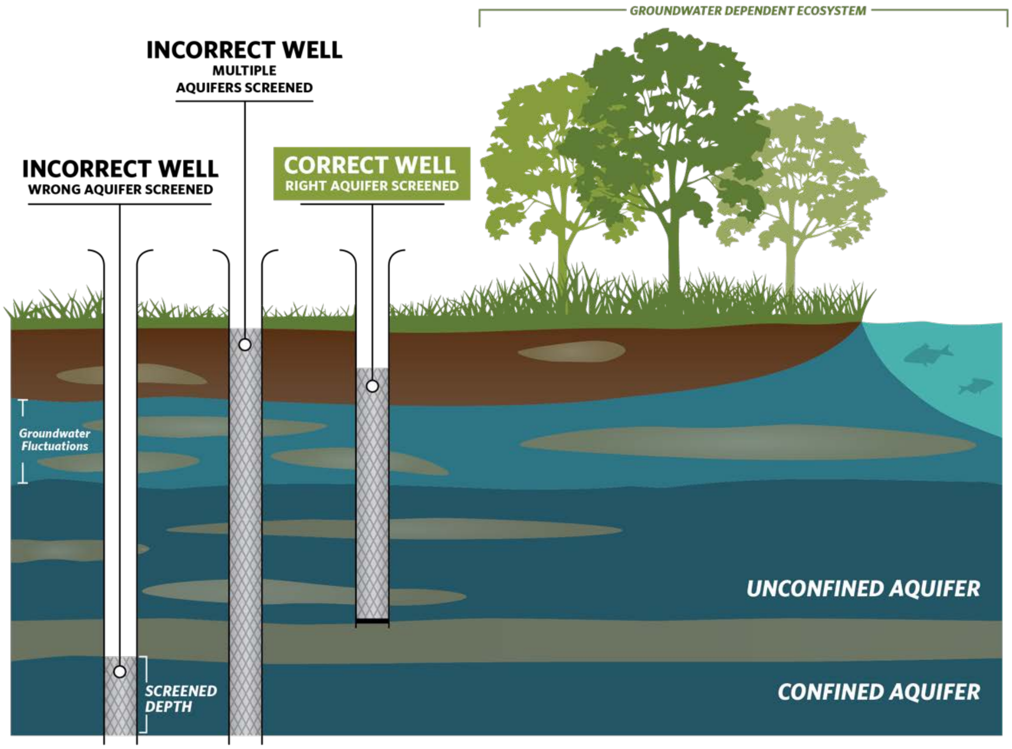

Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)[11] to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

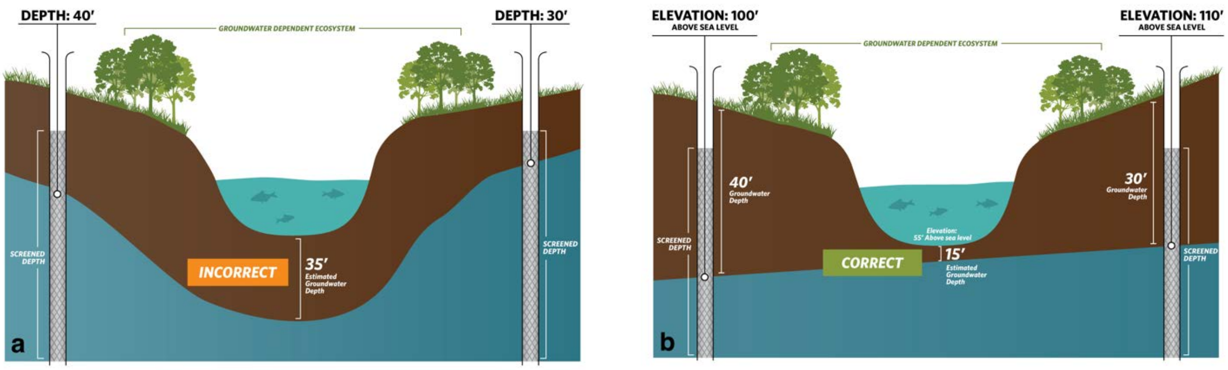

Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. (b) Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

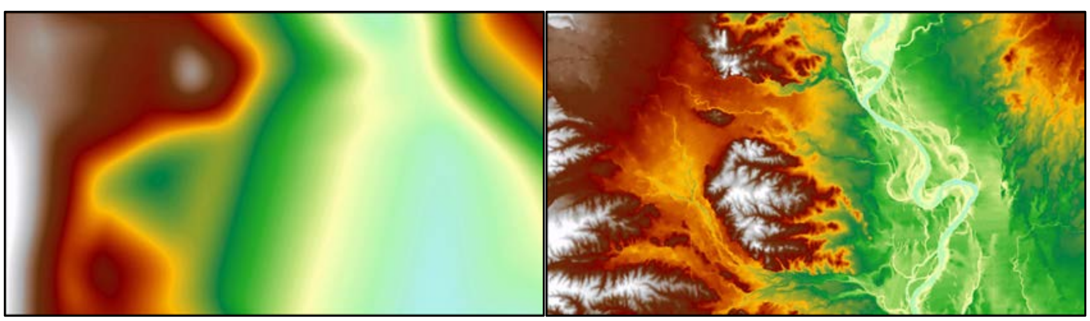

Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. (Right) Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

[11] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://iewer.nationalmap.gov/basic/

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, **The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network.** Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

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Groundwater Sustainability Plan

CMA

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

Geosyntec consultants

STETSON ENGINEERS INC.

DUDEK