Public Draft

Groundwater Sustainability Plan

Figures

WMA

Western Management Area

September 2021

Geosyntec consultants

STETSON ENGINEERS INC.

DUDEK

WATER RESOURCE PROFESSIONALS
SERVING CLIENTS SINCE 1957

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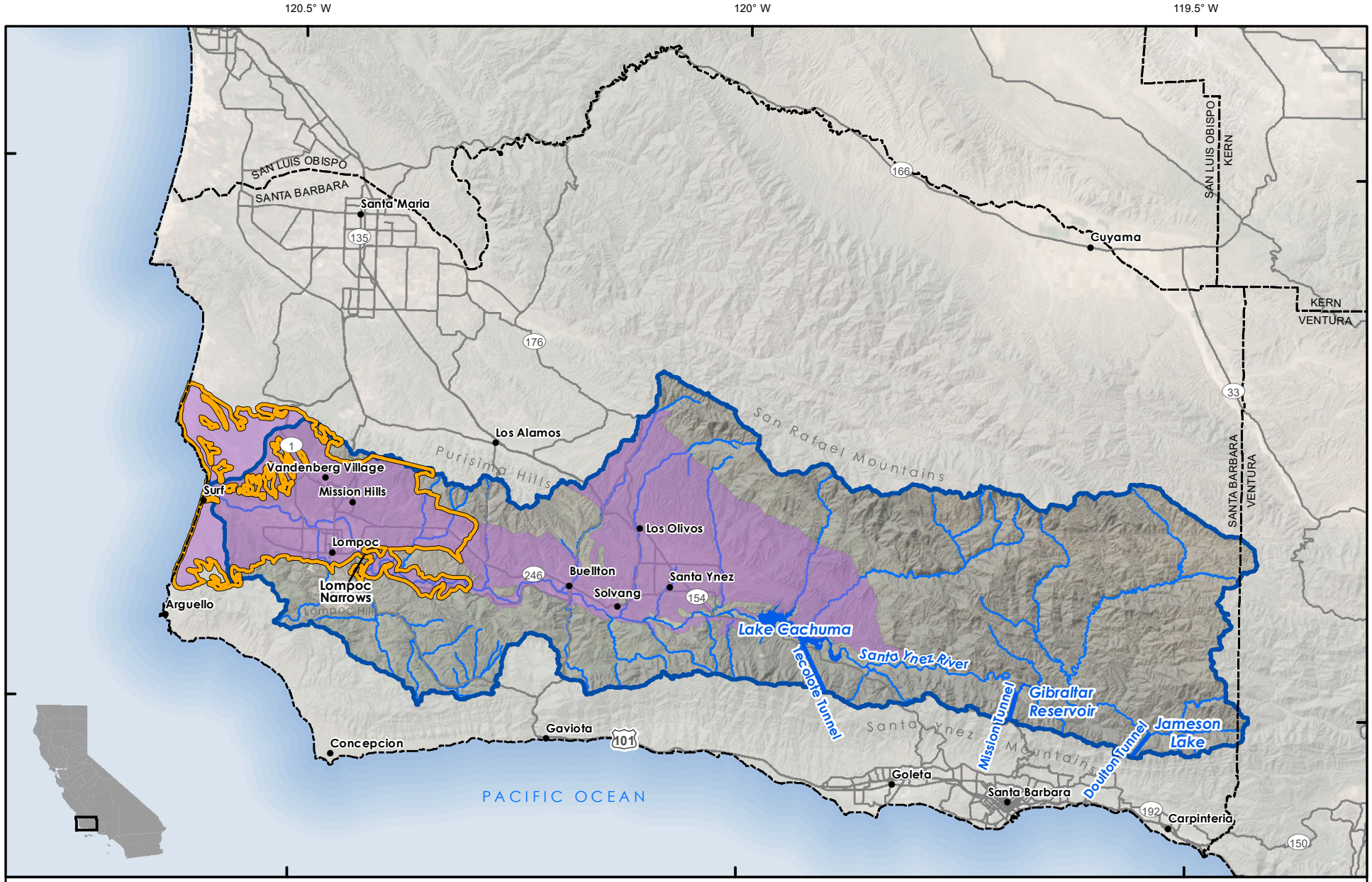

Western Management Area

Santa Ynez River Watershed

Santa Ynez River Valley

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SANTA YNEZ RIVER WATERSHED AND SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

WESTERN MANAGEMENT AREA

DRAFT

0 4 8 Miles

N

FIGURE 1a.1-1

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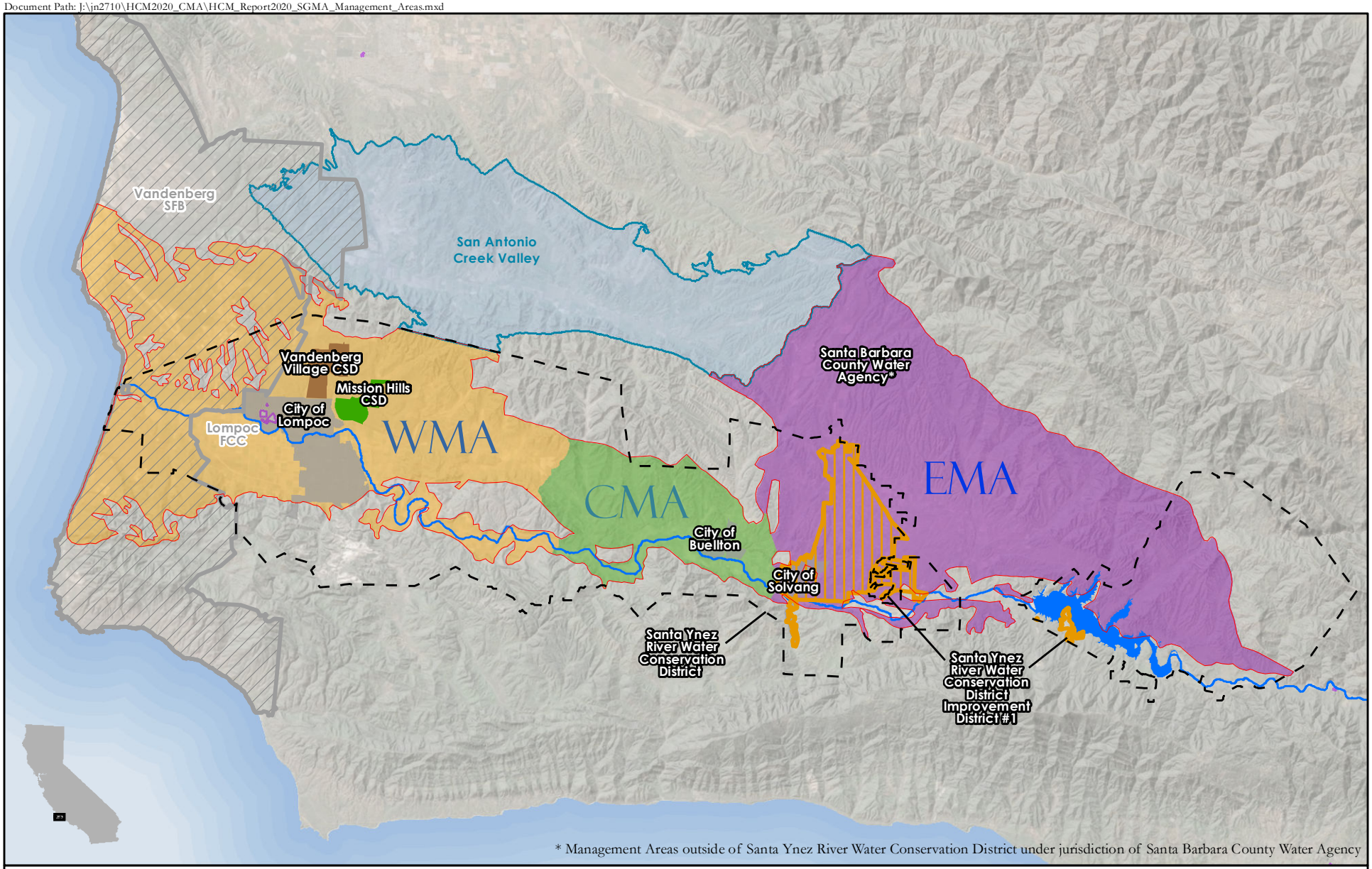

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Western Management Area (WMA)
Central Management Area (CMA)
Eastern Management Area (EMA)

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

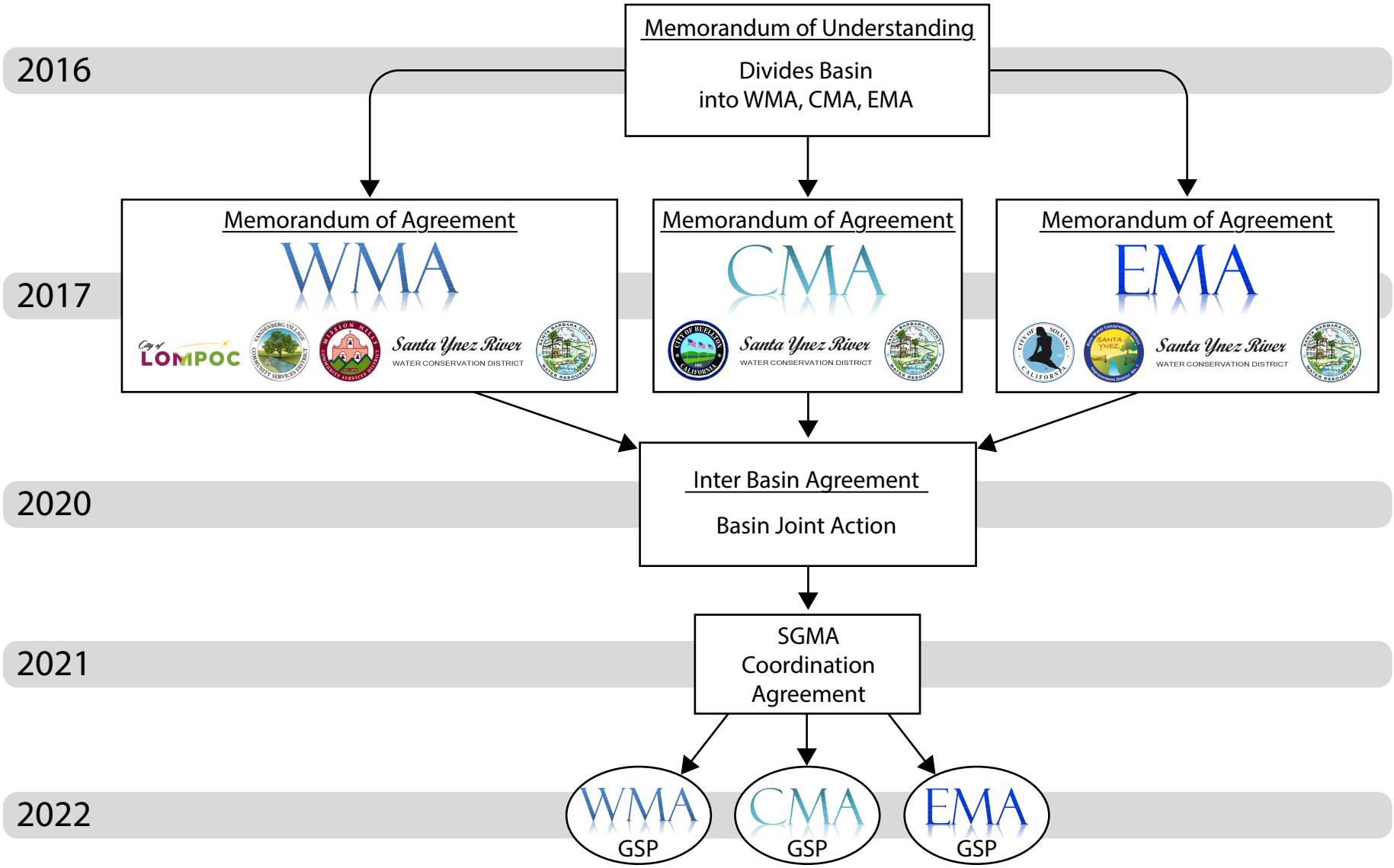
DRAFT

0 2 4 Miles

N

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

FIGURE 1a.3-1



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SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
SGMA ORGANIZATIONAL DOCUMENTS

FIGURE 1b.1-1

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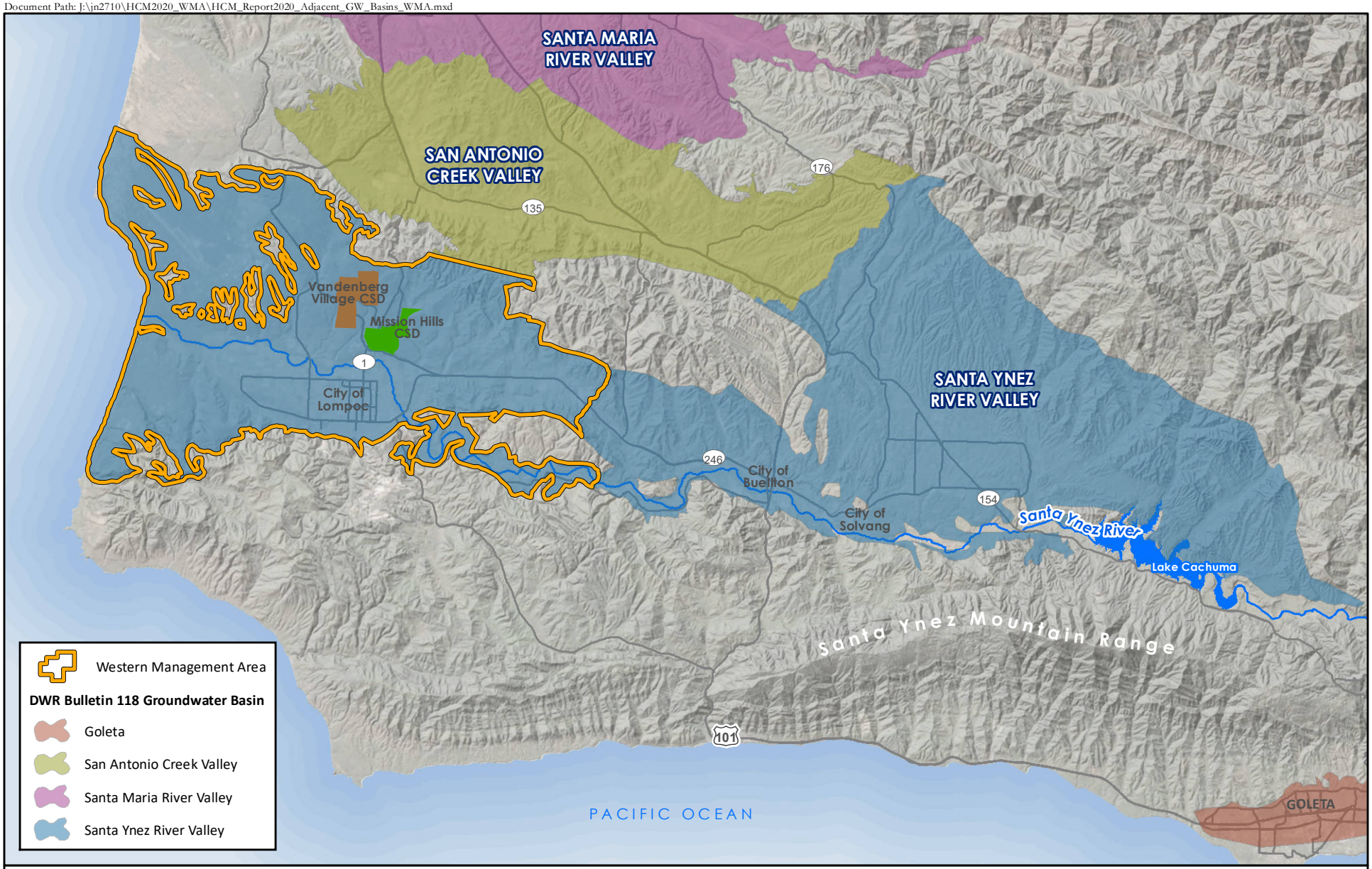

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Western Management Area
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ADJACENT AND NEIGHBORING GROUNDWATER BASINS
WESTERN MANAGEMENT AREA

DRAFT

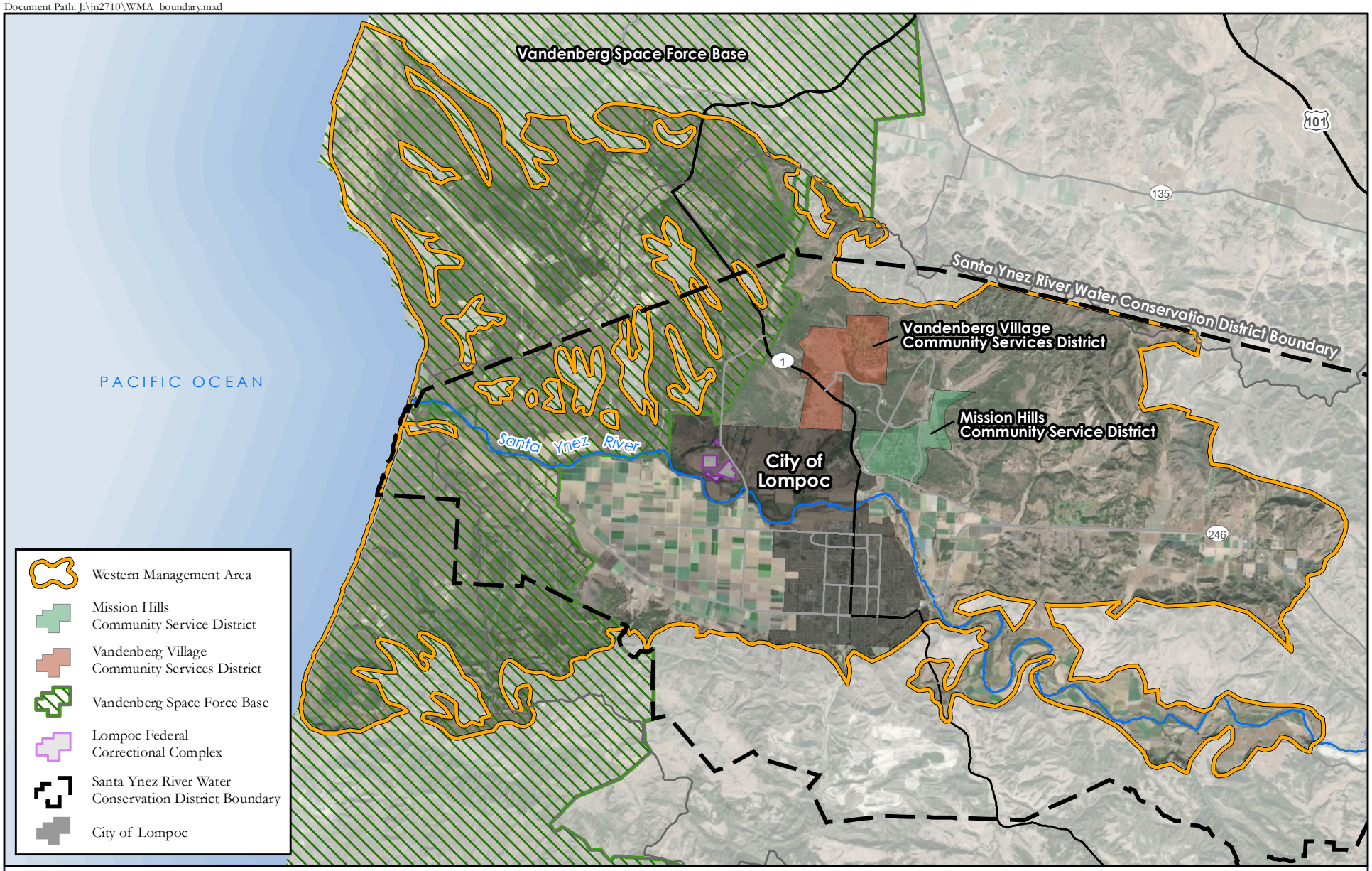
0 2 4 Miles

N

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

FIGURE 1d.1-1

Document Path: J:\jn2710\WMA_boundary.mxd



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Western Management Area
Groundwater Sustainability Agency

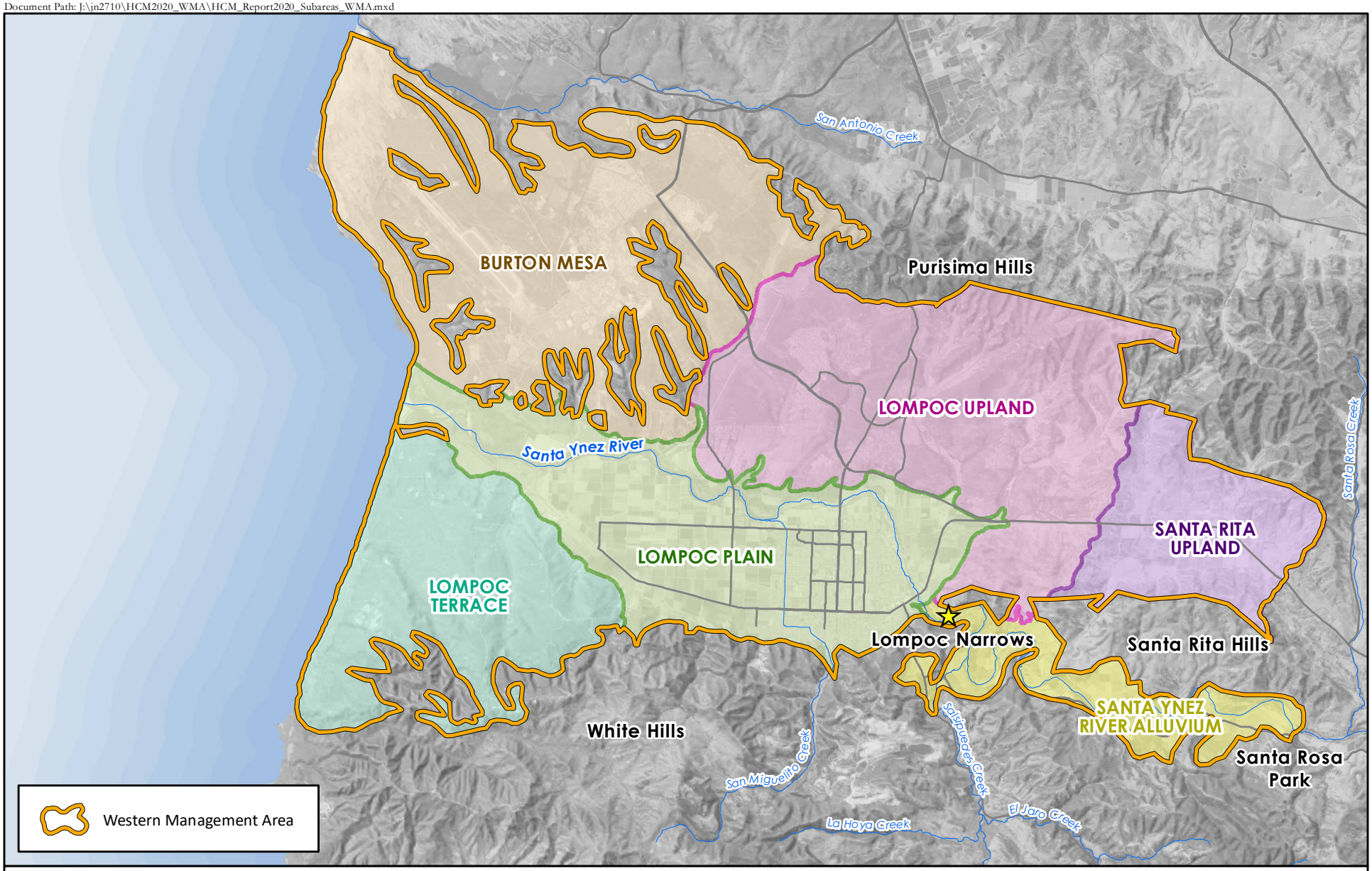
WESTERN MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

0 1 2 Miles

N

FIGURE 1d.1-2

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Subareas_WMA.mxd



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Groundwater Sustainability Agency

SUBAREAS
WESTERN MANAGEMENT AREA

DRAFT

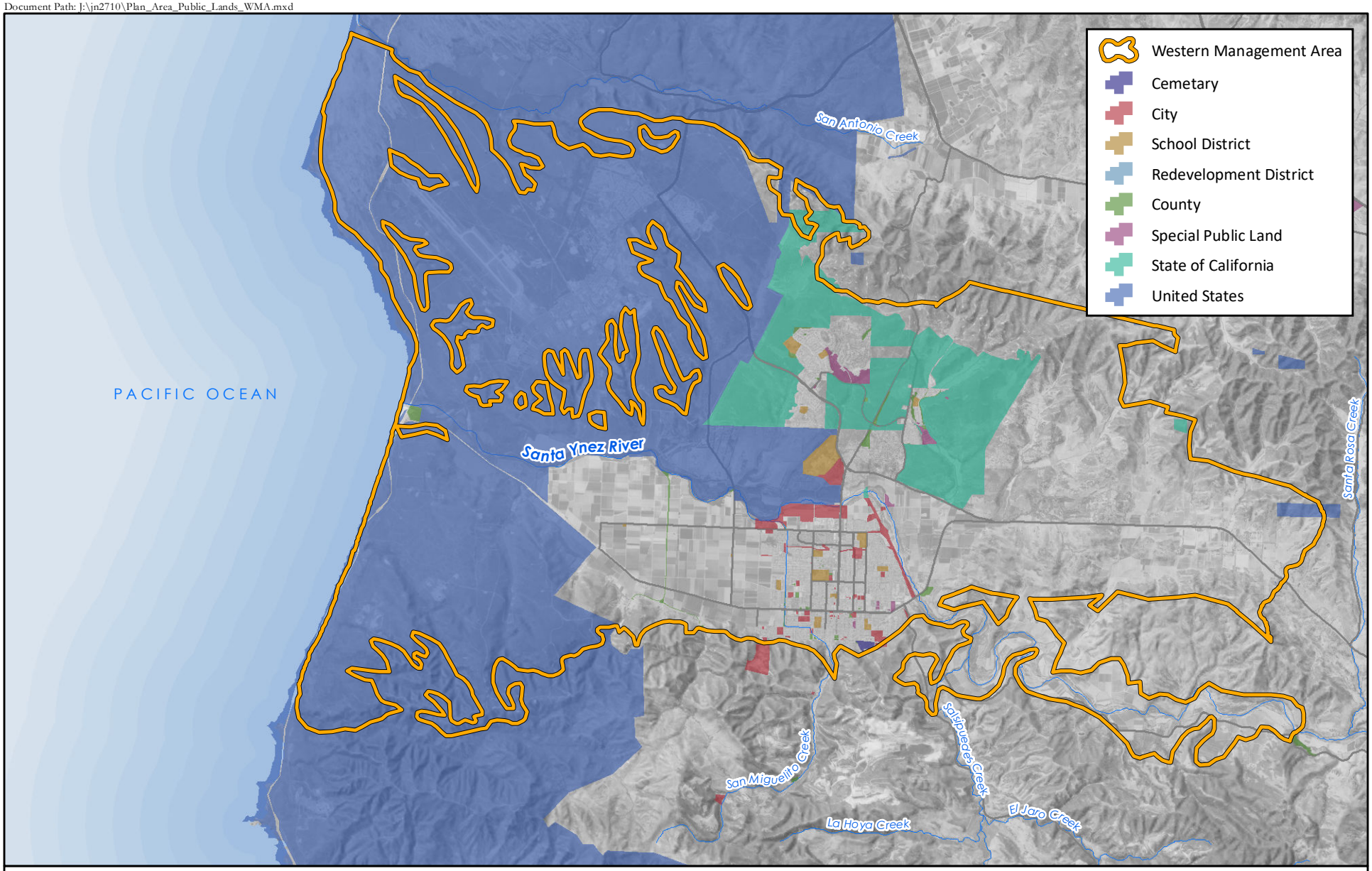
0 1 2 Miles

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

N

FIGURE 1d.1-3

Document Path: J:\jn2710\Plan_Area_Public_Lands_WMA.mxd



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PUBLIC LANDS
WESTERN MANAGEMENT AREA

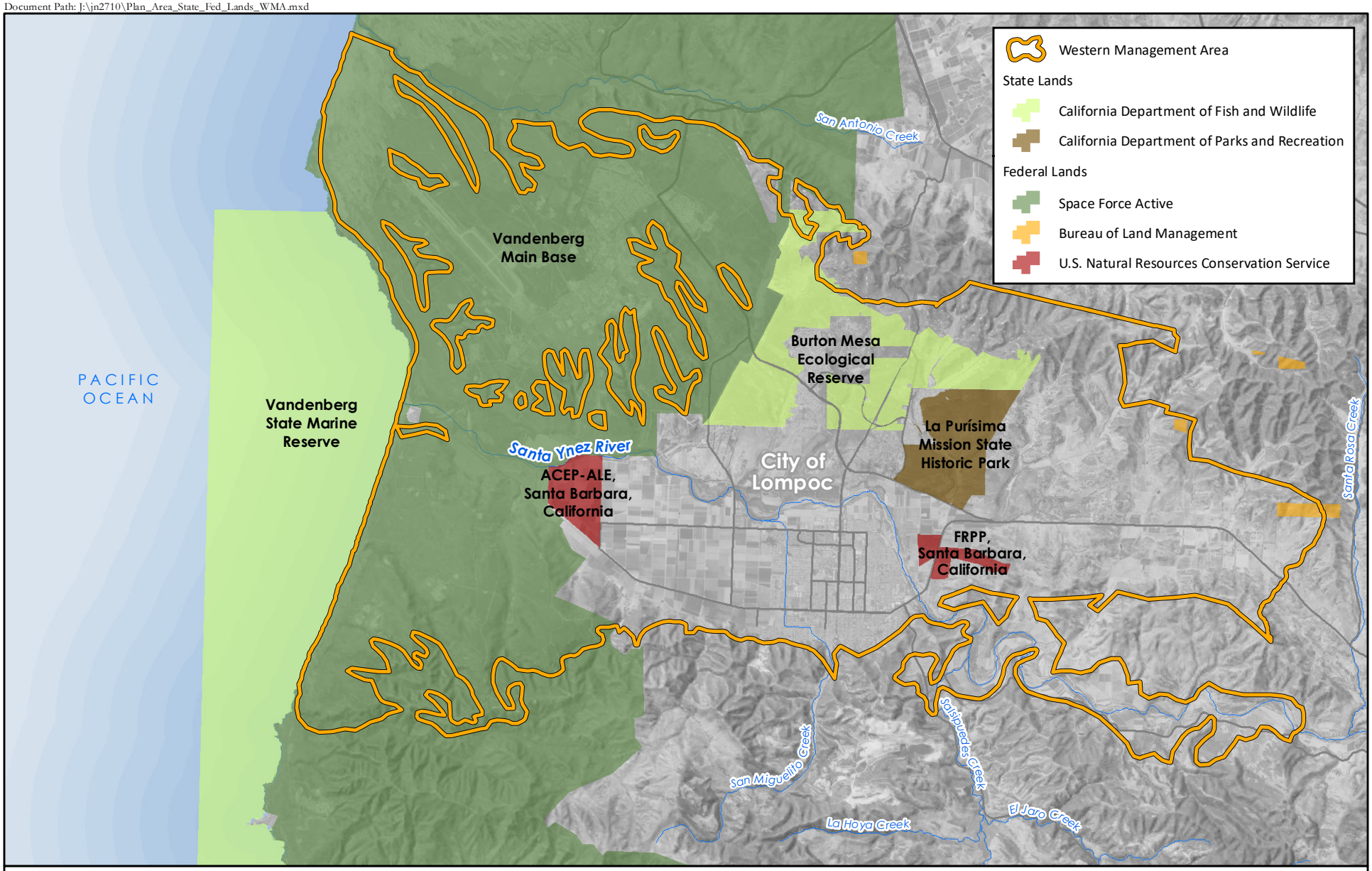
0 1 2 Miles

N

Source:
Santa Barbara County (2019) Parcel Data

FIGURE 1d.2-1

Document Path: J:\jn2710\Plan_Area_State_Fed_Lands_WMA.mxd



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Groundwater Sustainability Agency

STATE AND FEDERAL LANDS
WESTERN MANAGEMENT AREA

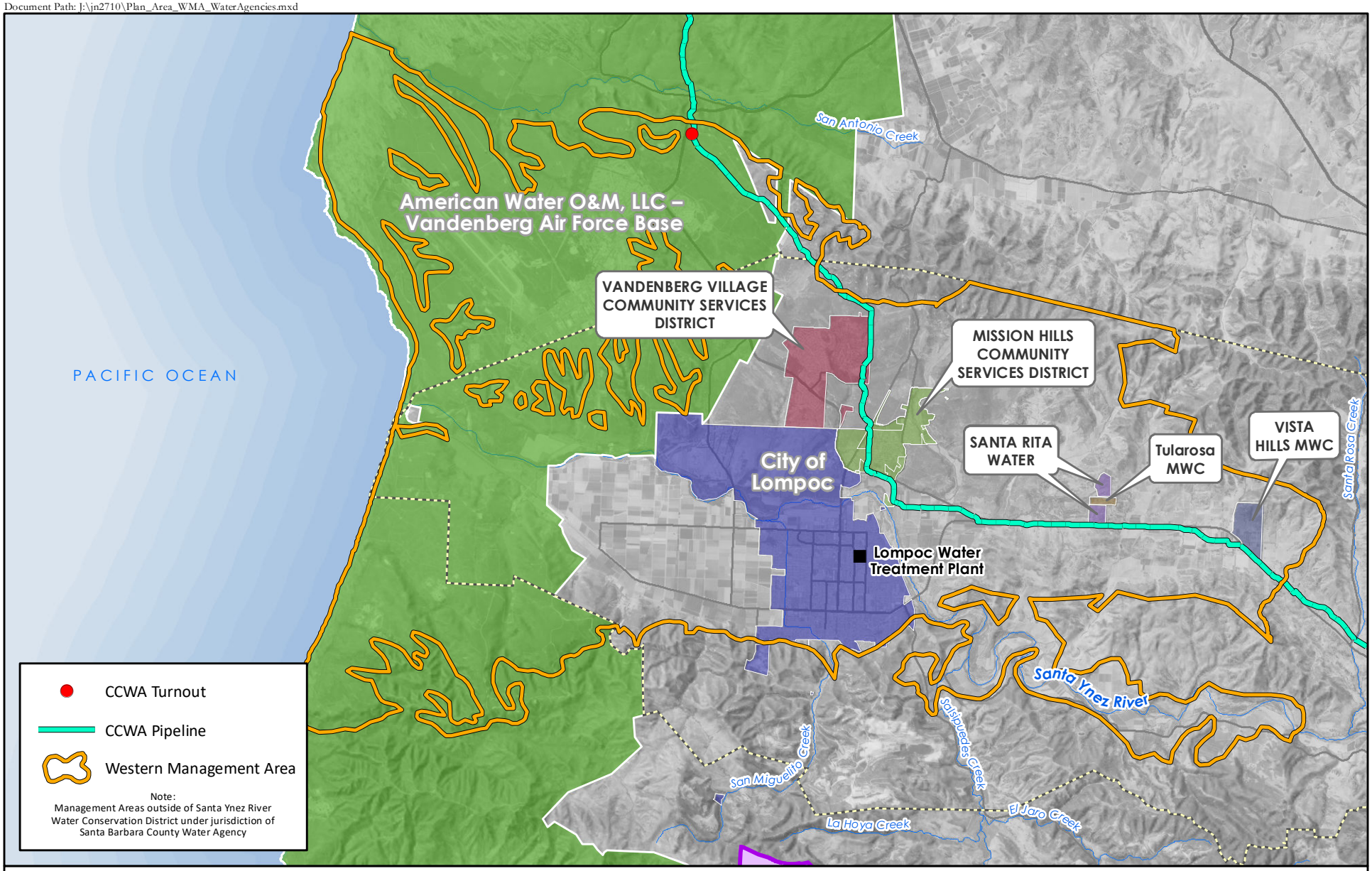
0 1 2 Miles

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

Document Path: J:\jn2710\Plan_Area_WMA_WaterAgencies.mxd



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Western Management Area
Groundwater Sustainability Agency

WATER AGENCIES AND INFRASTRUCTURE
WESTERN MANAGEMENT AREA

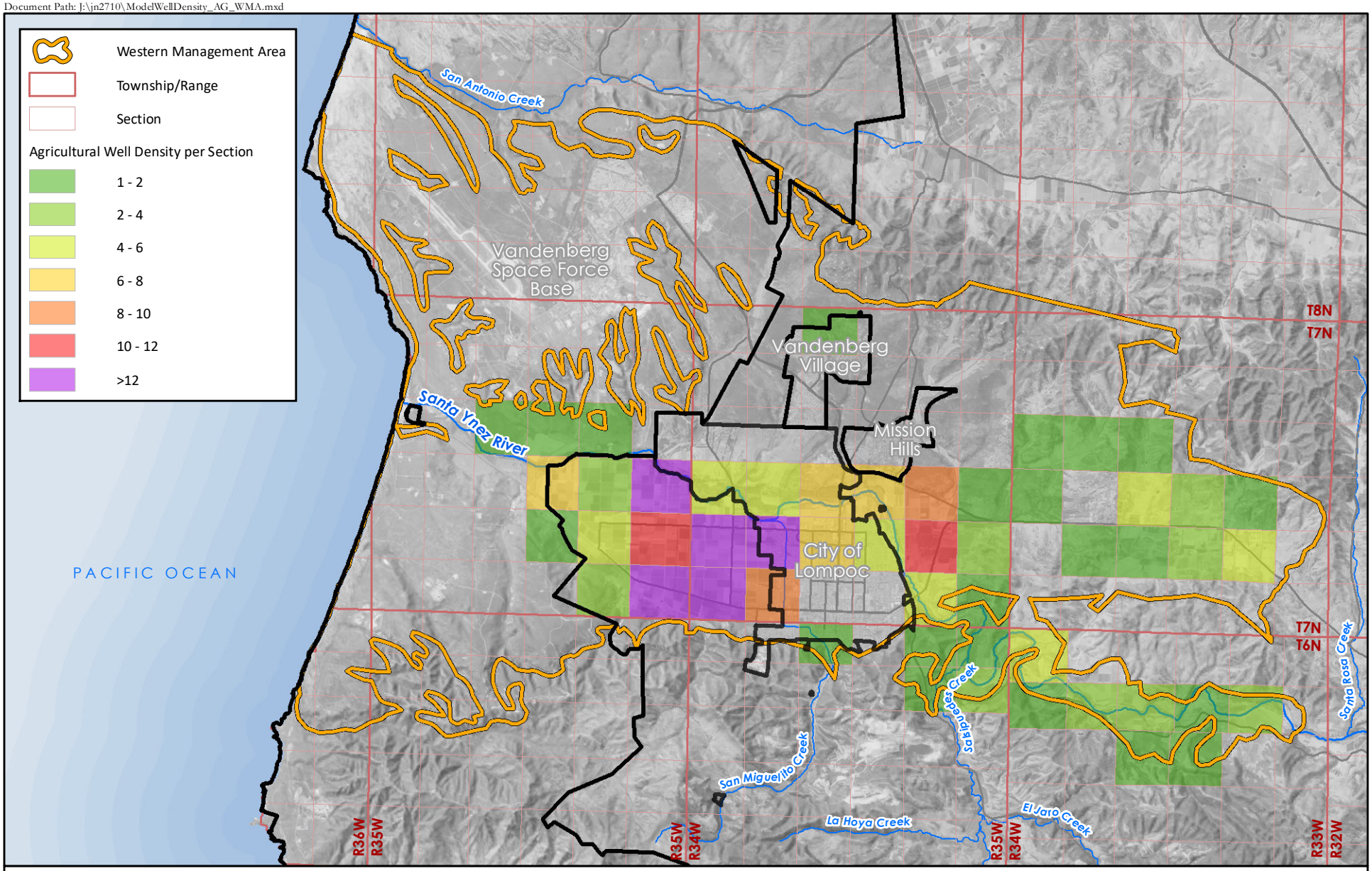
0 1 2 Miles

Source:
Central Coast Water Authority (CCWA)

N

FIGURE 1d.2-3

Document Path: J:\jn2710\ModelWellDensity_AG_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

REGISTERED PUMPING WELLS
AGRICULTURAL USE
DENSITY BY SECTION

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

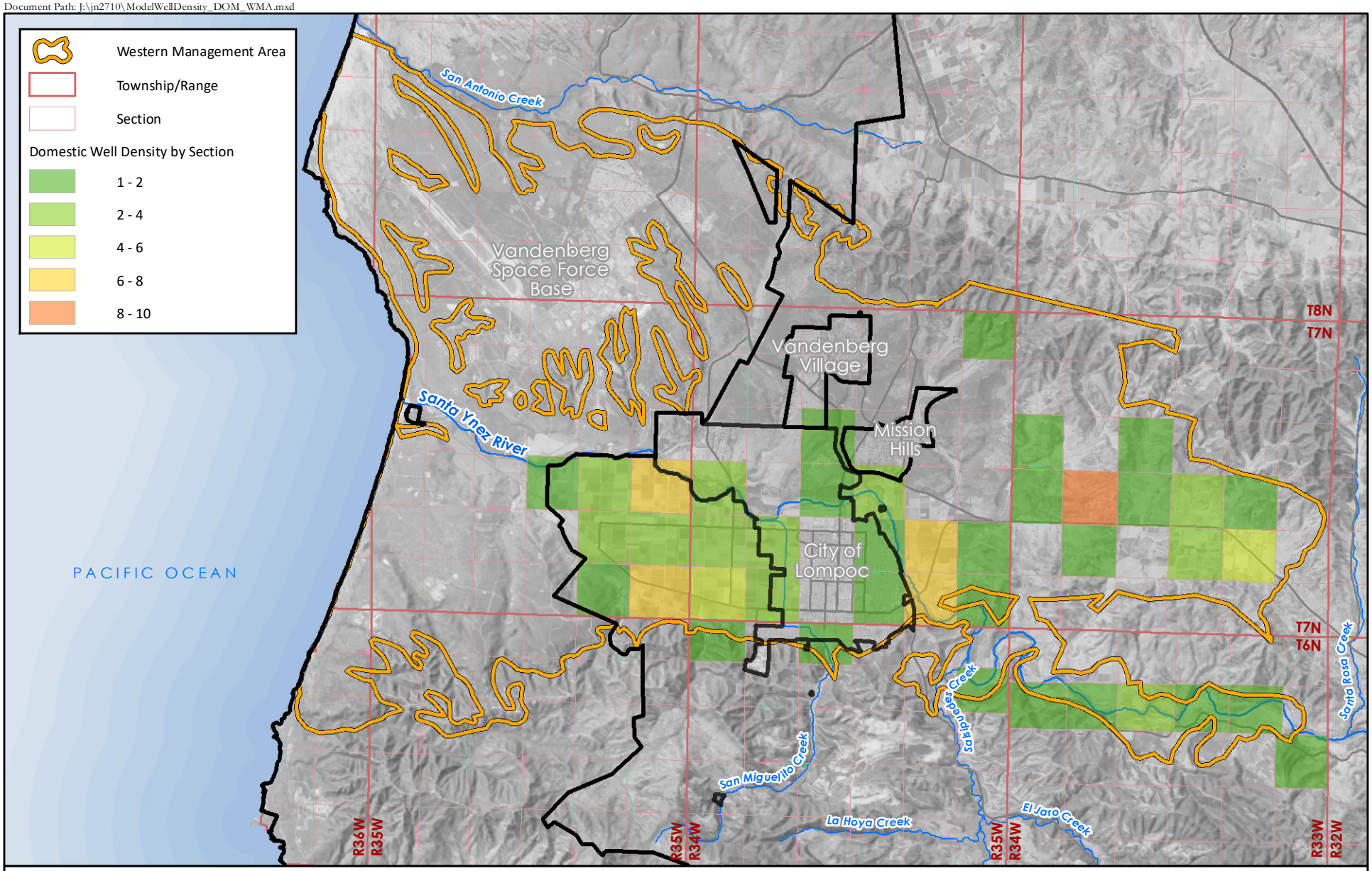
DRAFT

0 1 2 Miles

N

FIGURE 1d.3-1

Document Path: J:\jn2710\ModelWellDensity_DOM_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

REGISTERED PUMPING WELLS
DOMESTIC USE
DENSITY BY SECTION

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

DRAFT

0 1 2 Miles

N

FIGURE 1d.3-2

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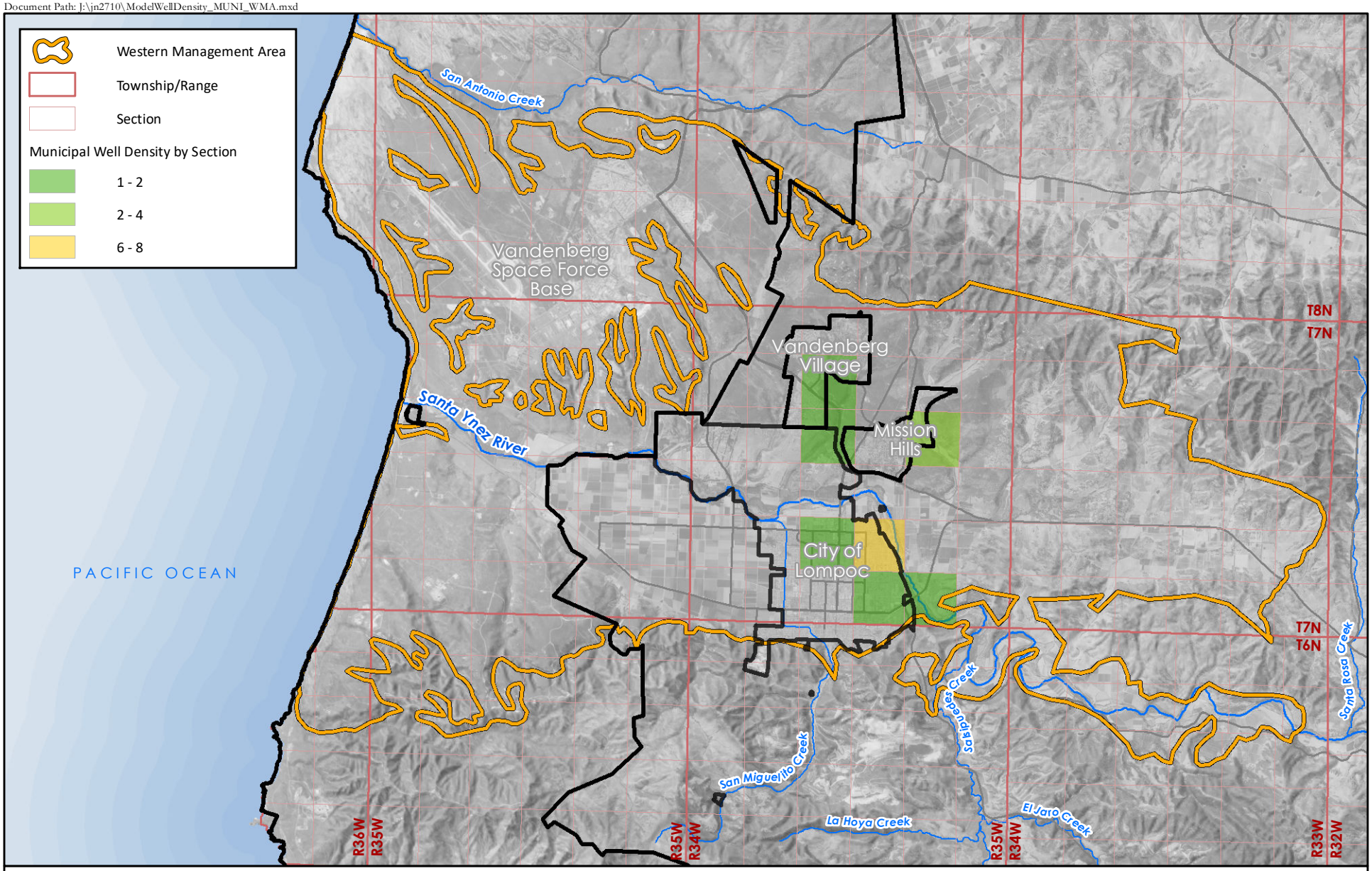

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Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REGISTERED PUMPING WELLS
MUNICIPAL USE
DENSITY BY SECTION

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

DRAFT

0 1 2 Miles

N

FIGURE 1d.3-3

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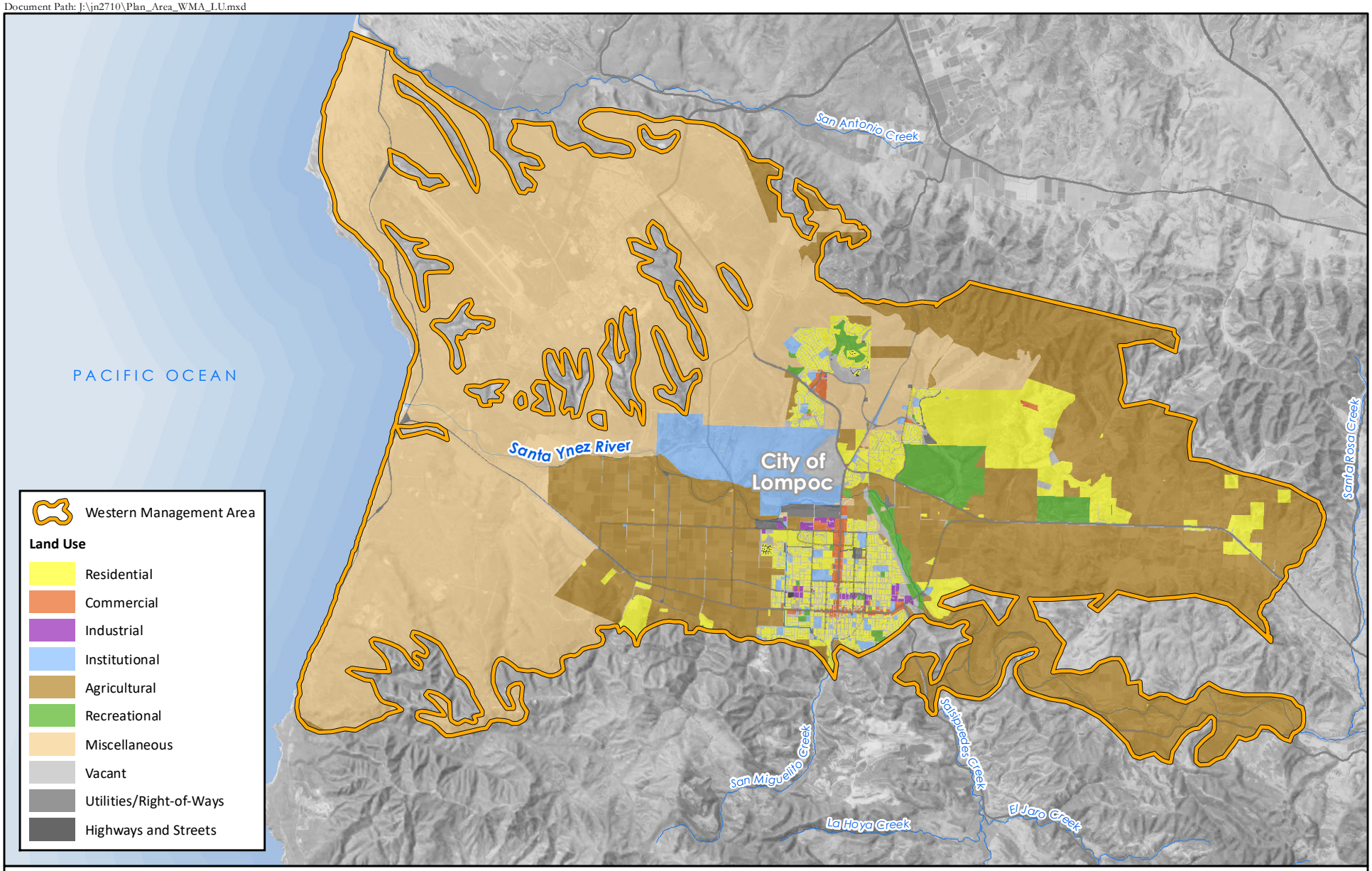

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Western Management Area
Groundwater Sustainability Agency

LAND USE
WESTERN MANAGEMENT AREA

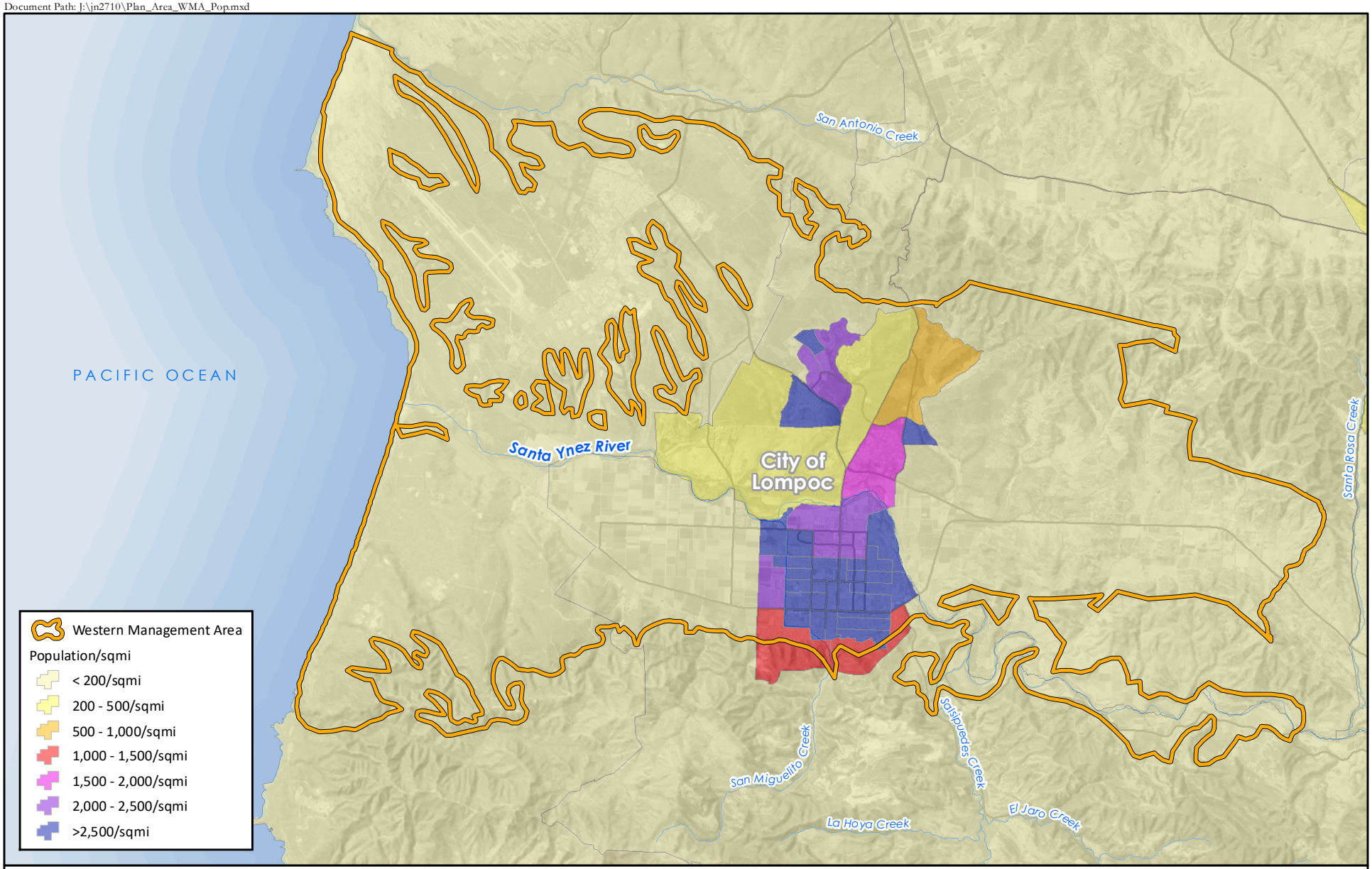
0 1 2 Miles

N

Source:
Santa Barbara County (2019)

FIGURE 1d.6-1

Document Path: J:\jn2710\Plan_Area_WMA_Pop.mxd



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

POPULATION DENSITY
WESTERN MANAGEMENT AREA

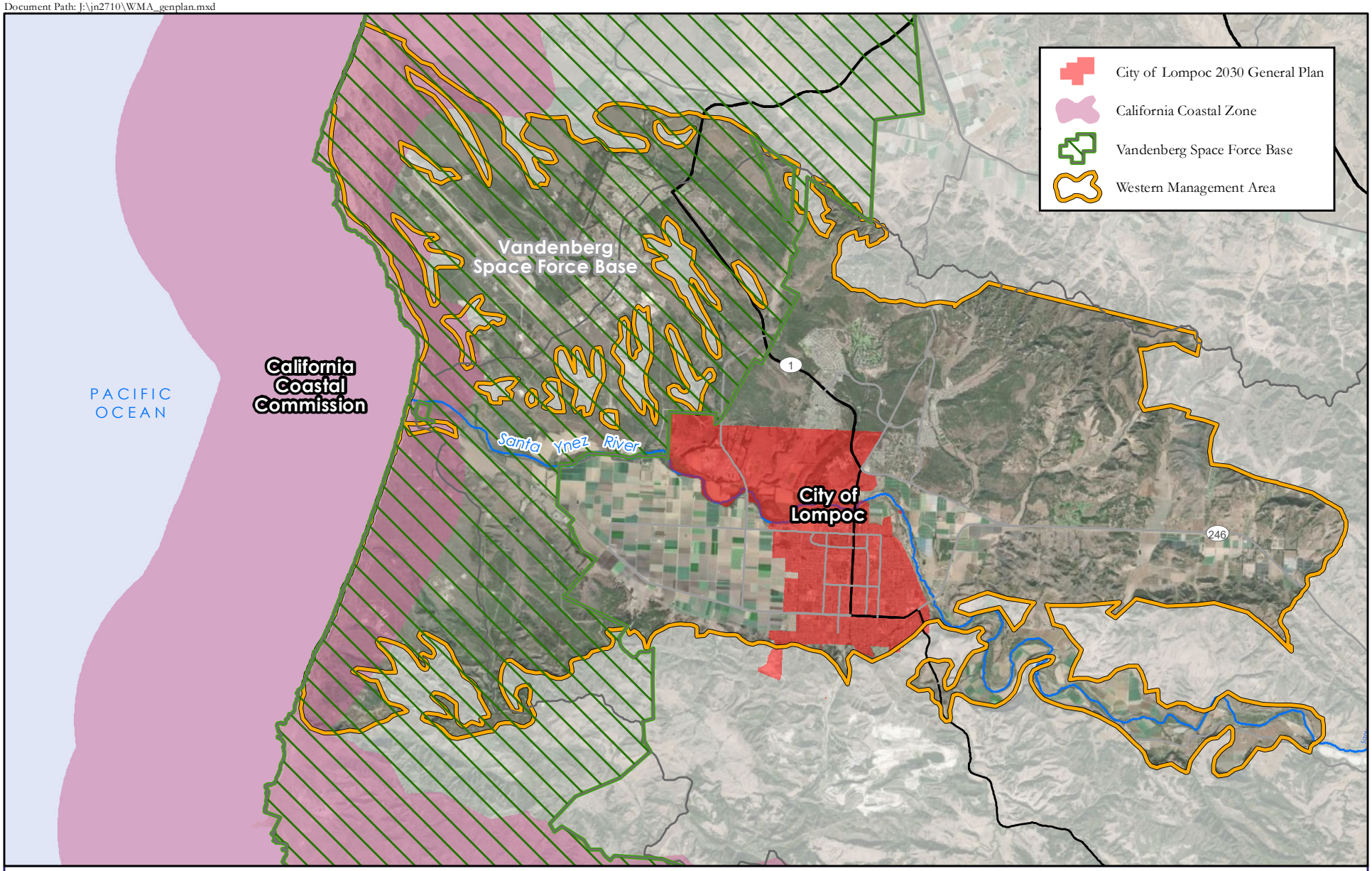
0 1 2 Miles

N

Source:
US Census 2018 (population adjusted from 2010)

FIGURE 1d.6-2

Document Path: J:\jn2710\WMA_genplan.mxd



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Western Management Area
Groundwater Sustainability Agency

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

0 1 2 Miles

N

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

FIGURE 1d.6-3

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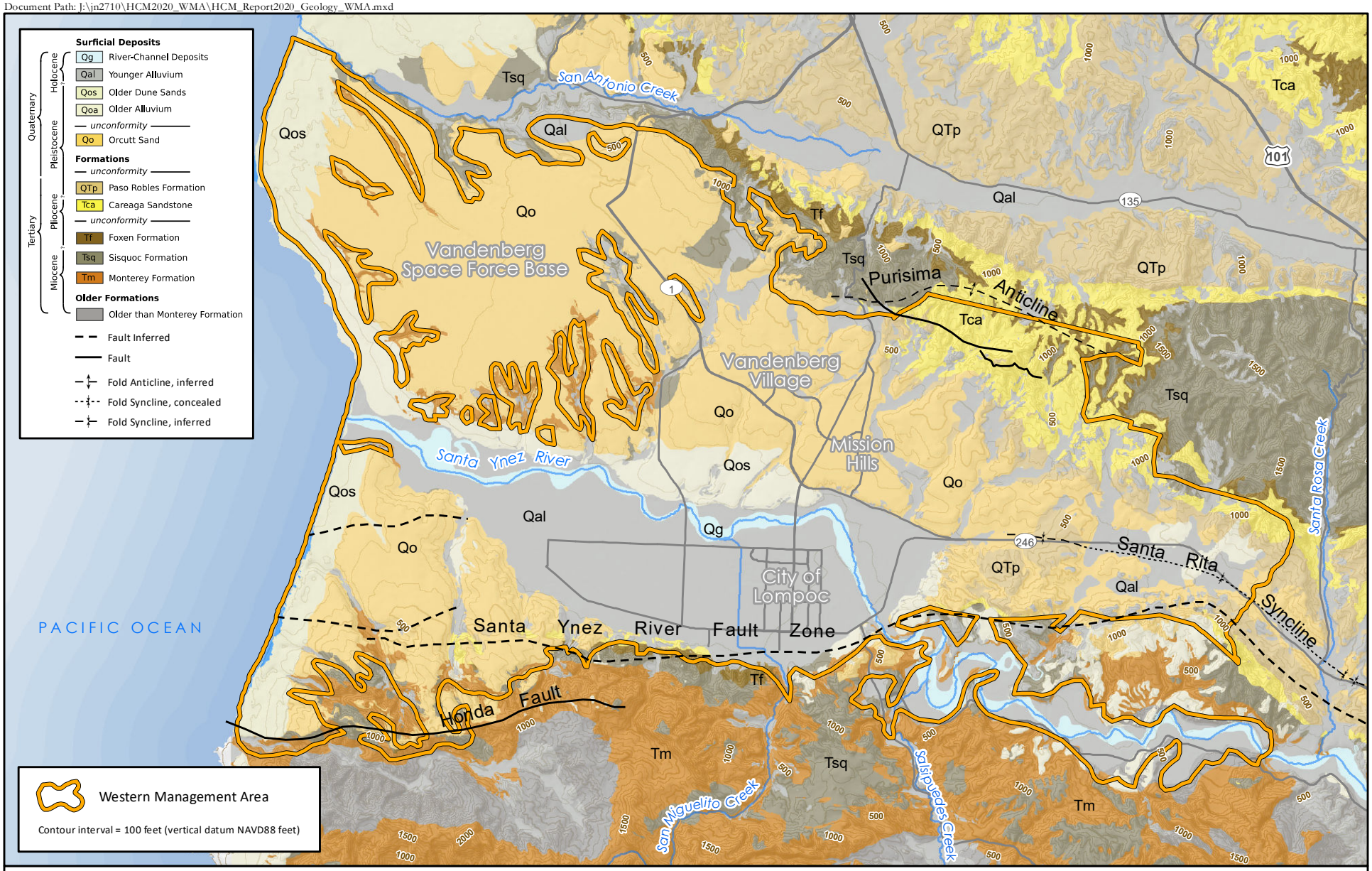

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WMA
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Western Management Area
Groundwater Sustainability Agency

SURFACE GEOLOGY
WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

N

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

FIGURE 2a.1-1

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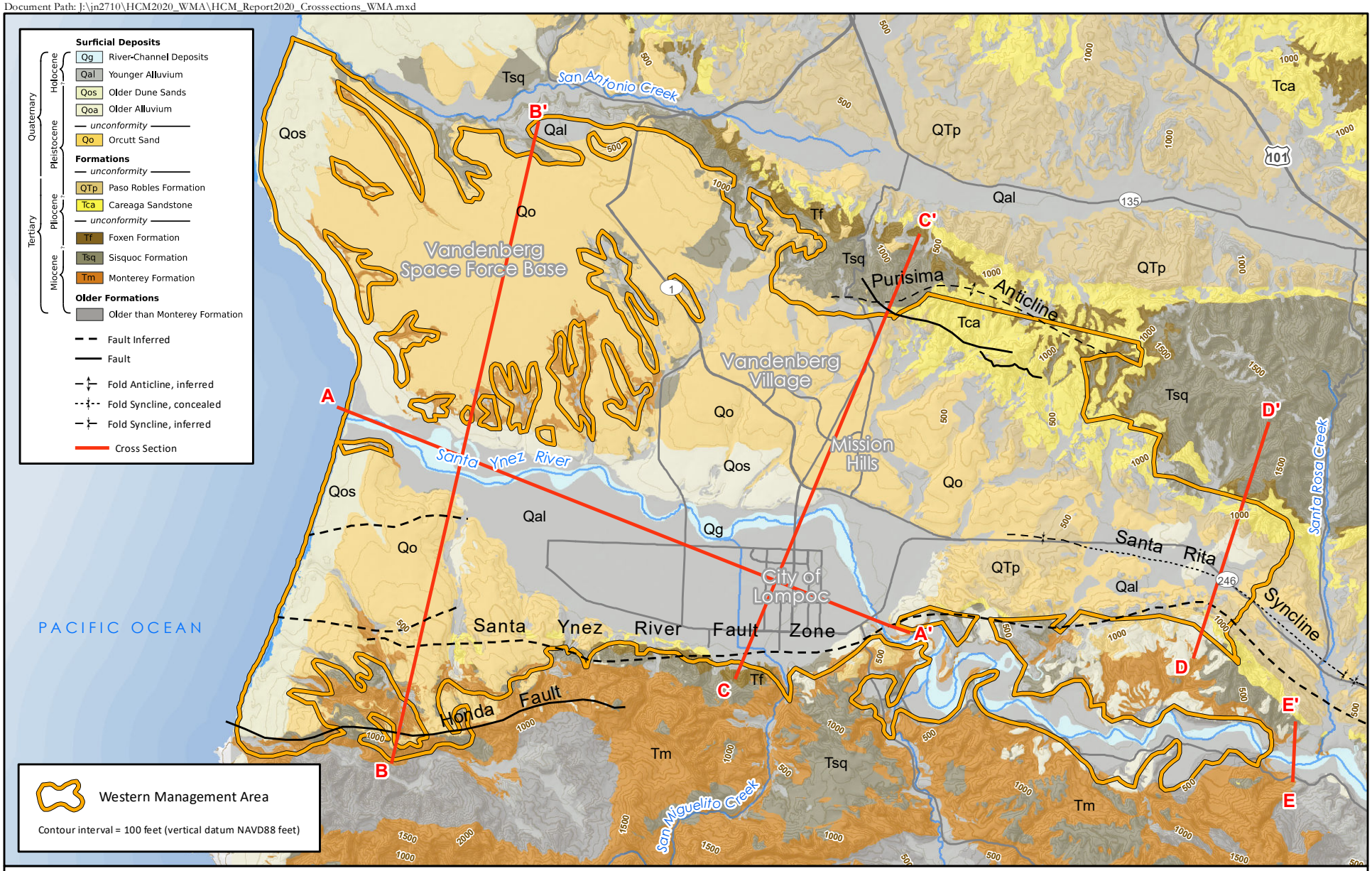

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WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

GEOLOGIC CROSS SECTIONS
WESTERN MANAGEMENT AREA

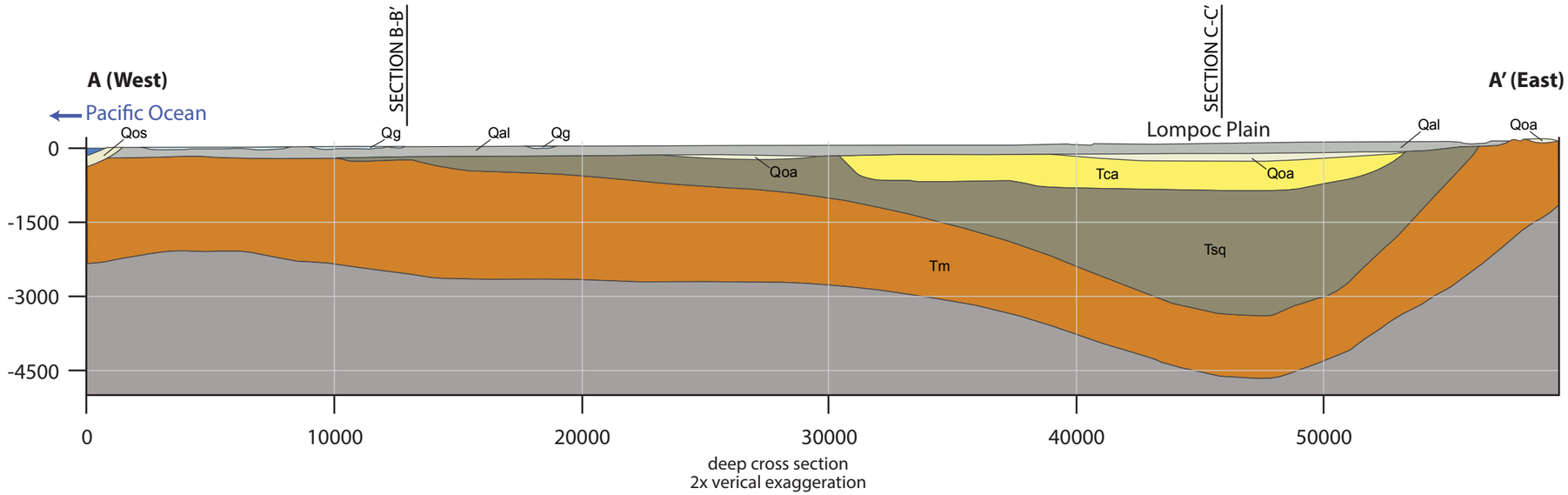
DRAFT

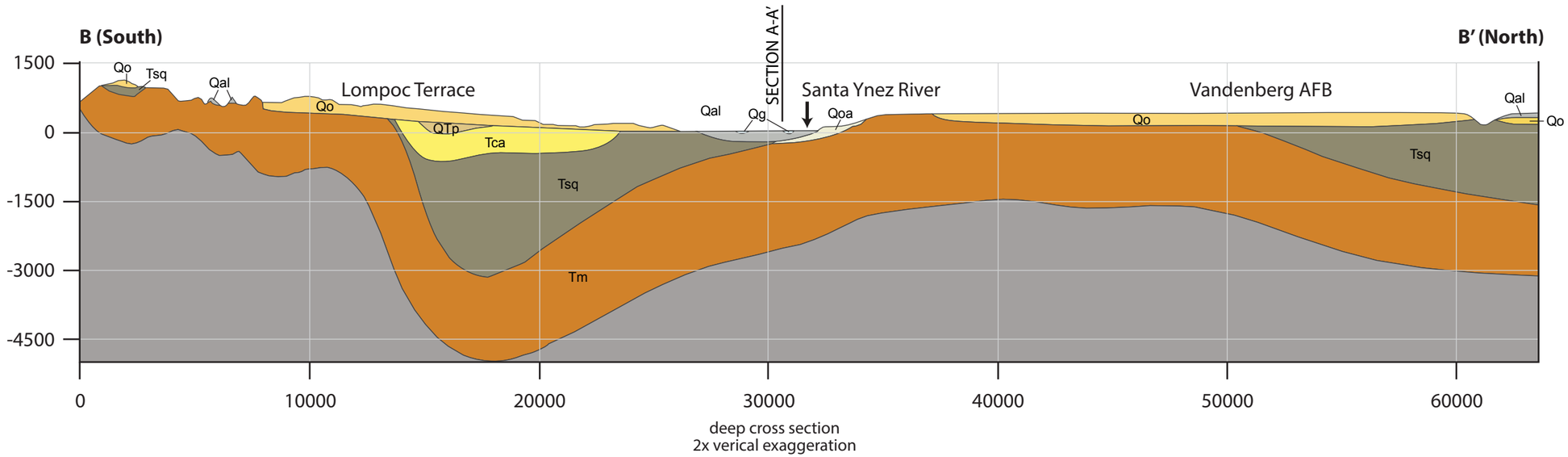
0 1 2 Miles

N

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

FIGURE 2a.1-2





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).

C:\Jobfolder\FIGURE 2a.1-3a_A-A_B-B_WMA Geologic Cross-sections_1c

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

WESTERN MANAGEMENT AREA GEOLOGIC CROSS SECTIONS A-A' AND B-B'

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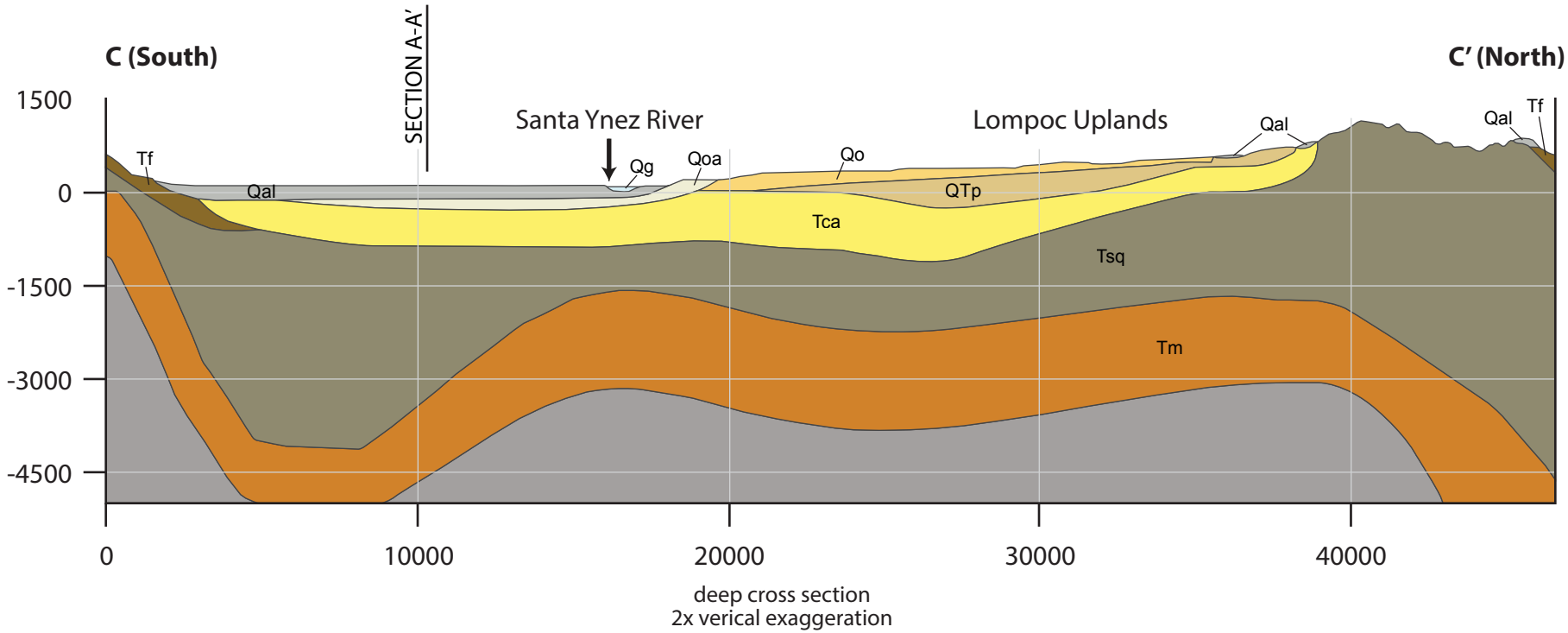
C/JobFolder/FIGURE 2a.1-3b_C-C_WMA Geologic Cross-sections_1c



Model Geology

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- 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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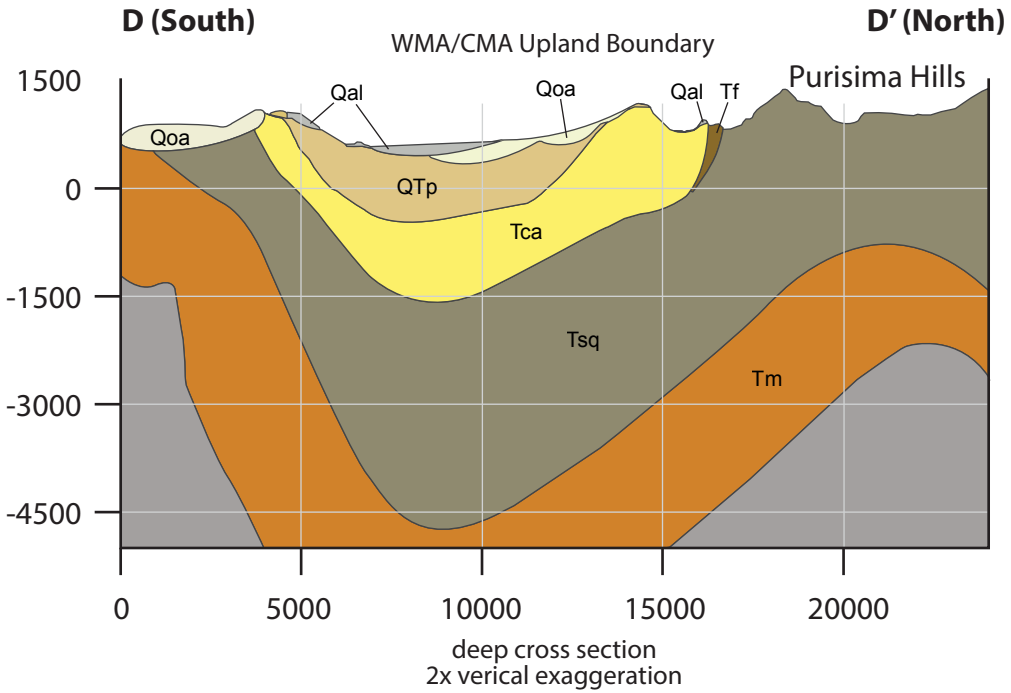
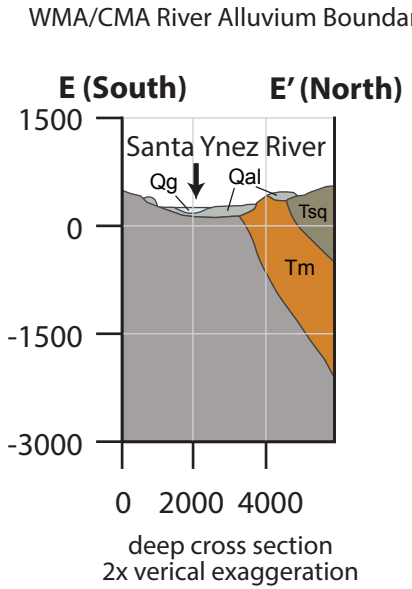
WESTERN MANAGEMENT AREA GEOLOGIC CROSS SECTION C-C'

Geosyntec consultants

FIGURE 2a.1-3b

C/JobFolder/FIGURE 2a.1-3c_D-D_E-E_WMA Geologic Cross-sections_1c





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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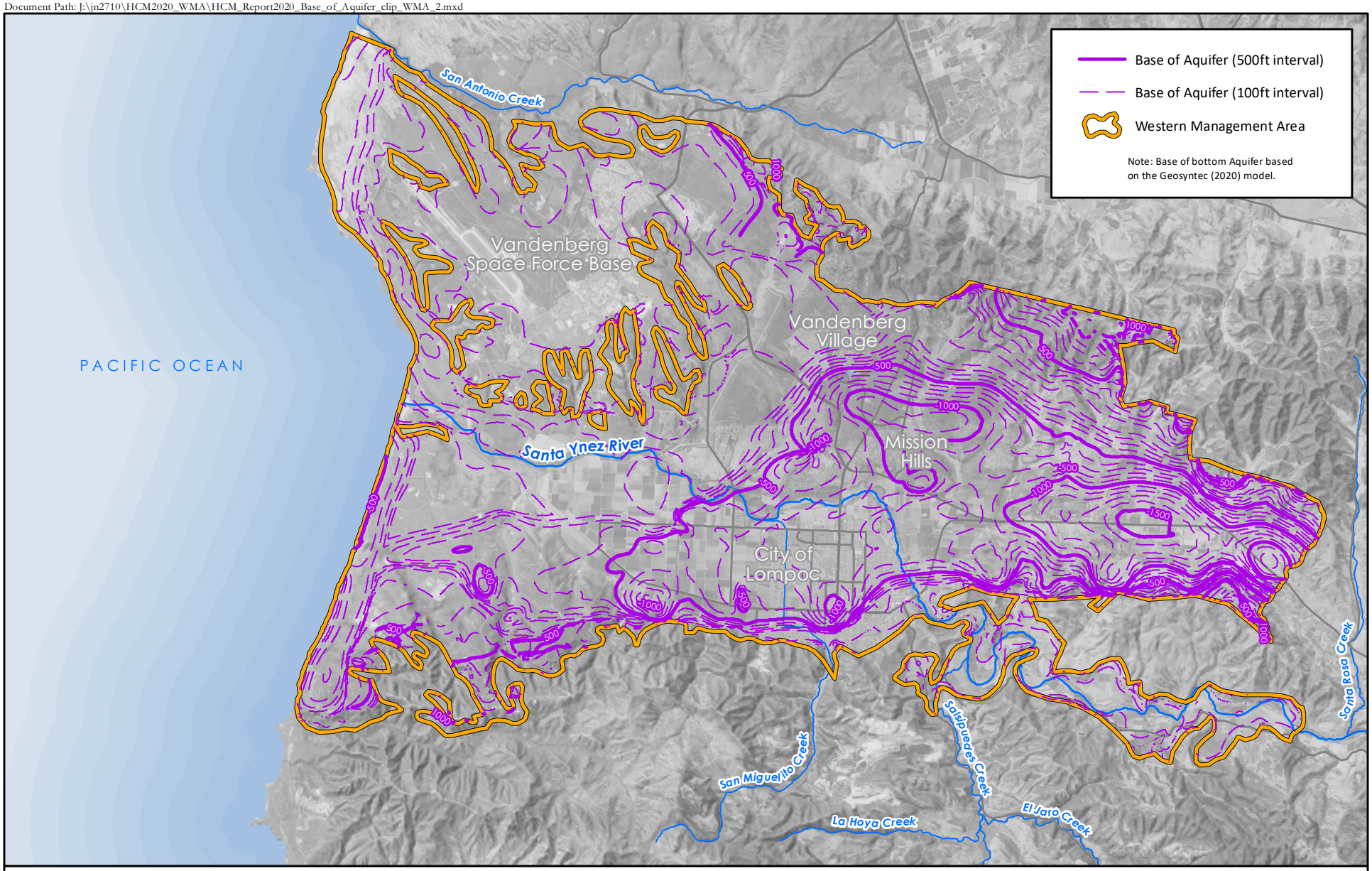
WESTERN MANAGEMENT AREA
GEOLOGIC CROSS SECTIONS D-D' AND E-E'

Geosyntec consultants

FIGURE 2a.1-3c

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Base_of_Aquifer_clip_WMA_2.mxd



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BOTTOM OF THE BASIN SUBSURFACE ELEVATION CONTOUR
WITHIN WESTERN MANAGEMENT AREA

DRAFT

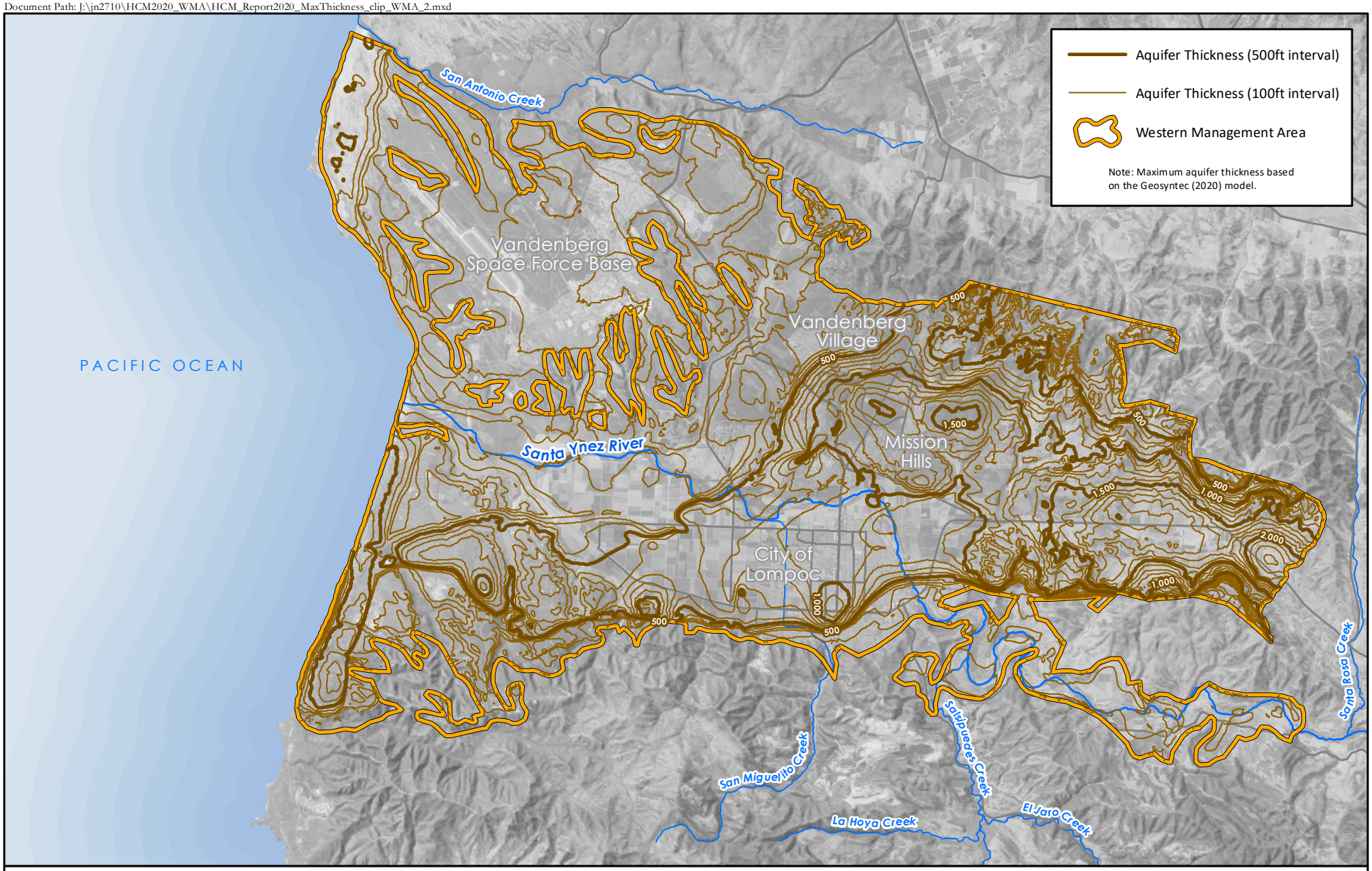
0 1 2 Miles

N

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

FIGURE 2a.2-1

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_MaxThickness_clip_WMA_2.mxd



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MAXIMUM THICKNESS OF THE BASIN
WITHIN WESTERN MANAGEMENT AREA

DRAFT

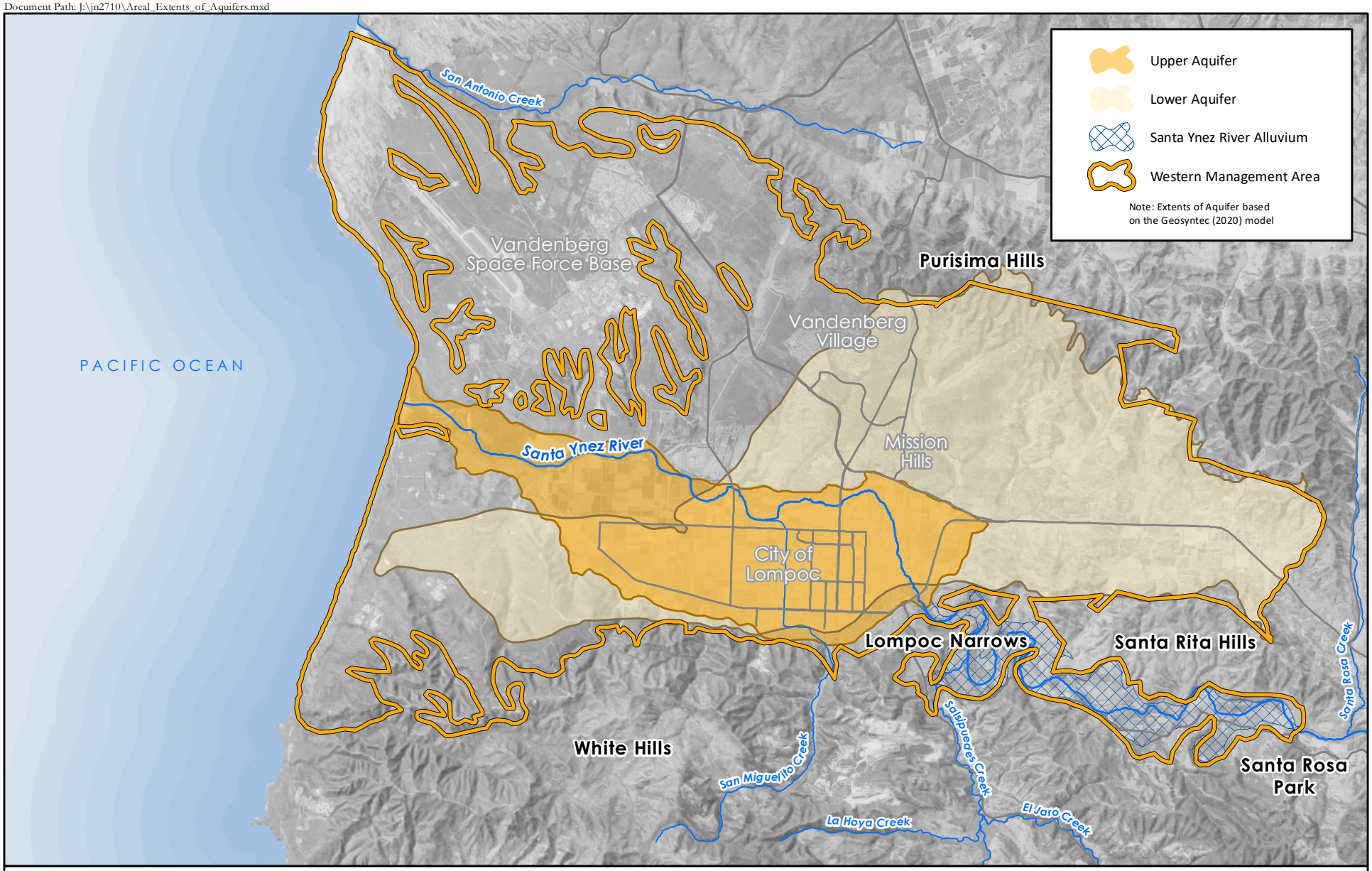
0 1 2 Miles

N

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

FIGURE 2a.2-2

Document Path: J:\jn2710\Areal_Extents_of_Aquifers.mxd



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AREAL EXTENTS OF THE PRINCIPLE AQUIFERS WESTERN MANAGEMENT AREA

DRAFT

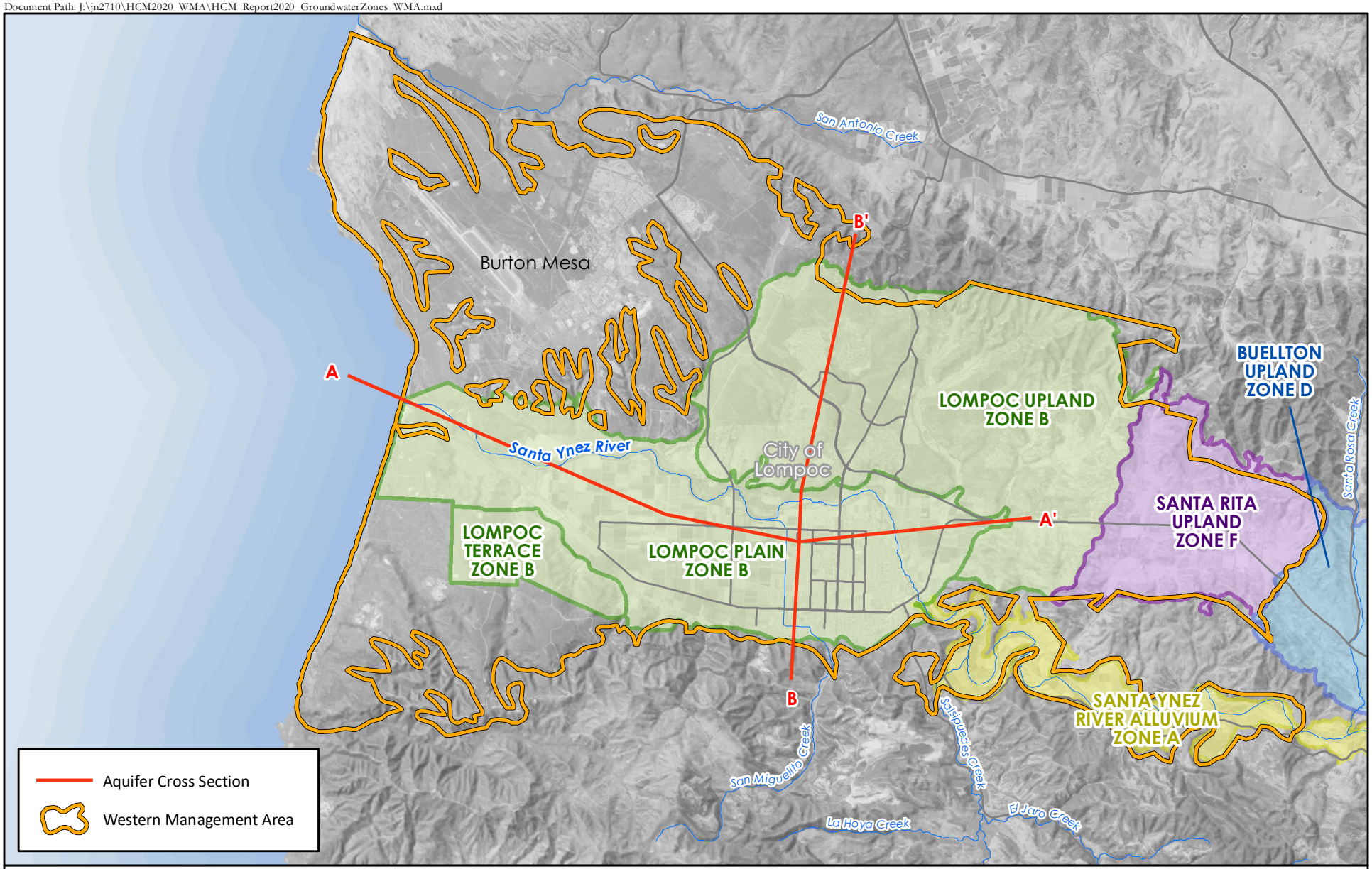
0 1 2 Miles

Sources: NAIP (2018)

N

FIGURE 2a.2-3

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_GroundwaterZones_WMA.mxd



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

DRAFT

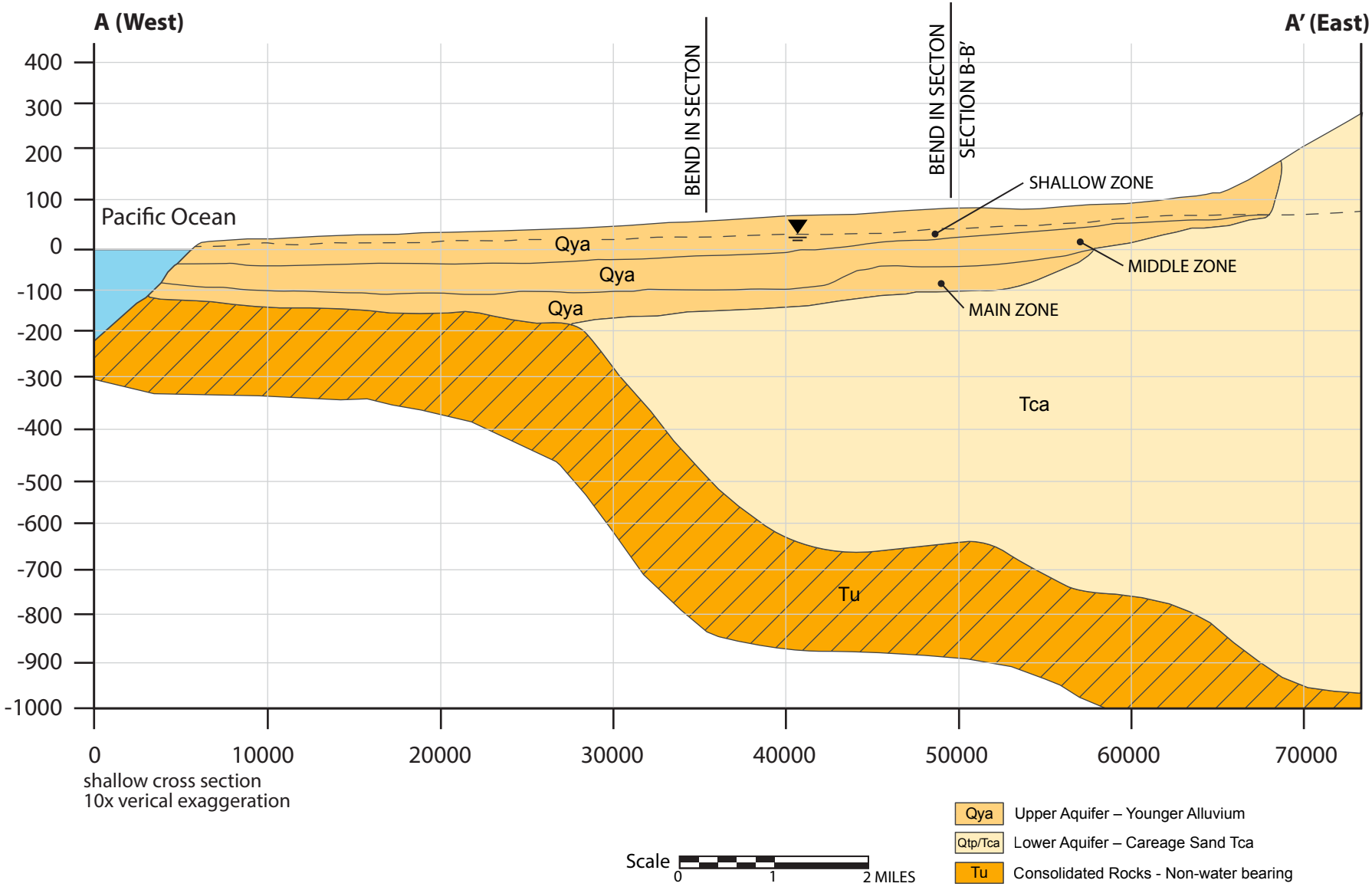
0 1 2 Miles

Sources:
West Yost and Associates (2012)
NAIP (2018)

N

FIGURE 2a.2-4

C/JobFolder/FIGURE 2a.2-4a_A-A_WMA Aquifer Cross-sections_1c



Cross sections based on City of Lompoc Groundwater Management Plan (West Yost, 2013); Originally based on United States Geological Survey, Bright and Others, 1992 (Plate 1).

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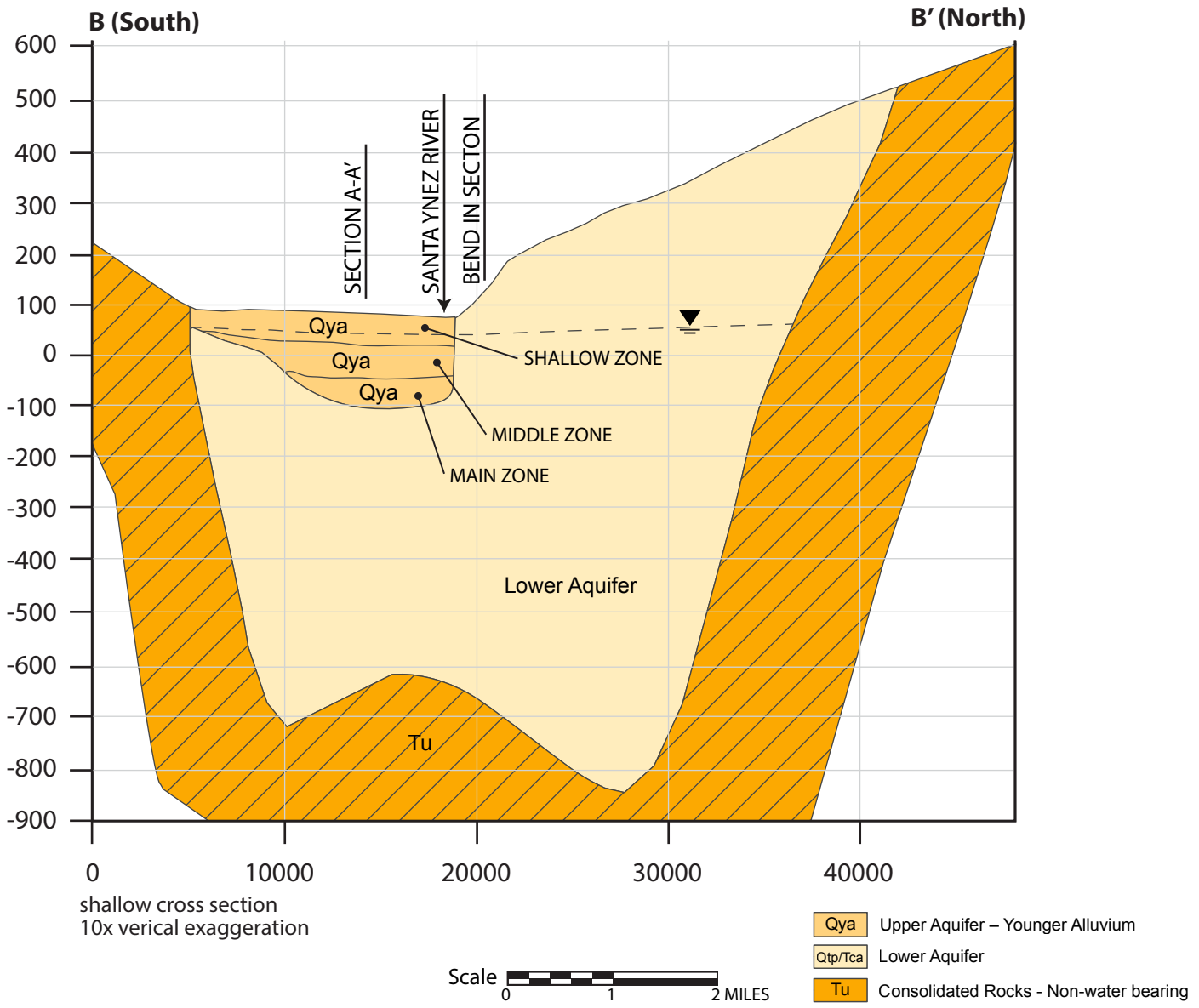
WESTERN MANAGEMENT AREA AQUIFER CROSS SECTION A-A'

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 2a.2-5a

C/JobFolder/FIGURE 2a.2-4b_B-B_WMA Aquifer Cross-sections_1c



Cross sections based on City of Lompoc Groundwater Management Plan (West Yost, 2013); Originally based on United States Geological Survey, Bright and Others, 1992 (Plate 1).

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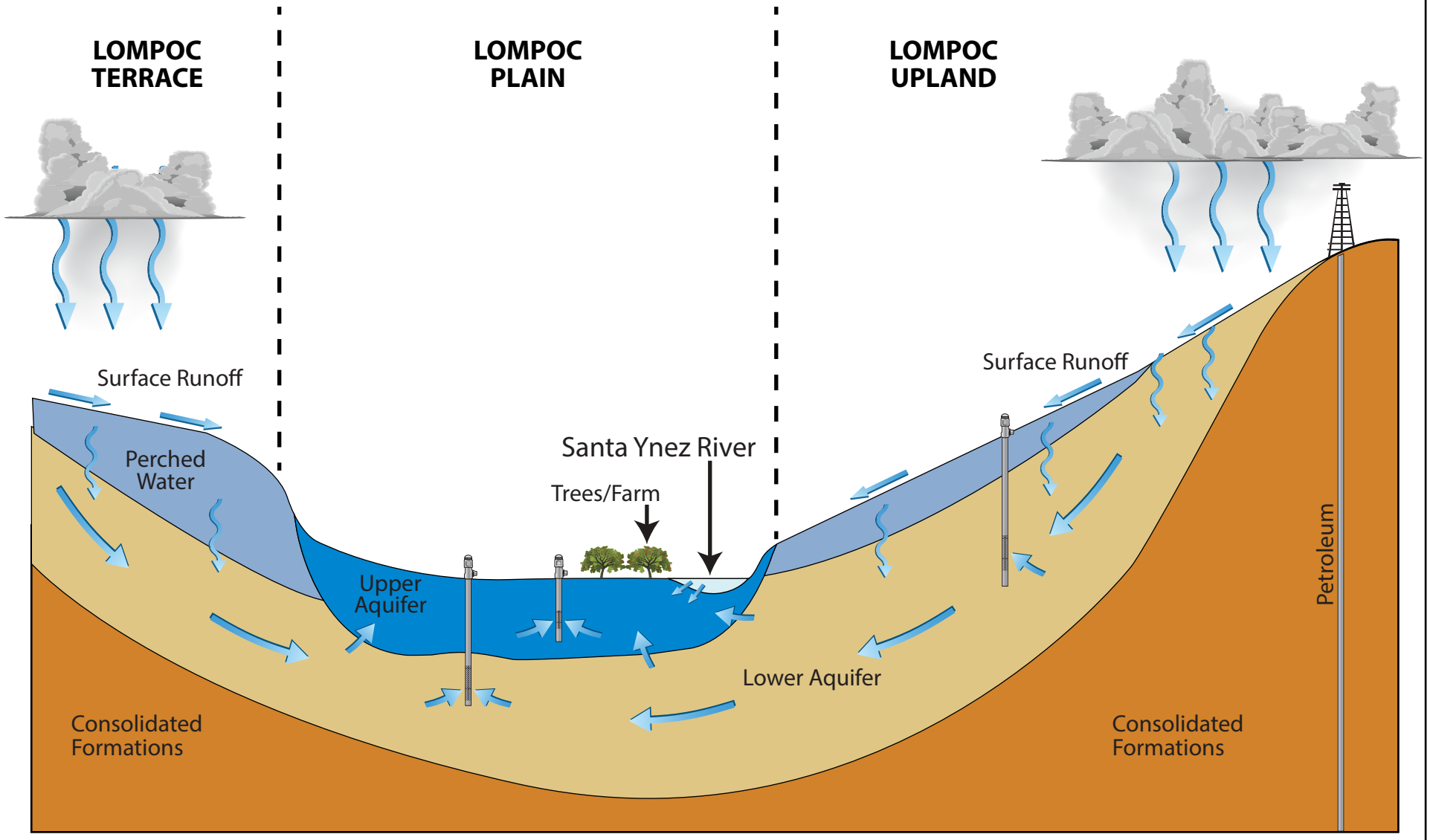
WESTERN MANAGEMENT AREA AQUIFER CROSS SECTION B-B'

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 2a.2-5b

C/JobFolder/SantaYnezRiver_Aquifer Cross Section WMA_1a.ai



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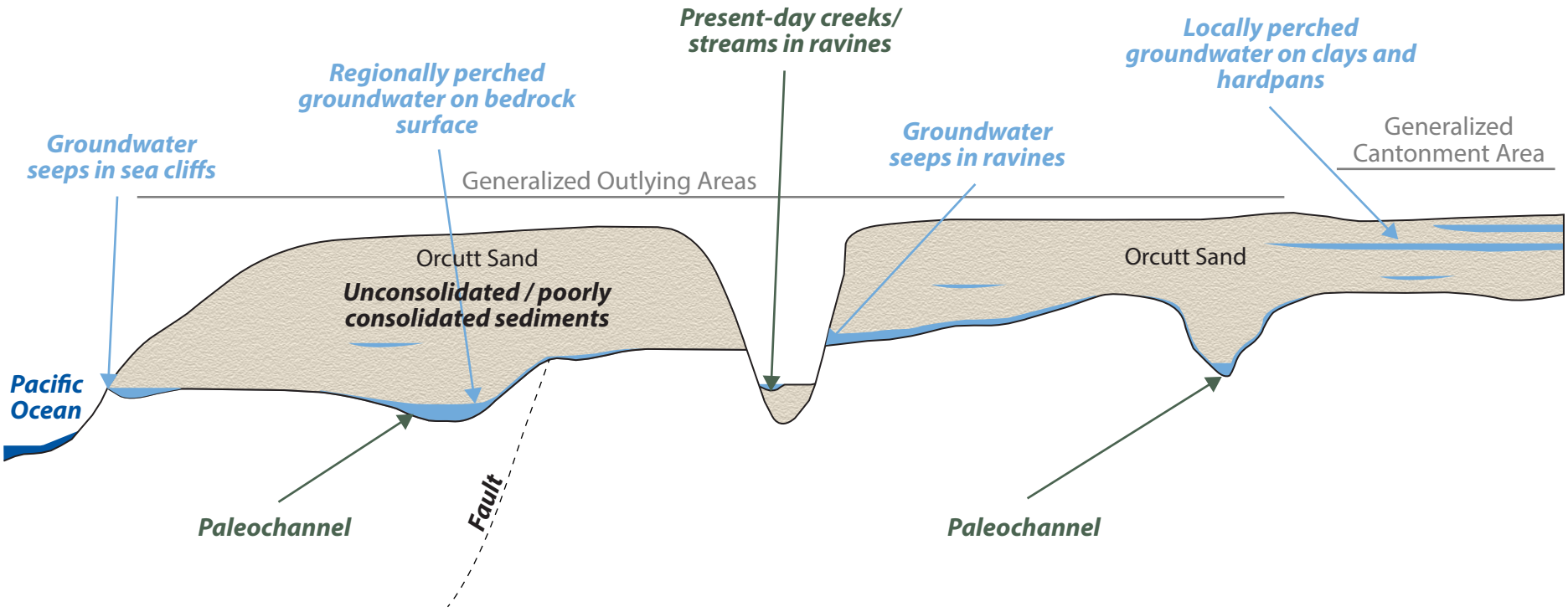
GROUNDWATER FLOW CONCEPT
WESTERN MANAGEMENT AREA

FIGURE 2a.2-6

C/JobFolder/FIGURE 2a.2-5_HydrogeologicCrossSection_1a



NOT TO SCALE. This a generalized diagram with a high degree of vertical exaggeration to illustrate general concepts. It is not meant to illustrate any specific site at VSFB.

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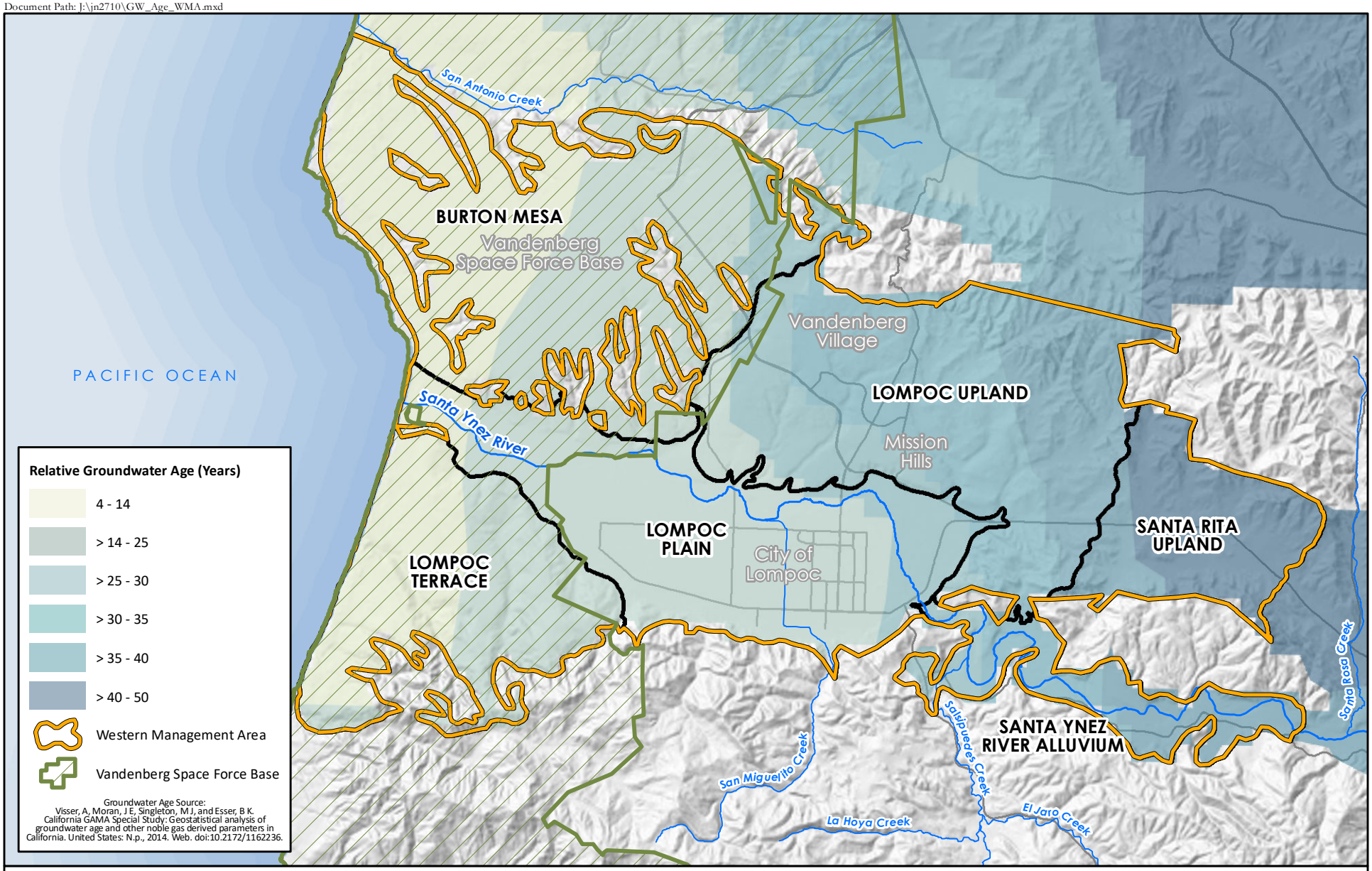
SIMPLIFIED CONCEPTUAL GEOLOGICAL / HYDROGEOLOGIC CROSS-SECTION
VANDENBERG SPACE FORCE BASE

FIGURE 2a.2-7

Document Path: J:\jn2710\GW_Age_WMA.mxd



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RELATIVE GROUNDWATER AGE
WESTERN MANAGEMENT AREA

DRAFT

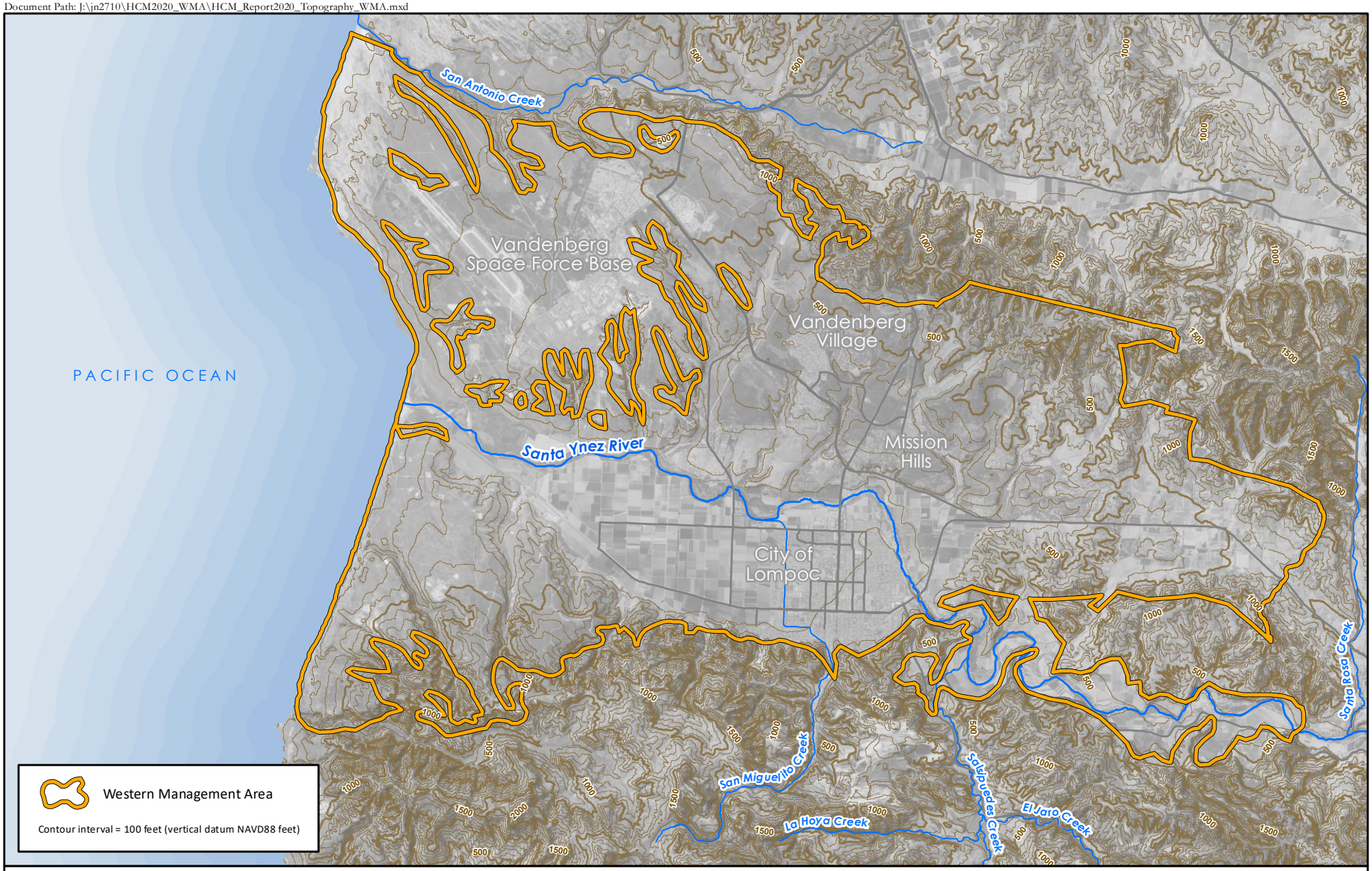
0 1 2 Miles

N

Sources:
Waterboard, 2020
USGS National Elevation Dataset, 2002

FIGURE 2a.2-8

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Topography_WMA.mxd



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TOPOGRAPHY
WESTERN MANAGEMENT AREA

DRAFT

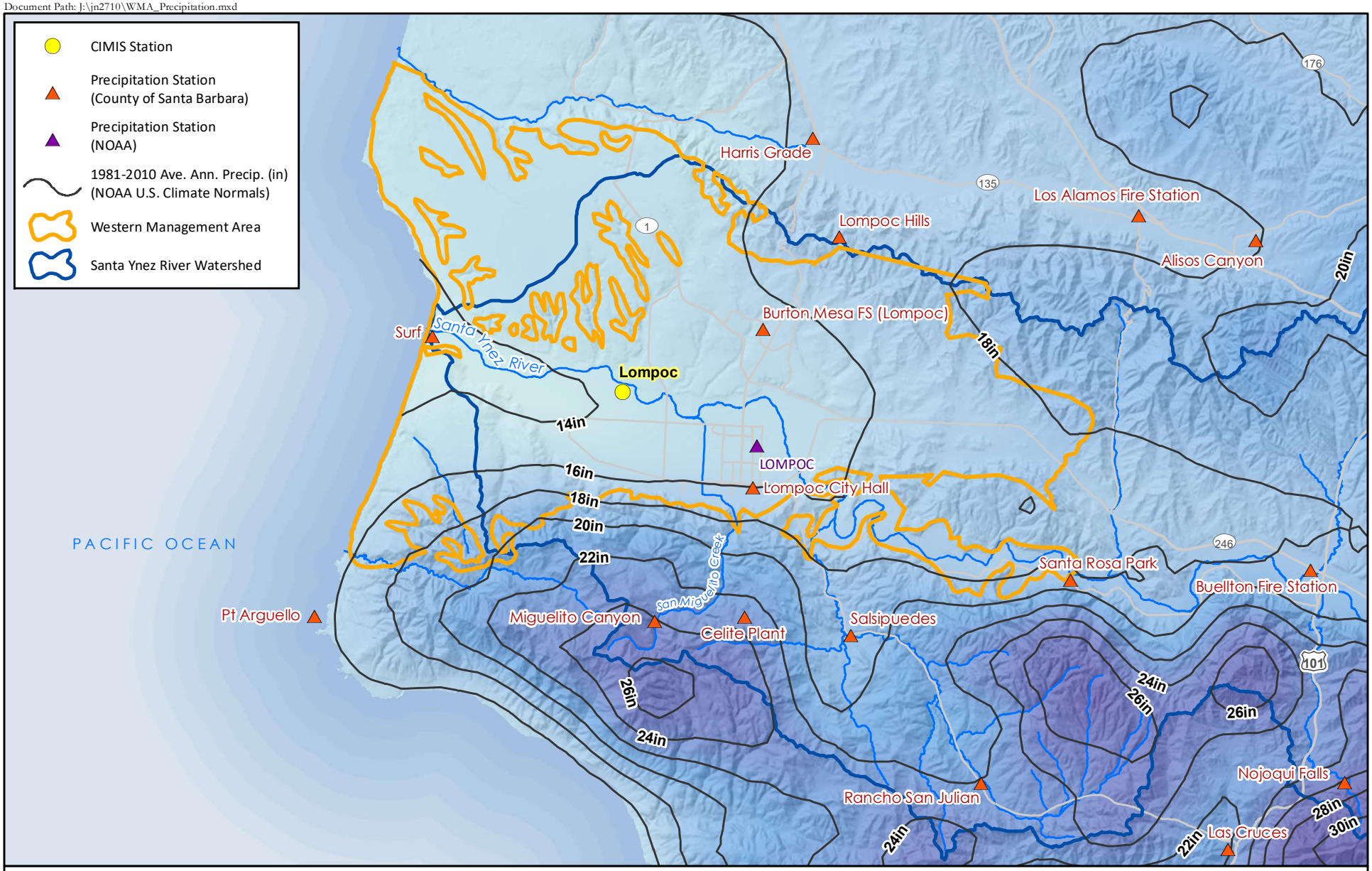
0 1 2 Miles

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

N

FIGURE 2a.3-1

Document Path: J:\jn2710\WMA_Precipitation.mxd



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PRECIPITATION STATIONS AND ISOHYETALS
WESTERN MANAGEMENT AREA

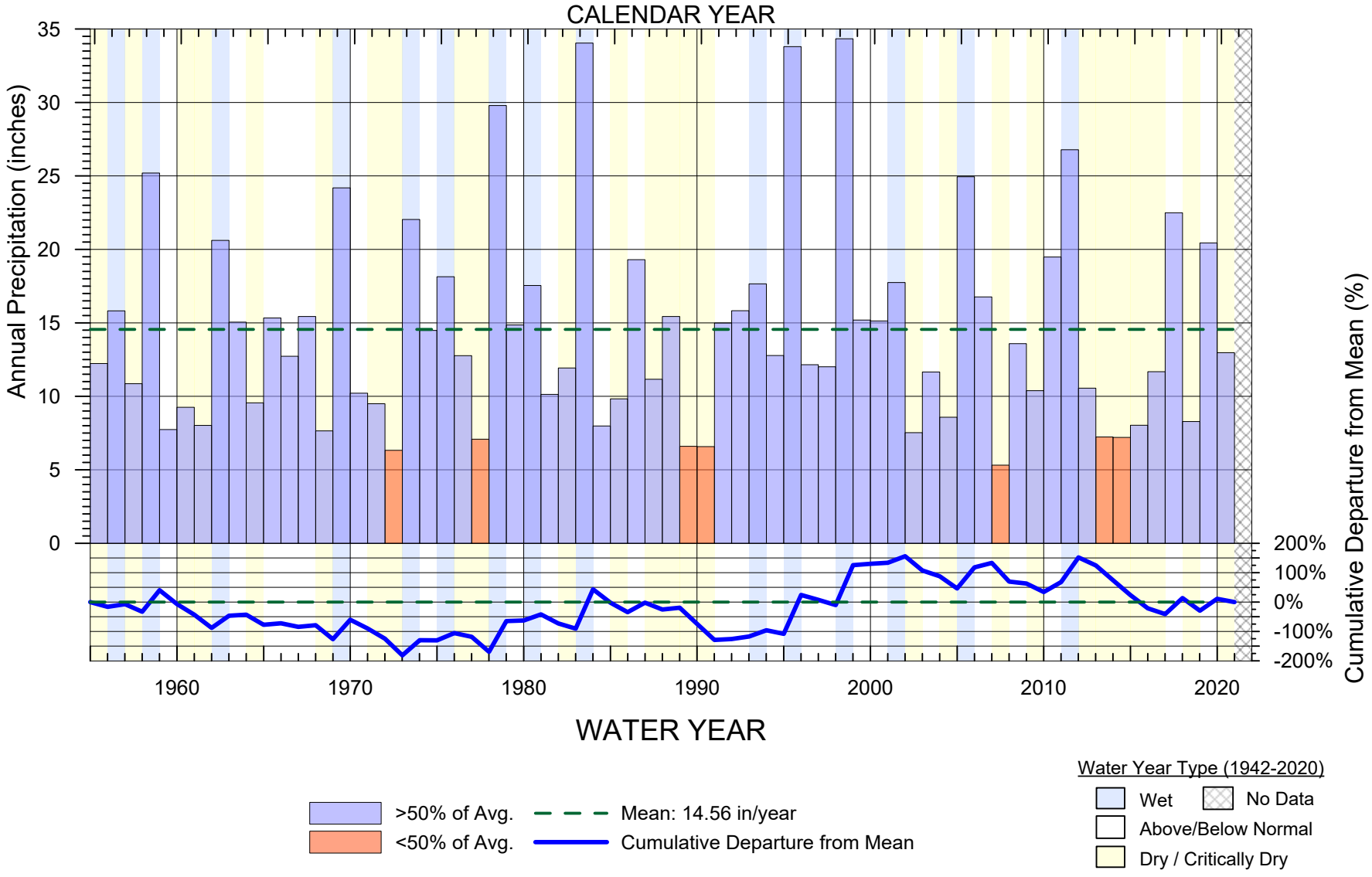
DRAFT

0 2 4 Miles

N

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

FIGURE 2a.3-2



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LOMPOC CITY HALL
PRECIPITATION AND
CUMULATIVE DEPARTURE FROM MEAN
WY 1955 - 2020

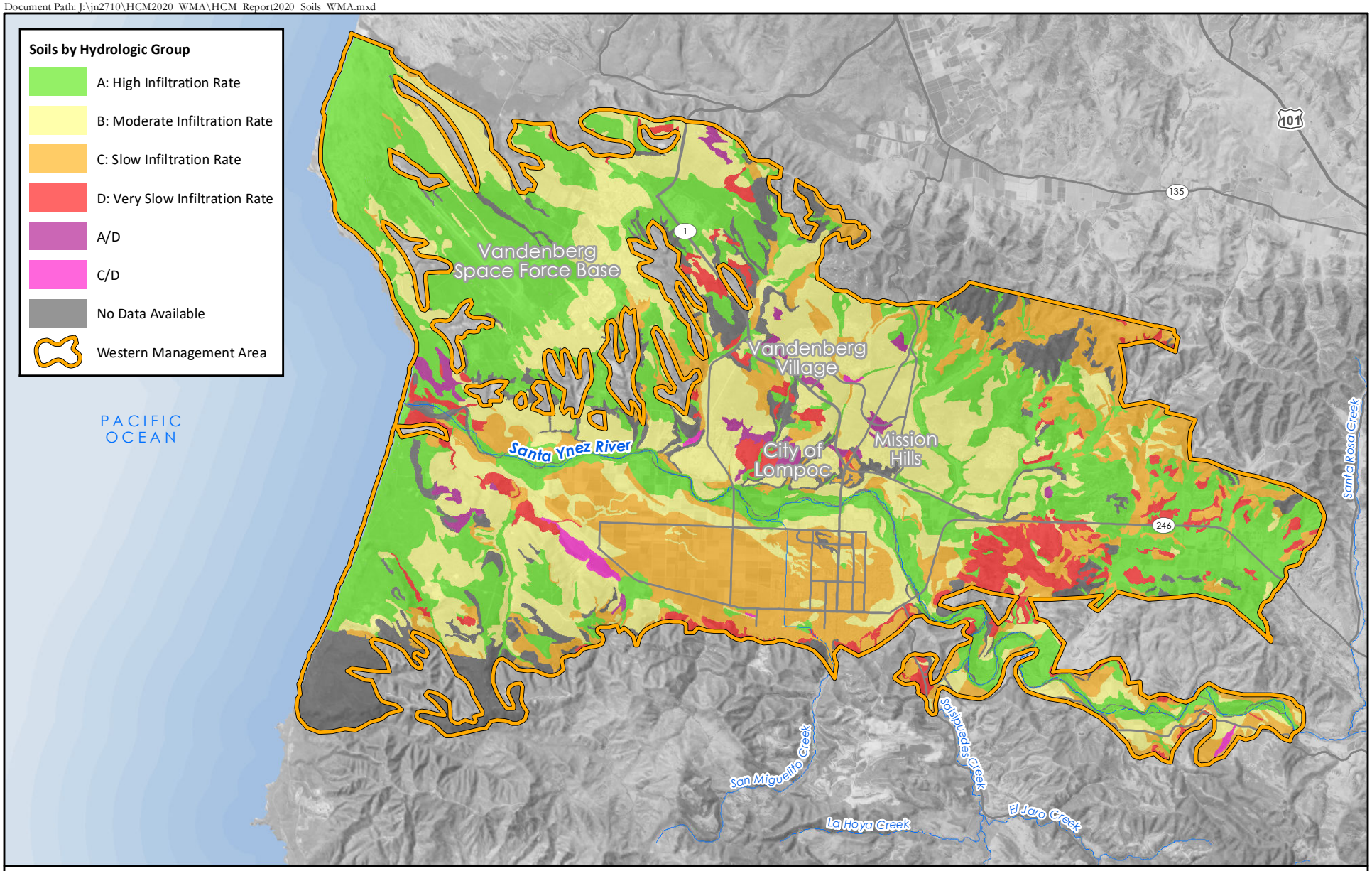
DRAFT
6/30/2021

Source: Santa Barbara County (2021)
Preciptiation Gage #439

FIGURE 2a.3-3

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

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Soils_WMA.mxd



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SOIL CHARACTERISTICS
WESTERN MANAGEMENT AREA

DRAFT

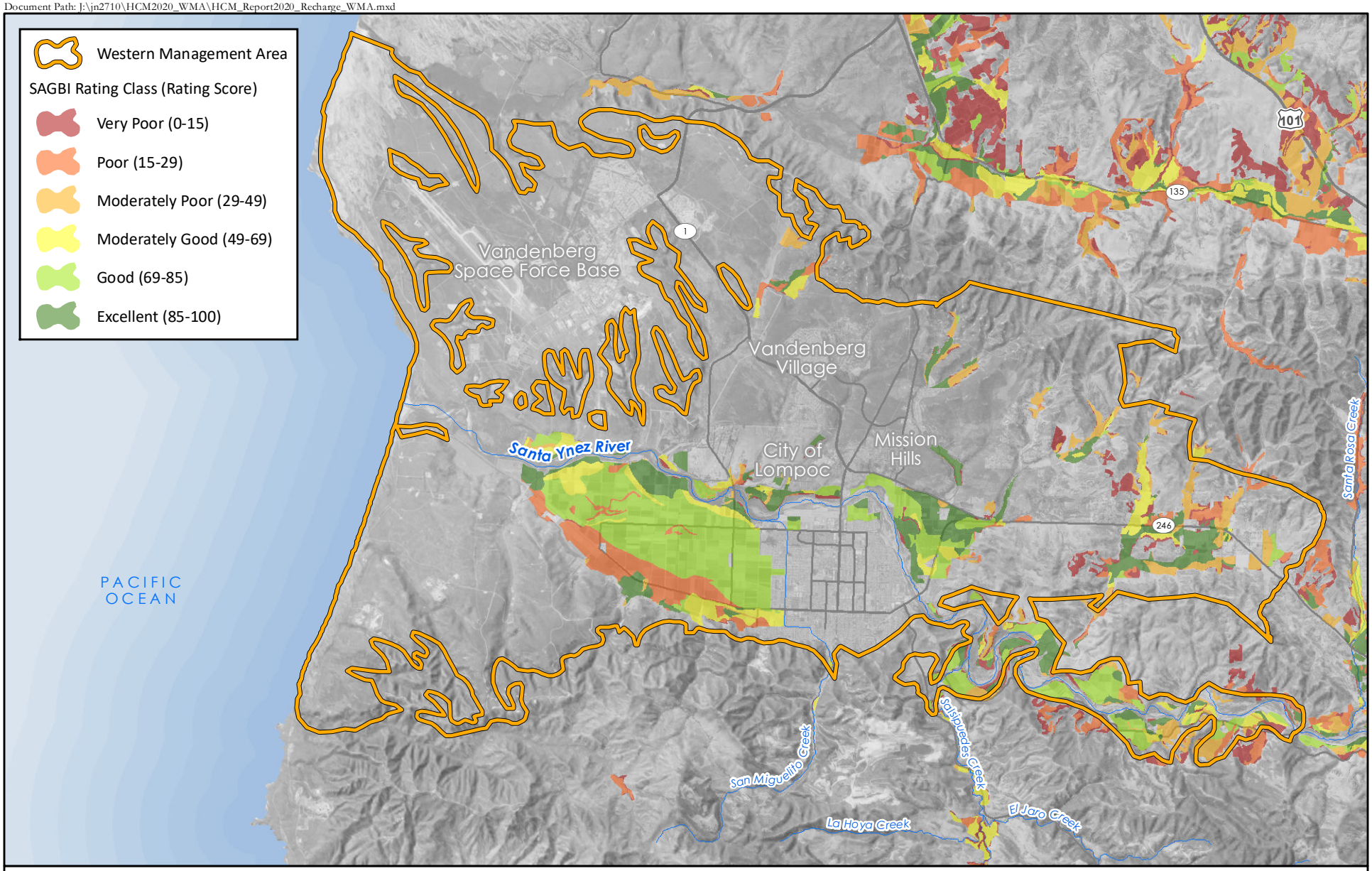
0 1 2 Miles

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

N

FIGURE 2a.3-4

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Recharge_WMA.mxd



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Groundwater Sustainability Agency

POTENTIAL GROUNDWATER RECHARGE AREAS
WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

N

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

FIGURE 2a.3-5

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_SYRwatershed_WMA.mxd

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Western Management Area

Santa Ynez River Watershed

SANTA YNEZ RIVER WATERSHED AND SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

WESTERN MANAGEMENT AREA

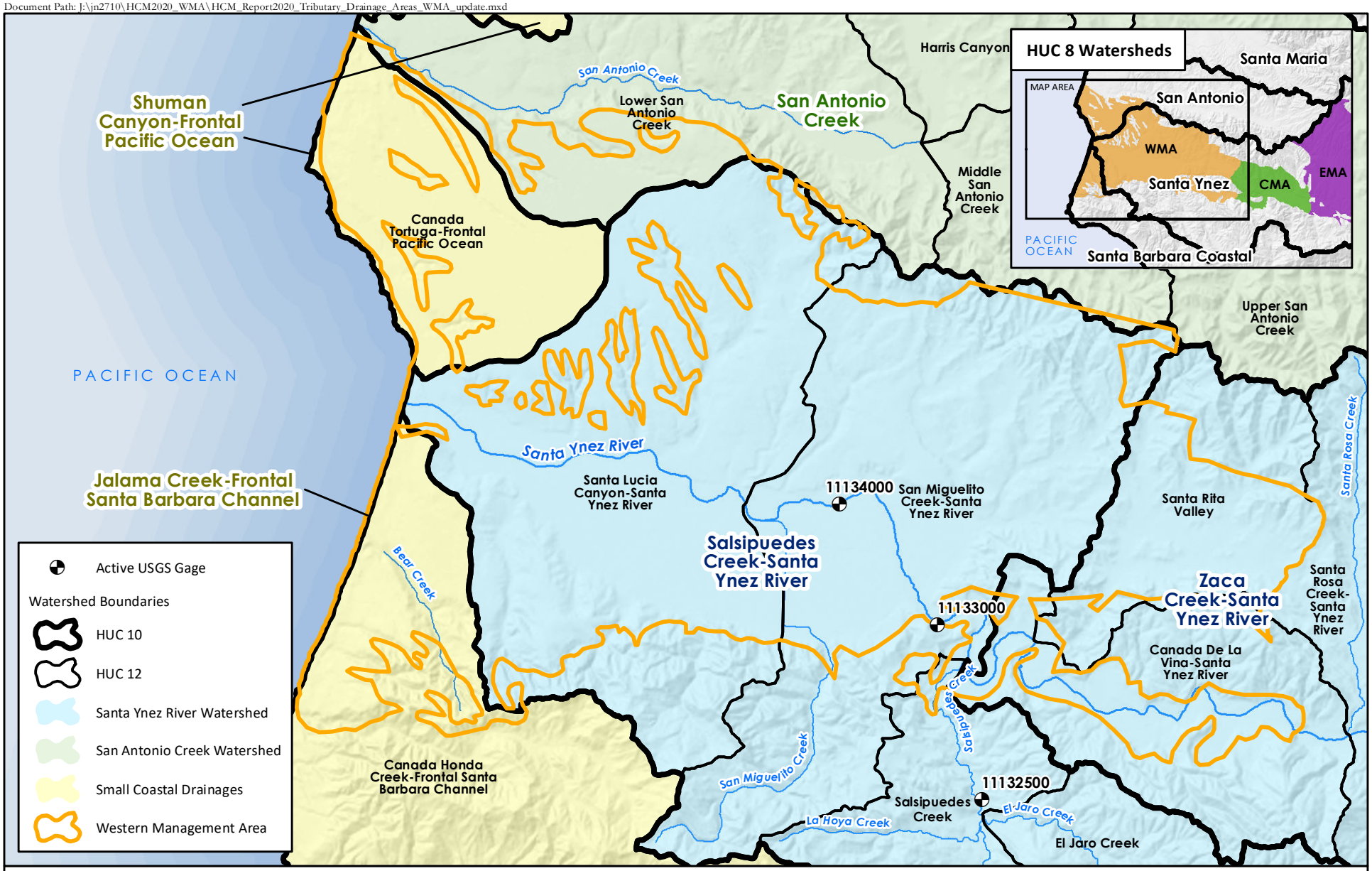
DRAFT

0 4 8 Miles

N

FIGURE 2a.3-6

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Tributary_Drainage_Areas_WMA_update.mxd



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Western Management Area
Groundwater Sustainability Agency

TRIBUTARY DRAINAGE AREAS
WESTERN MANAGEMENT AREA

DRAFT

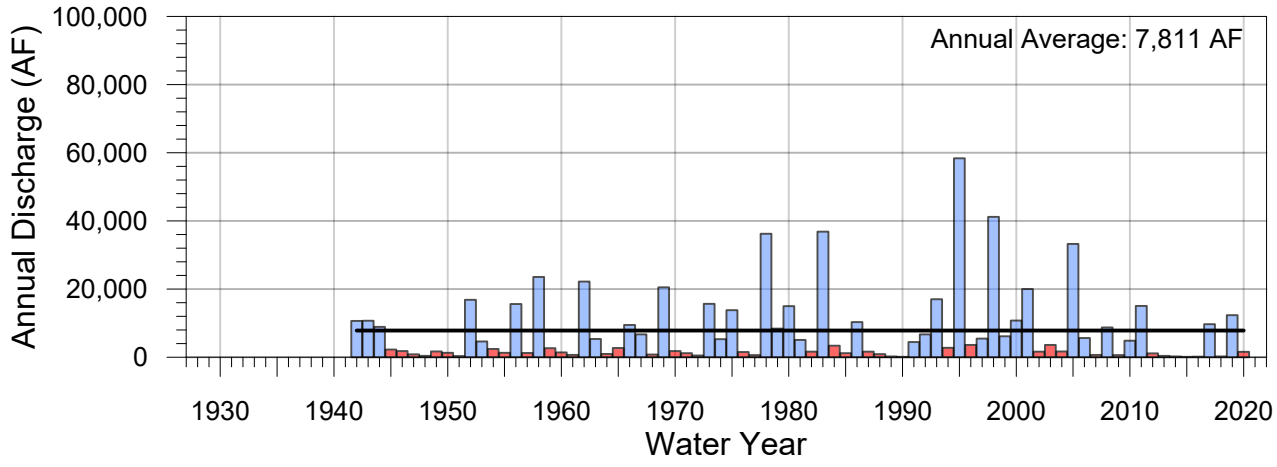
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002
National Hydrography Dataset

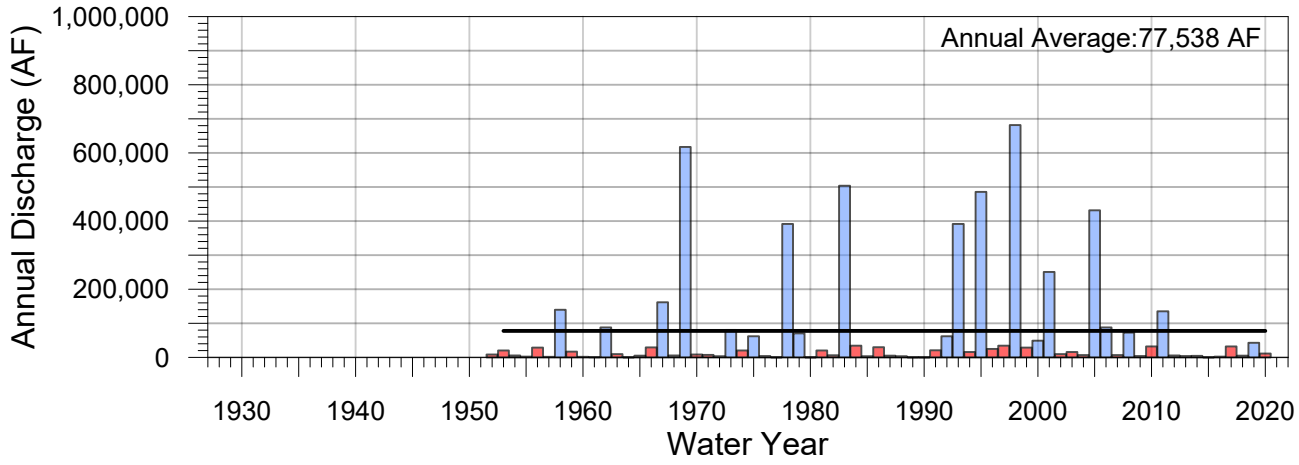
N

FIGURE 2a.3-7

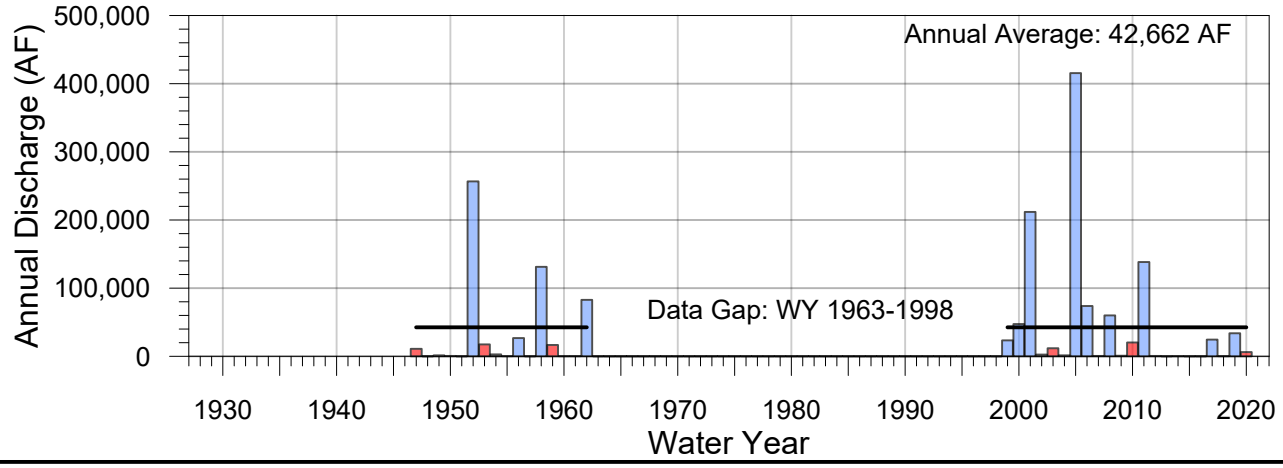
11132500 SALSIPUEDES C NR LOMPOC CA
(WY 1942 - 2020)



11133000 SANTA YNEZ R A NARROWS NR LOMPOC CA
(WY 1953 - 2020)



11134000 SANTA YNEZ R A H ST NR LOMPOC CA
(WY 1947 - 2020)



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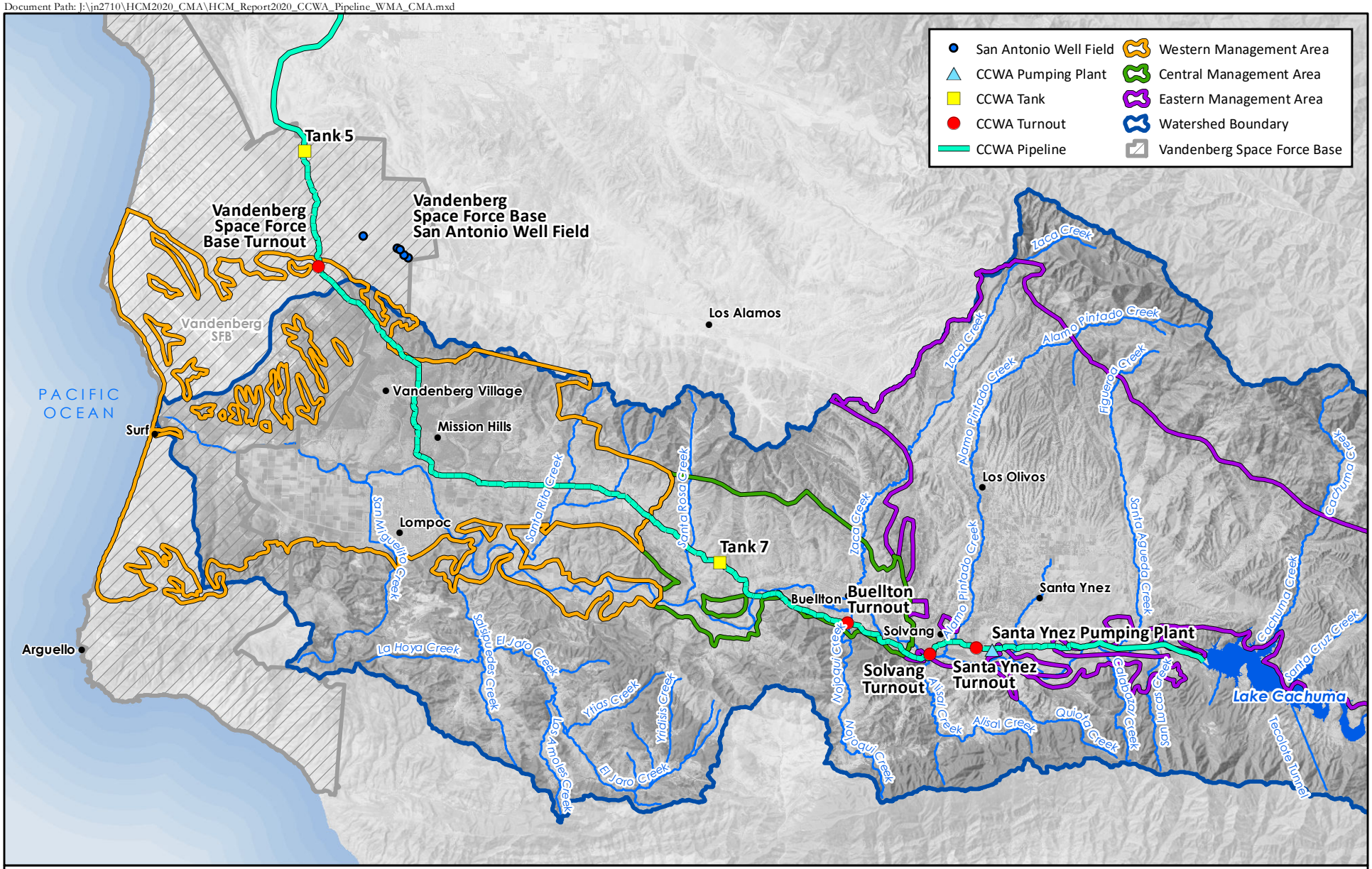
ANNUAL FLOWS
SANTA YNEZ RIVER

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

Data Source: USGS (2020) streamflow data

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

Document Path: J:\jn2710\HCM2020_CMA\HCM_Report2020_CCWA_Pipeline_WMA_CMA.mxd



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

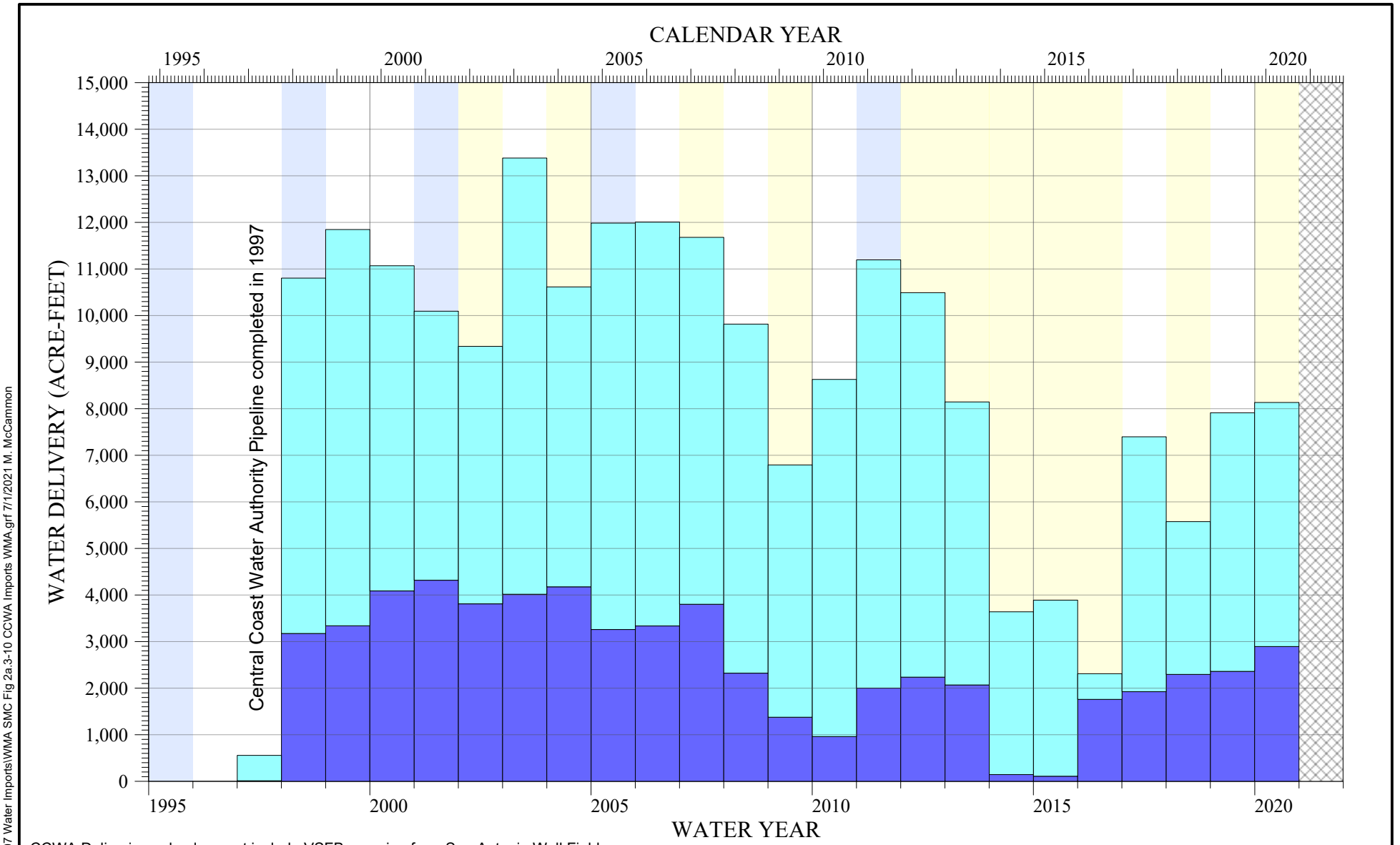
DRAFT

0 2 4 Miles

Source: Central Coast Water Authority (CCWA)

N

FIGURE 2a.3-9



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

Source: Central Coast Water Authority (2021)

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Western Management Area
Groundwater Sustainability Agency

ANNUAL WATER IMPORTS
CENTRAL COAST WATER AUTHORITY

DRAFT
7/1/2021

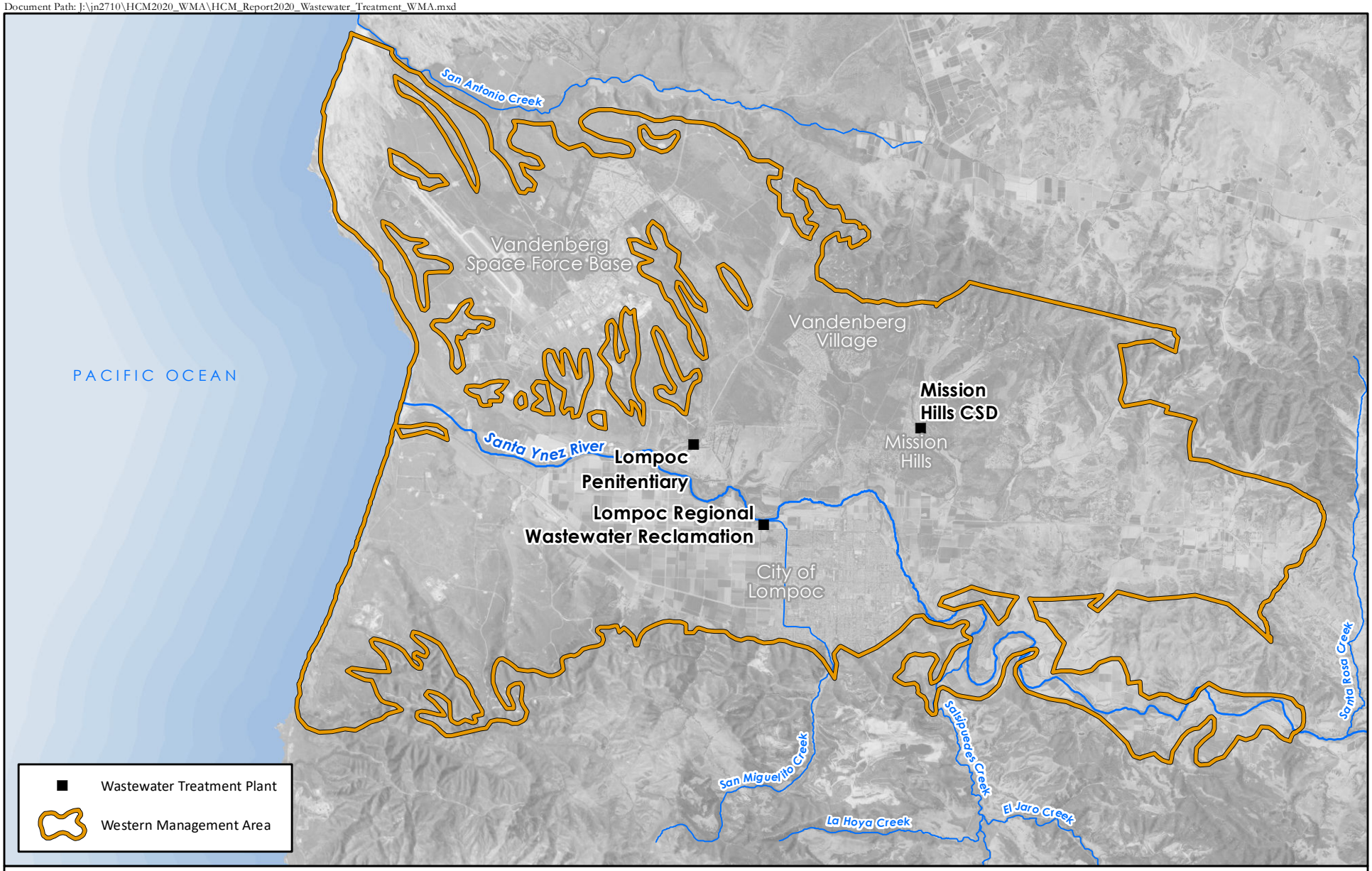
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Santa Ynez Imports
- Vandenberg SFB
- Non-WMA

FIGURE 2a.3-10

I:\DATA\2710\Analyses\2021-07 Water Imports\WMA SMC Fig 2a.3-10 CCWA Imports WMA.grf 7/1/2021 M. McCammon

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Wastewater_Treatment_WMA.mxd



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WASTEWATER TREATMENT PLANTS
WESTERN MANAGEMENT AREA

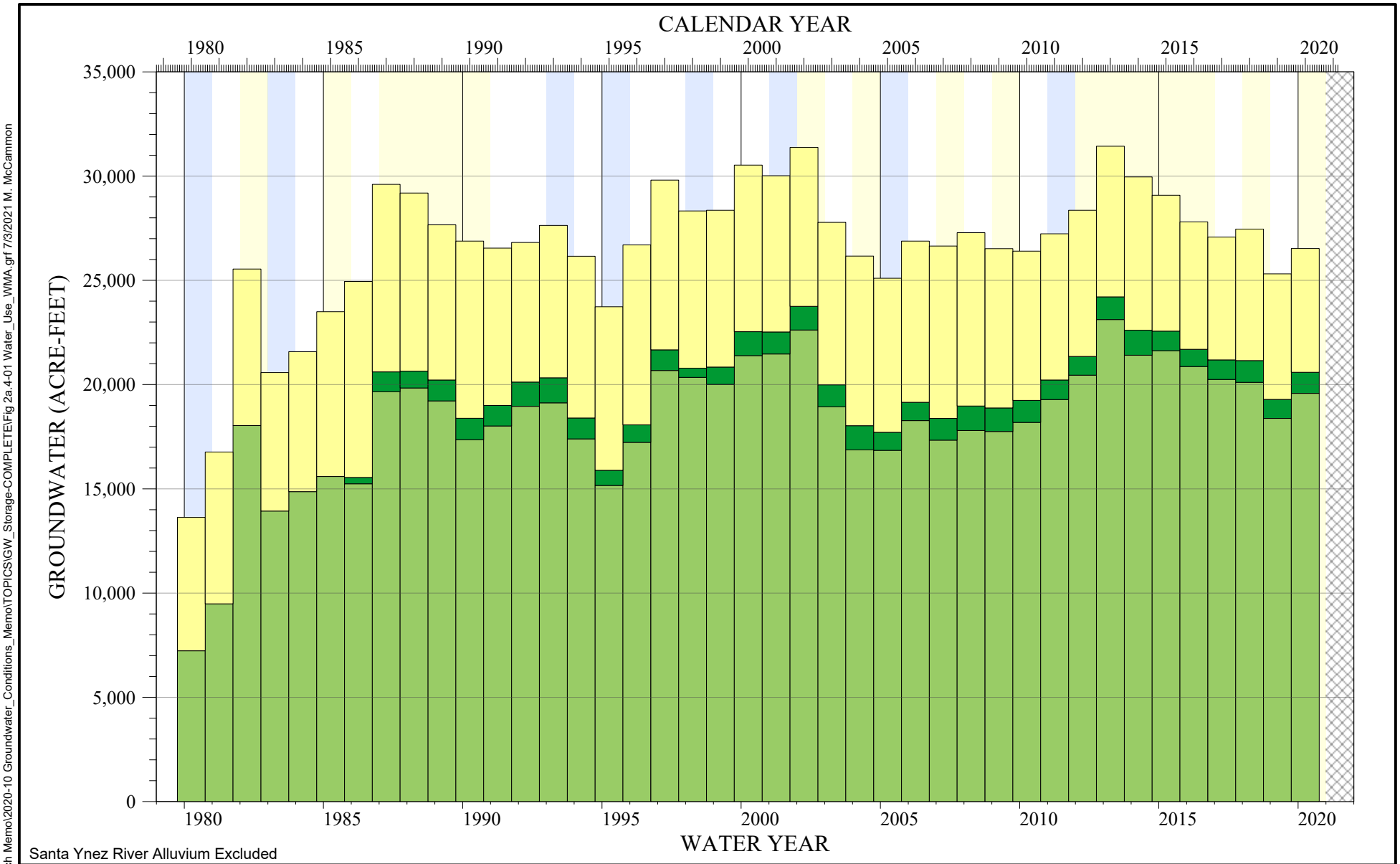
DRAFT

0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2a.3-11



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GROUNDWATER USE
DISTRICT ZONES B & F

Other Water
Special Irrigation Water
Agricultural Water

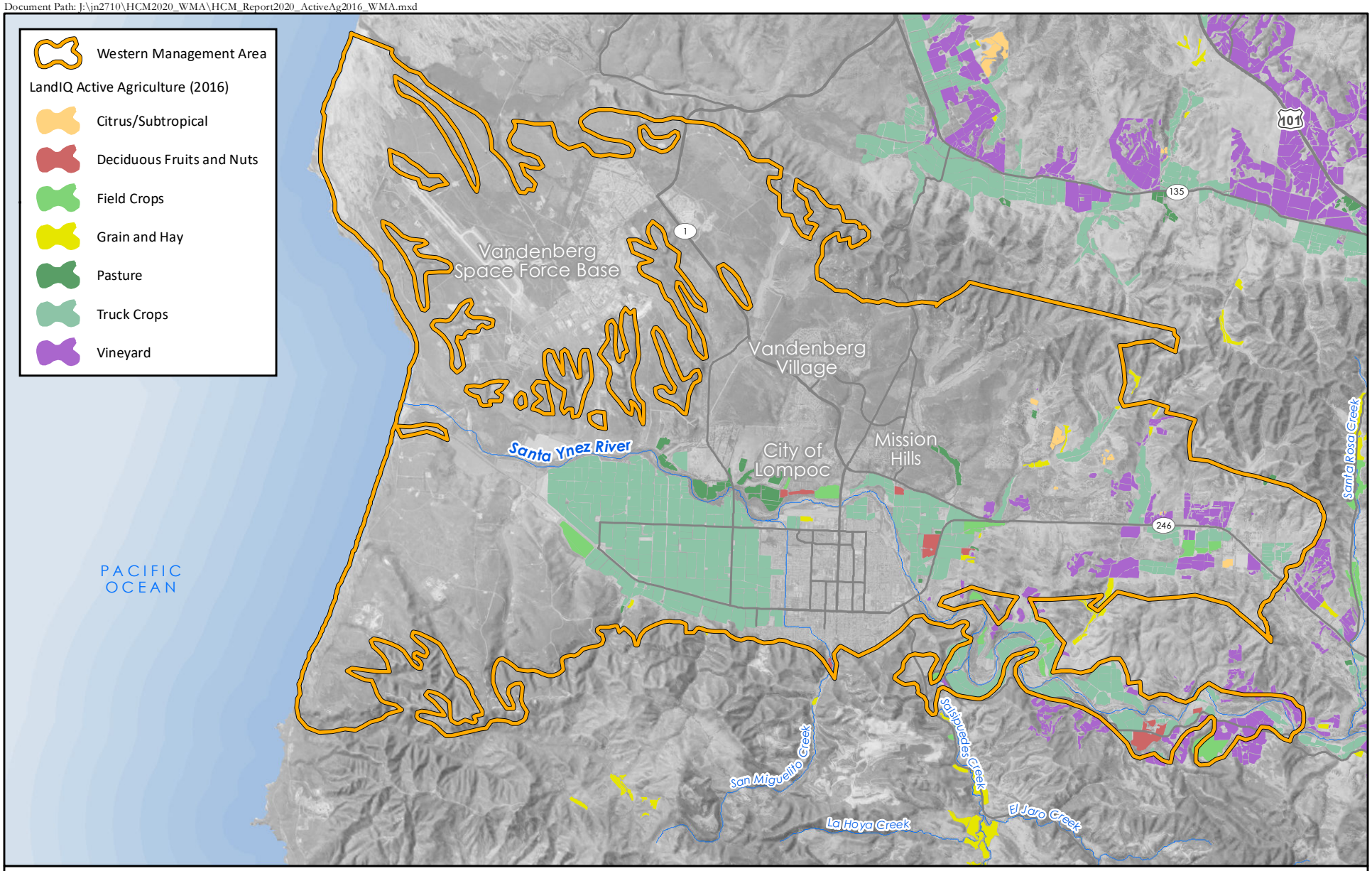
Water Year Type (1942-2020)
Wet
No Data
Above/Below Normal
Dry / Critically Dry

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Storage-COMPLETE\Fig 2a.4-01 Water_Use_WMA.grf 7/3/2021 M. McCammon

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_ActiveAg2016_WMA.mxd



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ACTIVE AGRICULTURAL AREA 2016
WESTERN MANAGEMENT AREA

DRAFT

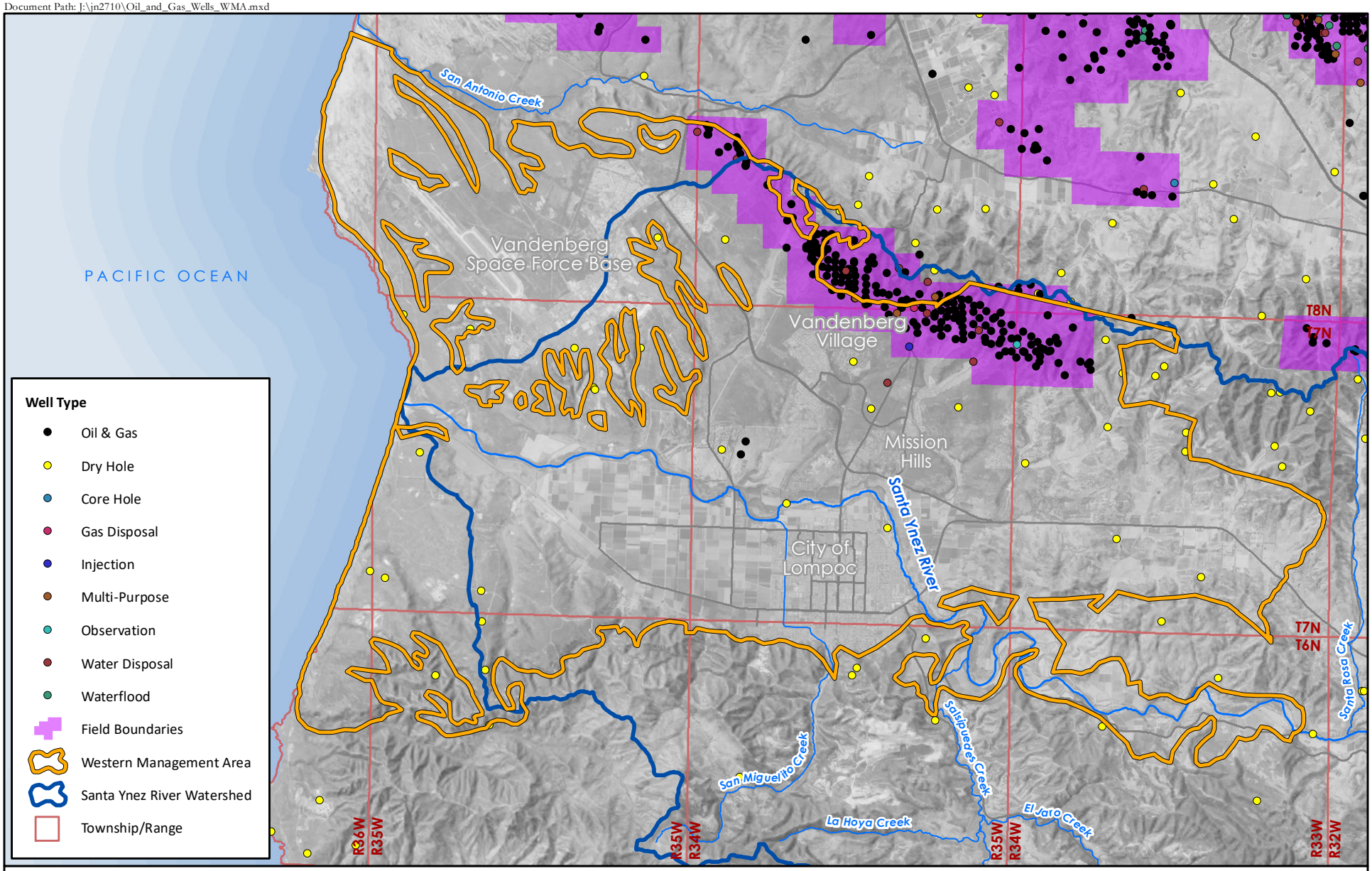
0 1 2 Miles

N

Source:
California Department of Water Resources, LandIQ 2016

FIGURE 2a.4-2

Document Path: J:\jn2710\Oil_and_Gas_Wells_WMA.mxd



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OIL AND GAS WELL LOCATIONS

DRAFT

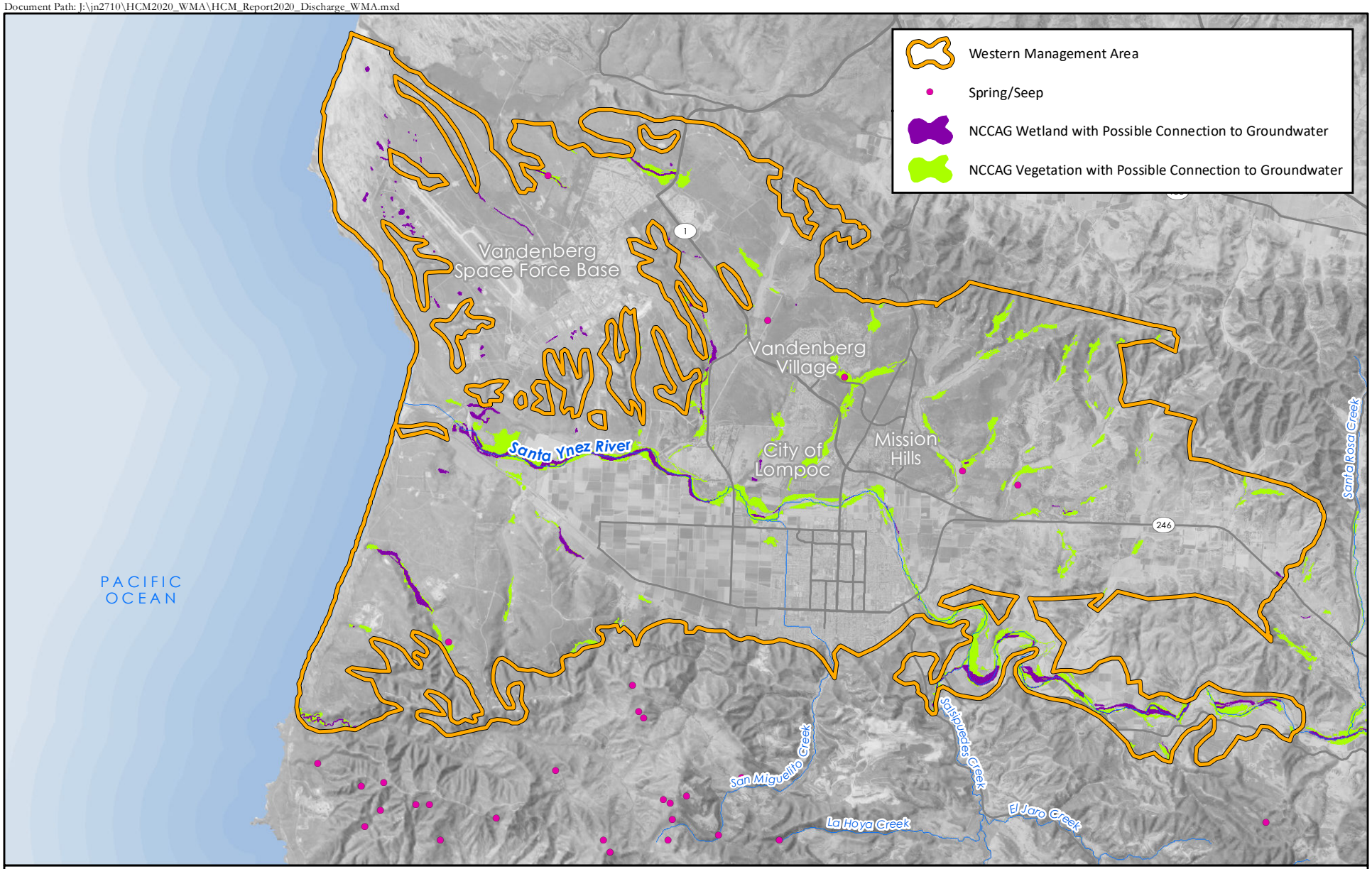
0 1 2 Miles

N

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

FIGURE 2a.4-3

Document Path: J:\jn2710\HCM2020_WMA\HCM_Report2020_Discharge_WMA.mxd



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POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS AND GROUNDWATER DISCHARGE AREAS

WESTERN MANAGEMENT AREA

DRAFT

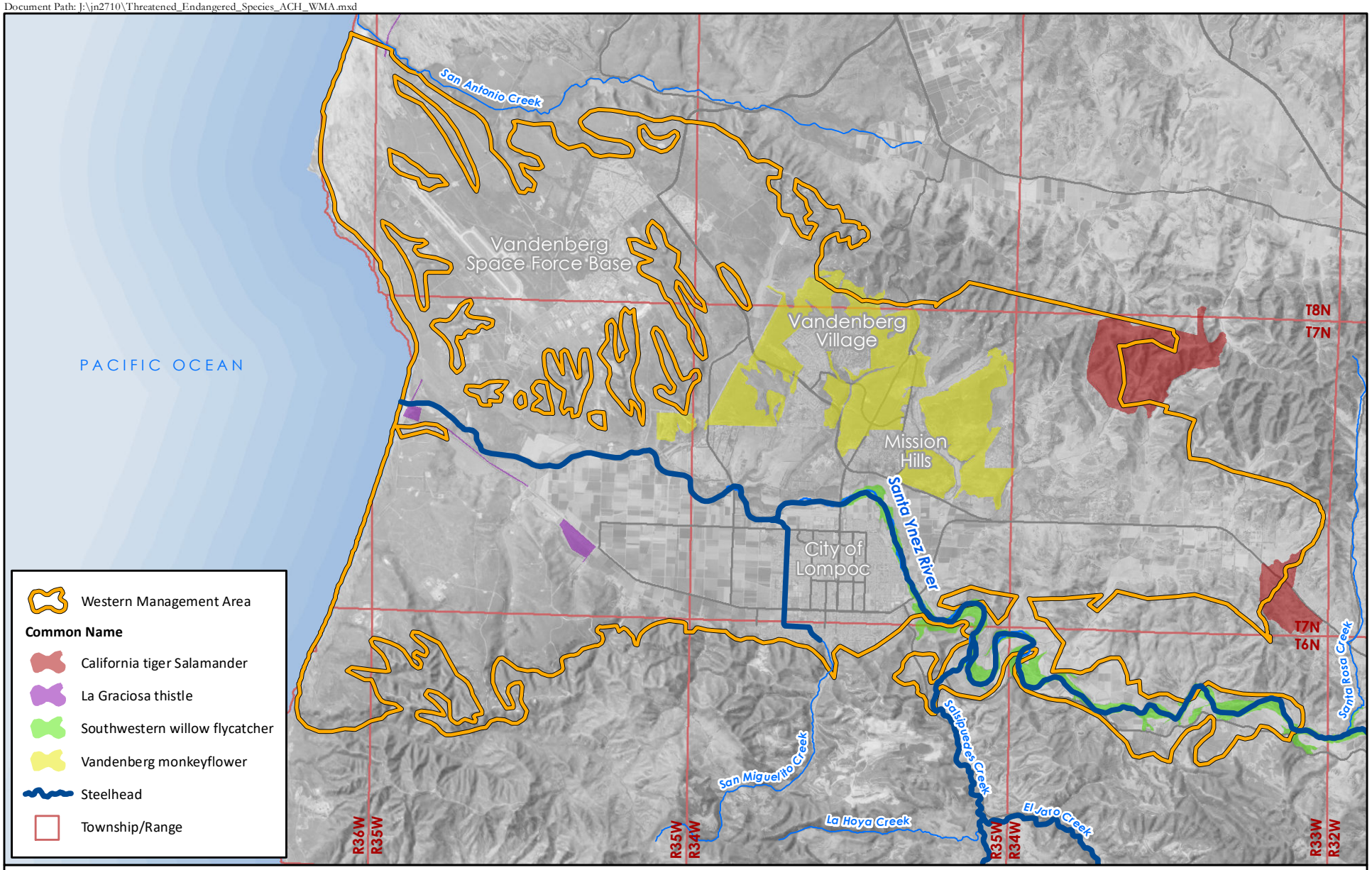
0 1 2 Miles

N

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

FIGURE 2a.4-4

Document Path: J:\jn2710\Threatened_Endangered_Species_ACH_WMA.mxd



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THREATENED & ENDANGERED SPECIES ACTIVE CRITICAL HABITAT

DRAFT

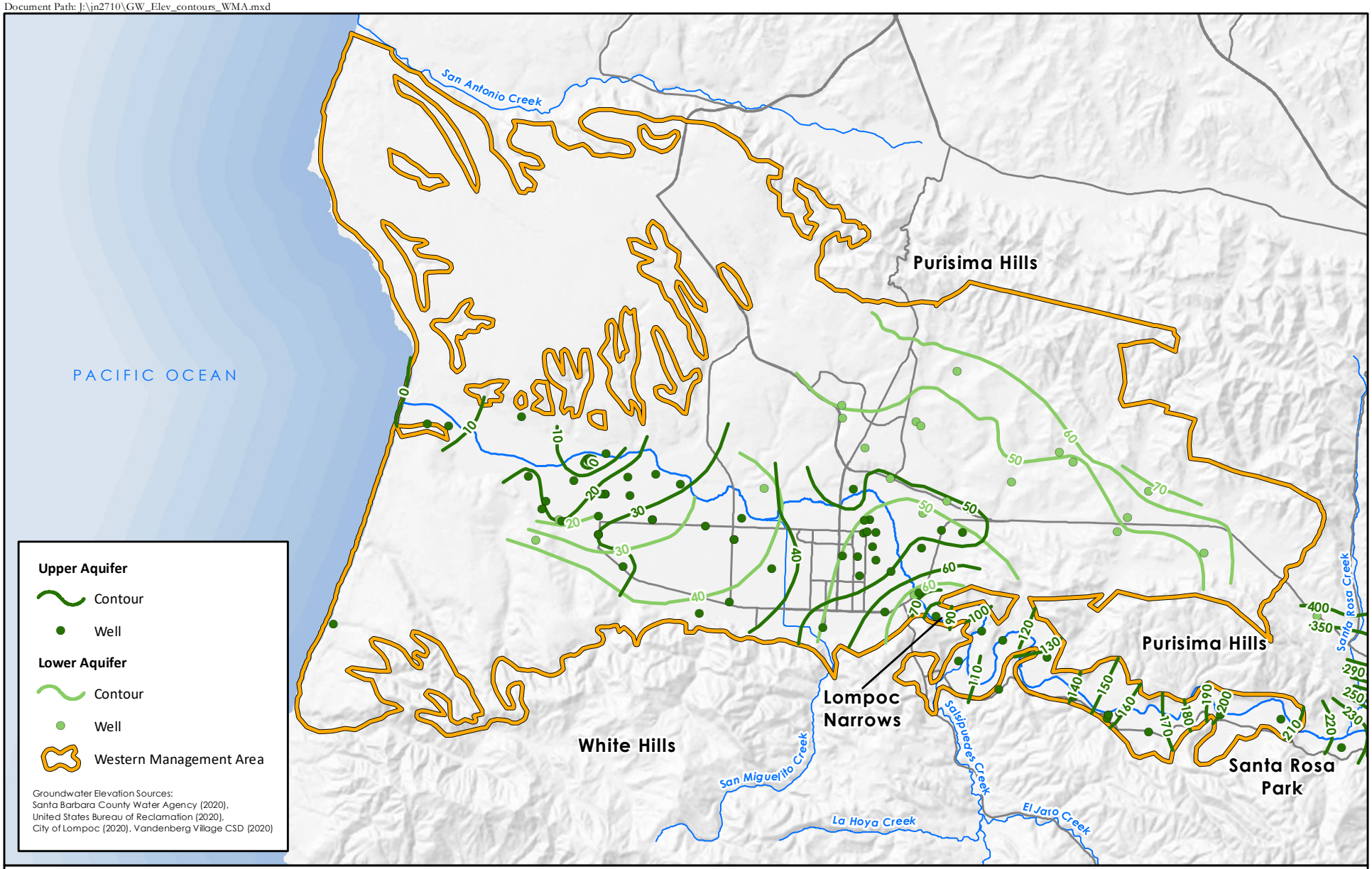
0 1 2 Miles

N

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

FIGURE 2a.4-5

Document Path: J:\jn2710\GW_Elev_contours_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

GROUNDWATER ELEVATION CONTOURS
SEASONAL HIGH
SPRING 2020
WESTERN MANAGEMENT AREA

DRAFT

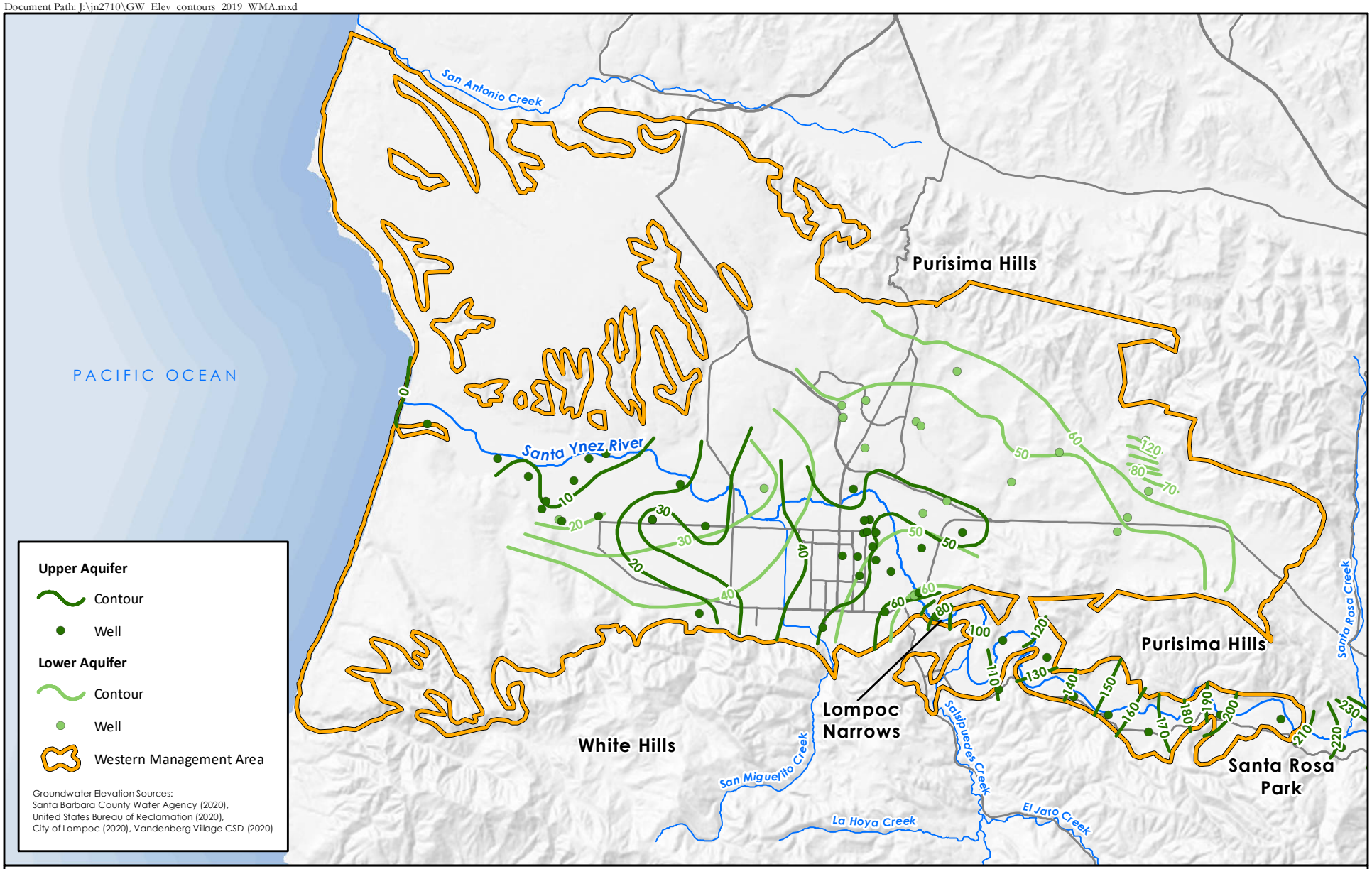
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2b.1-1

Document Path: J:\jn2710\GW_Elev_contours_2019_WMA.mxd



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GROUNDWATER ELEVATION CONTOURS
SEASONAL LOW
FALL 2019
WESTERN MANAGEMENT AREA

DRAFT

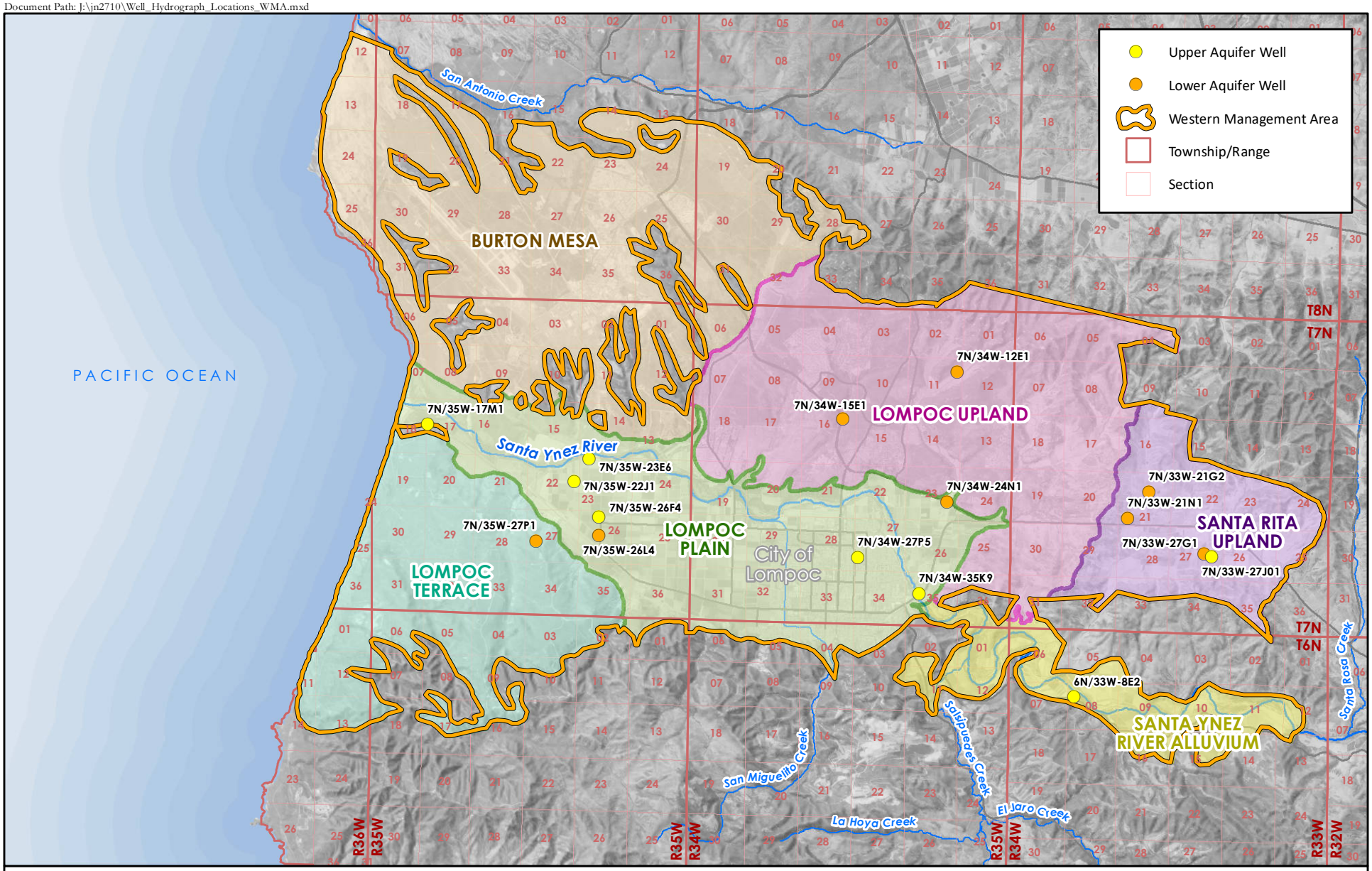
0 1 2 Miles

Sources:
USGS National Elevation Dataset, 2002

N

FIGURE 2b.1-2

Document Path: J:\jn2710\Well_Hydrograph_Locations_WMA.mxd



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WELL HYDROGRAPH LOCATIONS
WITHIN WESTERN MANAGEMENT AREA

DRAFT

0 1 2 Miles

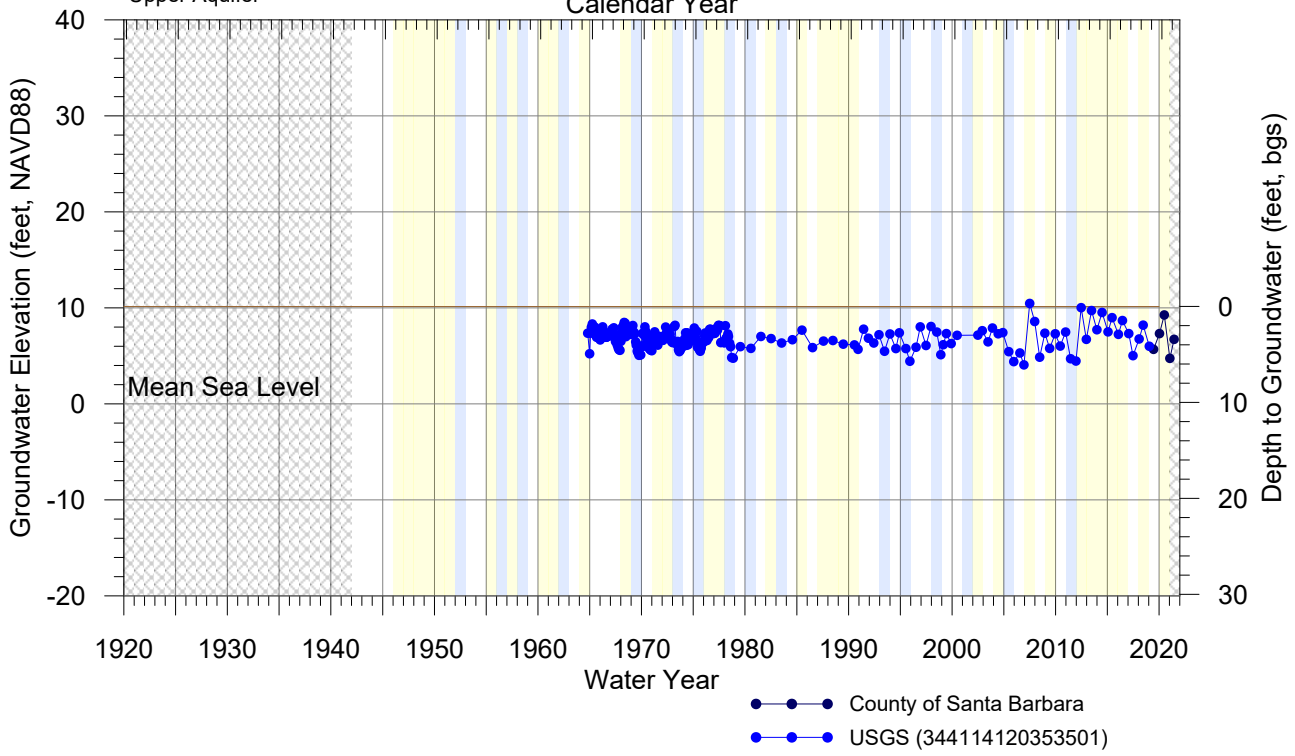
N

FIGURE 2b.1-3

Santa Ynez River Estuary
Upper Aquifer

7N/35W-17M1
Calendar Year

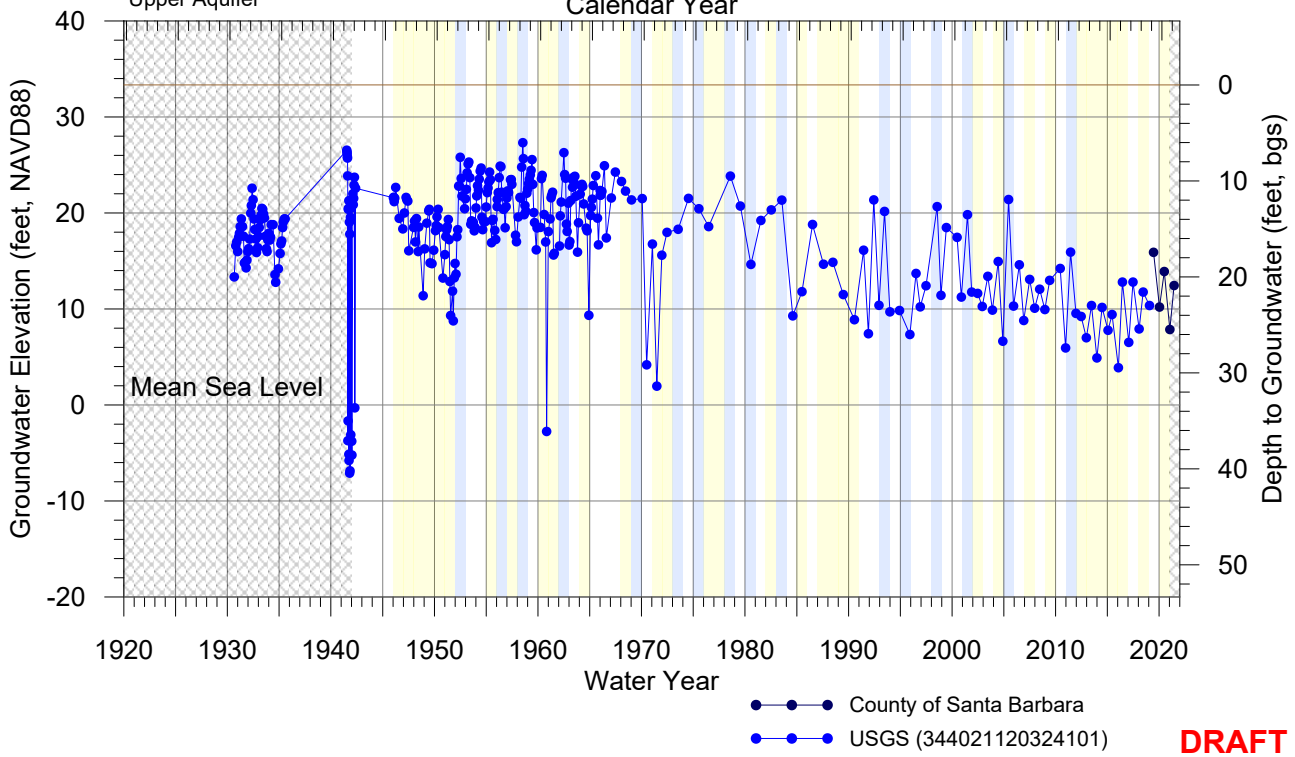
FIGURE 2b.1-4A



Western Lompoc Plain
Upper Aquifer

7N/35W-22J1
Calendar Year

FIGURE 2b.1-4B



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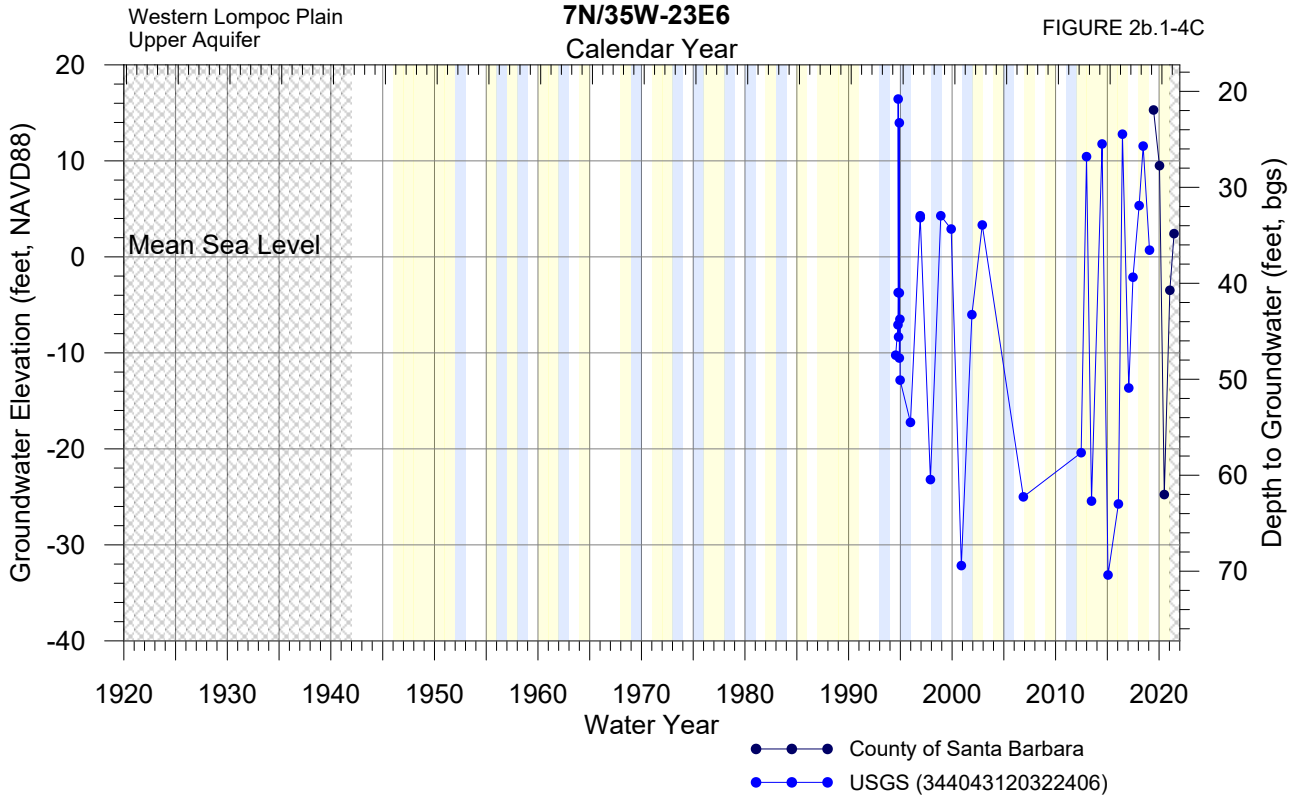
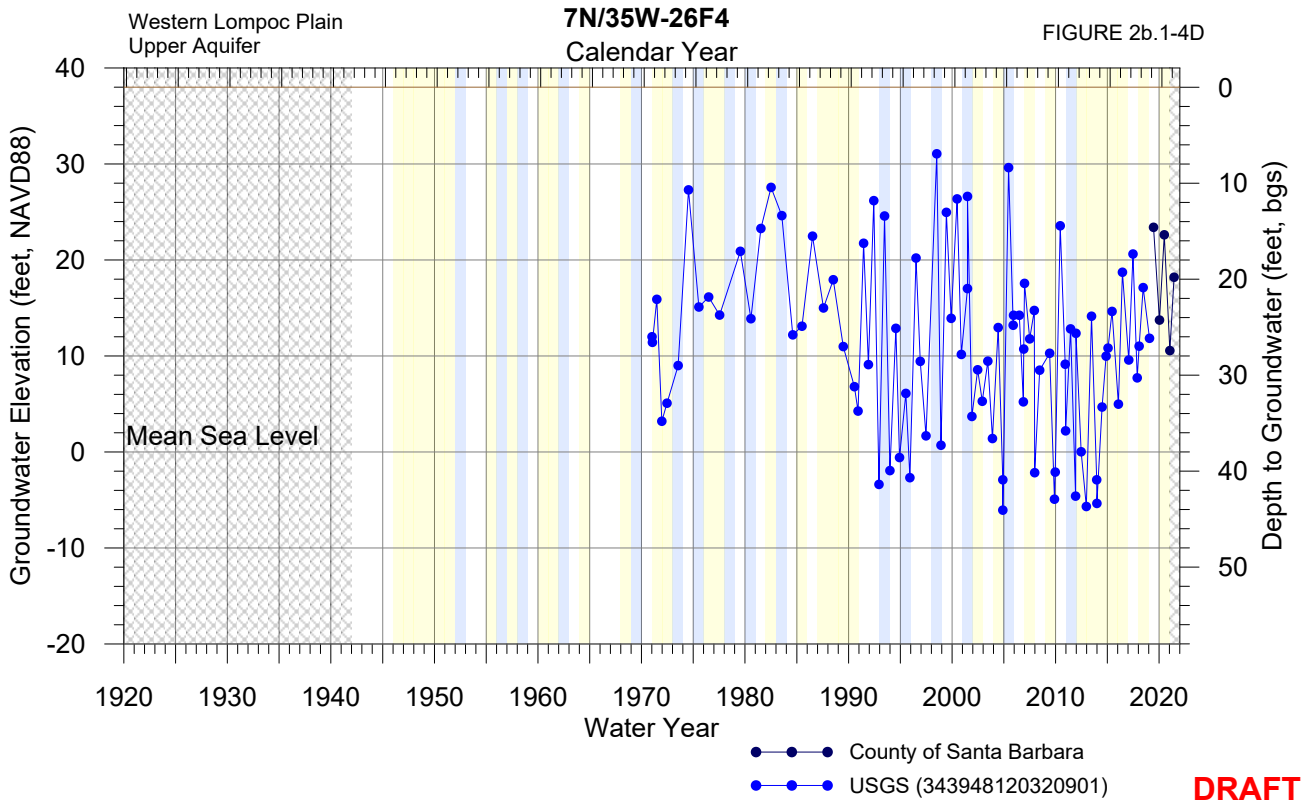
SELECTED HYDROGRAPHS
LOMPOC PLAIN

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-04AB Lompoc Plain 17M1 22J1.grf 6/28/2021 M. McCammon





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Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC PLAIN

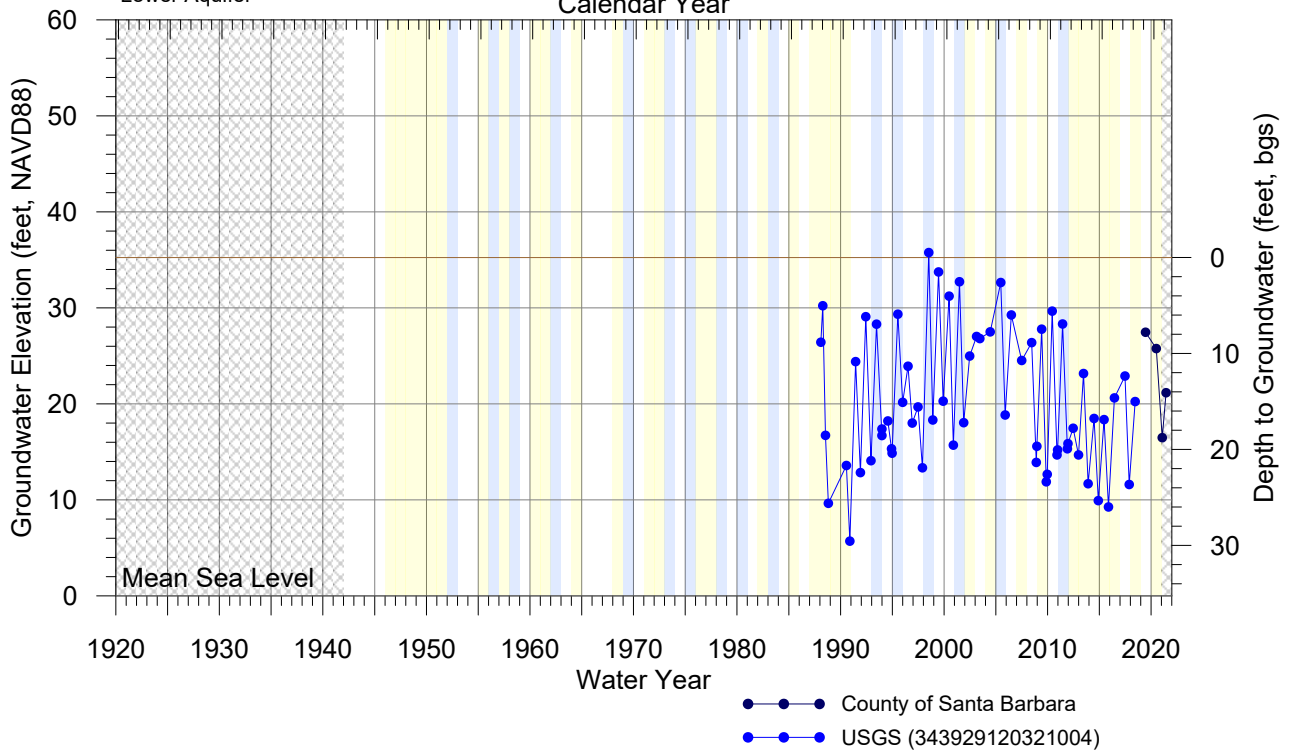
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-04CD Lompoc Plain GWE 23E6 26F4.grf 6/28/2021 M. McCammon

Central Lompoc Plain
Lower Aquifer

7N/35W-26L4
Calendar Year

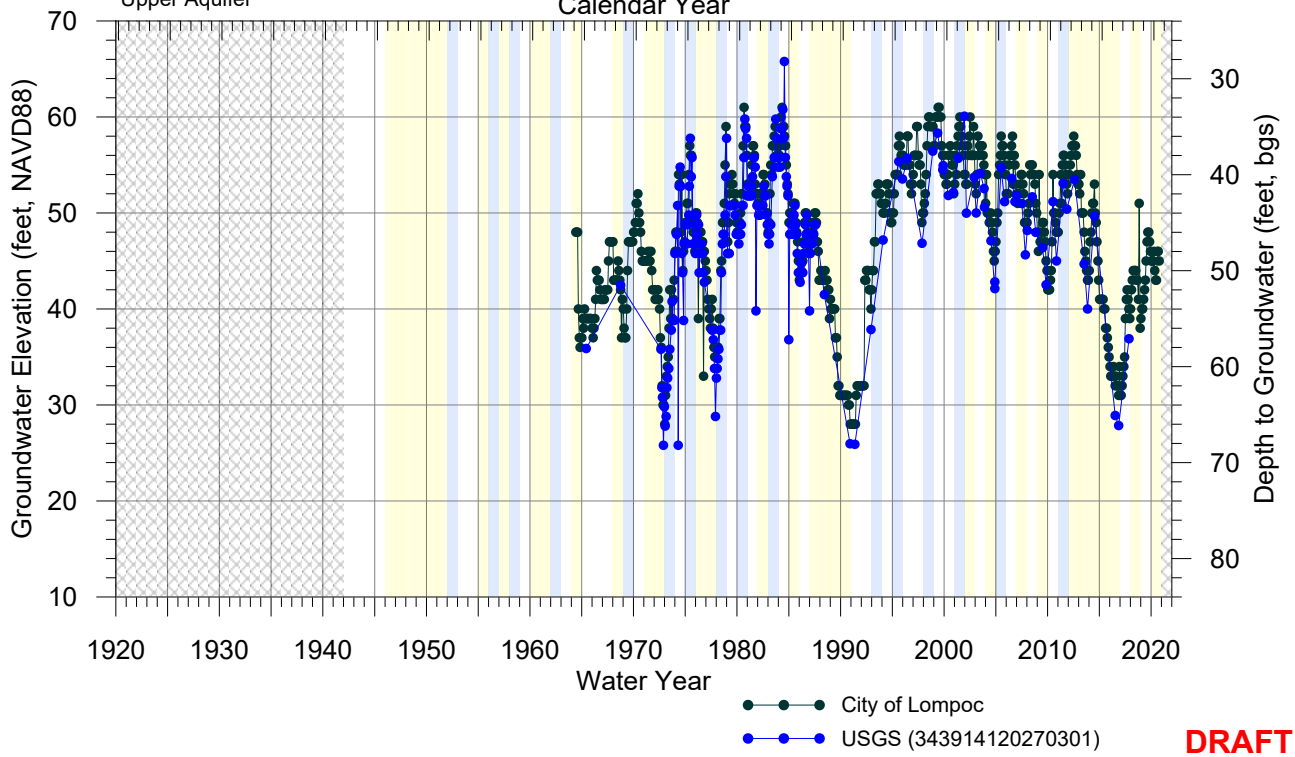
FIGURE 2b.1-4E



Eastern Lompoc Plain
Upper Aquifer

Lompoc 4 [7N/34W-27P5]
Calendar Year

FIGURE 2b.1-4F



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

SELECTED HYDROGRAPHS
LOMPOC PLAIN

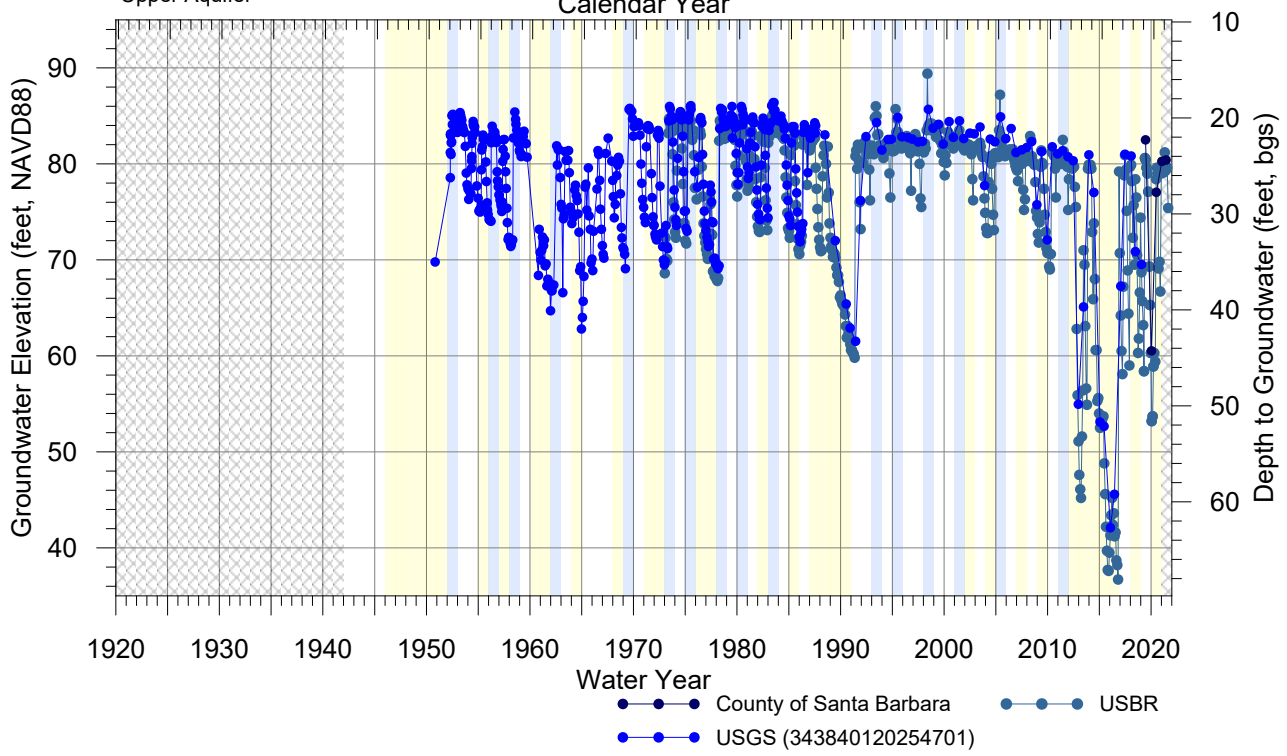
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_SelectedWMA\Fig 2b.1-04EF Lompoc Plain GWE.grf 6/28/2021 M. McCammon

Eastern Lompoc Plain
Upper Aquifer

7N/34W-35K9
Calendar Year

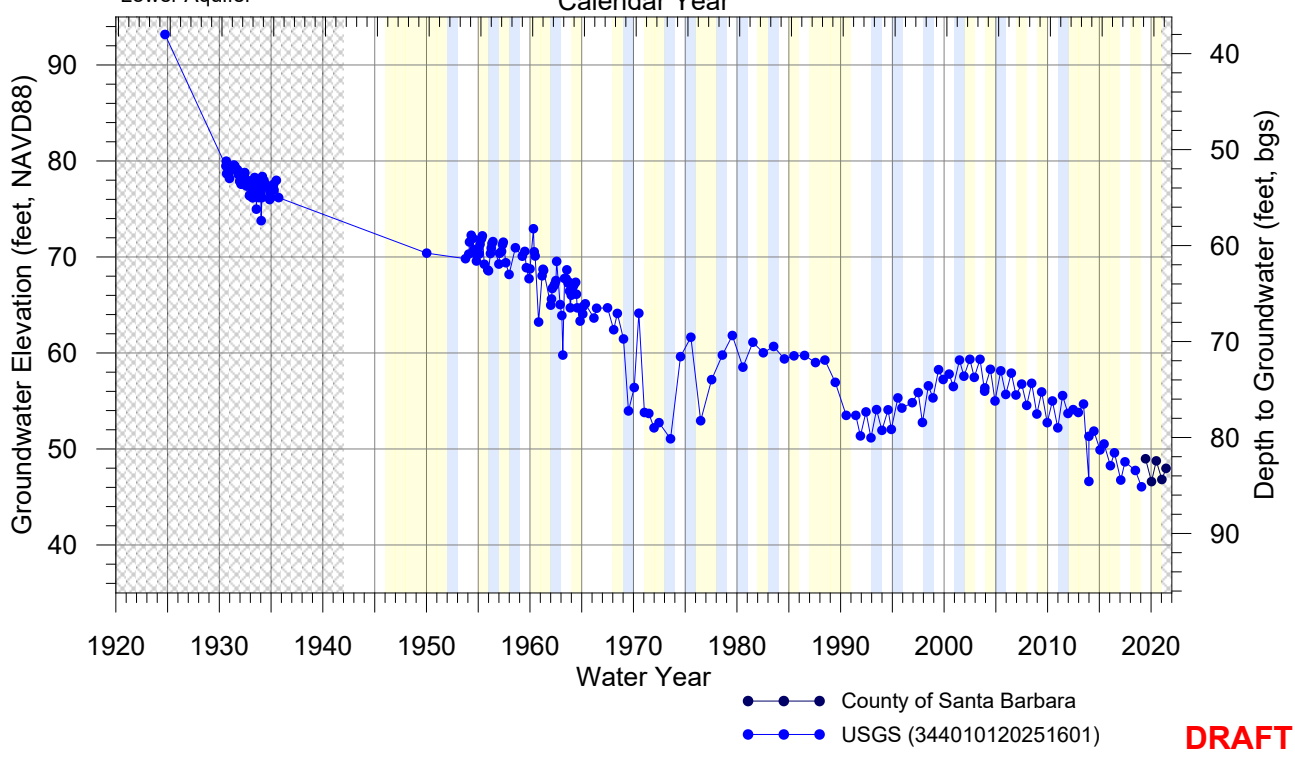
FIGURE 2b.1-4G



Eastern Lompoc Plain
Lower Aquifer

7N/34W-24N1
Calendar Year

FIGURE 2b.1-4H



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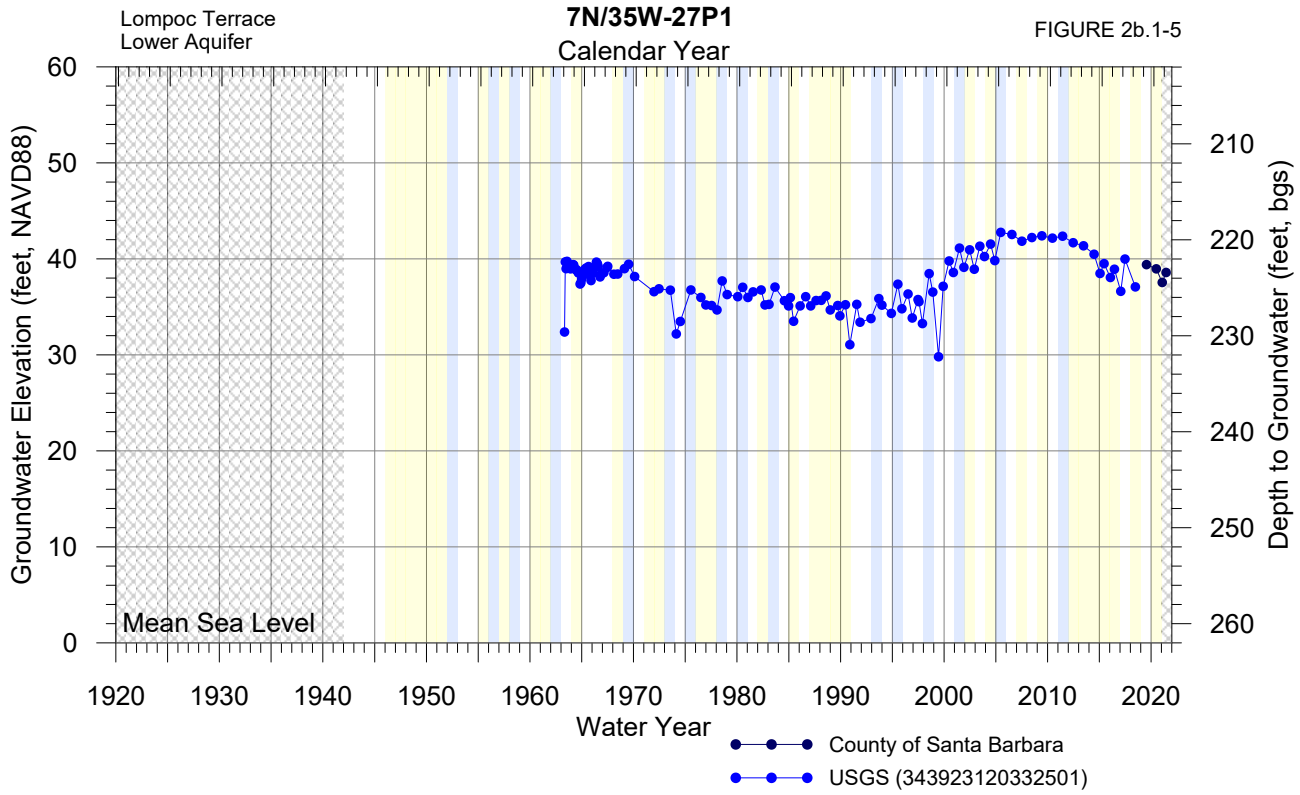
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC PLAIN

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_SelectedWMA\Fig 2b.1-04GH Lompoc Plain GWE.grf 6/28/2021 M. McCammon



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Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPH
LOMPOC TERRACE

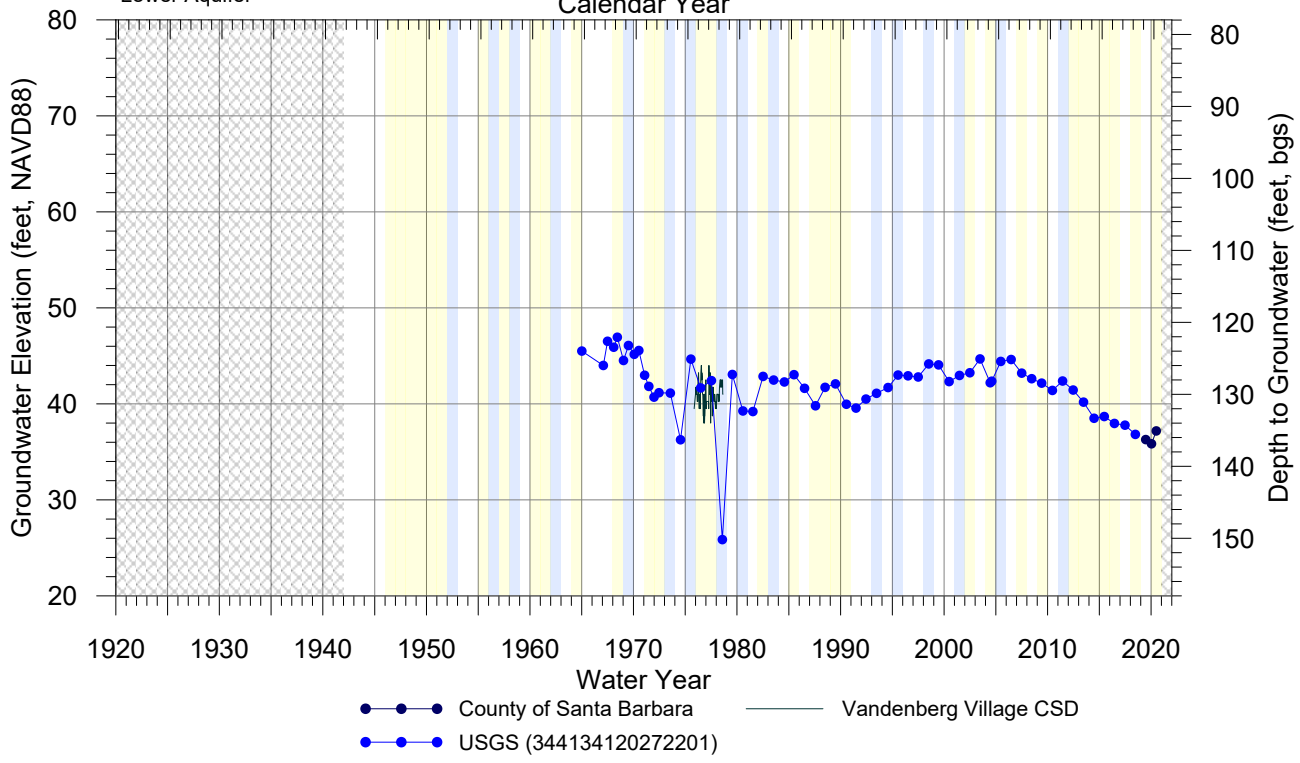
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-05 Lompoc Terrace GWE.grf 6/28/2021 M. McCammon

Western Lompoc Upland
Lower Aquifer

VVCSD 3 [7N/34W-15E1]
Calendar Year

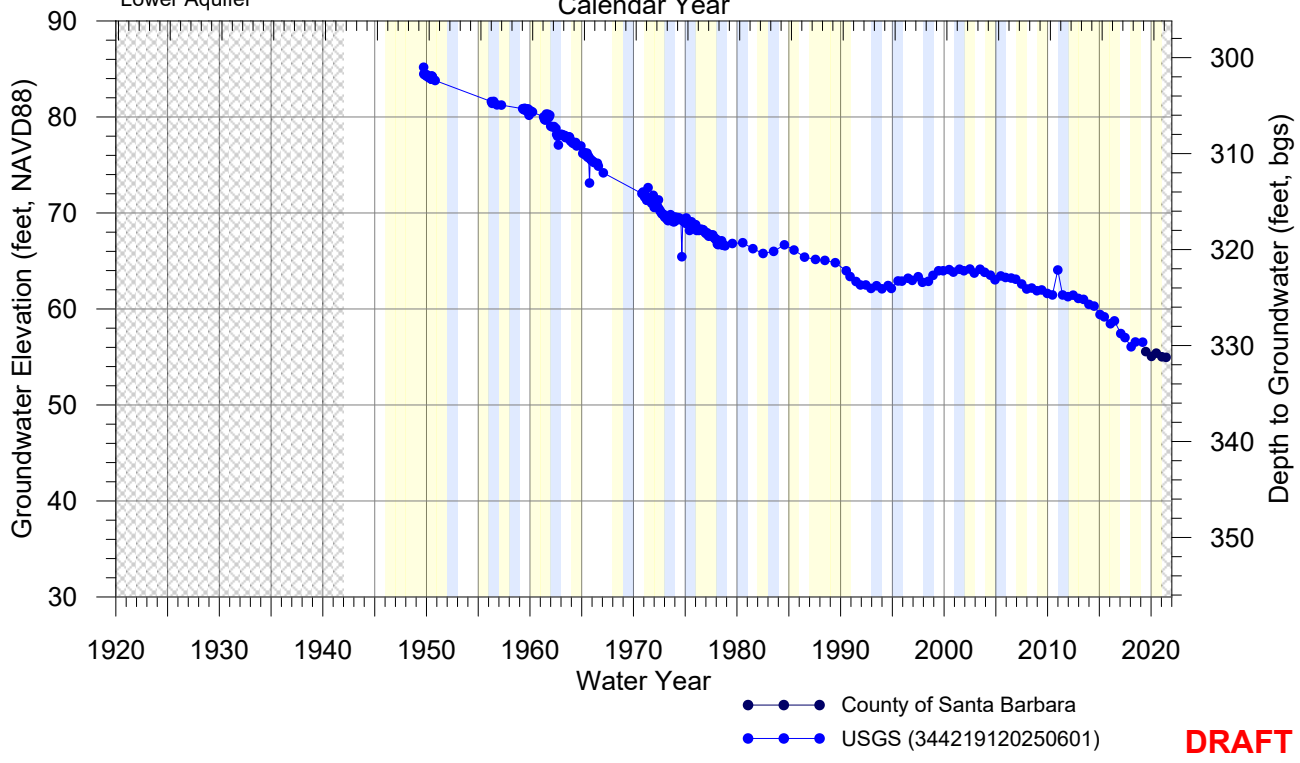
FIGURE 2b.1-6A



Eastern Lompoc Upland
Lower Aquifer

7N/34W-12E1
Calendar Year

FIGURE 2b.1-6B



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Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
LOMPOC UPLAND

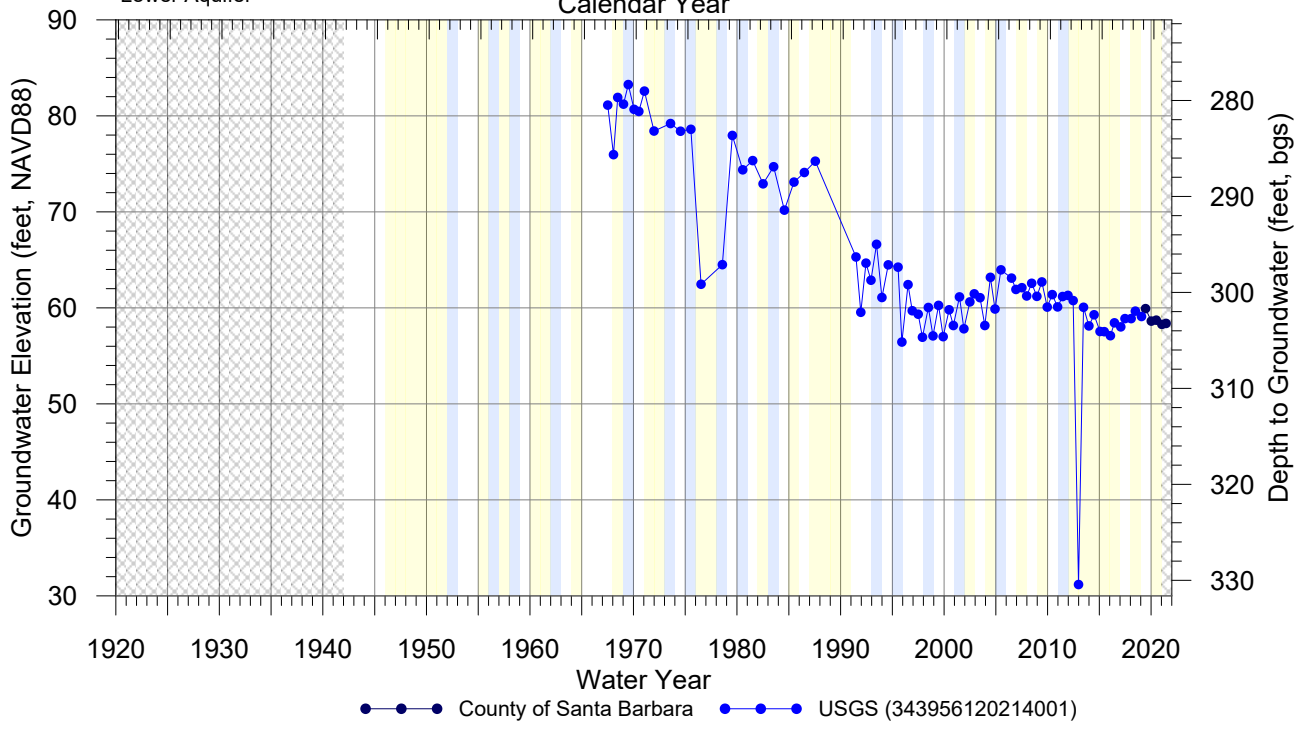
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_SelectedWMA\Fig 2b.1-06 Lompoc Upland GWE.grf 6/28/2021 M. McCammon

Santa Rita Upland
Lower Aquifer

7N/33W-21N1
Calendar Year

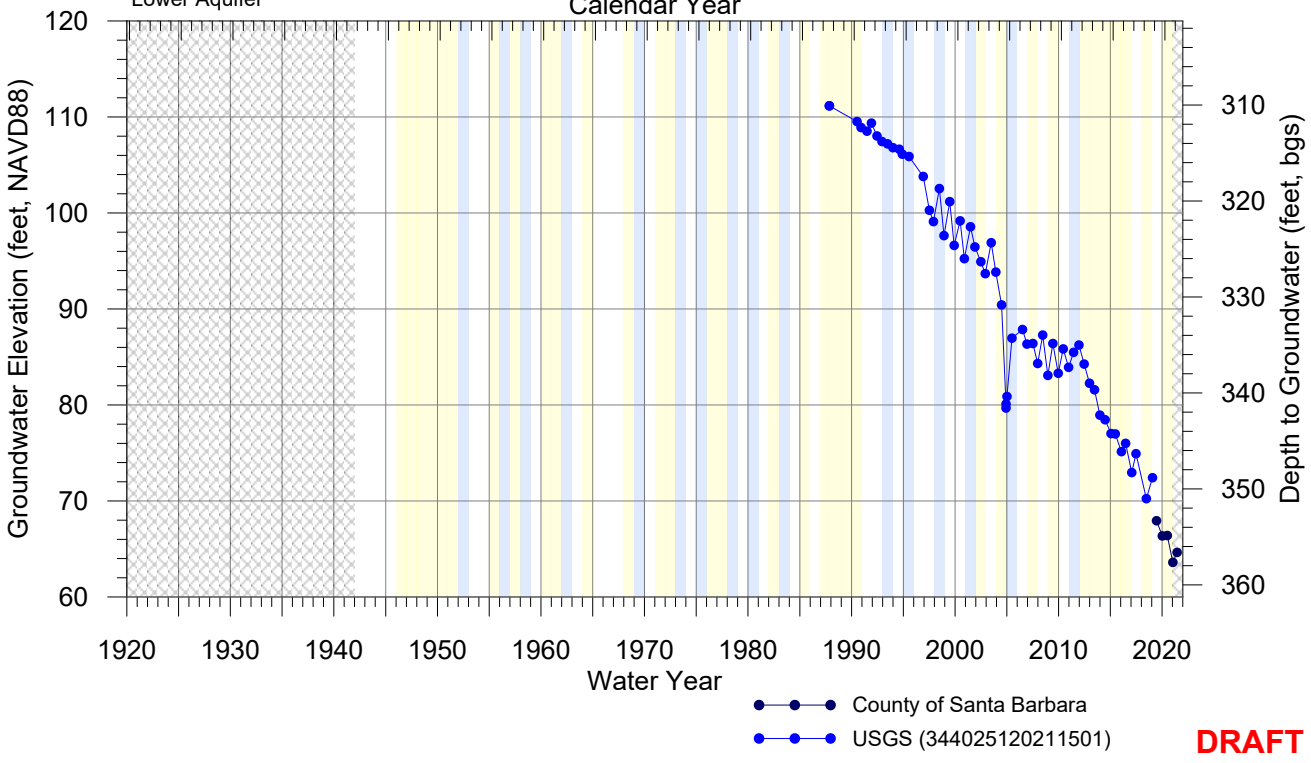
FIGURE 2b.1-7A



Santa Rita Upland
Lower Aquifer

7N/33W-21G2
Calendar Year

FIGURE 2b.1-7B



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Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA RITA UPLAND

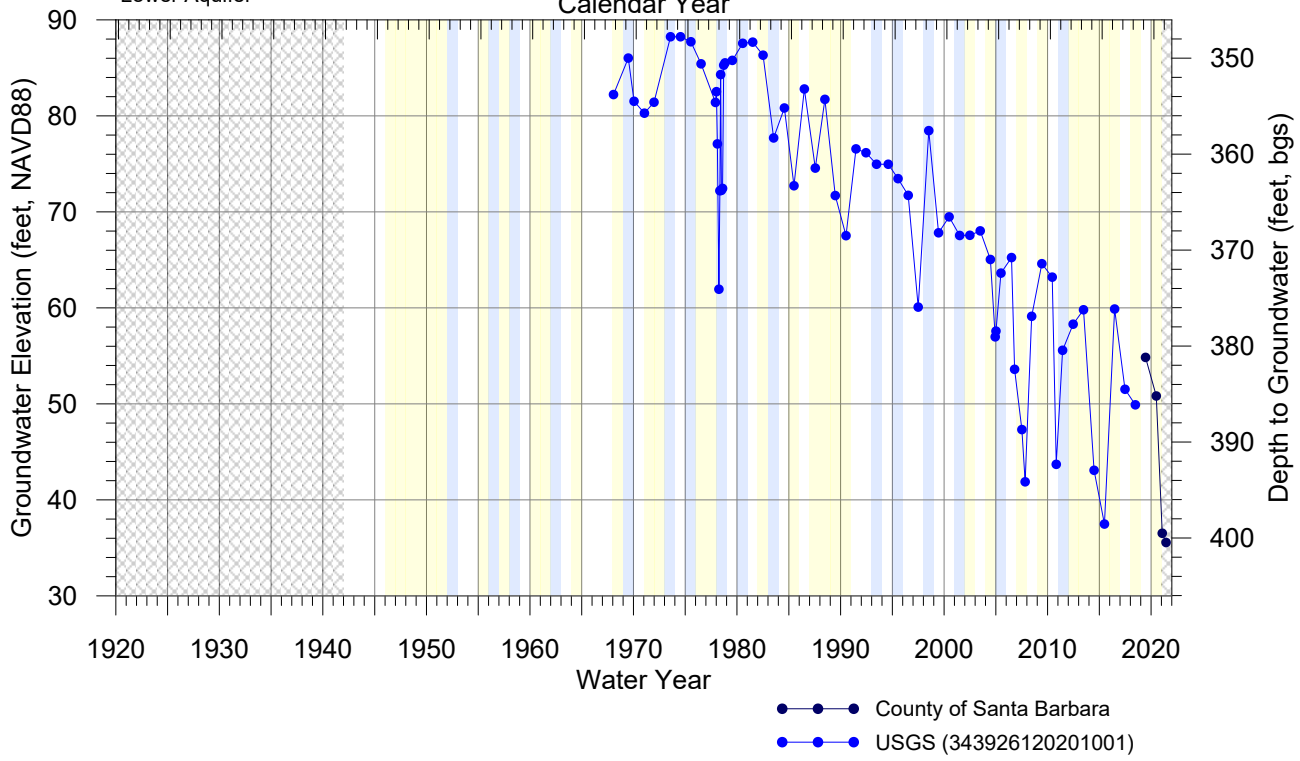
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-07AB Santa Rita Upland GWE.grf 6/28/2021 M. McCammon

Santa Rita Upland
Lower Aquifer

7N/33W-27G1
Calendar Year

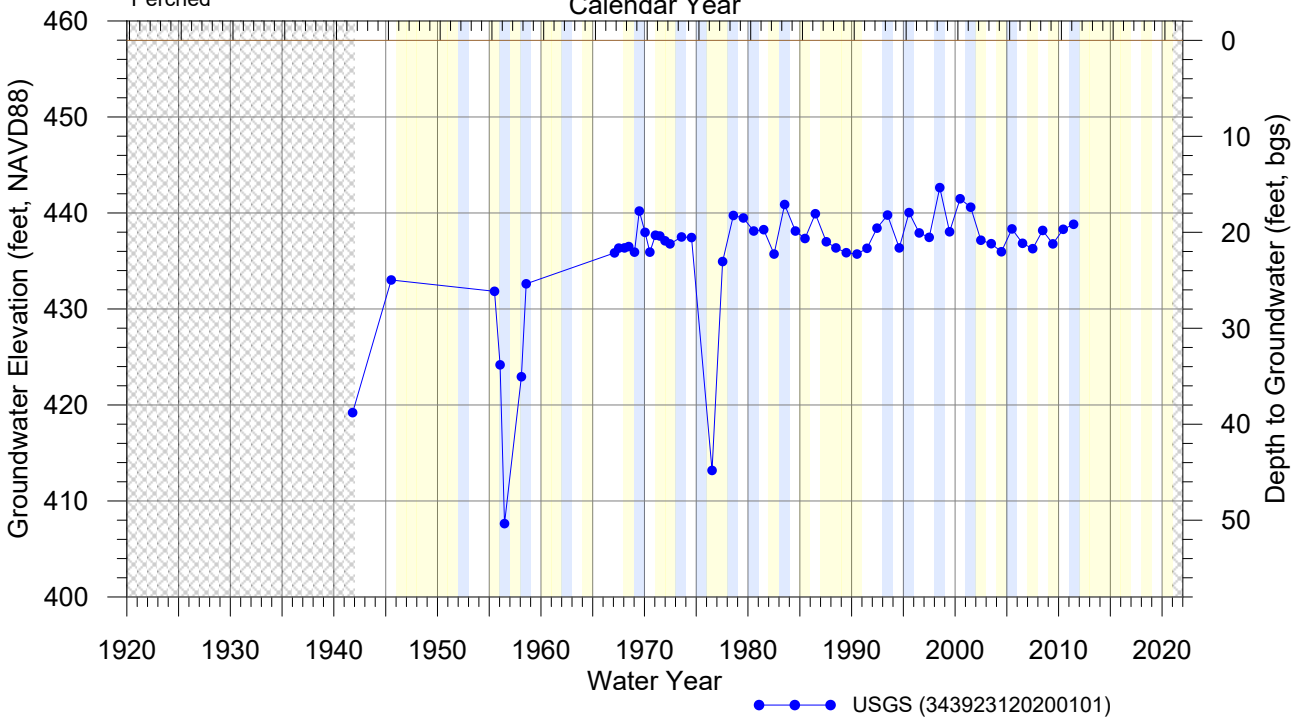
FIGURE 2b.1-7C



Santa Rita Upland
Perched

7N/33W-27J1
Calendar Year

FIGURE 2b.1-7D



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8/27/2021

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WMA
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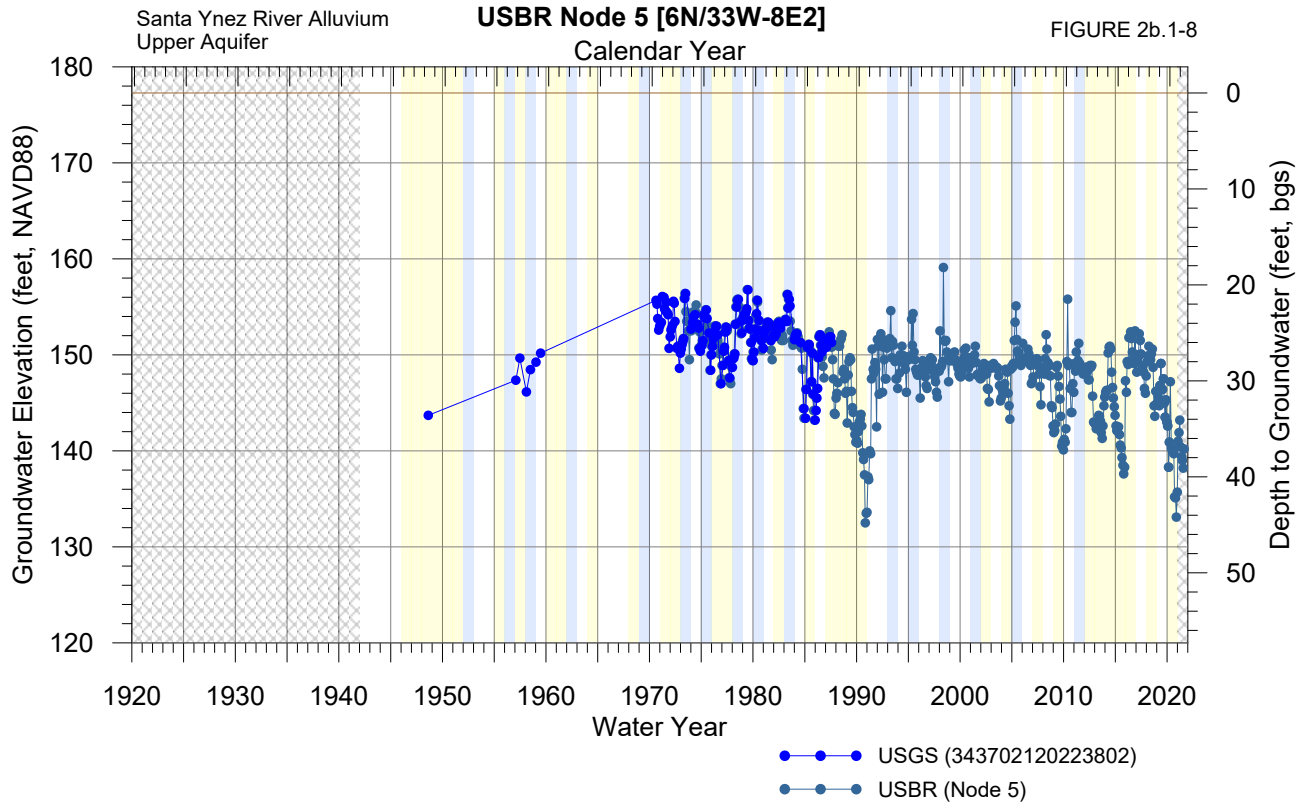
Western Management Area
Groundwater Sustainability Agency

SELECTED HYDROGRAPHS
SANTA RITA UPLAND

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-07CD Santa Rita Upland GWE.grf 8/27/2021 M. McCammon



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6/28/2021

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Western Management Area
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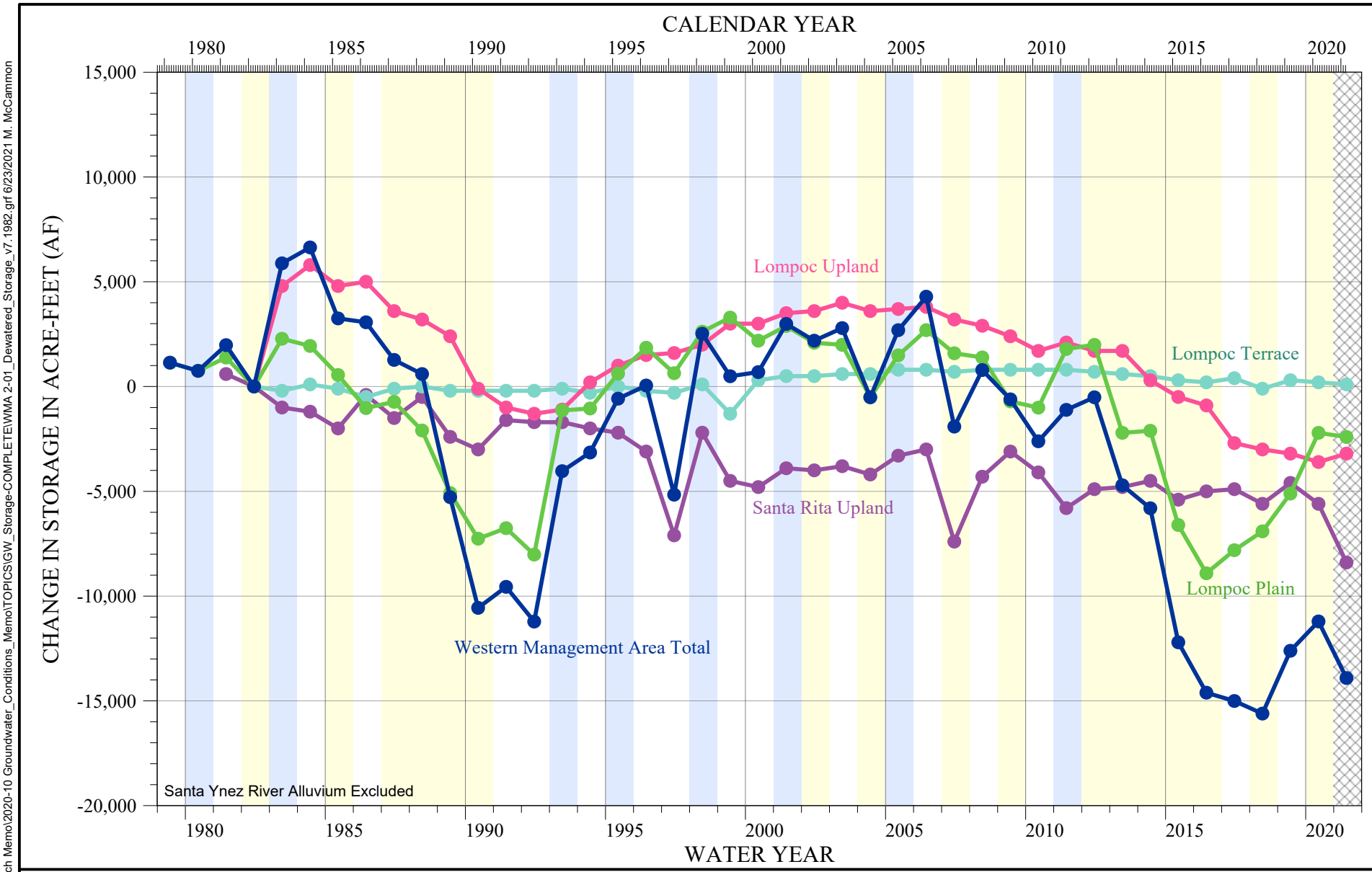
SELECTED HYDROGRAPH
SANTA YNEZ RIVER ALLUVIUM

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Elevation-COMPLETE\GWE_Selected\WMA\Fig 2b.1-08 Santa Ynez Alluvium GWE.grf 6/28/2021 M. McCammon



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CUMULATIVE CHANGE IN GROUNDWATER STORAGE BY SUBAREA, RELATIVE TO MARCH 1982

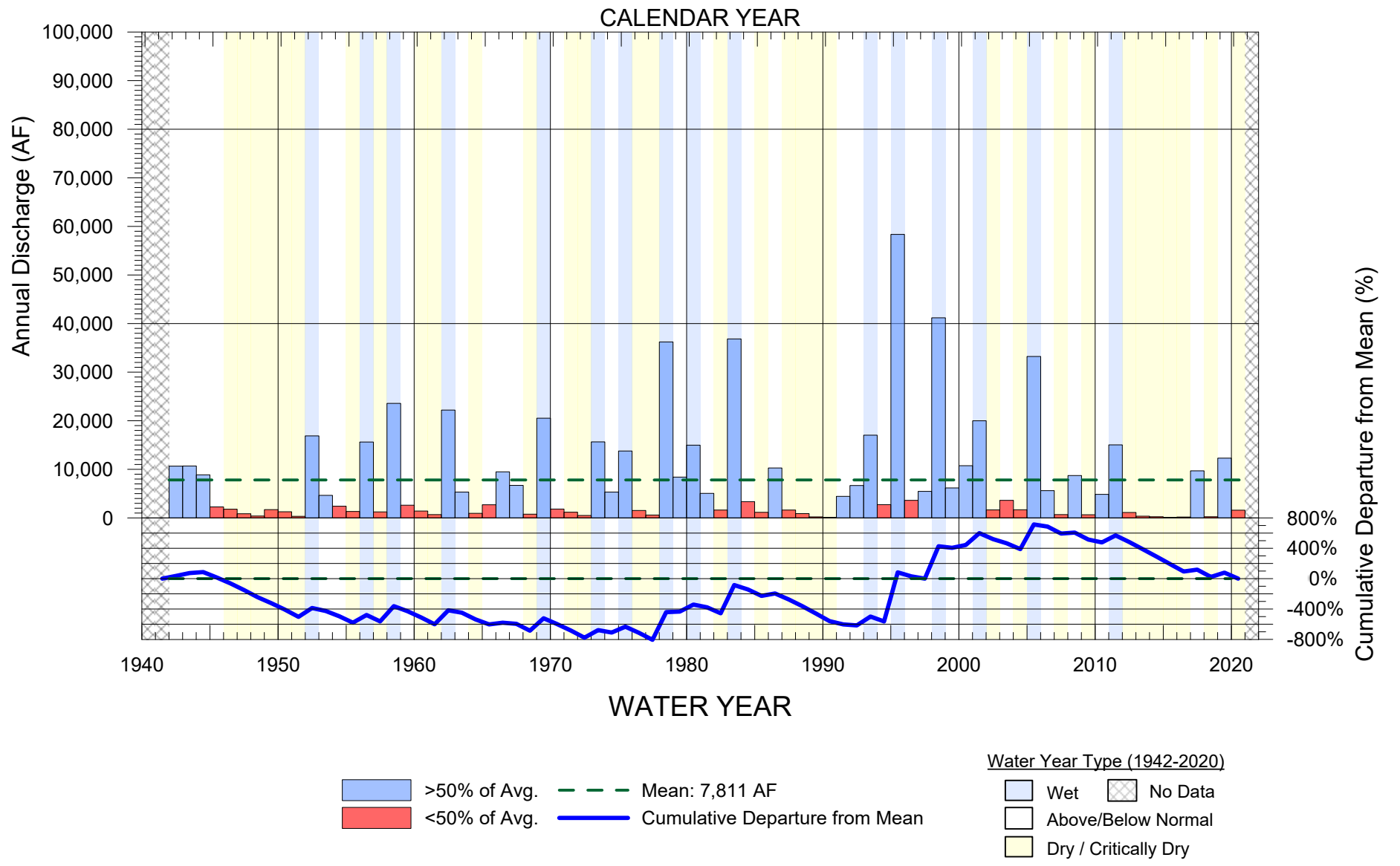
DRAFT
6/23/2021

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Storage-COMPLETE\WMA 2-01_Dewatered_Storage_v7.1982.grf 6/23/2021 M. McCammon



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

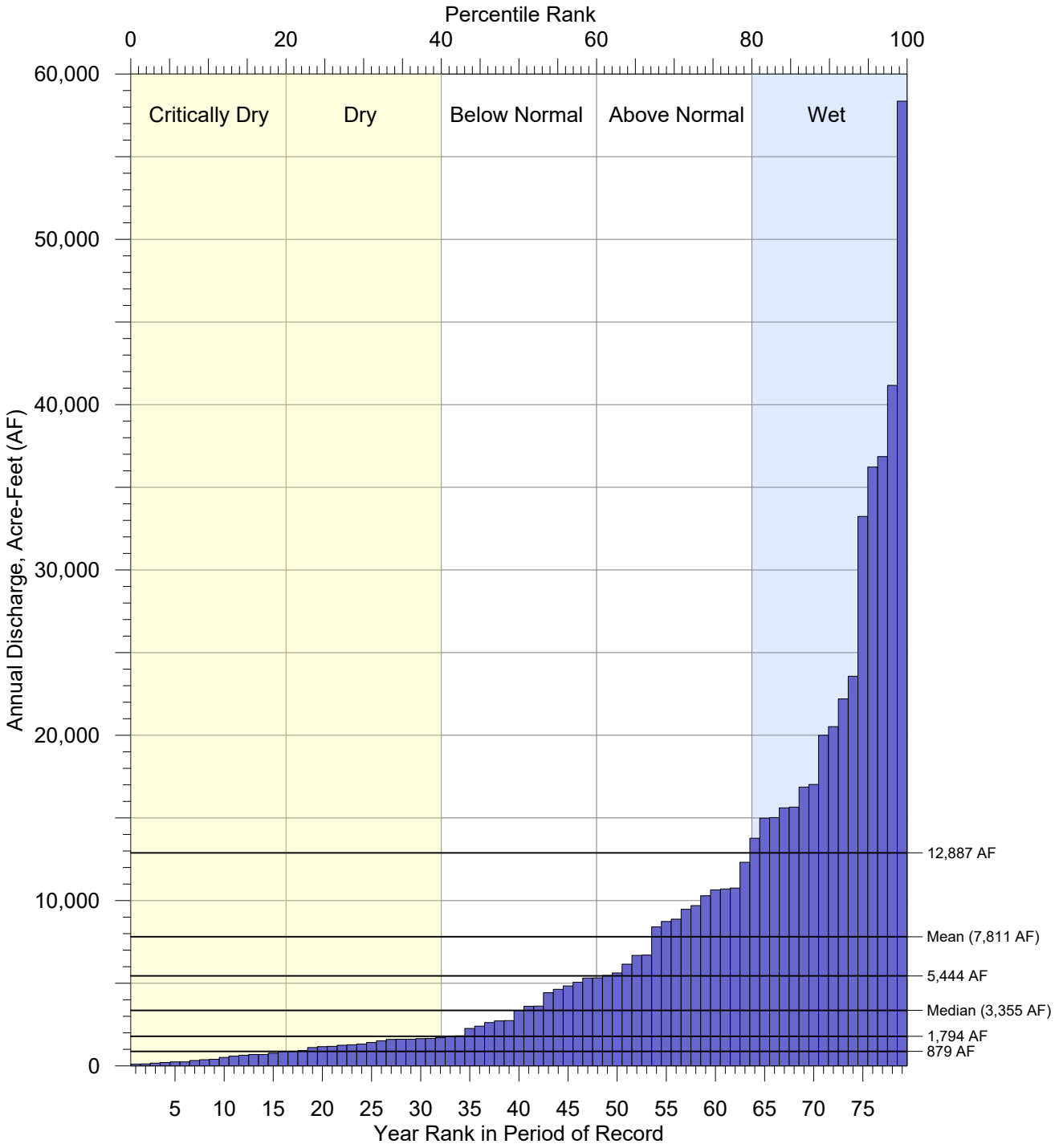
DRAFT
7/20/2021

Sources: USGS (2020) streamflow data

FIGURE 2b.2-2

I:\DATA\2710\Analyses\2020-11 SW Flow Statistics\Salispuedes_CDM.grf 7/20/2021 M. McCammon

SANTA YNEZ RIVER ANNUAL FLOWS
11132500 SALSIPUEDES CREEK NEAR LOMPOC
PERIOD OF RECORD (WY 1942 - 2020)



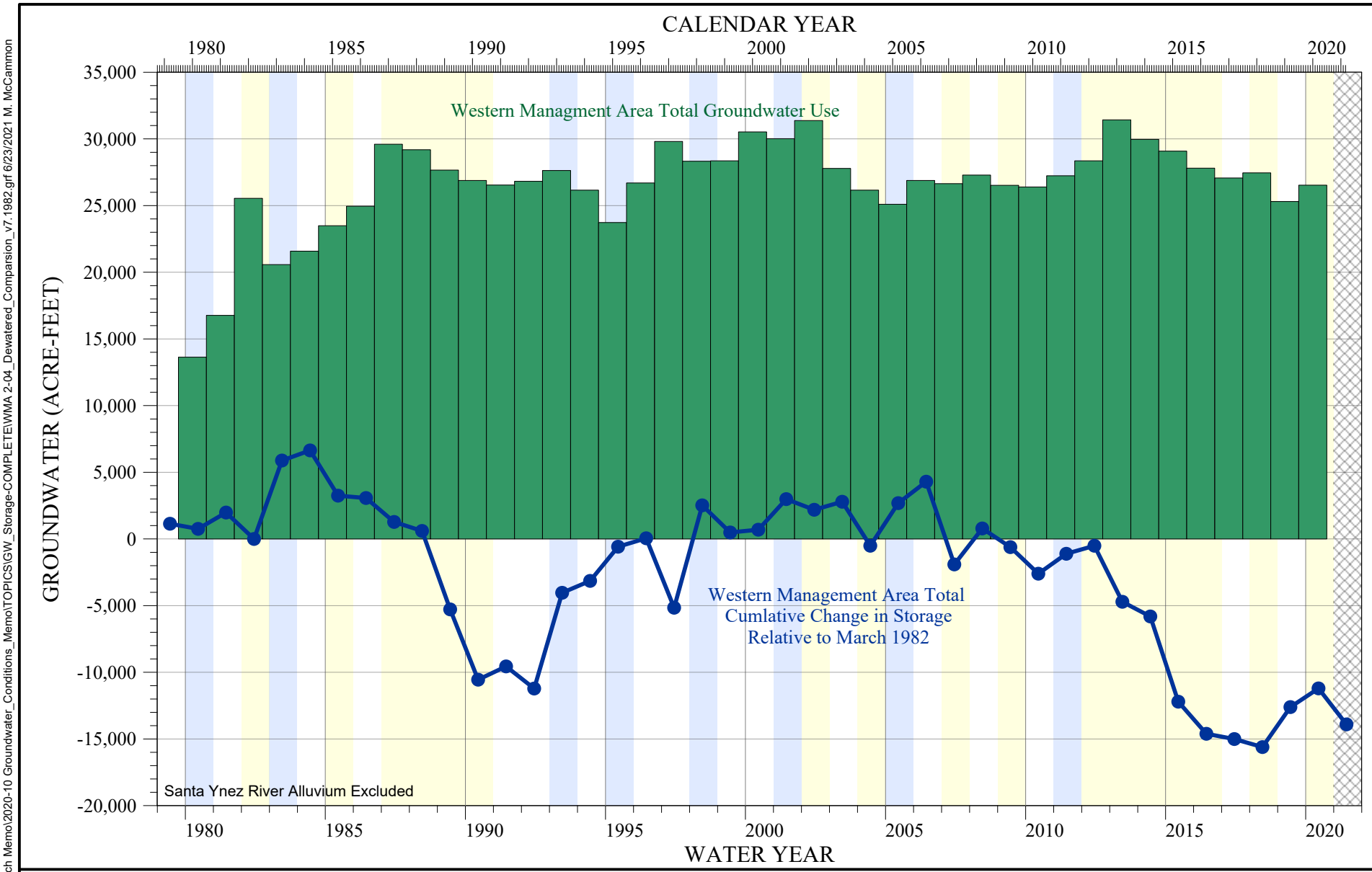
Data Source: USGS (2020) streamflow data

STETSON ENGINEERS INC.

WATER YEAR TYPE
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

DRAFT
7/20/2021

I:\DATA\2710\Analyses\2020-11 SW Flow Statistics\Salispuedes_Year_type.grf 7/20/2021 M. McCammon



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Groundwater Sustainability Agency

CHANGE IN STORAGE AND USE

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6/23/2021

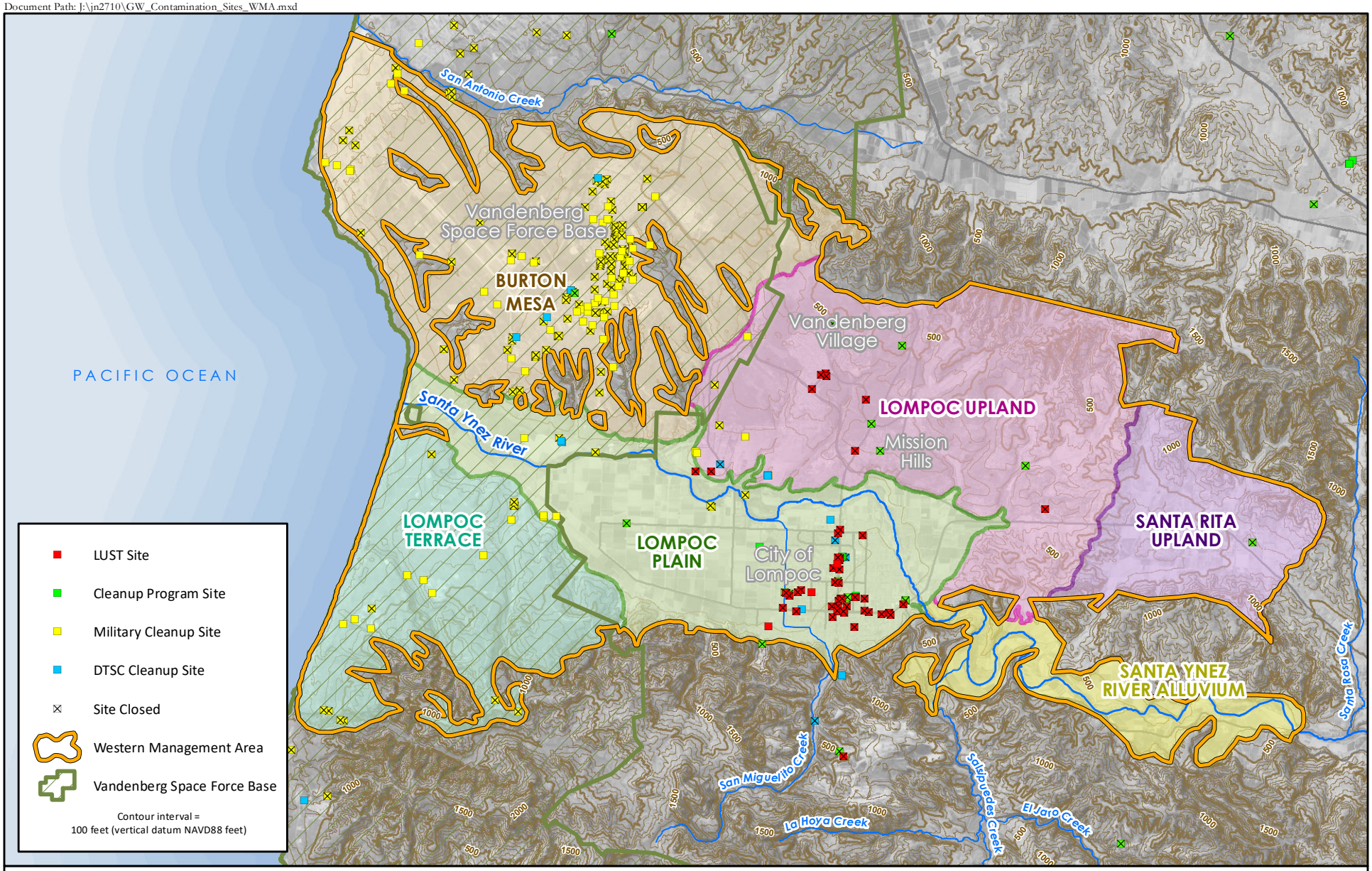
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry
- No Data

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

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\GW_Storage-COMPLETE\WMA 2-04_Dewatered_Comparsion_v7.1982.grf 6/23/2021 M. McCammon

Document Path: J:\jn2710\GW_Contamination_Sites_WMA.mxd



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Groundwater Sustainability Agency

LOCATION OF POTENTIAL POINT SOURCES OF GROUNDWATER CONTAMINANTS
WESTERN MANAGEMENT AREA

DRAFT

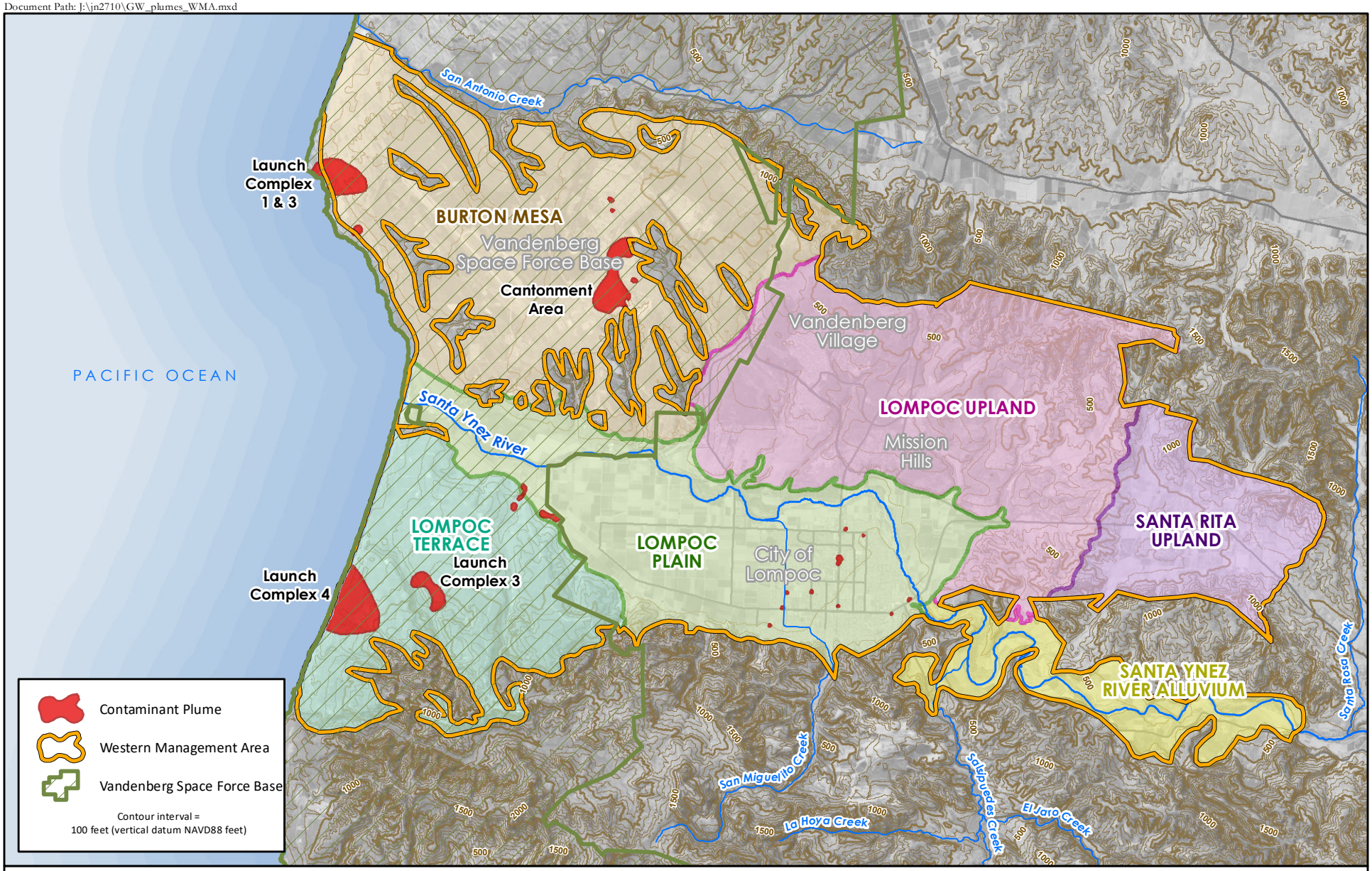
0 1 2 Miles

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

N

FIGURE 2b.3-1

Document Path: J:\jn2710\GW_plumes_WMA.mxd



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GROUNDWATER PLUMES
WESTERN MANAGEMENT AREA

DRAFT

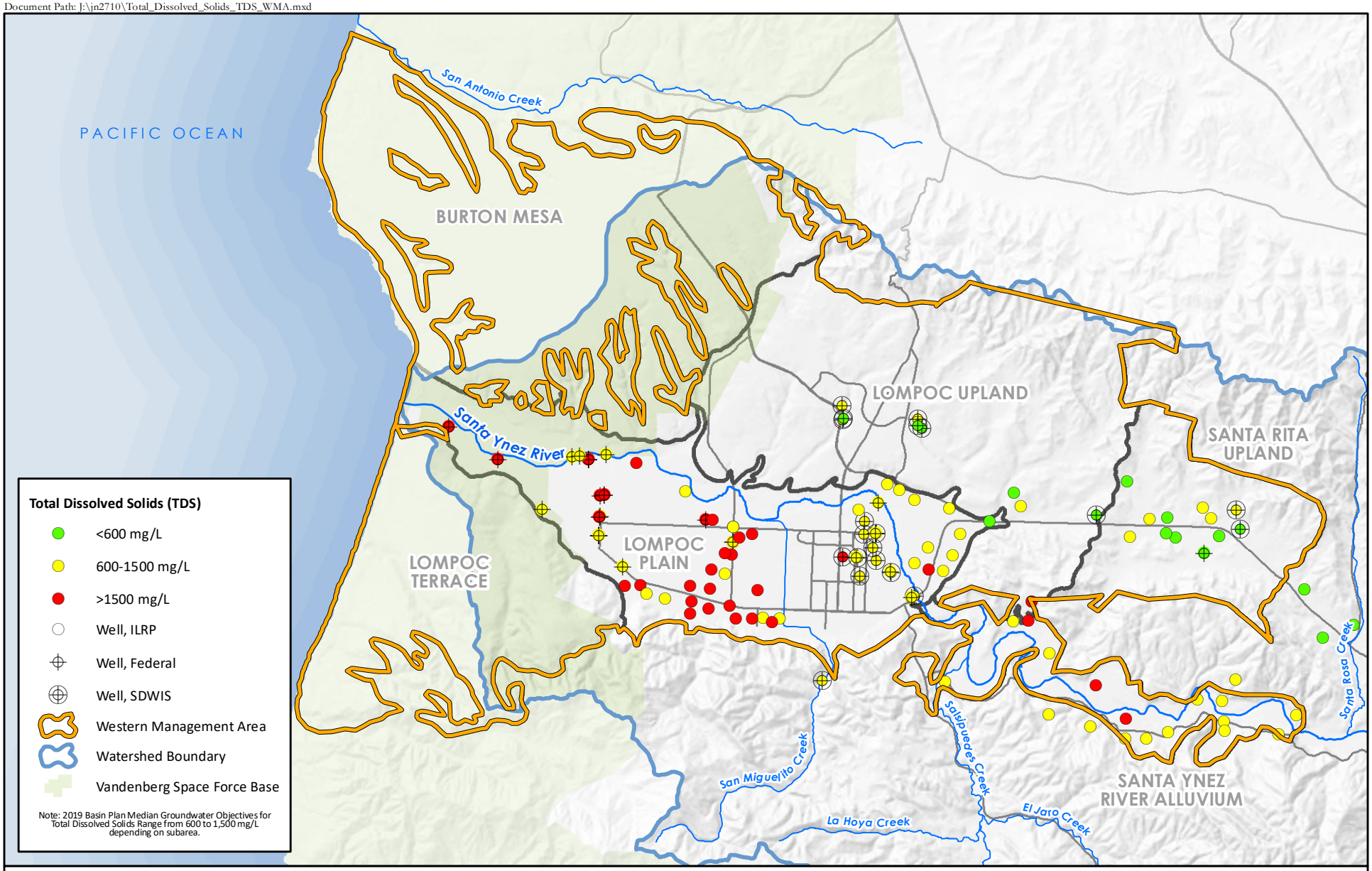
0 1 2 Miles

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

N

FIGURE 2b.3-2

Document Path: J:\jn2710\Total_Dissolved_Solids_TDS_WMA.mxd



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

DRAFT

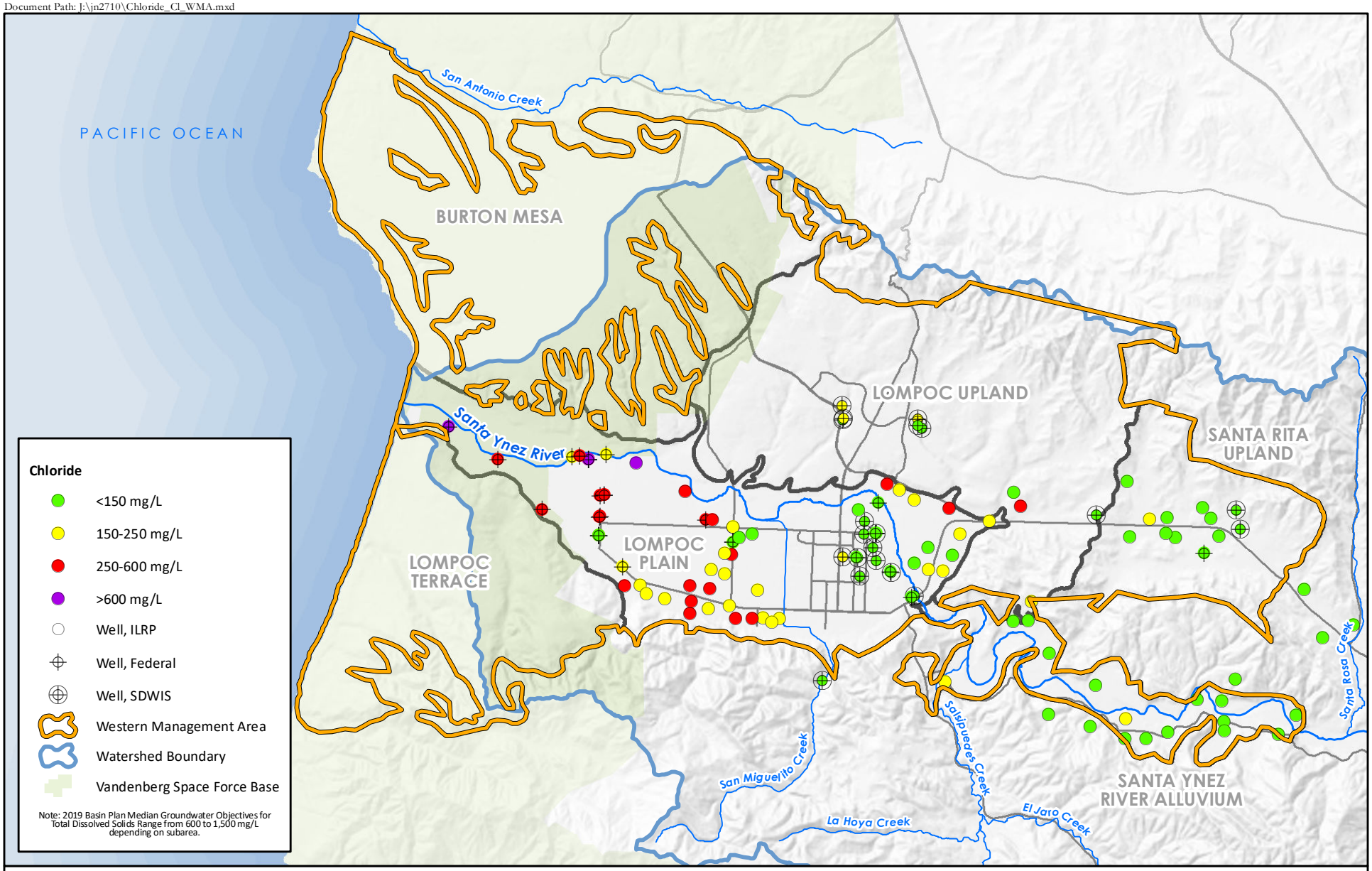
0 1 2 Miles

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

Document Path: J:\jn2710\Chloride_Cl_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

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

DRAFT

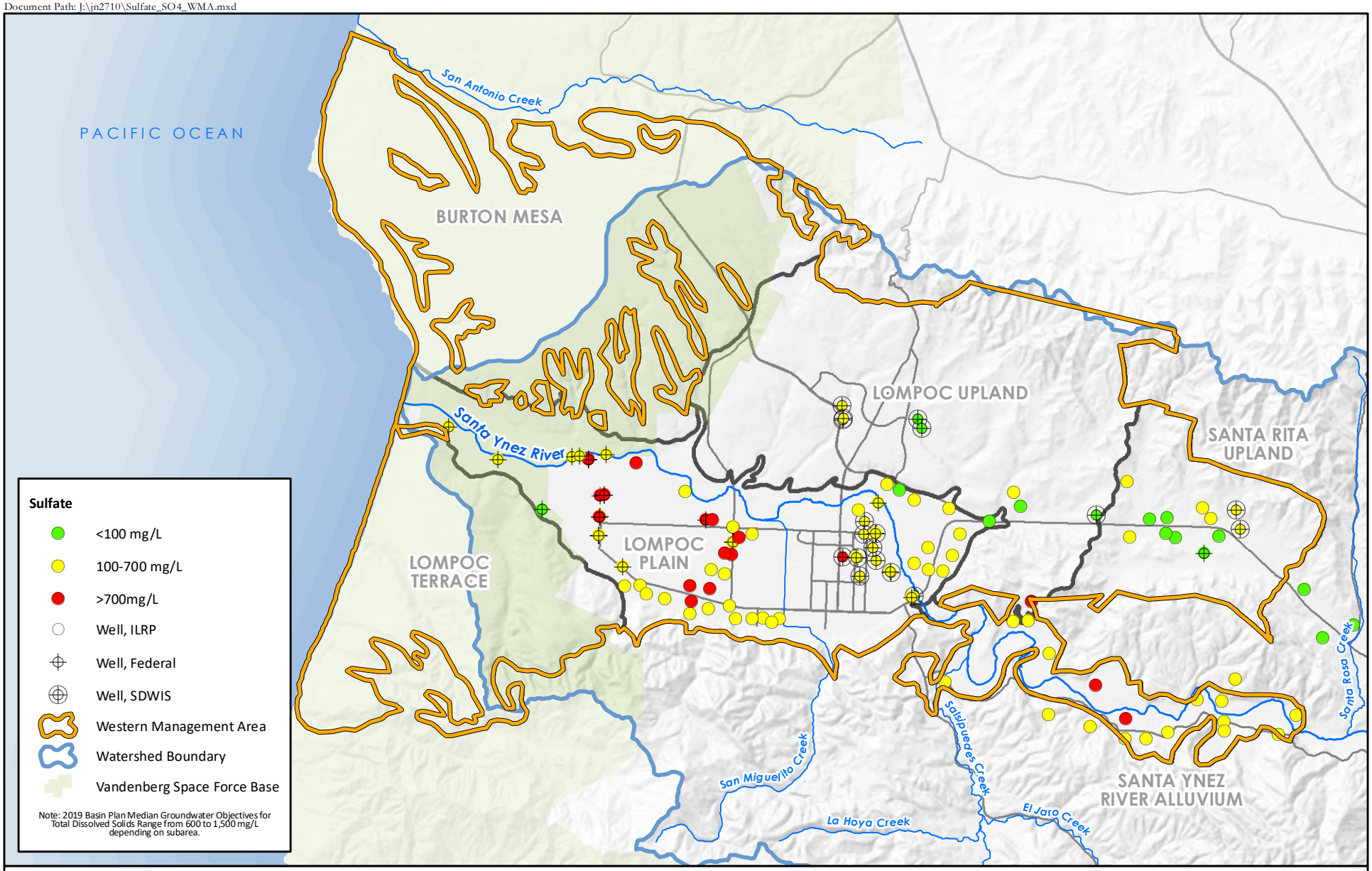
0 1 2 Miles

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

Document Path: J:\jn2710\Sulfate_SO4_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

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

DRAFT

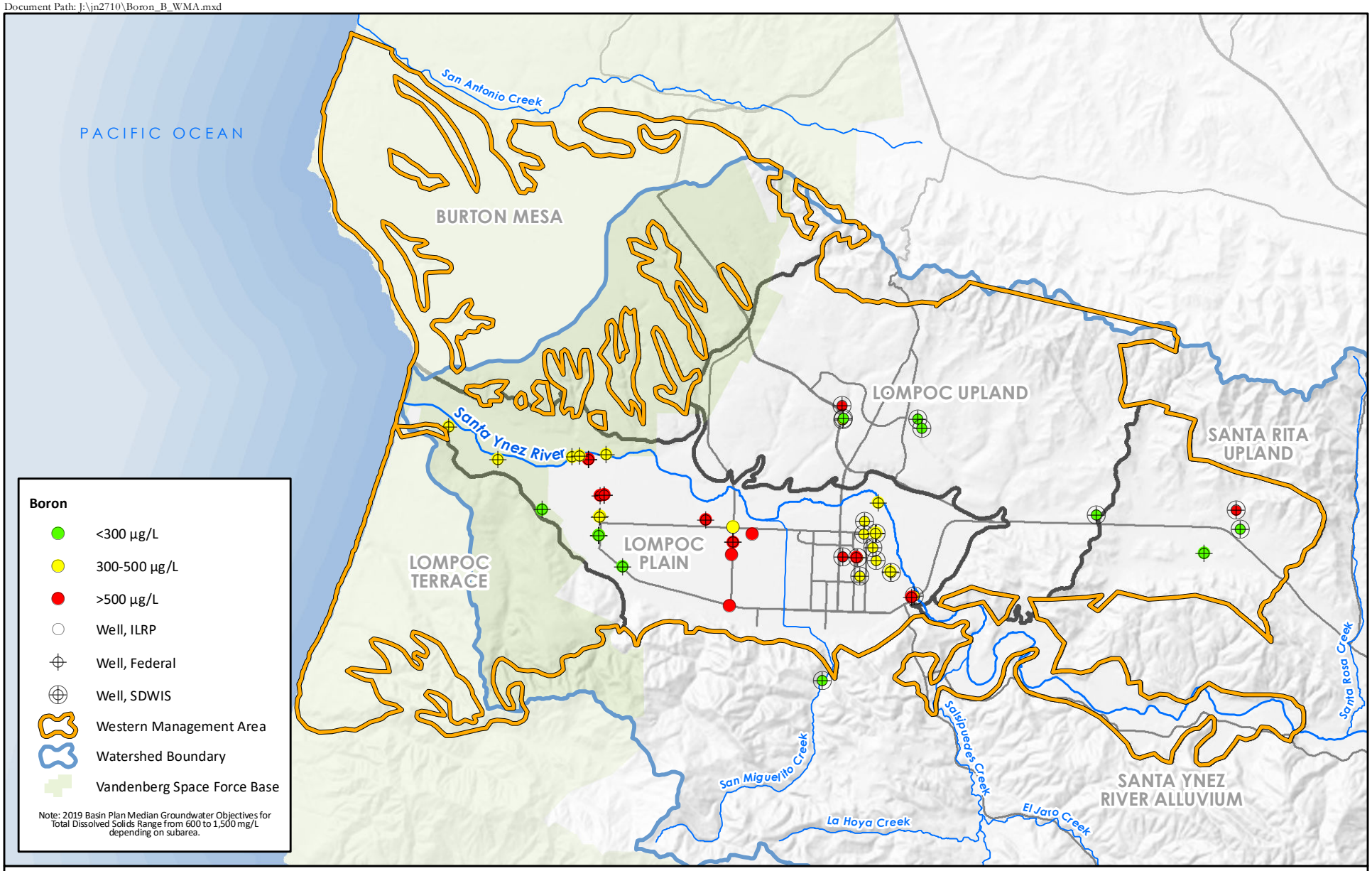
0 1 2 Miles

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

Document Path: J:\jn2710\Boron_B_WMA.mxd



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

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

DRAFT

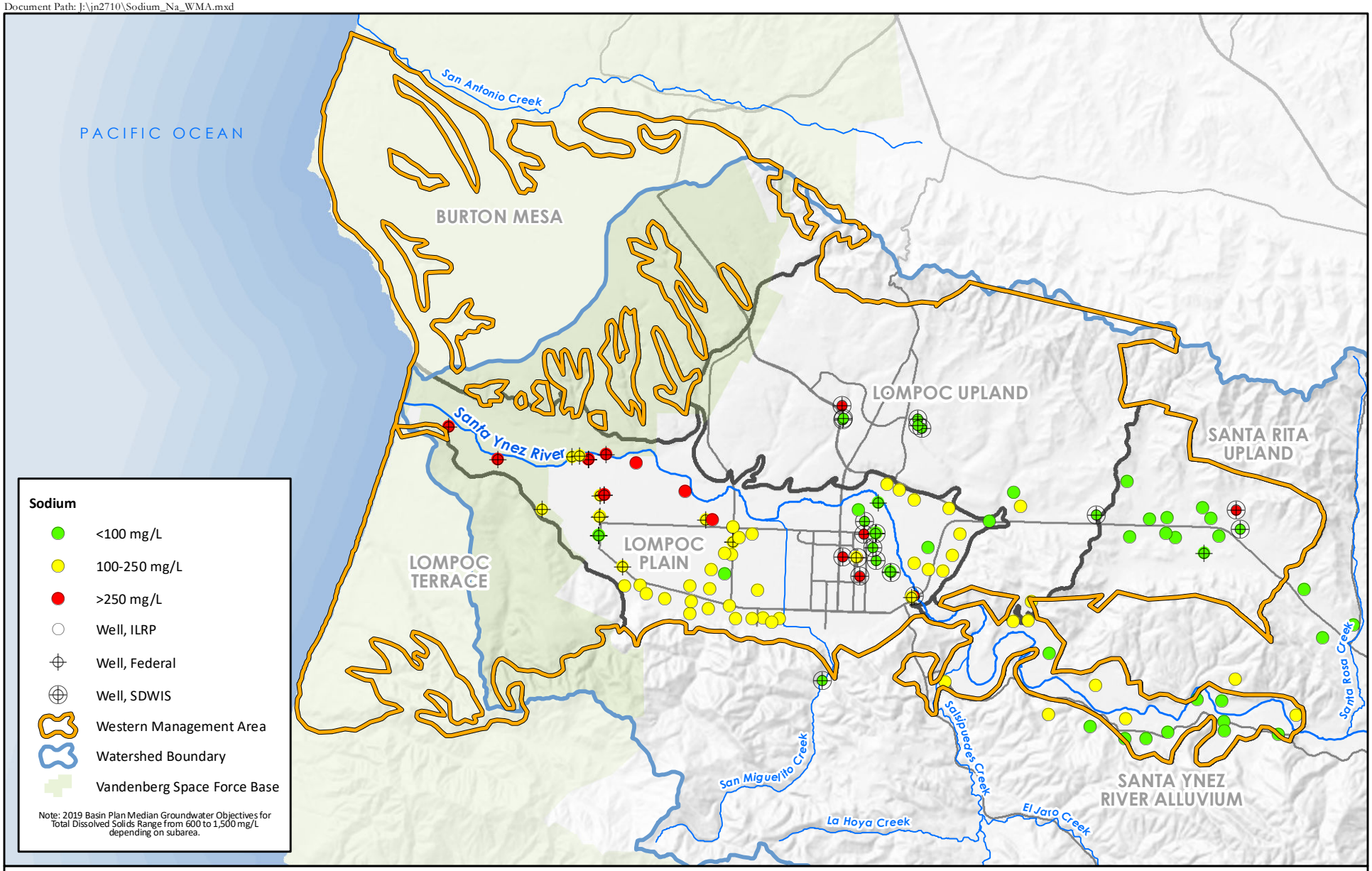
0 1 2 Miles

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

Document Path: J:\jn2710\Sodium_Na_WMA.mxd



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

DRAFT

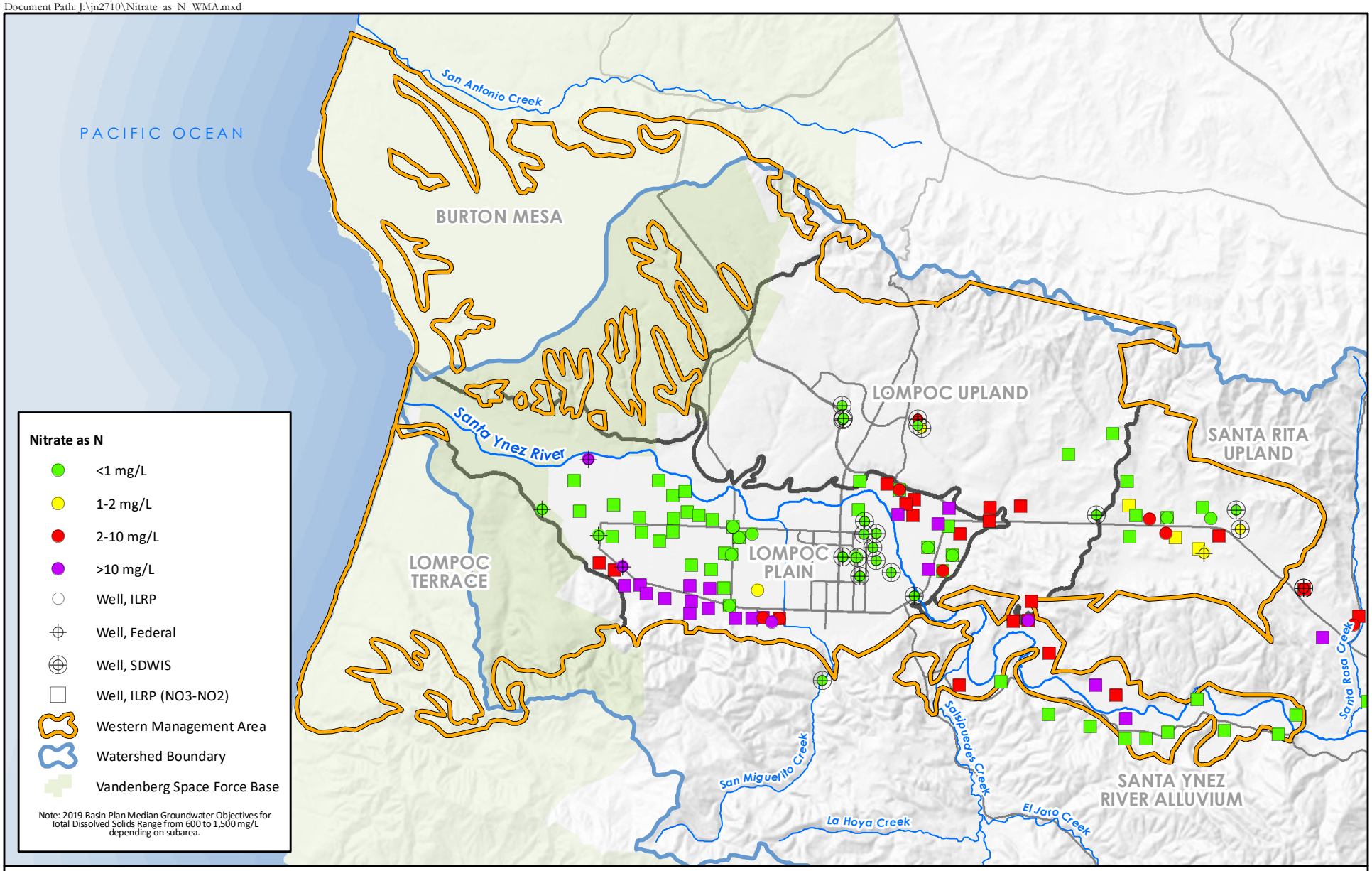
0 1 2 Miles

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

Document Path: J:\jn2710\Nitrate_as_N_WMA.mxd



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

DRAFT

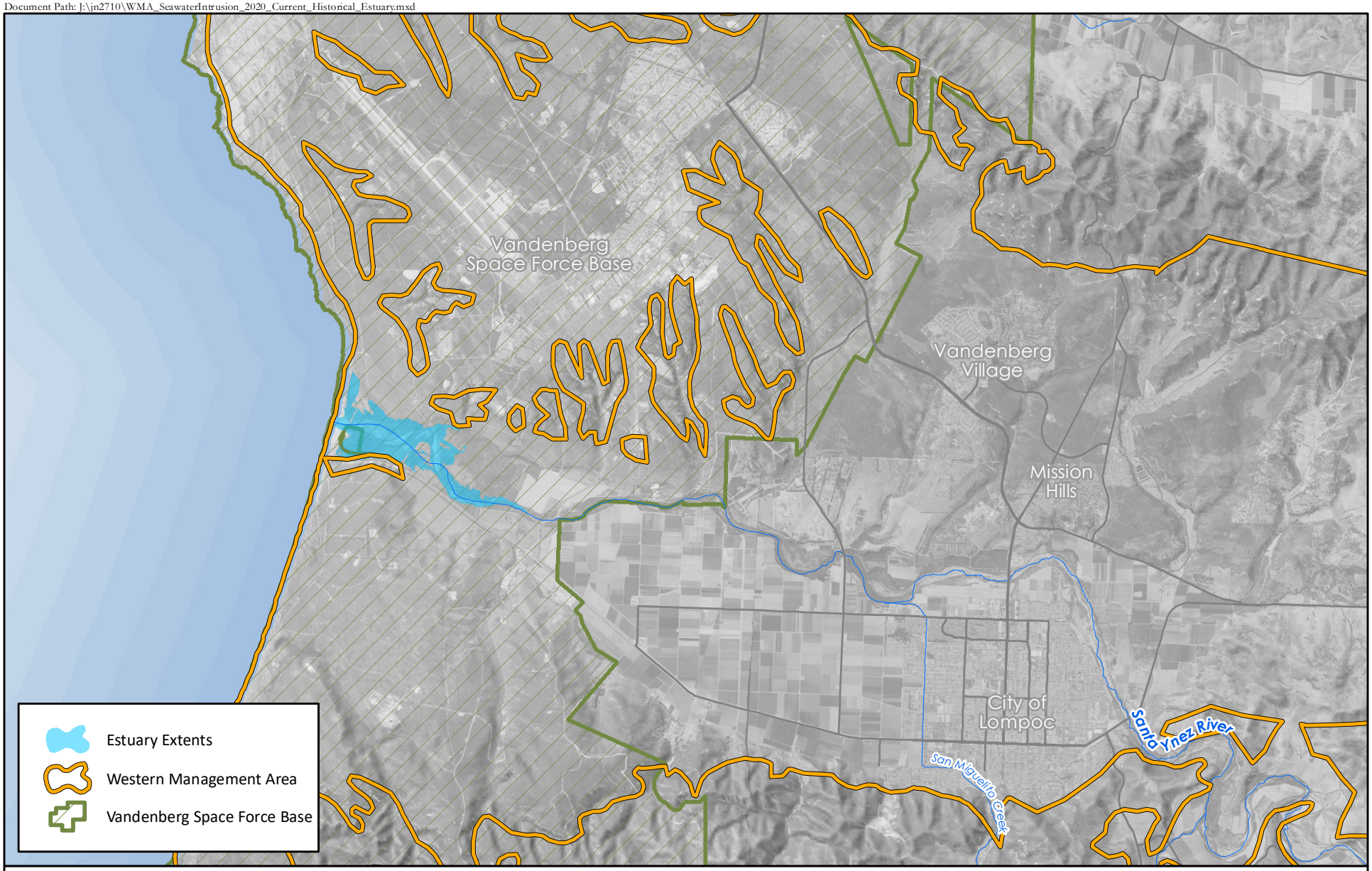
0 1 2 Miles

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

Document Path: J:\jn2710\WMA_SeawaterIntrusion_2020_Current_Historical_Estuary.mxd



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SEAWATER INTRUSION
CURRENT AND HISTORICAL ESTUARY EXTENT
SANTA YNEZ RIVER

DRAFT

0 0.75 1.5 Miles

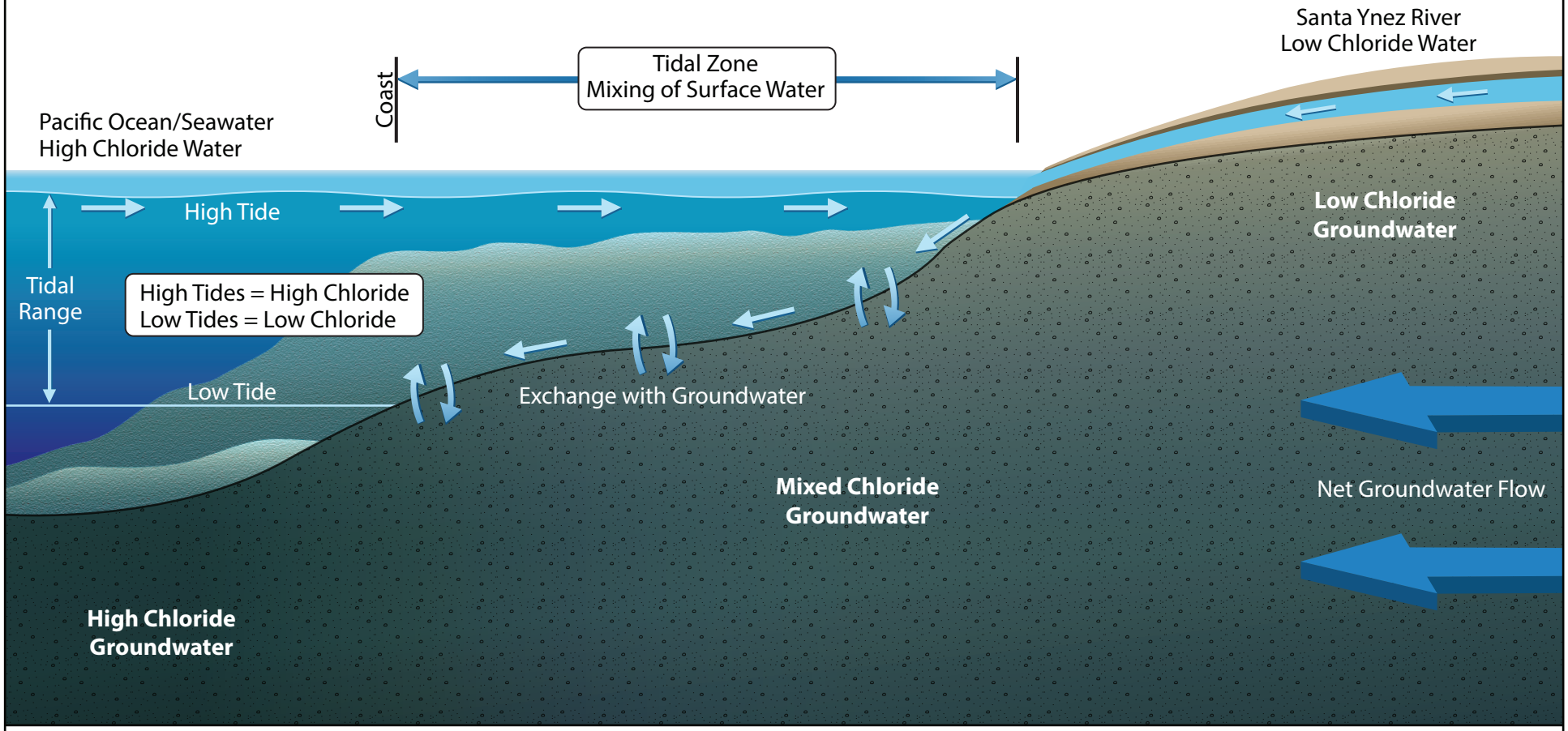
N

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

FIGURE 2b.4-1

C/JobFolder/Seawater_Intrusion_2a.ai

Santa Ynez Estuary
Conceptual Model



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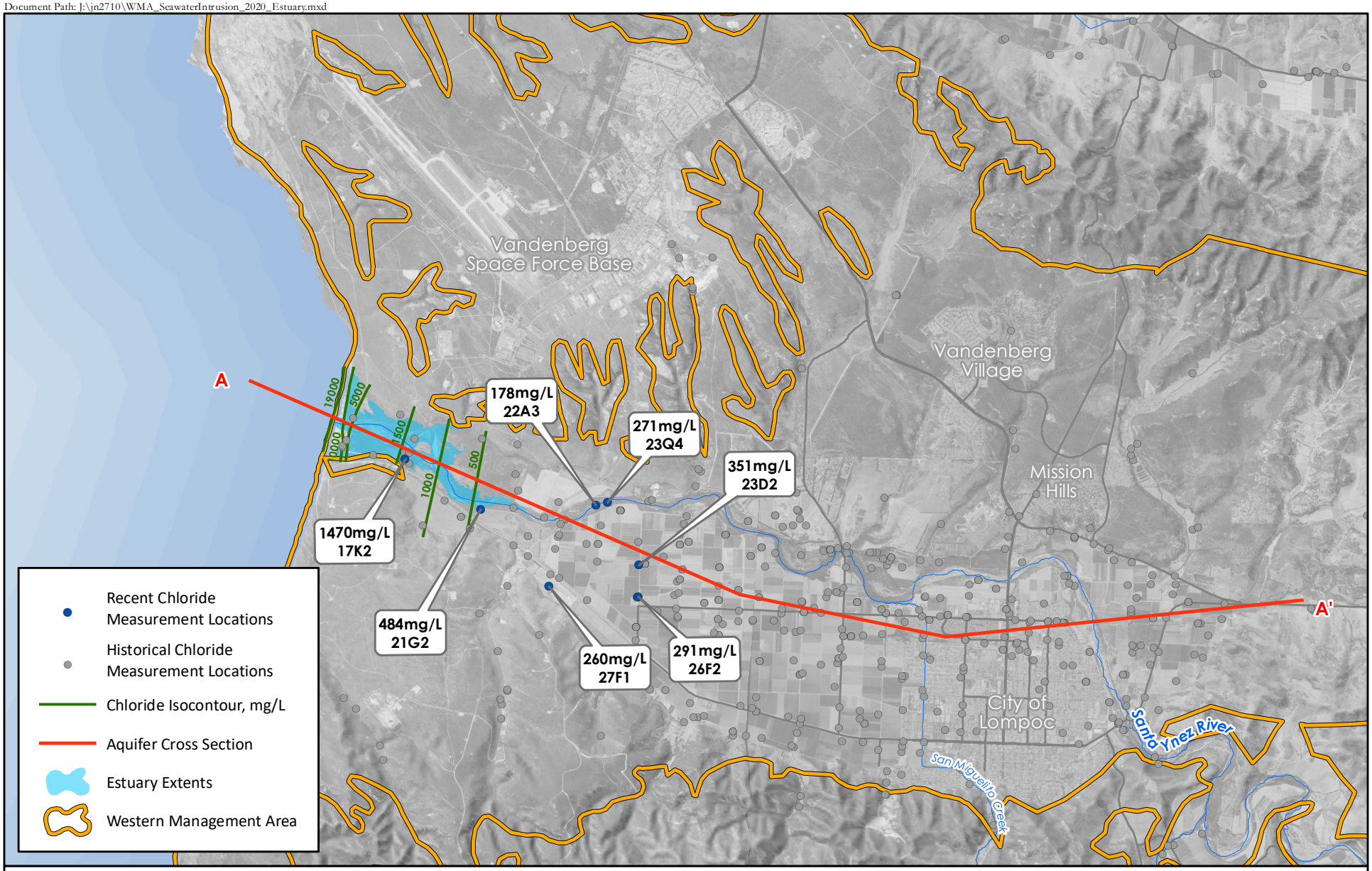
WESTERN MANAGEMENT AREA
CONCEPTUAL MODEL OF MIXING IN
SANTA YNEZ RIVER ESTUARY

Note: A sandbar (not shown) results in fresher estuary stuface water and is protective of the endangered tidewater goby. (*Eucyclogobius newberryi*) USFWS (2005)

FIGURE 2b.4-2

Document Path: J:\jn2710\WMA_SeawaterIntrusion_2020_Estuary.mxd



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SEAWATER INTRUSION
ISOCONTOUR OF CHLORIDE ADVANCEMENT
2020

DRAFT

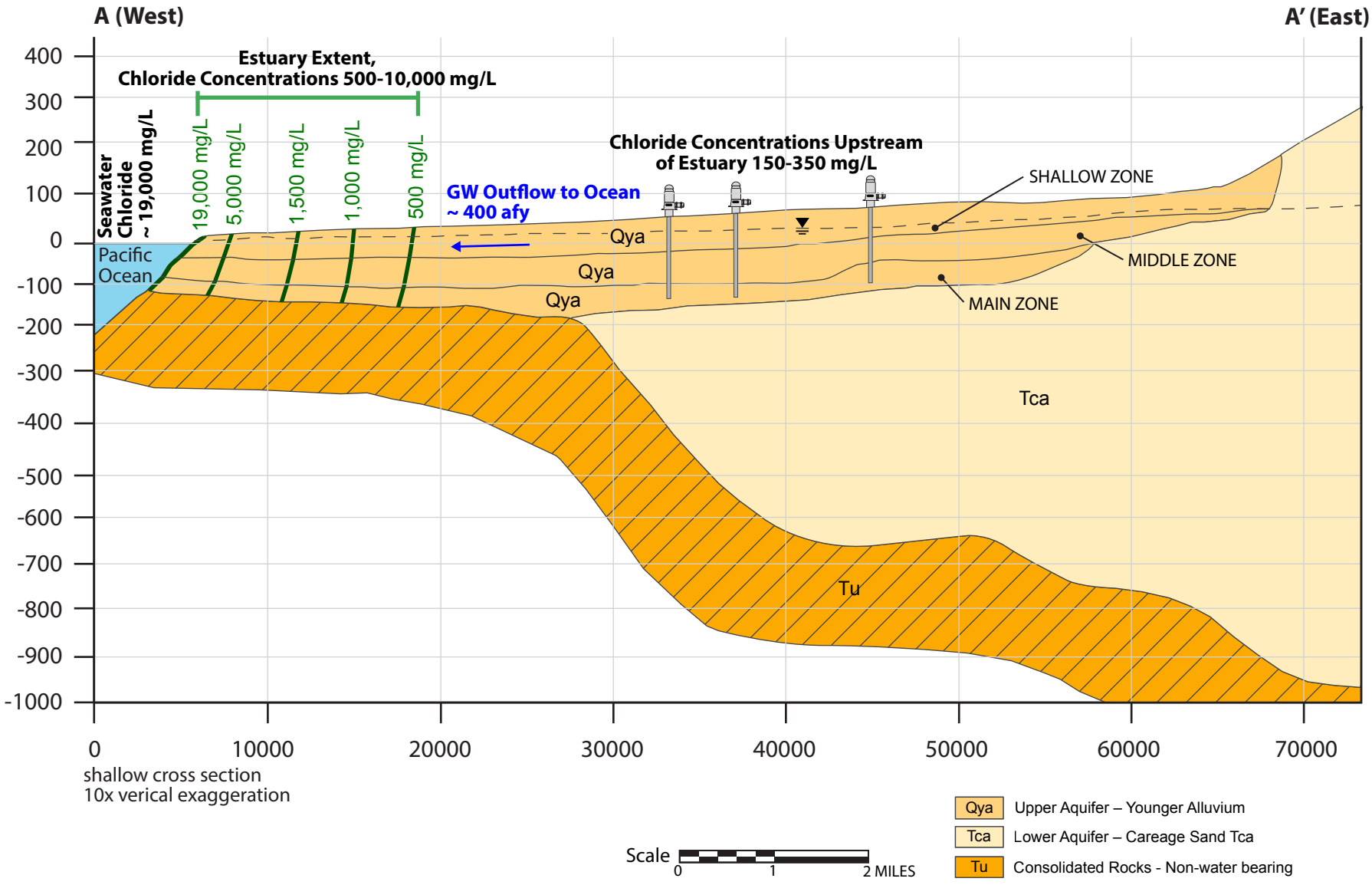
0 0.75 1.5 Miles

N

Sources:
Pacific States Marine Fisheries Commission (2018)
West Yost and Associates (2012);
USGS NWIS (2020); NAIP (2018)

FIGURE 2b.4-3

C/JobFolder/A-A_WMA Aquifer Cross-sections_Chloride Advancement Front_1e.ai



Cross sections based on City of Lompoc Groundwater Management Plan (West Yost, 2013); Originally based on United States Geological Survey, Bright and Others, 1992 (Plate 1).

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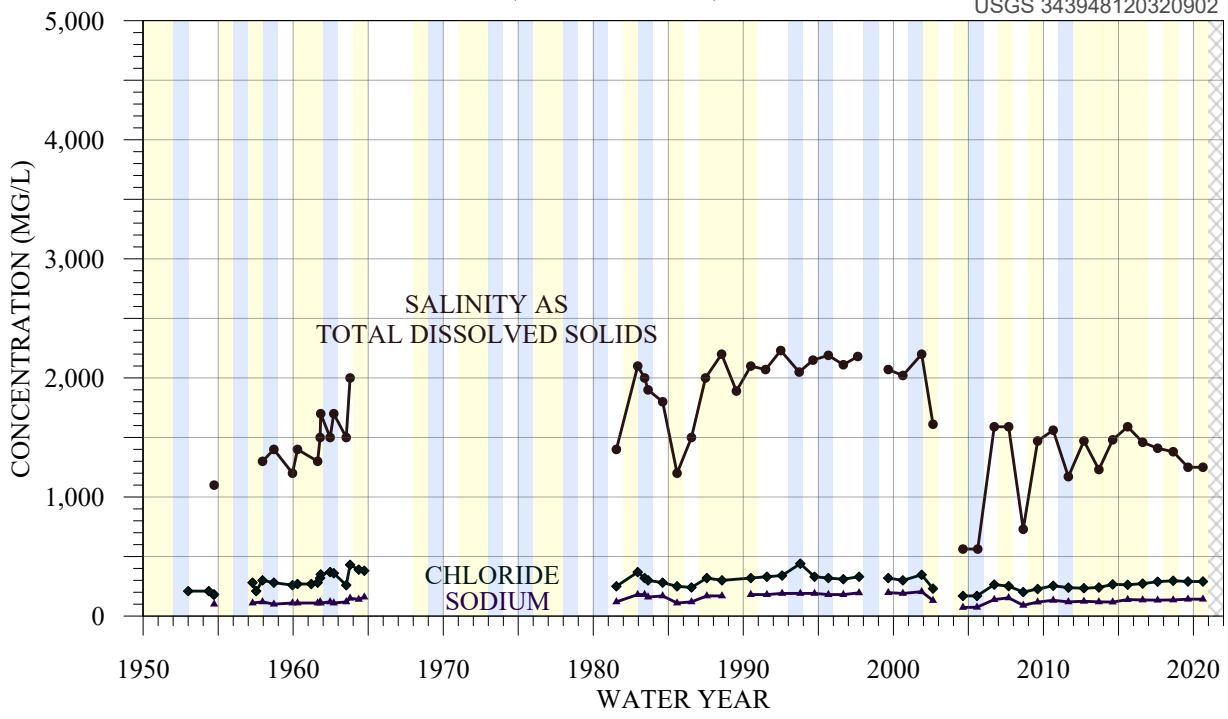
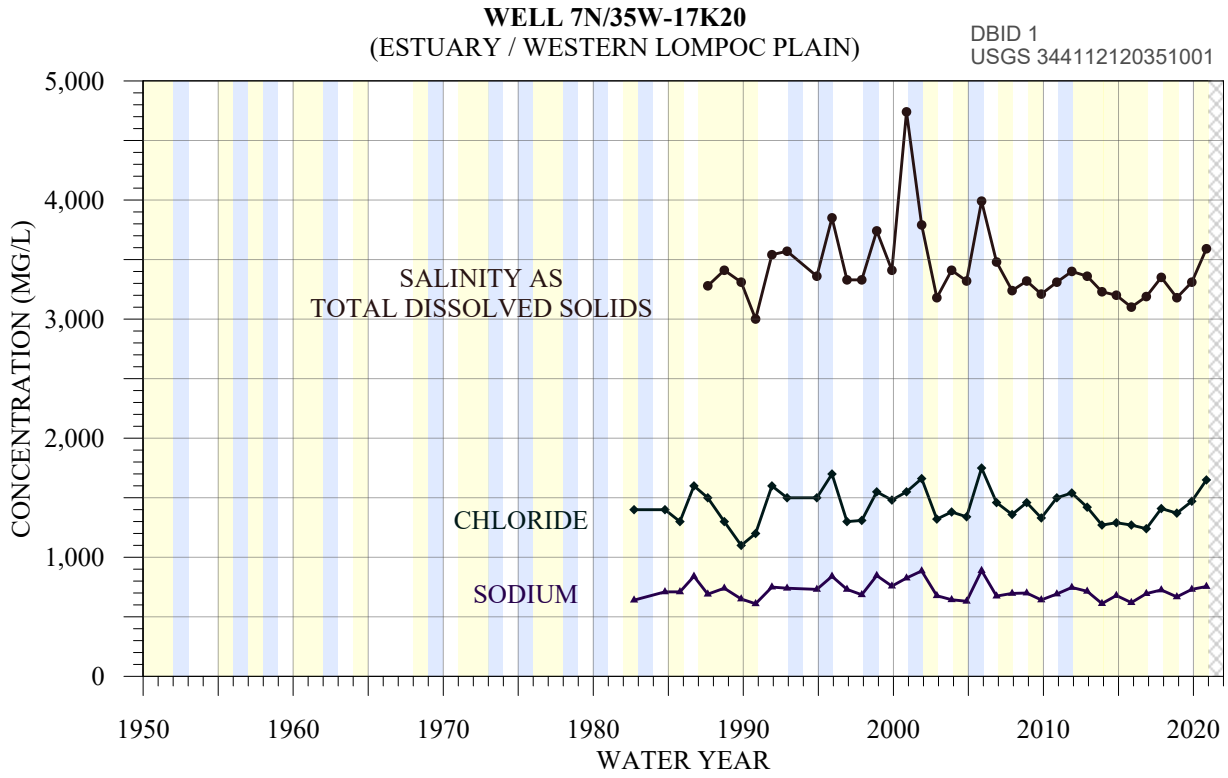
WESTERN MANAGEMENT AREA AQUIFER CROSS-SECTION A-A'
UPPER AQUIFER CHLORIDE CONCENTRATION
NEAR AND UPSTREAM OF ESTUARY

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 2b.4-4





DRAFT
6/23/2021

Data Source: USGS (2021) water quality data.

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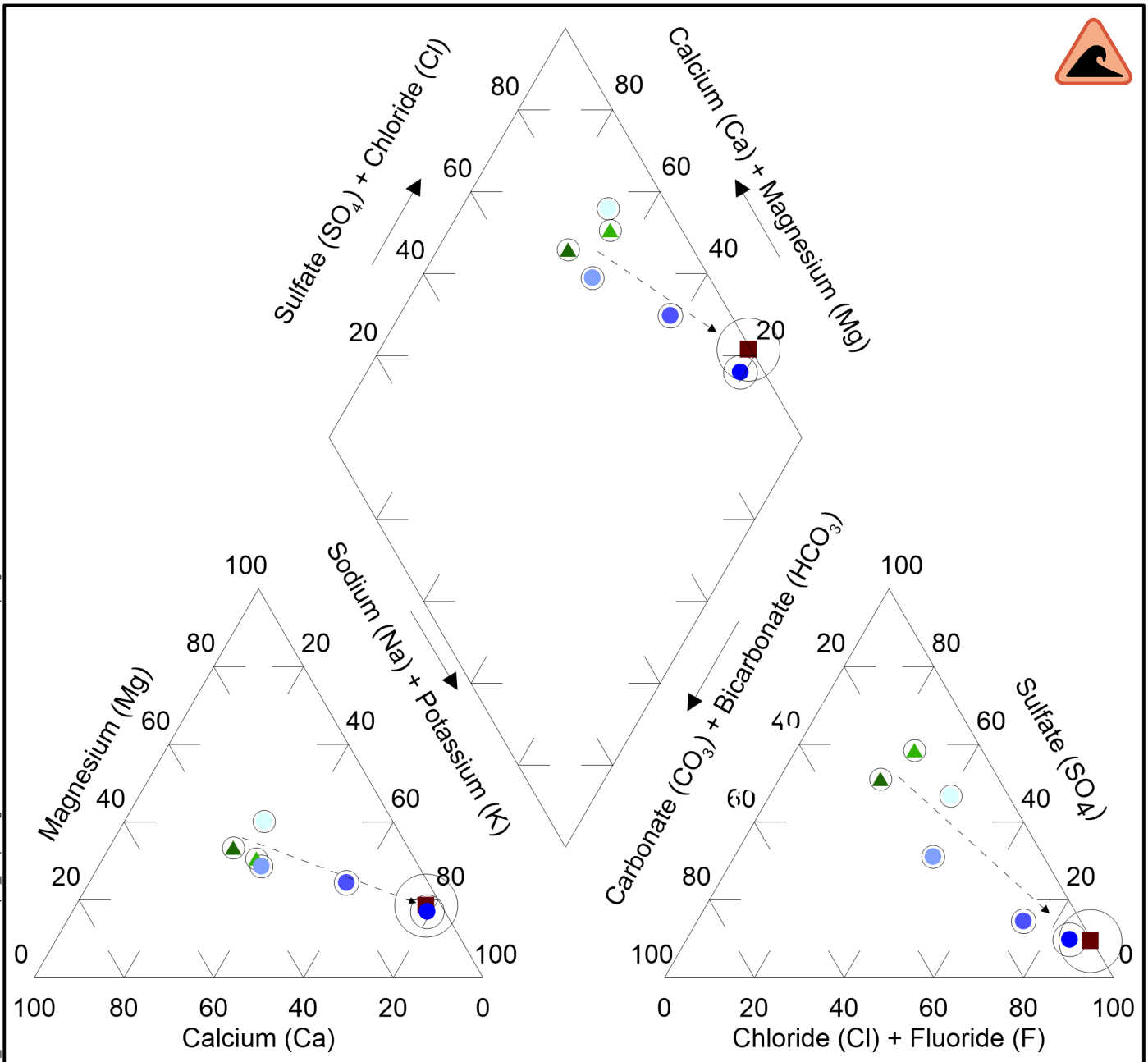
MAJOR WATER QUALITY TRENDS
SELECTED WELLS
LOMPOC PLAIN SUBAREA

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

TDS
Chloride
Sodium

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\WQ_Seawater-COMPLETE\WMA 4-02 Seawater_OBSERVATIONS.grf 6/23/2021 M. McCammon



Symbol		USGS ID	Location	Sample Date
▲	Plain SW	11135000	Santa Ynez River Lompoc	1/3/1980
▲	Plain SW	11135000	Santa Ynez River Pine Creek	12/19/1983
■	Ocean	-----	Sea Water Composition	----------
●	Plain GW	343948120320901	Well 7N/35W-26F4	8/21/2019
●	Estuary GW	344041120341101	Well 7N/35W-21G2	8/13/2019
●	Estuary GW	344112120351001	Well 7N/35W-17K20	8/20/2019
●	Coast GW	344135120355201	Well 7N/35W-18H1	8/30/1963

Outer Circle is proportional to measured Total Dissolved Solids.

Data Source: USGS (2020) data and Hem (1985).

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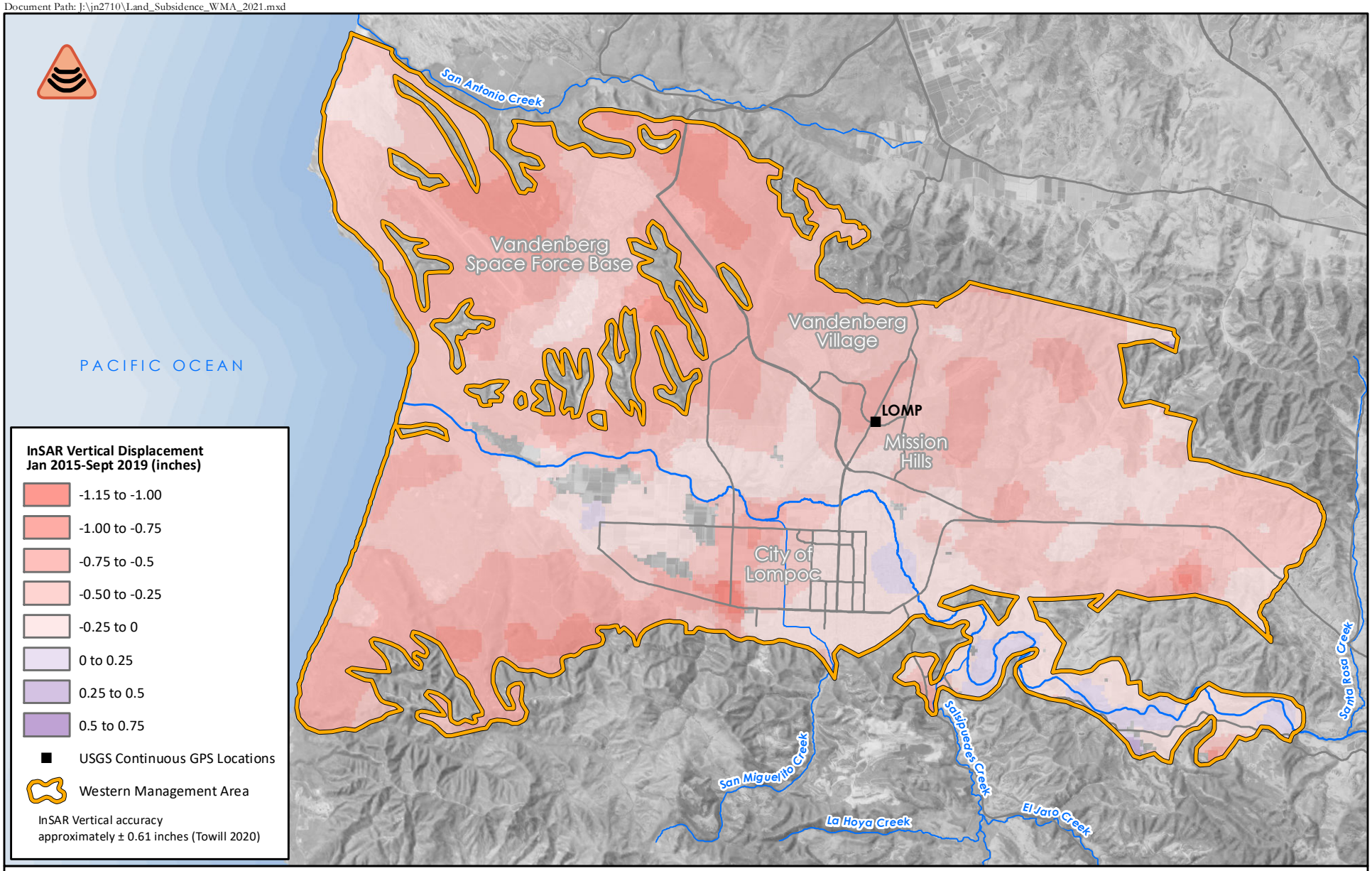
LOWER SANTA YNEZ RIVER
PIPER DIAGRAM
WATER QUALITY INFLUENCE FROM SEA WATER INTRUSION

DRAFT
6/23/2021

I:\DATA\2710\Reports - Tech Memo\2020-10 Groundwater_Conditions_Memo\TOPICS\WQ_Seawater-COMPLETE\Piper_Graphs\Fig 2b.4-03 Lower Santa Ynez River Piper.grf 6/23/2021 M. McCammon

Document Path: J:\jn2710\Land_Subsidence_WMA_2021.mxd



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

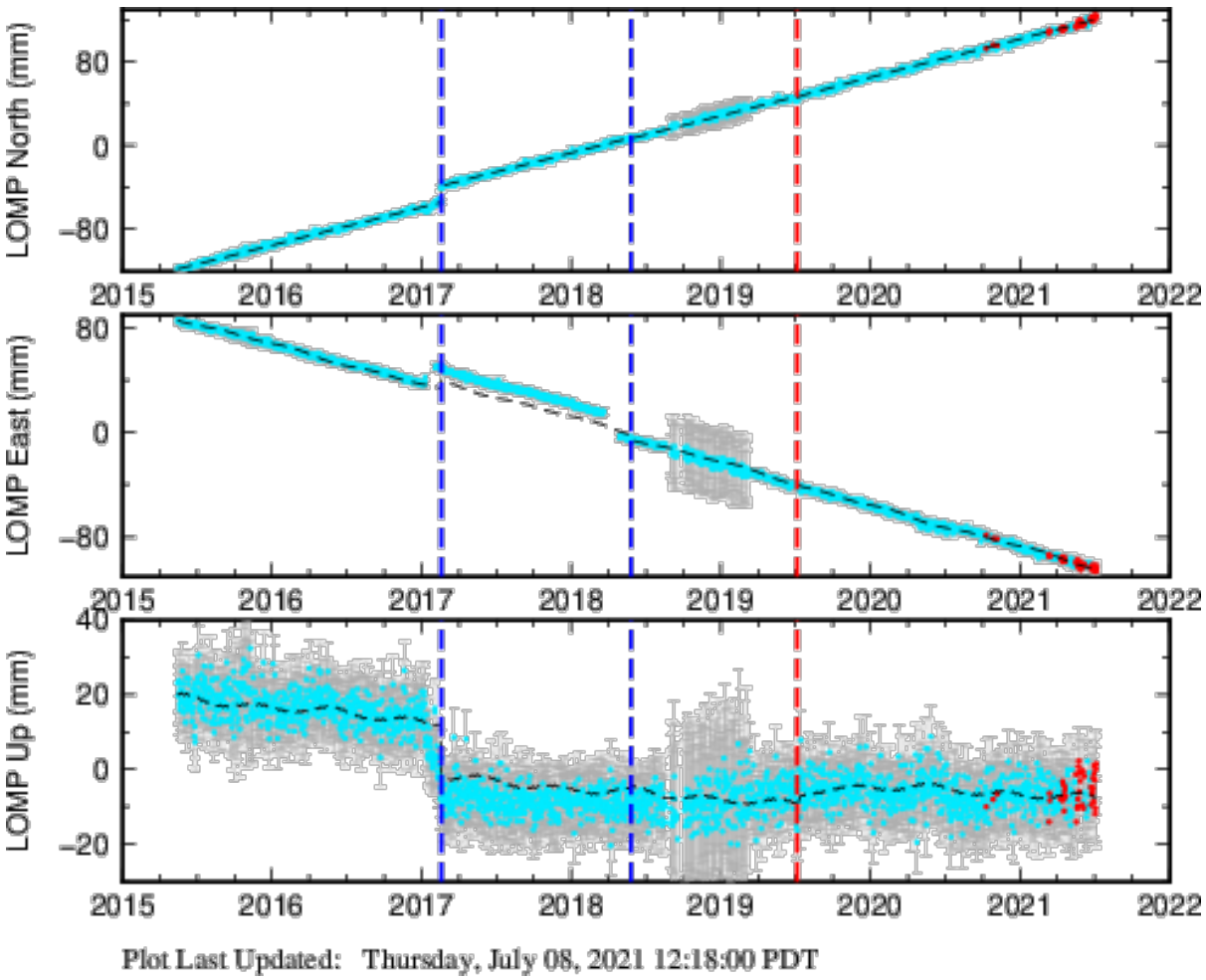
DRAFT

0 1 2 Miles

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

N

FIGURE 2b.5-1



Manually Entered

Earthquakes

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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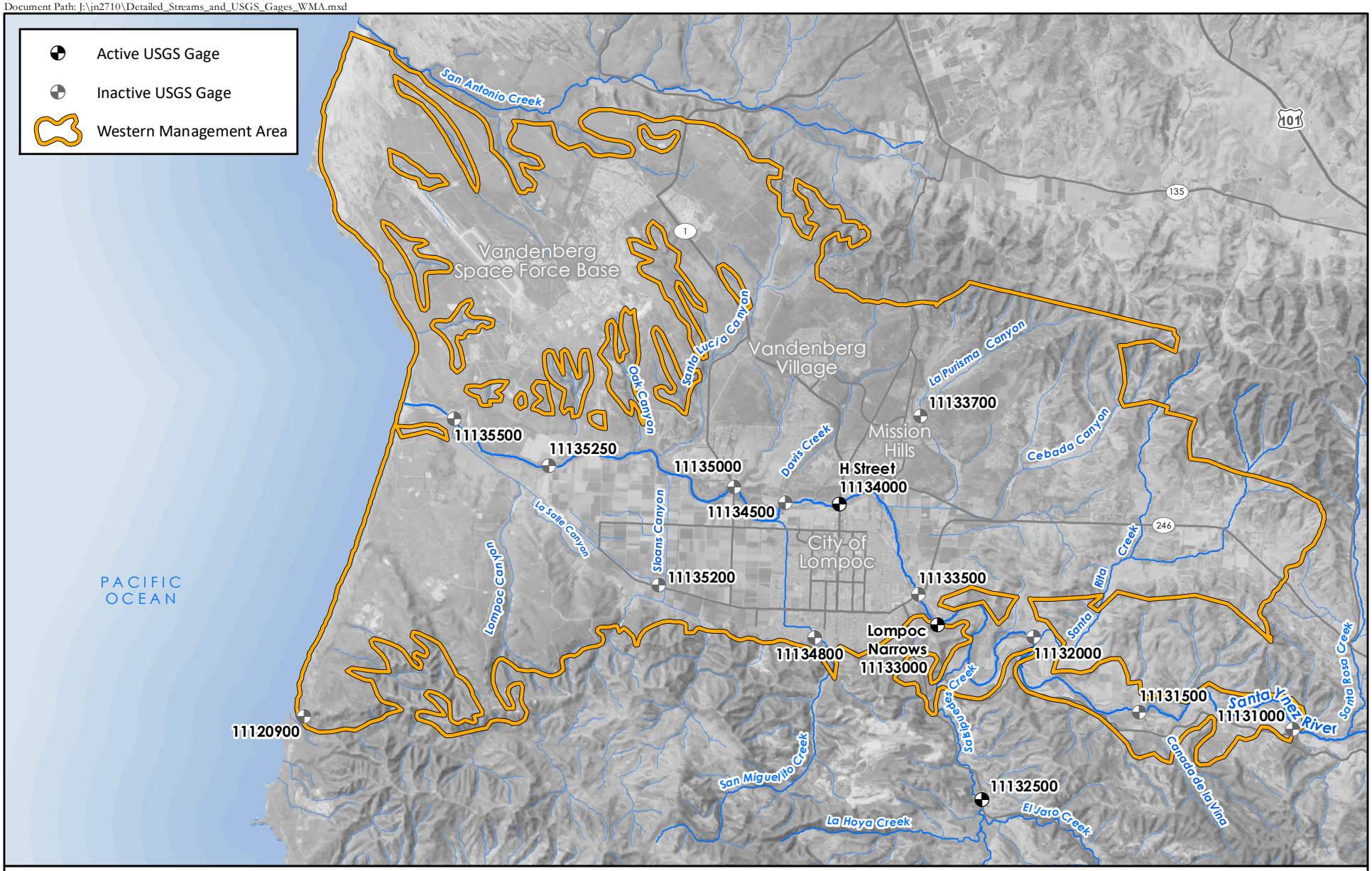
CONTINUOUS GLOBAL POSITIONING SYSTEM
LOMP STATION TRENDS

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

Document Path: J:\jn2710\Detailed_Streams_and_USGS_Gages_WMA.mxd



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DETAILED STREAMS AND USGS GAGES
WESTERN MANAGEMENT AREA

DRAFT

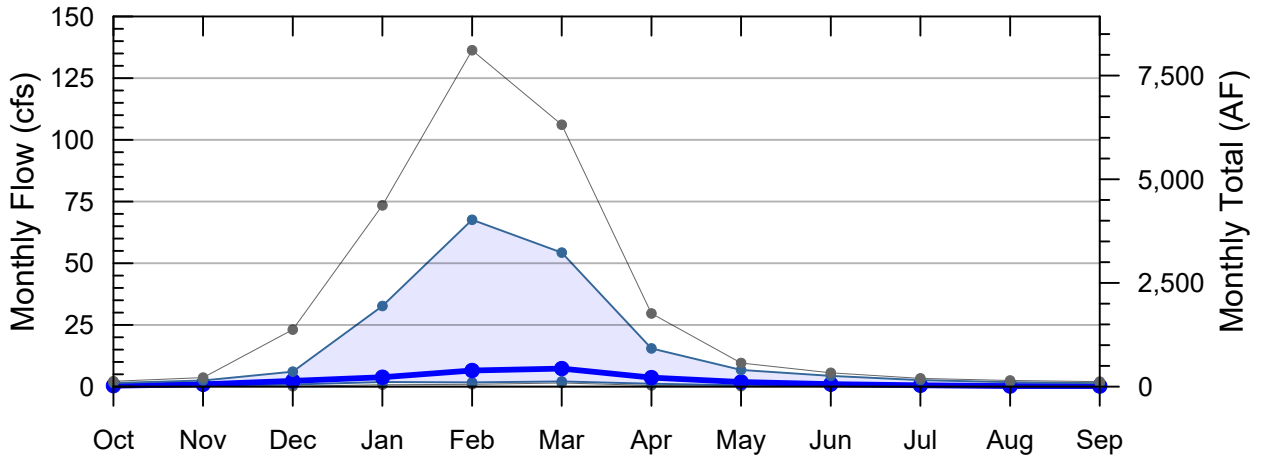
0 1 2 Miles

Source:
USGS Gages 2011

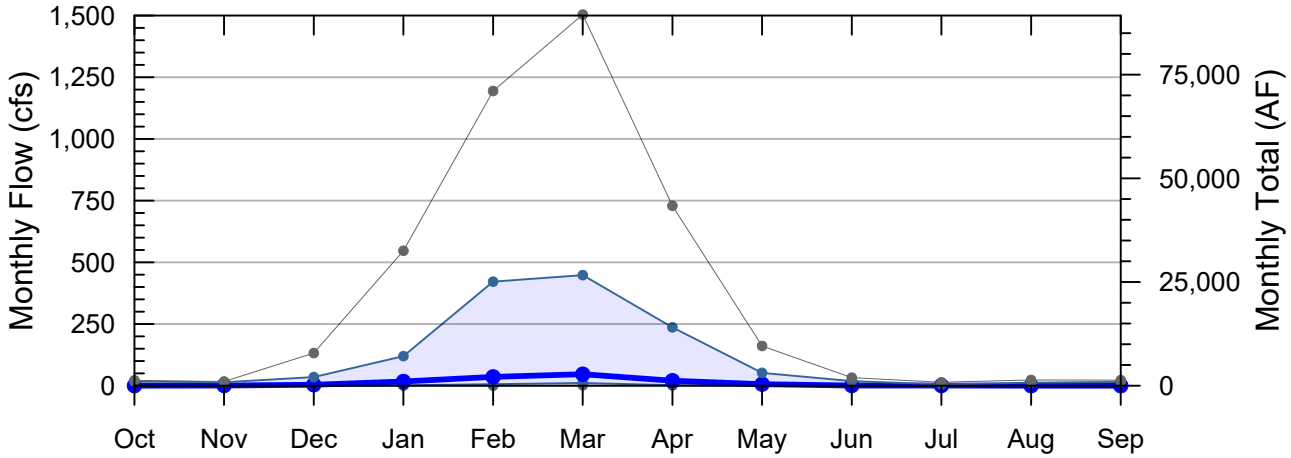
N

FIGURE 2b.6-1

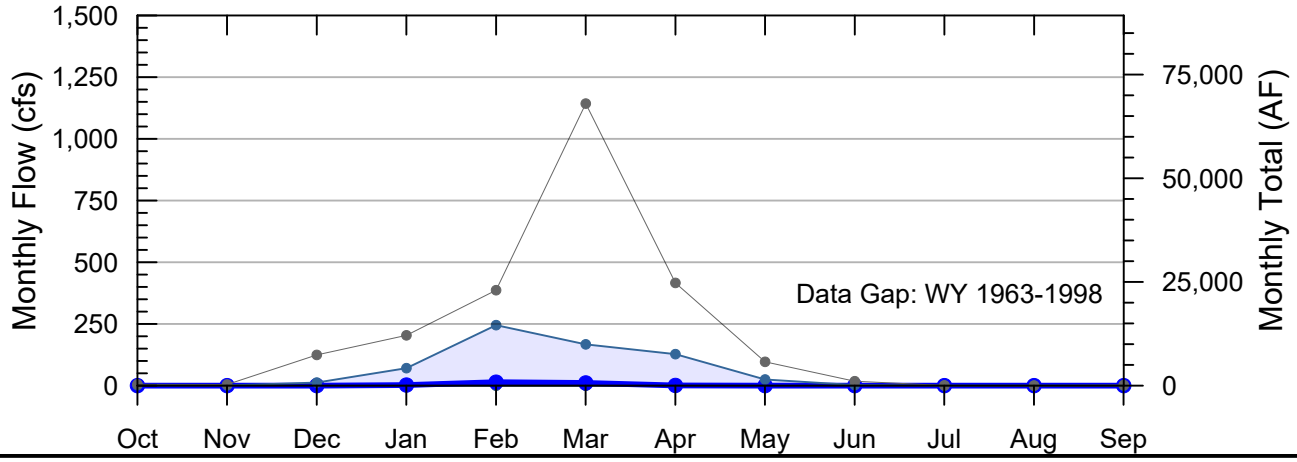
11132500 SALSIPUEDES C NR LOMPOC CA
(WY 1942 - 2020)



11133000 SANTA YNEZ R A NARROWS NR LOMPOC CA
(WY 1953 - 2020)



11134000 SANTA YNEZ R A H ST NR LOMPOC CA
(WY 1947 - 2020)



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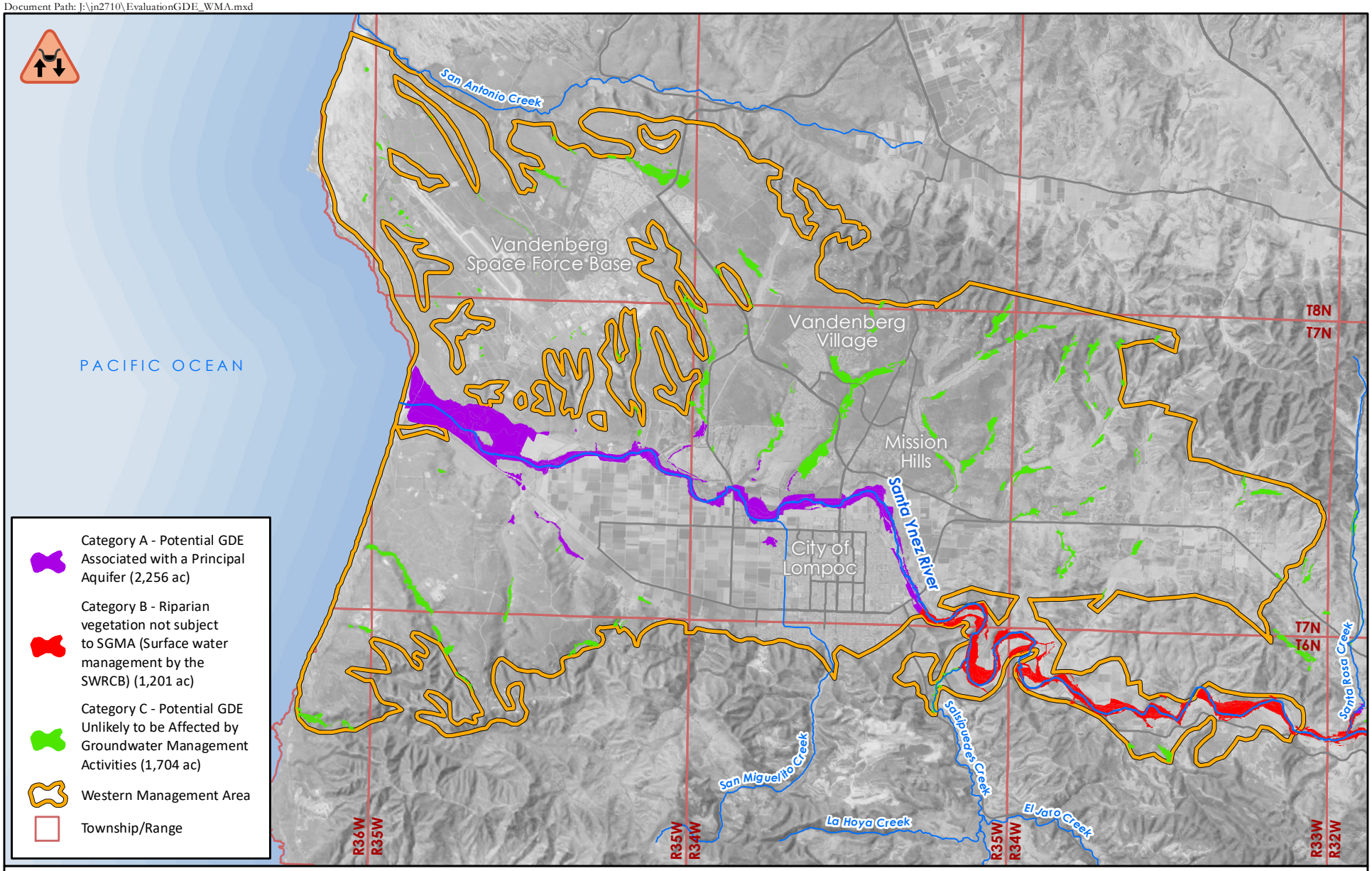
MONTHLY FLOW STATISTICS
SANTA YNEZ RIVER

Data Source: USGS (2020) streamflow data

Percentile
10% 80%
20% 90%
50%
Zone from 20%-80%

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

Document Path: J:\jn2710\EvaluationGDE_WMA.mxd



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EVALUATION OF GROUNDWATER DEPENDENT ECOSYSTEMS

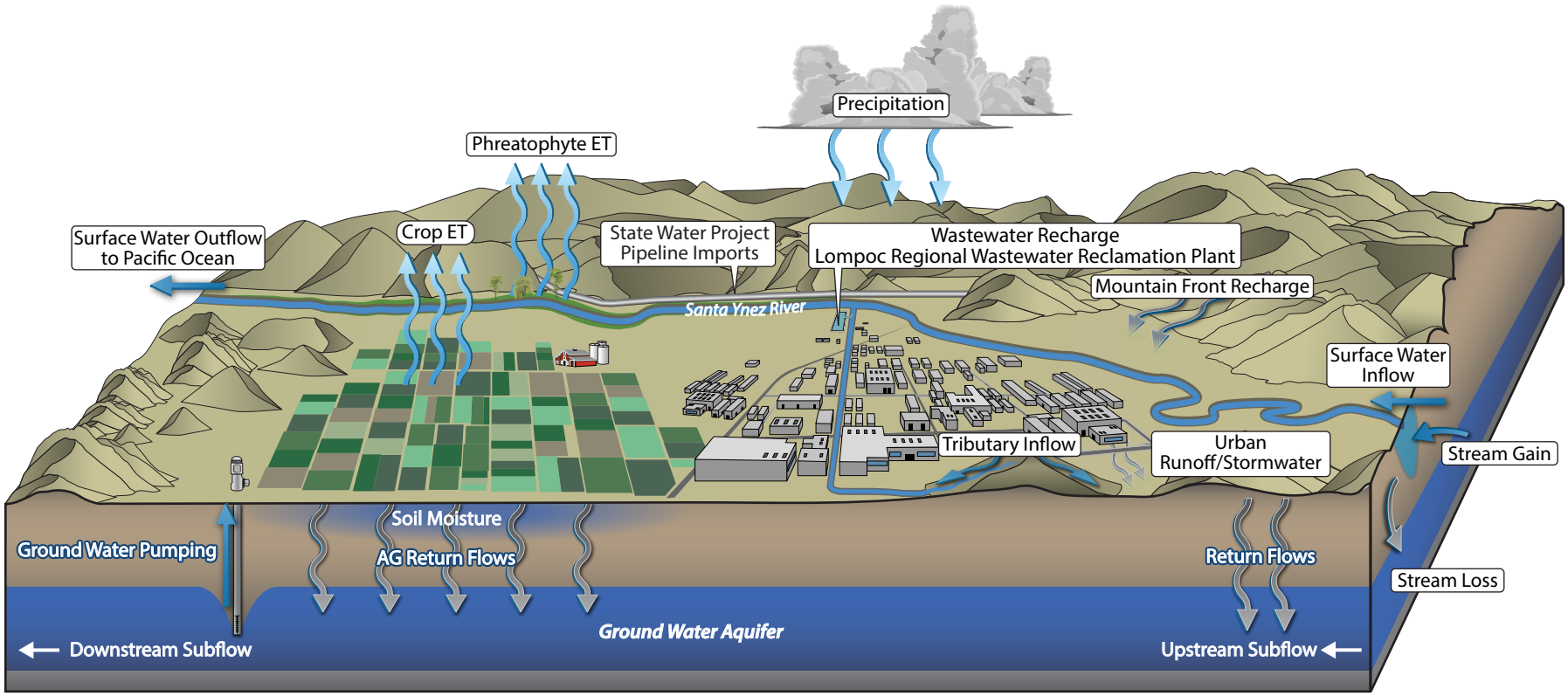
DRAFT

0 1 2 Miles

N

FIGURE 2b.6-3

C/JobFolder/WaterCycle_2f_2019_LEFT.ai



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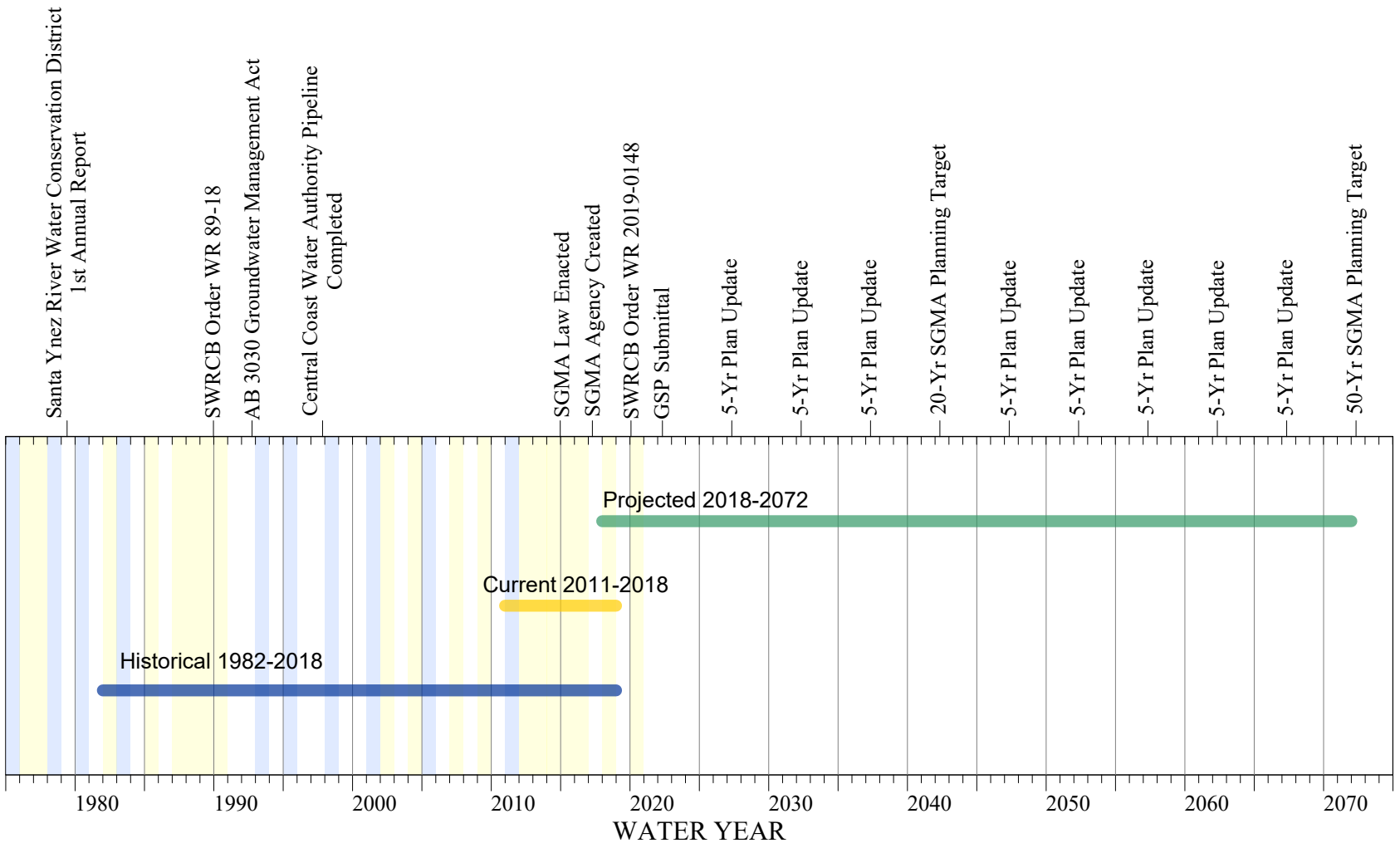
HYDROGEOLOGICAL CONCEPTUAL MODEL
WESTERN MANAGEMENT AREA
SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

FIGURE 2c.1-1



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HISTORICAL, CURRENT, AND PROJECTED WATER BUDGET PERIODS

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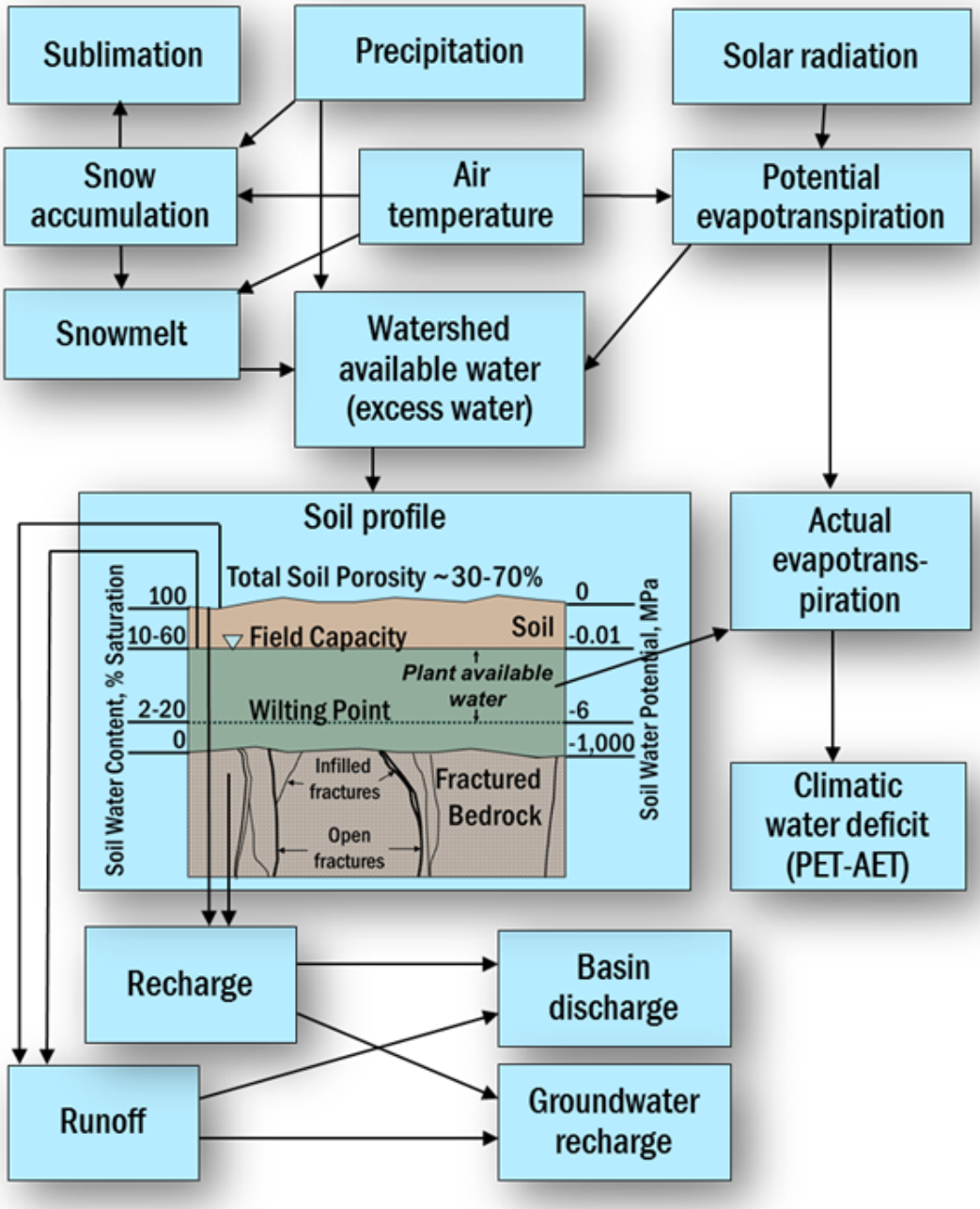
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.1-2

I:\DATA\2710\Analyses\2021-07 Time Periods\Fig 2a.1-2 Water Budget Timelines WMA.grf 7/3/2021 M. McCammon



Source: Thorne, et al (2012).

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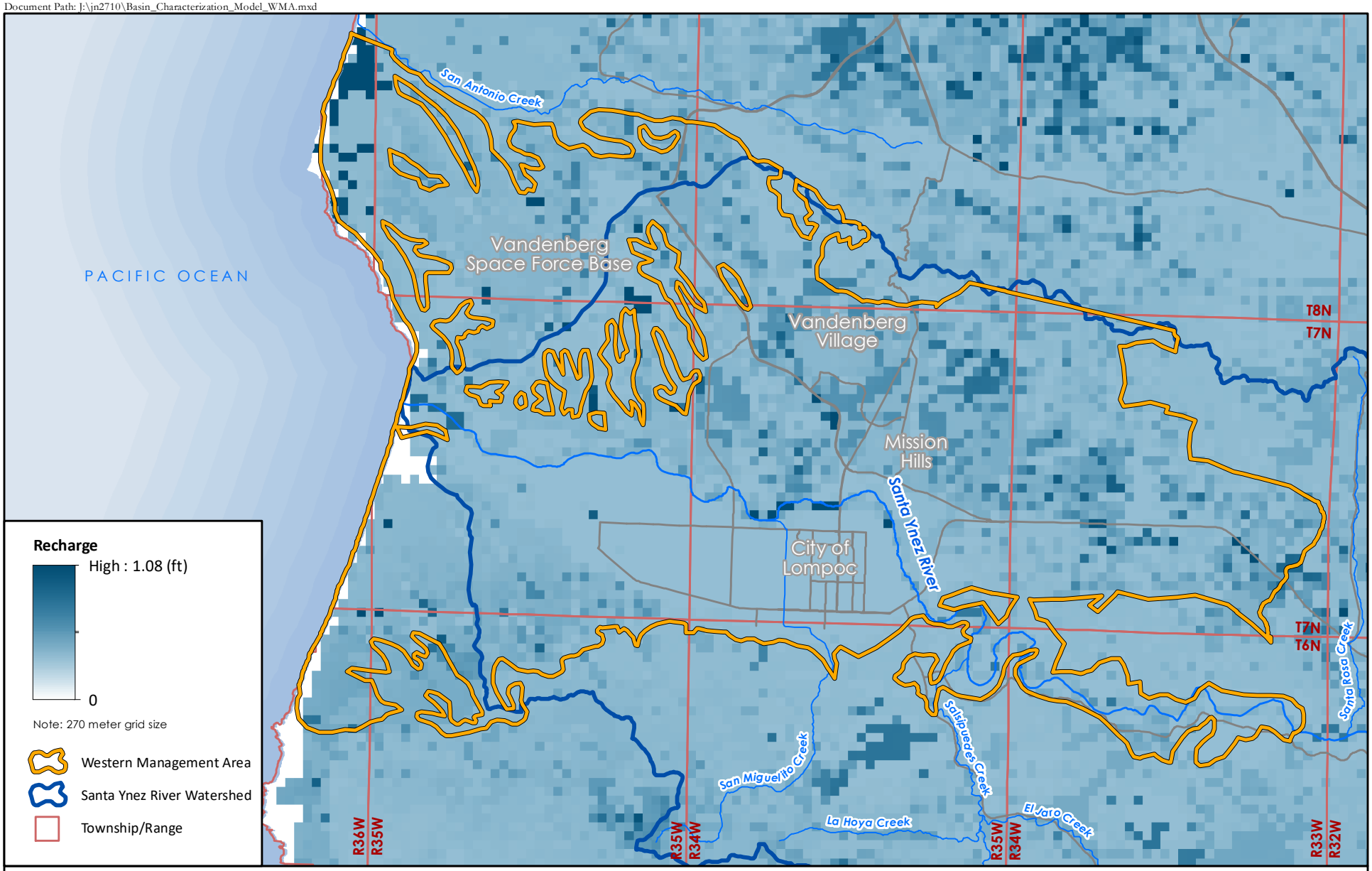
BASIN CHARACTERIZATION MODEL
WATER COMPONENTS

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\2021-07 BCM Components

Document Path: J:\jn2710\Basin_Characterization_Model_WMA.mxd



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BASIN CHARACTERIZATION MODEL (BCM) RECHARGE

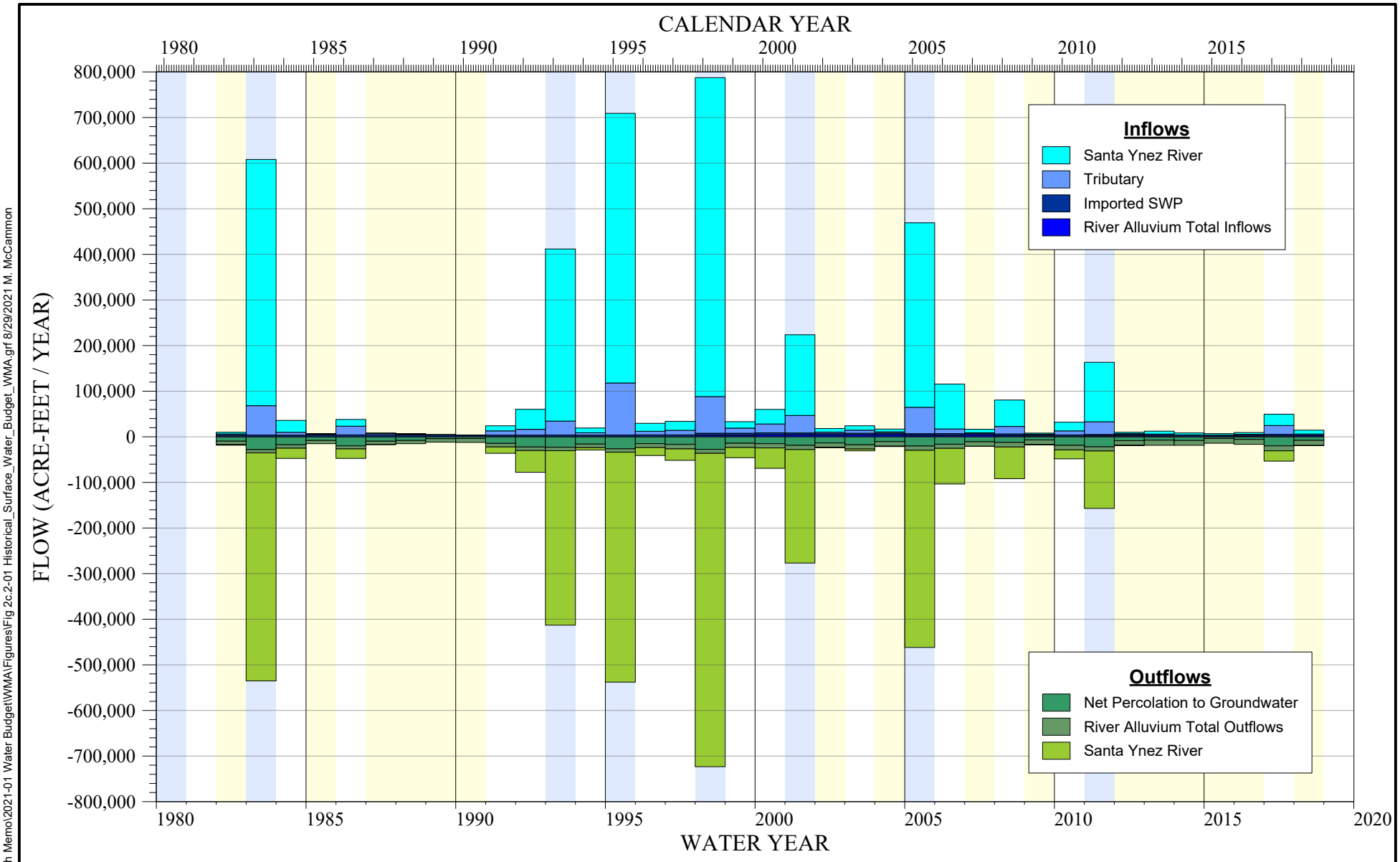
DRAFT

0 1 2 Miles

Source:
Flint, L.E., and A.L. Flint. 2017

N

FIGURE 2c.1-4



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HISTORICAL SURFACE WATER COMPONENTS 1982-2018

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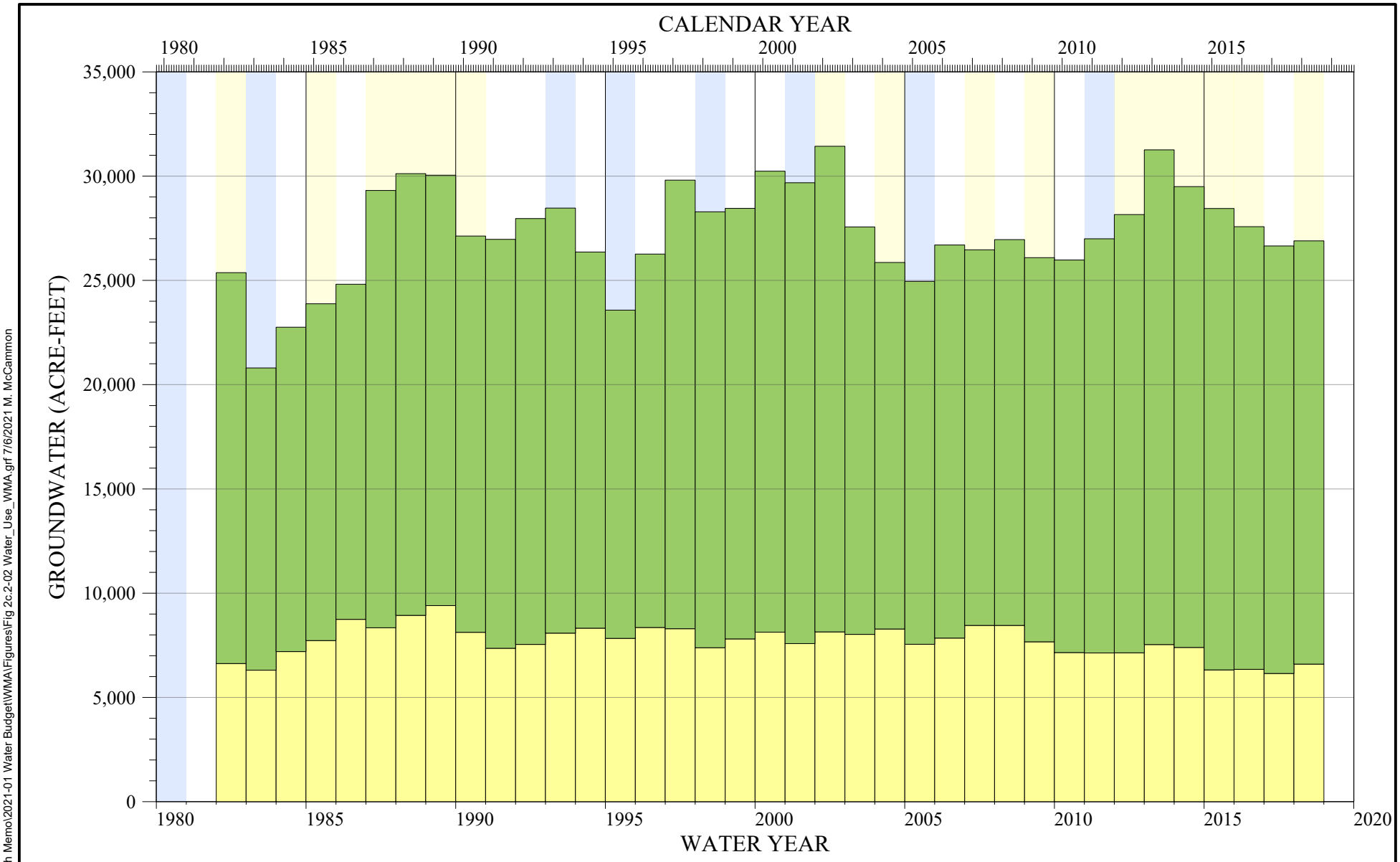
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.2-1

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.2-01 Historical_Surface_Water_Budget_WMA.grf 8/29/2021 M. McCammon



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GROUNDWATER PUMPING BY SECTOR
WY1982-2018

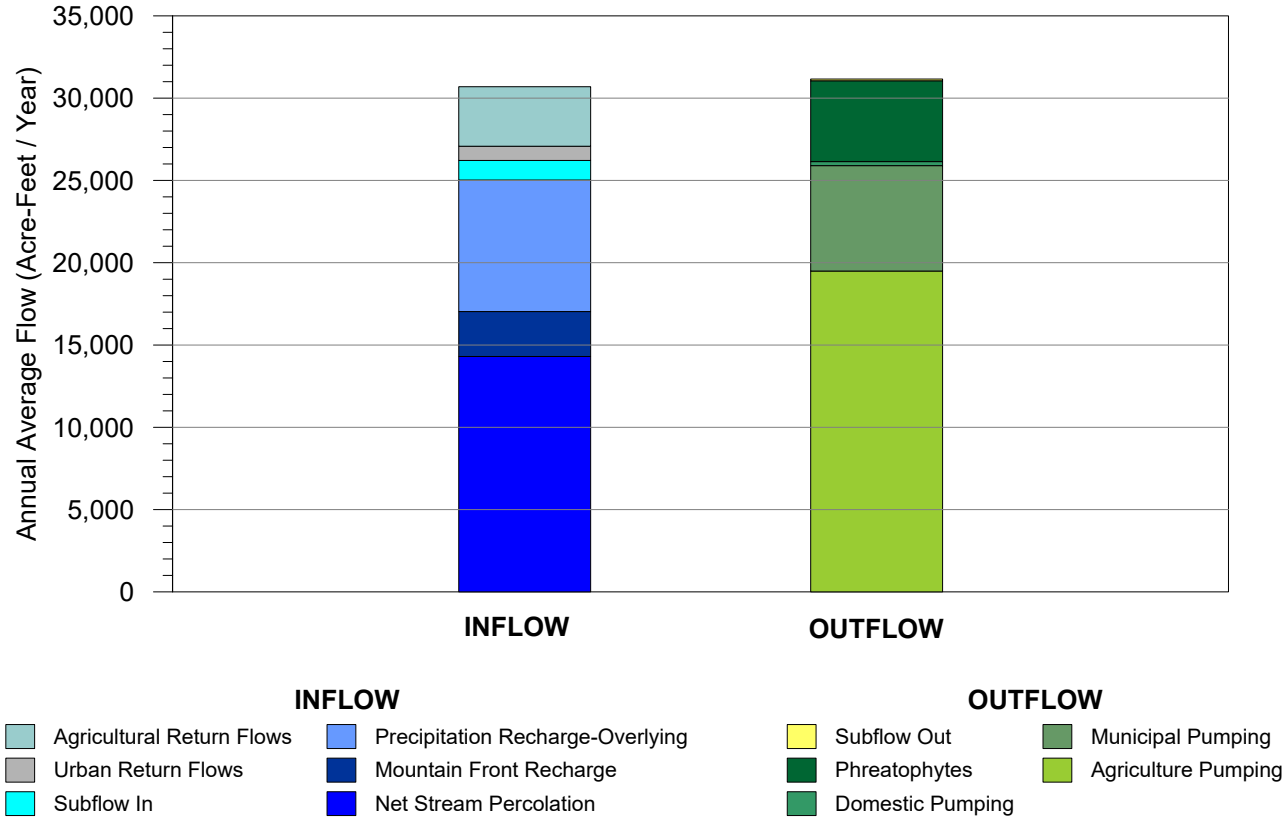
Agricultural
Municipal/Domestic

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

FIGURE 2c.2-2

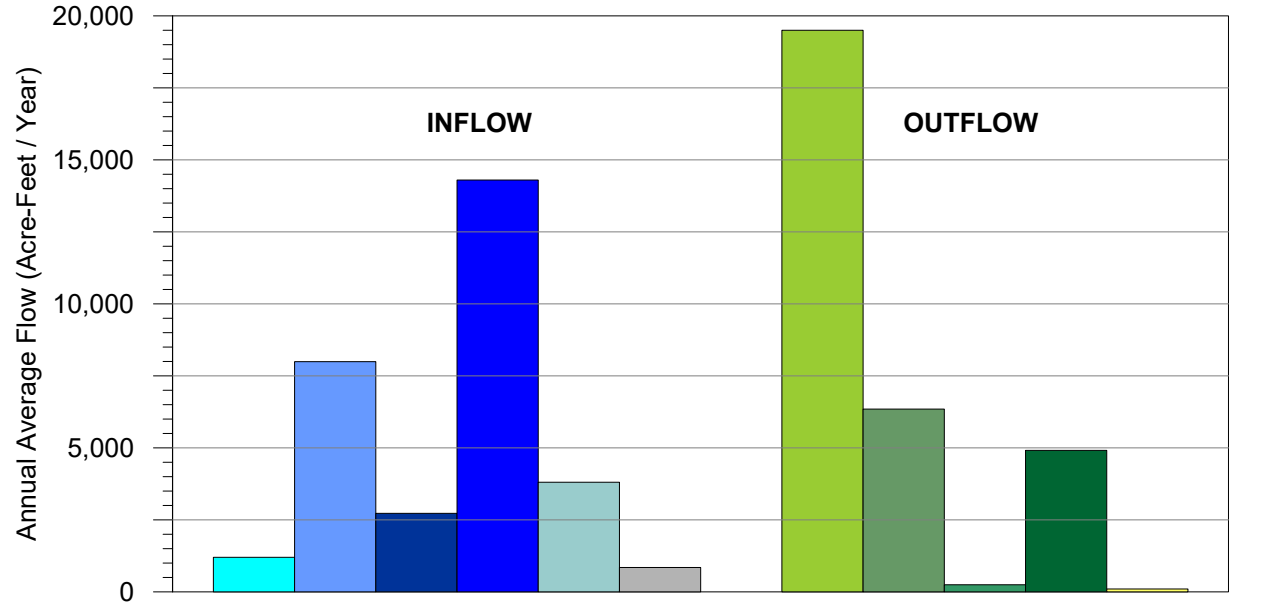
I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.2-02 Water_Use_WMA.grf 7/6/2021 M. McCammon

FIGURE 2c.2-3A



KEY GROUNDWATER COMPONENTS

FIGURE 2c.2-3B



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AVERAGE GROUNDWATER BUDGET VOLUMES HISTORICAL WY1982-2018

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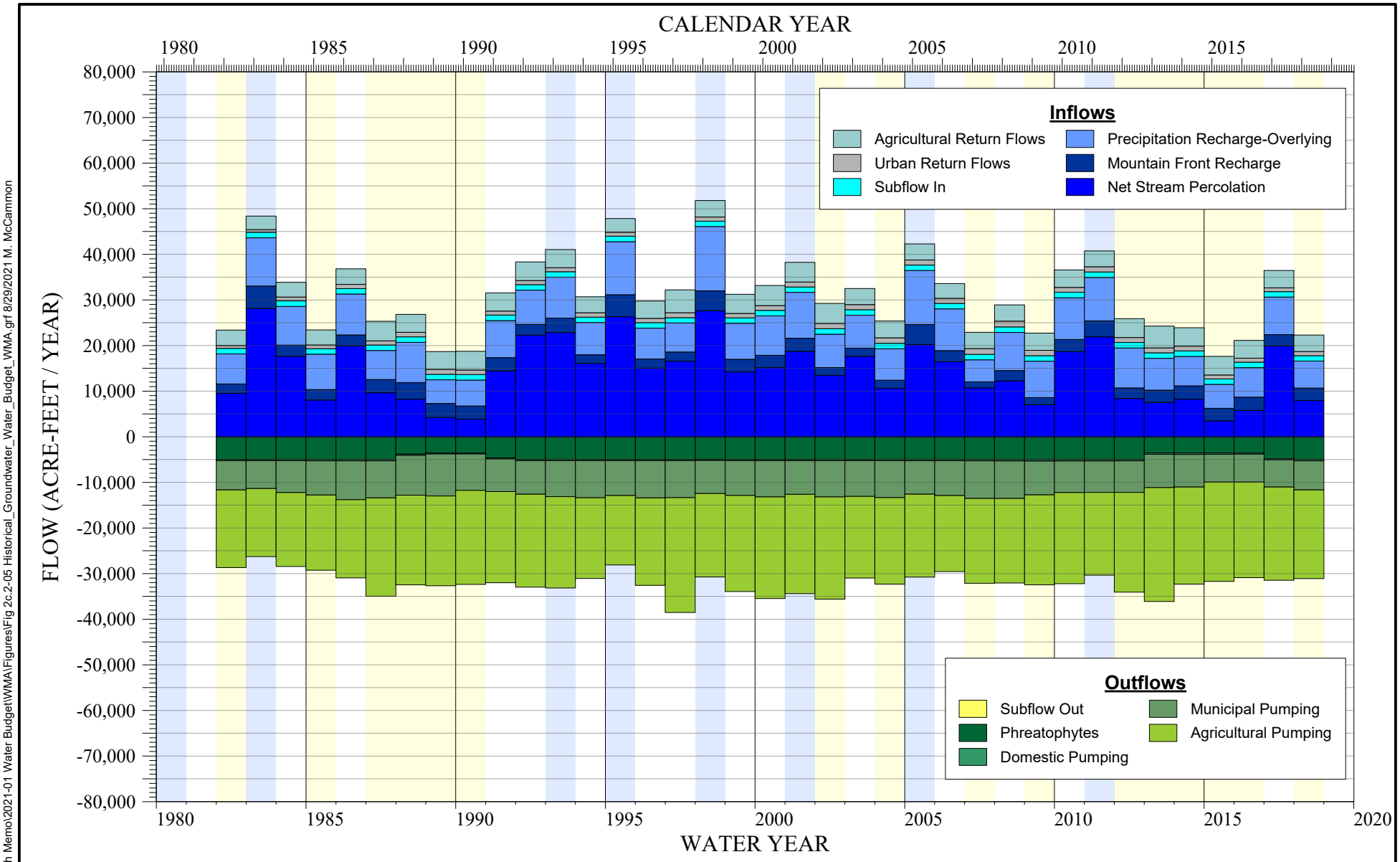
I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.2-03AB Avg Historical GW Budgets WMA.grf 9/9/2021 M. McCammon



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HISTORICAL GROUNDWATER COMPONENTS 1982-2018

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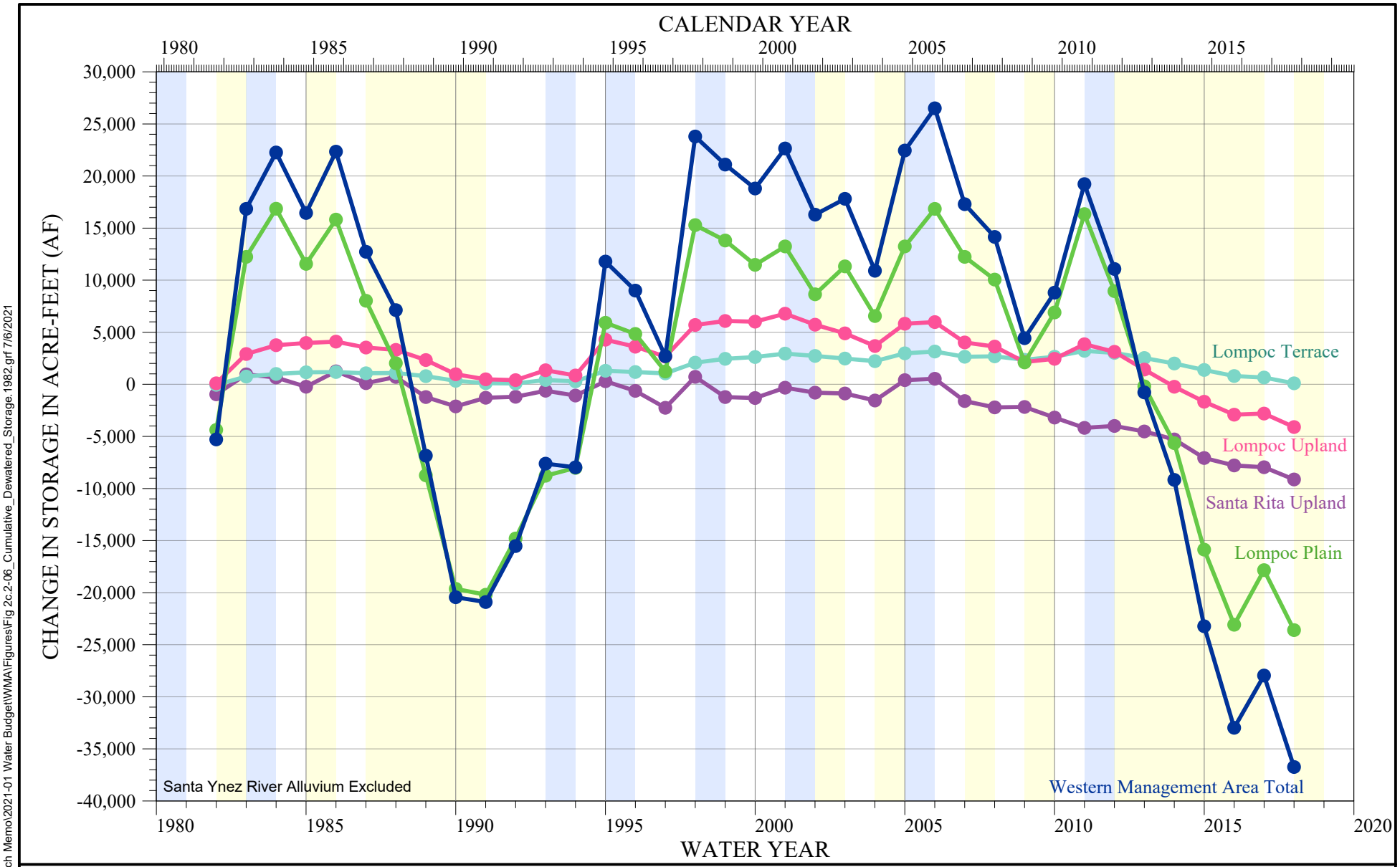
8/29/2021

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

FIGURE 2c.2-4

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.2-05 Historical_Groundwater_Water_Budget_WMA.grf 8/29/2021 M. McCammon



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CUMULATIVE CHANGE IN GROUNDWATER STORAGE BY SUBAREA, RELATIVE TO MARCH 1982

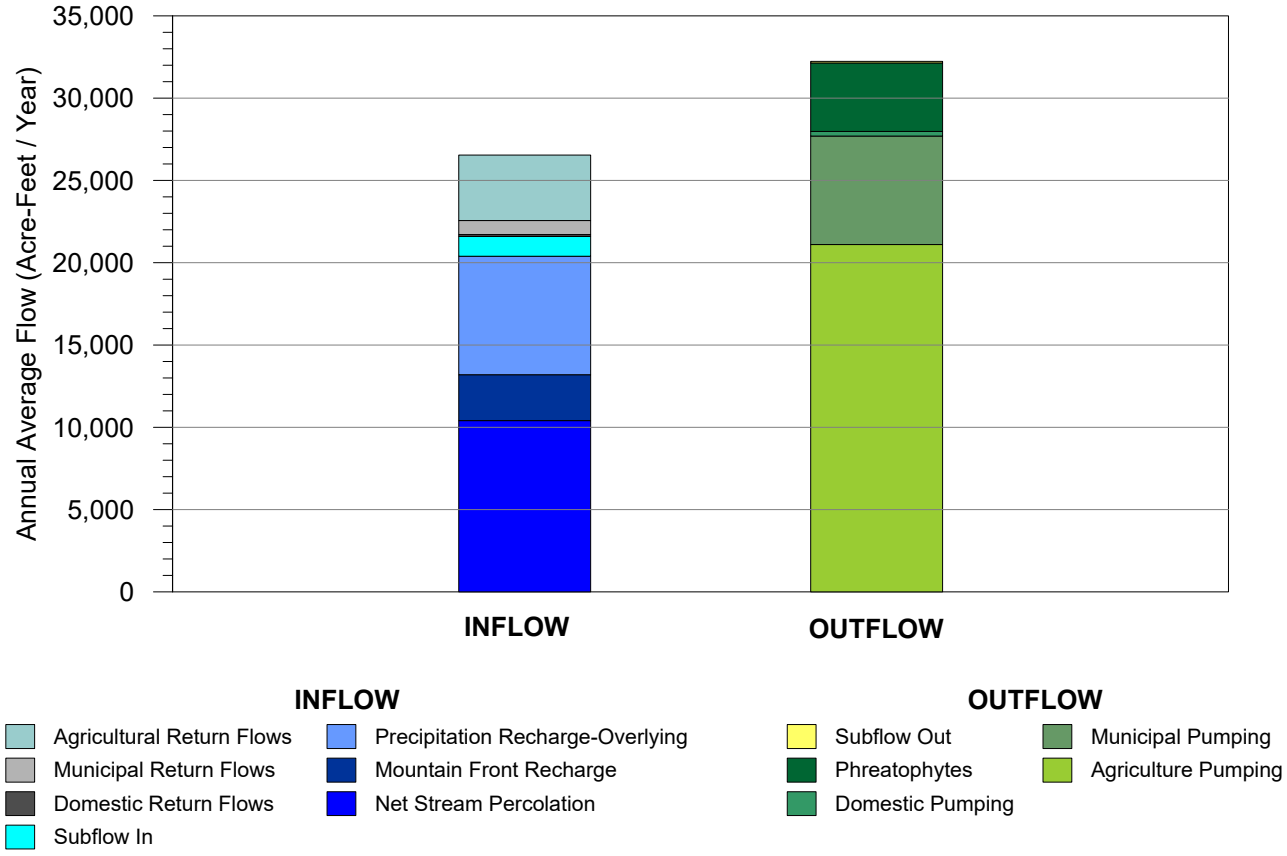
DRAFT
7/6/2021

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

FIGURE 2c.2-5

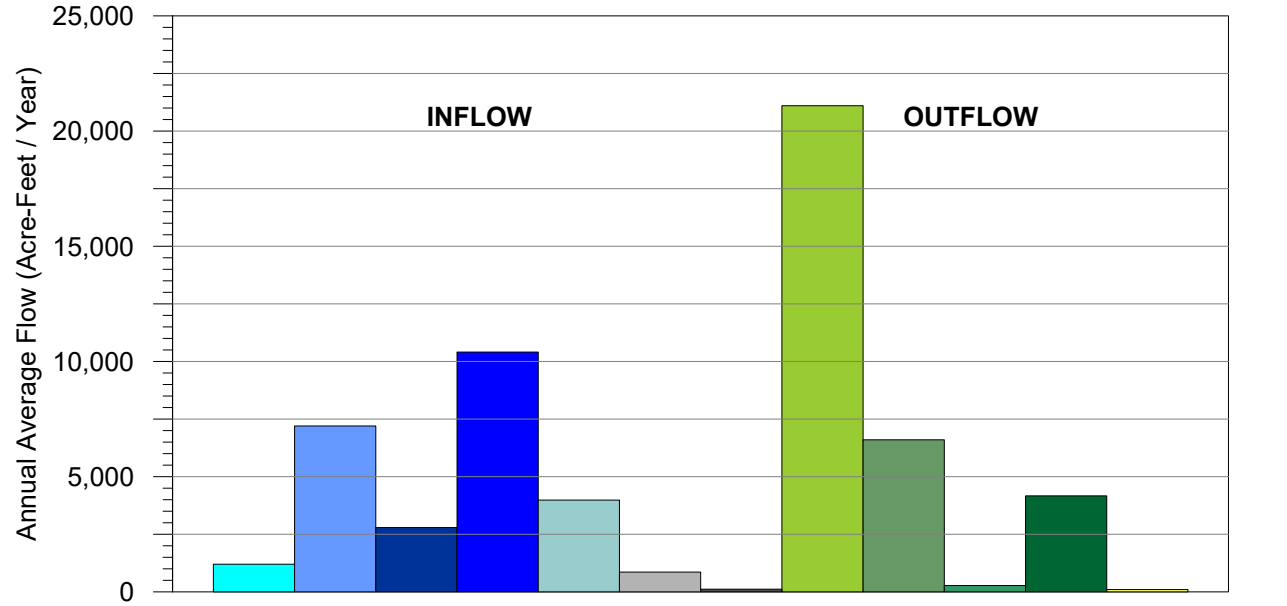
I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.2-06_Cumulative_Dewatered_Storage.1982.grf 7/6/2021

FIGURE 2c.3-1A



KEY GROUNDWATER COMPONENTS

FIGURE 2c.3-1B



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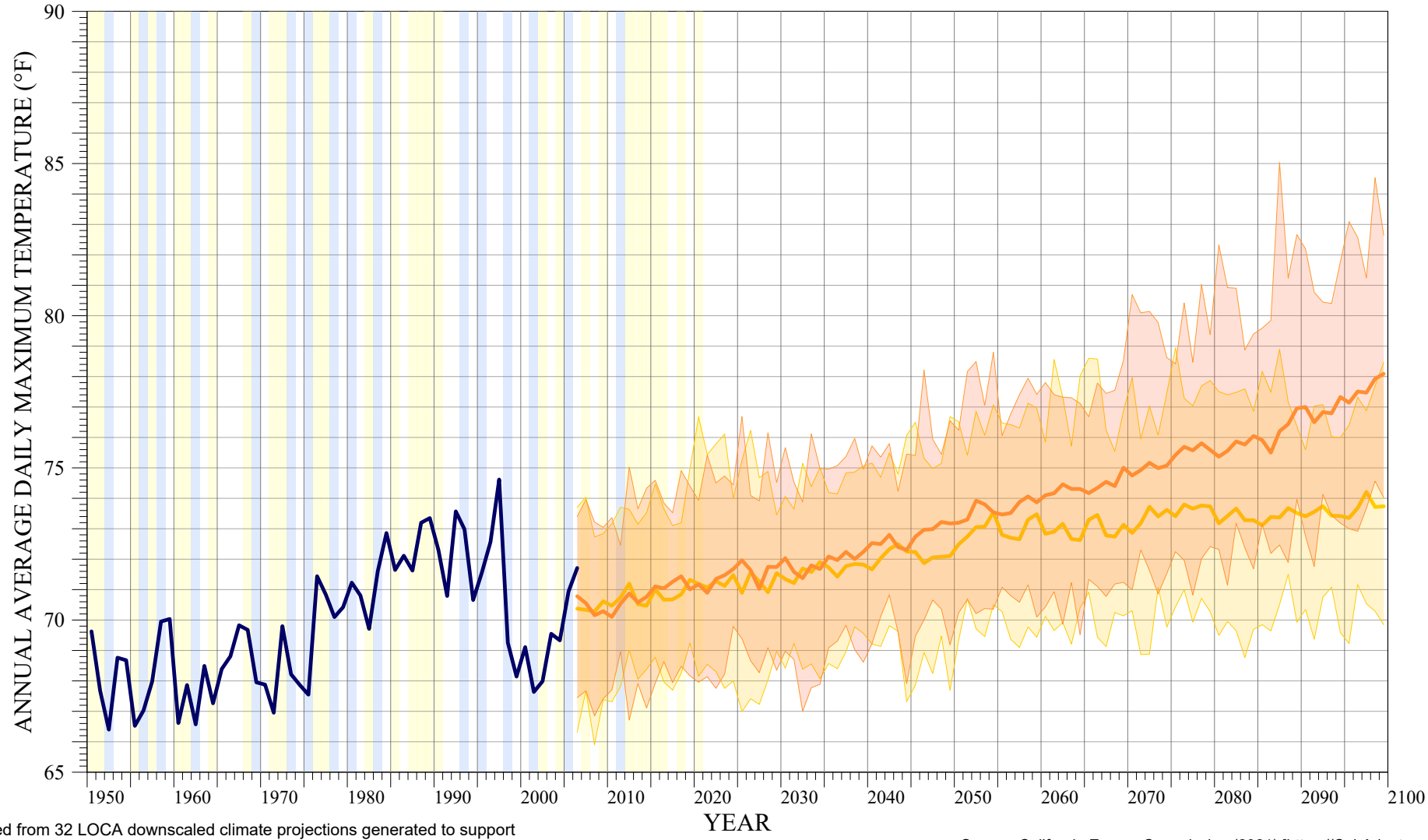
AVERAGE GROUNDWATER BUDGET VOLUMES CURRENT WY2011-2018

DRAFT 9/9/2021

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.3-01AB Avg Current GW Budgets WMA.grf 9/9/2021 M. McCammon



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 LOMPOC
CLIMATE PROJECTIONS

Climate Change Scenario
- High Emissions (RCP 8.5) Average
- Medium Emissions (RCP 4.5) Average
- Historical Observations

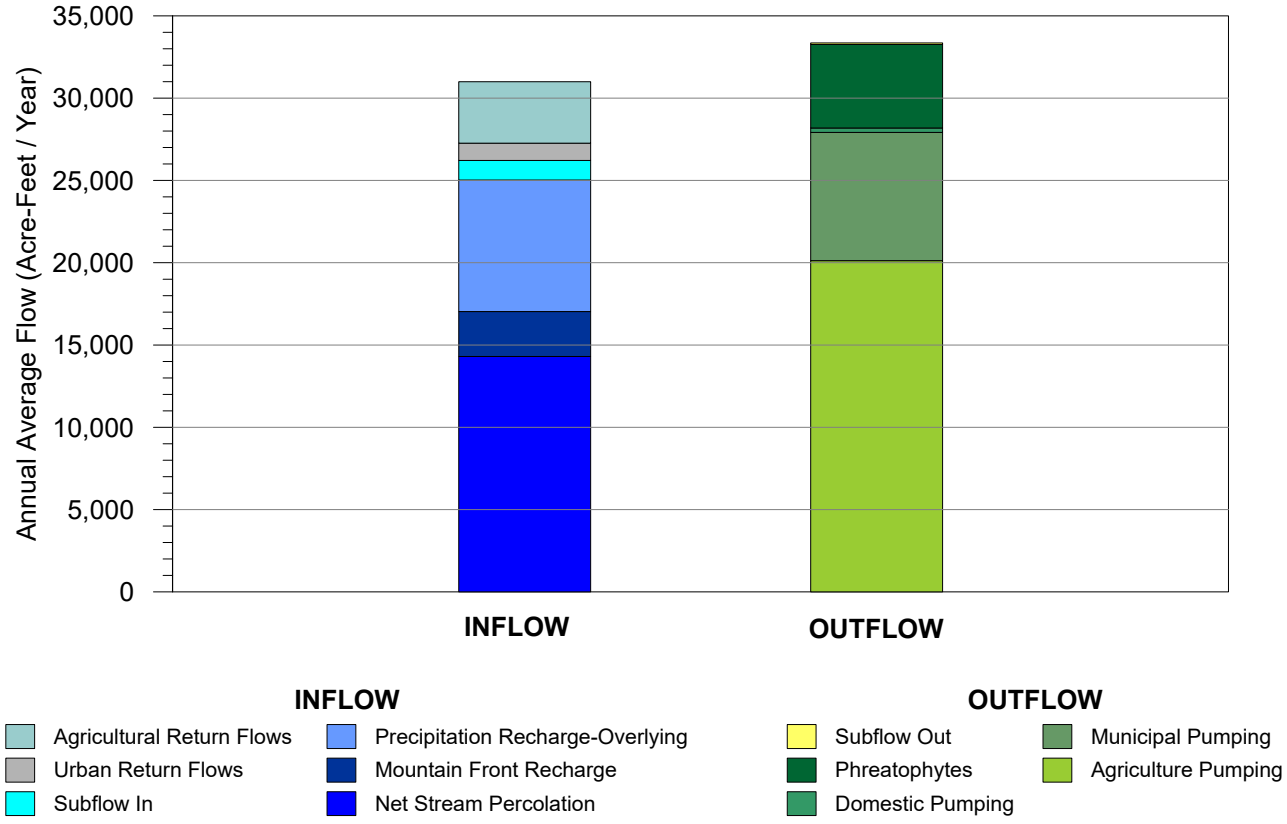
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

FIGURE 2c.4-1

I:\DATA\2710\Analyses\2021-07 Project Temps\Fig 2c.4-01 Projected Lompoc Temperature.grf 7/3/2021 M. McCammon

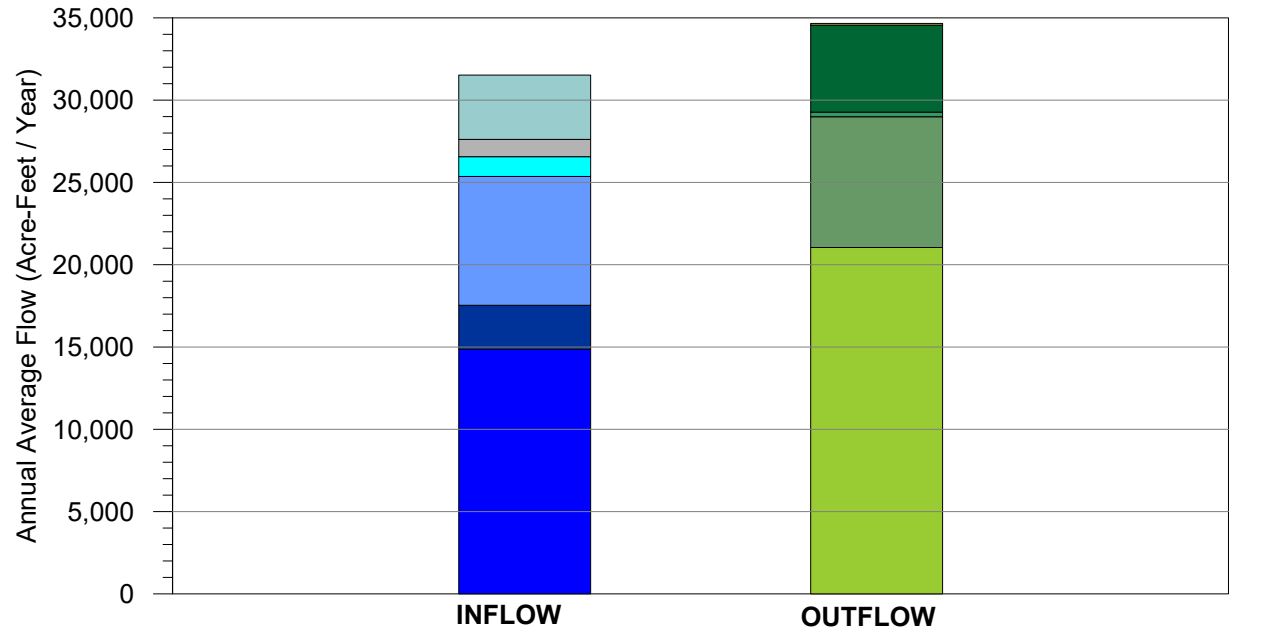
20-YEAR BUDGET, FUTURE 2042

FIGURE 2c.4-2A



50-YEAR BUDGET, FUTURE 2072

FIGURE 2c.4-2B



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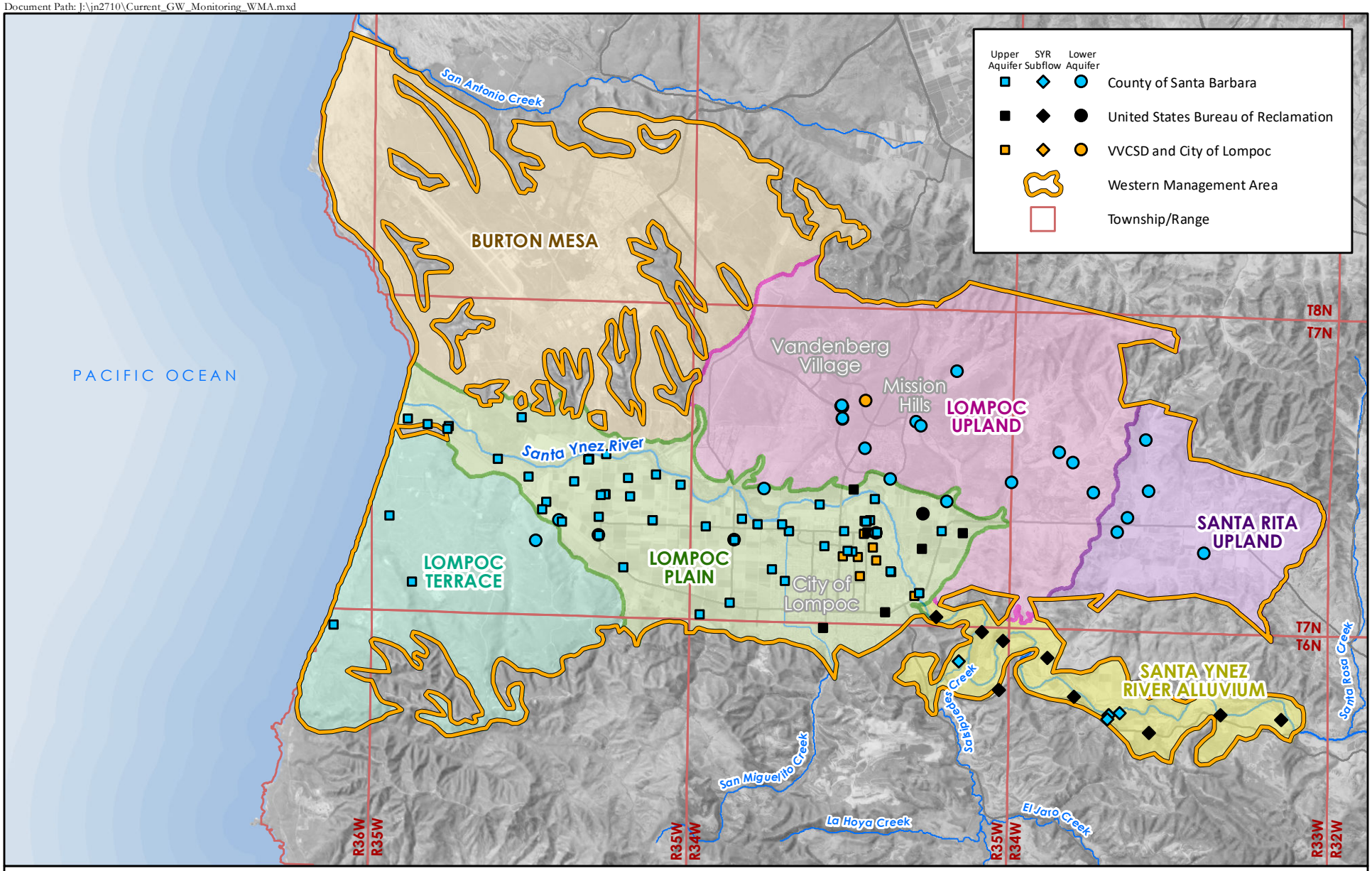
Western Management Area
Groundwater Sustainability Agency

AVERAGE GROUNDWATER BUDGET VOLUMES FUTURE PROJECTIONS

DRAFT 9/9/2021

I:\DATA\2710\Reports - Tech Memo\2021-01 Water Budget\WMA\Figures\Fig 2c.4-02AB Avg Future GW Budgets.grf 9/9/2021 M. McCammon

Document Path: J:\jn2710\Current_GW_Monitoring_WMA.mxd



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CURRENT GROUNDWATER LEVEL MONITORING PROGRAMS

DRAFT

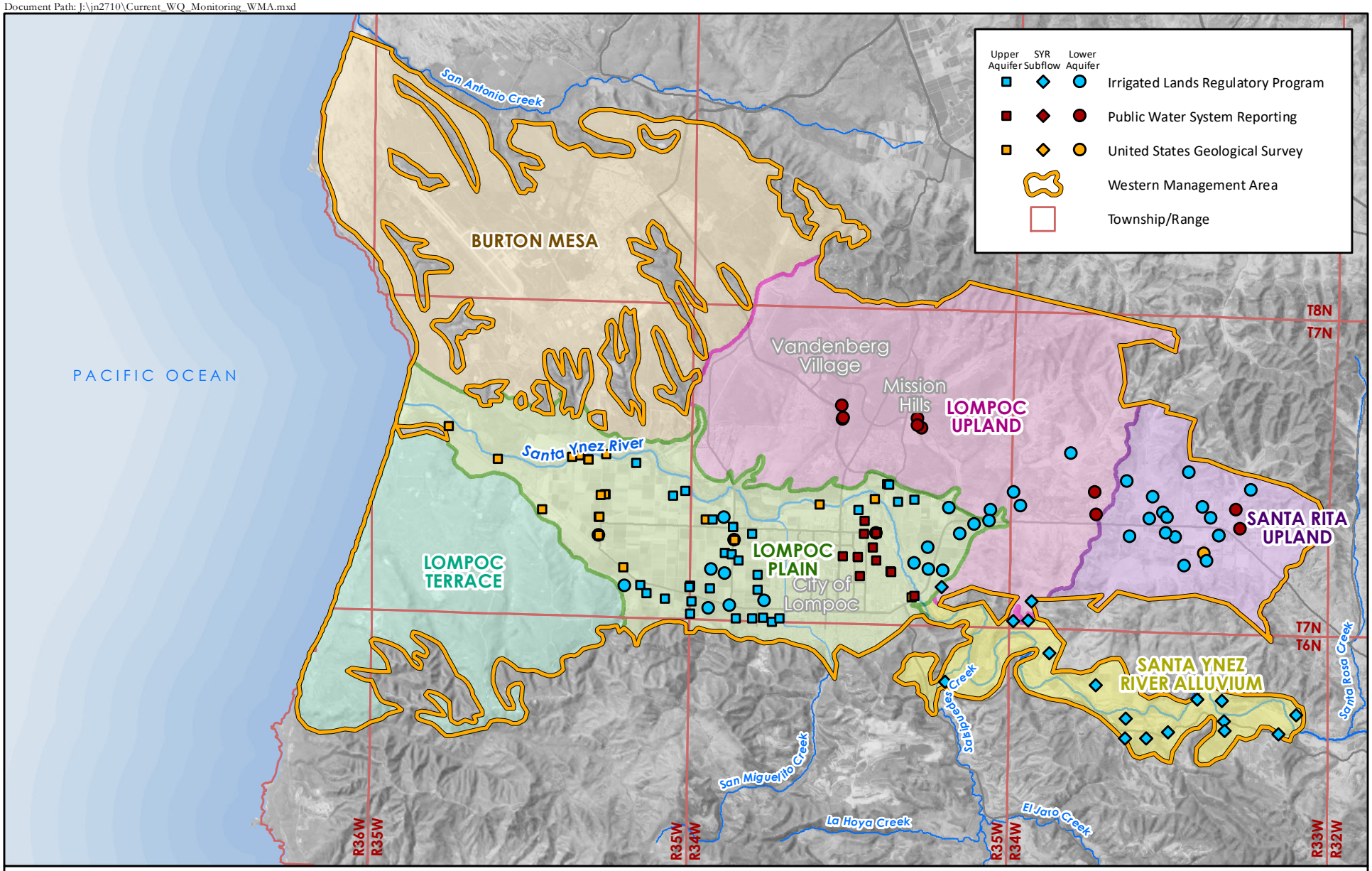
0 1 2 Miles

N

Note:
Wells shown were monitored 2015-2021.

FIGURE 3a.2-1

Document Path: J:\jn2710\Current_WQ_Monitoring_WMA.mxd



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Groundwater Sustainability Agency

CURRENT WATER QUALITY MONITORING PROGRAMS

DRAFT

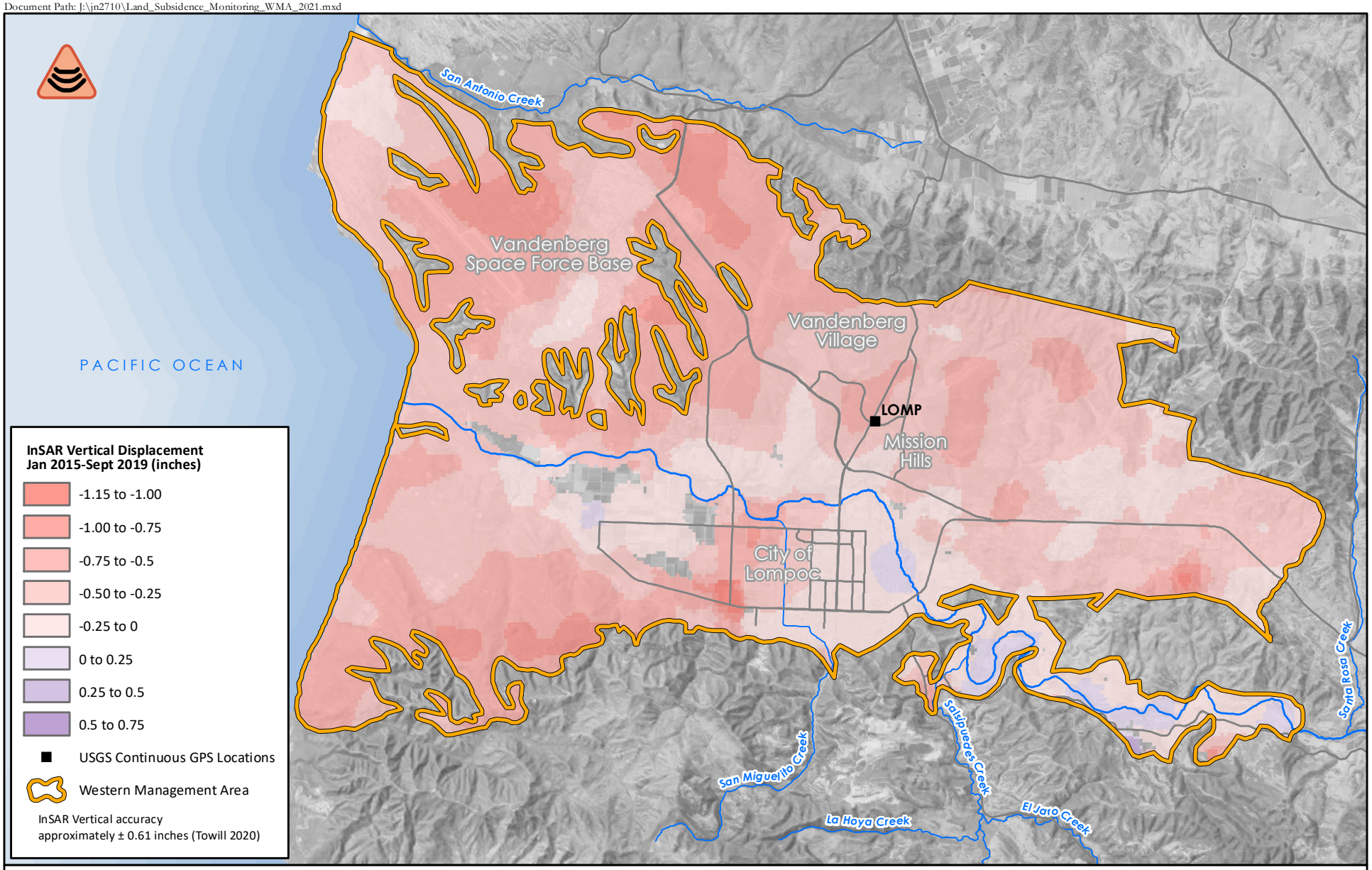
0 1 2 Miles

N

Note:
Wells shown were monitored 2015-2021.

FIGURE 3a.2-2

Document Path: J:\jn2710\Land_Subsidence_Monitoring_WMA_2021.mxd



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Western Management Area
Groundwater Sustainability Agency

LAND SUBSIDENCE MONITORING
WITHIN WESTERN MANAGEMENT AREA

DRAFT

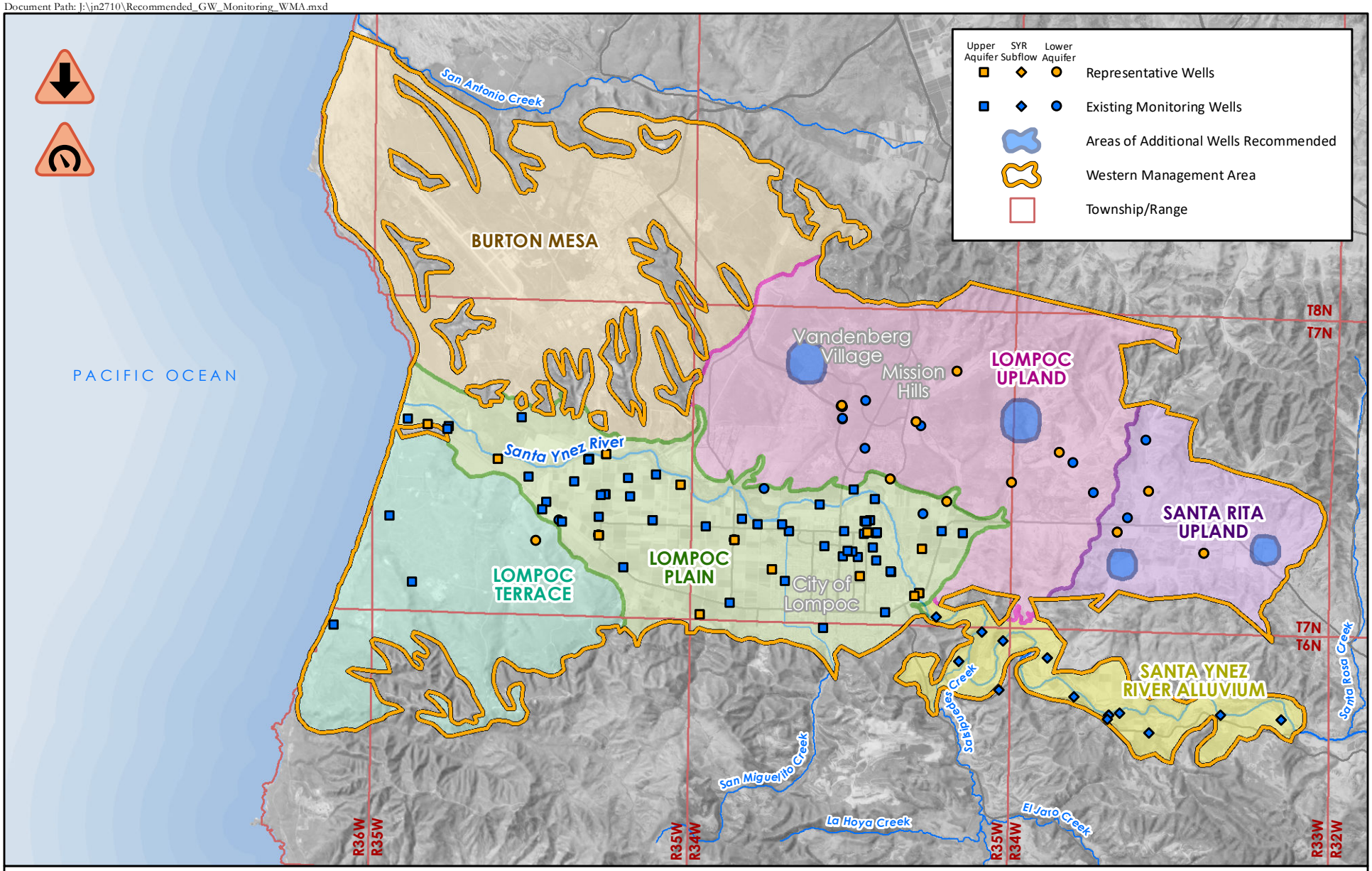
0 1 2 Miles

N

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

FIGURE 3a.2-3

Document Path: J:\jn2710\Recommended_GW_Monitoring_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

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

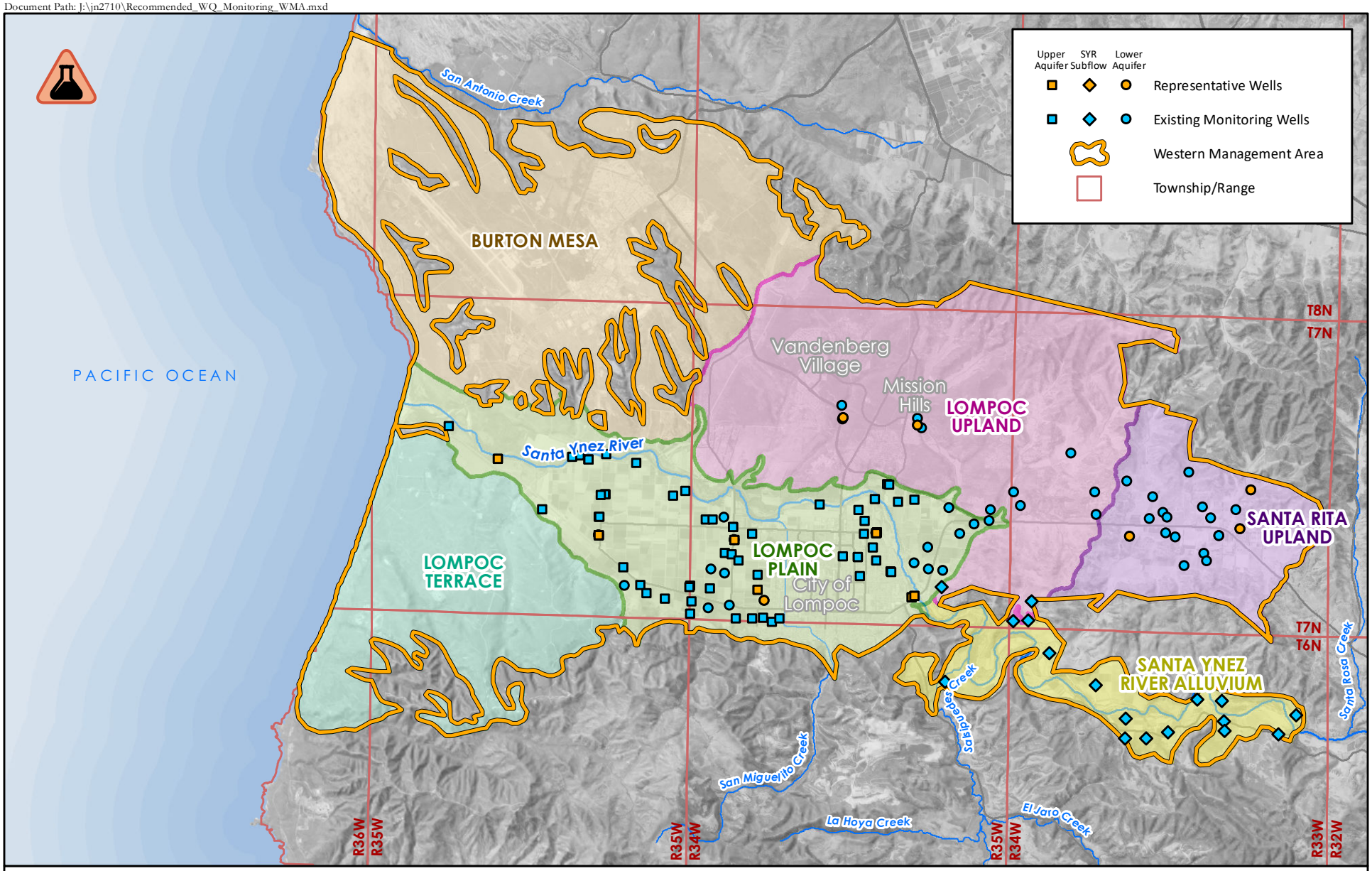
DRAFT

0 1 2 Miles

N

FIGURE 3a.3-1

Document Path: J:\jn2710\Recommended_WQ_Monitoring_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

WMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR WATER QUALITY

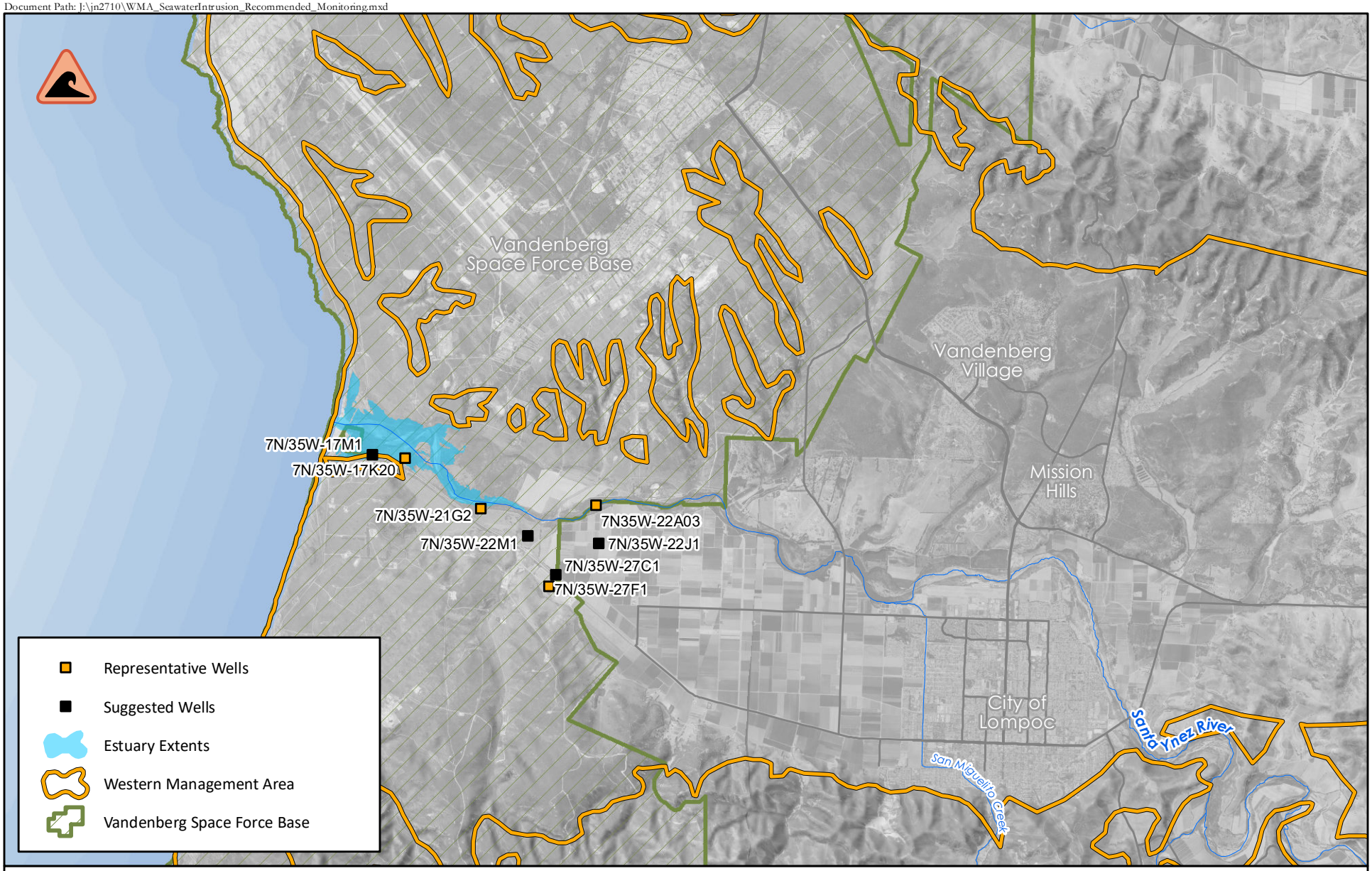
DRAFT

0 1 2 Miles

N

FIGURE 3a.3-2

Document Path: J:\jn2710\WMA_SeawaterIntrusion_Recommended_Monitoring.mxd



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Western Management Area
Groundwater Sustainability Agency

WMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR SEAWATER INTRUSION

DRAFT

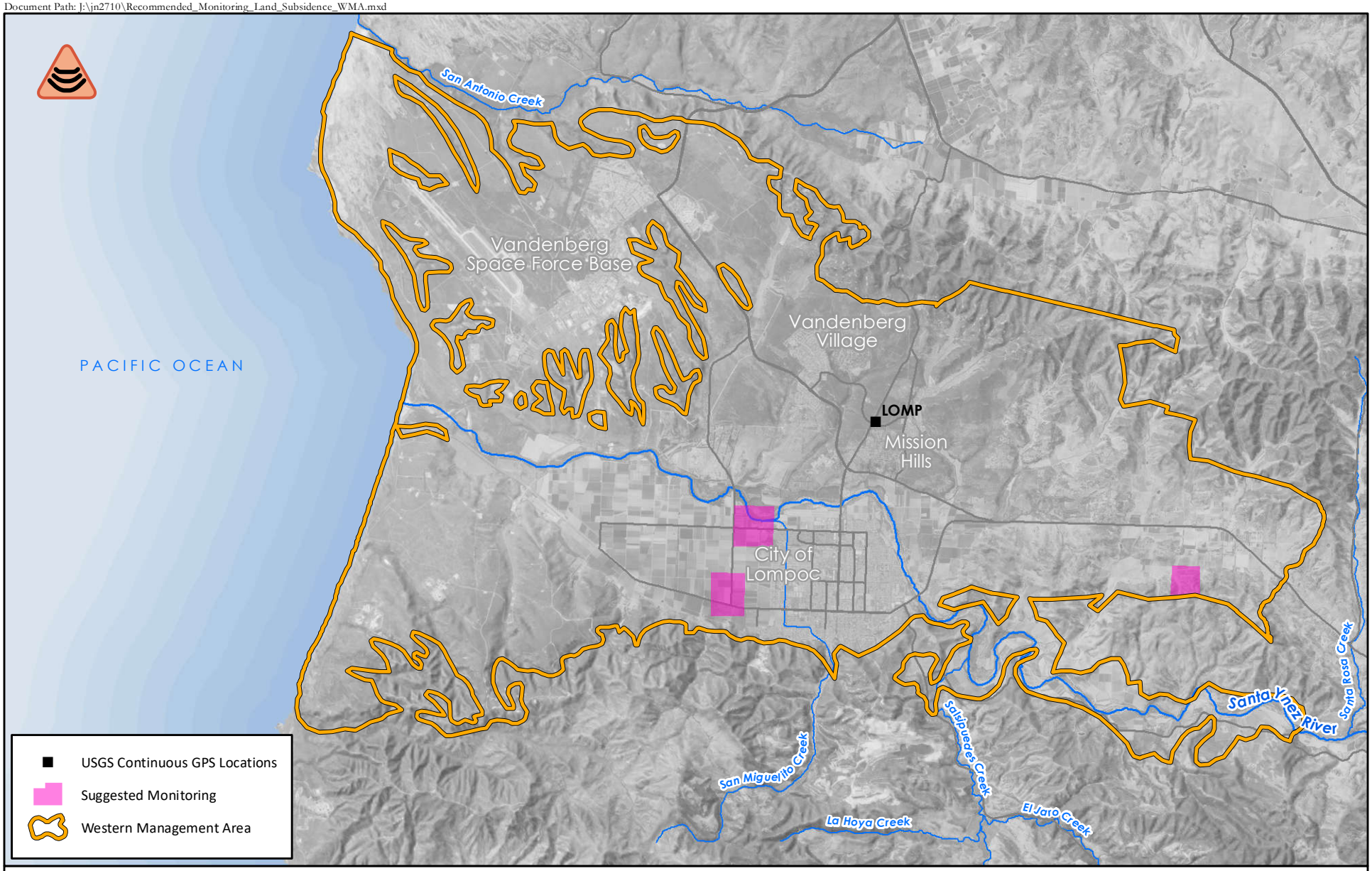
0 0.75 1.5 Miles

N

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

FIGURE 3a.3-3

Document Path: J:\jn2710\Recommended_Monitoring_Land_Subsidence_WMA.mxd



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Groundwater Sustainability Agency

WMA SUPPLEMENTAL MONITORING NETWORK FOR LAND SUBSIDENCE

DRAFT

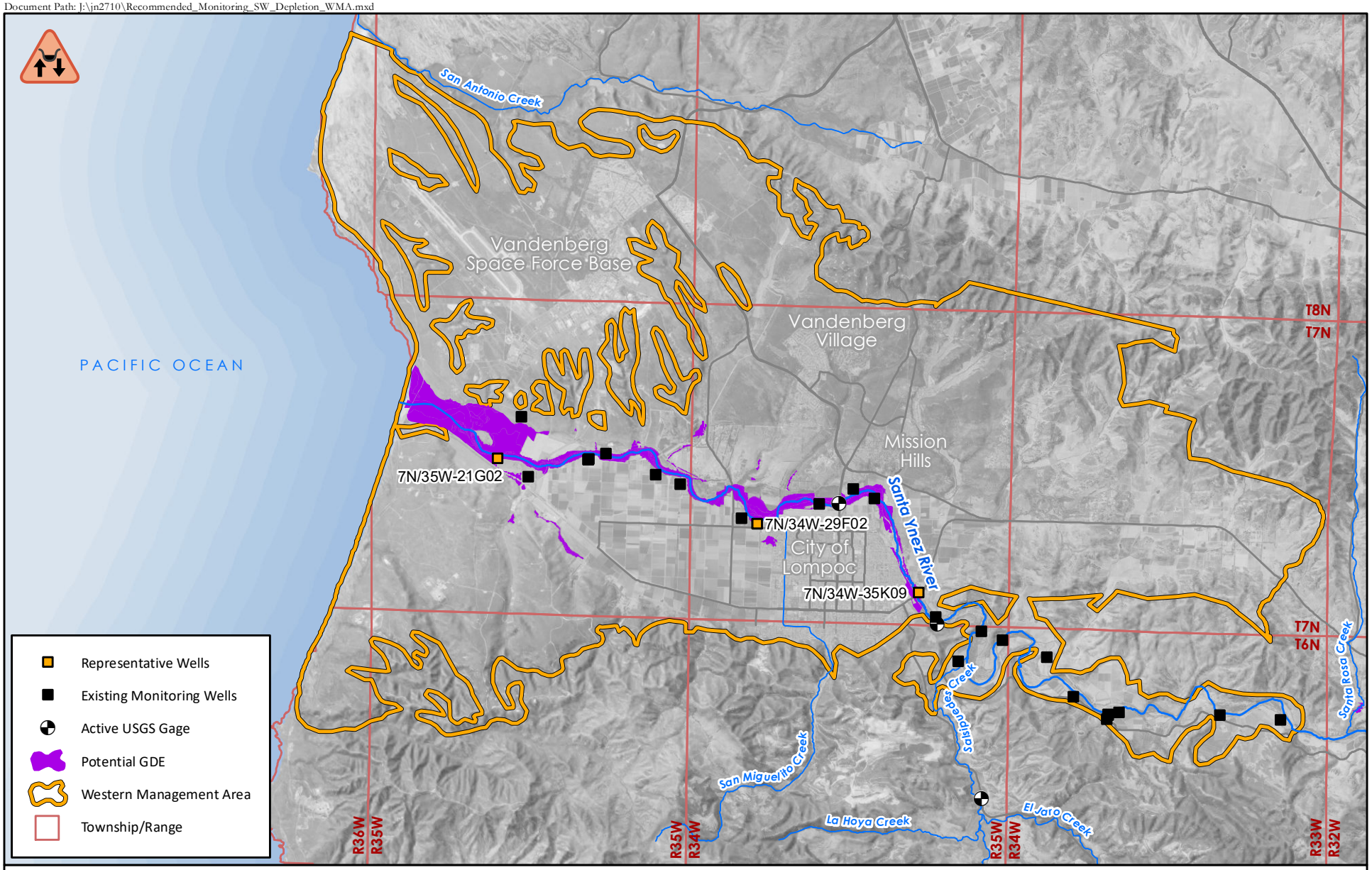
0 1 2 Miles

Note:
Primary land subsidence monitoring will be from remote sensing InSAR data.

N

FIGURE 3a.3-4

Document Path: J:\jn2710\Recommended_Monitoring_SW_Depletion_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

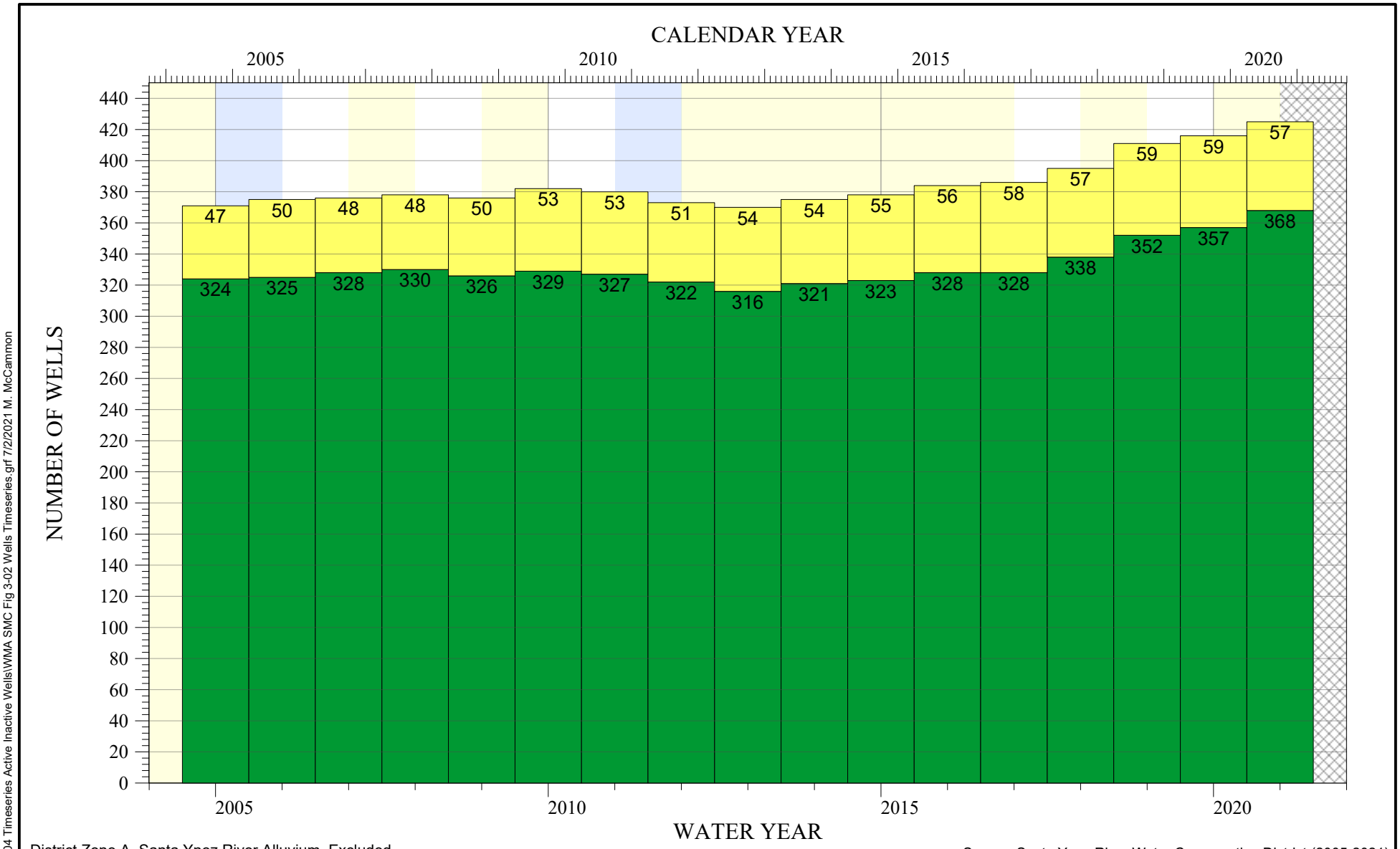
WMA MONITORING NETWORK AND REPRESENTATIVE MONITORING FOR GROUNDWATER DEPENDENT ECOSYSTEMS

DRAFT

0 1 2 Miles

N

FIGURE 3a.3-5



District Zone A, Santa Ynez River Alluvium, Excluded

Source: Santa Ynez River Water Conservation District (2005-2021)

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Groundwater Sustainability Agency

REGISTERED ACTIVE AND INACTIVE WELLS
DISTRICT ZONES B & F

DRAFT
7/2/2021

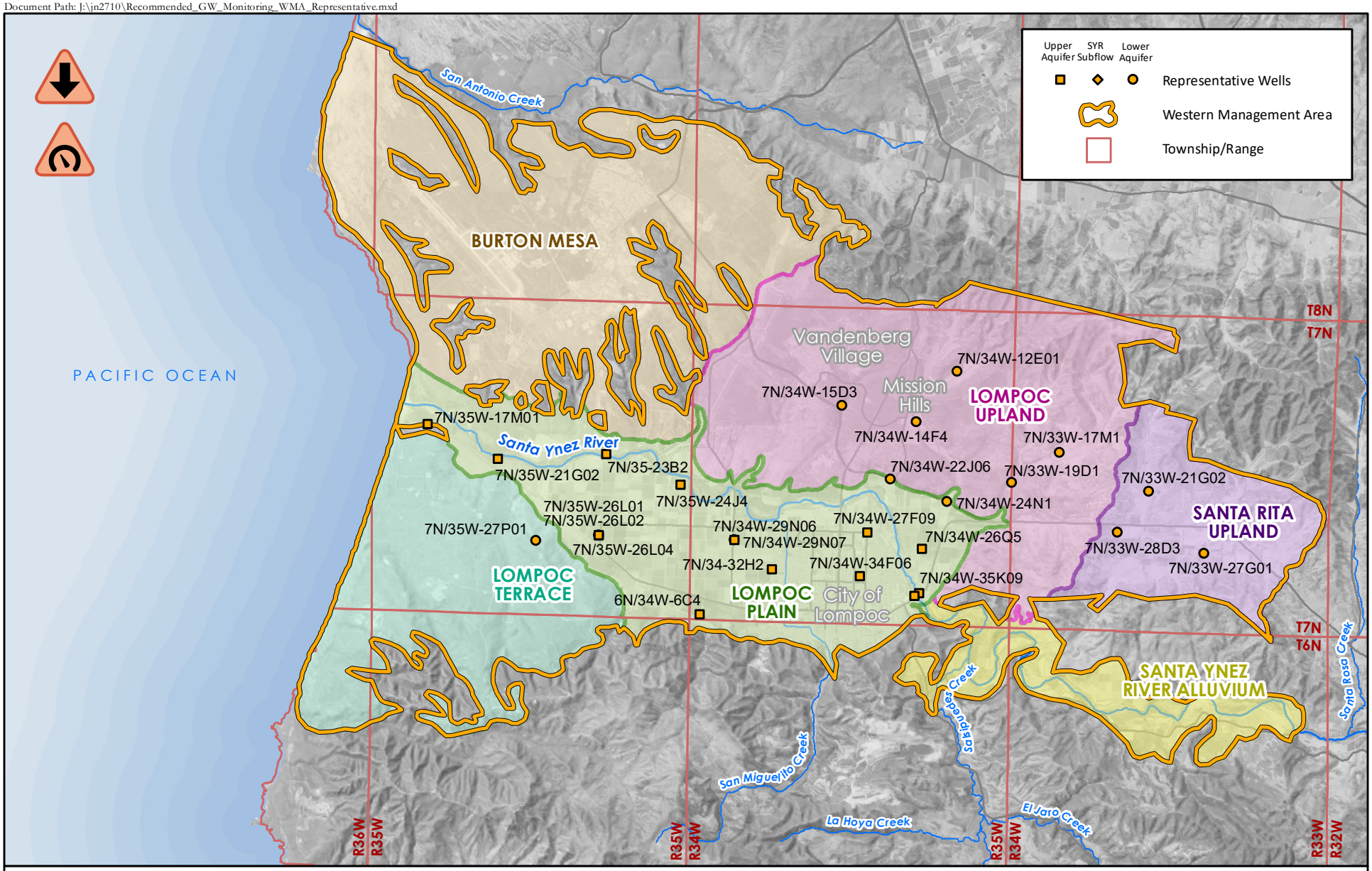
Water Year Type (1942-2020)
- Wet
- No Data
- Above/Below Normal
- Dry / Critically Dry

Well Type
- Active
- Inactive

FIGURE 3b.2-1

I:\DATA\2710\Analyses\2021-04 Timeseries Active Inactive Wells\WMA SMC Fig 3-02 Wells Timeseries.grf 7/2/2021 M. McCammon

Document Path: J:\jn2710\Recommended_GW_Monitoring_WMA_Representative.mxd



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Western Management Area
Groundwater Sustainability Agency

WMA REPRESENTATIVE MONITORING WELLS FOR GROUNDWATER LEVELS AND GROUNDWATER STORAGE

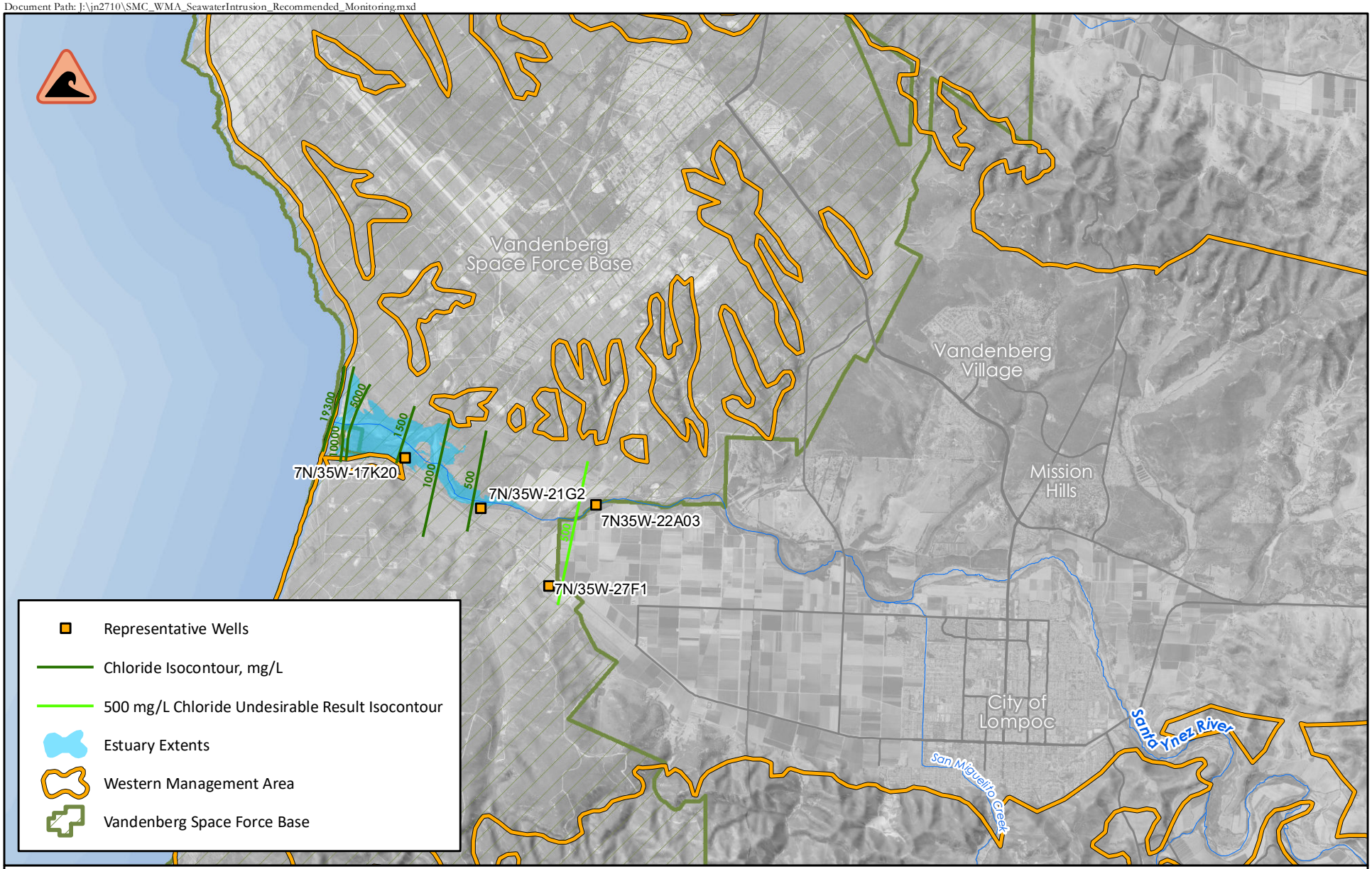
DRAFT

0 1 2 Miles

N

FIGURE 3b.2-2

Document Path: J:\jn2710\SMC_WMA_SeawaterIntrusion_Recommended_Monitoring.mxd



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Western Management Area
Groundwater Sustainability Agency

WMA MONITORING NETWORK AND REPRESENTATIVE MONITORING WELLS FOR SEAWATER INTRUSION

DRAFT

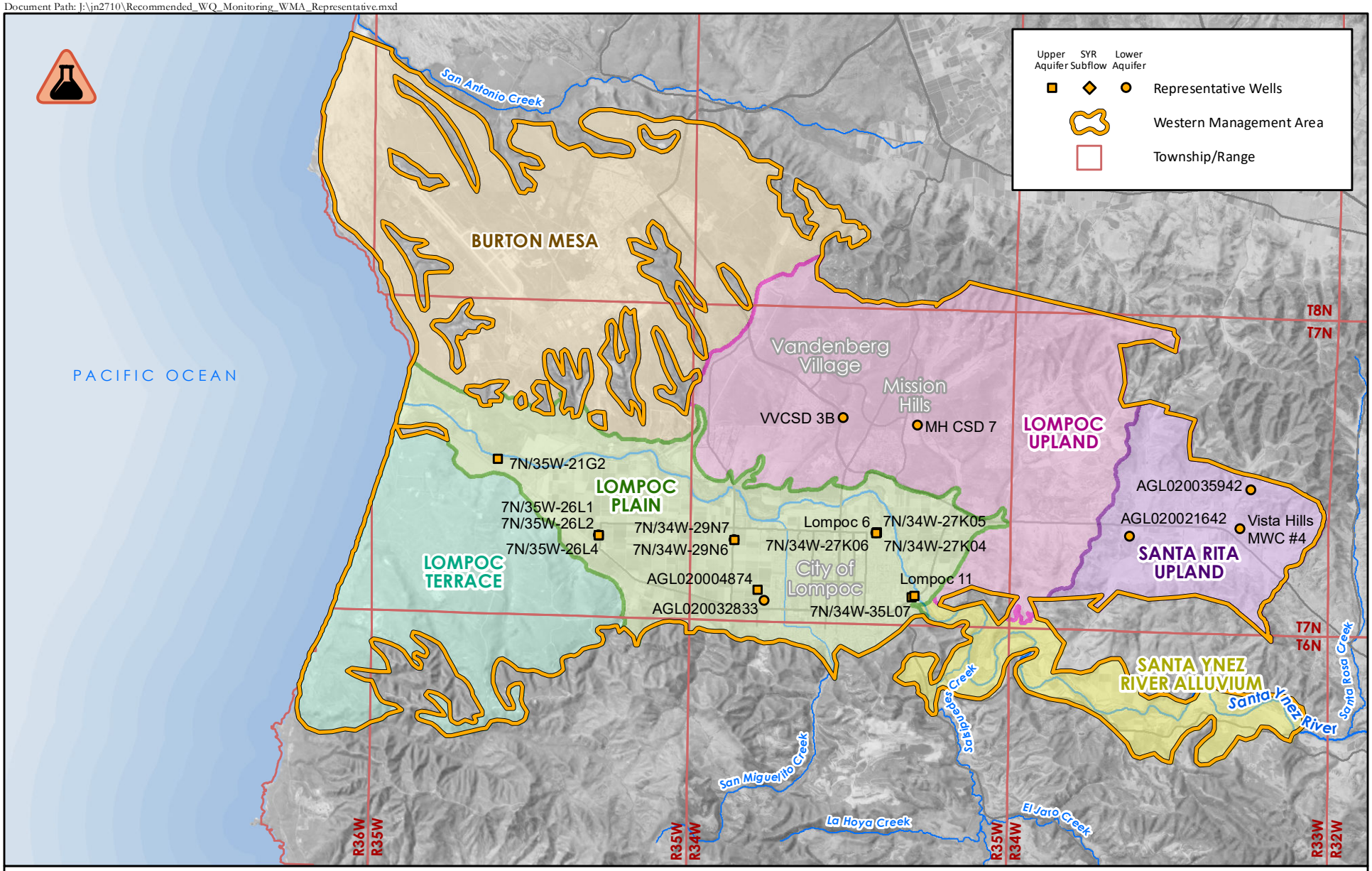
0 0.75 1.5 Miles

N

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

FIGURE 3b.2-3

Document Path: J:\jn2710\Recommended_WQ_Monitoring_WMA_Representative.mxd



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WMA

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

WMA REPRESENTATIVE MONITORING WELLS FOR WATER QUALITY

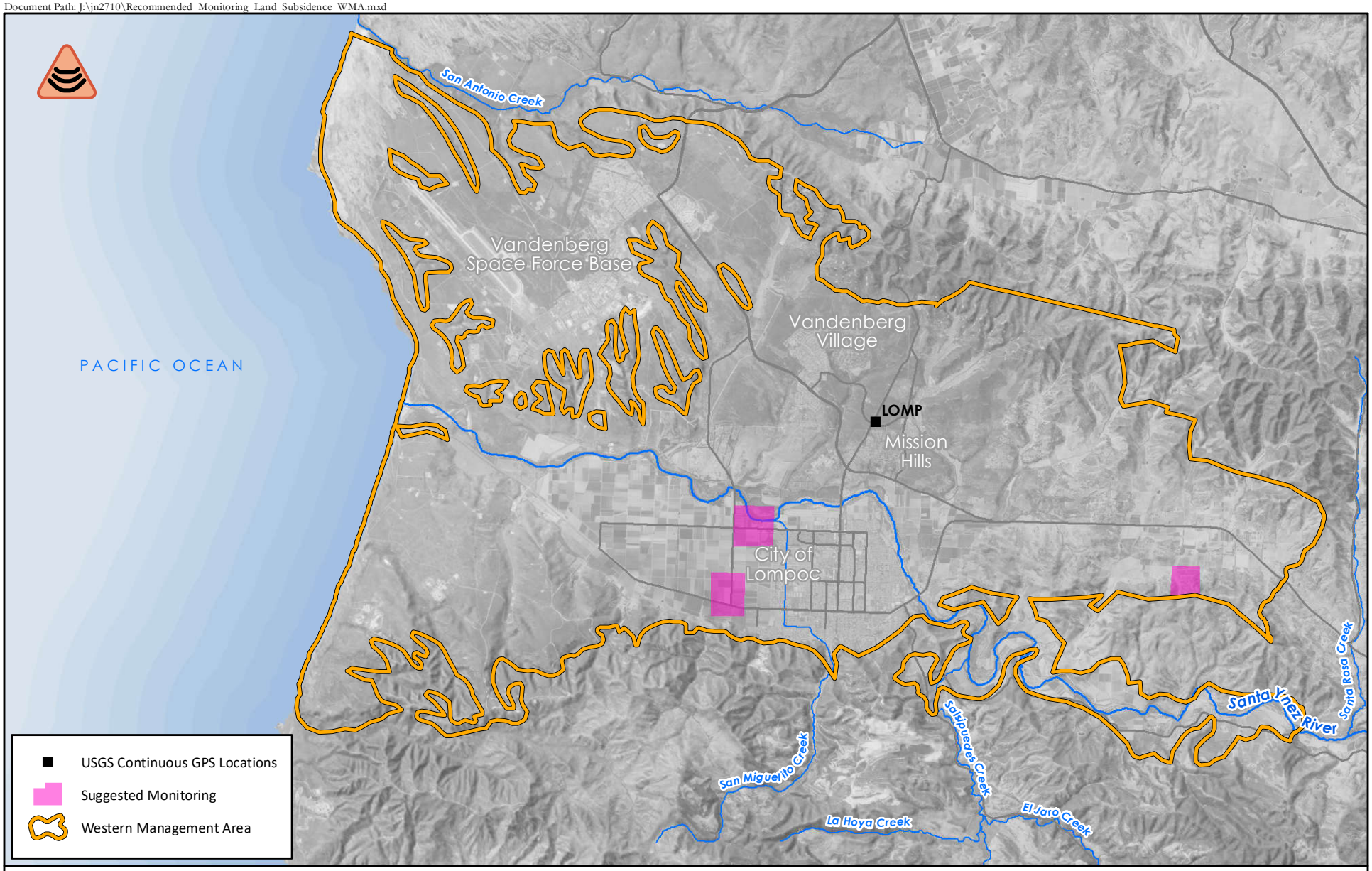
DRAFT

0 1 2 Miles

N

FIGURE 3b.2-4

Document Path: J:\jn2710\Recommended_Monitoring_Land_Subsidence_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

WMA SUPPLEMENTAL MONITORING NETWORK FOR LAND SUBSIDENCE

DRAFT

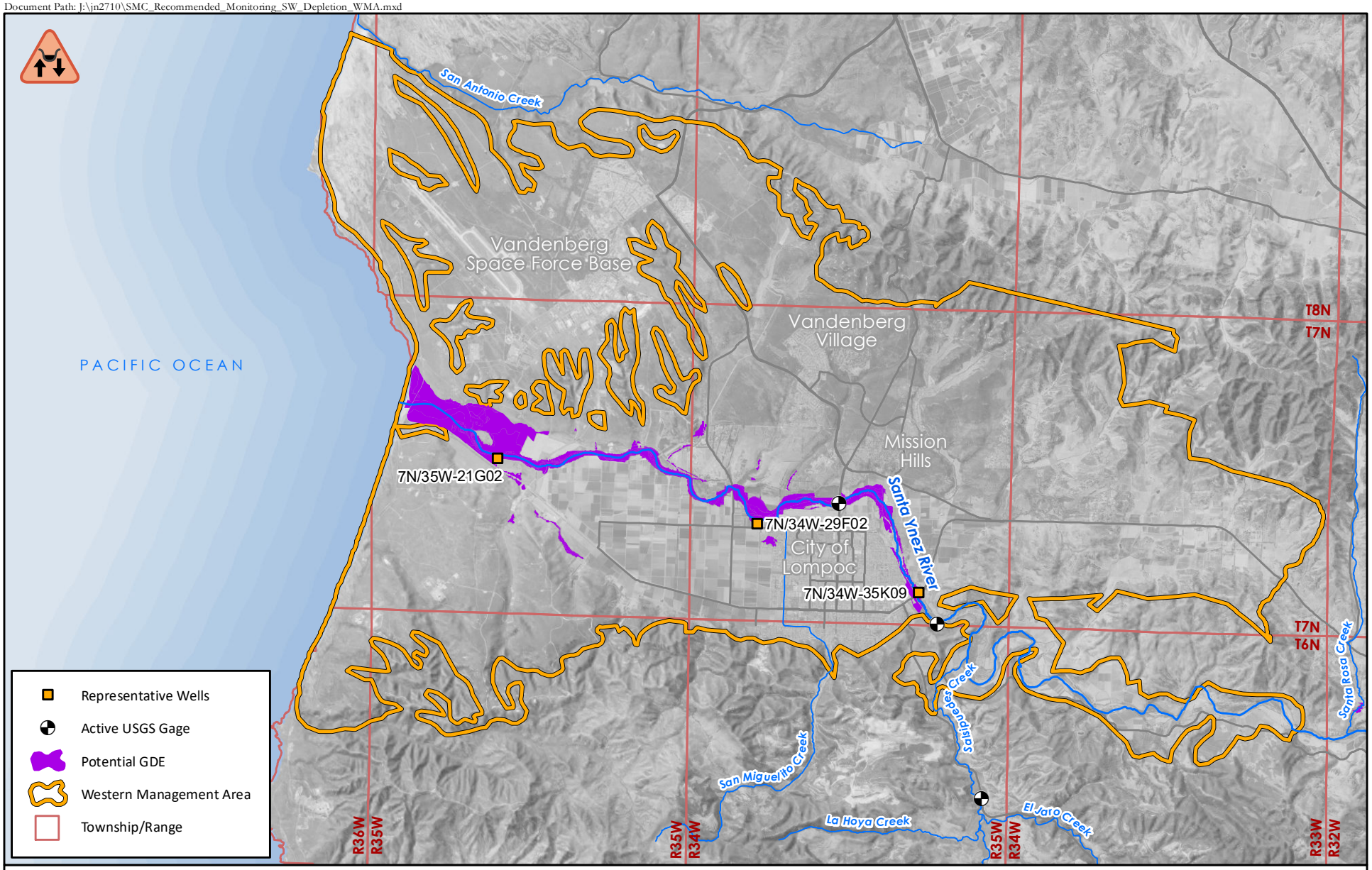
0 1 2 Miles

Note:
Primary land subsidence monitoring will be from remote sensing InSAR data.

N

FIGURE 3b.2-5

Document Path: J:\jn2710\SMC_Recommended_Monitoring_SW_Depletion_WMA.mxd



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Western Management Area
Groundwater Sustainability Agency

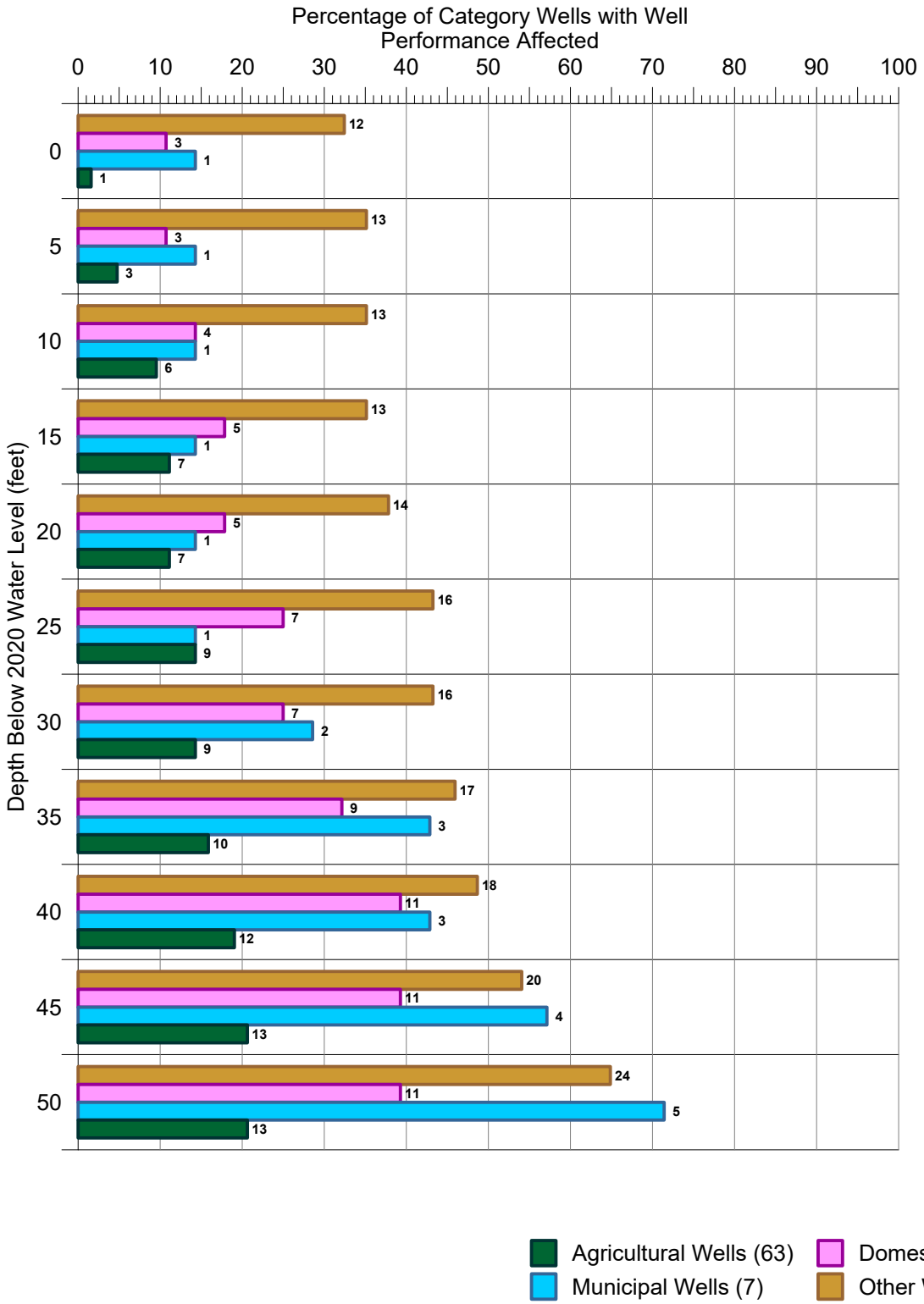
WMA REPRESENTATIVE MONITORING FOR GROUNDWATER DEPENDENT ECOSYSTEMS

DRAFT

0 1 2 Miles

N

FIGURE 3b.2-6



DRAFT
5/19/2021

Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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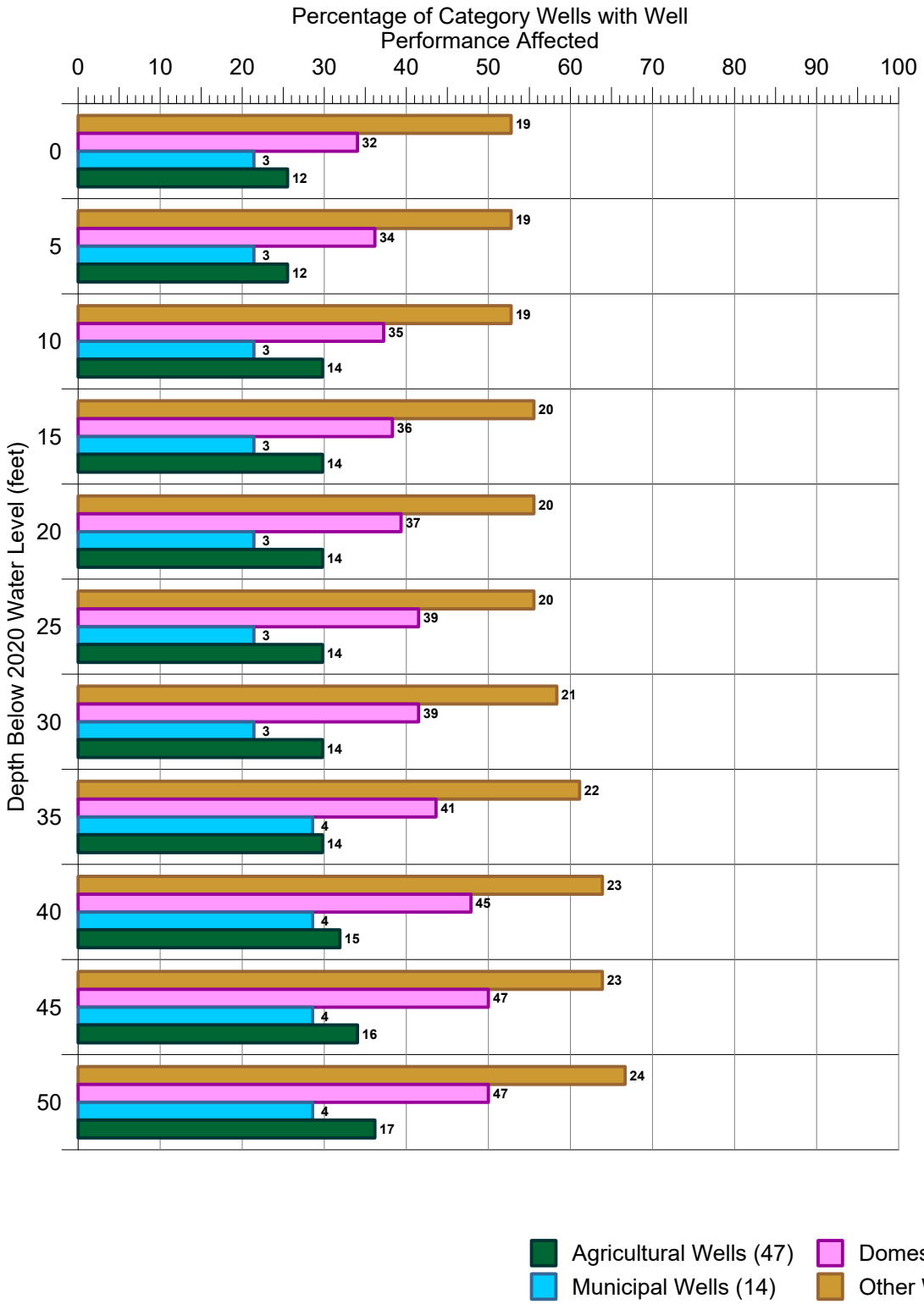
Western Management Area
Groundwater Sustainability Agency

WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-03 WMA_UA_Perforation_Top_Analysis_BAR.grf 5/19/2021 M. McCammon



DRAFT
5/19/2021

Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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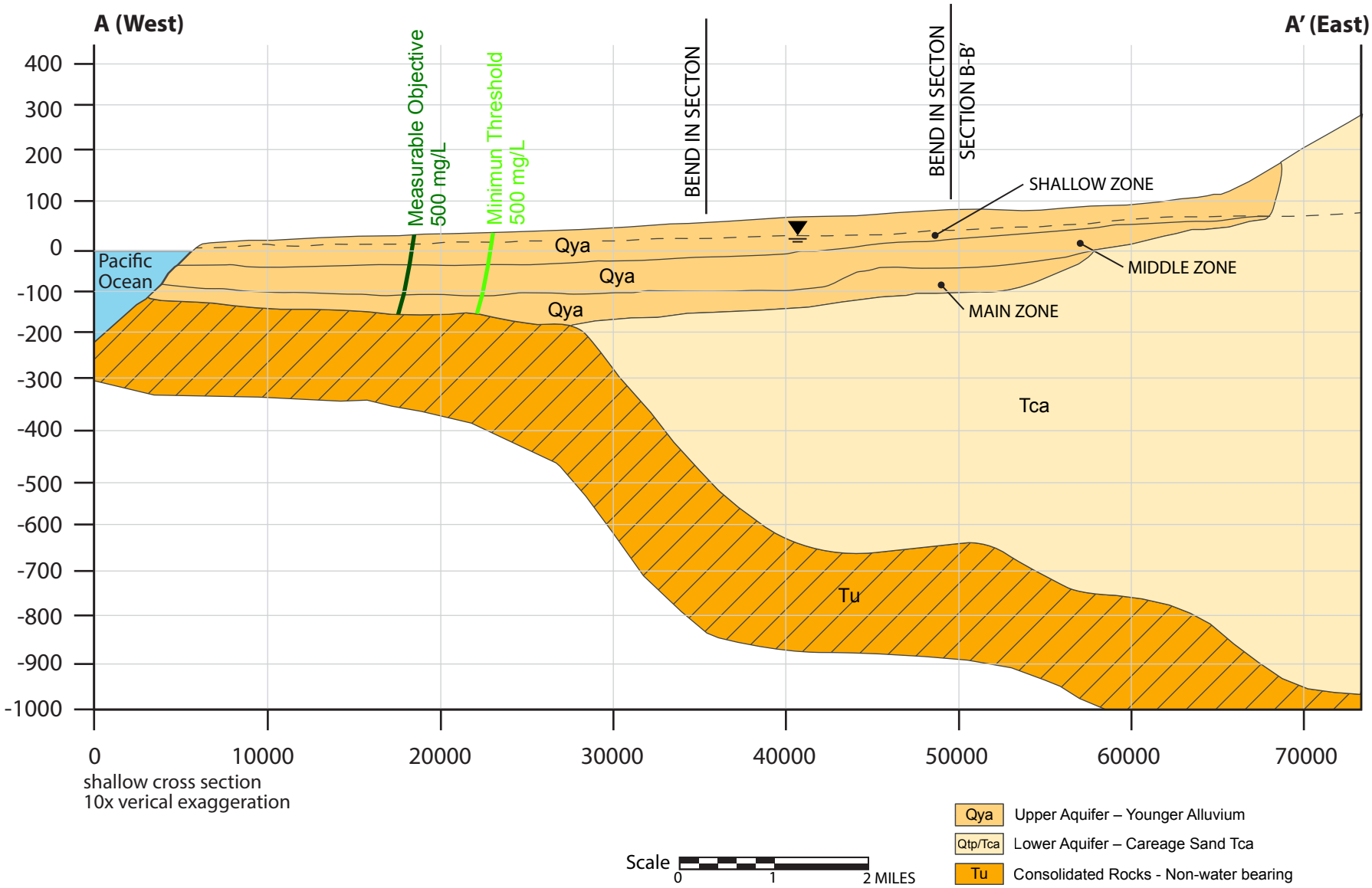
Western Management Area
Groundwater Sustainability Agency

WELL PERFORATIONS RELATIVE TO LOWER AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 2-03 WMA_LA_Perforation_Top_Analysis_BAR.grf 5/19/2021 M. McCammon



Cross sections based on City of Lompoc Groundwater Management Plan (West Yost, 2013); Originally based on United States Geological Survey, Bright and Others, 1992 (Plate 1).

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Western Management Area
Groundwater Sustainability Agency

WESTERN MANAGEMENT AREA AQUIFER CROSS SECTION A-A'
CHLORIDE ADVANCEMENT FRONT
MEASURABLE OBJECTIVE AND MINIMUM THRESHOLD

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 3b.3-3

PUBLIC DRAFT

GROUNDWATER SUSTAINABILITY PLAN

APPENDICES

WMA

Western Management Area

SEPTEMBER 2021

Geosyntec consultants

STETSON ENGINEERS INC.

DUDEK

WATER RESOURCE PROFESSIONALS
SERVING CLIENTS SINCE 1957

WMA GSP 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. 10 pg.

Appendix 1b-B: SYRWCD Letter, Notice of Decision to Become a Groundwater Sustainability Agency - Santa Ynez River Valley Groundwater Basin, Western Management Area, dated February 2, 2017. 48 pg.

Appendix 1b-C: Intra-Basin Administrative Agreement for Implementation of the Sustainable Groundwater Management Act in the Santa Ynez River Valley Groundwater Basin. 16 pg.

Appendix 1b-D: [PLACEHOLDER] Coordination Agreement. 1 pg.

Appendix 1c-A: Santa Ynez SGMA Meeting List, dated July 1, 2021. 3 pg.

Appendix 1c-B: Restrictions on Public Meetings due to SARS-COV-2 (COVID-19). 35 pg.

Appendix 1c-C: Draft Final Public Outreach and Engagement Plan, Western Management Area, dated February 2020, 32 pg.

Appendix 1c-D: Sustainable Groundwater Management Act Newsletter No.1 through No.4 and Press Releases. 10 pg.

Appendix 1c-E: Groundwater Communication Portal, Location: California, Client: California Department of Water Resources by GEI Consultants, 2018. 3 pg.

Appendix 1d-A: Stetson Engineers Technical Memorandum, Santa Ynez River Valley Groundwater Basin - Internal Management Area Boundary Changes, dated August 10, 2021. 4 pg.

Appendix 1e-A: Draft Final Data Management Plan, Western Management Area, dated February 2020. 33 pg.

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. 9 pg.

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. 19 pg.

Appendix 2b-A: Dudek Land Subsidence Technical Memorandum 11736, Dated December 2020. 21 pg.

Appendix 2c-A: Stetson Engineers Draft Technical Memorandum, WMA/CMA Numerical Model Documentation, Dated May 19, 2021. 109 pg.

CHAPTER 3 – MONITORING AND SUSTAINABLE MANAGEMENT CRITERIA

Appendix 3a-A: California Statewide Groundwater Elevation Monitoring (CASGEM) Program Procedures for Monitoring Entity Reporting. 33 pg.

Appendix 3b-A: Groundwater Level Hydrographs for Assessing Chronic Decline in Groundwater Levels, Western Management Area. Dated May 10, 2021. 27 pg.

Appendix 3b-B: Stetson Engineers Draft Technical Memorandum Sustainable Management Criteria: WMA Groundwater Decline Analysis, 26 pg.

Appendix 3b-C: Time Series Chloride Graphs for Assessing Seawater Intrusion, Western Management Area. 3 pg.

Appendix 3b-D: Time Series Graphs for Assessing Degraded Groundwater Quality, Western Management Area. 54 pg.

Appendix 3b-E: Stetson Engineers Groundwater Level Hydrographs for Assessing Surface Water Depletion, Western Management Area. 4 pg.

CHAPTER 4 – PROJECT AND MANAGEMENT ACTIONS

No Appendices

CHAPTER 5 – IMPLEMENTATION

No Appendices

PUBLIC REVIEW COMMENTS

Appendix PC-A: [PLACEHOLDER] Public Review Comments

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

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: _____

City Manager

Address: 1644 Oak St

Solvang, CA 93463

Email bradb@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: _____
MARC BIERUZINSKI, 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 _____

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

Email _____

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

Email _____

CITY OF LOMPOC

By: _____

Address: _____

_____

Email _____

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: Robert H Wyckoff

Address: 3757 Constellation Road
Lompoc, CA 93436

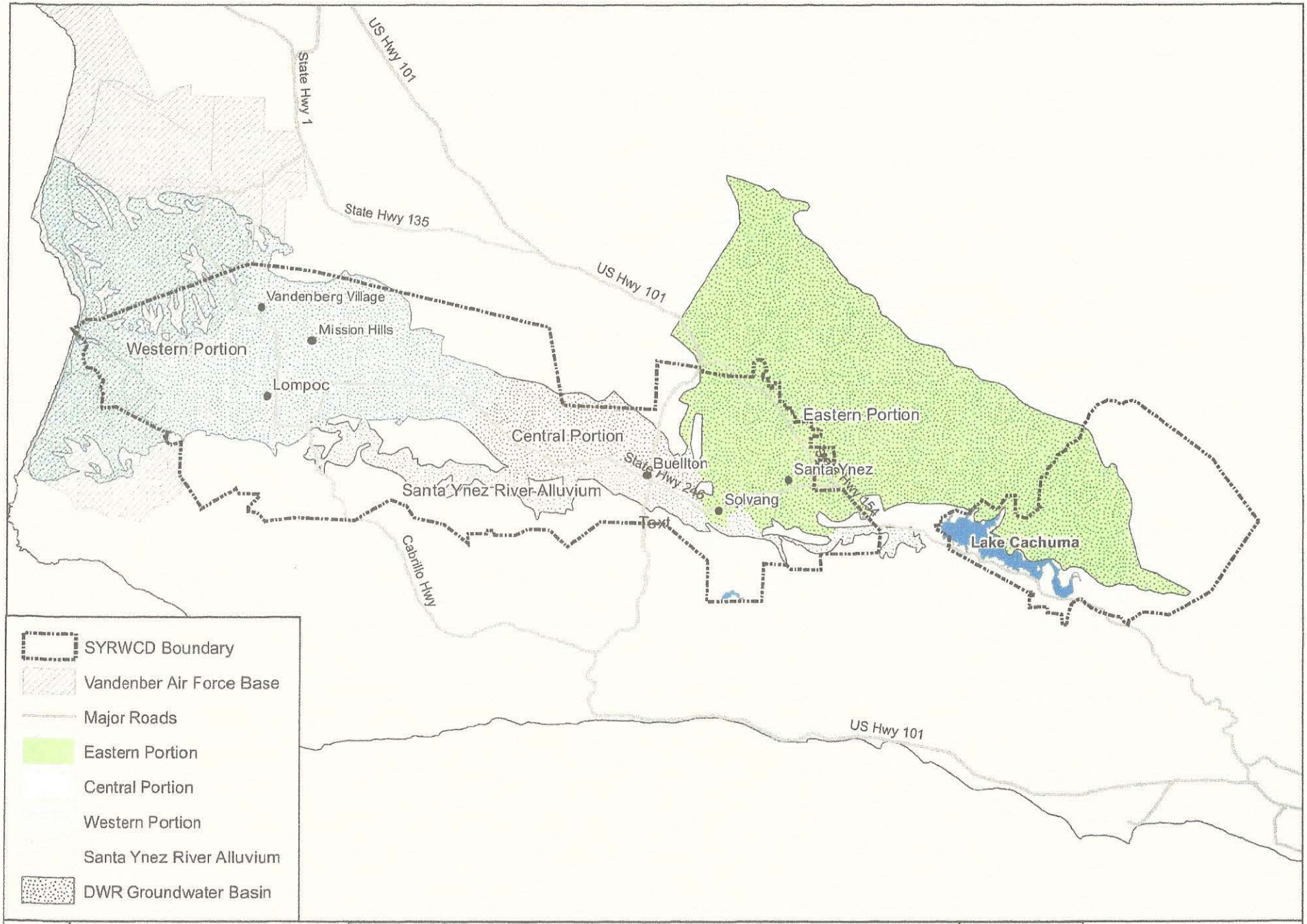
Email rewyckoff@verizon.net

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: M.W. Riley

Address: 1550 E. Burton Mesa
Blvd, Lompoc, CA 93436

Email mrd@mhcsd.



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, Western Management Area, Dated February 2, 2017

SANTA YNEZ RIVER VALLEY BASIN
WESTERN MANAGEMENT AREA
GROUNDWATER SUSTAINABILITY AGENCY

CITY OF LOMPOC,
VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT,
MISSION HILLS COMMUNITY SERVICES DISTRICT,
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, Western 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 Lompoc (City), the Mission Hills Community Services District (MHCSD), the Vandenberg Village Community Services District (VVCSD) and the Santa Barbara County Water Agency (County Water Agency) hereby give notice of their decision to form the Western Management Area Groundwater Sustainability Agency (GSA) for the Western Portion of the Santa Ynez River Valley Basin (Basin Number 3-015, DWR Bulletin 118), which includes the Lompoc Area Basins and all reaches of the Santa Ynez River within the Western 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 Western Management Area GSA. The digital GIS data corresponding to the three figures in Exhibit 1 is included with this submittal.

The Western Portion will consist of the Western Management Area GSA (WMA GSA). The agencies that will be part of the WMA GSA include the City, MHCSD, VVCSD, the County Water Agency, and the SYRWCD, herein referred to as the "WMA Agencies". The WMA Agencies are the only public agencies in the WMA GSA, as defined by SGMA, eligible to form a GSA. The WMA GSA will be a non-overlapping, multi-agency GSA with boundaries that follow the entire Western Portion of the Santa Ynez River Valley Basin as defined by the 2016 version of DWR Bulletin 118. The WMA Agencies agreed to form a GSA under a Memorandum of Agreement (MOA) as discussed below.

A public hearing (Water Code §10723 (b)) on the WMA GSA formation was held on November 17, 2016 at the Lompoc City Council Chambers, as required by SGMA. The public hearing was jointly held by the WMA Agencies. Copies of the public notices for the public hearing are provided in Exhibit 2.

On December 6, 2016, the Lompoc City Council passed Resolution 6083(16) wherein the City resolved to become a member of the WMA GSA in cooperation with the other WMA Agencies. On December 6, 2016, the Santa Barbara County Board of Supervisors serving as the Santa Barbara County Water Agency Directors passed Resolution 16-283 wherein the County Water Agency resolved to become a member of the WMA GSA in cooperation with the other WMA Agencies. On December 6, 2016, VVCSD passed Resolution 204-16, wherein the VVCSD resolved to become a member of the WMA GSA in cooperation with the other WMA Agencies. On December 21, 2016, the MHCSD passed Resolution 16-309 wherein the MHCSD resolved to become a member of the WMA GSA in cooperation with the other WMA Agencies. On January 11, 2017, the Board of Directors for the SYRWCD passed resolution 664 wherein the SYRWCD resolved to become a member of the WMA GSA in cooperation with the other WMA Agencies. Exhibit 3 contains a copy of each approved resolution to form the Santa Ynez River Basin, WMA GSA, by each WMA Agency.

The MOA between the City, VVCSD, MHCSD, SYRWCD and the County Water Agency to form the Santa Ynez River Basin WMA 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 divided into three portions by DWR as shown on Figure 1 in Exhibit 1. In addition to the WMA GSA, there will be two other GSAs formed in the Santa Ynez River Valley Basin (for a total of three GSAs), including the Central 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 Central portion of the Basin will consist of the Central Management Area GSA. The agencies, as defined by the Act that will be part of the Central Management GSA include the SYRWCD, the City of Buellton, and the County Water Agency. A public hearing on the Central

Management GSA formation was held on November 8, 2016 at the Buellton City Council Chambers. The public hearing was jointly held by the three 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 WMA 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 GSP for the WMA. Included as Exhibit 6 are letters of intent to participate in the GSA by various members of industry as well as Vandenberg Air Force Base. 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 WMA 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 District, City, VVCSD, MHCSD or County Water Agency relating to the Santa Ynez River Valley Basin, WMA 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 805-693-1156 or by email at bbuelow@syrwcd.com. Mr. Buelow will be the primary point of contact for the WMA GSA.

Sincerely,

Bruce Wales

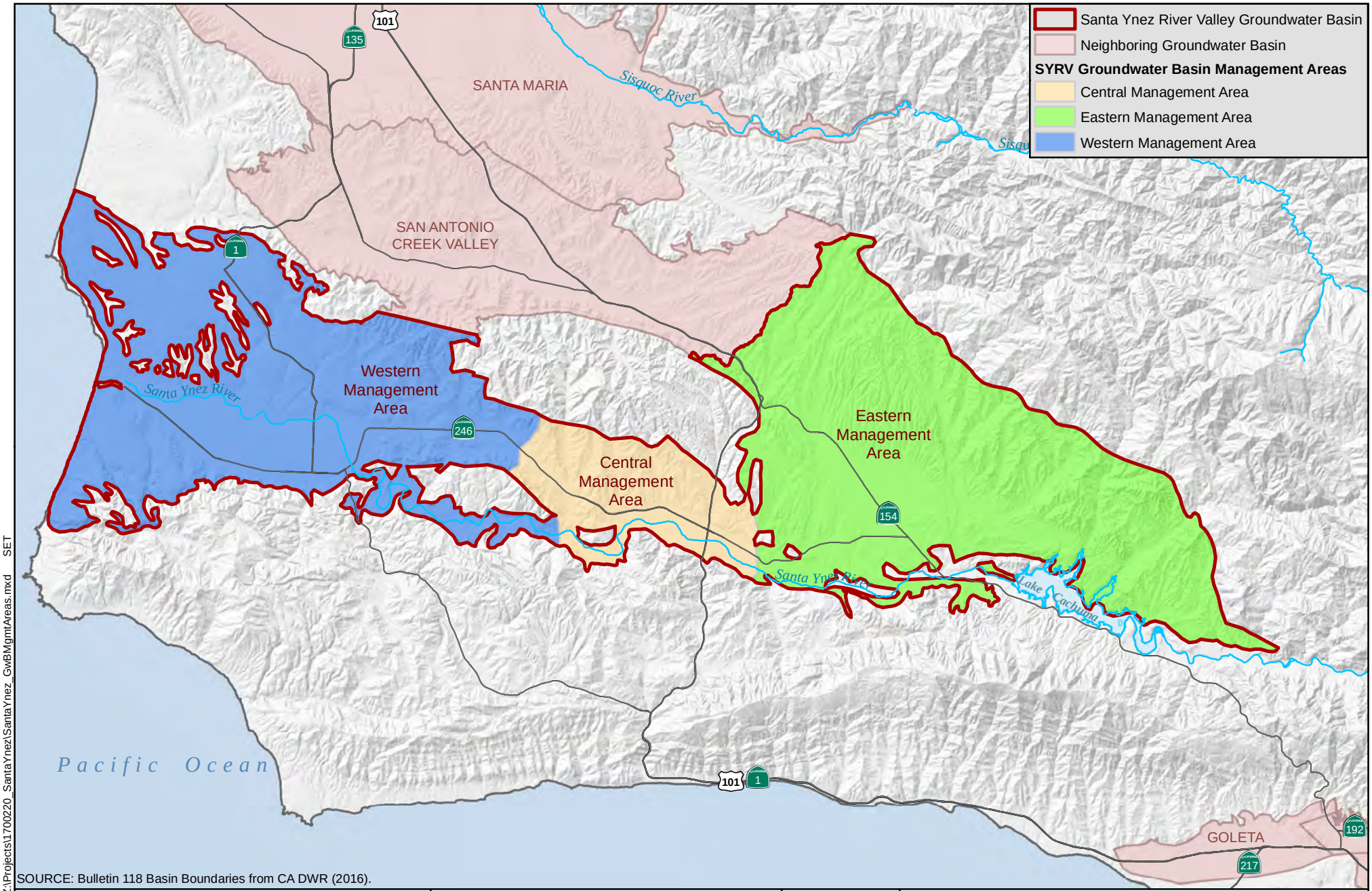
Bruce Wales
General Manager
Santa Ynez River Water Conservation District

cc: Mike Riley, Mission Hills CSD
Joe Barget, Vandenberg Village CSD
Larry Bean, City of Lompoc
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 WMA GSA
Exhibit 2 – Copies of Notices for Public Hearing on November 17, 2016
Exhibit 3 – Copies of Approved Resolutions Forming the WMA GSA
Exhibit 4 – Signed Copy of Memorandum of Agreement to form the WMA GSA
Exhibit 5 – List of Uses and Users of Groundwater in the WMA GSA
Exhibit 6 – Letters of Intent to Participate in the WMA GSA

Exhibit 1

Figures



SOURCE: Bulletin 118 Basin Boundaries from CA DWR (2016).

6 3 0 6

Miles

Santa Ynez River Valley
Groundwater Basin GSA Formation
Santa Barbara County, California

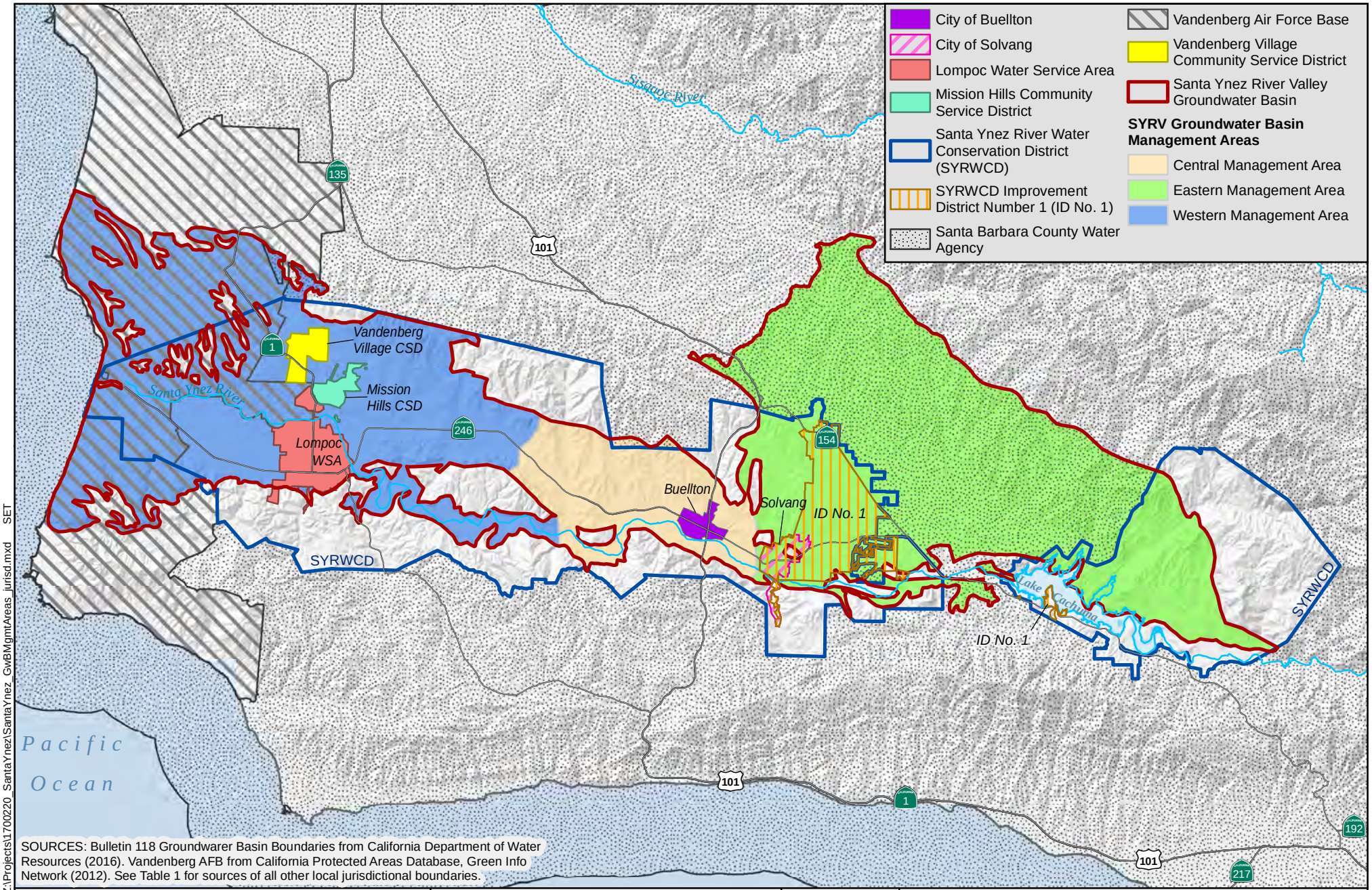
Santa Ynez River Water Conservation District

GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN MANAGEMENT AREAS

JANUARY 2017 FIGURE 1

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.

6 3 0 6

Miles

Santa Ynez River Valley Groundwater Basin GSA Formation
Santa Barbara County, California

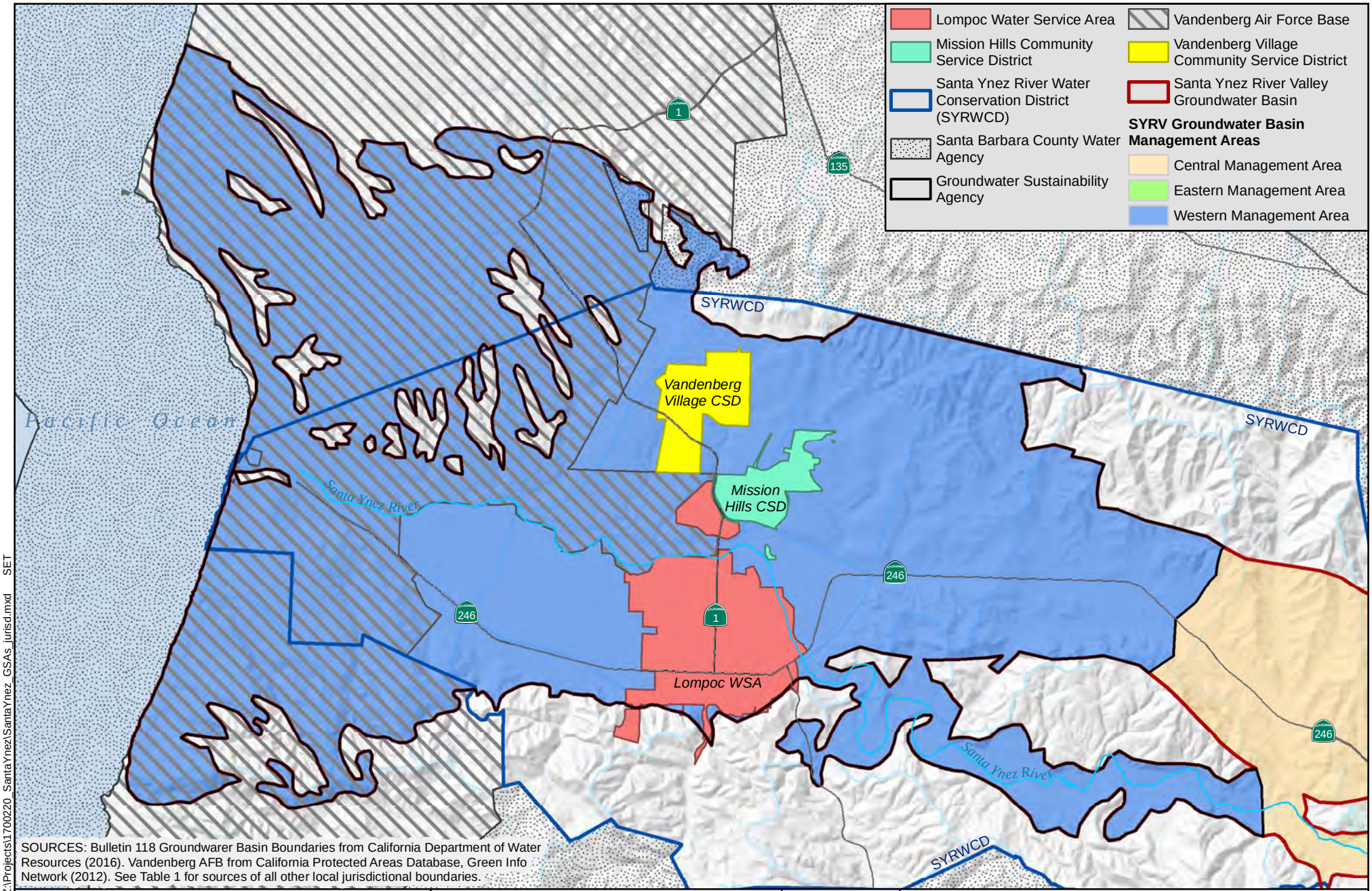
Santa Ynez River Water Conservation District

GEI Consultants

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN MANAGEMENT AREAS AND LOCAL JURISDICTIONS

JANUARY 2017 FIGURE 2

25Jan2017 Z:\Projects\1700220_SantaYnez\SantaYnez_GwBMgmtAreas_jurisd.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.

2.5 1.25 0 2.5

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 WESTERN 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 51443
Ad# 3872518

Notice to Form Groundwater Sustainability Agency

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

November 4, 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 4th of November, 2016 at Santa Barbara, CA.

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 Lompoc (City), Vandenberg Village Community Services District (VVCSD), Mission Hills Community Services District (MHCSD), and Santa Barbara County Water Agency (County) will hold a public hearing on Thursday, November 17, 2016 at 6:30 PM at the City of Lompoc City Council Chambers located at 100 Civic Center Plaza, Lompoc, California 93436.

The purpose of the joint meeting and hearing is to consider whether the District, City, VVCSD, MHCSD, and County should decide to become a Groundwater Sustainability Agency (GSA) for the Western Management Area (WMA) portion of the Santa Ynez River Valley Groundwater Basin (Basin). The WMA consists of the Lompoc Area Basins. 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 the District Office at (805) 693-1156.

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

BRUCE A. WALES
SECRETARY TO THE BOARD

Nov. 4/2016-51443

*** Proof of Publication ***

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA.

LOMPOC RECORD

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT
P.O. BOX 719
SANTA YNEZ, CA 93460

ORDER NUMBER 93510

I AM THE PRINCIPAL CLERK OF THE PRINTER OF THE LOMPOC RECORD, NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED IN THE CITY OF LOMPOC, COUNTY OF SANTA BARBARA, AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATON BY THE SUPERIOR COURT OF THE COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA, ADJUDICATION #47065.

THAT THE NOTICE OF WHICH THE ANNEXED IS A PRINTED COPY (SET IN TYPE NOT SMALLER THAT NONPAREIL), HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO-WIT:

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURE THAT THE FOREGOING IS TRUE AND CORRECT.

PUBLISHED ON: 11/06/2016

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 Lompoc (City), Vandenberg Village Community Services District (VVCSD), Mission Hills Community Services District (MHCSD), and Santa Barbara County Water Agency (County) will hold a public hearing on Thursday, November 17, 2016 at 6:30 PM at the City of Lompoc City Council Chambers located at 100 Civic Center Plaza, Lompoc, California 93436.

The purpose of the joint meeting and hearing is to consider whether the District, City, VVCSD, MHCSD, and County should decide to become a Groundwater Sustainability Agency (GSA) for the Western Management Area (WMA) portion of the Santa Ynez River Valley Groundwater Basin (Basin). The WMA consists of the Lompoc Area Basins. 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 the District Office at (805) 693-1156.

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

BRUCE A. WALES
SECRETARY TO THE BOARD

Legal #93510
Pub date: Nov 6, 2016

TOTAL AD COST: 72.24
FILED ON: 11/7/2016

DATED AT SANTA MARIA, CA THIS 7th DAY OF Nov, 2016

Teresa Ramirez
SIGNATURE

Exhibit 3

Copies of Approved Resolutions forming the GSA

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 WESTERN MANAGEMENT AREA FOR THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN	)	**RESOLUTION NO.** 16-283

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 Western portion of the Basin, known as the "Western Management Area";

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 Western 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District are "Local Agencies" as defined in Water Code §10721(n), and collectively include all of the lands within the Western Management Area of the Basin; and

WHEREAS, the Santa Barbara County Water Agency desires to form a Groundwater Sustainability Agency in conjunction with the Santa Ynez River Water Conservation District, the city of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District, 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District, held a public hearing on November 17, 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District.

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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District, known as the Western 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 Western 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District, 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, the City of Lompoc, the Vandenberg Village Community Services District, and the Mission Hills Community Services District 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 Directors
of the Santa Barbara County Water Agency

By: _____
Deputy

ACCEPTED AND AGREED:
SANTA BARBARA COUNTY WATER AGENCY

By: _____
Peter Adam, Chair, Board of Directors

APPROVED AS TO FORM:
MICHAEL C. GHIZZONI
COUNTY COUNSEL

By: _____
Deputy

CERTIFIED COPY

RESOLUTION NO. 6083(16)

A Resolution of the City Council of the City of Lompoc, County of Santa Barbara, State of California, To Form a Groundwater Sustainability Agency for the Western Management Area of the Santa Ynez River Valley Groundwater Basin

WHEREAS, the California legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act (Act) (California Water Code sections 10720 et. seq.) as amended, which became effective January 1, 2015; and

WHEREAS, pursuant to the Act, sustainable groundwater management is intended to occur pursuant to Groundwater Sustainability Plans (Plan) that are created and adopted by local Groundwater Sustainability Agencies (Agency); 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 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 the Act, 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 Western portion of the Basin, known as the "Western Management Area" (WMA); and

WHEREAS, pursuant to California Water Code subsection 10723(a), a local agency or combination of local agencies, as defined in California Water Code subsection 10721(n), may decide to become or form an Agency; and

WHEREAS, the City of Lompoc (City) overlies a portion of the WMA, has a water supply, manages water and has land-use responsibilities, and is therefore a "Local Agency" as defined by California Water Code subsection 10721(n); and

WHEREAS, the District, Santa Barbara County Water Agency (SB County Water), Vandenberg Village Community Services District (Vandenberg Village), and Mission Hills Community Services District (Mission Hills) are also Local Agencies with interests in the WMA; and

WHEREAS, the City, District, Vandenberg Village, Mission Hills, and the Lompoc Federal Correctional Complex (FCC) as well as portions of Vandenberg Air Force Base (VAFB), collectively represent approximately 64% of the territory within the WMA; and

WHEREAS, the City, District, Vandenberg Village, and Mission Hills are all public agencies that are all eligible to form an Agency in the WMA; and

WHEREAS, portions of VAFB, which are outside the District boundaries, comprise 35% of the remaining WMA territory; and

WHEREAS, SB County Water covers the remaining 1% of the WMA area not within the District and therefore will not be a voting member of the Agency; and

WHEREAS, VAFB and FCC are federal agencies, which are not subject to the Act and have chosen not to participate in the Agency; and

WHEREAS, the City desires to form an Agency in conjunction with the District, Vandenberg Village, Mission Hills, and SB County Water, which may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, the City held a public hearing on December 6, 2016, pursuant to California Water Code subsection 10723(b), after publication of notice of such hearing pursuant to California Government Code Section 6066; and

WHEREAS, the District, Vandenberg Village, and SB County Water have already or will imminently hold hearings to consider formation of the Agency, pursuant to California Water Code subsection 10723(b), after publication of notice of such hearings pursuant to California Government Code section 6066; and

WHEREAS, it would be in the best interests of the City to form an Agency, in conjunction with the District, Vandenberg Village, Mission Hills, and SB County Water.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LOMPOC, CALIFORNIA, DOES HEREBY RESOLVE, DECLARE, FIND, AND ORDER AS FOLLOWS:

SECTION 1. The foregoing is true and correct.

SECTION 2. The City Council herein decides to form an Agency in conjunction with the District, Vandenberg Village, Mission Hills, and SB County Water, known as the Western Management Area Groundwater Sustainability Agency, and which shall have all the powers granted to an Agency pursuant to the Act.

SECTION 3. The portion of the Basin that the Agency hereby created shall be managed and shall be the geographic portion of the Basin as depicted in the notification provided to the Department of Water Resources as the WMA, pursuant to California Water Code section 10723.8, and which boundary may be modified from time to time.

SECTION 4. The Agency hereby created shall consider the interests of all beneficiary uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans, as required by California Water Code section 10723.2.

SECTION 5. 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.

SECTION 6. The City Manager shall be authorized to execute a Memorandum of Agreement or other legal agreements(s) with the District, Vandenberg Village, Mission Hills, and SB County Water, and cause notice to be given to the California Department of Water Resources of the decision of the City in conjunction with the District, Vandenberg Village, Mission Hills, and SB County Water to create the above referenced Agency.

SECTION 7. Effective Date. This Resolution is effective on the day of its adoption.

The foregoing Resolution was proposed by Council Member Mosby, seconded by Council Member Vega, and was duly passed and adopted by the Council of the City of Lompoc at its regular meeting on December 6, 2016, by the following vote:

AYES: Council Member(s): James Mosby, Victor Vega, DeWayne Holmdahl, and Mayor Bob Lingl.

NOES: Council Member(s): None

ABSENT: Council Member(s): None

Bob Lingl, Mayor
City of Lompoc

ATTEST:

Stacey Haddon, City Clerk
City of Lompoc

I HEREBY CERTIFY THAT THE
foregoing instrument is a true and correct copy of the original on file in the Lompoc City Clerk's Department.
ATTEST:

K

RESOLUTION 16-309

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MISSION HILLS COMMUNITY SERVICES DISTRICT DECIDING TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT FOR THE WESTERN MANAGEMENT AREA OF THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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 (GSPs) that are created and adopted by local Groundwater Sustainability Agencies (GSAs); and

WHEREAS, the California Department of Water Resources (DWR) Bulletin 118 describes the Santa Ynez River Valley Groundwater Basin (Basin) in three portions: western, central, and eastern; 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 (SYRWCD) 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 western portion of the Basin, known as the "Western 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 GSA; and

WHEREAS, Mission Hills Community Services District (MHCSD) overlies a portion of the Western 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, SYRWCD 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) and overlies over 99 percent of the Western 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 Western Management Area including the less than 1 percent of the total area not overlain by the SYRWCD. The County Water Agency is therefore a "Local Agency" as defined by the California Water Code 10721(n); and

WHEREAS, SYRWCD, County Water Agency, City of Lompoc, Mission Hills Community Services District (MHCSD), and VVCSD, collectively include all of the lands within the Western Management Area of the Basin; and

WHEREAS, MHCSD desires to form a GSA in conjunction with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD, and which may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, MHCSD in conjunction with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD held a public hearing on November 17, 2016; pursuant to California Water Code §10723(b), after publication of notice of such hearing pursuant to California Government Code §6066; and

WHEREAS, at the public hearings, SYRWCD, County Water Agency, City of Lompoc, MHCSD, and VVCSD considered oral and written comments to the extent provided by the public; and

WHEREAS, it would be in the best interests of MHCSD to form a GSA in conjunction with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD.

NOW, THEREFORE BE IT RESOLVED that the Board of Directors of the Mission Hills Community Services District declares and directs:

1. That the foregoing is true and correct.

2. That MHCSD herein decides to form a GSA in conjunction with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD known as the Western Management Area GSA, and which shall have all the powers granted to a GSA pursuant to SGMA.

3. That the portion of the groundwater basin that the GSA hereby created shall manage shall be that portion of the Basin as depicted in the notification provided to the DWR as the Western Management Area, pursuant to California Water Code 10723.8, and which boundary may be modified from time to time.

4. That the GSA hereby created shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing GSPs as required by California Water Code §10723.2.

5. That the GSA 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 MHCSD Board President or General Manager shall be authorized to execute a Memorandum of Agreement or other legal agreement(s) with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD, and cause notice to be given to DWR of the decision of the MHCSD in conjunction with the SYRWCD, County Water Agency, City of Lompoc, and VVCSD to create the above referenced GSA.

PASSED AND ADOPTED by the Board of Directors of the Mission Hills Community Services District this 21st day of December, 2016, upon motion by Director Fasold, seconded by Director MacKenzie and as approved by the following vote:

AYES:	Directors:	Dietrich, Fasold, Heavin, MacKenzie, Nix
NOES:		none
ABSENT:		none
ABSTAIN:		none

Walt Fasold, Temporary President

ATTEST:

Casey Fowler
Secretary to the Board of Directors

VANDENBERG VILLAGE
COMMUNITY SERVICES DISTRICT
3757 Constellation Road • Vandenberg Village • Lompoc, CA 93436
Telephone: (805) 733-2475 • Fax: (805) 733-2109

"Pride in Community Service"

Resolution 204-16

December 6, 2016

DECIDING TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT FOR THE WESTERN MANAGEMENT AREA OF THE SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN

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 (GSPs) that are created and adopted by local Groundwater Sustainability Agencies (GSAs); and

WHEREAS, the California Department of Water Resources (DWR) Bulletin 118 describes the Santa Ynez River Valley Groundwater Basin (Basin) in three portions: western, central, and eastern; 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 (SYRWCD) 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 western portion of the Basin, known as the "Western 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 GSA; and

WHEREAS, Vandenberg Village Community Services District (VVCSD) overlies a portion of the Western 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, SYRWCD 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) and overlies over 99 percent of the Western 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 Western Management Area including the less than 1 percent of the total area not overlain by the SYRWCD. The County Water Agency is therefore a "Local Agency" as defined by the California Water Code 10721(n); and

WHEREAS, SYRWCD, County Water Agency, city of Lompoc, Mission Hills Community Services District (MHCSD), and VVCSD, collectively include all of the lands within the Western Management Area of the Basin; and

WHEREAS, VVCSD desires to form a GSA in conjunction with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD, and which may include at a later time other Local Agencies and other legally authorized entities; and

WHEREAS, VVCSD in conjunction with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD held a public hearing on November 17, 2016; and VVCSD held a separate public hearing on December 6, 2016; pursuant to California Water Code §10723(b), after publication of notice of such hearing pursuant to California Government Code §6066; and

WHEREAS, at the public hearings, SYRWCD, County Water Agency, city of Lompoc, and MHCSD, and VVCSD considered oral and written comments to the extent provided by the public; and

WHEREAS, it would be in the best interests of VVCSD to form a GSA in conjunction with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD.

NOW, THEREFORE BE IT RESOLVED, that the Board of Directors of the Vandenberg Village Community Services District declares and directs:

1. That the foregoing is true and correct.

2. That VVCSD herein decides to form a GSA in conjunction with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD known as the Western Management Area GSA, and which shall have all the powers granted to a GSA pursuant to SGMA.

3. That the portion of the groundwater basin that the GSA hereby created shall manage shall be that portion of the Basin as depicted in the notification provided to the DWR as the Western Management Area, pursuant to California Water Code 10723.8, and which boundary may be modified from time to time.

4. That the GSA hereby created shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing GSPs as required by California Water Code §10723.2.

5. That the GSA 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 VVCSD Board President shall be authorized to execute a Memorandum of Agreement or other legal agreement(s) with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD, and cause notice to be given to DWR of the decision of the VVCSD in conjunction with the SYRWCD, County Water Agency, city of Lompoc, and MHCSD to create the above referenced GSA.

PASSED AND ADOPTED by the Board of Directors of the Vandenberg Village Community Services District this 6th day of December, 2016, upon motion by Director Blair, seconded by Director Wyckoff, and as approved by the following vote:

AYES: Directors Blair, Brooks, Bumpass, Fox and Wyckoff
NOES: None
ABSENT: None
ABSTAIN: None

Robert Wyckoff, President
Board of Directors

ATTEST:

Stephanie Garner
Secretary to the Board of Directors

RESOLUTION NO. 664

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 WESTERN 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 and recognized by the District, is designated as a corresponding groundwater "Management Area" as defined by the Act; this Resolution concerns the western portion of the Basin, known as the "Western 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 approximately ninety-nine percent of the Western Management Area, and is therefore a "Local Agency" as defined within California Water Code 10721 (n); and

WHEREAS, the City of Lompoc (City) overlies a portion of the Western 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 Mission Hills Community Services District (MHCSD) overlies a portion of the Western Management area, has a water supply, manages water and is therefore a "Local Agency as defined by California Water Code §10721 (n); and

WHEREAS, the Vandenberg Village Community Services District (VVCSD) overlies a portion of the Western Management area, has a water supply, manages water 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 Western Management Area including the approximate 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, MHCSD, VVCSD and County Water Agency collectively include all of the lands within the Western Management Area of the Basin; and

WHEREAS, the District desires to form a Groundwater Sustainability Agency in conjunction with the City, MHCSD, VVCSD 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, MHCSD and VVCSD, 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, MHCSD, VVCSD and County Water Agency held a public hearing on November 17, 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, the City of Lompoc City Council and the Vandenberg Village CSD Board of Directors each adopted resolutions to join the Western Management Area GSA in conjunction with the District; and on December 21, 2016 the Mission Hills CSD Board of Directors adopted a resolution to join the Western 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, MHCSD, VVCSD 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, MHCSD, VVCSD and County Water Agency, known as the Western 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 Western 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, MHCSD, VVCSD 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, MHCSD, VVCSD 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
Cynthia Allen
Brett Marymee
Larry Flinkingshelt

NOES, Directors: None

ABSENT/ABSTAINING, Directors: None

Cynthia Allen, President

Bruce A. Wales, Secretary

Exhibit 4

Signed Copy of Memorandum of Agreement to form the WMA GSA

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

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 a "Groundwater Sustainability Agency" (GSA) and adopt a "Groundwater Sustainability Plan" (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 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 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.

C. The Parties are the agencies qualified to be a GSA under the Act for the Western Management Area (WMA) of the Basin. The map attached hereto as Exhibit A designates the boundaries of the three Management Areas of the Basin.

D. A separate GSA for each Management Area is the most efficient approach 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 memorandum of understanding for implementing SGMA which recognized the three Management Areas corresponding to DWR's three portions of the Basin 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. The Parties wish to provide a framework to form a GSA and to implement SGMA in the WMA, 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 WMA GSA. The purpose of this MOA is to form a GSA for the WMA 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 WMA. By execution of this MOA, the Parties collectively determine and elect to be the GSA for the Western Management Area of the Basin. It is presumed the WMA GSA will be the sole GSA for this portion of the Basin.

2. Organization of the WMA. The District covers approximately 64 percent of the WMA comprising the Lompoc Plain, Lompoc Terrace and Lompoc Uplands (including the Santa Rita Valley). This area includes the City of Lompoc, the communities of Vandenberg Village and Mission Hills, the Lompoc Federal Correctional Complex (Lompoc FCC) and portions of Vandenberg Air Force Base (VAFB). VAFB covers the majority of the remaining WMA outside the District (approximately the remaining 35 percent of the WMA). As Federal entities, VAFB and Lompoc FCC are not required to be subject to SGMA. The Santa Barbara County Water Agency ("County Water Agency") covers approximately 1 percent of the WMA area not within the District, VAFB and Lompoc FCC. The City of Lompoc, the District, Vandenberg Village Community Services District (VVCSD), Mission Hills Community Services District (MHCSD) 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 WMA. The formation of the WMA GSA is supported by the following:

a. The District has augmented the groundwater supply for the WMA through water rights releases under SWRCB Order 89-18 and preceding SWRCB orders since 1953.

b. The District has monitored groundwater production and groundwater storage in the Basin, including the WMA since 1979.

c. The District, City of Lompoc, VVCSD, and MHCSD have a history of collaboration on projects that benefit groundwater use and management in the WMA. These include: 1) comprehensive studies of supplemental winter groundwater recharge from the river; 2) interconnections between the entities' water systems for operational flexibility and increased system reliability; and 3) comprehensive U.S. Geological Survey hydrogeologic studies of the WMA in the late 1980s through the early 1990s and ongoing monitoring of groundwater levels and groundwater quality.

d. VAFB will not participate in the GSA in accordance with a Department of Defense policy decision applicable to all military installations in California. Similarly, the Lompoc FCC is not planning to participate either.

e. Areas within the WMA represented by the County Water Agency have "de minimis" groundwater production, if any, and constitute a trivial percentage of the total Management Area. Therefore, the County Water Agency will not be a voting member of the WMA GSA Committee nor will it have any financial responsibility for funding the GSA or GSP activities for the WMA, except for the cost of its staff participation in meetings.

f. In consideration of the interests of all groundwater users in the WMA GSA, the Santa Barbara County Planning and Development Department, VAFB, Lompoc FCC, State Lands Commission and members of the agricultural community will

be invited to participate in the WMA Advisory Committee to be established by the WMA GSA.

3. Development of the GSP. A separate GSP will be developed for each of the three Management Areas. The Intra-Basin Coordination Agreement will be incorporated into each GSP, 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 WMA. In developing the GSP the GSA shall consider all beneficial uses and users of groundwater in the WMA, including the interests listed in Section §10723.2 of the Act.

4. GSA Governing Body. There is hereby established a GSA Committee for the WMA which shall be subject to the following:

a. Voting will be weighted. The District shall have four votes, the City of Lompoc shall have two votes, and VVCSD and MHCSD shall each have one vote. The GSA will be represented by an appointed person or persons from their respective entities. The County Water Agency will be a non-voting member of the GSA. The County Water Agency will be represented by a 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 to transact business shall be a simple majority of voting members. All proposed actions or resolutions must pass by a simple majority vote (presently at least 5 votes needed), provided however, actions or resolutions to adopt budgets or any type of fee/charge, or to approve the GSP, must pass by a 75 percent vote (presently at least 6 votes needed).

d. The composition, voting procedures, and powers of the GSA Committee and whether the GSA Committee should be replaced by a joint powers authority to implement the GSP, 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 of GSA. The GSA Committee shall have all 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 fund GSA and GSP activities. The GSA Committee shall proceed in a timely fashion to develop a GSP for the WMA, and consider the interests of all beneficial users of groundwater within the WMA as prescribed by Section §10723.2 of the Act, as well as the requirements set forth in the Intra-Basin Coordination Agreement.

6. Costs. All Parties 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 shared by the voting parties as 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 the SGMA pursuant to §10730 et seq. of the Act. The County Water Agency, as a non-voting 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 WMA 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 Intra-Basin 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 MOA. 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 WMA 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 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 LOMPOC

By: _____

Address: Patrick Wiemiller
100 Civic Center Plaza, Lompoc, CA 93436

Email p_wiemiller@ci.lompoc.ca.us

Facsimile 805-736-5347

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA BARBARA COUNTY WATER AGENCY

By: (Signature on following page)

Address: _____

_____

Email _____

Facsimile _____

IN WITNESS WHEREOF, the Parties have executed this MOA as of the date first above written.

CITY OF LOMPOC

By: _____

Address: _____

_____

Email _____

Facsimile _____

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: Michael W. Luby 12/17/2014

Address: 1550 E. Burton Mesa Blvd.
Lompoc, CA 93436

Email mh2@mhcsd.org

Facsimile (805) 733-4188

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA BARBARA COUNTY WATER AGENCY

By: (Signature on following page)

Address: _____

_____

Email _____

Facsimile _____

IN WITNESS WHEREOF, the Parties have executed this MOA as of the date first above written.

CITY OF LOMPOC

By: _____

Address: _____

_____

Email _____

Facsimile _____

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: Robert H Wyckoff

Address: 3757 Constellation Road
Lompoc, CA 93436

Email jbarget@vvcsd.org

Facsimile (805) 733-2109

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA BARBARA COUNTY WATER AGENCY

By: (Signature on following page)

Address: _____

_____

Email _____

Facsimile _____

IN WITNESS WHEREOF, the Parties have executed this MOA as of the date first above written.

CITY OF LOMPOC

By: _____

Address: _____

_____

Email _____

Facsimile _____

MISSION HILLS COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT

By: _____

Address: _____

_____

Email _____

Facsimile _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: Bruce A Wales

Address: SYRWCD
3669 SAGUNTO ST. SUITE 10E, 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 _____

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:

RECOMMENDED FOR APPROVAL:
Santa Barbara County Water Agency

By: _____
Department Head

APPROVED AS TO FORM:
Risk Management

By: _____
Risk Management

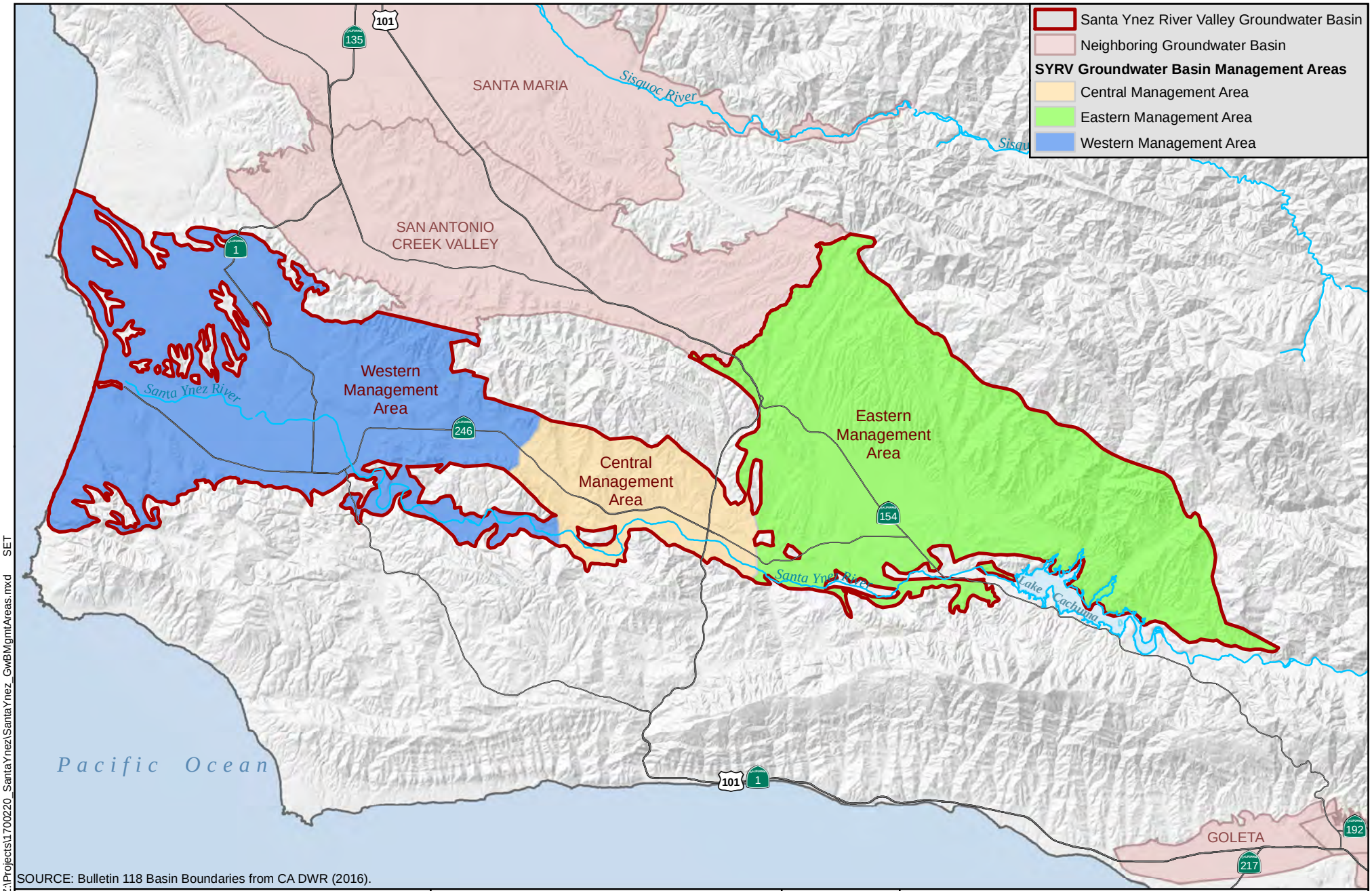
APPROVED AS TO FORM:

Michael C. Ghizzoni
County Counsel

By: _____
Deputy County Counsel

APPROVED AS TO ACCOUNTING FORM:
Theodore A. Fallati, CPA
Auditor-Controller

By: _____
Deputy



SOURCE: Bulletin 118 Basin Boundaries from CA DWR (2016).

6 3 0 6

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

25Jan2017 Z:\Projects\1700220_SantaYnez\SantaYnez_GwBMgmtAreas.mxd SET

EXHIBIT B

Santa Ynez River Valley Basin

GSA Organization

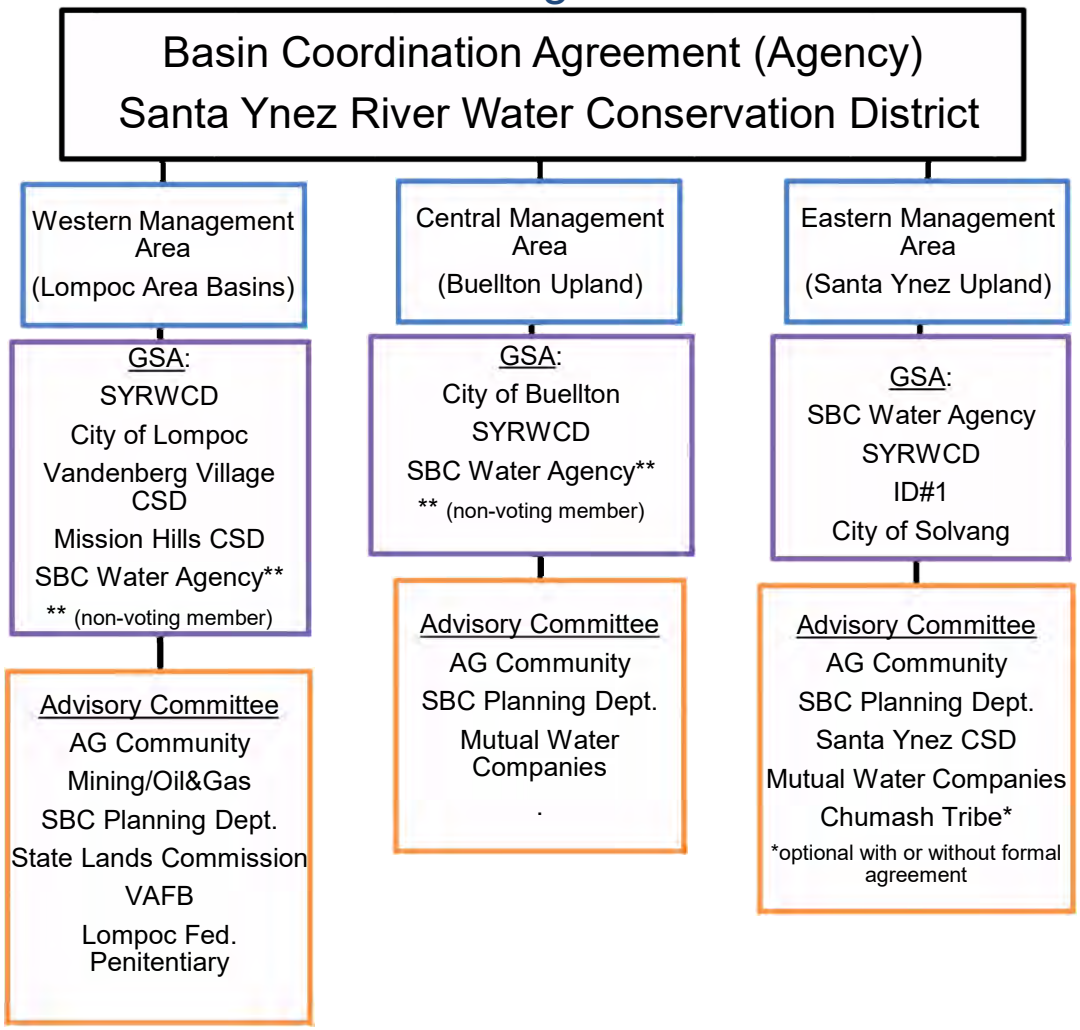


Exhibit 5

List of Uses and Users of Groundwater in the WMA

SANTA YNEZ RIVER VALLEY BASIN
WESTERN 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 Lompoc, Vandenberg Village Community Services District (CSD), and Mission Hills CSD are GSA members. Domestic water-well owners and agricultural users that are registered with the Santa Ynez River Water Conservation District (SYRWCD) will be invited to join the WMA GSA Advisory Committee.

(b) Municipal Well Operators: The City of Lompoc, Vandenberg Village CSD, and Mission Hills CSD are GSA members.

(c) Public Water Systems: City of Lompoc, Vandenberg Village CSD, and Mission Hills CSD are GSA members. Representatives from mutual water companies in the WMA will be invited to sit on the WMA GSA Advisory Committee.

(d) Local Land Use Planning Agencies: The City of Lompoc is a member of the WMA GSA and the Santa Barbara County Planning and Development Department is a member of the WMA GSA Advisory Committee.

(e) Environmental Users of Groundwater: The California Department of Fish and Wildlife (CDFW) will be consulted about the Burton Mesa chaparral and associated sensitive flora and fauna.

(f) Surface Water Users: SYRWCD calls for water-rights releases under Order from the State of California Water Quality Control Board. The City of Lompoc pumps groundwater from and discharges wastewater to the Santa Ynez River. Agricultural interests (vineyards and truck crops) that are within SYRWCD will be invited to serve on the WMA Advisory Committee.

(g) Federal Government: Vandenberg Air Force Base (AFB) and the Lompoc Federal Correctional Complex (Lompoc FCC) are located within the WMA. Neither is required to nor will they participate in SGMA. Both VAFB and the Lompoc Federal Penitentiary will be invited to join the WMA Advisory Committee.

(h) California Native American Tribes: None.

(i) Disadvantaged Communities: Portions of the City of Lompoc are considered Disadvantaged Communities by DWR.

(j) Entities Listed in SGMA Section 10927 that are monitoring groundwater elevations in all or part of the WMA managed by the GSA: SYRWCD in collaboration with the City of Lompoc, Vandenberg Village CSD and Mission Hills CSD monitors wells in the WMA and all are members of the GSA. The Santa Barbara County Water Agency is the CASGEM agency within the WMA and is a member of the GSA.

Exhibit 6

Letters of Intent to Participate in the WMA GSA

FREEPORT-MCMORAN OIL & GAS

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, CA 93455

Telephone: 805-934-8200

September 7, 2016

Mr. Bill Buelow, Water Resources Manager
Santa Ynez River Water Conservation District
P.O. Box 719
Santa Ynez, CA 93460

Re: Freeport-McMoRan Participation in SGMA - Santa Ynez River Valley Groundwater Basin

Dear Mr. Buelow,

Thank you for reaching out to Freeport-McMoRan Oil & Gas (FM O&G) regarding the implementation of the Sustainable Groundwater Management Act (SGMA) in the Santa Ynez River Valley Groundwater Basin (SYR Basin).

We understand that the Santa Ynez River Water Conservation District (SYRWCD) is currently working on agreements to form Groundwater Sustainability Agencies (GSA) for the entire SYR Basin, including the Western Management Area (Lompoc Area Basins) where FM O&G operates within the Lompoc Oil Field.

As you are aware, FM O&G operations are within the boundaries of the SYRWCD and FM O&G has filed groundwater production reports for two fresh water production wells located in the Lompoc Area Basins. Water produced by the wells is used to support FM O&G operations in the Lompoc Field. As such, FM O&G would like to work with the SYRWCD in its effort to create the GSA by participating in an advisory role.

We look forward to working with the SYRWCD on this task of great importance. Please contact me directly at 805-934-8220, if we can be of further assistance.

Sincerely,

Patrick Vowell
Environmental Health & Safety Advisor
Office: (805) 934-8215
Mobile: (805) 260-0250
Email: pvowell@fmi.com

IMERYS

Imerys Minerals California, Inc

October 12, 2016

Mr. Bill Buelow
Water Resources Manager
Santa Ynez River Water Conservation District
P.O. Box 719
Santa Ynez, CA 93460

Re: Imerys Participation in SGMA - Santa Ynez River Valley Groundwater Basin

Dear Mr. Buelow:

Thank you for reaching out to Imery's regarding the implementation of the Sustainable Groundwater Management Act ("SGMA") in the Santa Ynez River Valley Groundwater Basin ("SYR Basin").

We understand that the Santa Ynez River Water Conservation District ("SYRWCD") is currently working on agreements to form Groundwater Sustainability Agencies ("GSA") for the entire SYR Basin, including the Western Management Area ("Lompoc Area Basins") where Imerys operates.

As you are aware, Imerys' operations are within the boundaries of the SYRWCD and Imerys has filed groundwater production reports for wells located in San Miguelito Canyon. Water produced by the wells is used to support Imerys operations. As such, Imerys would like to work with the SYRWCD in its effort to create the GSA by participating in an advisory role.

We look forward to working with the SYRWCD on this task of great importance. Please contact me directly at 805-737-2440, if we can be of further assistance.

Sincerely,

Vindi Ndulute

Environmental Manager

Vindi.Ndulute@imerys.com

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

MEMORANDUM FOR: SANTA YNEZ RIVER WATER CONSERVATION DISTRICT
ATTENTION: MR.BILL BUELOW

FROM: 30 SW/CD
747 Nebraska Ave Suite A-200
Vandenberg AFB CA 93437-6261

SUBJECT: Santa Ynez River Basin Groundwater Sustainability Agency (GSA) (Your Ltr, 4 Oct 16)

1. Thank you for inviting Vandenberg AFB to participate in the formation of the GSA for the Santa Ynez basin. The management of our groundwater resources is not only a high priority for the base, but a high priority for the Air Force as well.

2. I accept your offer to participate in this endeavor and look forward to working with you and your staff to preserve this valuable resource. The work of the team will indeed help shape the future of the Central Coast's water usage.

3. The detailed requirements of the Air Force's participation will need to be developed and reviewed for final approval through a Memorandum of Agreement or similar document. As a federal agency, we reserve all rights that apply and understand that higher levels of authority may direct changes to local base decisions.

4. Should you have any questions, please work directly with the base's representative in this matter, Mr. Ken Domako, at (805) 606-0126 or kenneth.domako@us.af.mil

17 OCT 16

RONALD B. CORTOPASSI, USAF
Executive Director

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

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: _____
Deputy

SANTA BARBARA COUNTY WATER AGENCY

By: _____
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, 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

Katherine A. Stewart, President
Board of Directors

7 Jan 2020
Date

APPROVED AS TO FORM:

Michael A. Munoz
Senior Deputy County Counsel

12/23/19
Date

ATTEST:

Stephanie Garner
Secretary, Board of Directors

1/7/20
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:

[PLACEHOLDER] Coordination Agreement

APPENDIX 1B-C: PLACEHOLDER FOR SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN COORDINATION AGREEMENT

The Santa Ynez River Valley Groundwater Basin Coordination Agreement is not executed by all parties as of June 25, 2021. The process is ongoing and Young Wooldridge, LLP has produced draft documents which are under review by GSA member agency staff.

Santa Ynez River Valley Groundwater Basin Coordination Agreement

This Coordination Agreement ("Agreement") is made by and between the Western Management Area Groundwater Sustainability Agency ("WMA GSA"), the Central Management Area Groundwater Sustainability Agency ("CMA GSA"), and the 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 collectively referred to as the "Parties." This Agreement shall be effective as of the date on which it becomes fully executed ("Effective Date").

Agreement

Now, therefore, the Parties agree as follows: …….

Chapter 1 – Introduction and Plan Area

Appendix 1c-A:

Santa Ynez SGMA Meeting List, as of July 1, 2021

Appendix 1c-A Santa Ynez SGMA Meeting List

Summary of Stakeholder Outreach for SGMA 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 Stakeholder Outreach for SGMA 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

Appendix 1c-A Santa Ynez SGMA Meeting List

Summary of Stakeholder Outreach for SGMA 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	GSA Citizens Advisory Group Meeting

Chapter 1 – Introduction and Plan Area

Appendix 1c-B:

Restrictions on Public Meetings due to SARS-COV-2 (COVID-19)

APPENDIX 1C-B: 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.

_____

GAVIN NEWSOM
Governor of California

ATTEST:

_____

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. If operating outdoors, a tent, canopy, or other sun shelter may be used as long as the sides are not closed;
    g. Complete the RISE attestation, including its social distancing protocol, and self-certification process at: https://recoverysbc.org/reopen-your-business/. (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.** As required by the State Public Health Officer Order of July 13, 2020, all gatherings are prohibited unless otherwise excepted.

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.

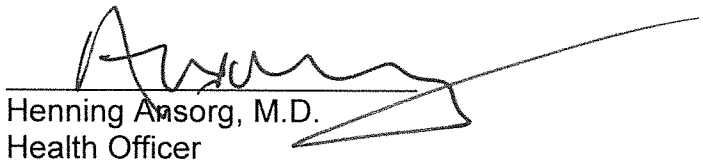
This Order is made in accordance with all applicable State and Federal laws, including but not limited to: Health and Safety Code sections 101040 and 120175; Health and Safety Code sections 101030 et seq., 120100 et seq.; and Title 17 of the California Code of Regulations section 2501.

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. Barbershops and Hair Salons, except outdoor operations, if outdoor operations are allowed by the licensing or permitting authority.
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. Fitness centers, gyms, and studios including but not limited to those for dance, yoga, pilates, crossfit, cycling, boxing, and martial arts, except outdoor operations

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

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

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.

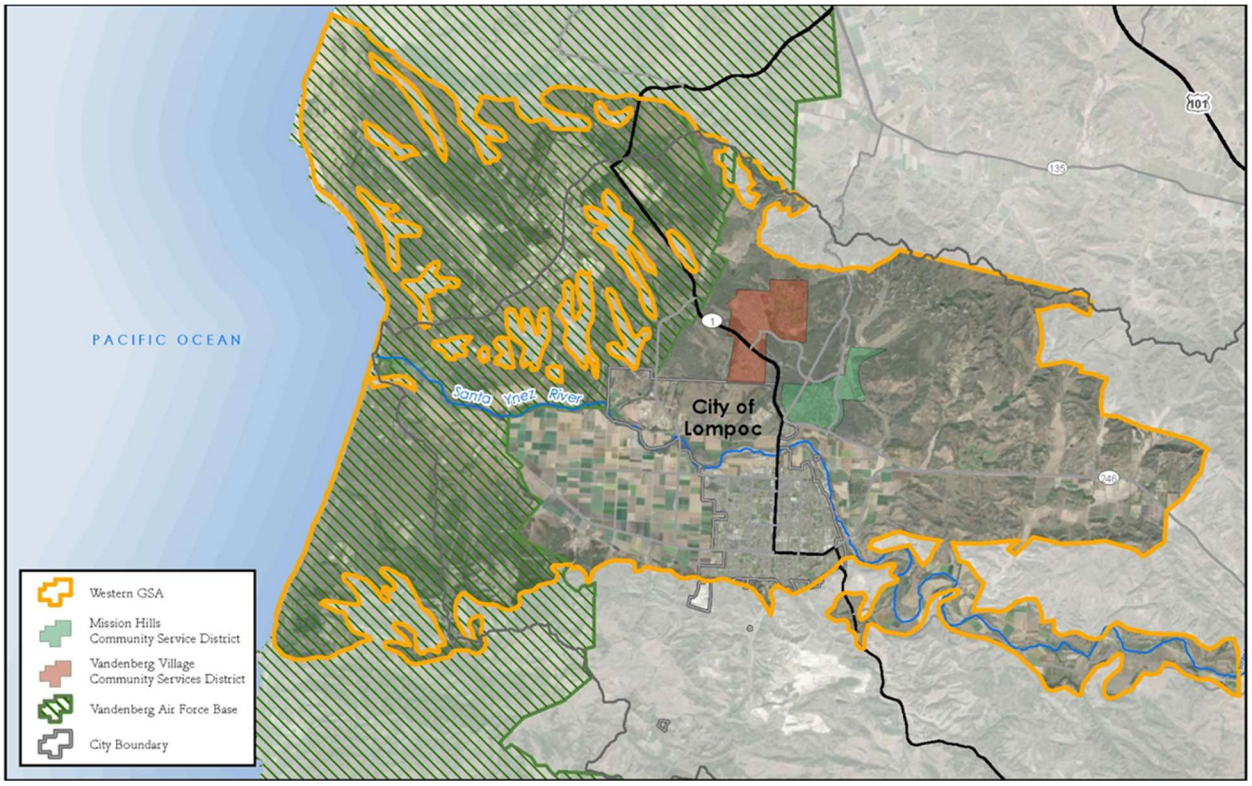
Sonia Y Angell, MD, MPH
State Public Health Officer & Director
California Department of Public Health

Chapter 1 – Introduction and Plan Area

Appendix 1c-C:

Draft Final Public Outreach and Engagement Plan, Western Management Area, Dated February 2020

DRAFT FINAL
PUBLIC OUTREACH AND ENGAGEMENT PLAN



WMA

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

Prepared by

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants

FEBRUARY 2020

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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 (DWR Bulletin 118).
CAG	Citizen Advisory Group
CMA	Santa Ynez River Valley Groundwater Basin Central Management Area
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
MHCSD	Mission Hills Community Services District
SGMA	Sustainable Groundwater Management Act of 2014
Stakeholder	An individual or entity interested in 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
VVCSD	Vandenberg Village Community Services District
WMA	Santa Ynez River Valley 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 the following 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
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 (Sections 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 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 GROUNDWATER 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)

The WMA, as described in Bulletin 118 is comprised of the Lompoc Plain, Lompoc Terrace and Lompoc Upland and Santa Rita Valley. The CMA includes the Buellton Upland, 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 WMA Boundary. 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 agreements prior to submittal of the GSPs to DWR.

Figure 1: Management Areas and Santa Ynez River Valley Groundwater Basin Boundaries

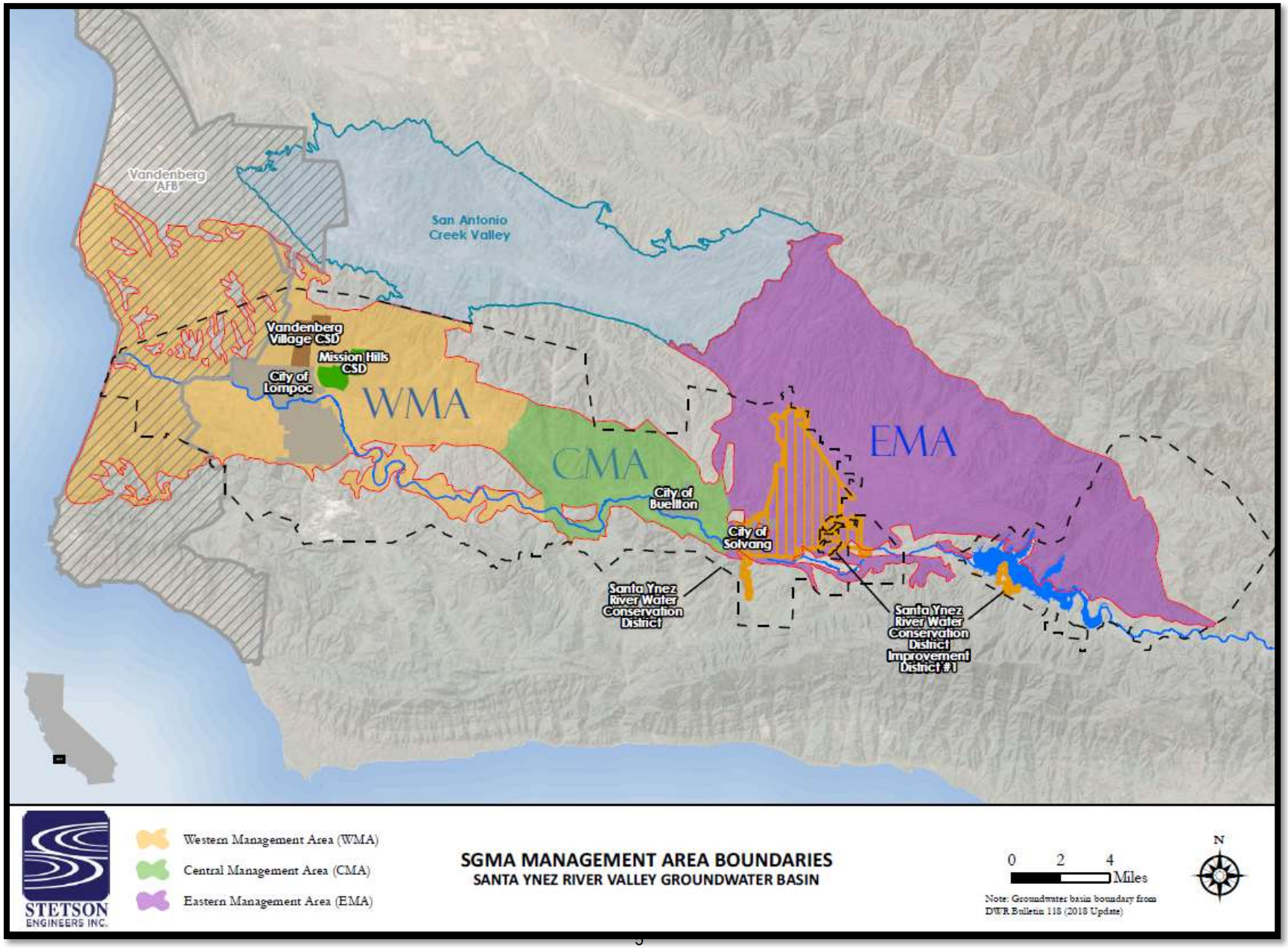
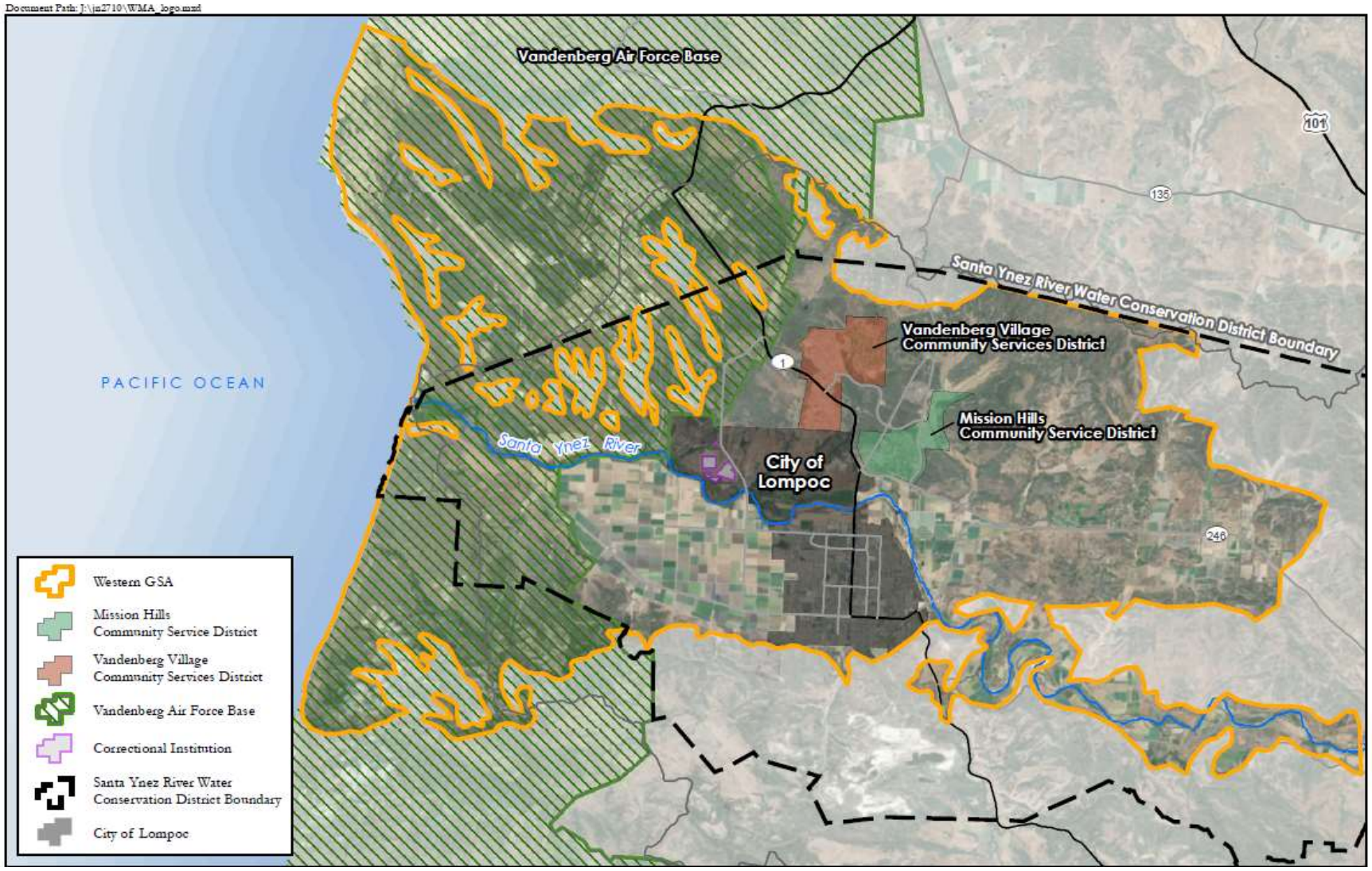


Figure 2: Western Management Area Boundary



3 WESTERN MANAGEMENT AREA

Land use within the WMA includes agriculture, open space, residential, commercial and industrial uses in the county unincorporated areas as well as the City of Lompoc, Mission Hills, Vandenberg Village and portions of the Vandenberg Air Force Base. Groundwater basins of the WMA include the Santa Ynez River alluvial deposits and those of the older uplands and plains. The Santa Ynez River Water Conservation District (SYRWCD) jurisdiction includes all of the groundwater basins and additional watershed areas. The SYRWCD, formed in 1939, has the responsibility of administering and protecting water uses within the SYRVB.

In conjunction with the groundwater replenishment in the WMA, Santa Ynez River water is stored in Cachuma Reservoir in accordance with SWRCB Order WR 89-18 for the benefit of downstream water users. Releases from Cachuma Reservoir replenish downstream groundwater basins based on the accrual of credit water stored in the Above Narrows and Below Narrows accounts in the Reservoir. Vandenberg Air Force Base, part of which is within the WMA, has contracted for imported water from the State Water Project. The Federal Bureau of Prisons is a groundwater user within the WMA.

3.1 Stakeholders and Interested Parties

Interested parties and stakeholders in the WMA include residents, domestic well owners, public agency representatives, landowners, non-governmental organizations, agricultural well owners, tribal interests, 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 WMA is included as Appendix B. Appendix C includes a detailed indexed map of the WMA so individuals can identify whether or not they reside within the WMA.

3.2 Western Management Area Groundwater Sustainability Agency Formation

The WMA GSA was formed on January 11, 2017, through a Memorandum of Agreement between the City of Lompoc, SYRWCD, Vandenberg Village Community Services District (VVCSD), Mission Hills Community Services District (MHCSD), and the Santa Barbara County Water

Agency. The WMA filed a notice of intent to form a GSA with the DWR and became the exclusive GSA for the WMA in May 2017.

3.3 Decision-Making Process

WMA GSA member agencies formed a GSA Committee, comprised of appointed representatives from each member agency. The WMA GSA Committee (Committee) is responsible for implementing the requirements of SGMA including overseeing the development of a WMA GSP and coordinating activities between the agencies and GSAs within the SYRVGB. The Santa Barbara County Water Agency participates on the WMA GSA Committee as a non-voting member. Votes are weighted as shown in Table 1 and were established at the time of WMA GSA formation by Memorandum of Agreement between the participating agencies. All proposed actions or resolutions must pass by a simple majority vote, requiring at least five votes to pass. Adoption of the GSP, budgets, and any type of fee or charge requires 75% or at least six votes to pass.

Table 1. Western Management Area Weighted Voting

Member Agency	Number of Votes
SYRWCD	4
City of Lompoc	2
VVCSD	1
MHCSD	1

3.4 Western Management Area Groundwater Sustainability Plan

The Committee has 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 (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 in accordance with the SGMA, to guide future management decisions. Example management decisions include: the amount of water that can be pumped from the WMA without causing undesirable results; and new project development to enhance water resource management. The SGMA, as well as the state agencies implementing the act (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 Western Management Area

During GSP development, the Committee will request stakeholder feedback as they develop criteria for "significant and unreasonable" undesirable results for the WMA. The Citizen Advisory Group (CAG) will play a central 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 WMA.

4.2 Outreach and Engagement Goals

Outreach and engagement for the WMA 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 WMA were contacted directly to discuss requirements of the SGMA and potential future changes to groundwater management in the WMA. The individual WMA member agencies issued public notices of intent of participate in the WMA 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 WMA GSA. Public notices announcing the various meeting and public hearings to form the WMA 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. Specifically, there were two meetings held between SYRWCD staff and members of the Lompoc Growers and Shippers Association to provide outreach to members of the Agricultural Community in the Lompoc Valley.

The Committee's goal is to build and maintain a collaborative and inclusive process for stakeholder engagement and GSP development and to consider the interests of diverse social, cultural, and economic elements of the population within the WMA 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 WMA 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 WMA GSA information, ask questions, and provide comments; and
4. Broad Participation: 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 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 WMA 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 via email at least quarterly throughout the GSP development process. Emails will provide notice of public meetings and other important updates.

5.2 Providing Feedback to the Groundwater Sustainable Agency

Questions and comments regarding the WMA GSA and GSP development process can be sent using the feedback link on the_WMA 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 WMA GSA will provide members of the public opportunities to 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 stakeholders need assistance in completing the online comment submittal form they can contact staff (contact information provided in Section 6). Notice of opportunities to comment will also be posted on the WMA 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 WMA, 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 WMA. CAG members are expected to work collaboratively with all of the following: other CAG members, at-large stakeholders, members of the public, the Committee, staff of member agencies of the WMA GSA, 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.

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 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
Western Management Area (WMA) Groundwater Sustainable Agency (GSA) Voting Member Agencies: Santa Ynez River Water Conservation District (SYRWCD), Mission Hills Community Services District (MHCSD), Vandenberg Air Force Base (VVCSD), and City of Lompoc	• Oversee Groundwater Sustainability Plan (GSP) development • Approve budgets, fees, and charges • Conduct public hearings • Consider stakeholder feedback • Adopt the GSP • Provide direction to GSA staff
WMA GSA Non-Voting Member Agency: Santa Barbara County Water Agency	• Participate in GSA meeting and Citizen Advisory Group (CAG) meetings as appropriate • Provide guidance to the GSA
WMA GSA Staff	• Administer the WMA and CAG • Provide notice of public meetings • Manage GSP consultant team
CAG	• Review technical information • Confer with other groundwater users and interested parties • Provide feedback and recommendations to the WMA
Interested Parties	• Attend GSA meetings and workshops • Read electronic newsletters • Provide input on draft and final GSP
GSP Consultant Team	• Develop draft GSP components • Present information and make changes as directed by the WMA • Prepare final GSP

6 CONTACT US

The best way to stay informed and receive the most current information for the WMA GSA and GSP development is to subscribe to the email distribution list. To subscribe, register as an interested party on the website: http://portal.santaynezwater.org/registration. 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 Western Management Area (WMA) Groundwater Sustainable Agency (GSA) will meet these requirements.

Sustainable Groundwater Management Act Requirement	**Western Management Area Groundwater Sustainability Agency**
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 an advisory committee (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 November 4, 6, 16, 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 hearing conducted on November 17, 2016;

	December 6 (two locations) and 21, 2016; January 11, 2017
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 Groundwater Sustainability Plan (GSP) development (SGMA Section 10727.8).	Completed on June 7, 2018
Submit initial notification of intent to prepare a GSP (GSP Regulations Section 353.6).	Completed on June 7, 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.
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.

GSAs 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 GSP, and implementation of the Groundwater Sustainability Plan (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 Lompoc, Vandenberg Village Community Services District (VVCSD), and Mission Hills Community Services District (MHCSD) are GSA members. Domestic water-well owners and agricultural users that have reported groundwater production with the Santa Ynez River Water Conservation District (SYRWCD) were invited to apply to become a member of the Western Management Area (WMA) GSA Citizen Advisory Group (CAG). Several representatives from the agricultural community are on the WMA CAG.

(b) Municipal Well Operators: The City of Lompoc, VVCSD, and MHCSD are GSA members. The City, VVCSD and MHCSD are all members of the WMA GSA.

(c) Public Water Systems: City of Lompoc, VVCSD, and MHCSD are GSA members. Representatives from mutual water companies in the WMA were invited to apply to become a member of the WMA GSA CAG.

(d) Local Land Use Planning Agencies: The City of Lompoc is a member of the WMA GSA and the Santa Barbara County Planning and Development Department through Santa Barbara County Water Agency is a member of the WMA 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 WMA GSA CAG.

(f) Surface Water Users: SYRWCD calls for water-rights releases under Order from the State of California Water Resources Control Board (SWRCB). The City of Lompoc pumps groundwater and discharges treated wastewater to the Santa Ynez River. Agricultural interests (i.e., vineyards and truck crops) that have reported groundwater production with SYRWCD. The City is a member of the WMA GSA and several representatives from the agricultural community are on the WMA GSA CAG

(g) Federal Government: Vandenberg Air Force Base and the Lompoc Federal Correctional Complex are located within the WMA. Neither is required to nor will they participate in SGMA. Both the Vandenberg Air Force Base and the Lompoc Federal Penitentiary. A VAFB representative is a member of the WMA CAG.

(h) California Native American tribes: None. (Santa Ynez Band of Chumash Indians are in the Eastern Management Area [EMA])

(i) Disadvantaged Communities: Portions of the City of Lompoc are considered Disadvantaged Communities by the Department of Water Resources (DWR). Residents of the City of Lompoc were invited to apply to become a member of the WMA CAG. The residents within the DAC are represented on the WMA GSA by the City of Lompoc.

(j) Entities Listed in SGMA Section 10927 that are monitoring groundwater elevations in all or part of the WMA managed by the GSA: SYRWCD in collaboration with the City of Lompoc, VVCSD and MHCSD monitors wells in the WMA and all are members of the GSA. The Santa Barbara County Water Agency is the CASGEM agency within the WMA and is a member of the GSA.

The WMA has also added the following entities that submitted letters requesting participation in the GSA and/or GSP process to the list of interested parties; Vandenberg Air Force Base, Freeport-McMoRan Oil & Gas (now Sentinel Peak Resources California LLC), Imerys Mineral California Inc., and the National Marine Fisheries Service.

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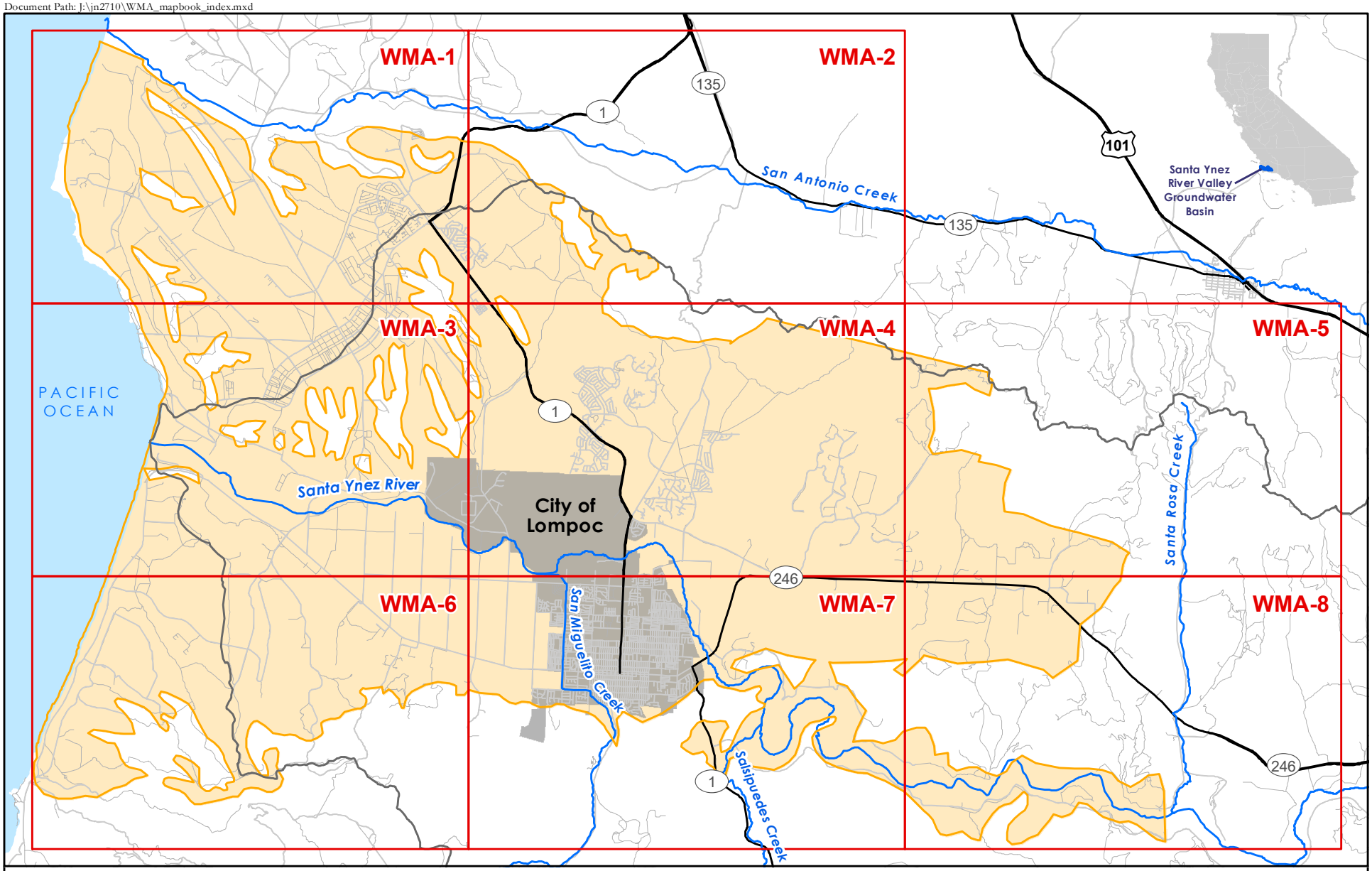

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Western GSA

City of Lompoc

WESTERN MANAGEMENT AREA BOUNDARY
MAPBOOK INDEX

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GROUNDWATER SUSTAINABILITY AGENCY

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WMA INDEX

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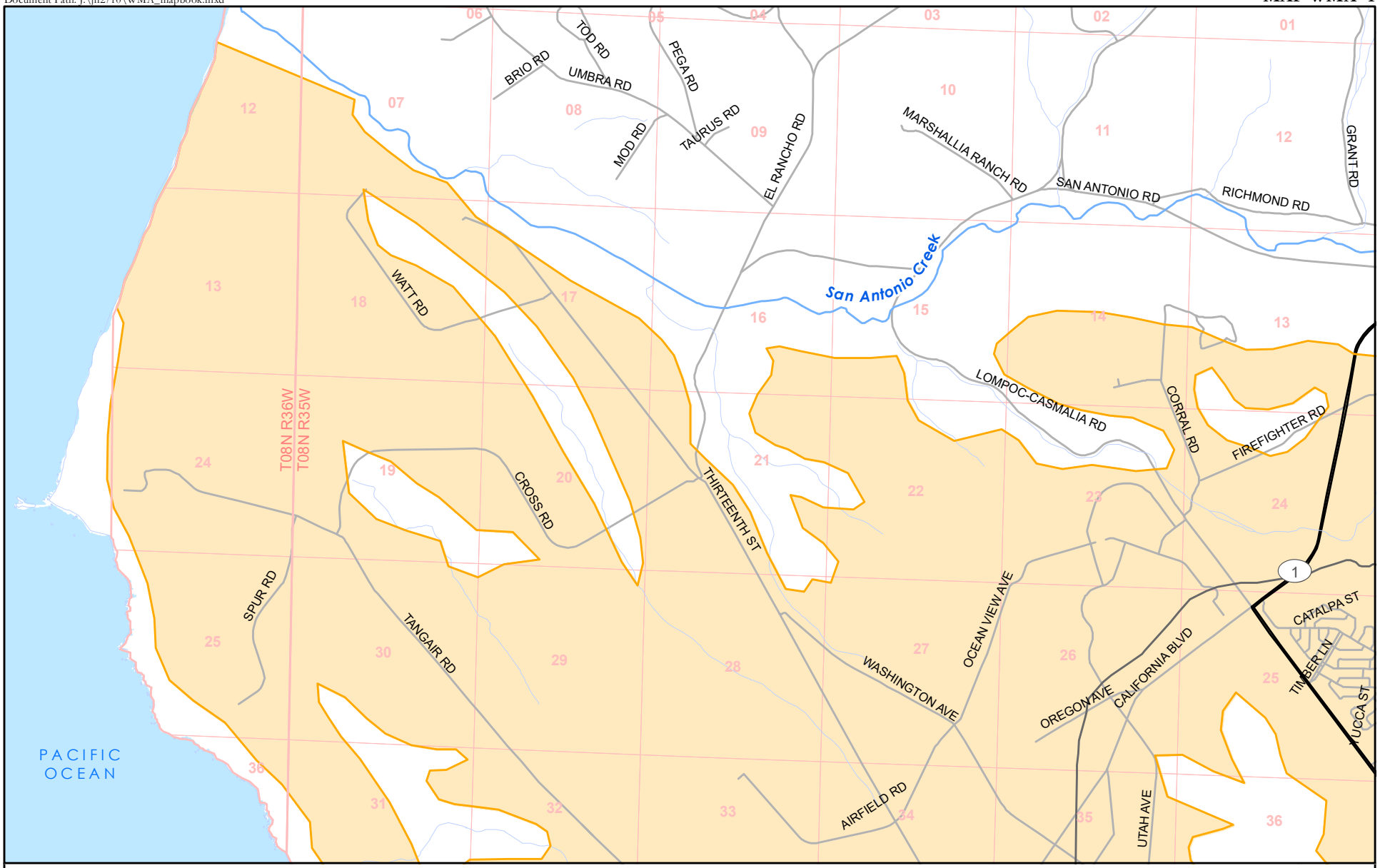

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WESTERN MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN
GROUNDWATER SUSTAINABILITY AGENCY

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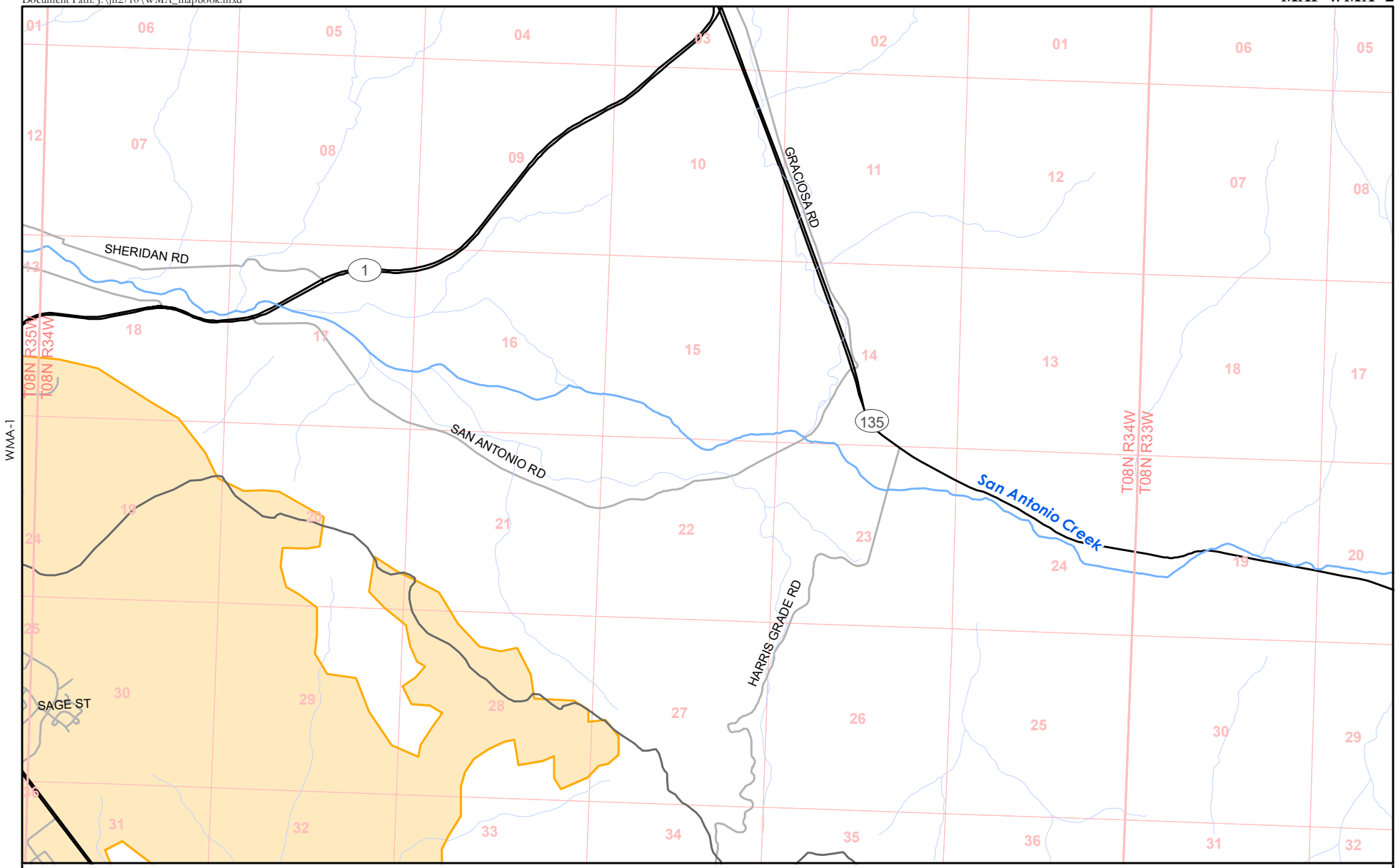

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WESTERN MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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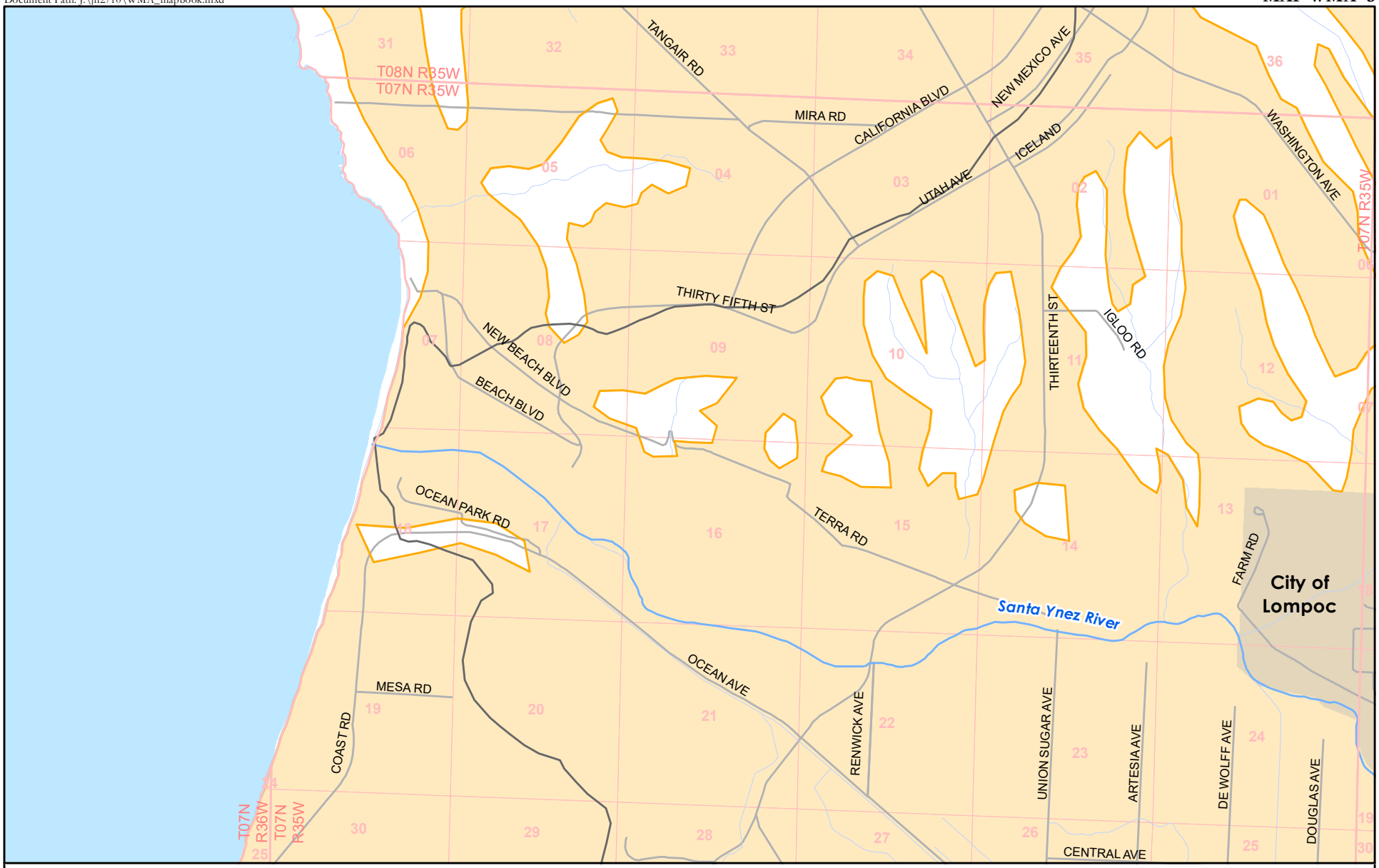

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WESTERN MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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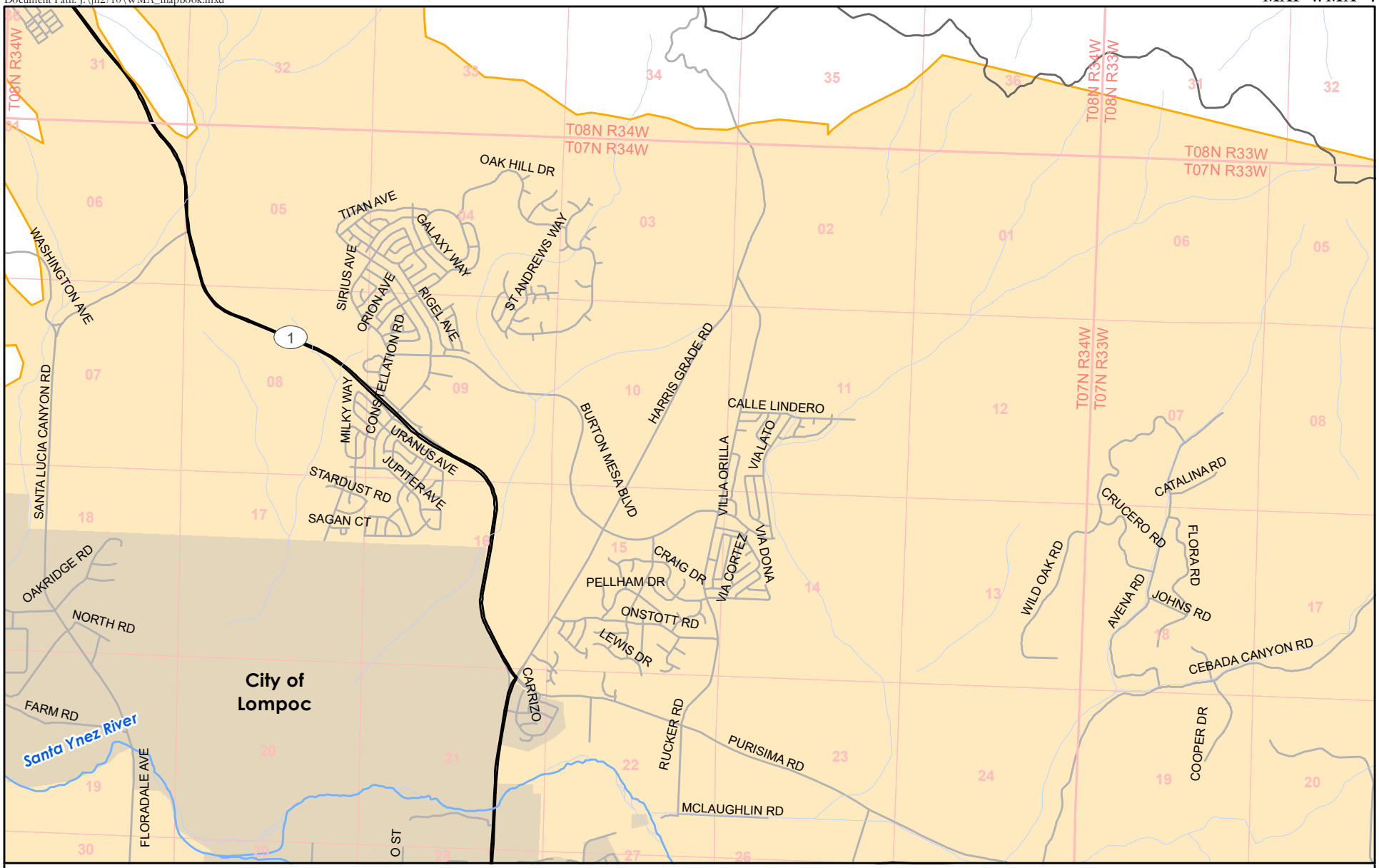

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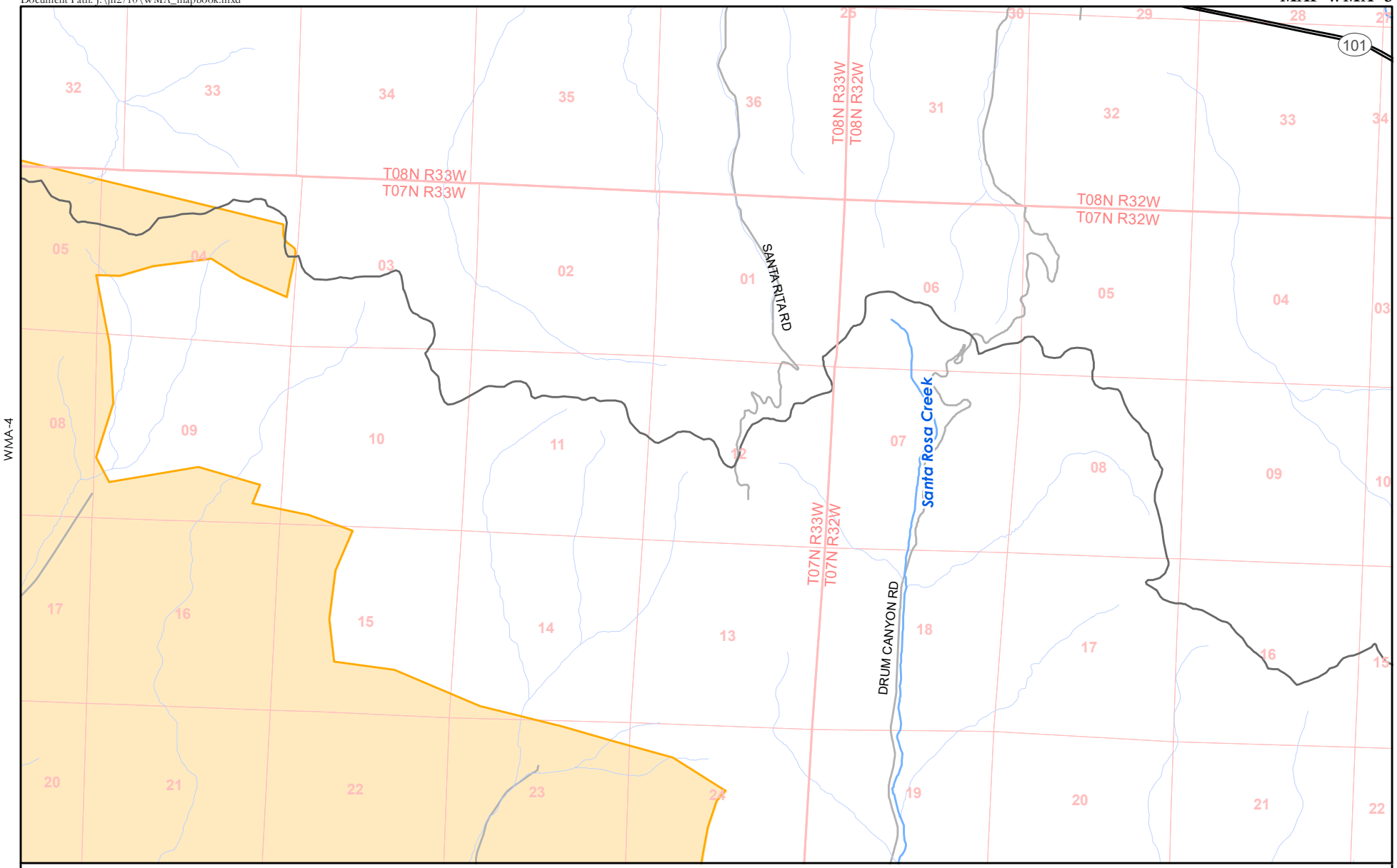

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GROUNDWATER SUSTAINABILITY AGENCY

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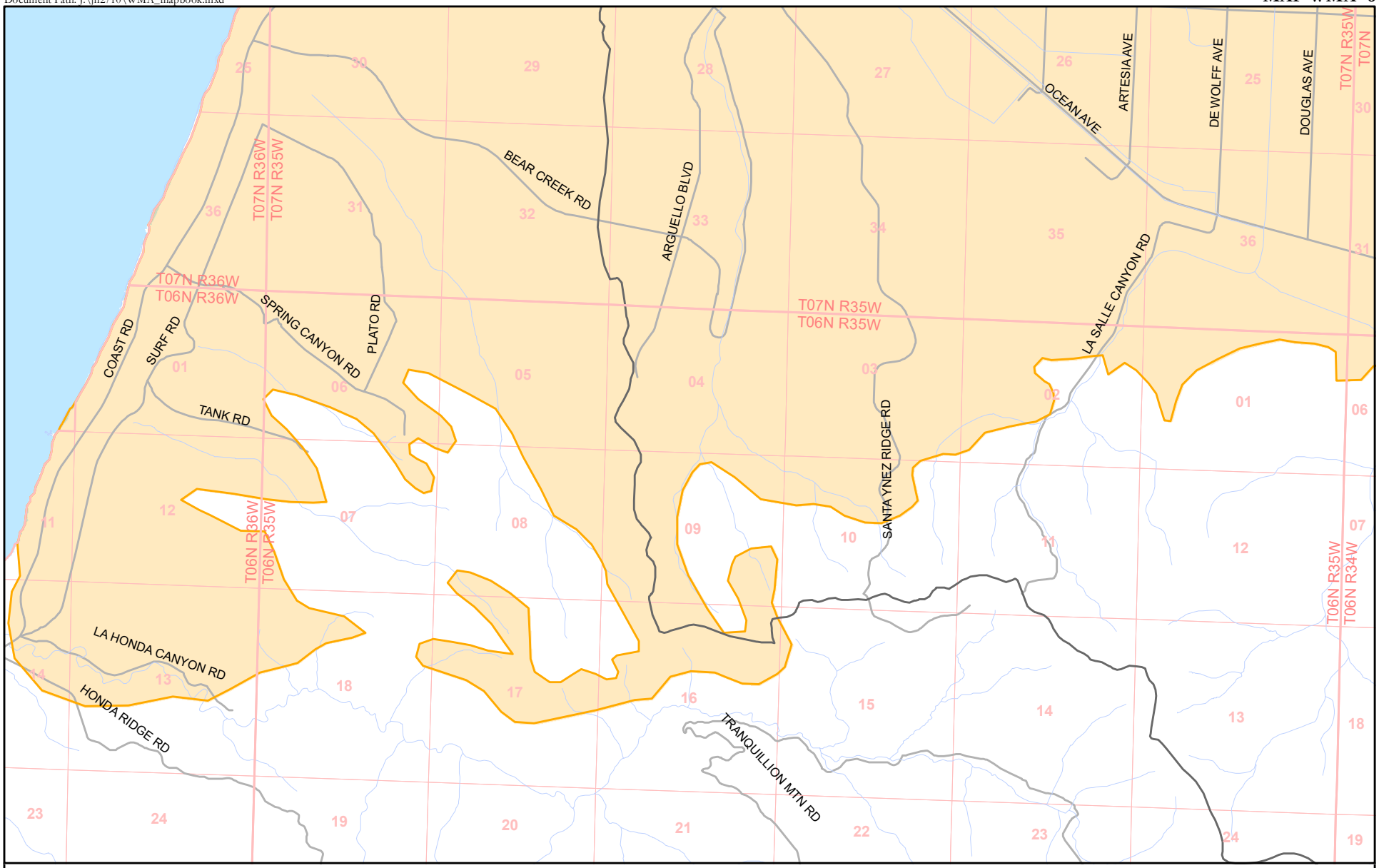

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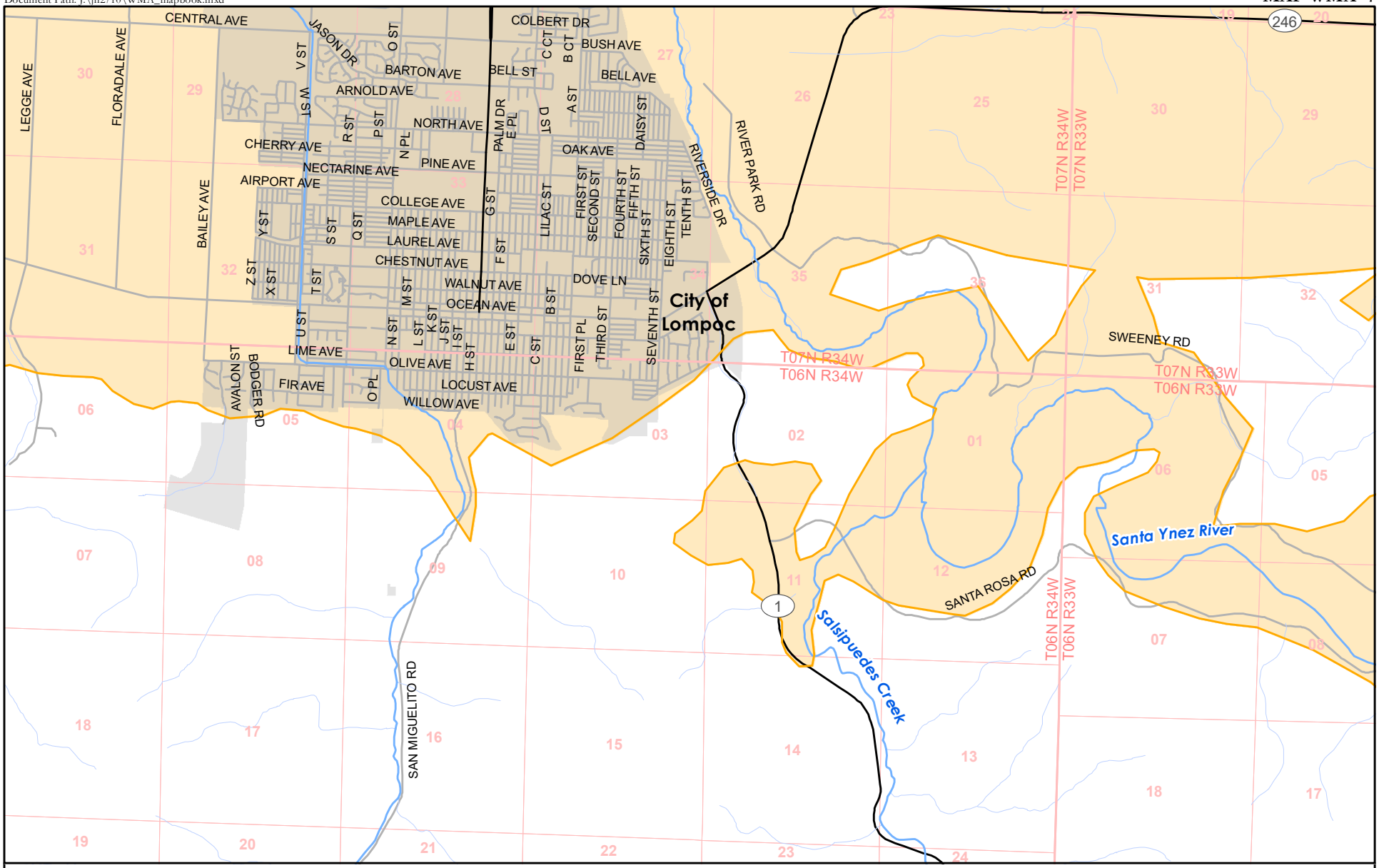

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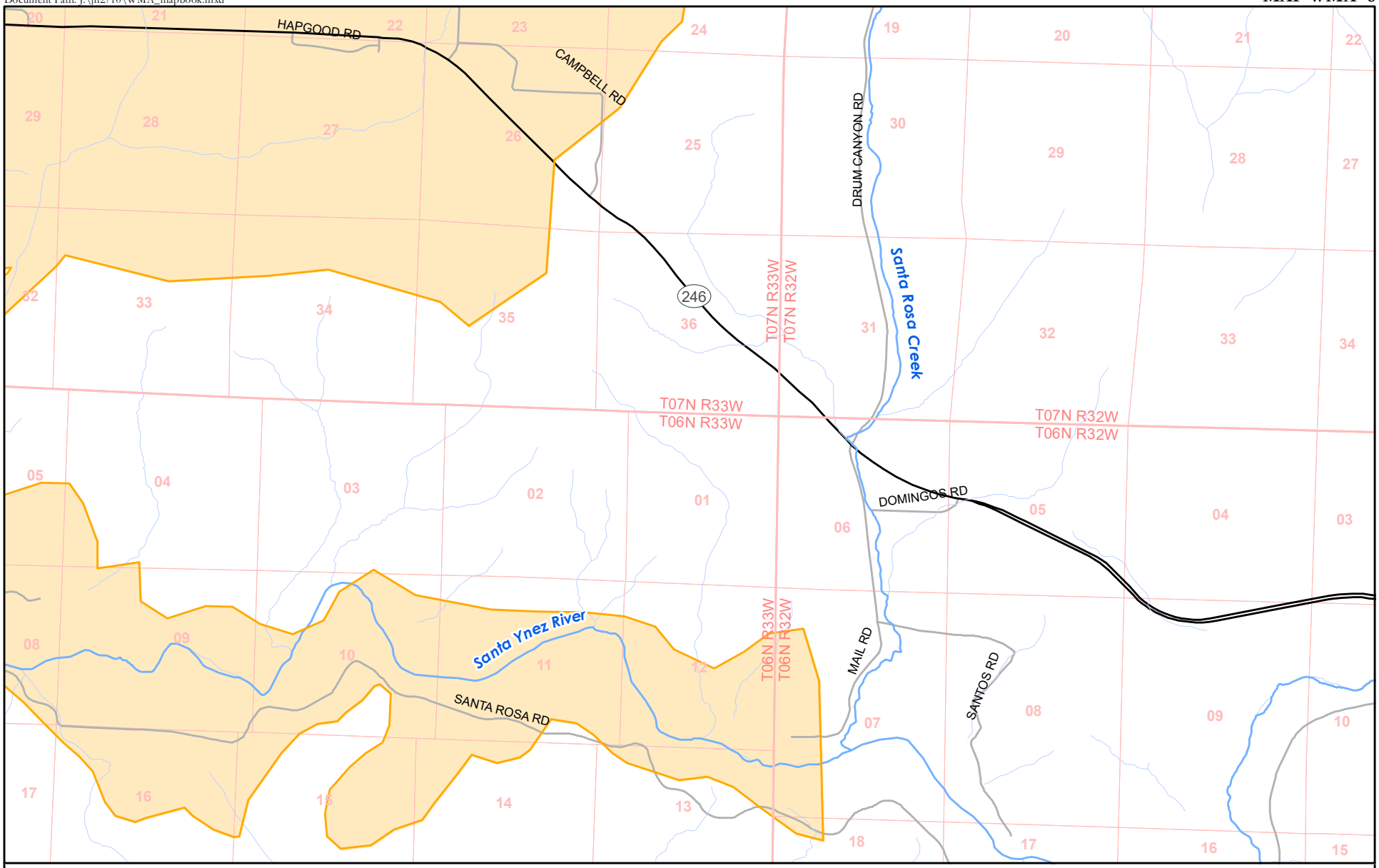

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WESTERN MANAGEMENT AREA BOUNDARY MAPBOOK

SANTA YNEZ RIVER VALLEY GROUNDWATER BASIN GROUNDWATER SUSTAINABILITY AGENCY

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Chapter 1 – Introduction and Plan Area

Appendix 1c-D:

Sustainable Groundwater Management Act Newsletter No.1 through No.4 and Press Releases

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

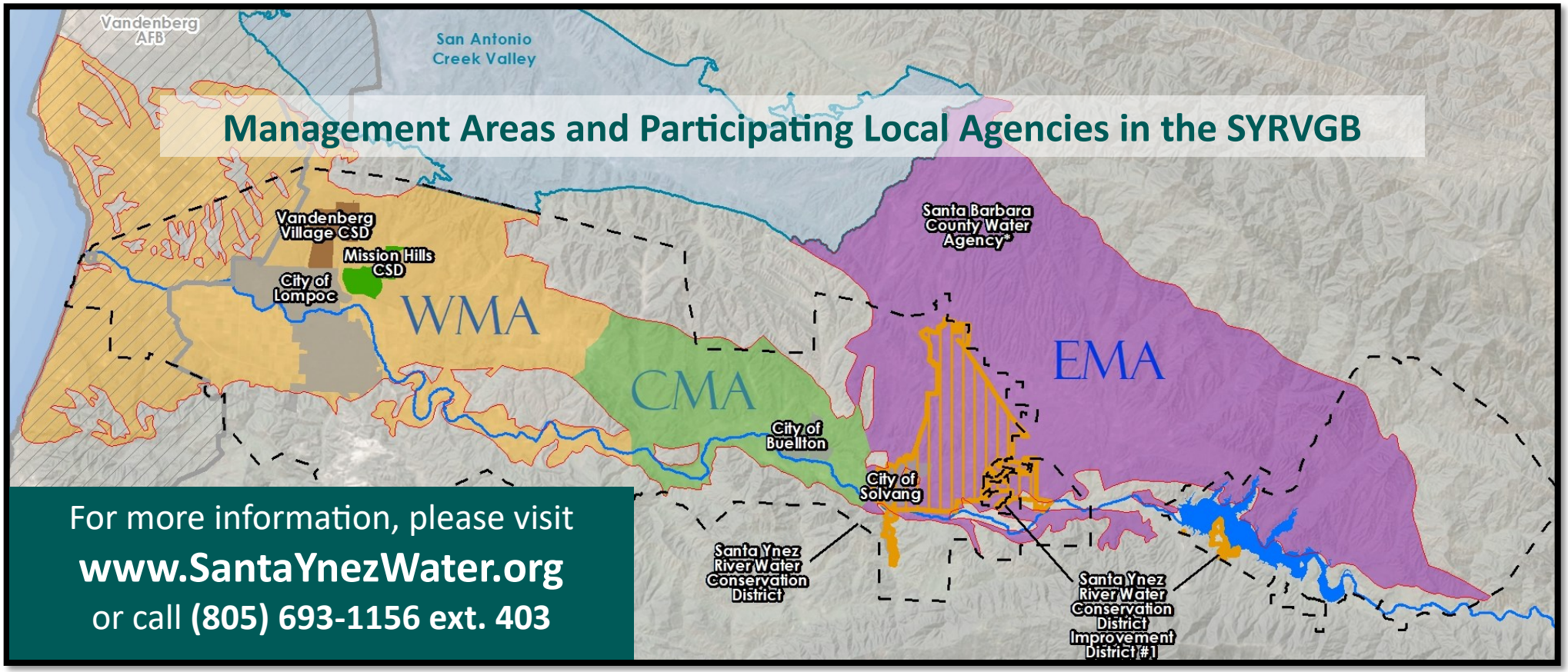
- Santa Ynez River Water Conservation District • City of Buellton
- Santa Barbara County Water Agency

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.**



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:

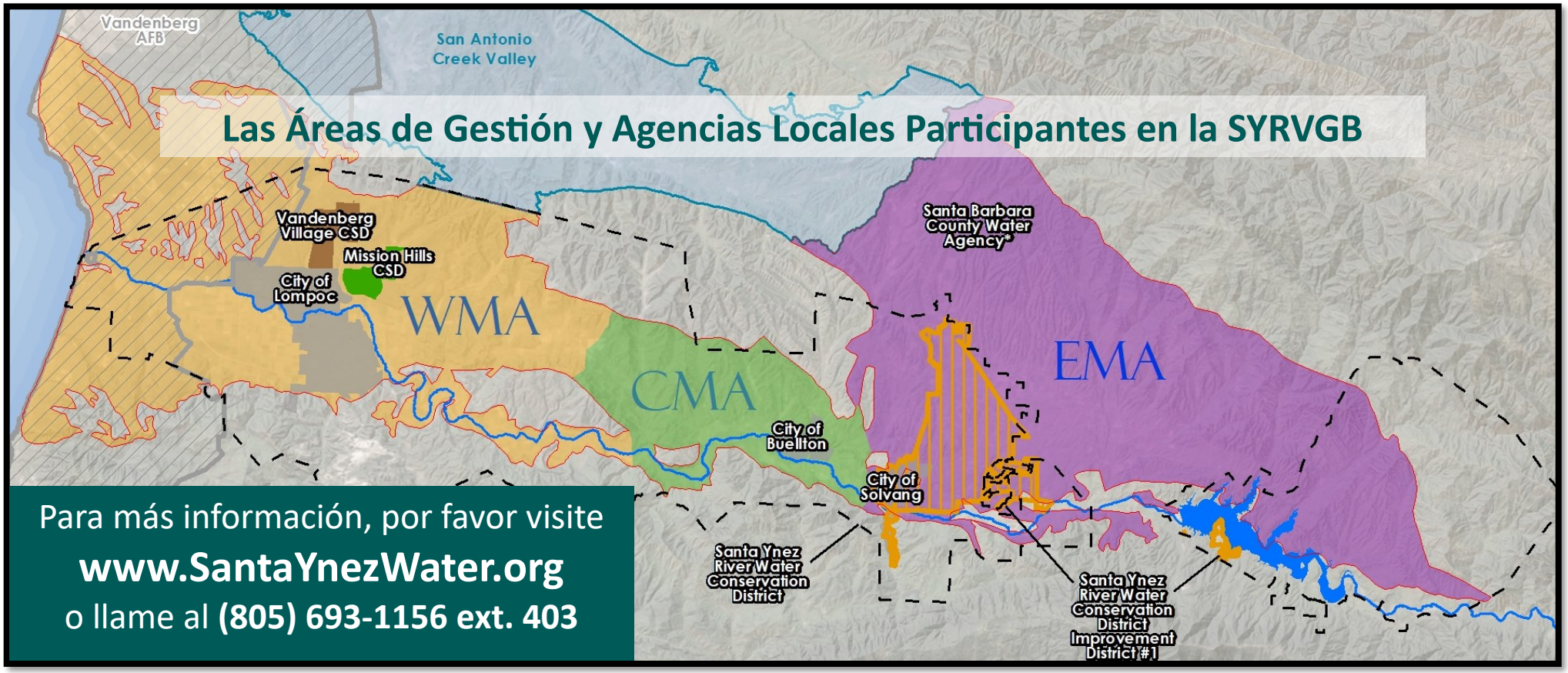
Zona de Gestión del Oeste (WMA, por sus siglas en inglés) Comité de GSA
- Distrito de Conservación de Agua del Río Santa Ynez • Ciudad de Lompoc
- Mission Hills CSD • Vandenberg Village CSD
- Agencia de Agua del Condado de Santa Bárbara

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

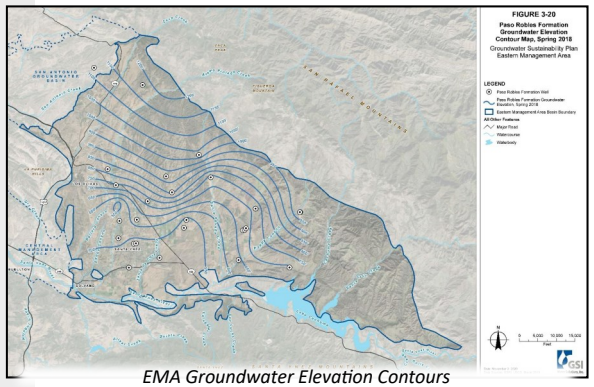
The Sustainable Groundwater Management Act (SGMA), enacted January 2015, creates a new framework for groundwater management. The management plan developed by this process will regulate future groundwater use and will be completed in early 2022.

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.

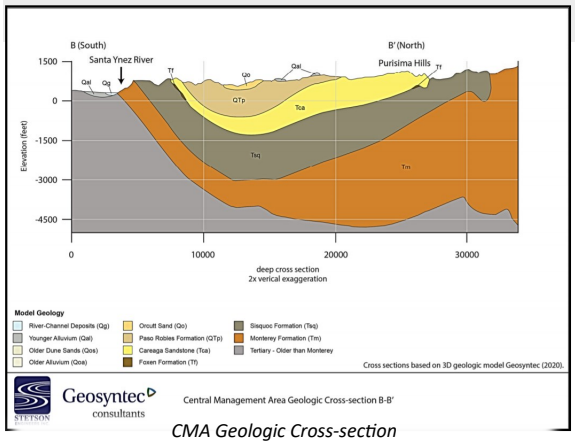
Check SantaYnezWater.org for schedule of Public Meetings and Workshops

Hydrogeological Conceptual Model:
Provides understanding of basin setting, physical characteristics and basin geometry (geology), hydrogeologic conditions, land use, and groundwater uses and users.

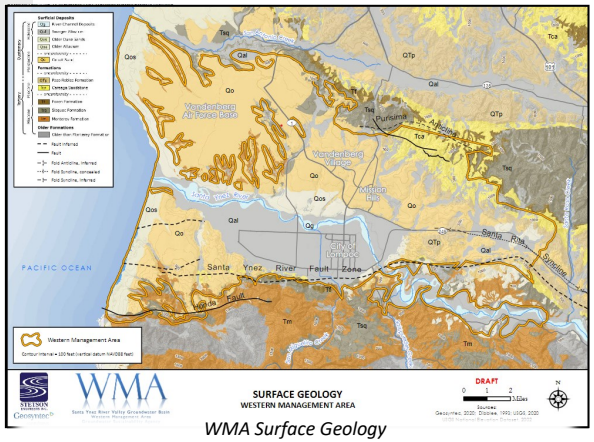
HCMs include a series of geologic maps and scaled cross-sections to provide a representation and geographic view of different data sets, as demonstrated by these examples from the draft HCMs.



EMA Groundwater Elevation Contours



CMA Geologic Cross-section



WMA Surface Geology

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* .

For more information, meeting announcements, and draft documents, please visit

SantaYnezWater.org
or call **(805) 693-1156 ext. 403**

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

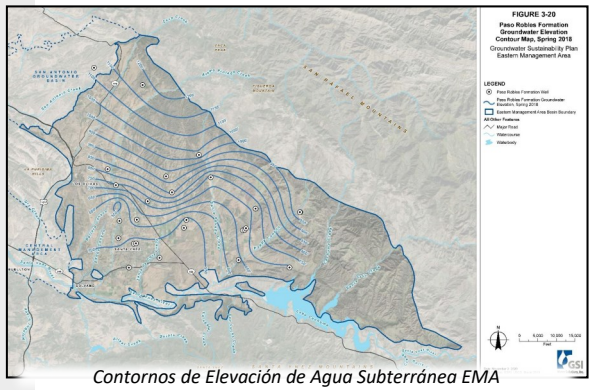
La Ley de Gestión Sostenible del Agua Subterránea (SGMA, por sus siglas en inglés), promulgada en enero del 2015, crea un nuevo marco para la sostenibilidad del agua subterránea. El plan de sostenibilidad desarrollado por este proceso regulará el uso futuro del agua subterránea y se completará a principios 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.

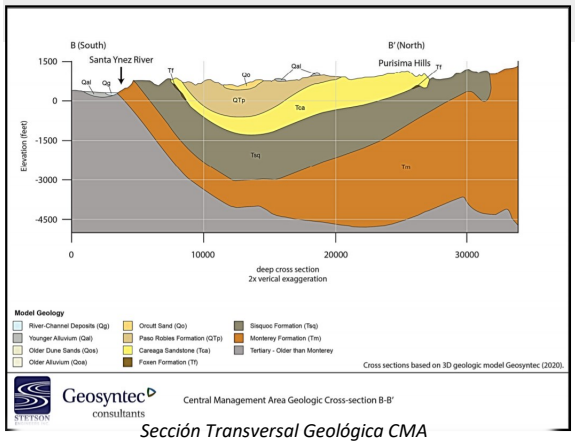
Visite SantaYnezWater.org para conocer el calendario de Reuniones Públicas y Talleres

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.

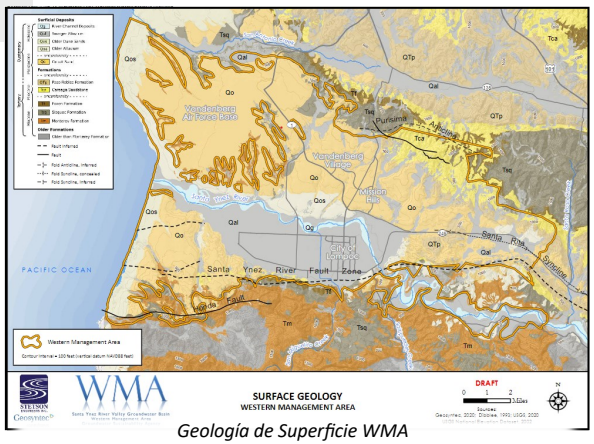
Los HCM incluyen una serie de mapas geológicos y secciones transversales escaladas para proporcionar una representación y vista geográfica de diferentes conjuntos de datos, como lo demuestran estos ejemplos de los borradores de HCM.



Contornos de Elevación de Agua Subterránea EMA



Sección Transversal Geológica CMA



Geología de Superficie WMA

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.*

Para obtener más información, anuncios de reuniones, y documentos preliminares, visite

SantaYnezWater.org

o llame al **(805) 693-1156 ext. 403**

Sustainable Groundwater Management Act Newsletter No. 3 March 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 developed by this process will regulate future groundwater use and will be completed in early 2022.

Check SantaYnezWater.org for schedule of Public Meetings and Workshops

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

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.

Visite SantaYnezWater.org para programar las Reuniones y los Talleres Públicos

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.

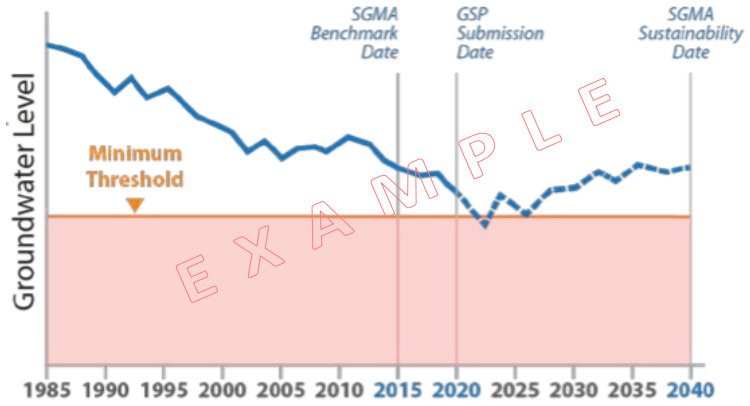
Check SantaYnezWater.org for schedule of Public Meetings and Workshops

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.

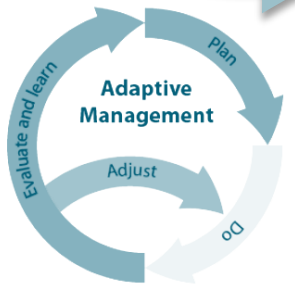
- Lowering GW Levels
- Reduction of Storage
- Seawater Intrusion
- Degraded Quality
- Land Subsidence
- Surface Water Depletion

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

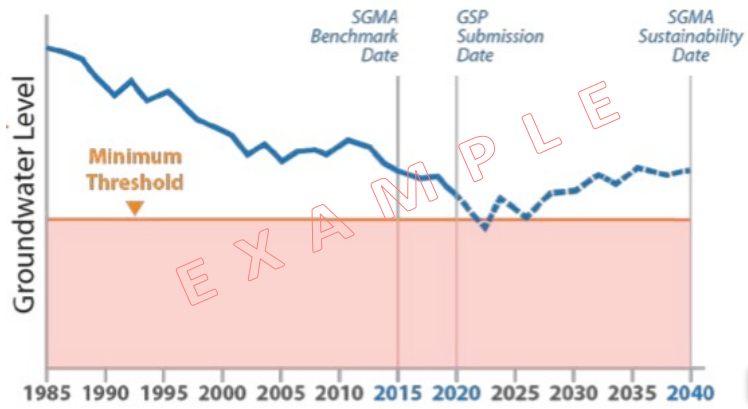
La Ley de Gestión Sostenible del Agua Subterránea (SGMA), promulgada en Enero del 2015, crea un nuevo marco para la gestión del agua subterránea. El plan de gestión (GSP) elaborado por representantes de los municipios y organismos locales, gestionará y regulará el futuro uso del agua subterránea y estará completado a principios del 2022.

Visite SantaYnezWater.org para programar las Reuniones y los Talleres Públicos

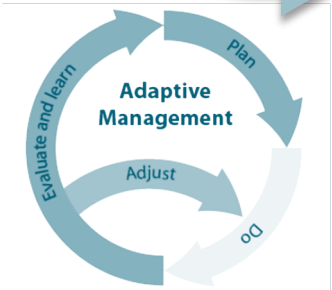
Las Agencias de Sostenibilidad del Agua Subterránea (GSAs) deben considerar y documentar las condiciones en las que cada uno de los seis indicadores de sostenibilidad se vuelven significativos y no razonables en su cuenca.

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

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

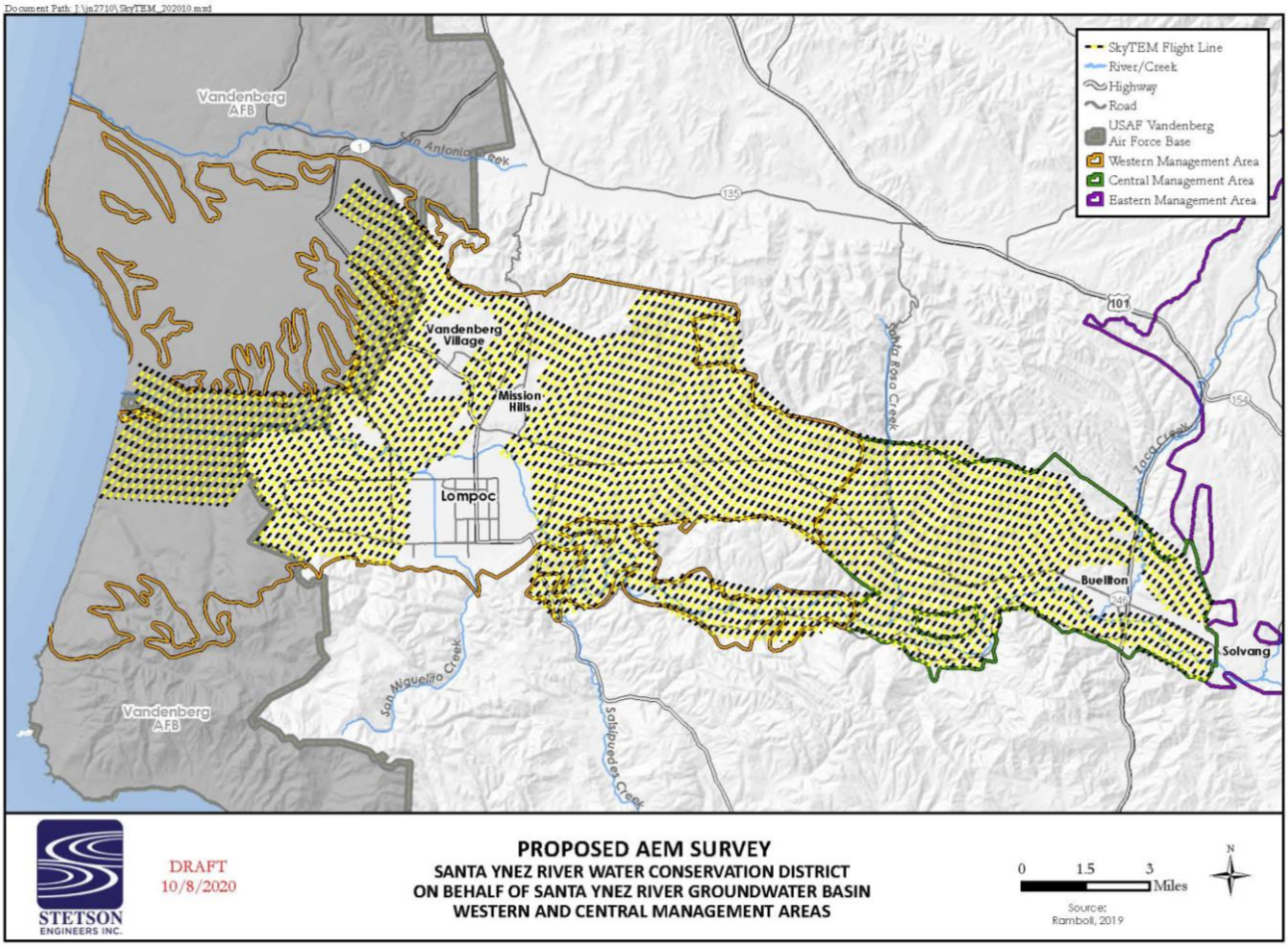
COUNTY TO CONDUCT GROUNDWATER SURVEY FLIGHTS

(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-


Document Path: J:\jn2710\SkyTEM_202010.mxd
SkyTEM Flight Line
River/Creek
Highway
Road
USAF Vandenberg Air Force Base
Western Management Area
Central Management Area
Eastern Management Area
Vandenberg AFB
San Antonio Creek
Vandenberg Village
Mission Hills
Lompoc
Santa Rosa Creek
Tajiguas Creek
Buellton
Solvang
San Miguelito Creek
Salsipuedes Creek
Vandenberg AFB
DRAFT
10/8/2020
STETSON ENGINEERS INC.
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
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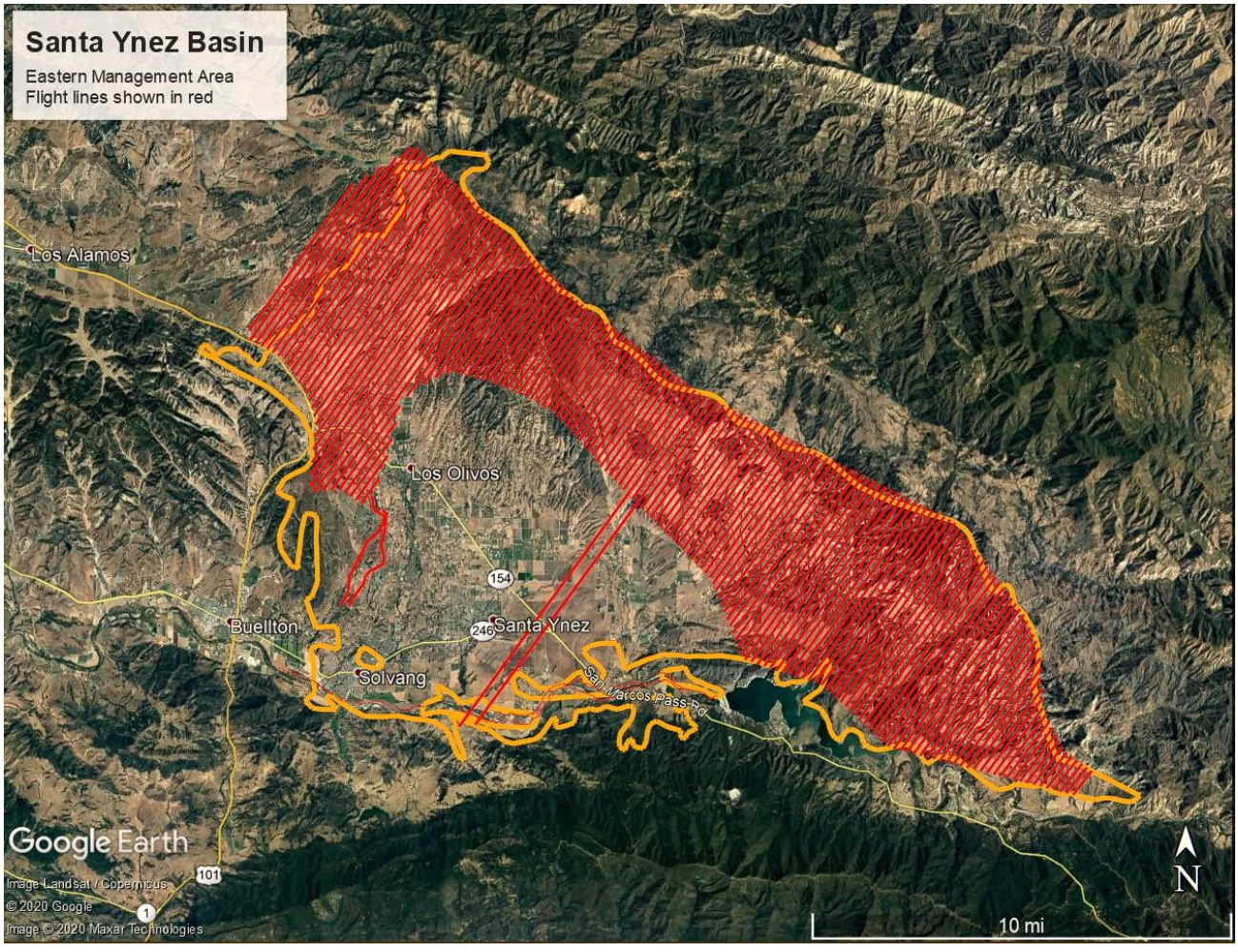
Source: Ramboll, 2019


Santa Ynez Basin
Eastern Management Area
Flight lines shown in red
Los Alamos
Los Olivos
Buellton
Santa Ynez
Solvang
San Marcos Pass Rd
Google Earth
Image Landsat / Copernicus
© 2020 Google
Image © 2020 Maxar Technologies
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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

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.

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

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: 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.

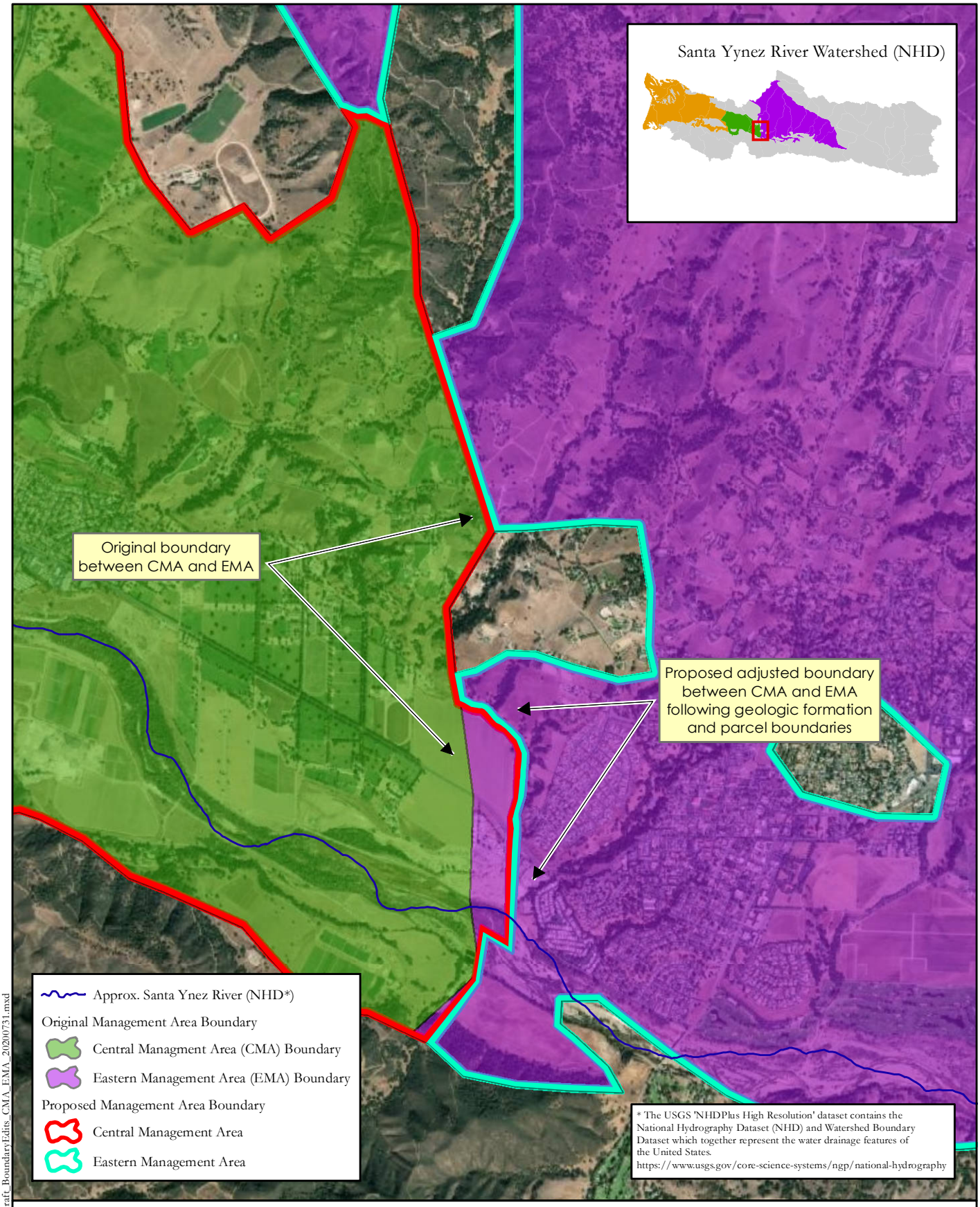
Summary of Changes to WMA-CMA Internal Boundary

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



Document Path: J:\jn2710\Draft_BoundaryEdits_CMA_EMA_20200731.mxd

STETSON ENGINEERS INC.

DRAFT
7/31/2020

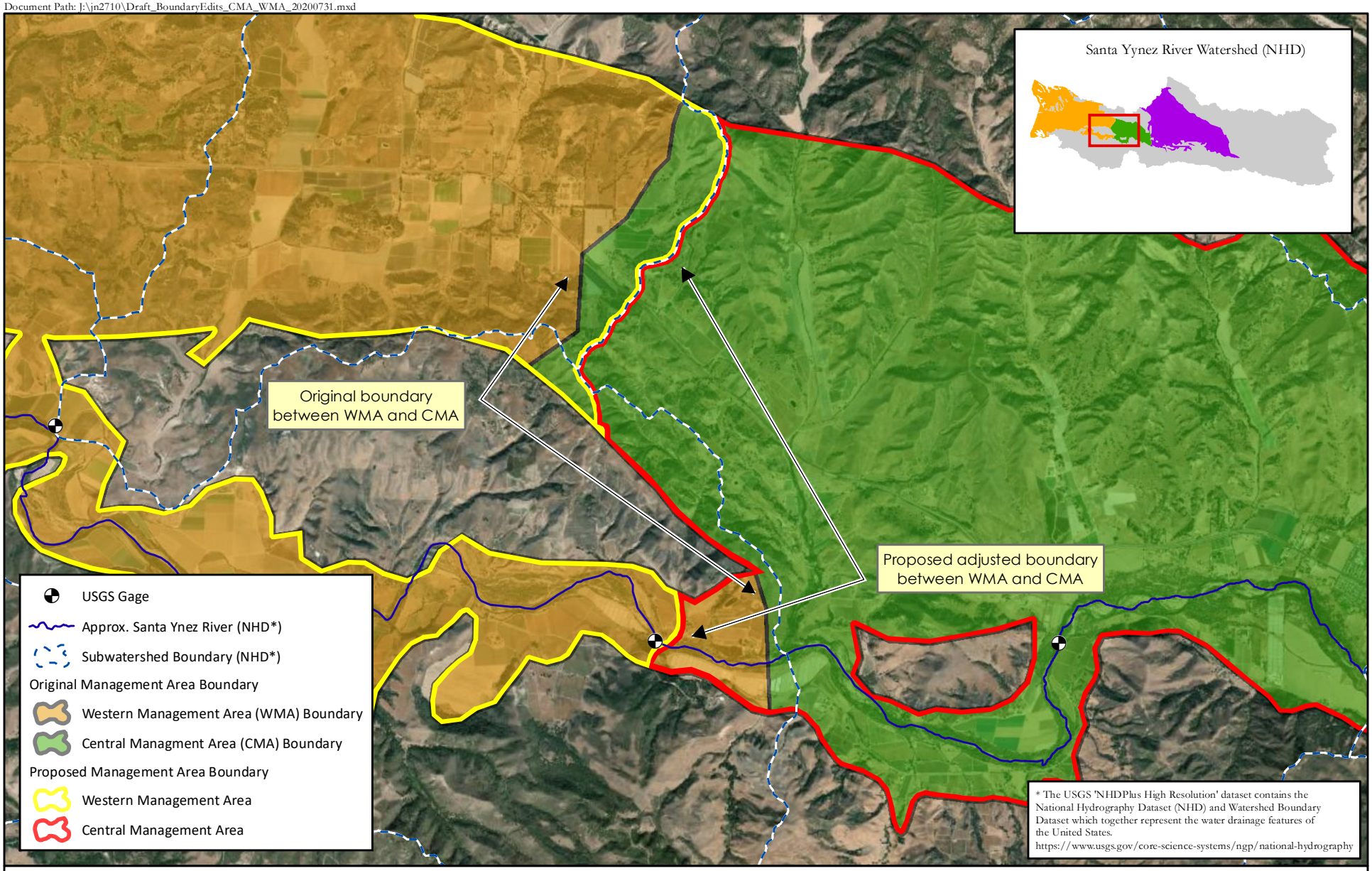
PROPOSED BOUNDARY ADJUSTMENTS
CENTRAL AND EASTERN MANAGEMENT AREAS

Proposed adjusted boundary between CMA and EMA
following geologic water-bearing formation boundary and parcels;
No exterior DWR Bulletin 118 boundaries are changed.

N

0 0.25 0.5 Miles

Document Path: J:\jn2710\Draft_BoundaryEdits_CMA_WMA_20200731.mxd



STETSON ENGINEERS INC.

DRAFT
7/31/2020

PROPOSED BOUNDARY ADJUSTMENTS
CENTRAL AND WESTERN MANAGEMENT AREAS

0 0.5 1 Miles

N

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.

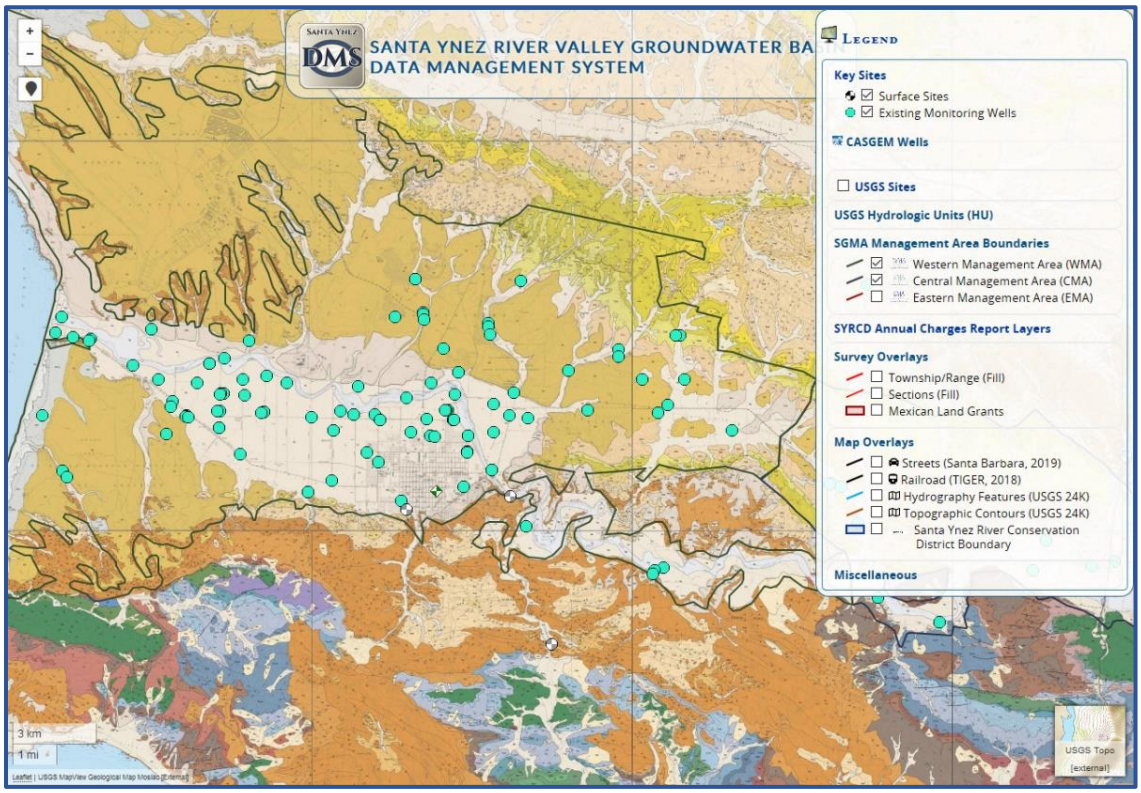
FIGURE 2

Chapter 1 – Introduction and Plan Area

Appendix 1e-A:

Draft Final Data Management Plan, Western Management Area, Dated February 2020

DRAFT FINAL
DATA MANAGEMENT PLAN



Screenshot including streaming geologic maps from the U.S. Geological Survey.

WMA

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

Prepared by:

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants

FEBRUARY 2020

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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
WMA	Western 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 Western Management Area (WMA) 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 Central Management Area (CMA) and Eastern Management Area (EMA). This document describes how the DMS is being implemented as part of the GSP development for the WMA (Figure 1-2).

The WMA consists of the western portion of the SYRVGB as shown in Figure 1-2. The subareas of the WMA consist of the Lompoc Plain, Lompoc Terrace and Lompoc Upland, the Santa Ynez River alluvium west of the confluence with Santa Rosa Creek, and the Santa Rita Upland. The WMA committee comprises representatives of five-member public agencies. The three public agencies wholly within the WMA all run public water systems: the City of Lompoc, Vandenberg Village Community Services District (CSD), and Mission Hills CSD. 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. The WMA includes portions of both Vandenberg Air Force Base and Federal Correctional Institution Lompoc; however, these are both federal entities and are not subject to SGMA.

This report describes the structure and content of the DMS being prepared for the WMA. 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 WMA and CMA 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 WMA, 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.

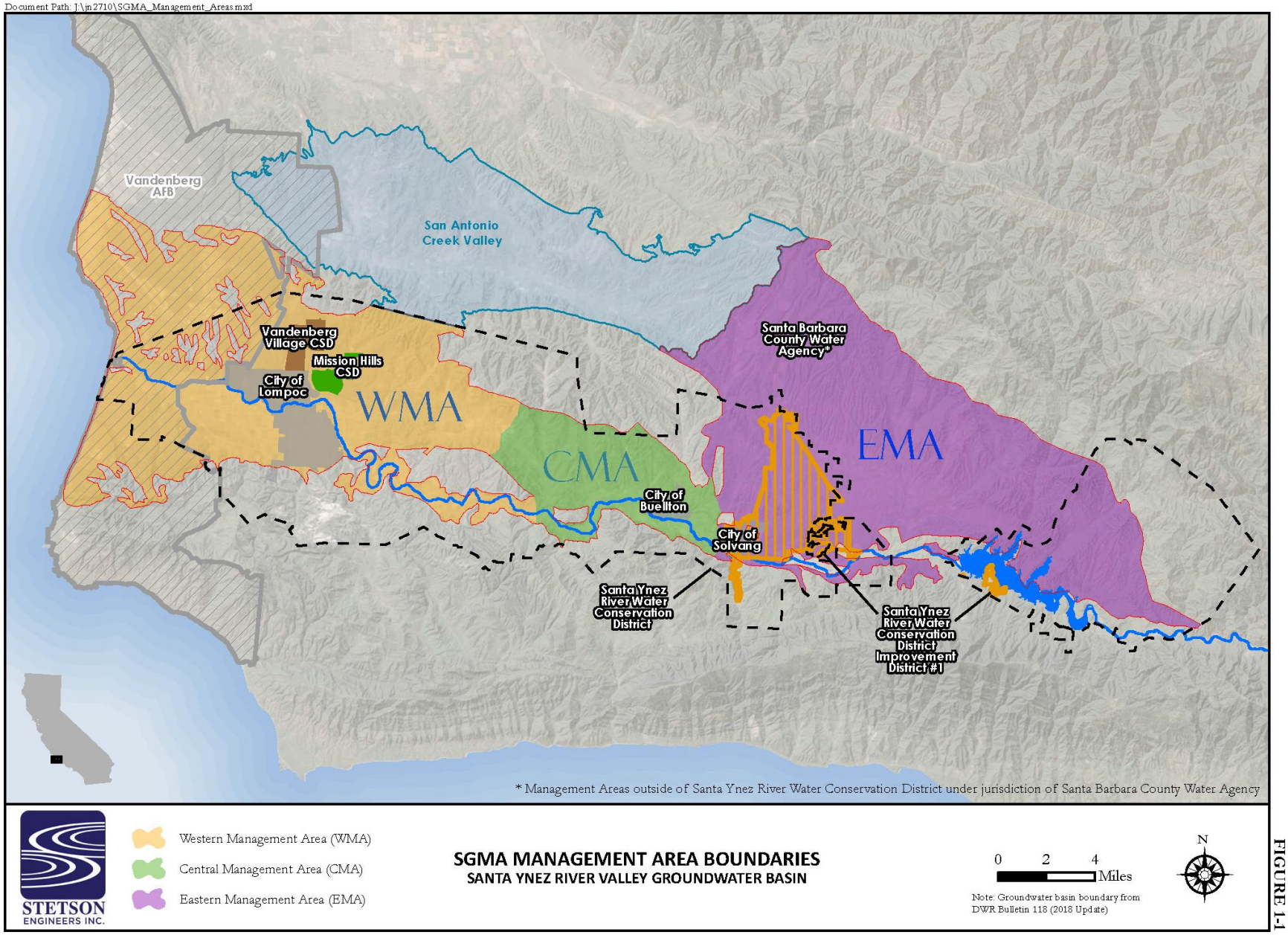
Document Path: J:\jn2710\SGMA_Management_Areas.mxd
Vandenberg AFB
San Antonio Creek Valley
Vandenberg Village CSD
Mission Hills CSD
City of Lompoc
WMA
CMA
EMA
Santa Barbara County Water Agency*
City of Buellton
City of Solvang
Santa Ynez River Water Conservation District
Santa Ynez River Water Conservation 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

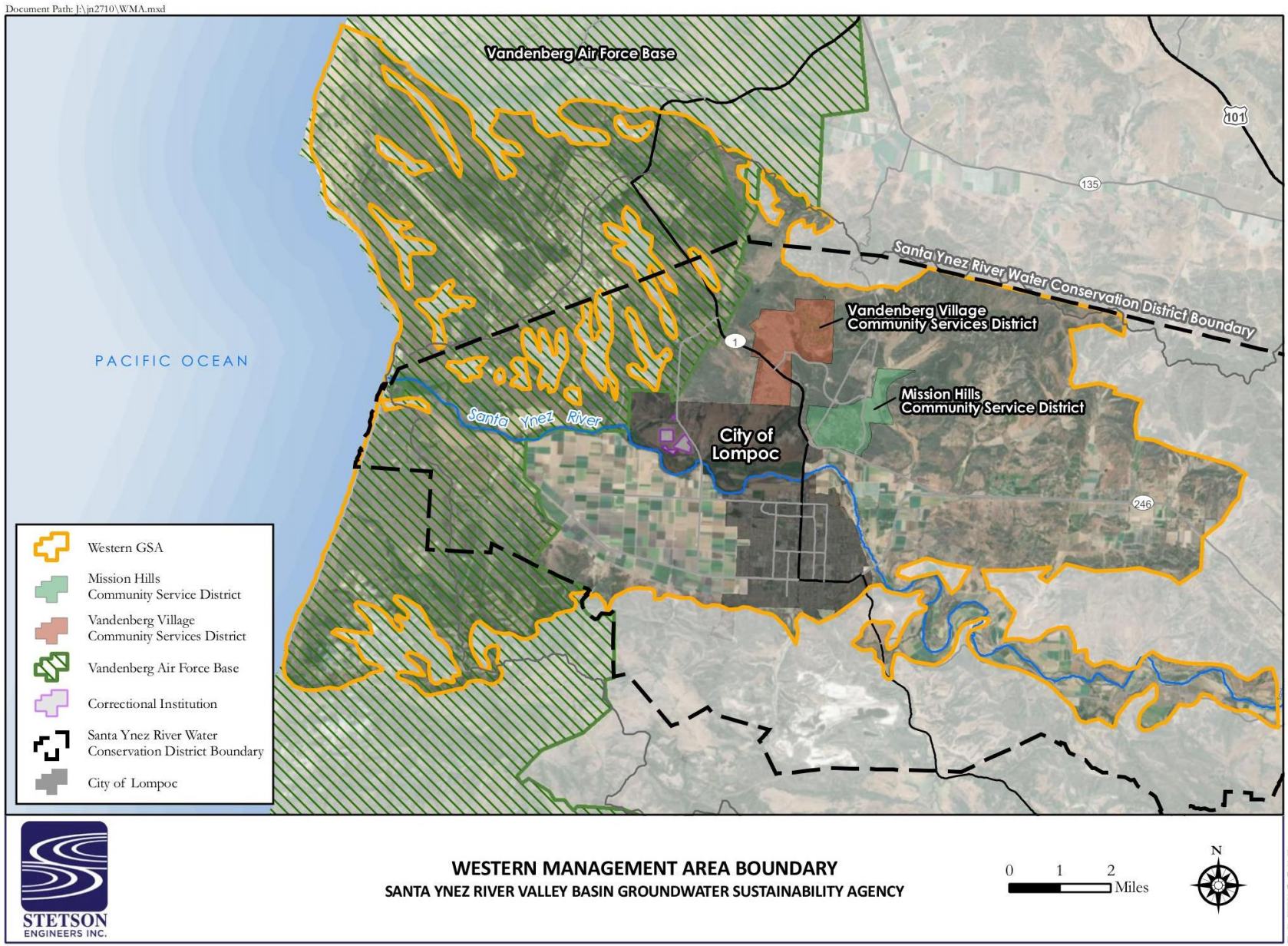
Document Path: J:\jn2710\WMA.mxd
Vandenberg Air Force Base
PACIFIC OCEAN
Santa Ynez River
City of Lompoc
Vandenberg Village Community Services District
Mission Hills Community Service District
Santa Ynez River Water Conservation District Boundary
101
135
1
246
Western GSA
Mission Hills Community Service District
Vandenberg Village Community Services District
Vandenberg Air Force Base
Correctional Institution
Santa Ynez River Water Conservation District Boundary
City of Lompoc
STETSON ENGINEERS INC.
WESTERN MANAGEMENT AREA BOUNDARY
SANTA YNEZ RIVER VALLEY BASIN GROUNDWATER SUSTAINABILITY AGENCY
0 1 2 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 WMA. 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 WMA. 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 WMA 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 WMA.

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 WMA data, which will include the WMA 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 WMA 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 WMA. 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 WMA 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 WMA. 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 WMA 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 WMA, CMA, 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
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
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
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 WMA and CMA both have a similar management history and similar datasets from SYRWCD, so currently both WMA and CMA 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 CMA 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 WMA and CMA 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 WMA and CMA 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 WMA 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 WMA has numerous USGS hydrogeological studies, whose data will be incorporated in the WMA 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 WMA. 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 WMA DMS. The State Water Resources Control Board's water rights database will also be queried for information to import into the WMA DMS (e.g., location information).

For water quality, two additional state databases will be utilized for the WMA 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 WMA 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 WMA 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 WMA. 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 WMA member agencies will be imported into the WMA DMS. This includes hydrogeologic data from the City of Lompoc, Vandenberg Village Community Services District, and Mission Hills Community Services District. In addition, available groundwater data from the SYRWCD and the Vandenberg Air Force Base will be obtained and imported into the WMA DMS. Data that are confidential will not be included in the WMA DMS.

SYRWCD records are expected to be the primary source of groundwater pumping data, as water users in the WMA and CMA 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 WMA 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 WMA 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 WMA DMS. Sites will be reviewed and screened in a three-tiered process for the purposes of potential inclusion in the WMA 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 WMA 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 WMA 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 WMA 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 WMA 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 CMA and EMA.

Tier 3: Minimum Criteria – Not for Inclusion in the GSP

Data that do not meet the criteria for the WMA 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 CMA 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 WMA GSA. It is intended that staff of the WMA GSA committee will have access to the DMS, as will the consultant team working for the WMA GSA committee.

Management Area	GSA Agencies
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
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

5.1.1 Administrative Access

A selected staff member from one of the WMA 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 WMA 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 WMA DMS will be the primary tool used to compile these data each year for the annual report. The WMA DMS will contain the sites used in the WMA 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 WMA 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 WMA 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 WMA 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 WMA 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 WMA 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

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.

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

Geosyntec consultants

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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

DRAFT

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).

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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).

Aquifers

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.

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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.

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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).

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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.

Surface Topography

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*

Surface Geology

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).

Descriptions of Geological Formations

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)

Cross Sections from Previous Reports

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)

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- *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'.

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- **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:

- Lompoc Plain: 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.
- Long cross-sections: 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.
- Short cross-sections: 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.

* * * * * *

Attachments

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

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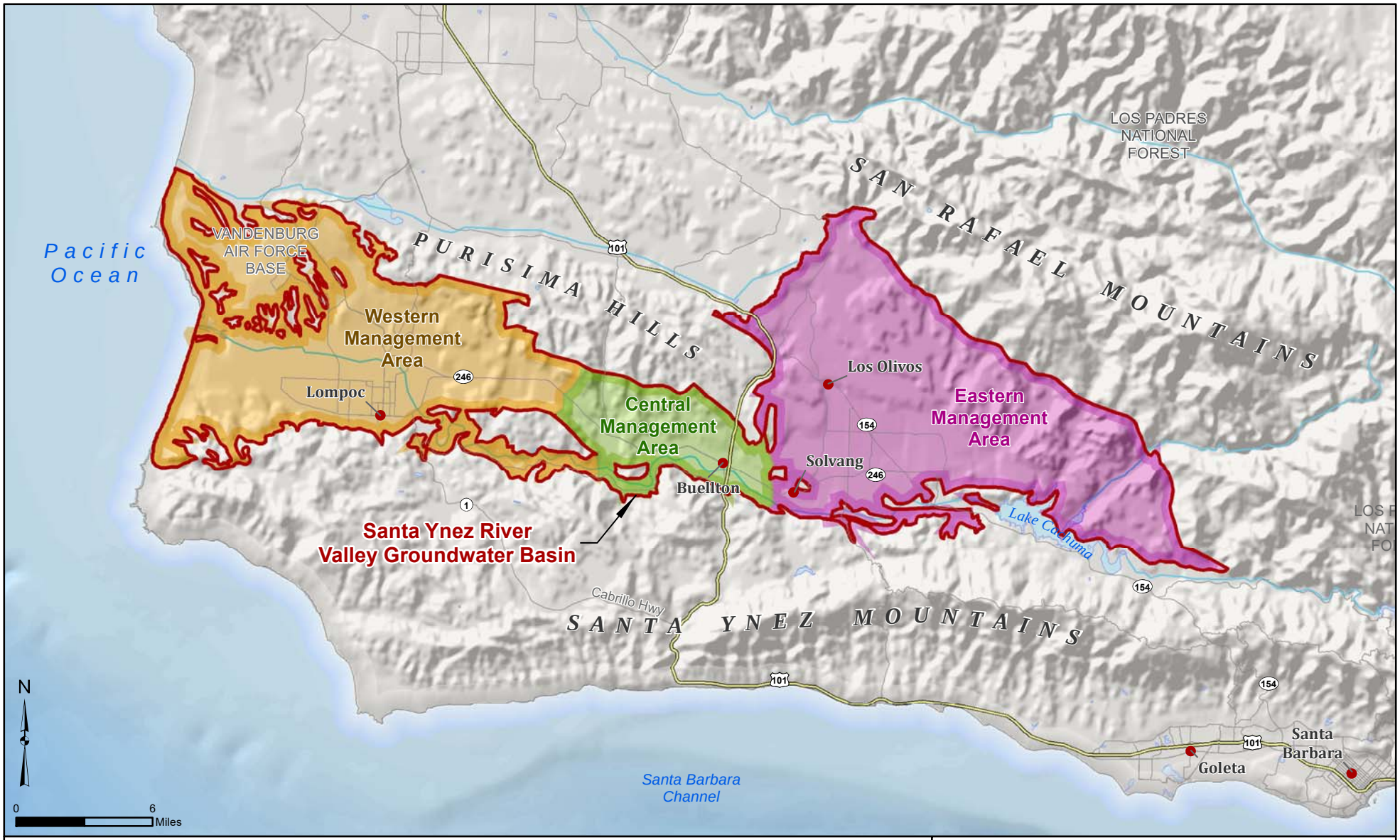
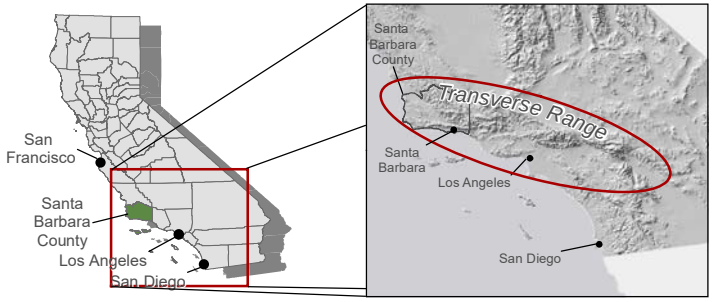


Explanation

- 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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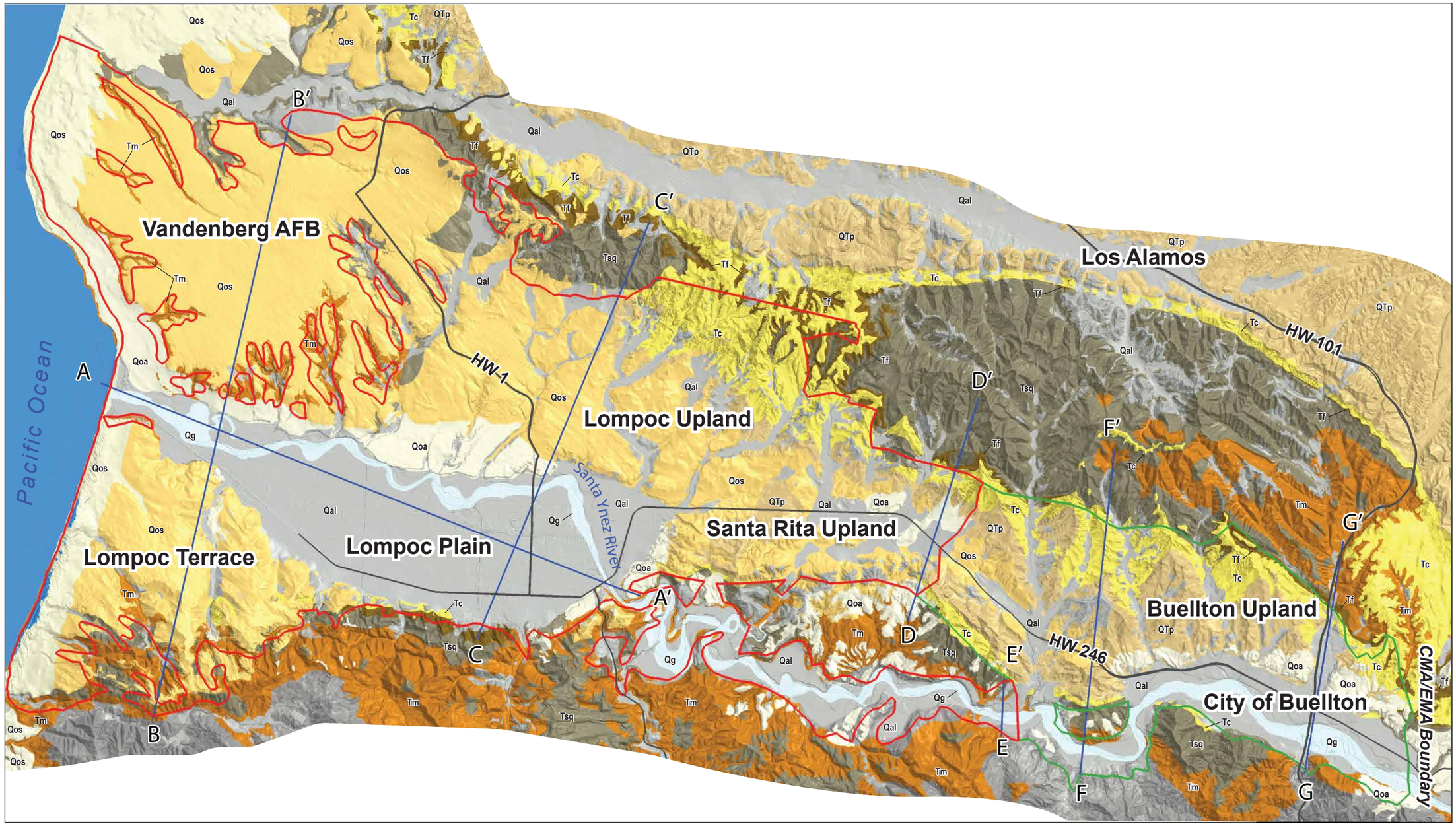


Legend

- 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

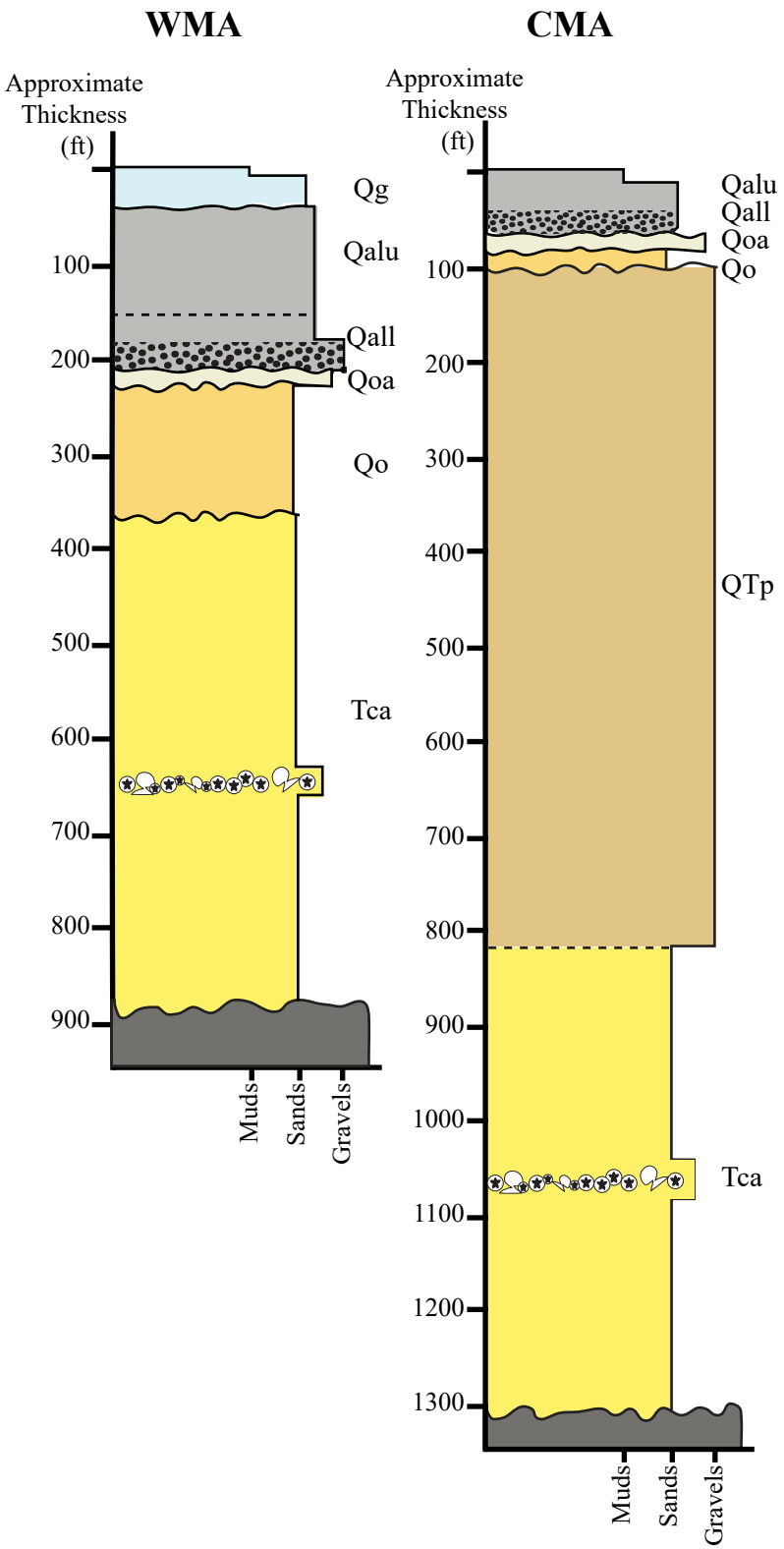
Geologic Map and Boundaries

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
Unconformity
Gravel Bed
Seashells
Undifferentiated Tertiary Rocks

Geosyntec consultants

Shallow Stratigraphic Columns of Santa Ynez River Valley

Date: April 2020	File No.:
Project No.: SB0959	Figure: 3

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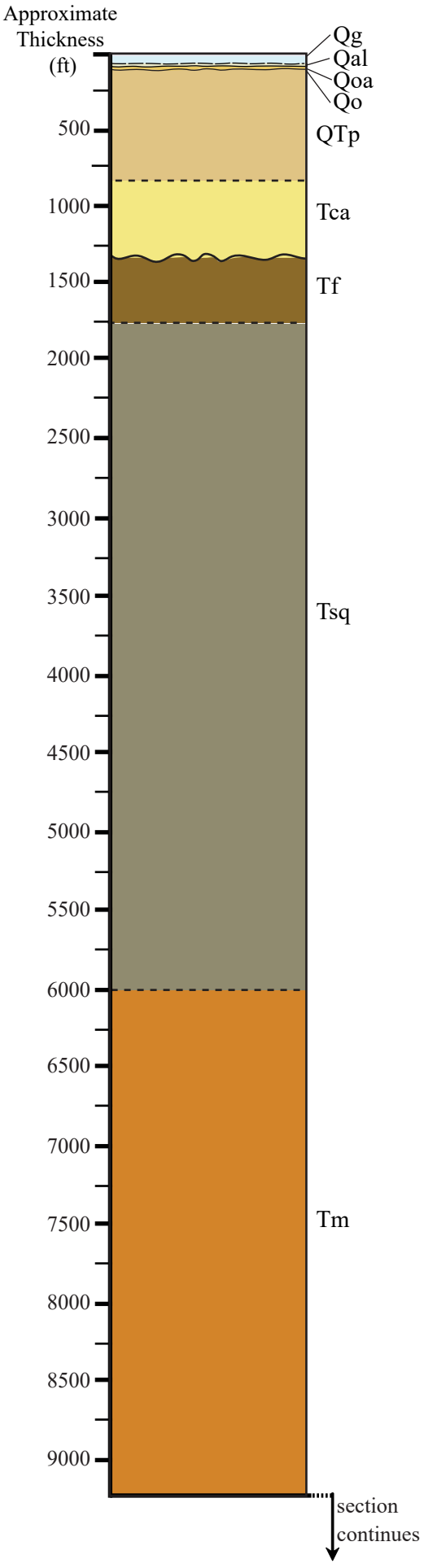

Formation Descriptions

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, Qo, Tf
Qal, QTp, Tsq
Qoa, Tca, Tm
Unconformity

Geosyntec consultants

Deep Stratigraphic Column of Santa Ynez River Valley

Date: April 2020	File No.:
Project No.: SB0959	Figure: 4

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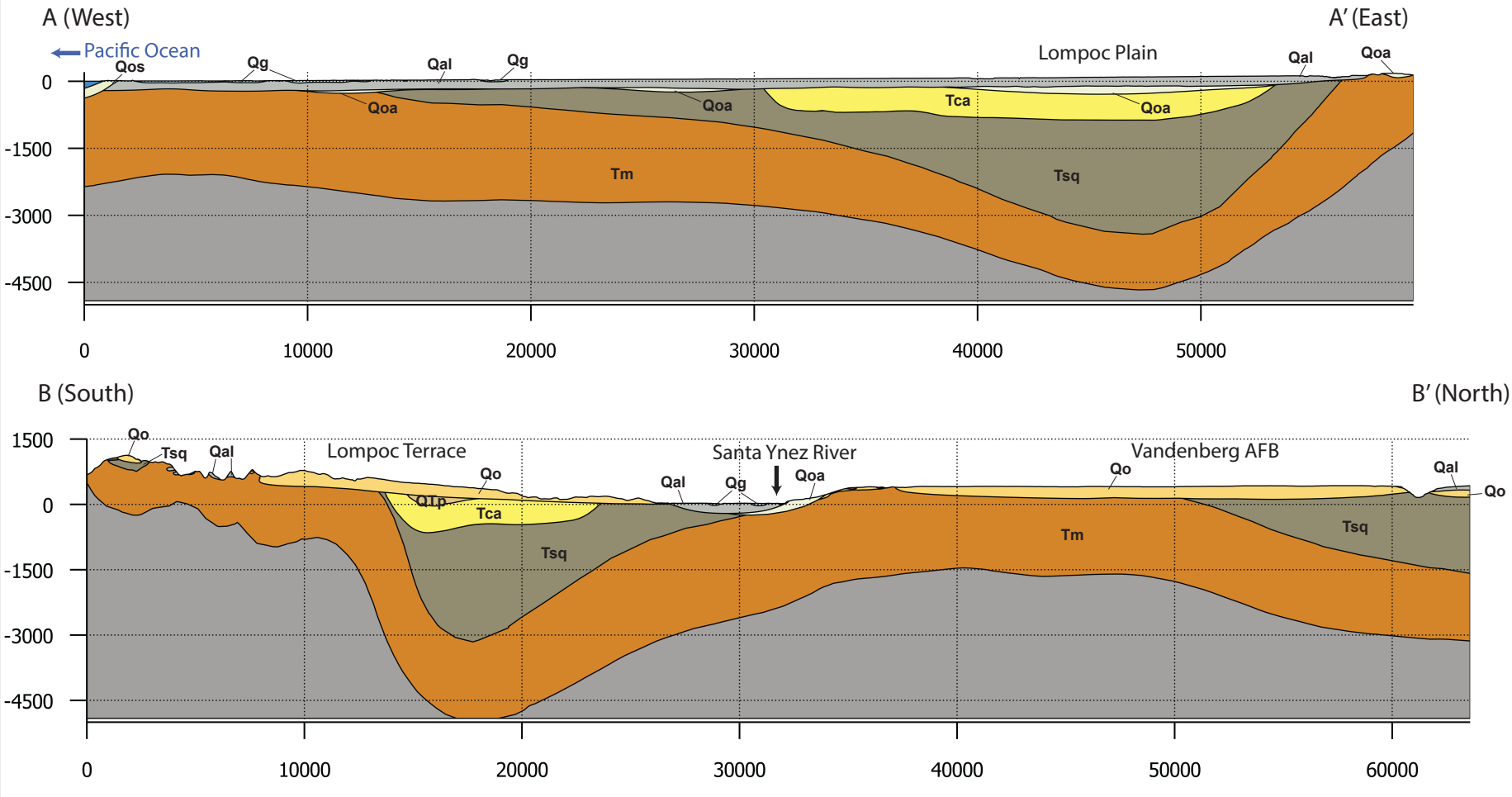
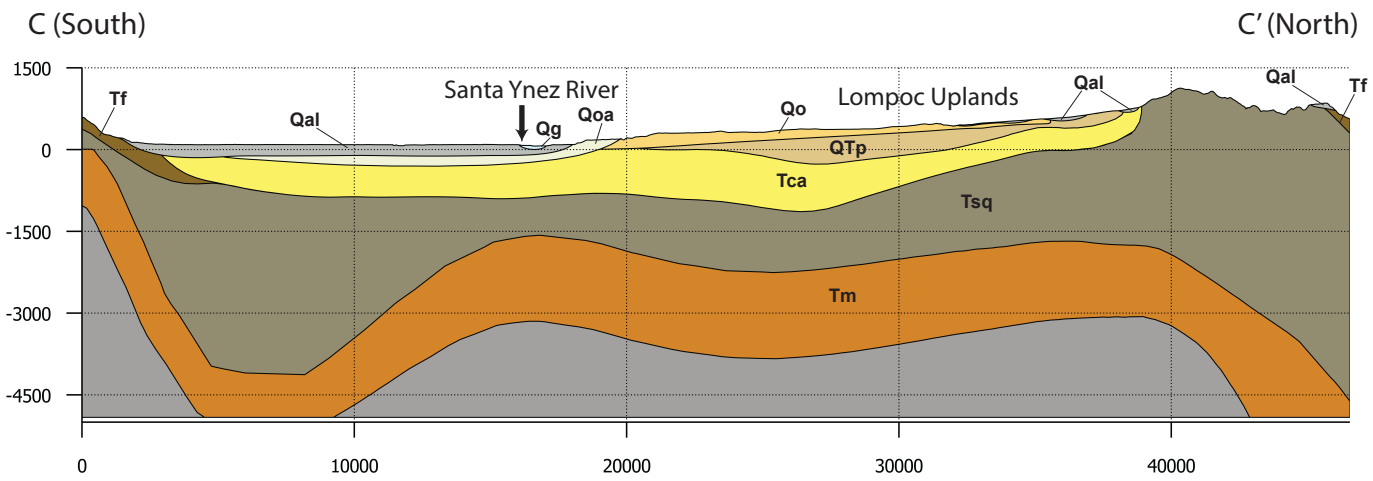
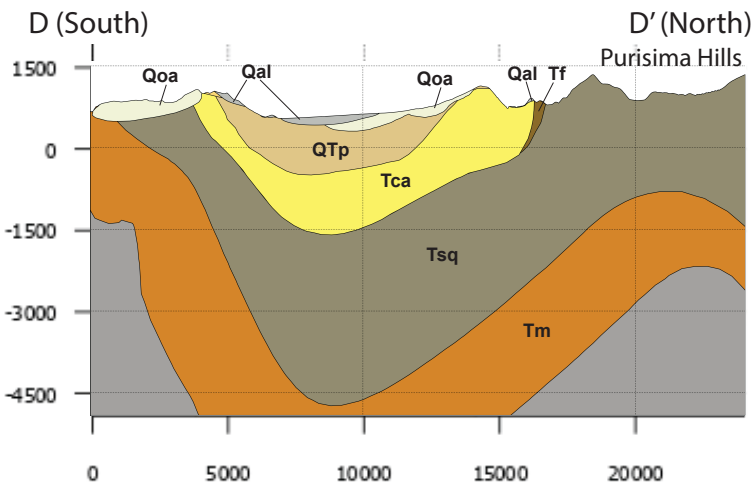
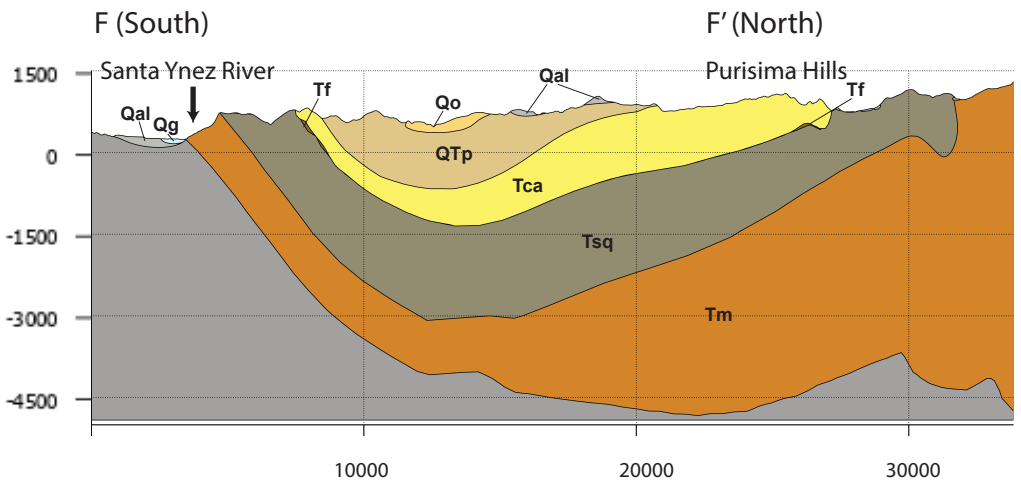
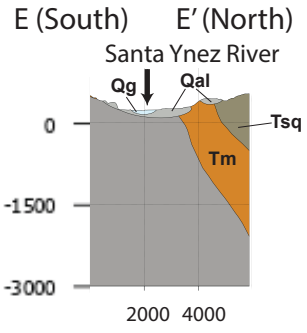
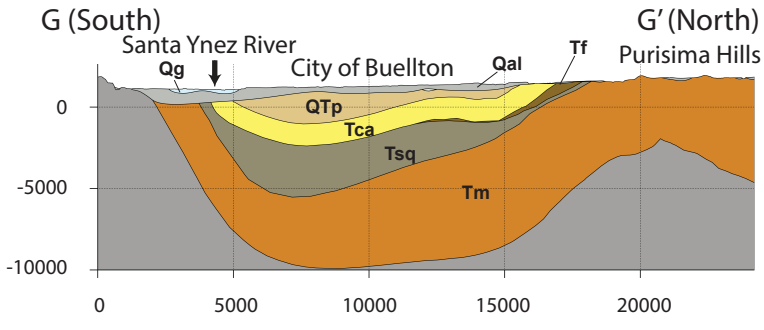




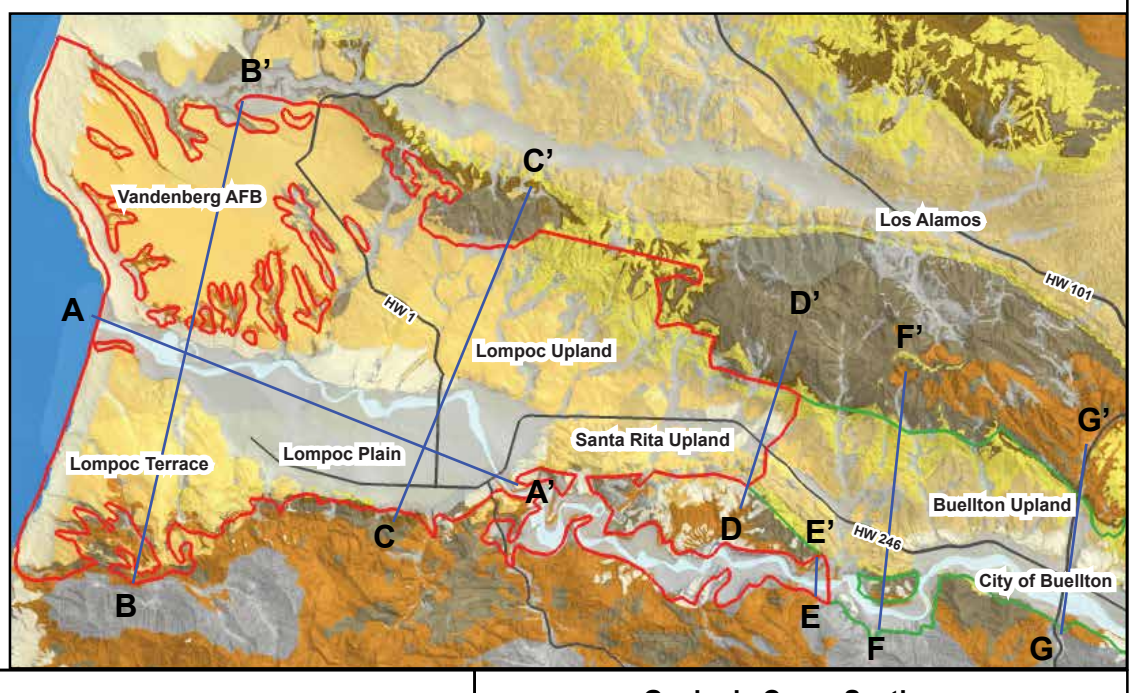








Section Locations



Geologic Model

- 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

Notes:
All images displayed at 2x vertical exaggeration
All units in Feet

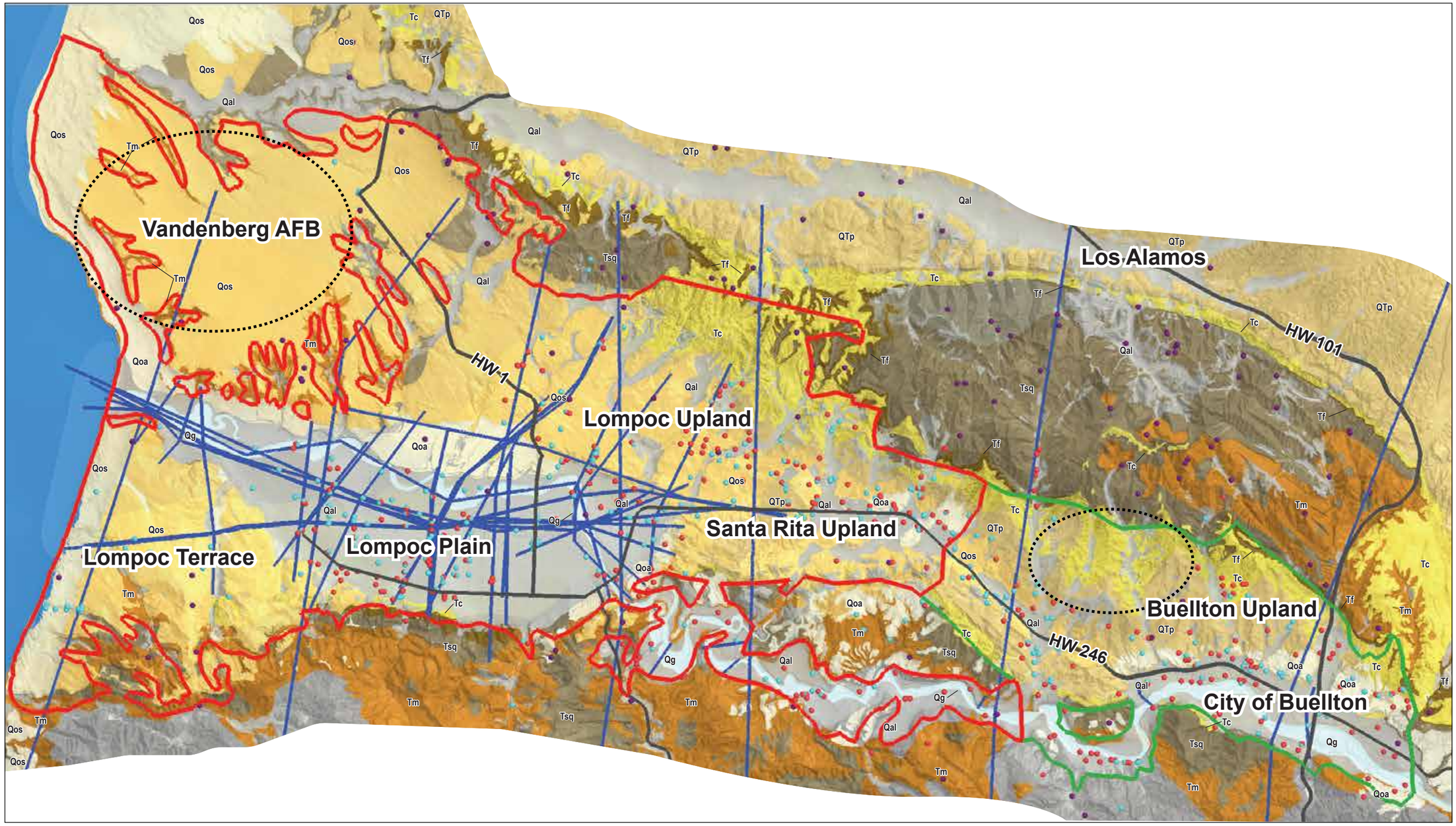
Geologic Cross Sections A-A' through G-G'

Santa Ynez River Valley
Santa Baraba 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

Geosyntec consultants

Santa Barbara | April 2020

Figure 6

Chapter 2 – Basin Setting

Appendix 2b-A:

Dudek Land Subsidence Technical Memorandum 11736, Dated December 2020

621 CHAPALA STREET
SANTA BARBARA, CALIFORNIA 93101
T 805.963.0651 F 805.963.2074

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

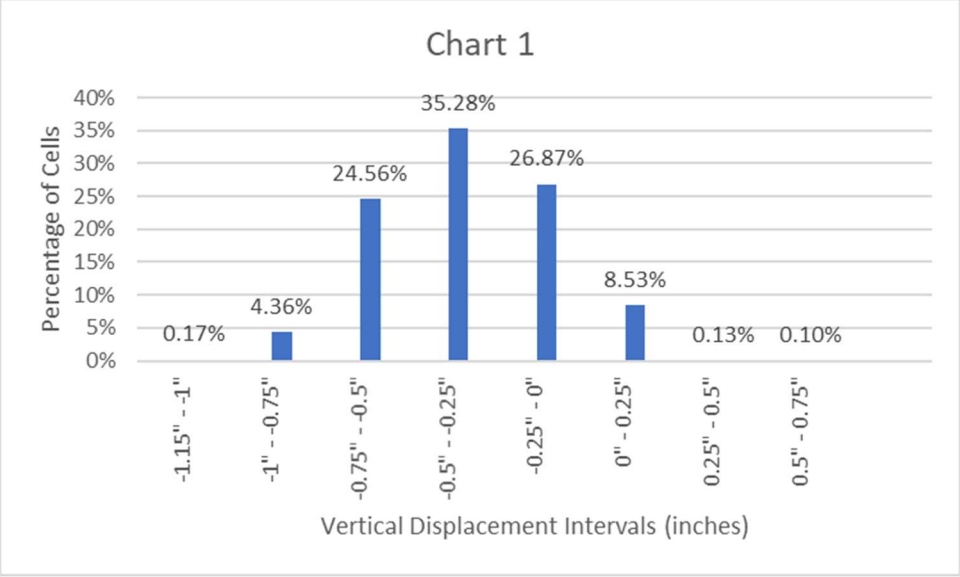
There is little or no documentation of physical evidence of subsidence such as well casing failure, infrastructure disruption, or earth fissures within the WMA and CMA. According to the 2013 City of Lompoc Groundwater Management Plan, there has been no evidence of land subsidence resulting from groundwater-level 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

Borchers, J.W., and M. Carpenter. 2014. *Land Subsidence from Groundwater Use in California*. Summary Report. Prepared by Luhdorff & Scalmanini Consulting Engineers with support from the California Water Foundation. April 2014.

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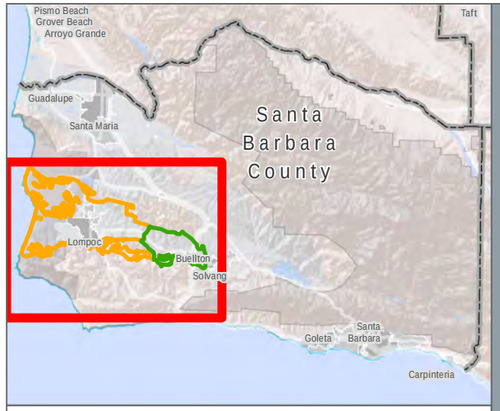
FIGURES



Western Management

Central Management

UNAVCO Monitoring Station

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

Figure 2a

Figure 2b

Figure 2c

Figure 2d

Figure 2e

ORES

VNDP

TJRN

135

101

154

1

246

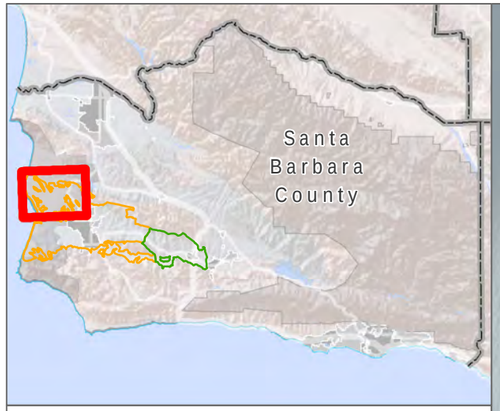
DUDEK

0 1 2 Miles

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

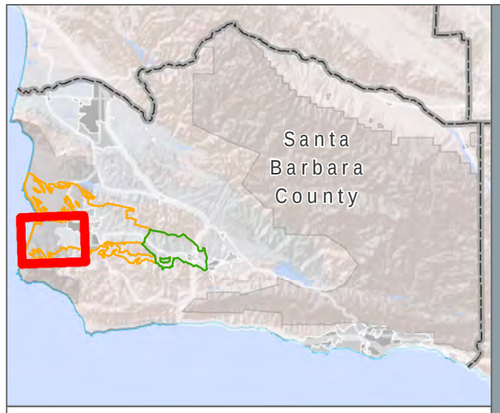
DUDEK

0 2,000 4,000 Feet

FIGURE 2a

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



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

Santa Ynez River
Oak Canyon
Santa Lucia Canyon
City of
Lompoc
San Miguelito Creek
Bear Creek
Lompoc Canyon
246
La Salle Canyon
Sloans Canyon
Cañada Honda Creek
Cañada Honda Creek

Sources: SGMA TRE ALTAMIRA InSAR Dataset, ESRI

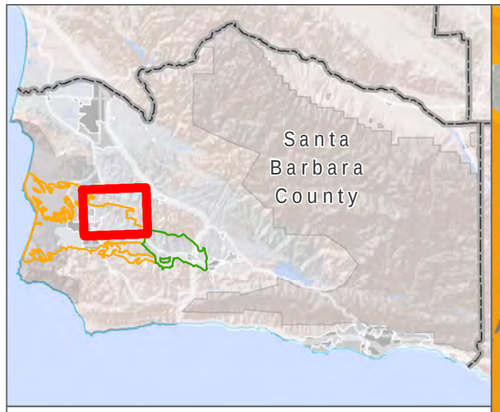
DUDEK

0 2,000 4,000 Feet

FIGURE 2b

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



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

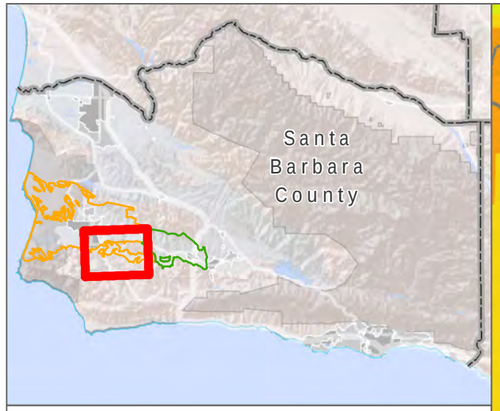
DUDEK

0 2,000 4,000 Feet

FIGURE 2c

Land Subsidence

Task 3 & 4 Services for Santa Ynez GSP Preparation - Western and Central Management Areas



Western Management Area

Central 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

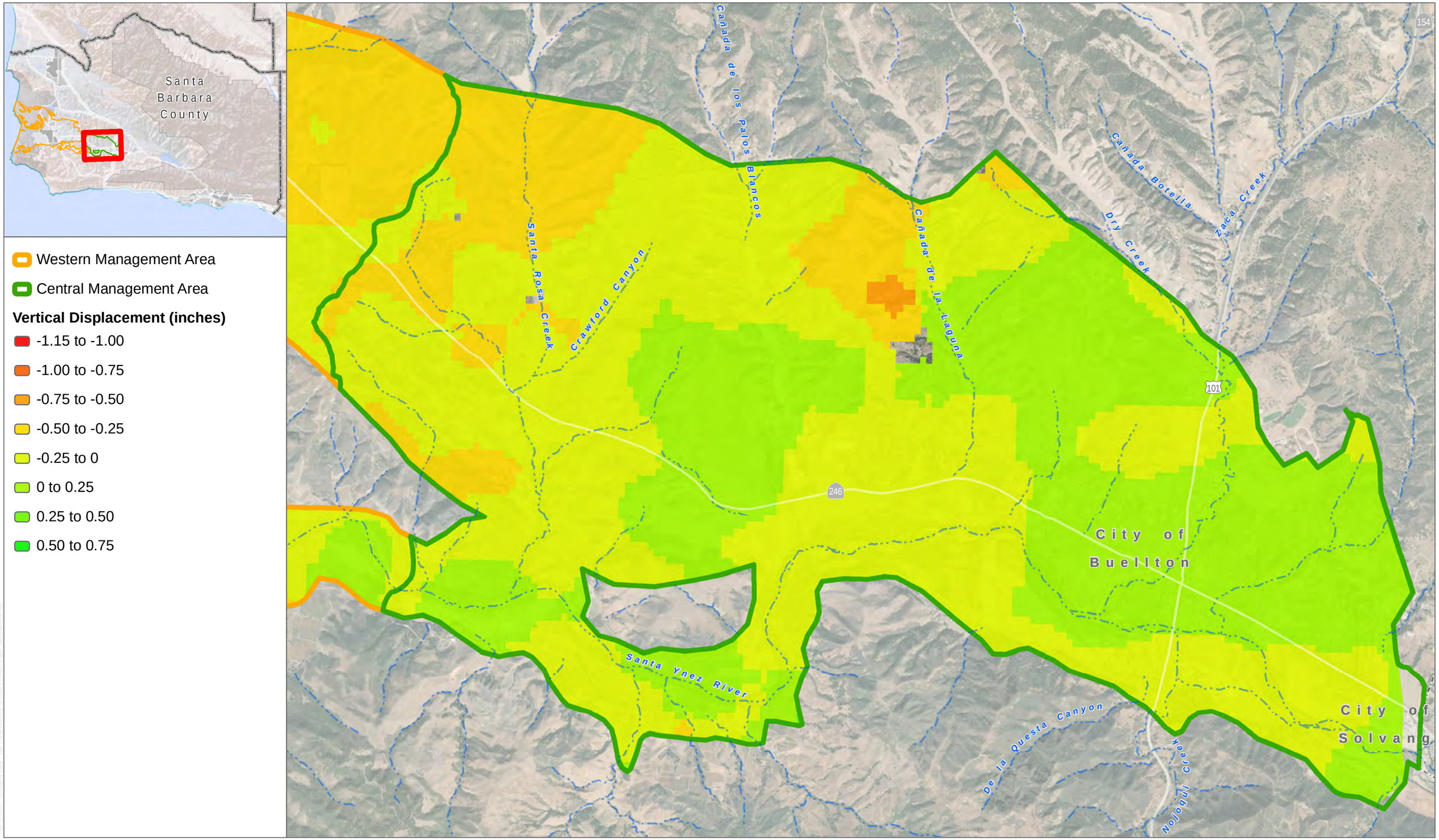
DUDEK

0 2,000 4,000 Feet

FIGURE 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

0 2,000 4,000 Feet

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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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

PROFESSIONAL SERVICES TERMS AND CONDITIONS

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.

Chapter 2 – Basin Setting

Appendix 2c-A:

Stetson Engineers Draft Technical Memorandum, WMA/CMA Numerical Model Documentation, Dated May 19, 2021

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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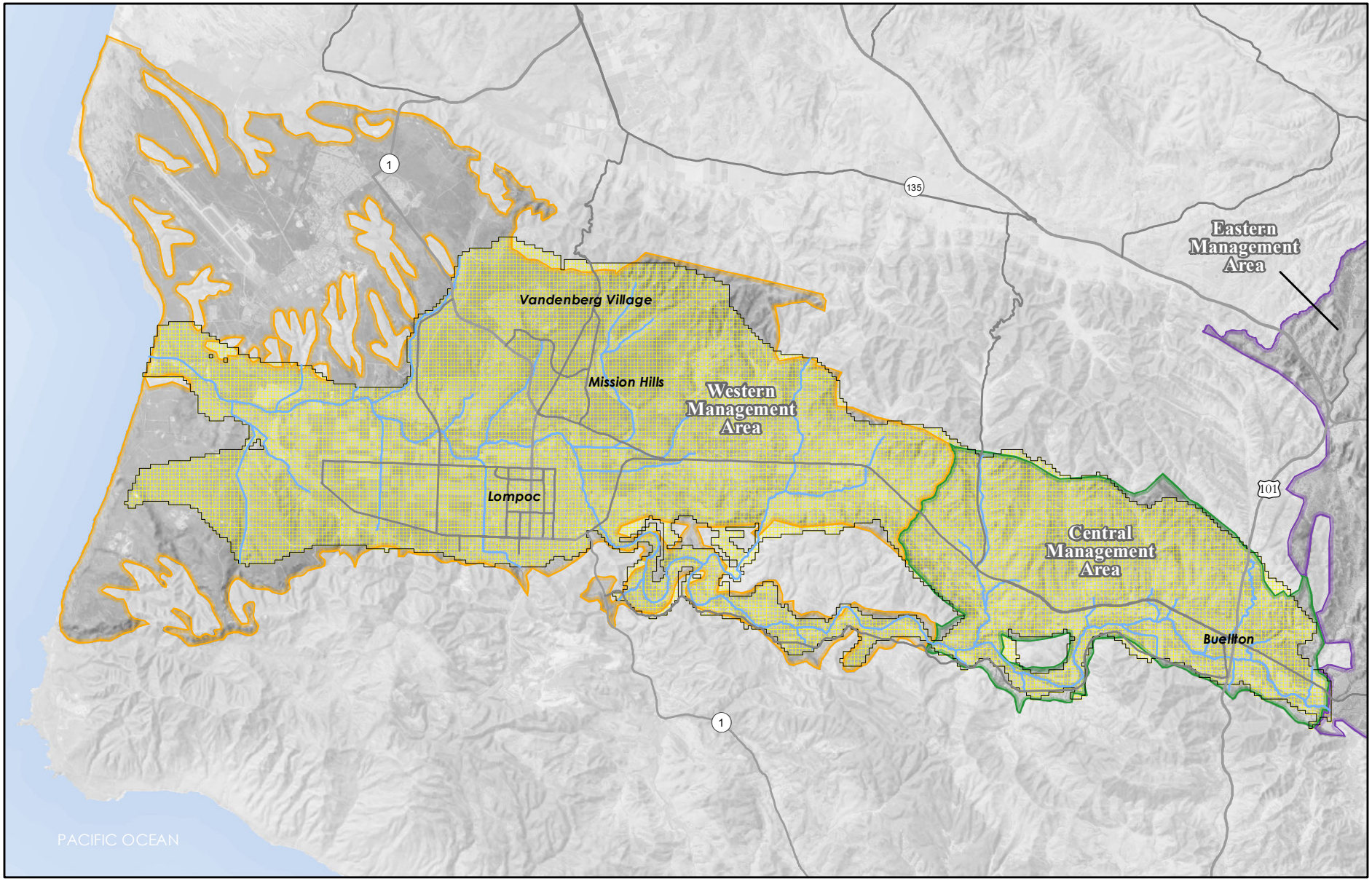
Figures

WMA/CMA Model Documentation

Document Path: J:\jn2710\SYR_Model_Documentation_Report_overview.mxd



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Model Boundary
Model Cell
Western Management Area
Central Management Area
Eastern Management Area

Model Cells and Areal Extents
WMA/CMA Model

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4/23/2021

0 2 4 Miles

N

FIGURE 1

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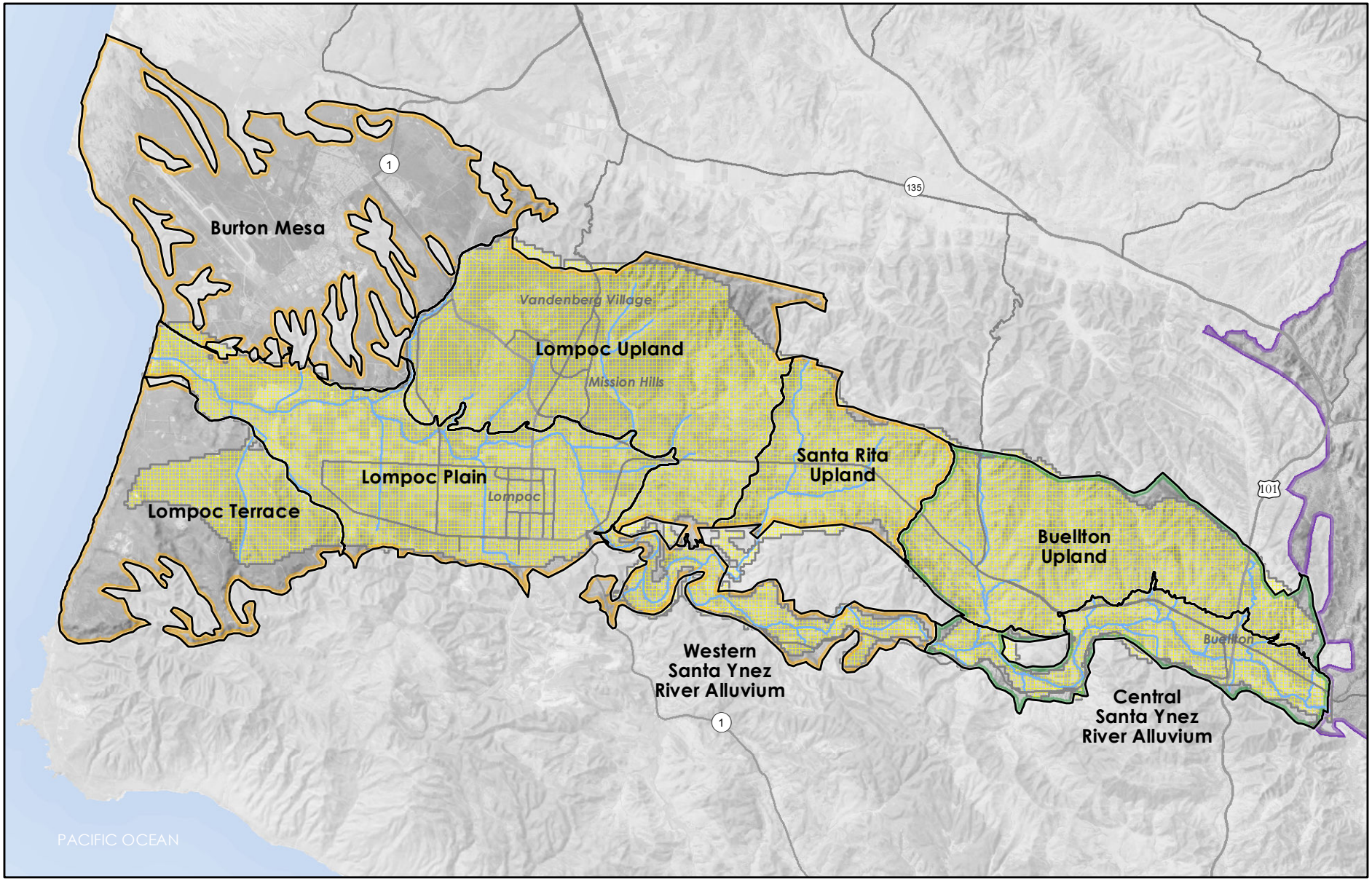

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Model Cell
Subarea Boundary
Model Boundary
Western Management Area
Central Management Area
Eastern Management Area

7 SUBAREAS WITHIN MODEL DOMAIN
WMA/CMA Model

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0 2 4 Miles

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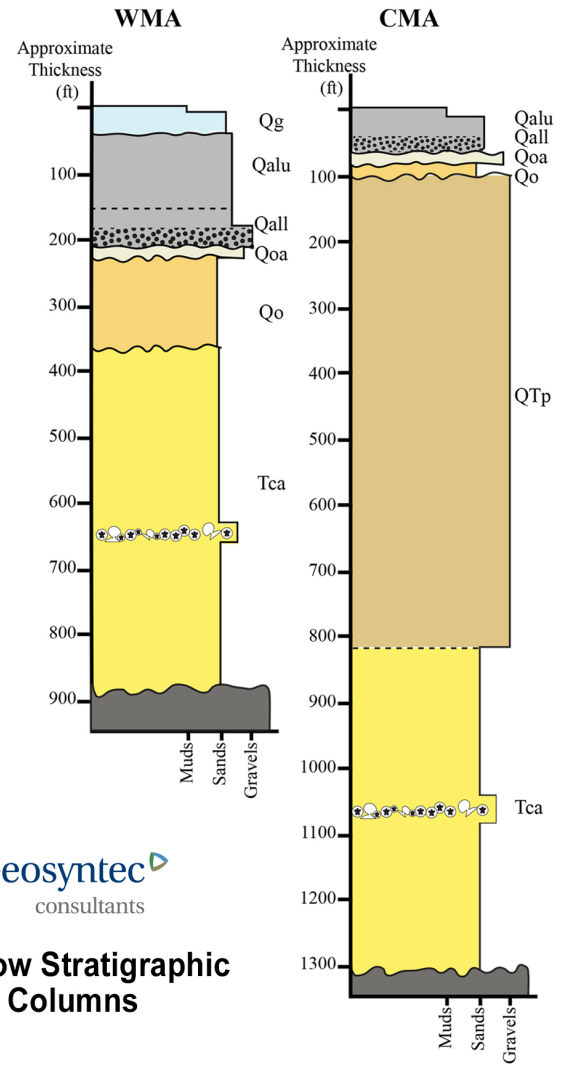
FIGURE 2



Geosyntec consultants

Shallow Stratigraphic Columns

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MODEL STRUCTURE AND GEOLOGIC LAYERING
WMA/CMA MODEL

FIGURE 3

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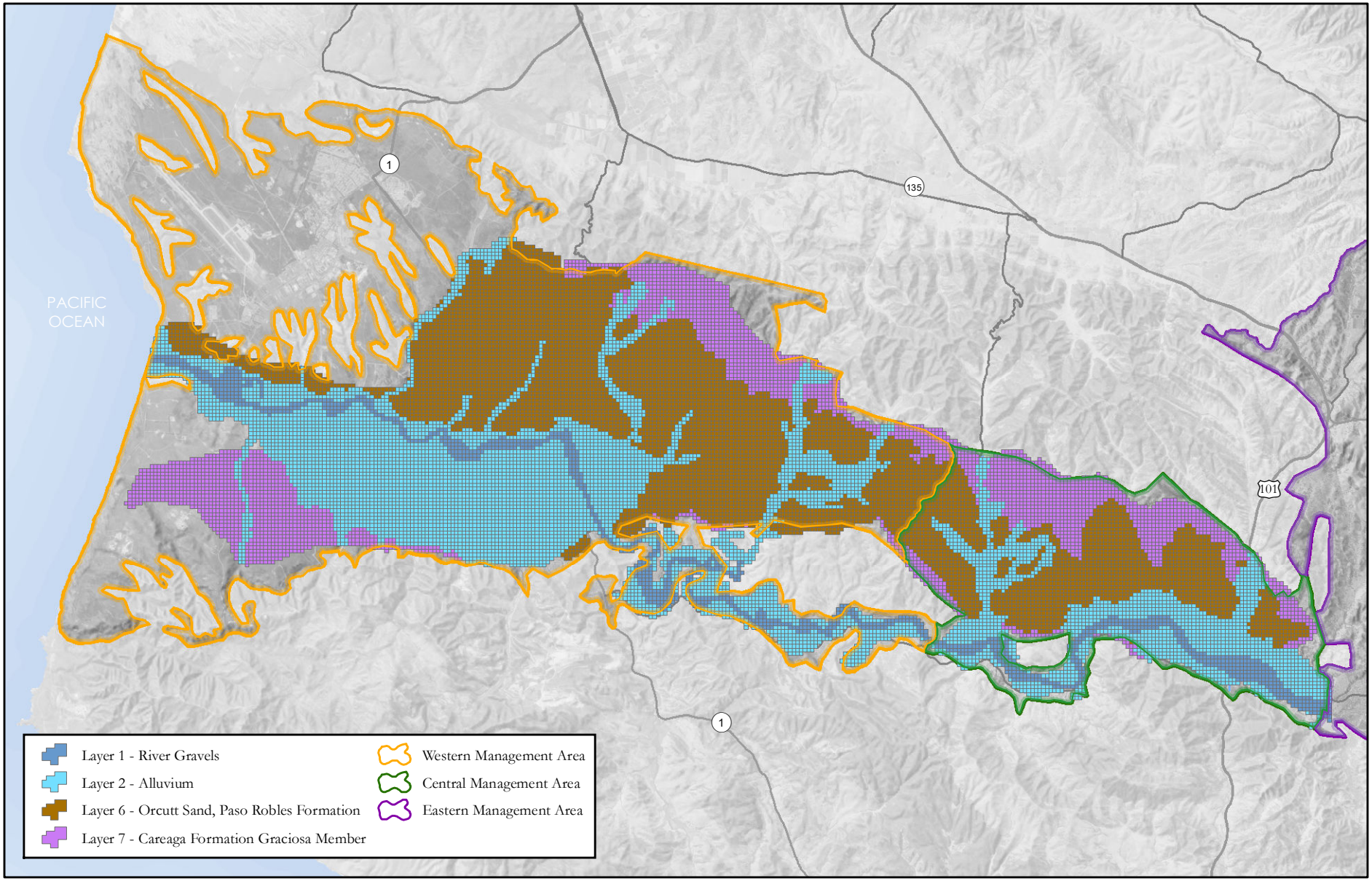

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UNSTRUCTURED GRID SHOWING MODEL LAYERS EXPOSED AT LAND SURFACE WMA/CMA MODEL

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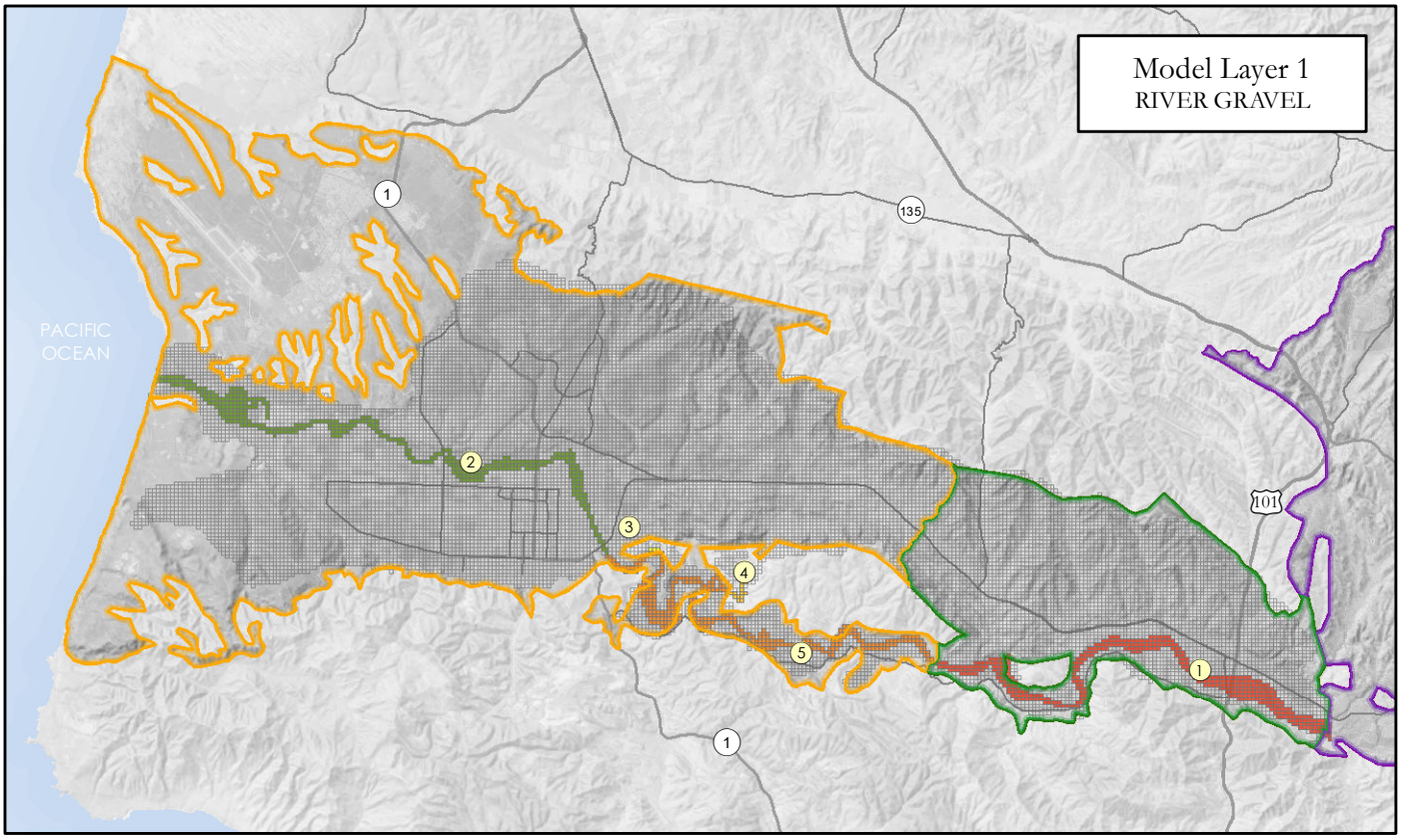
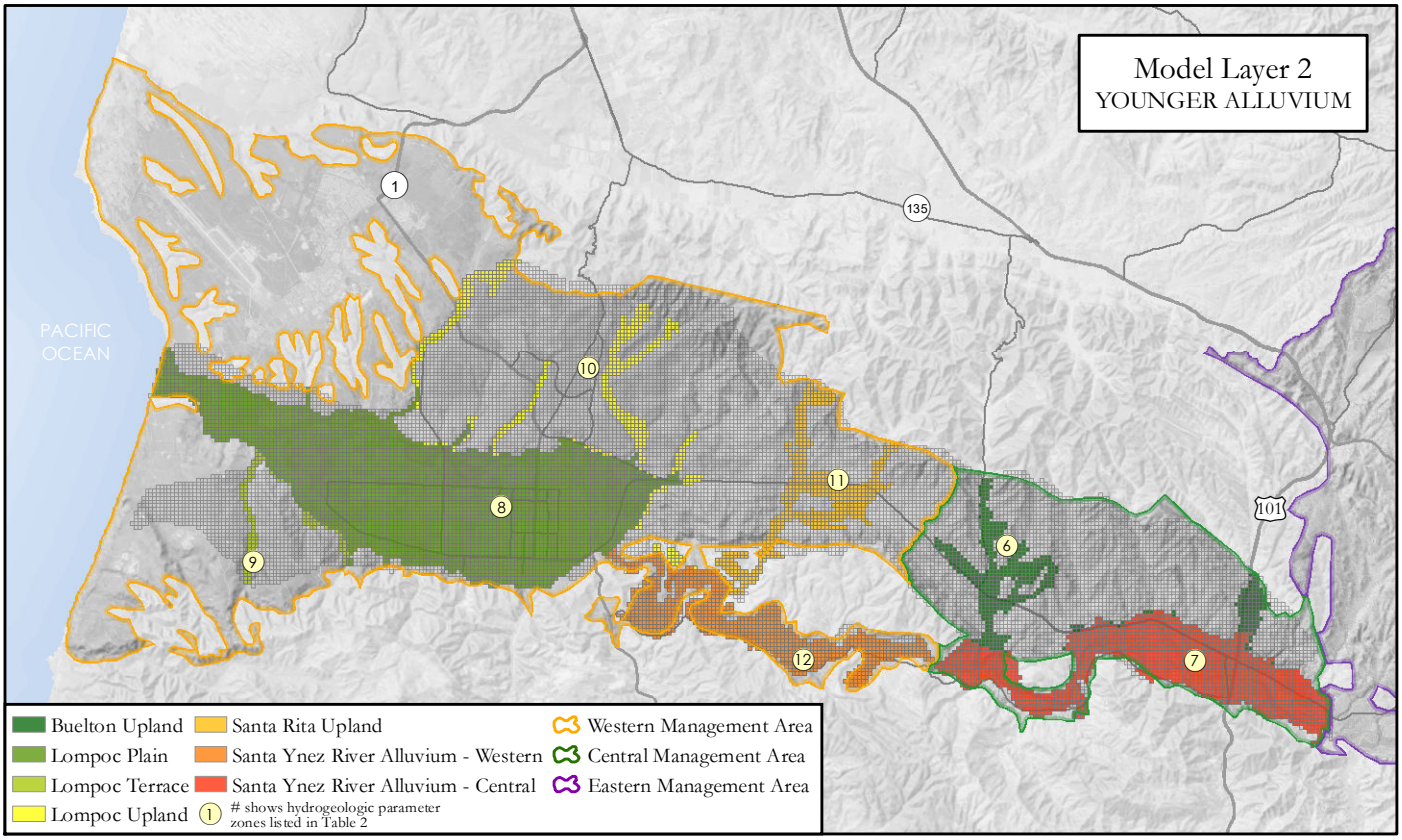
5/17/2021

0 2 4 Miles

N

FIGURE 4





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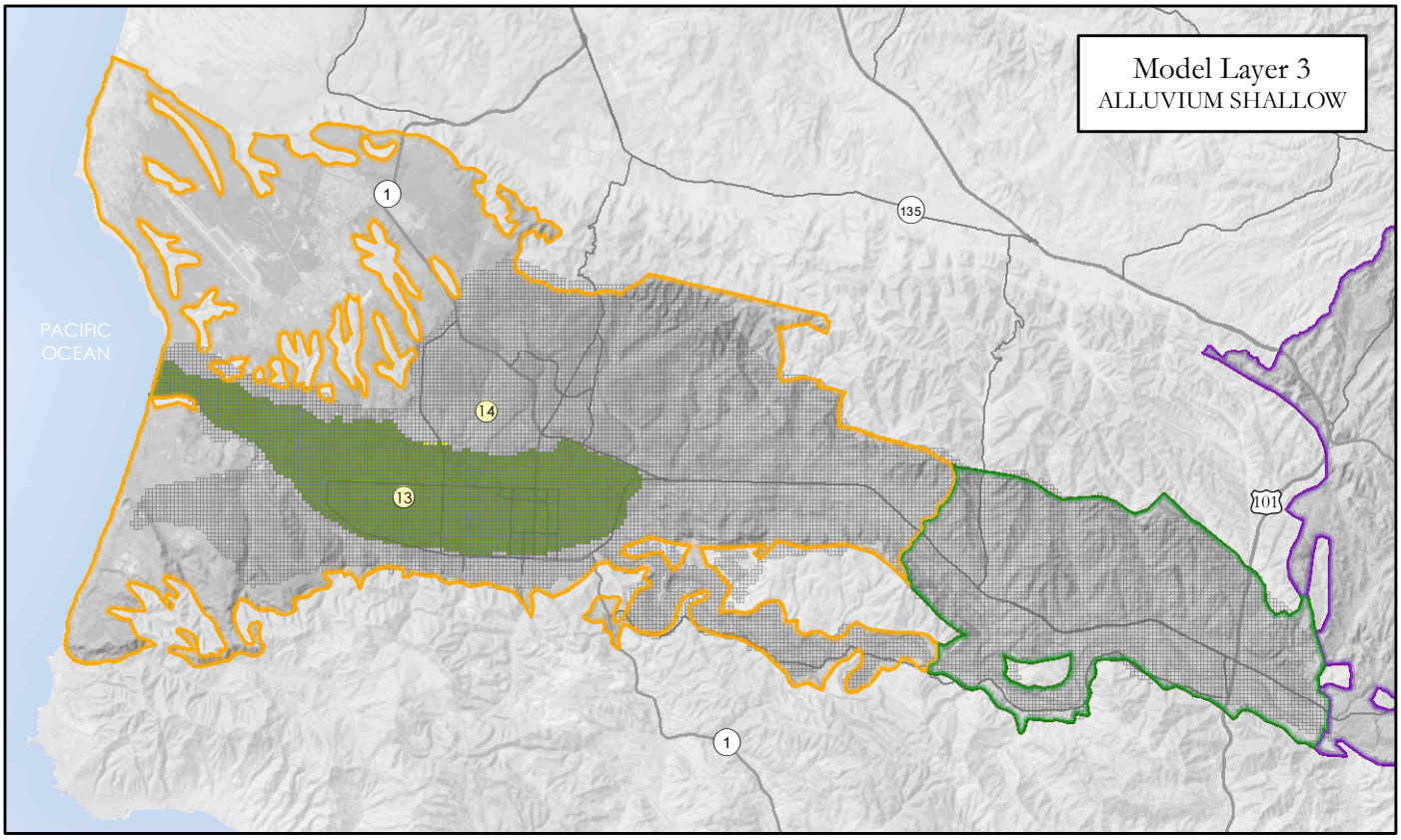
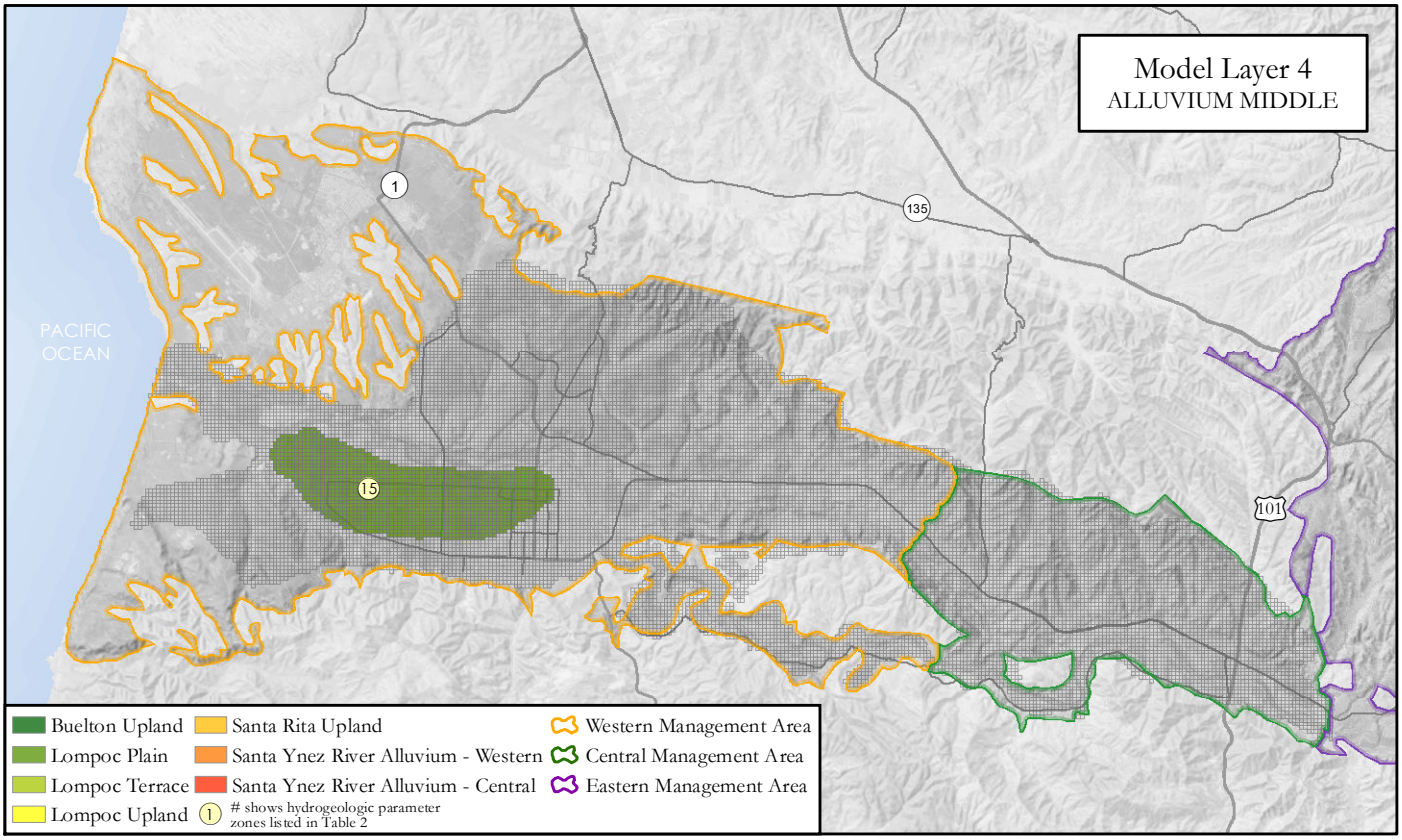
MODEL LAYERS 1 AND 2
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles





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MODEL LAYERS 3 AND 4
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles

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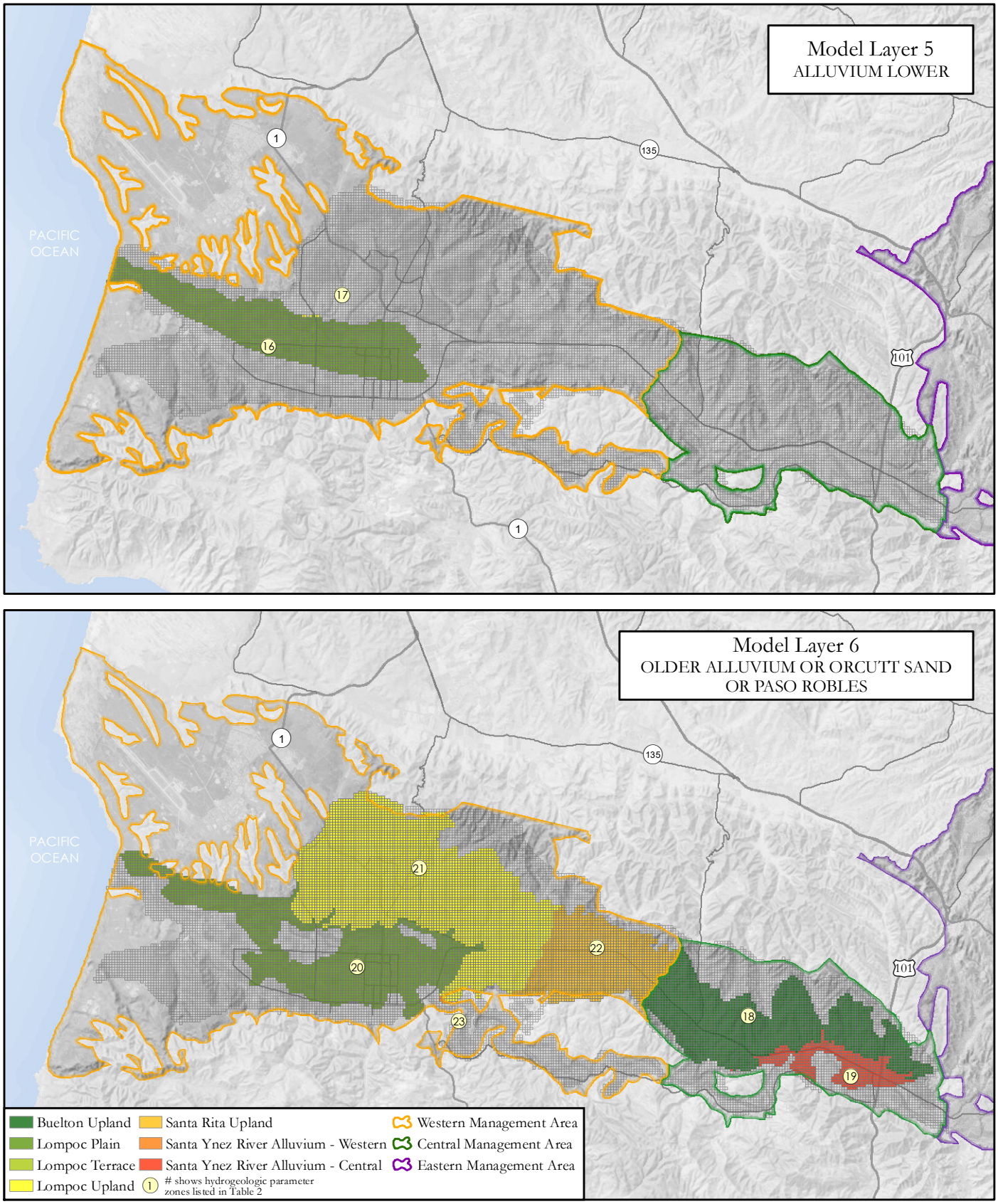

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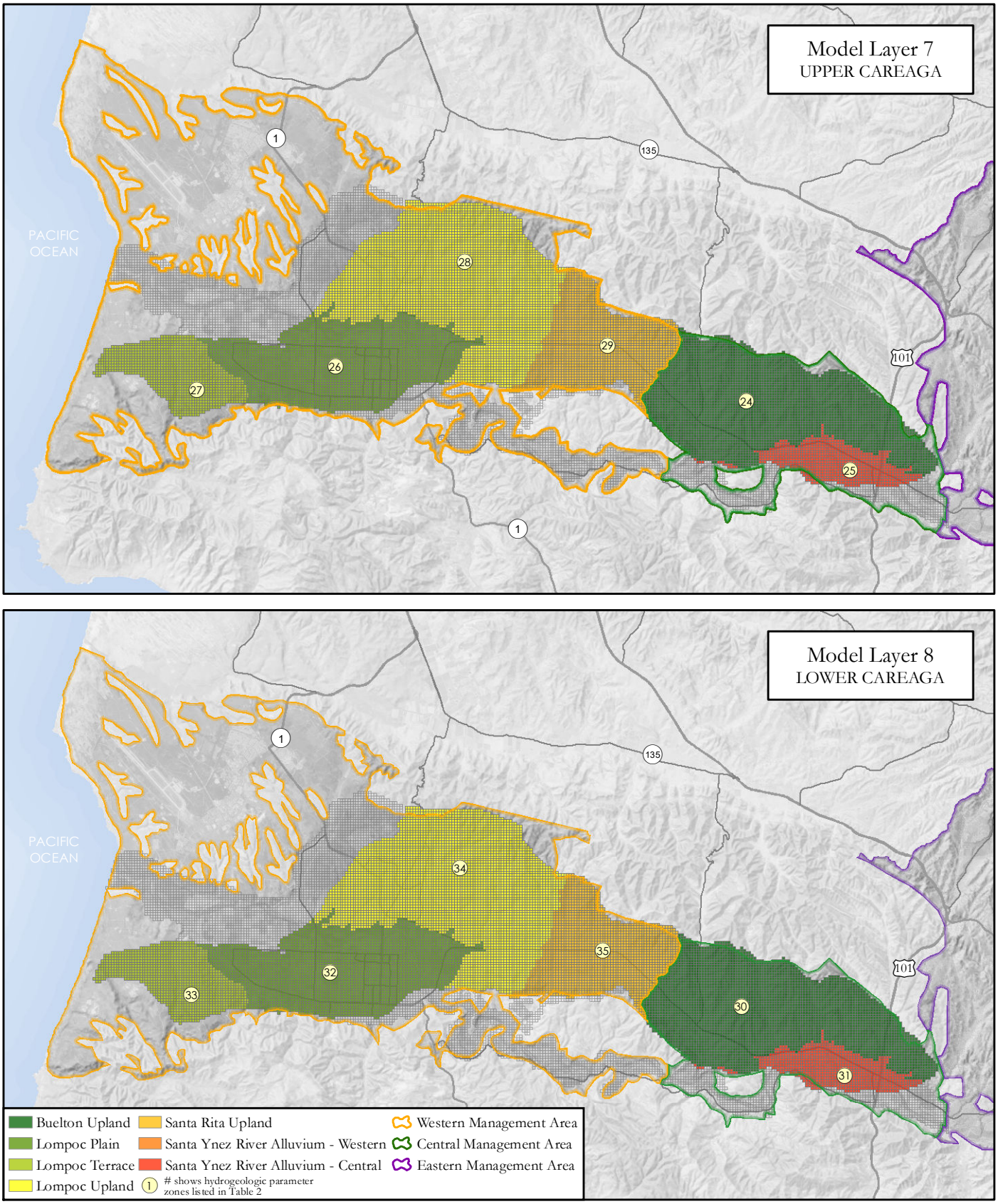
MODEL LAYERS 5 AND 6
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

N

0 2 4 Miles



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MODEL LAYERS 7 AND 8
HYDROGEOLOGIC PARAMETER ZONES AND SUBAREAS

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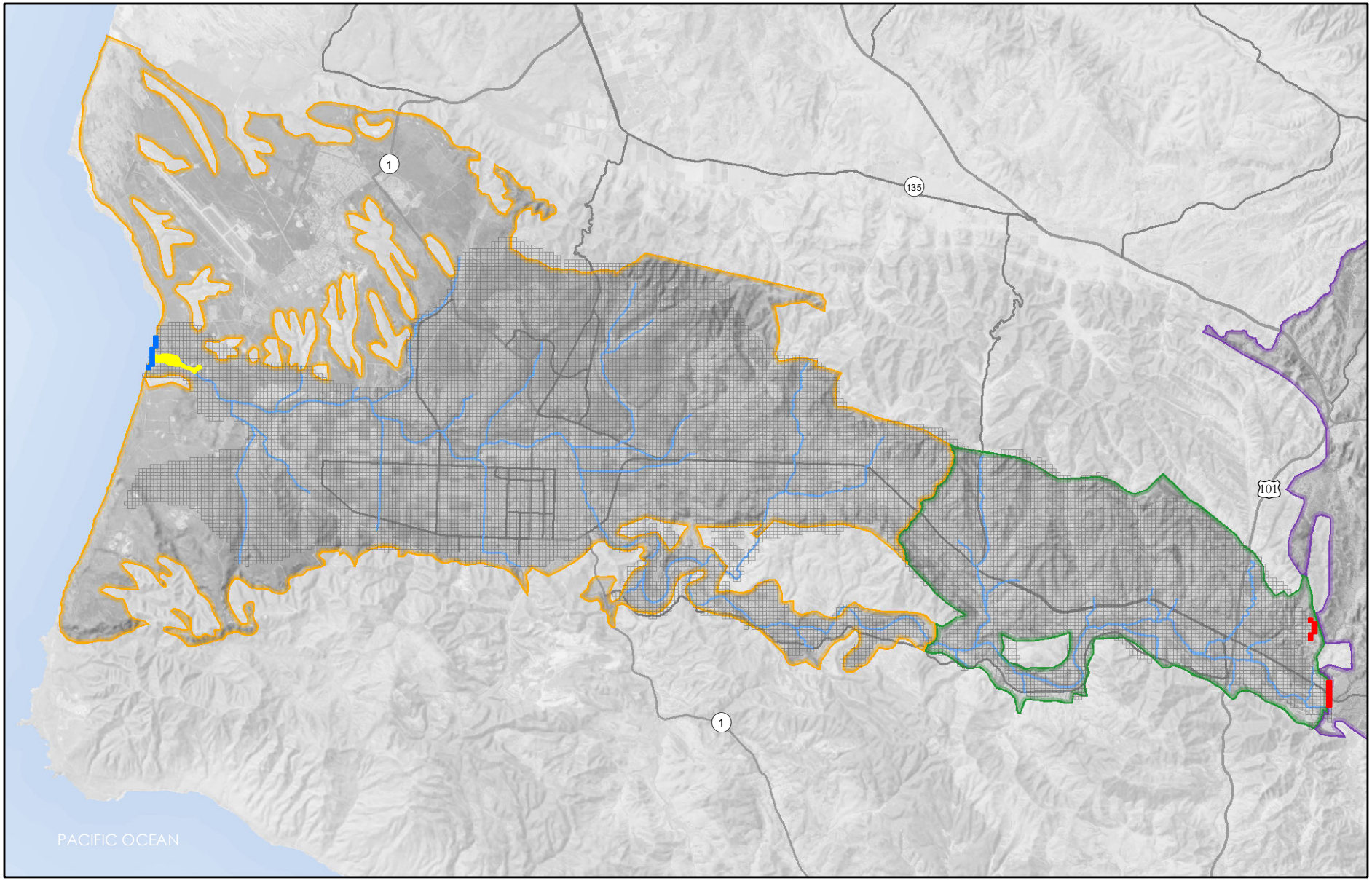

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Coast Constant Head
Lagoon Constant Head
Eastern Constant Head

CONSTANT HEAD BOUNDARY
WMA/CMA MODEL

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0 2 4 Miles

N

FIGURE 9

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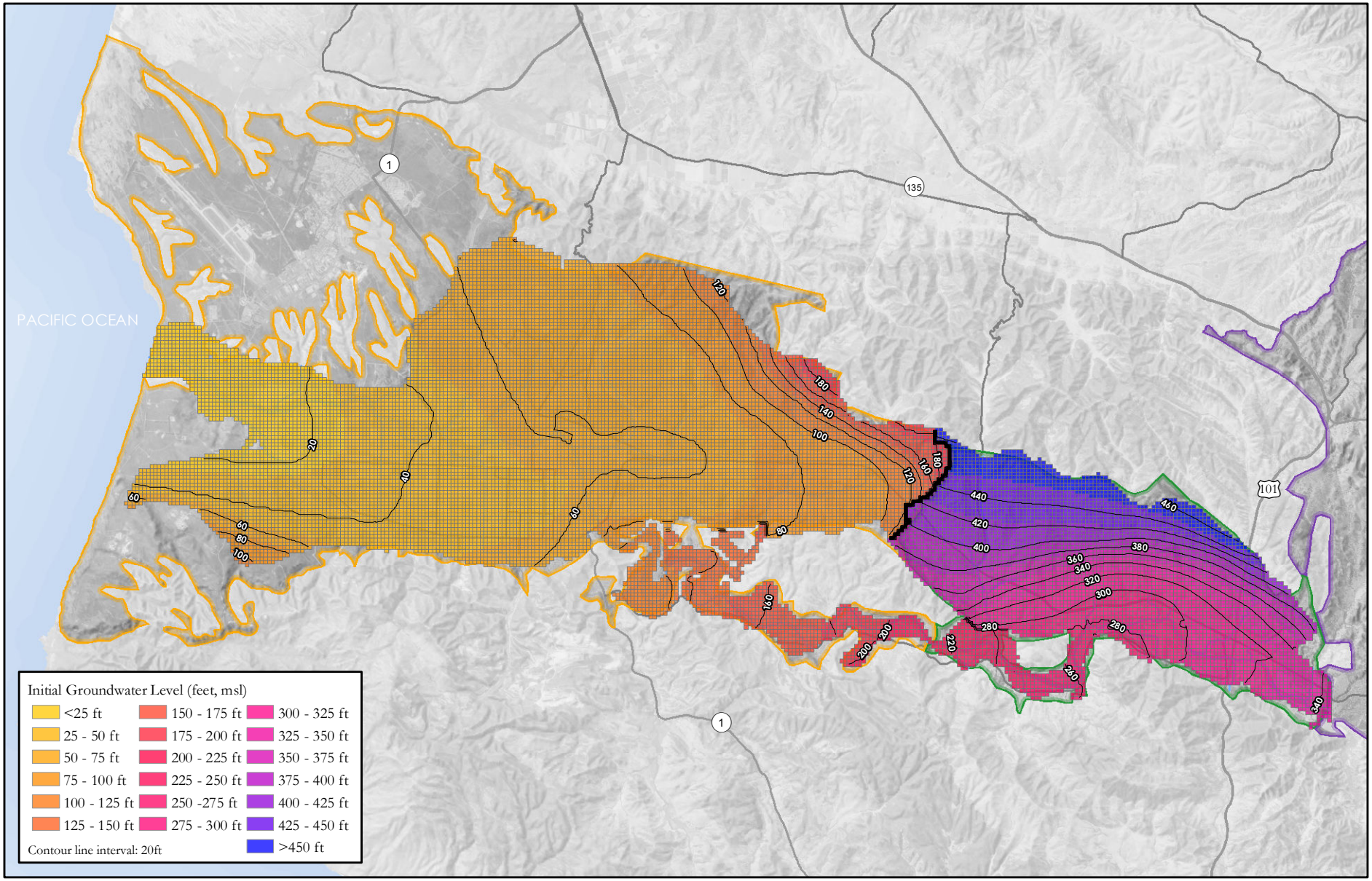

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INITIAL GROUNDWATER LEVELS
REPRESENTING OCTOBER 1981 CONDITIONS
WMA/CMA MODEL

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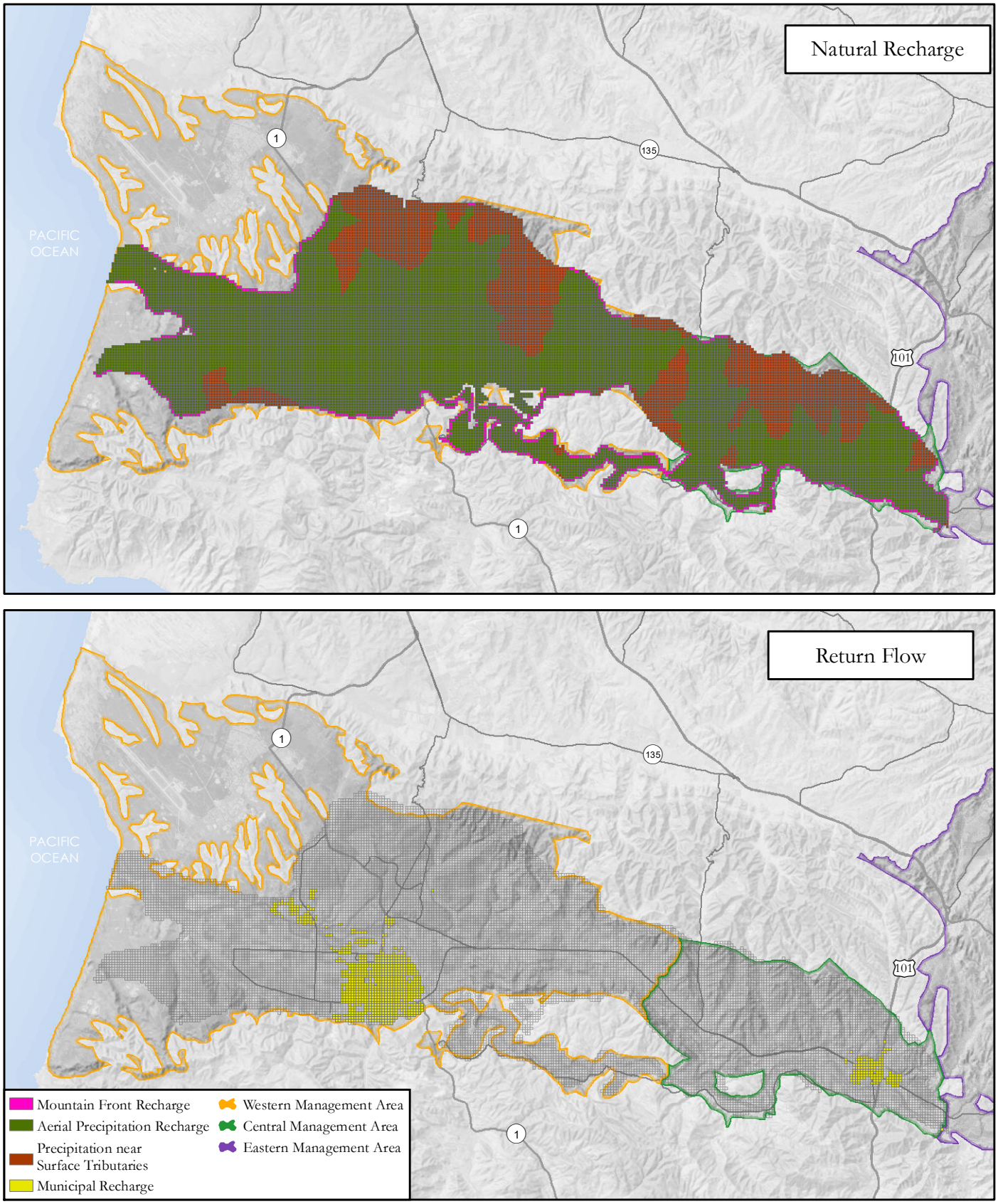
0 2 4 Miles

N

FIGURE 10



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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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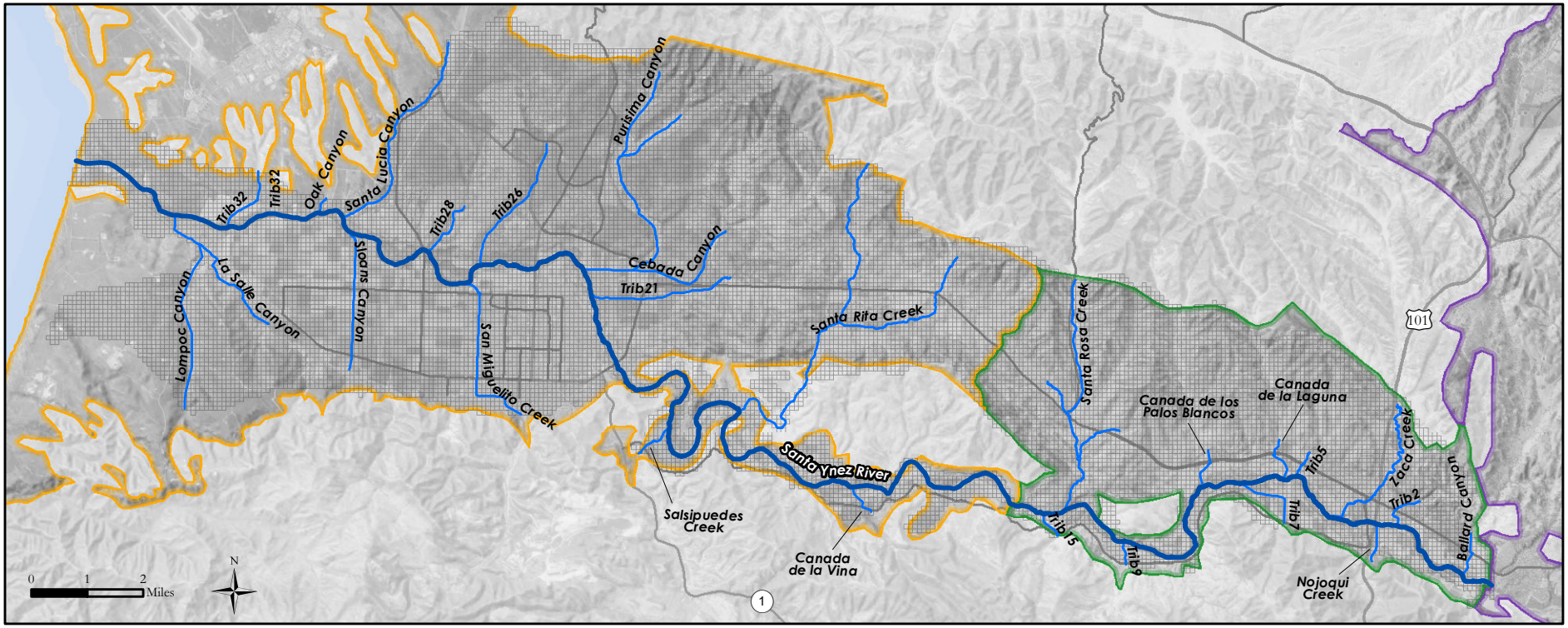

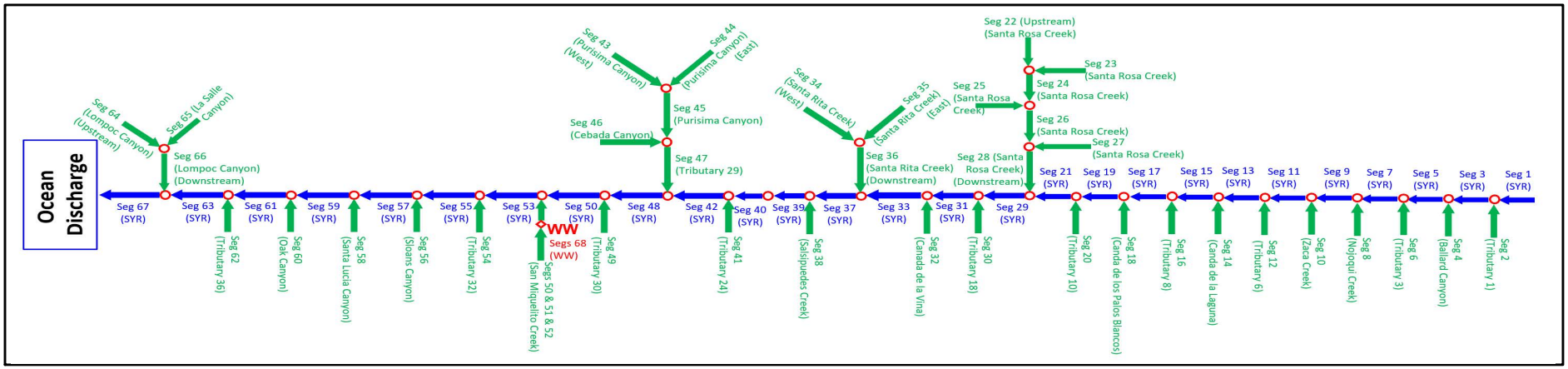

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SANTA YNEZ RIVER AND TRIBUTARY SYSTEM SIMULATED IN THE WMA/CMA MODEL

FIGURE 12

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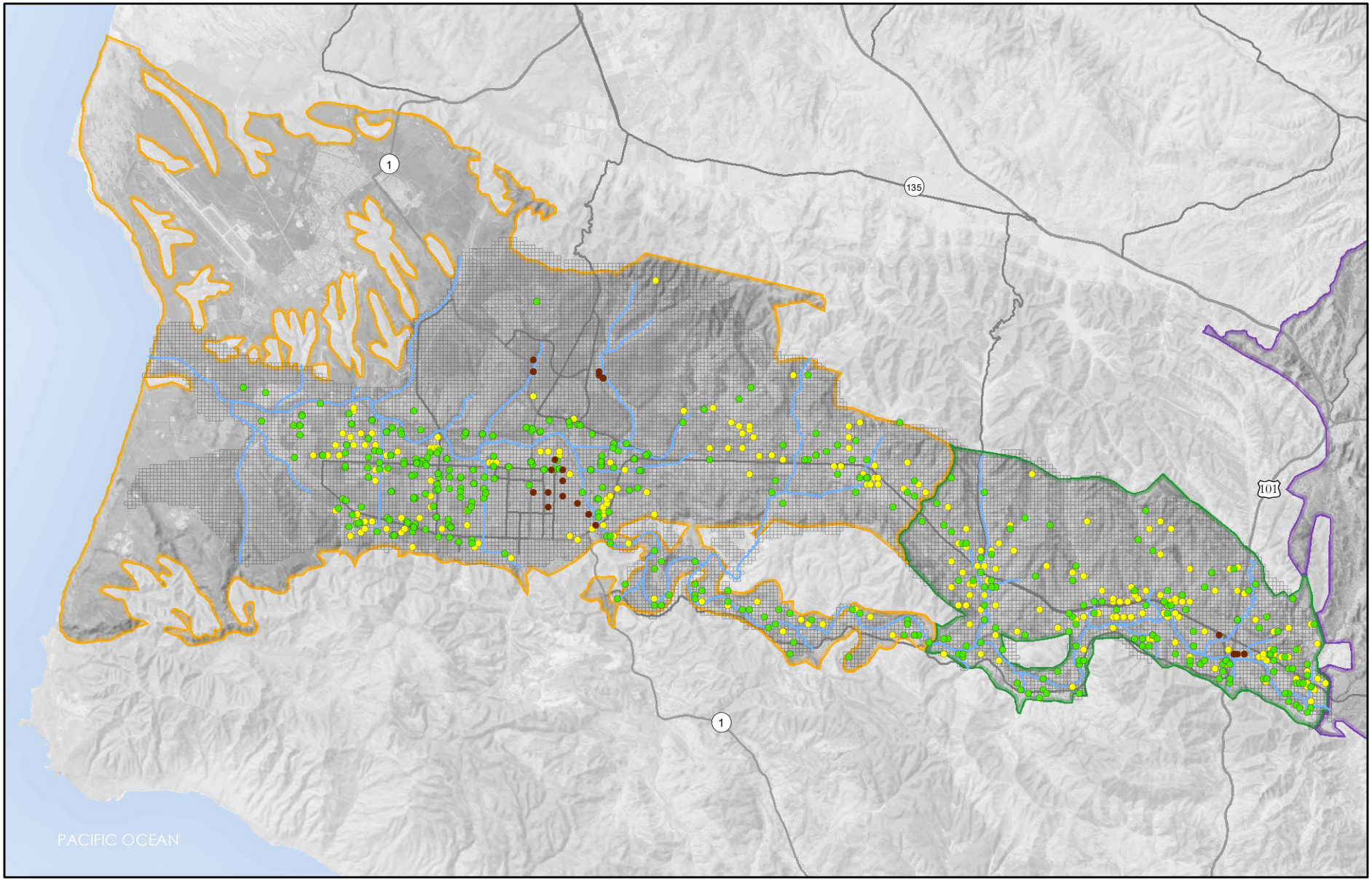

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- Municipal Well
- Agriculture Well
- Domestic Well

AGRICULTURAL, MUNICIPAL, AND DOMESTIC WELLS SIMULATED IN THE WMA/CMA MODEL

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0 2 4 Miles

N

FIGURE 13

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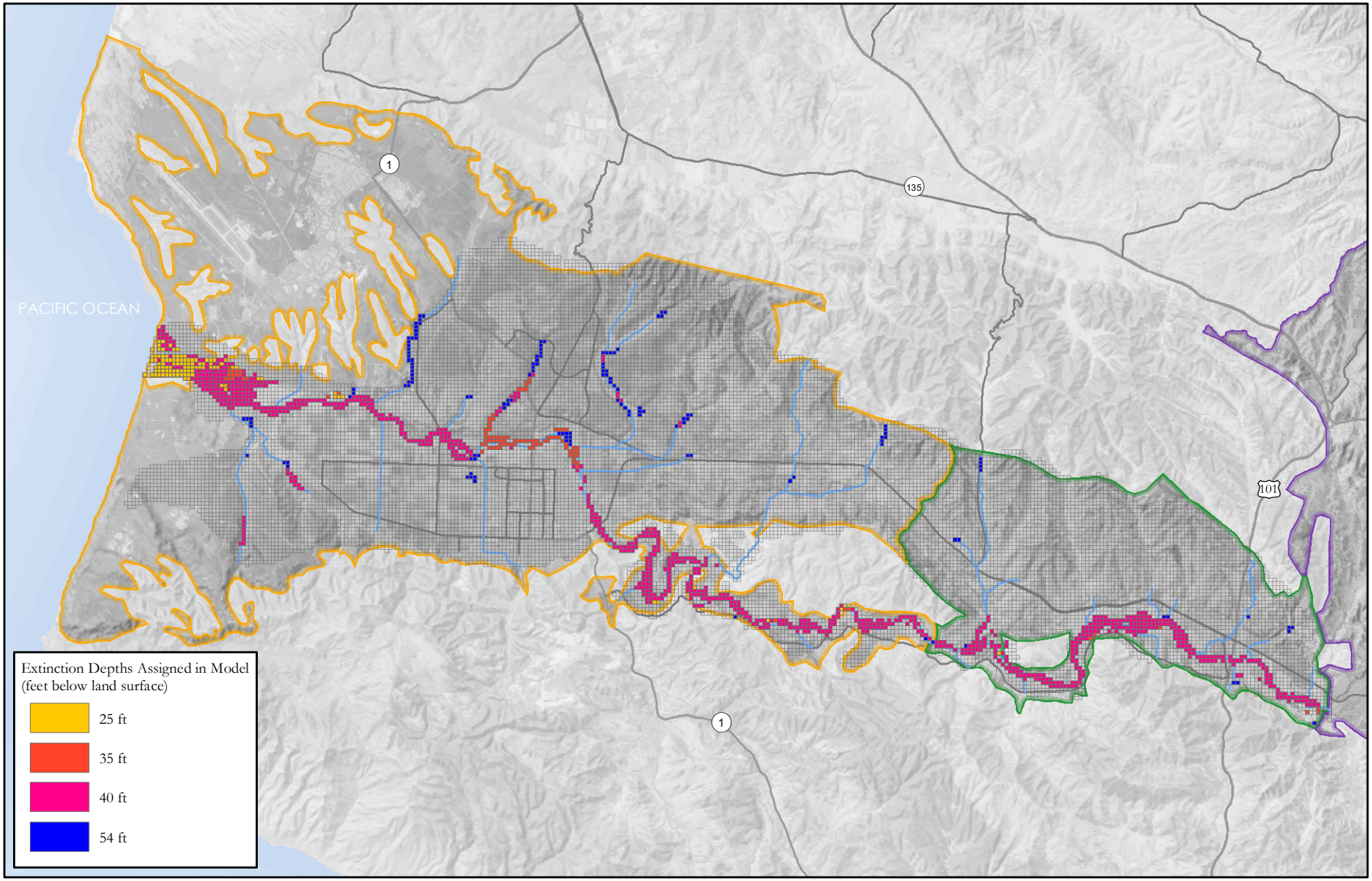

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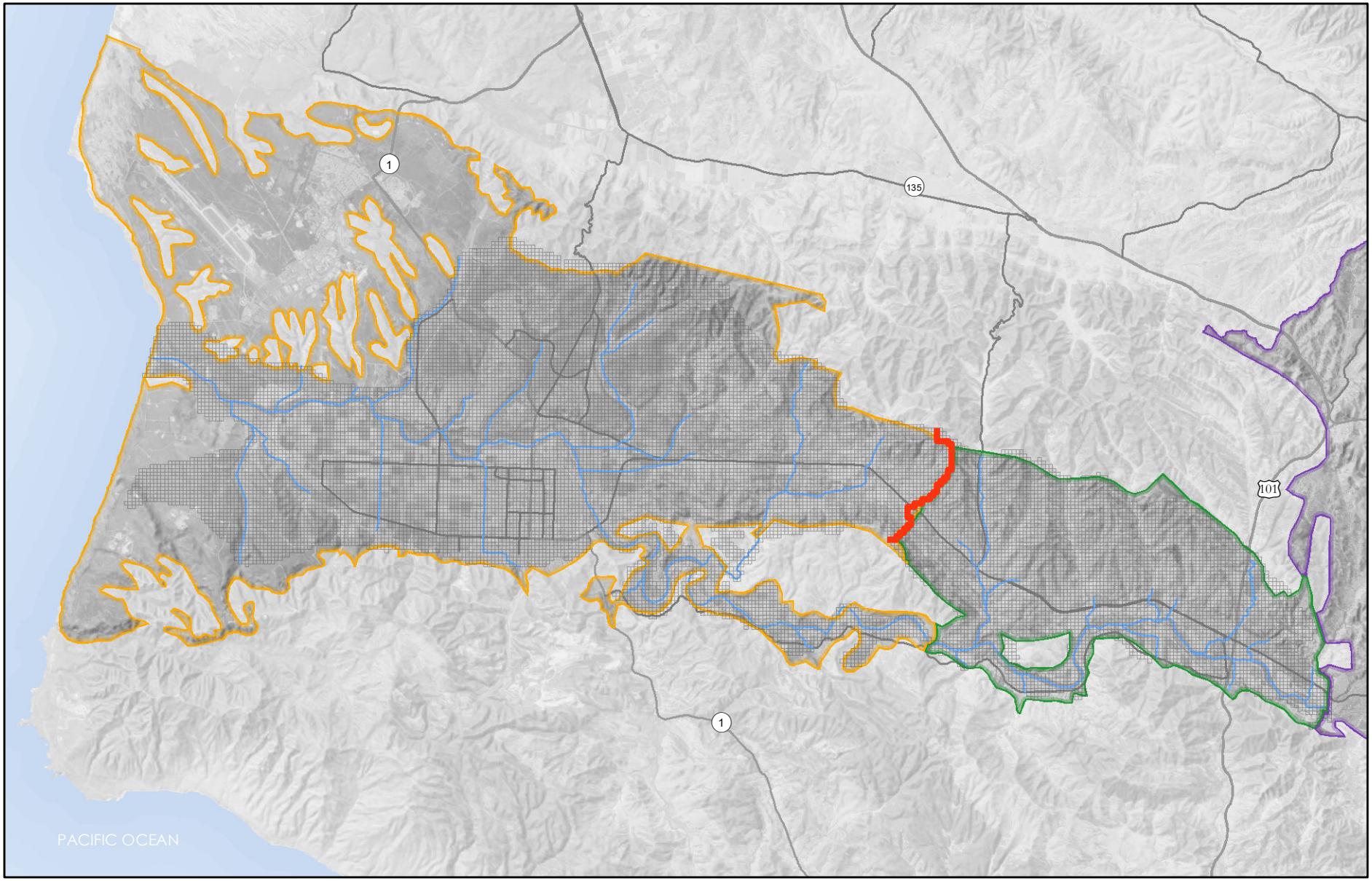
EVAPOTRANSPIRATION
ASSIGNED TO UPPERMOST LAYER IN WMA/CMA MODEL

0 2 4 Miles

N

FIGURE 14

Document Path: J:\jn2710\SYR_Model_Documentation_Report_FlowBar.mxd



STETSON ENGINEERS INC.

DRAFT
4/23/2021

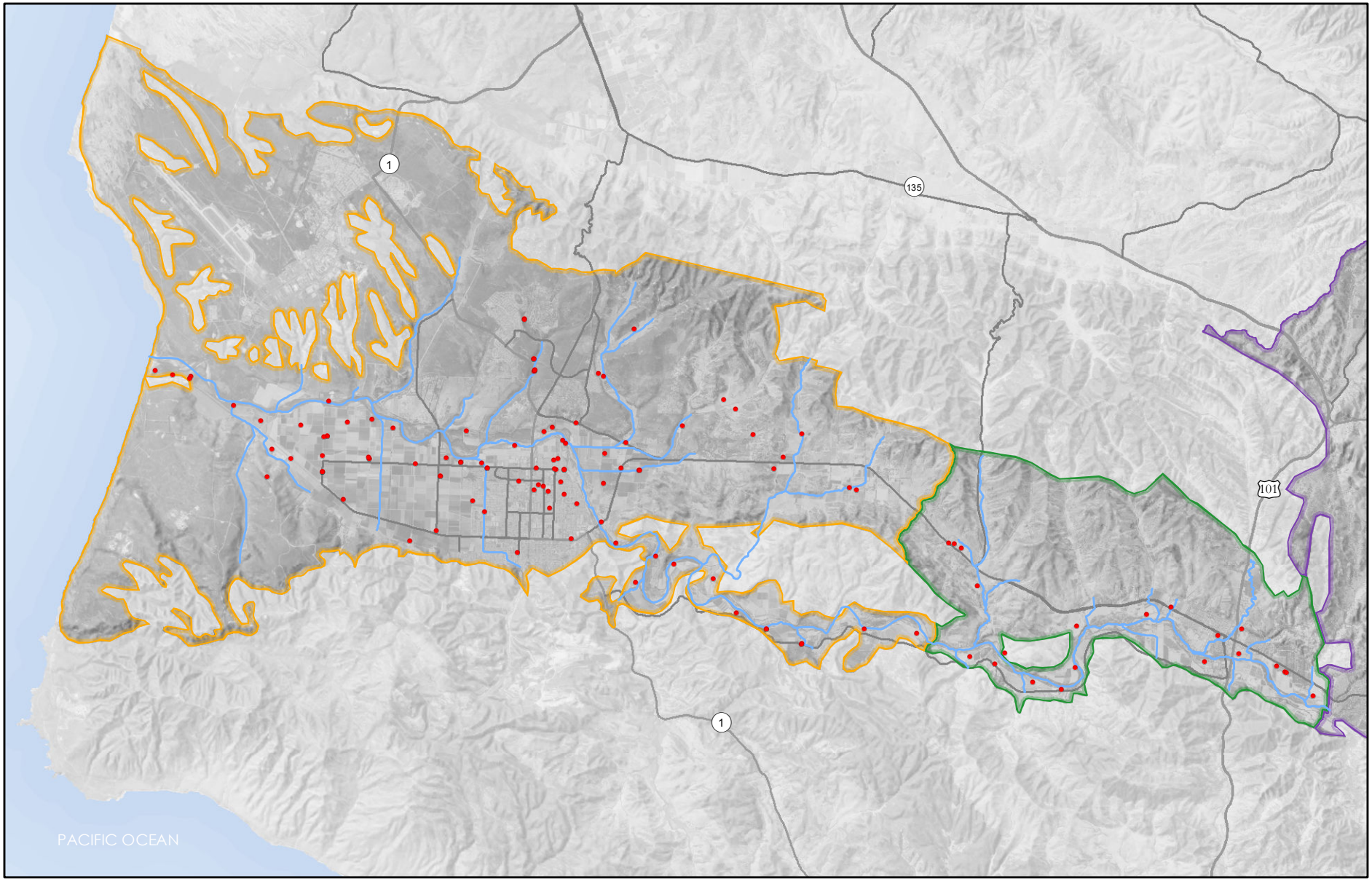
GROUNDWATER FLOW BARRIER
BETWEEN BUELTON AND SANTA RITA UPLAND
WMA/CMA MODEL

0 2 4 Miles

N

FIGURE 15

Document Path: J:\jn2710\SYR_Model_Documentation_Report_CalWells.mxd



STETSON ENGINEERS INC.

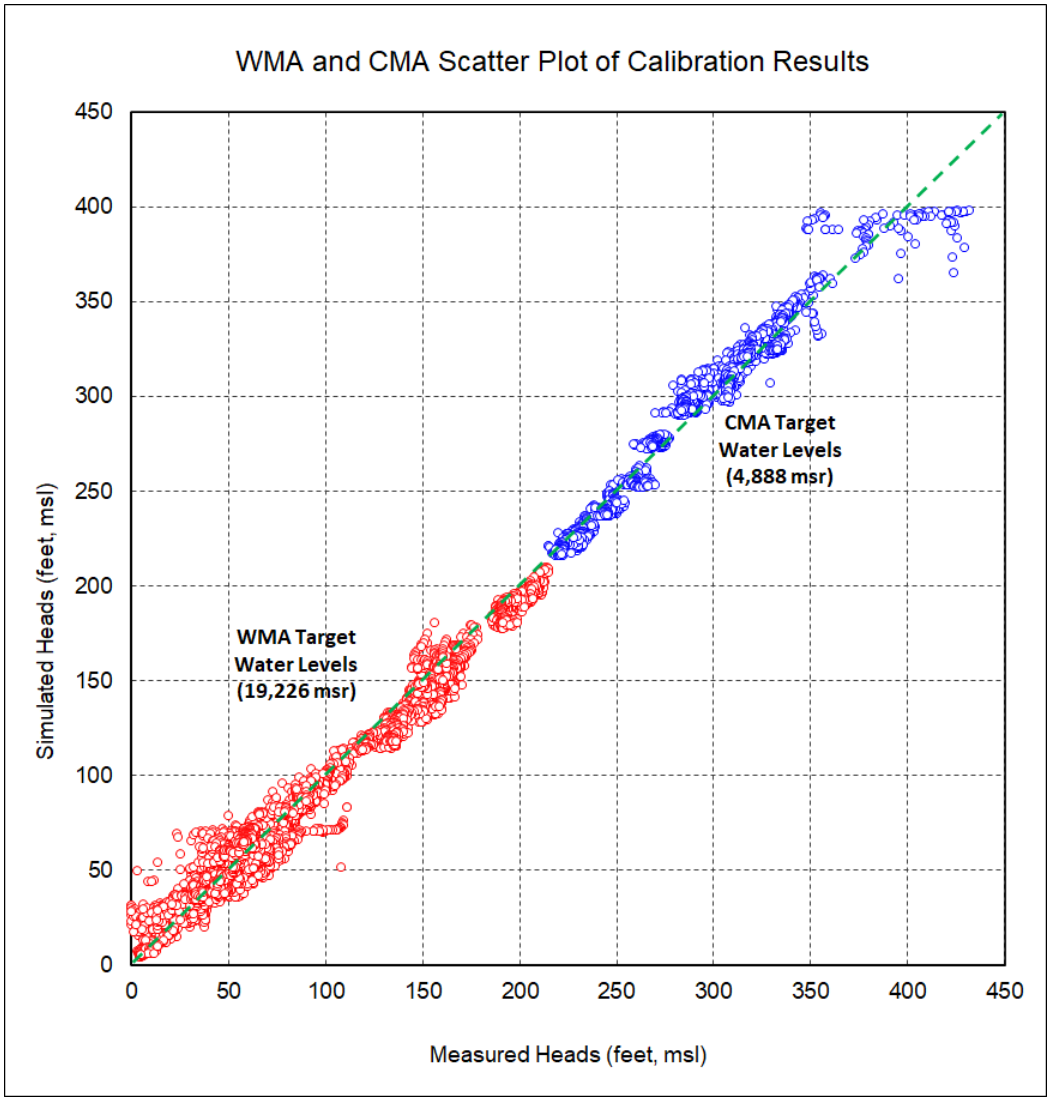
DRAFT
4/23/2021

TARGET WELL LOCATION FOR MODEL CALIBRATION
WMA/CMA MODEL

0 2 4 Miles

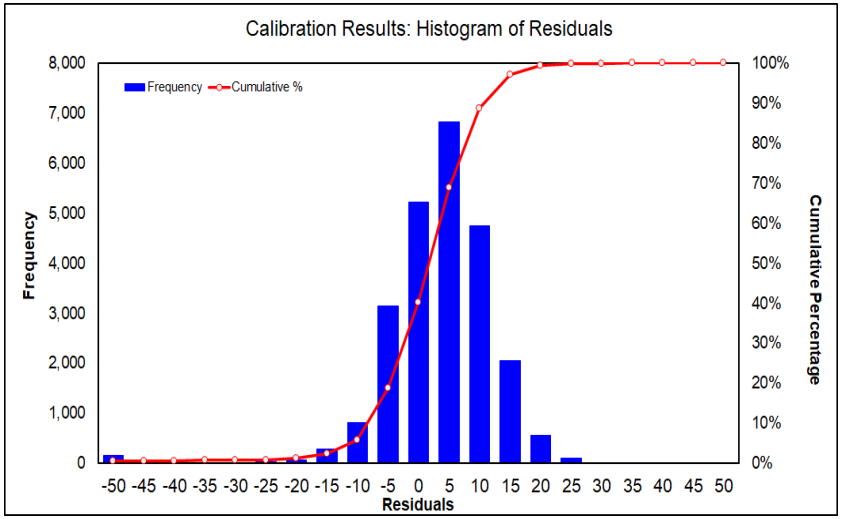
N

FIGURE 16



Residual (msr-sim) Statistics

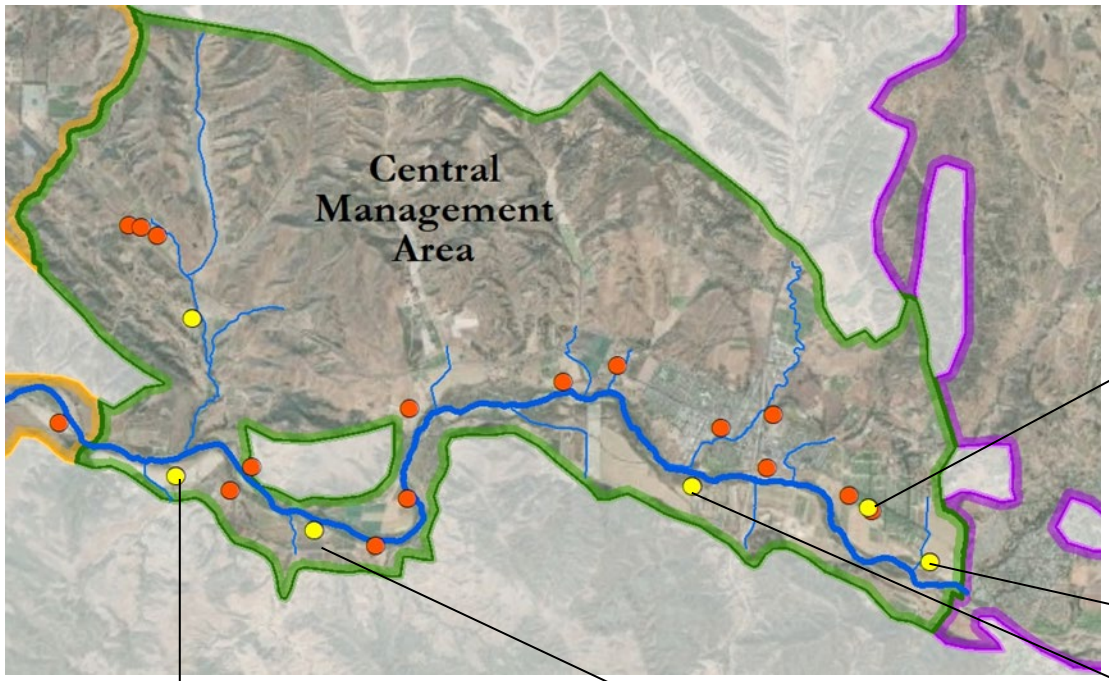
	ALL	WMA	CMA
Mean	0.99	1.40	-0.62
Standard Error	0.06	0.07	0.10
Median	1.70	2.09	-0.20
Mode	3.00	7.50	-6.50
Standard Deviation	9.63	10.13	7.10
Sample Variance	92.67	102.59	50.40
Kurtosis	22.30	22.92	4.96
Skewness	-3.05	-3.36	0.14
Range	138.26	135.92	102.00
Minimum	-79.56	-79.56	-43.30
Maximum	58.70	56.36	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

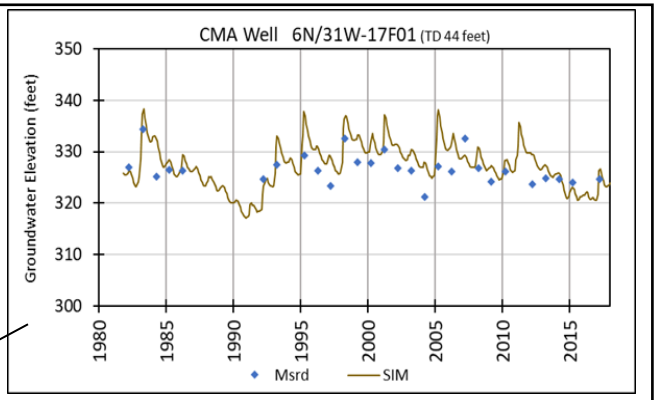


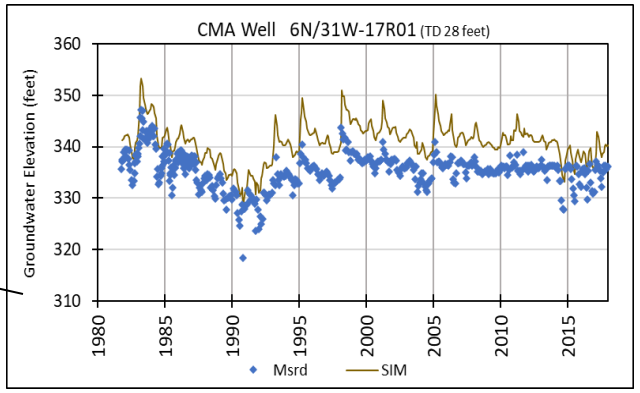
STETSON ENGINEERS INC.

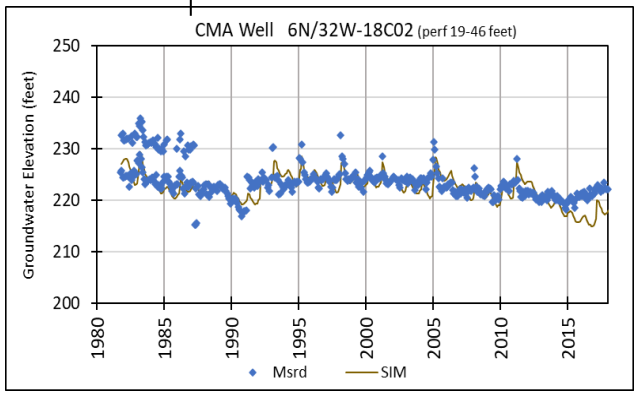
GROUNDWATER LEVEL CALIBRATION STATISTICS
WMA/CMA MODEL

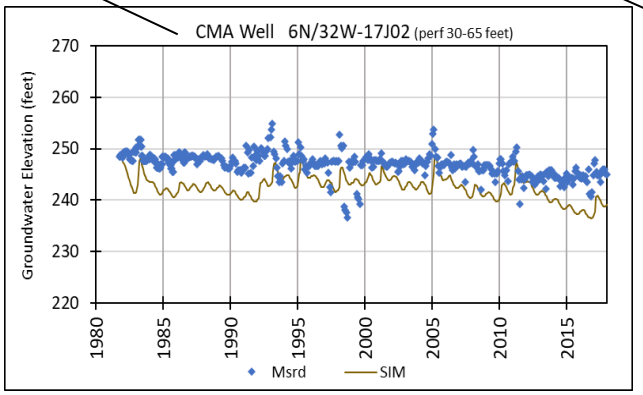
FIGURE 17

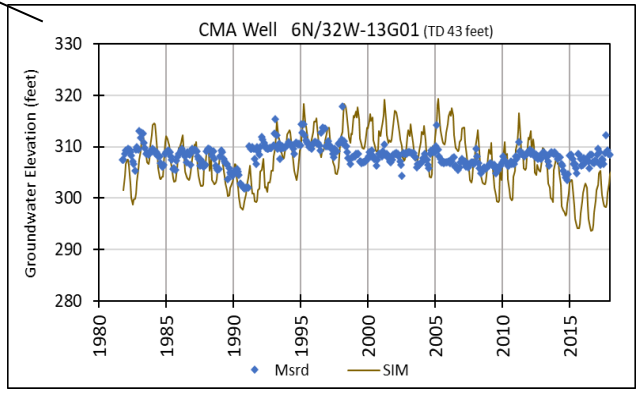








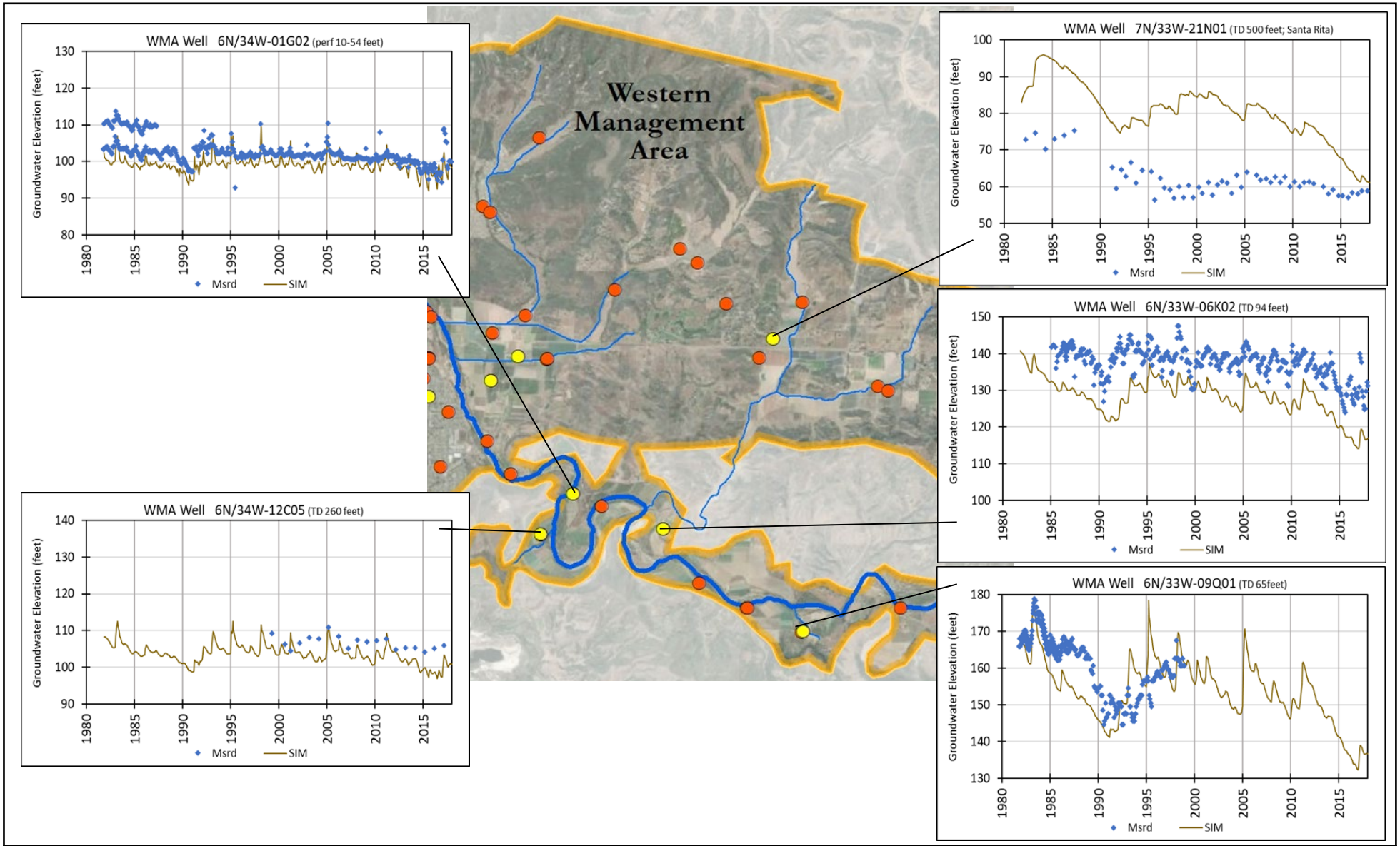




STETSON
ENGINEERS INC.

GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (1 OF 6)
WMA/CMA MODEL

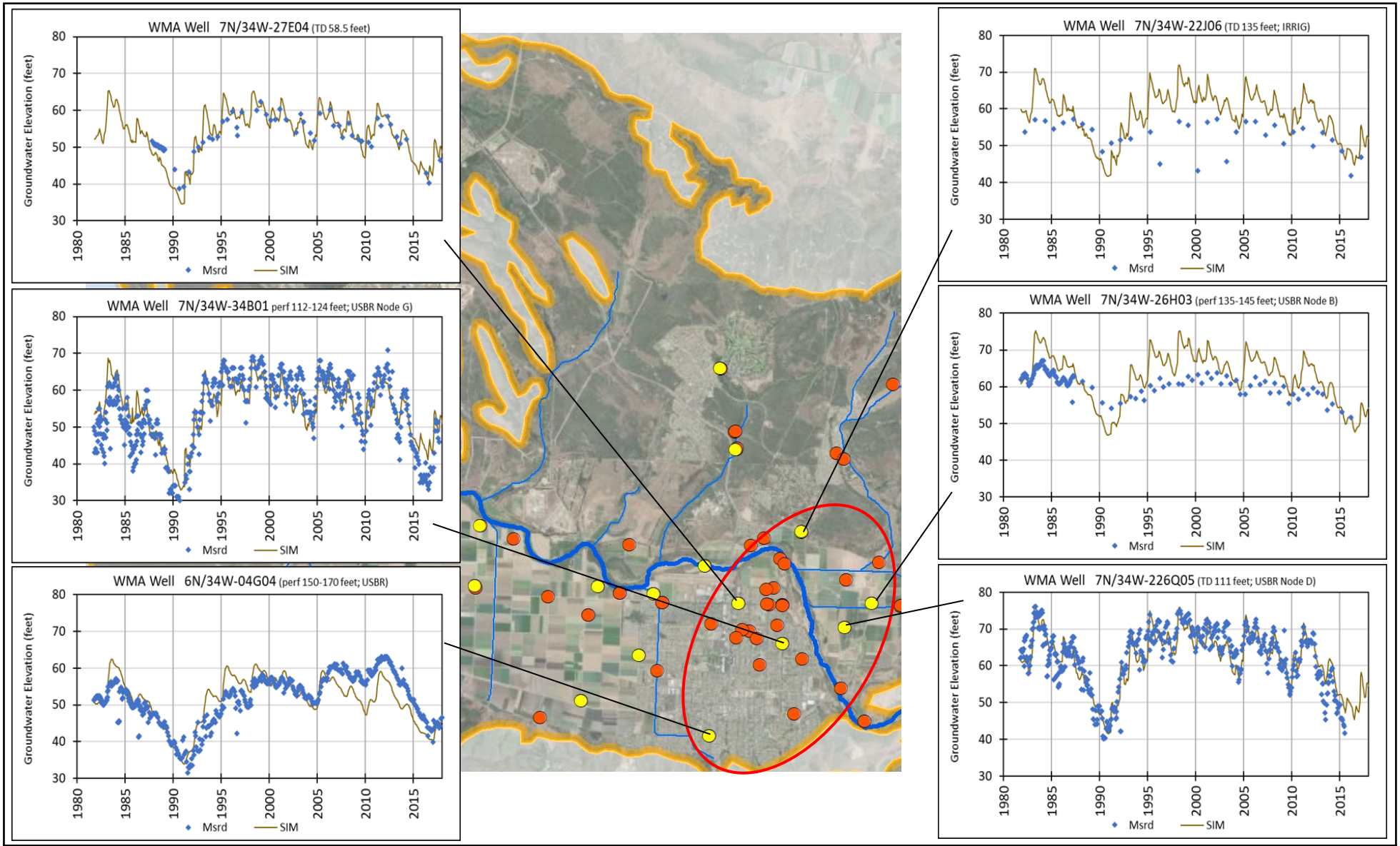
FIGURE 18



STETSON ENGINEERS INC.

GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (2 OF 6)
WMA/CMA MODEL

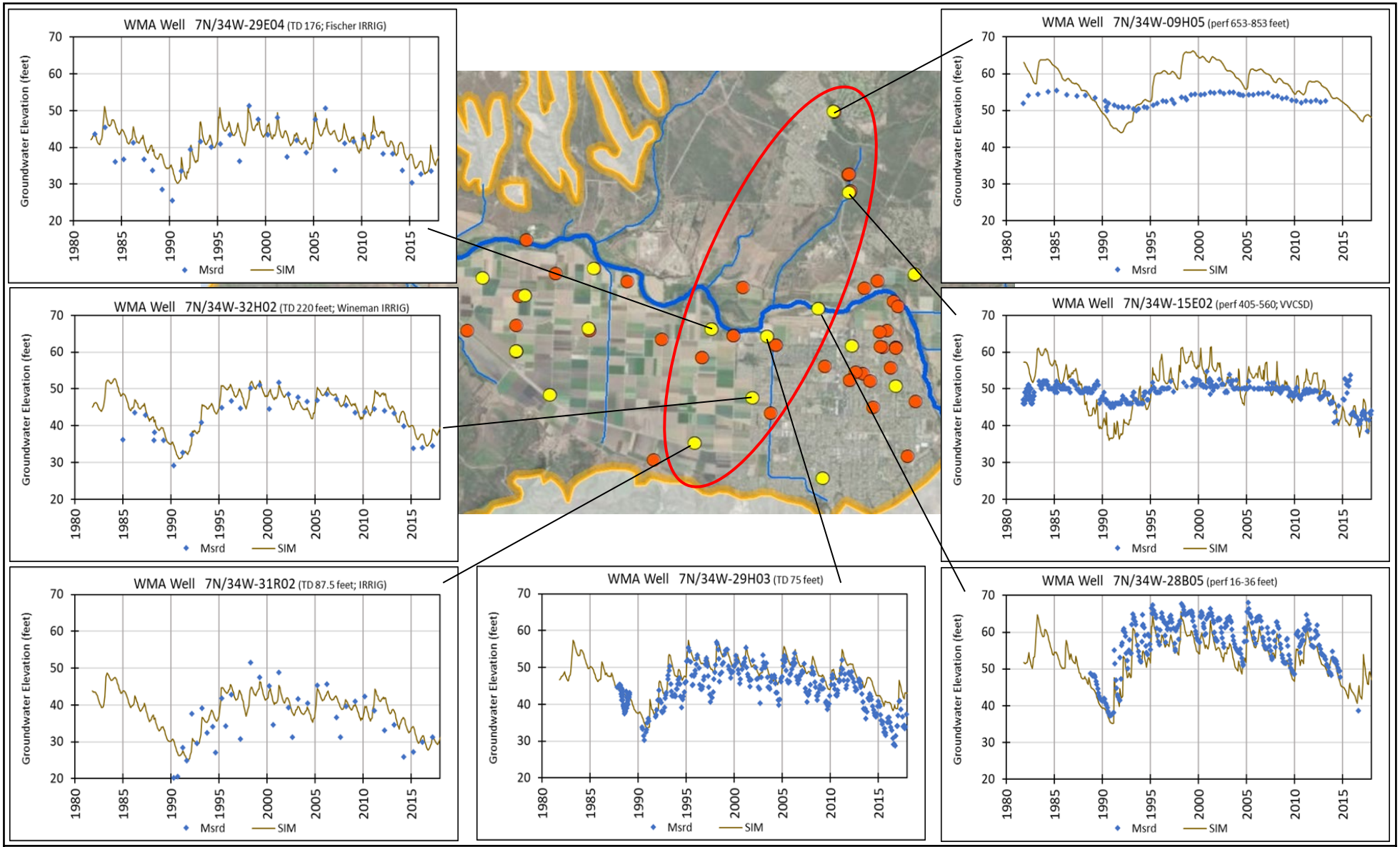
FIGURE 19



STETSON ENGINEERS INC.

GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (3 OF 6)
WMA/CMA MODEL

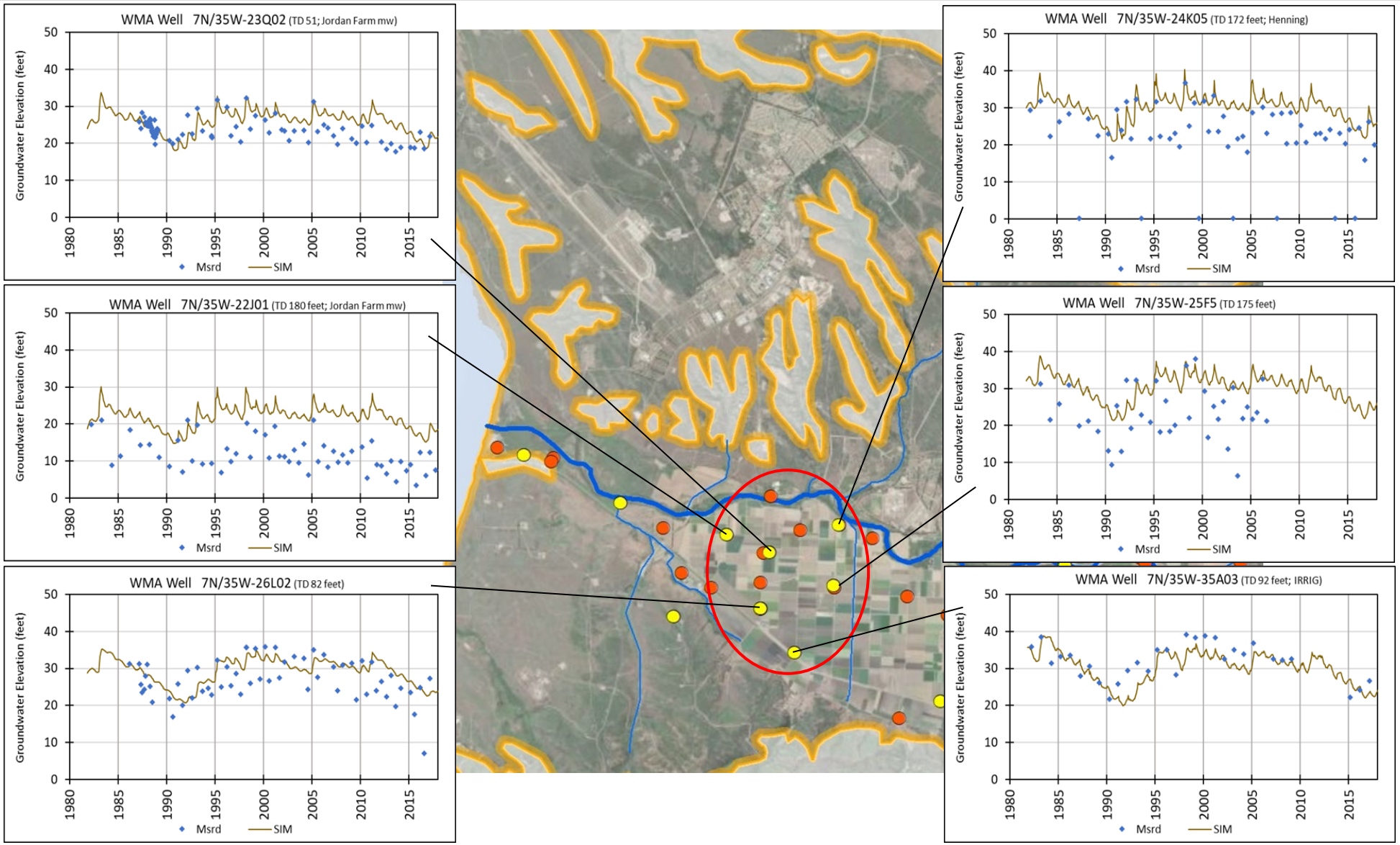
FIGURE 20



STETSON ENGINEERS INC.

GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (4 OF 6)
WMA/CMA MODEL

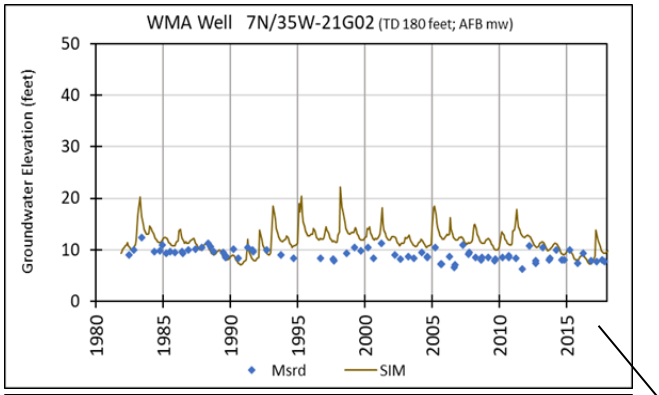
FIGURE 21

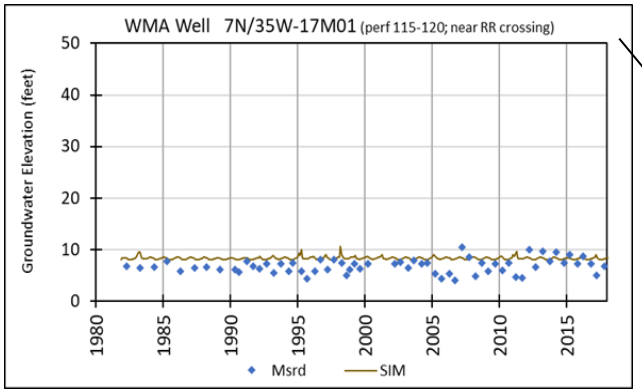


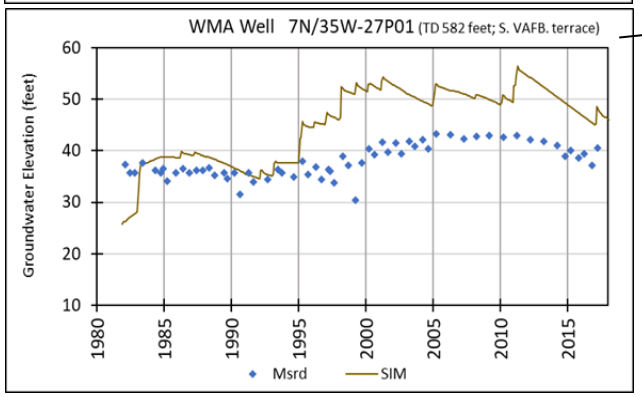
STETSON ENGINEERS INC.

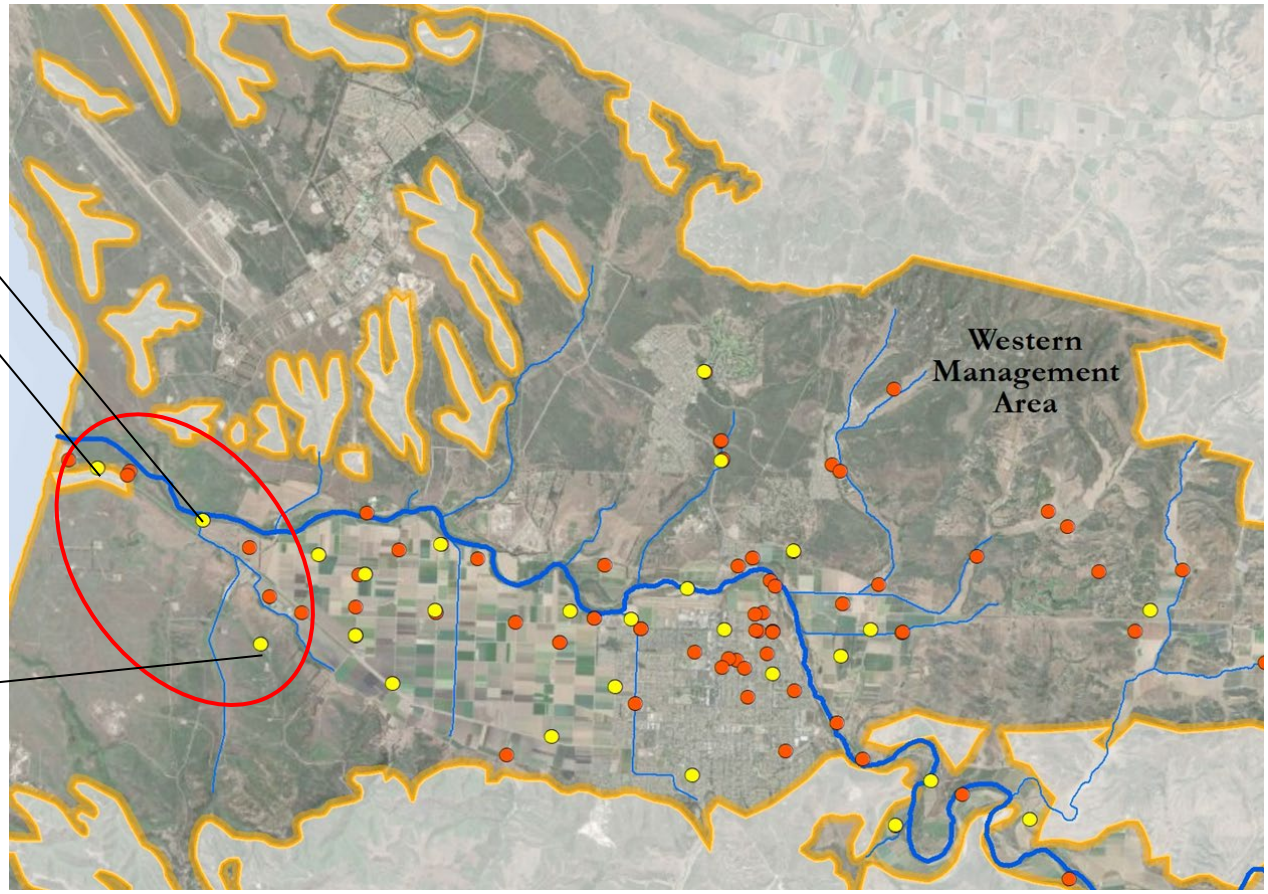
GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (5 OF 6)
WMA/CMA MODEL

FIGURE 22





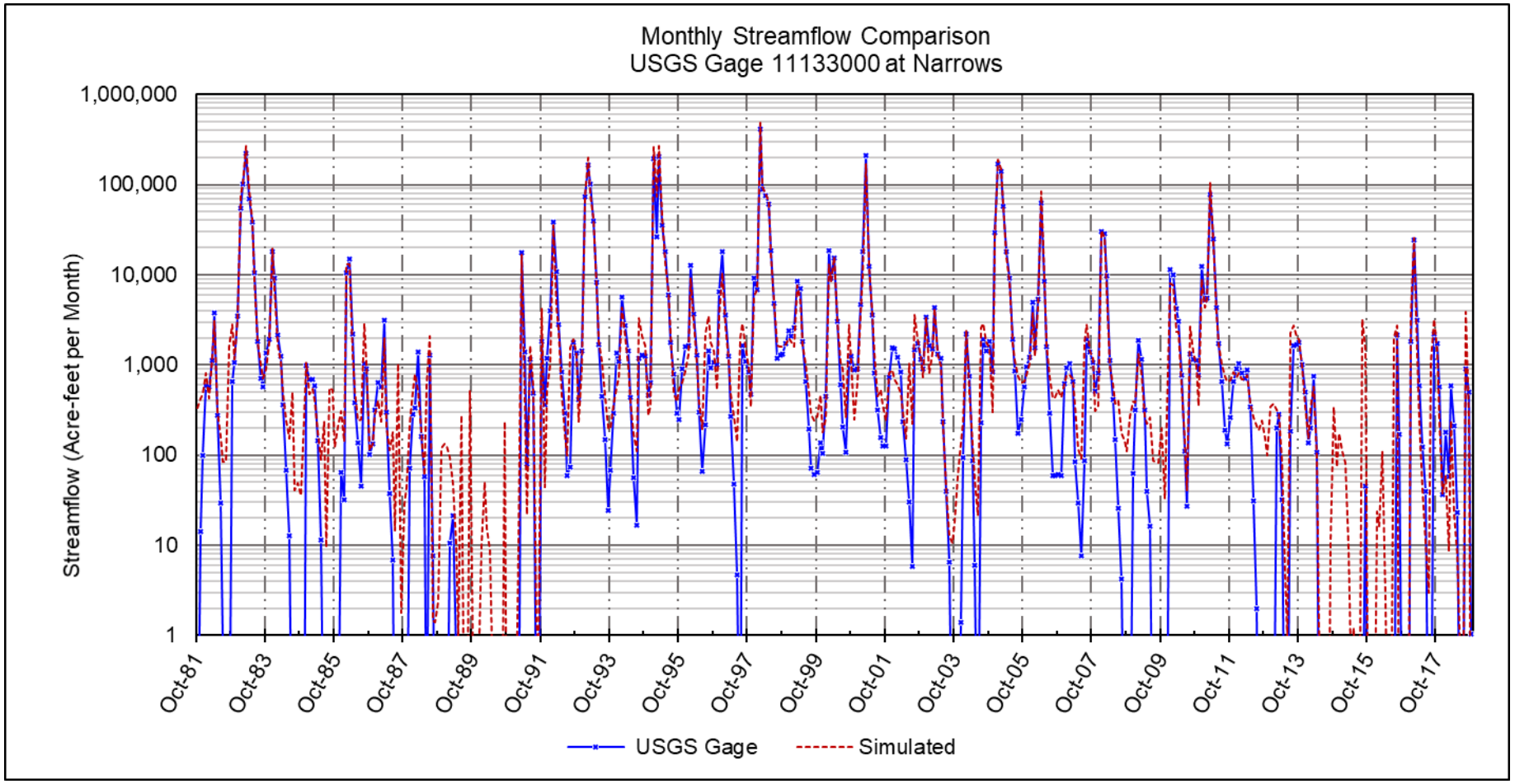




STETSON
ENGINEERS INC.

GROUNDWATER LEVEL CALIBRATION
MEASURED AND SIMULATED HYDROGRAPHS (6 OF 6)
WMA/CMA MODEL

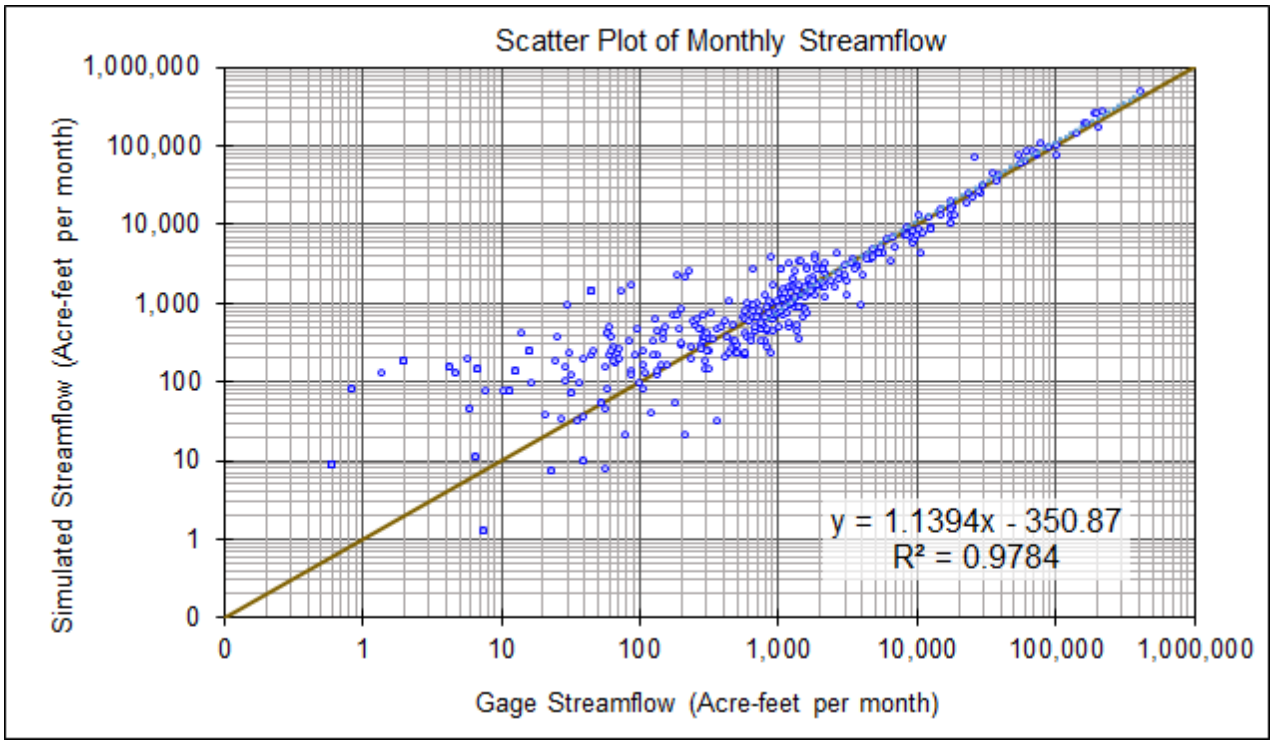
FIGURE 23

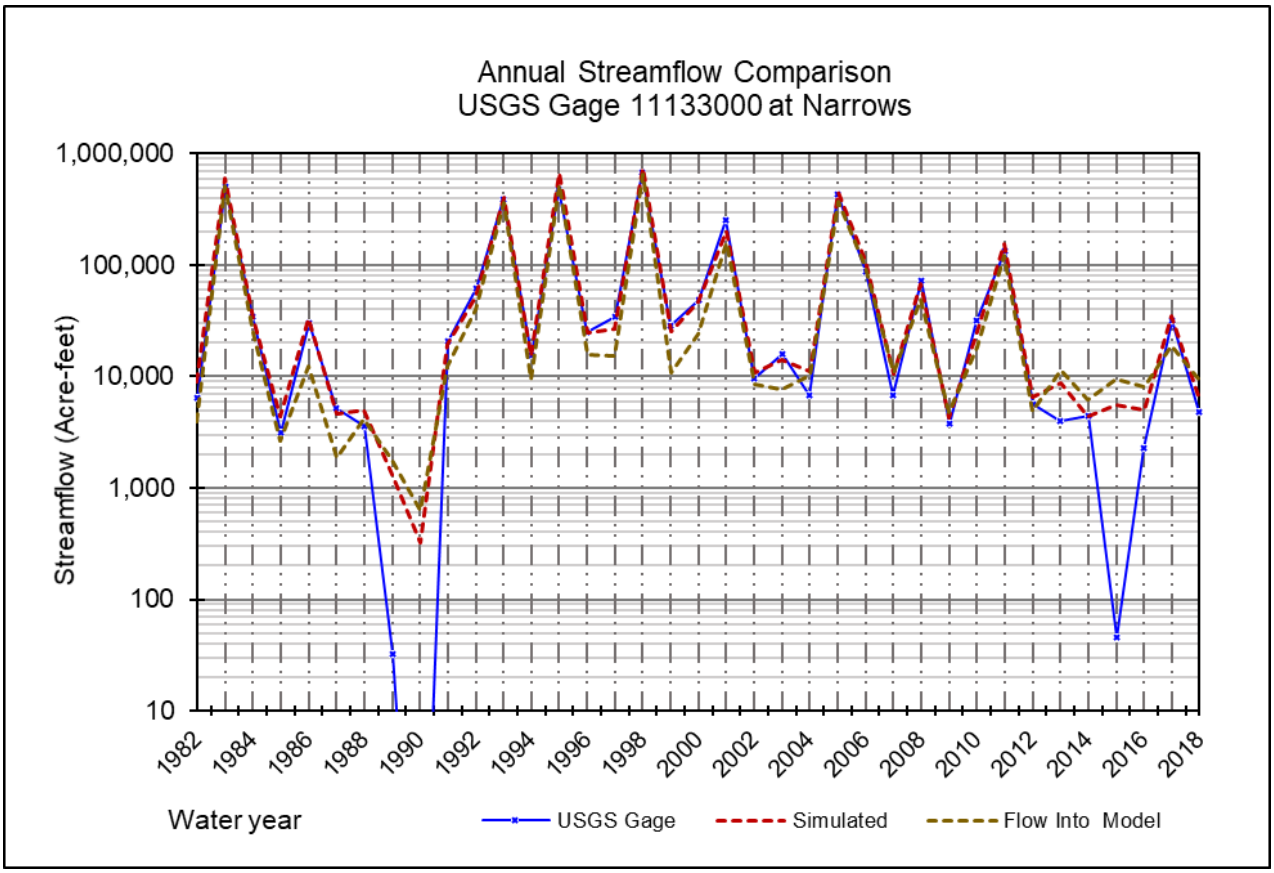


STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 1133000 NARROWS MEASURED AND SIMULATED HYDROGRAPH
WMA/CMA MODEL

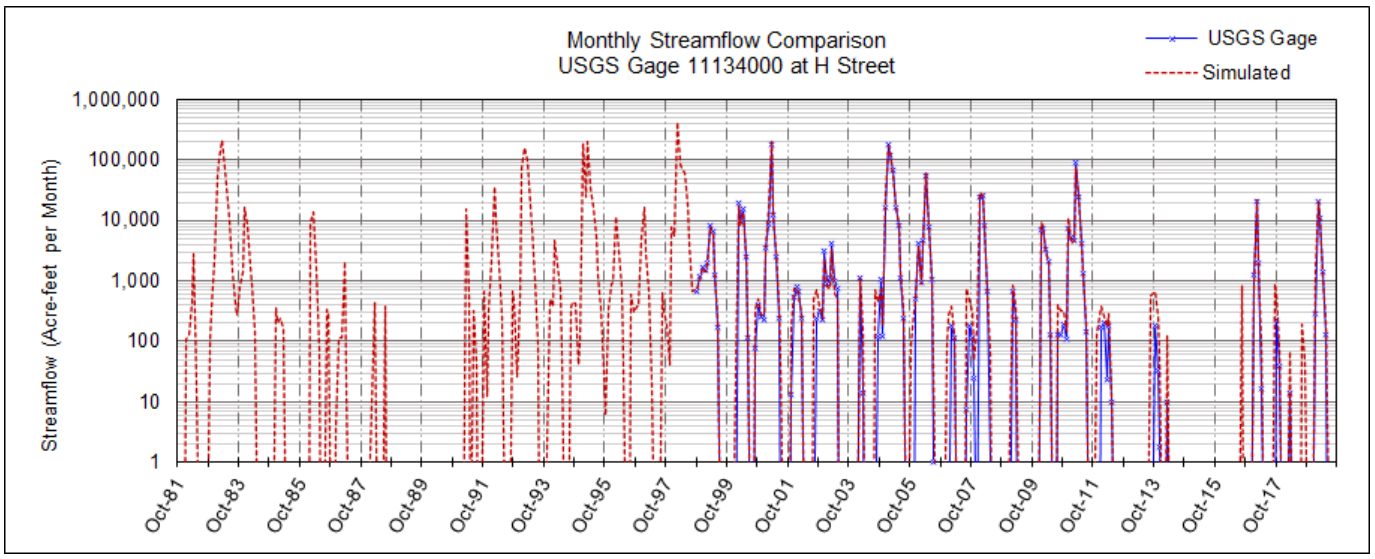
FIGURE 24

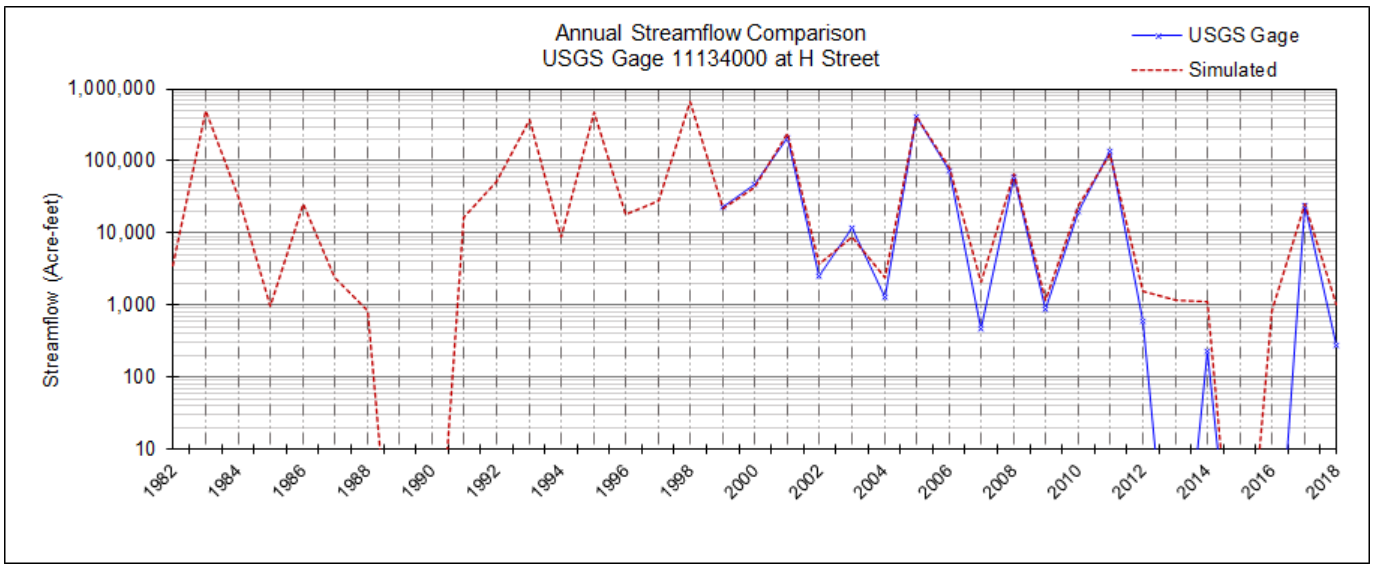


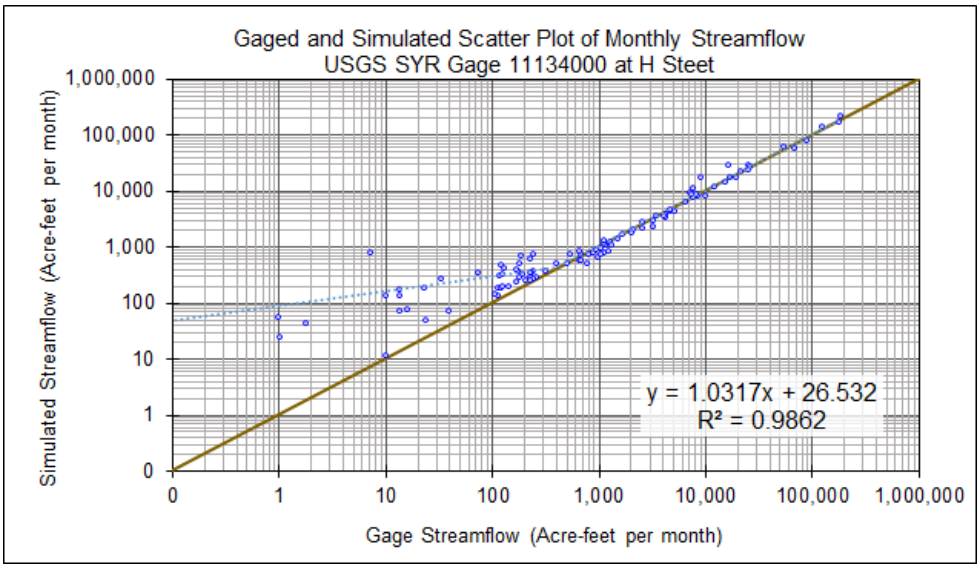


STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11133000 AT NARROWS
WMA/CMA MODEL

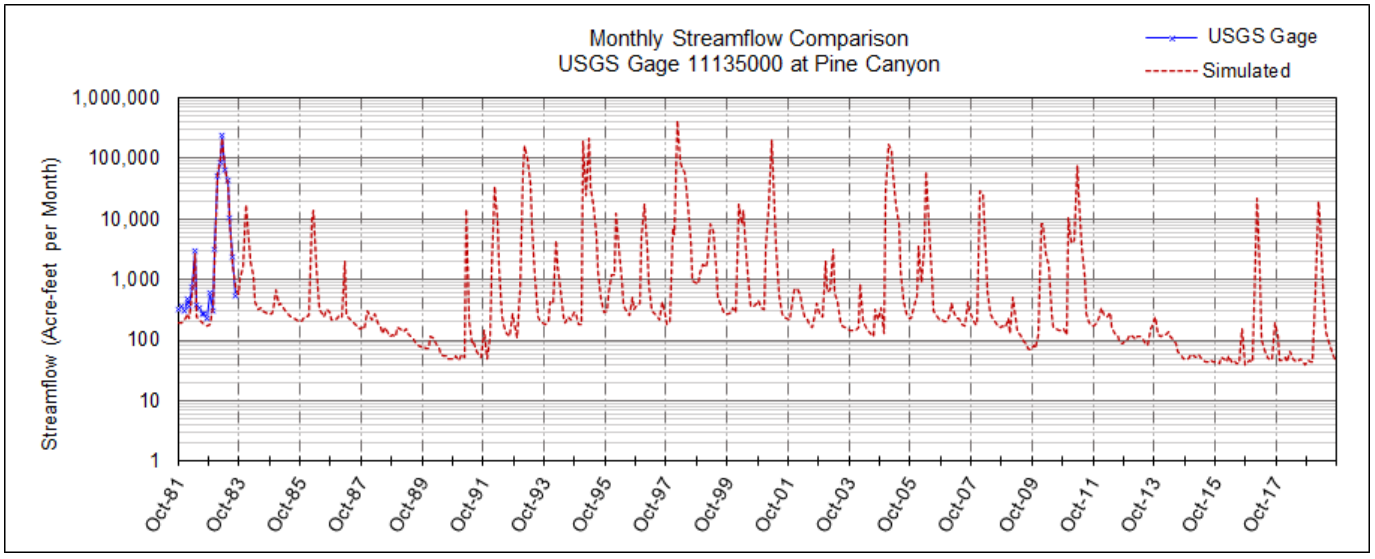


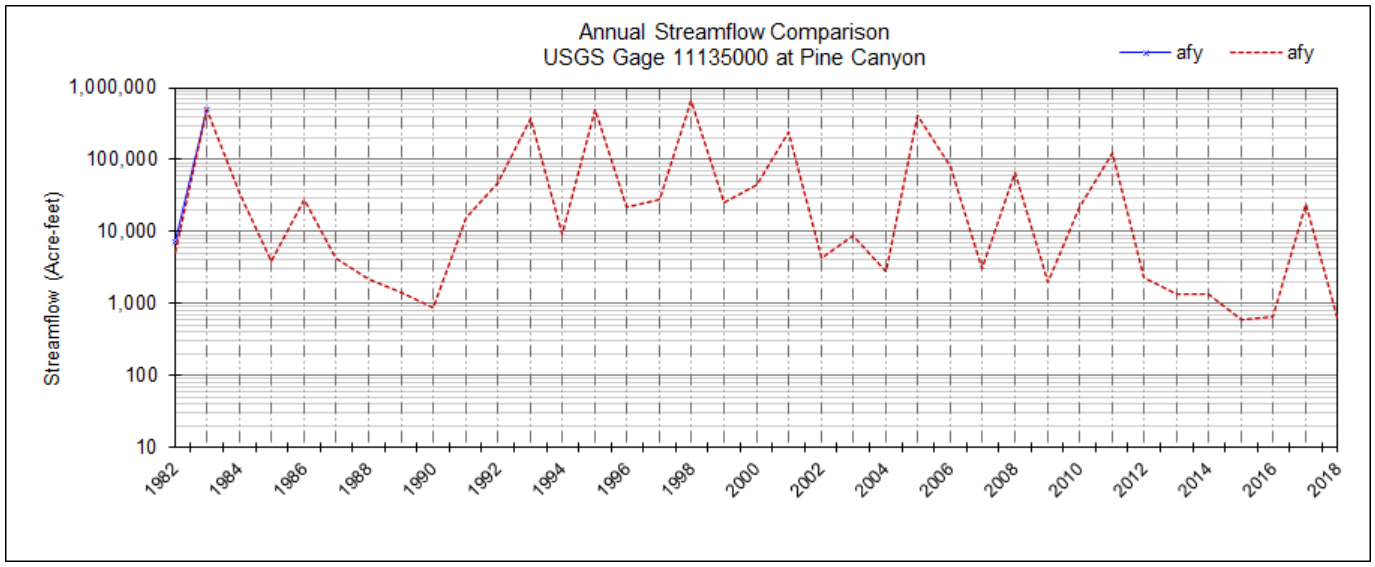


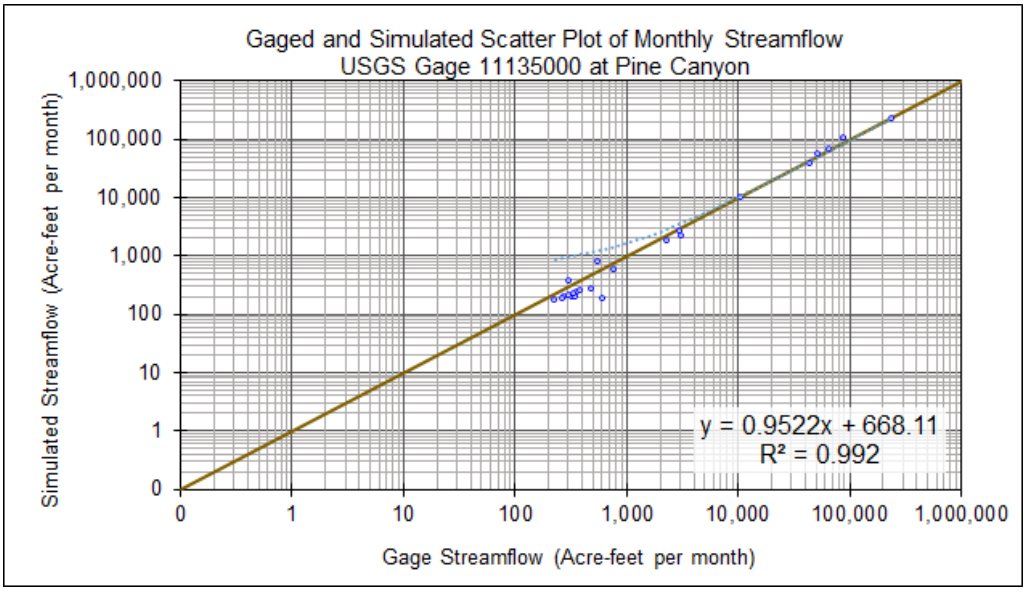


STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11134000 AT H Street
WMA/CMA MODEL

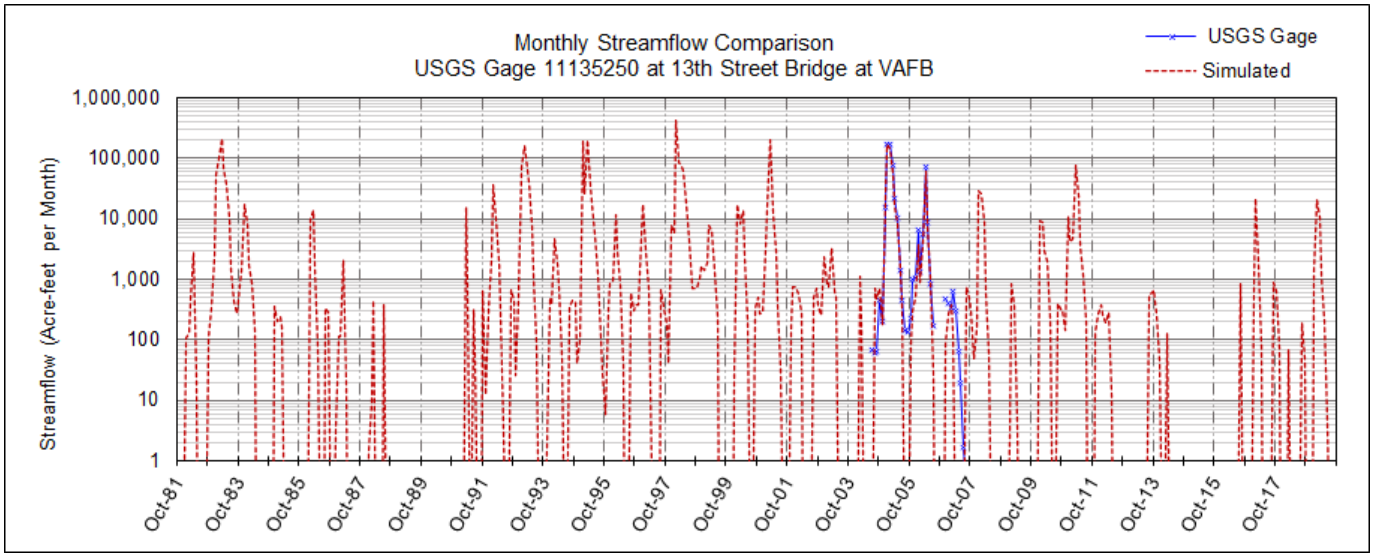


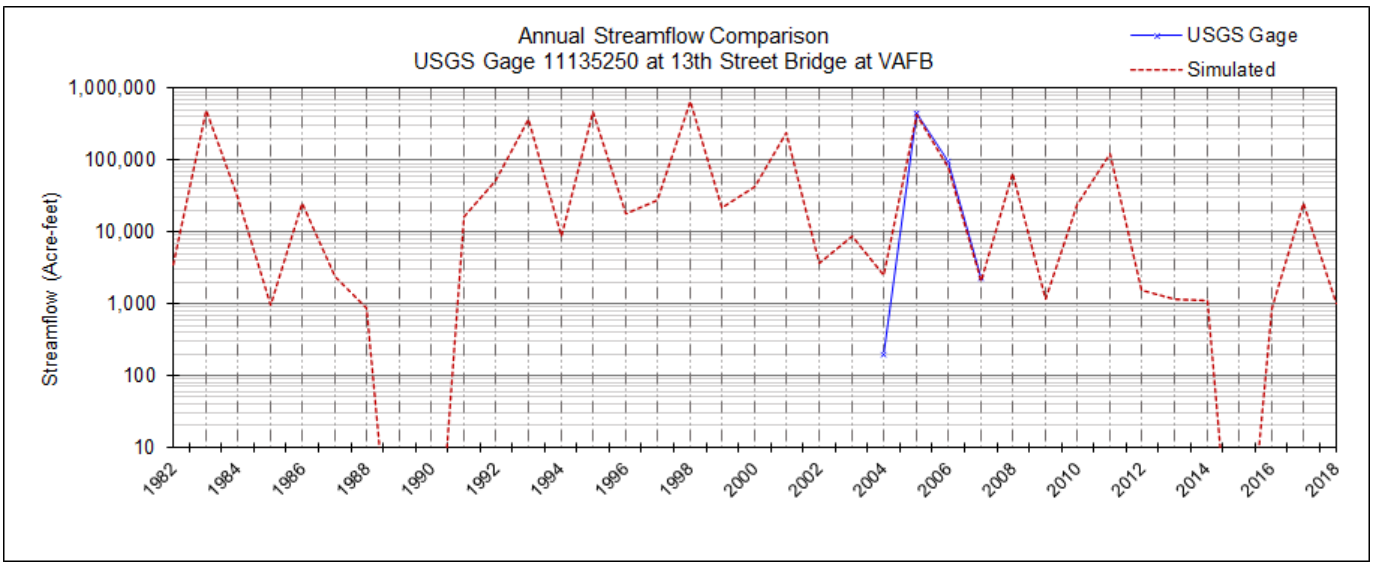


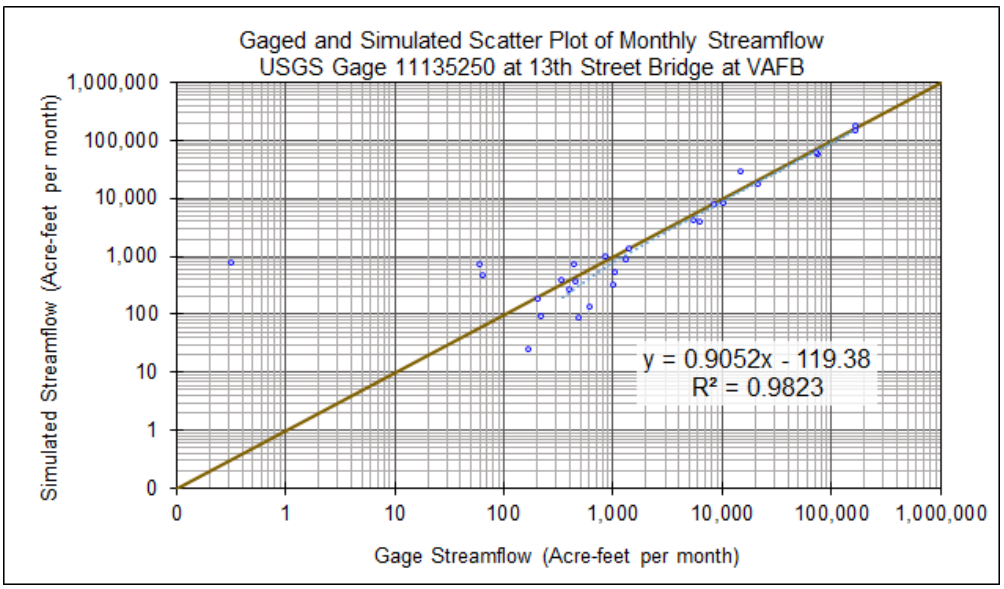


STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11135000 AT Pine Canyon
WMA/CMA MODEL

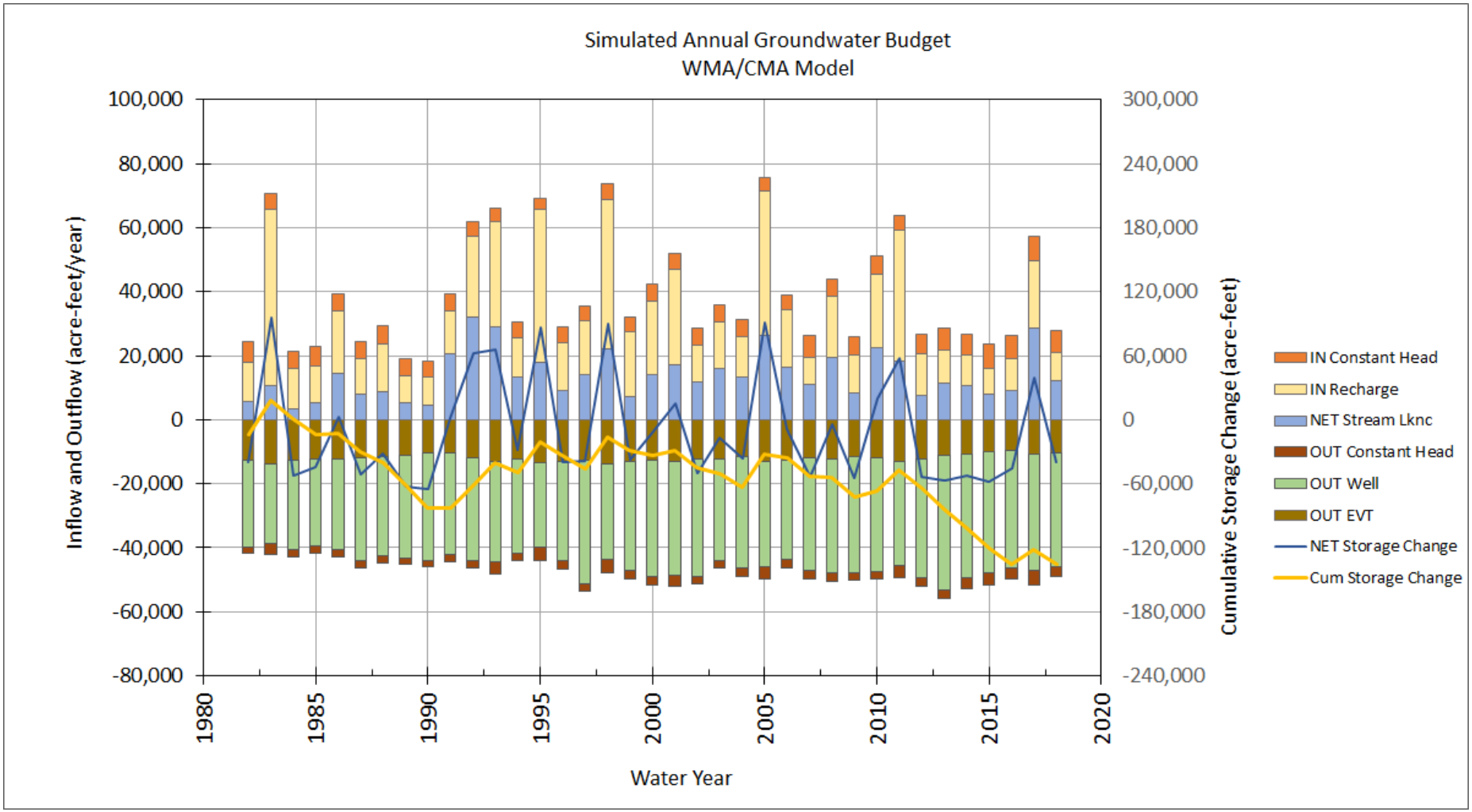






STETSON ENGINEERS INC.

STREAMFLOW CALIBRATION
USGS GAGE 11135250 AT 13th Street Bridge near VAFB
WMA/CMA MODEL



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

Data Point	Stream flow (cfd)	Stream flow (cfs)	Gage 11133000 Narrows		Gage 11134000 H Street		Below Lompoc WTP		Gage 11128500 Solvang		Gage 11129800 Zaca Creek	
			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

Attachment 4
WMA/CMA Model Pumping

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

Attachment 4
WMA/CMA Model Pumping

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

Attachment 4
WMA/CMA Model Pumping

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

Attachment 4

WMA/CMA Model Pumping

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

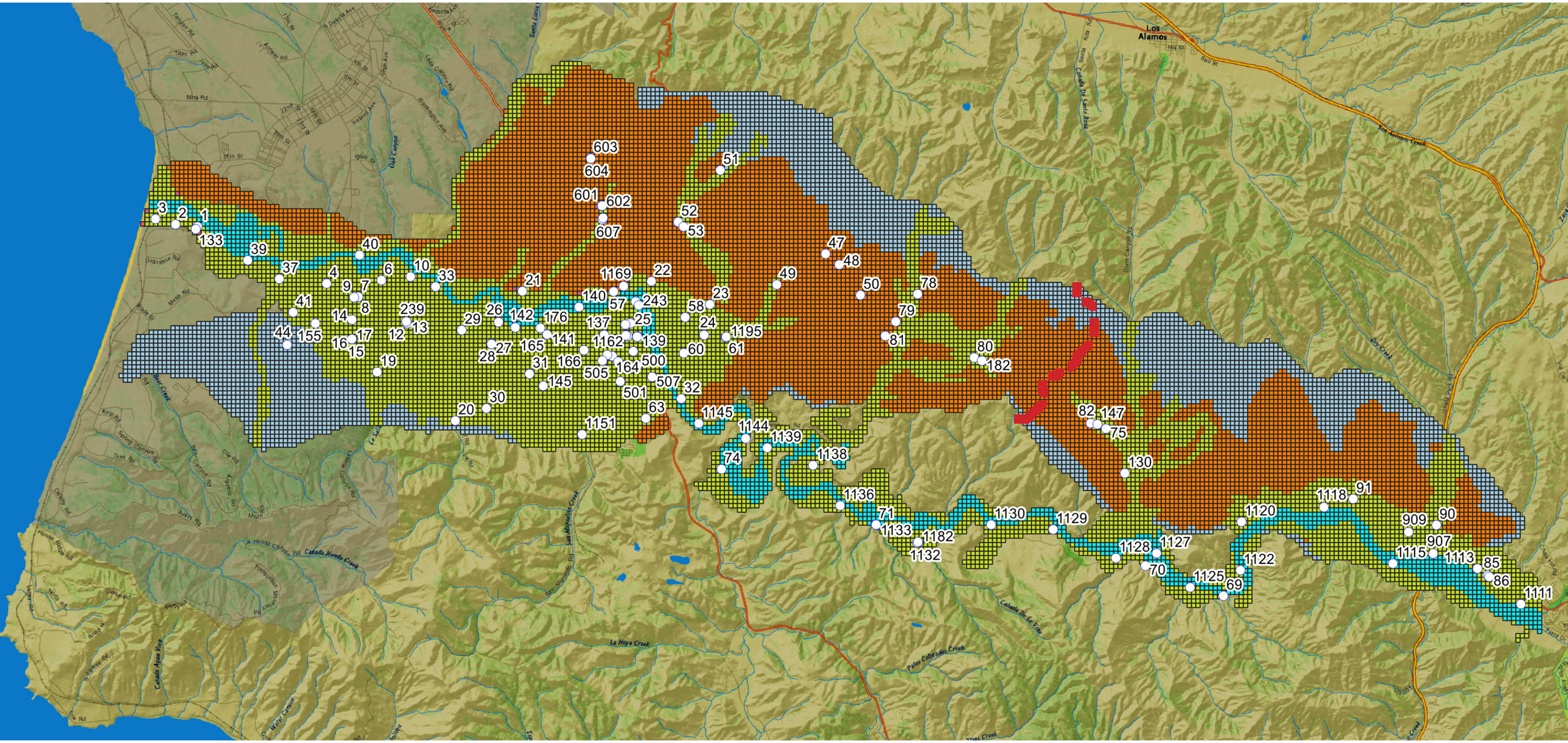
WMA/CMA Model Documentation

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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Avery Rd
Arguello Rd
Refugio Rd
La Honda Canyon Rd
Cañada Honda Creek
Tranquillon Mesa
Point Rd
North Rd
Road 1
Road 2
Tow Rd
Cañada Agua Viva
Gaviota Creek
La Hoya Creek
Santa Ynez River
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Santa Cruz Rd
Santa Lucia Rd
Hill St
Bell St
San Antonio Creek
Drum Canyon Rd
Dry Creek
Foxen Canyon Rd
Tepusquet Creek
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Cañada De La Vina
San Miguelito Creek
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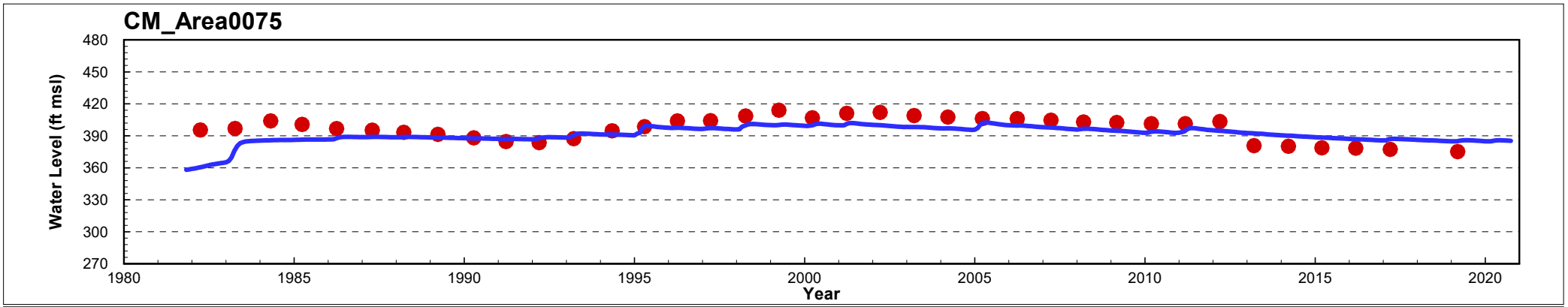
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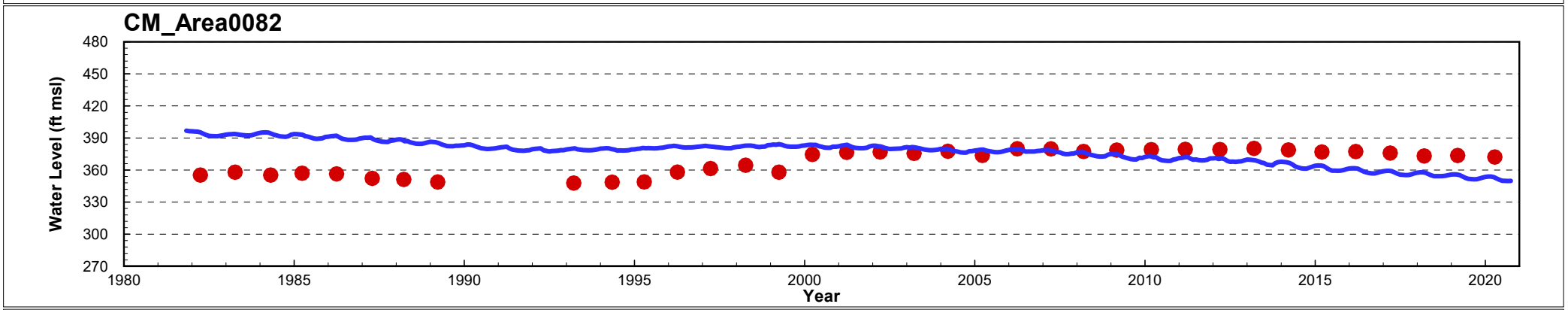
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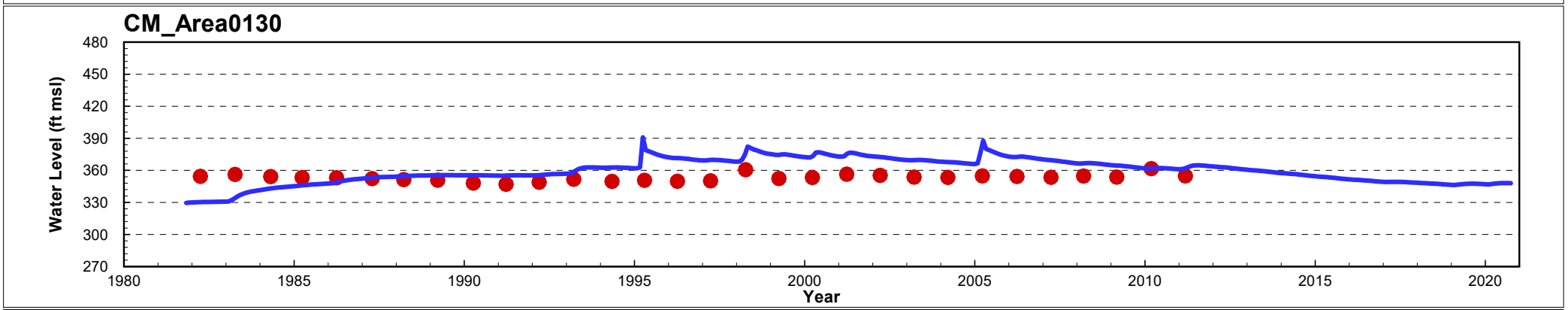
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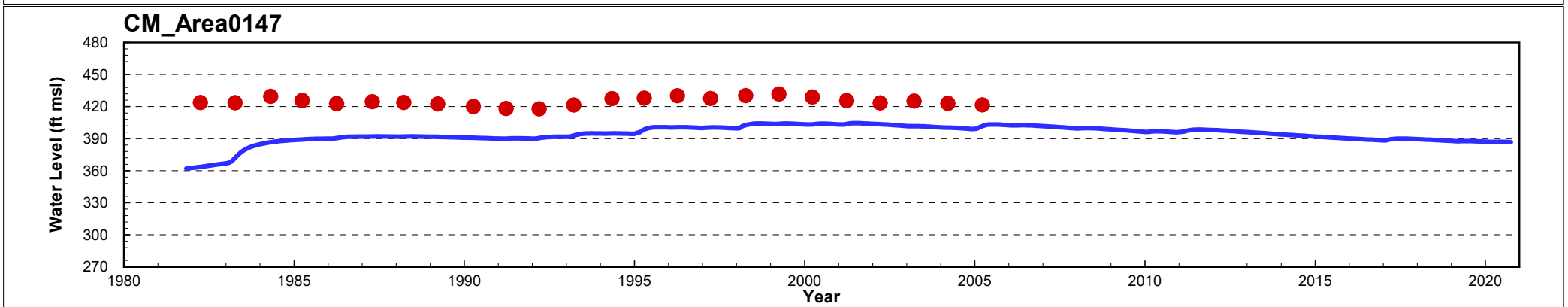
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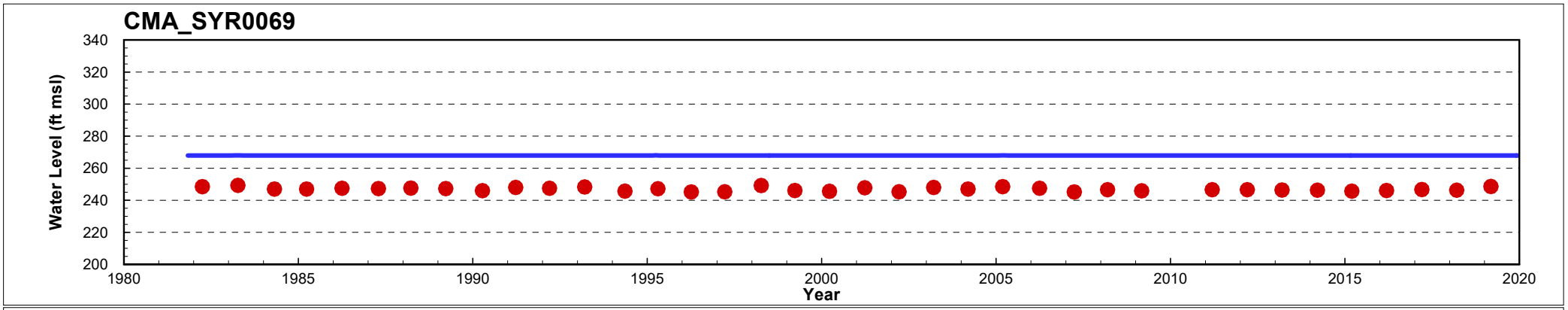
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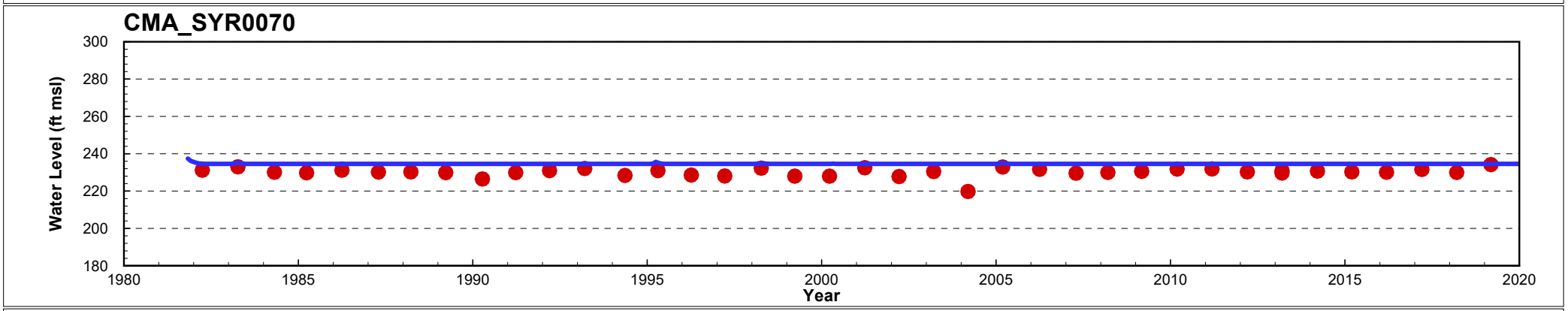
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2020
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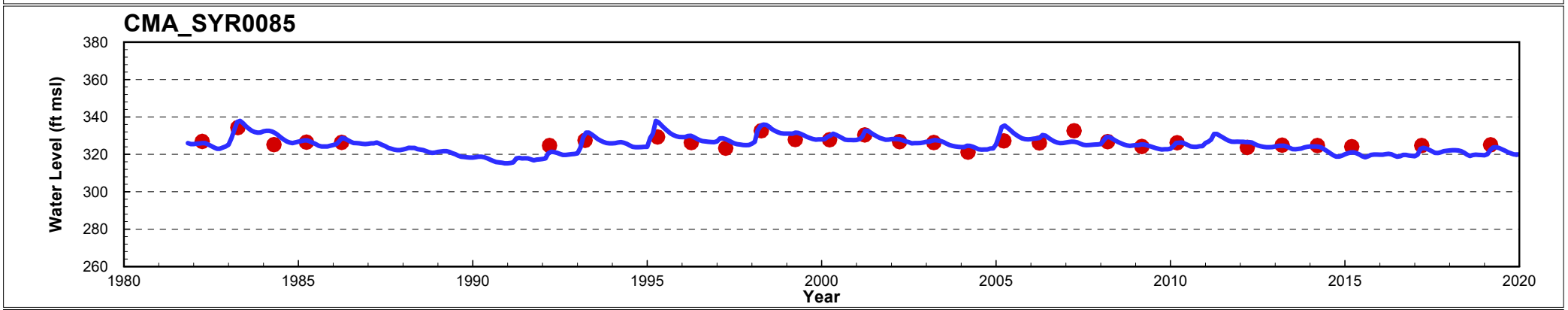
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2020
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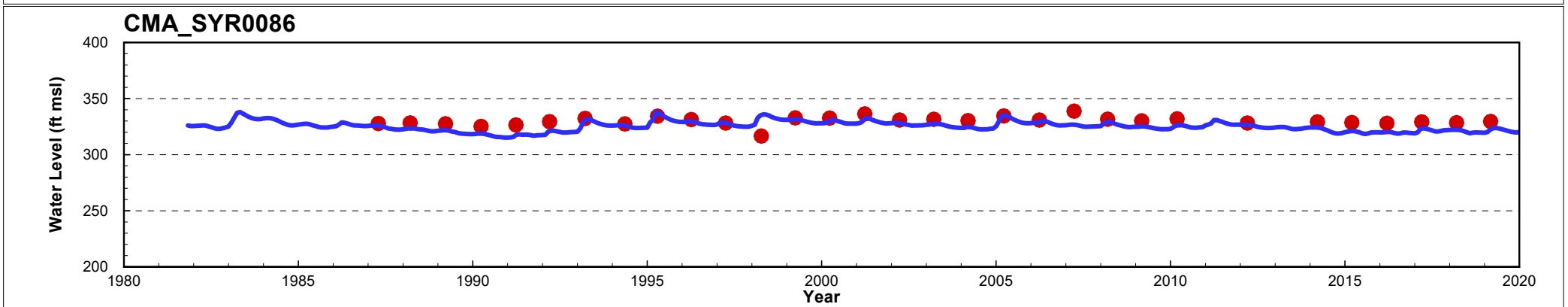
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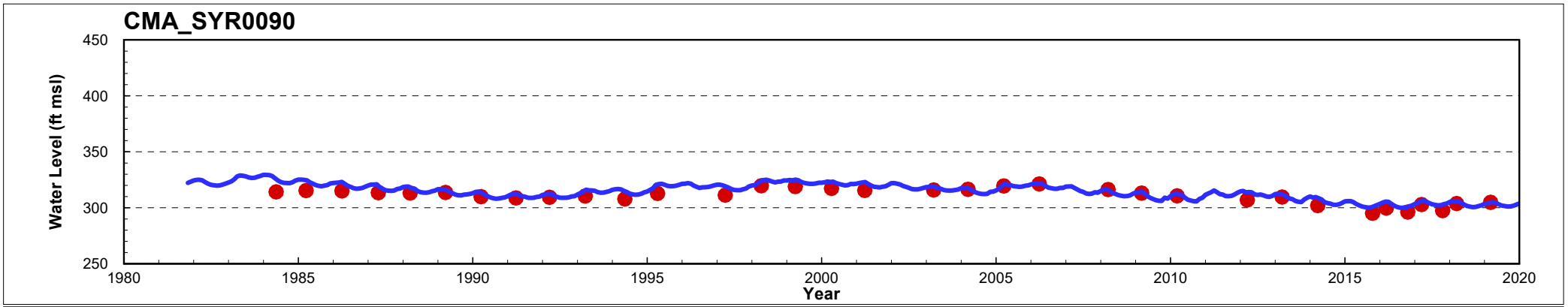
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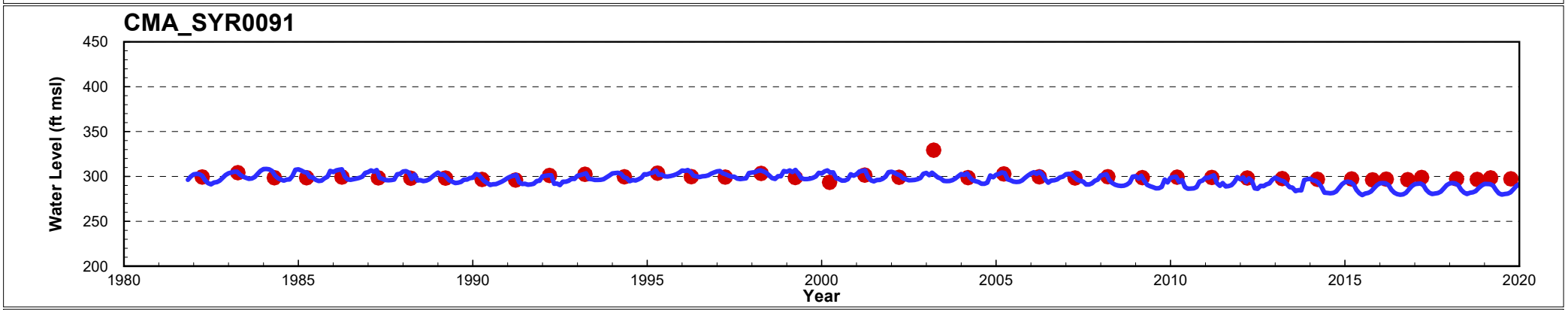
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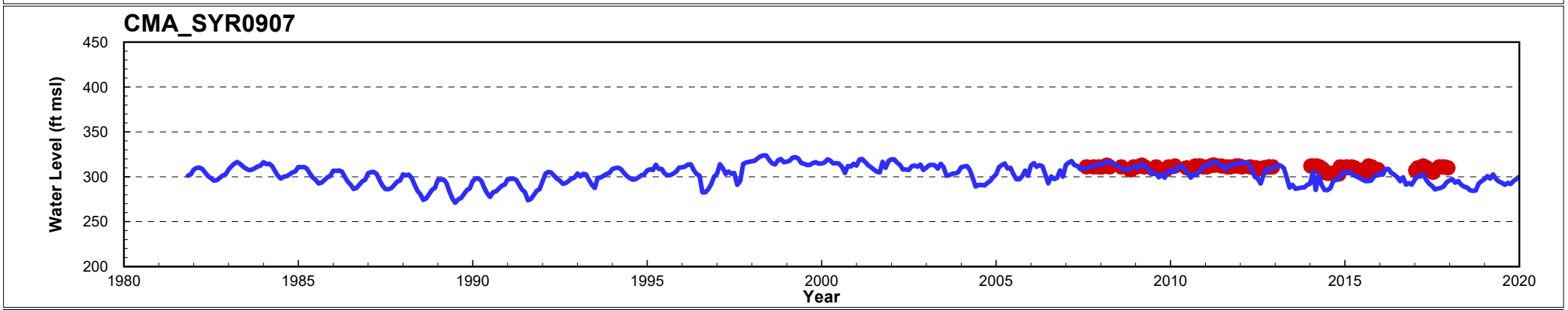
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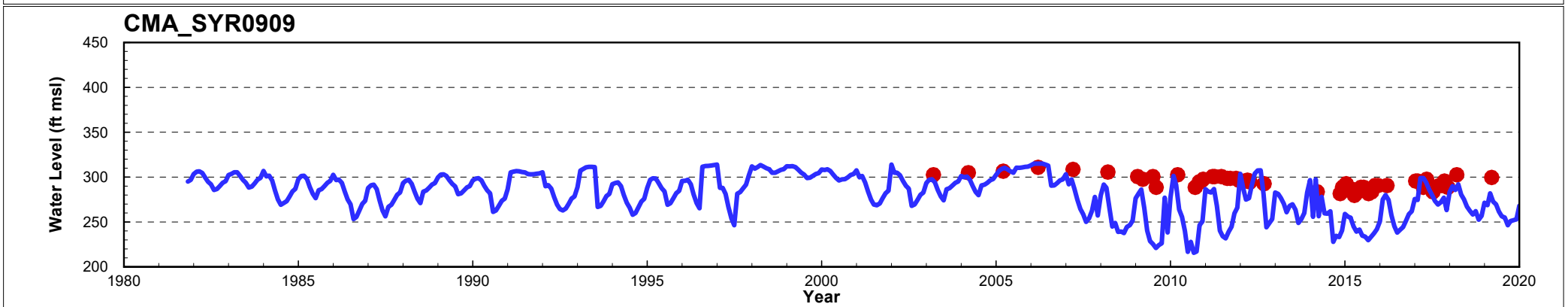
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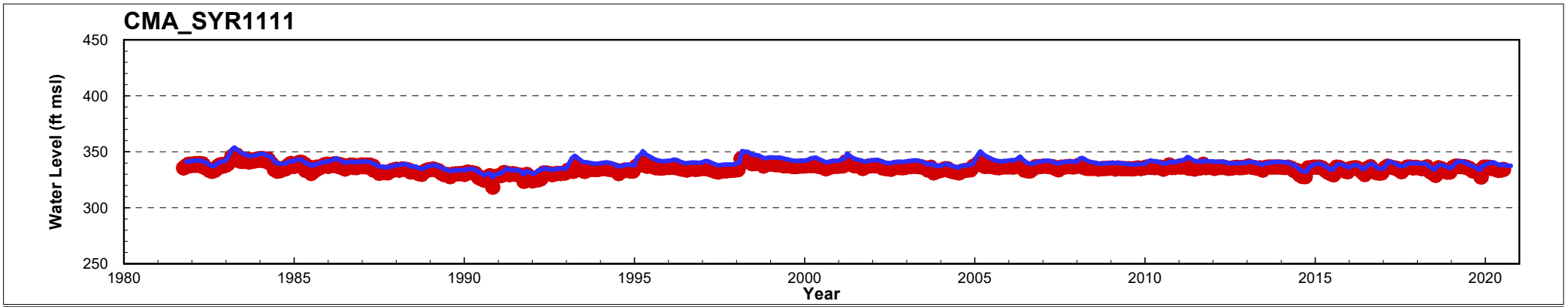
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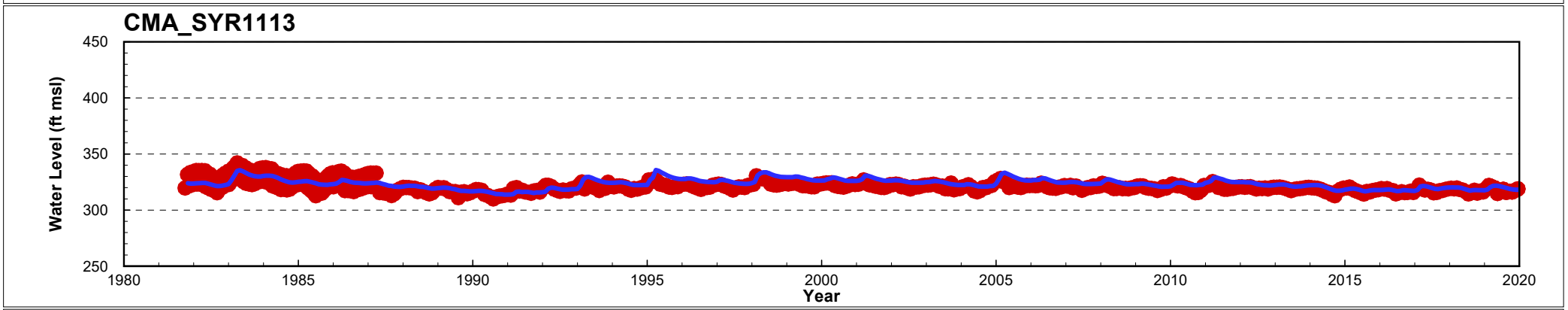
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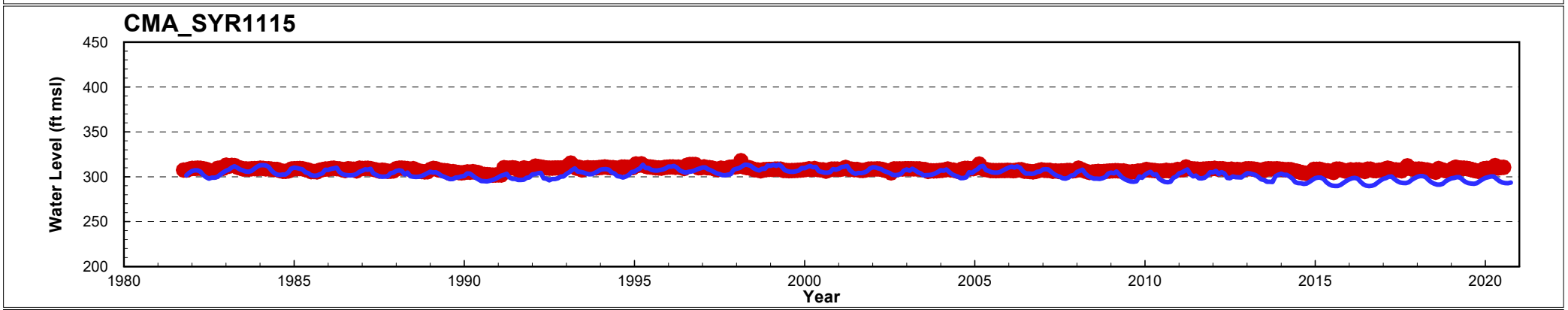
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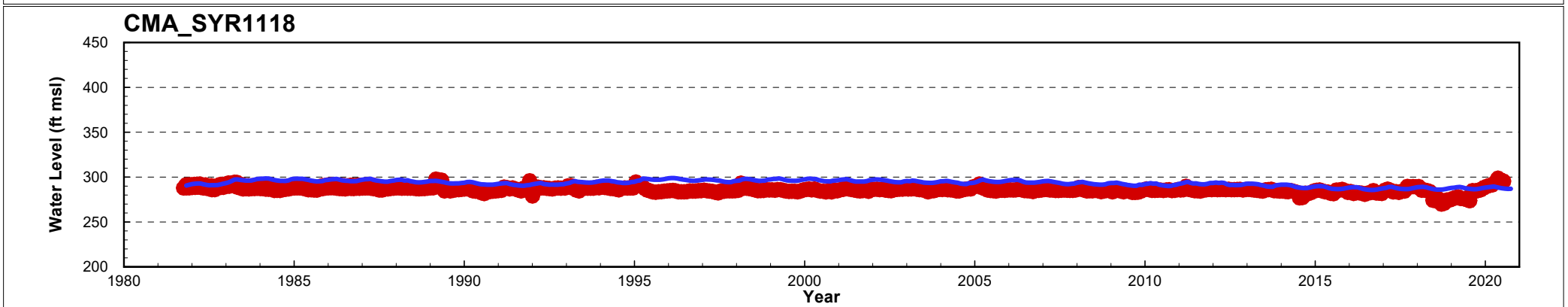
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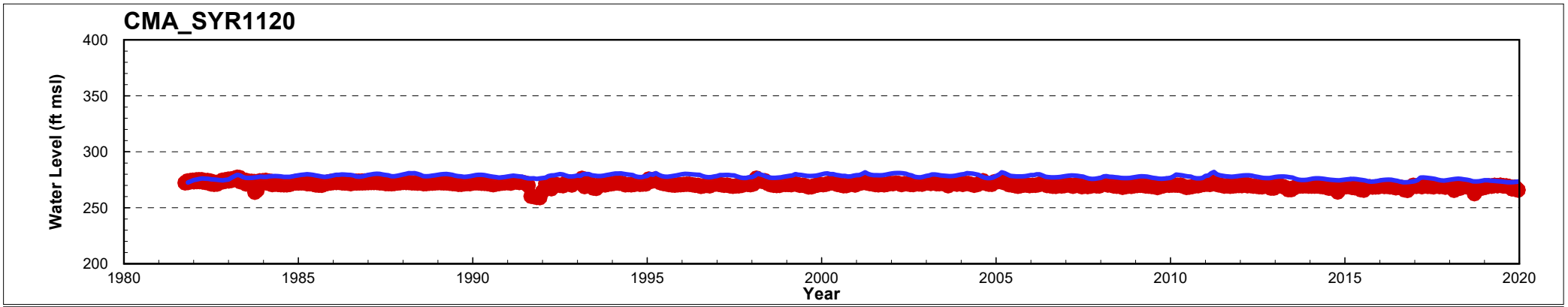
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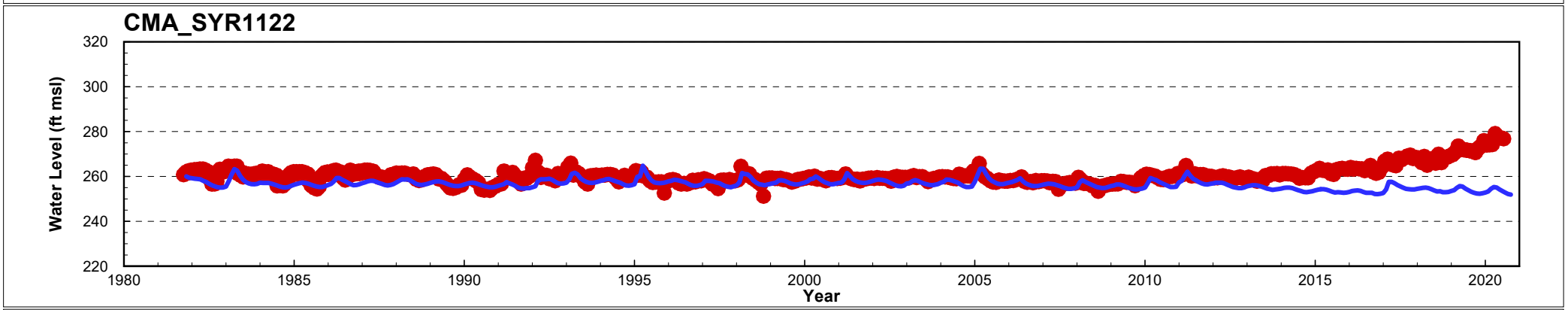
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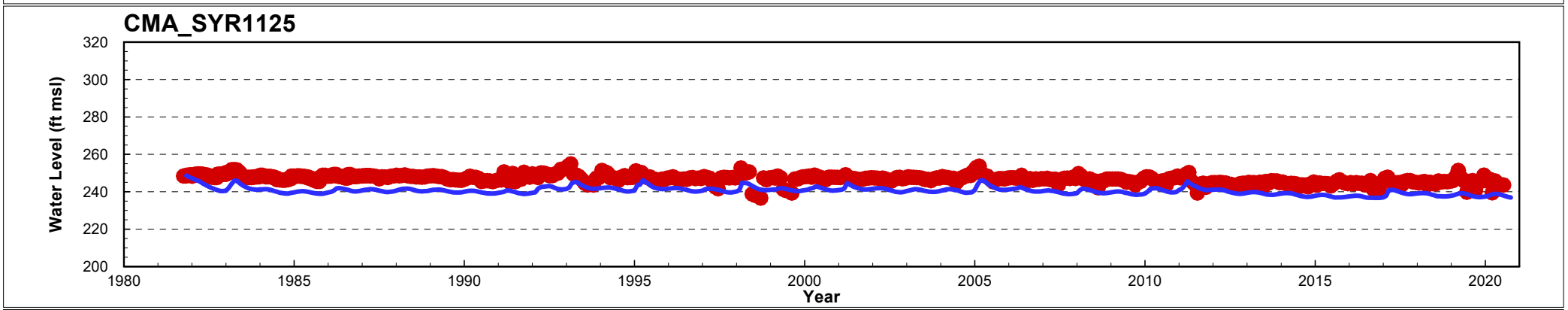
2020
Year


CMA_SYR1125
Water Level (ft msl)
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300
280
260
240
220
200
1980
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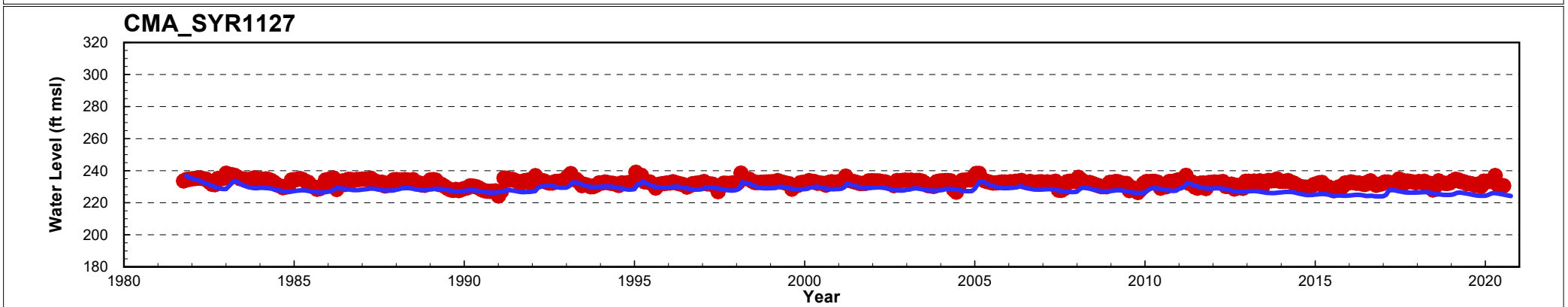
1990
1995
2000
2005
2010
2015
2020
Year


CMA_SYR1127
Water Level (ft msl)
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300
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1980
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1990
1995
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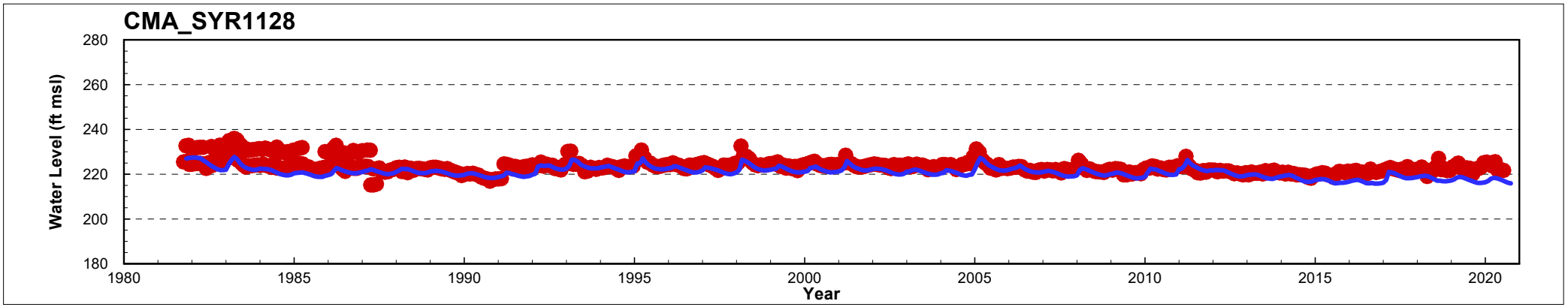
2005
2010
2015
2020
Year


CMA_SYR1128
Water Level (ft msl)
280
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1980
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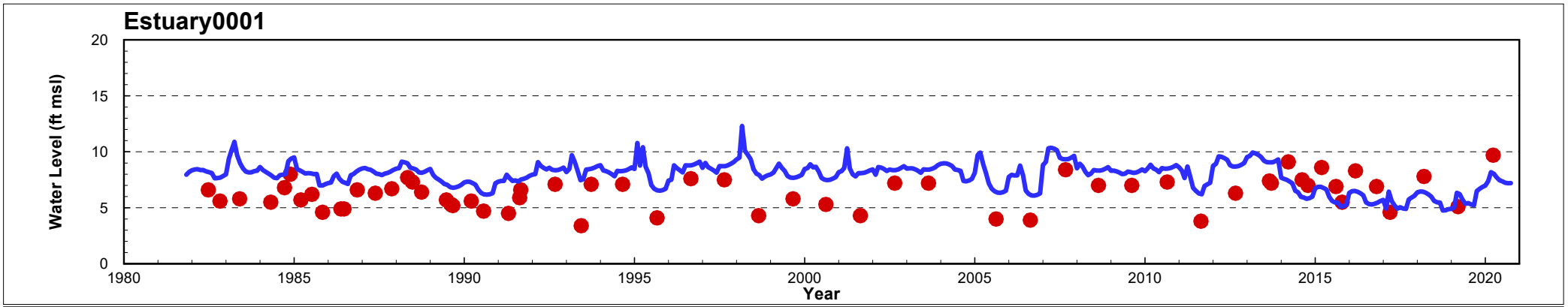
2020
Year


Estuary0001
Water Level (ft msl)
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5
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1980
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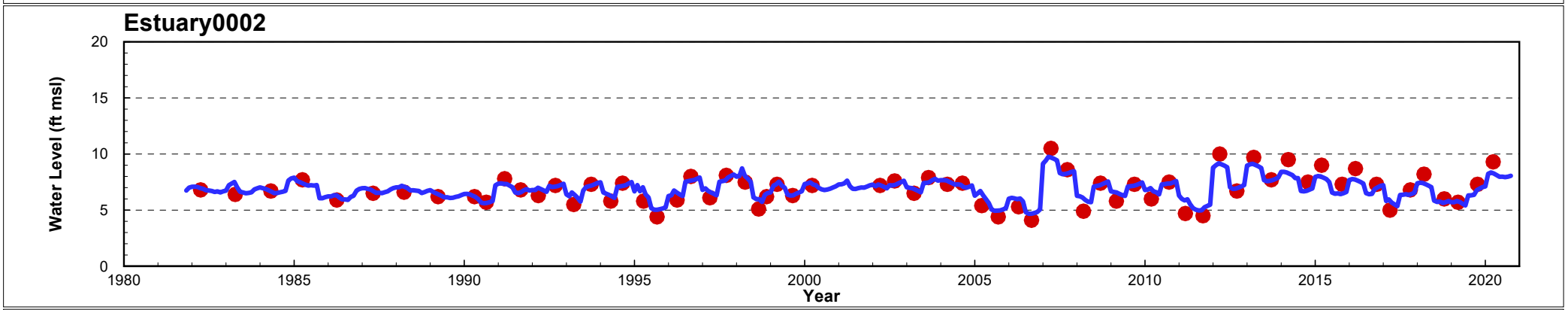
2010
2015
2020
Year


Estuary0002
Water Level (ft msl)
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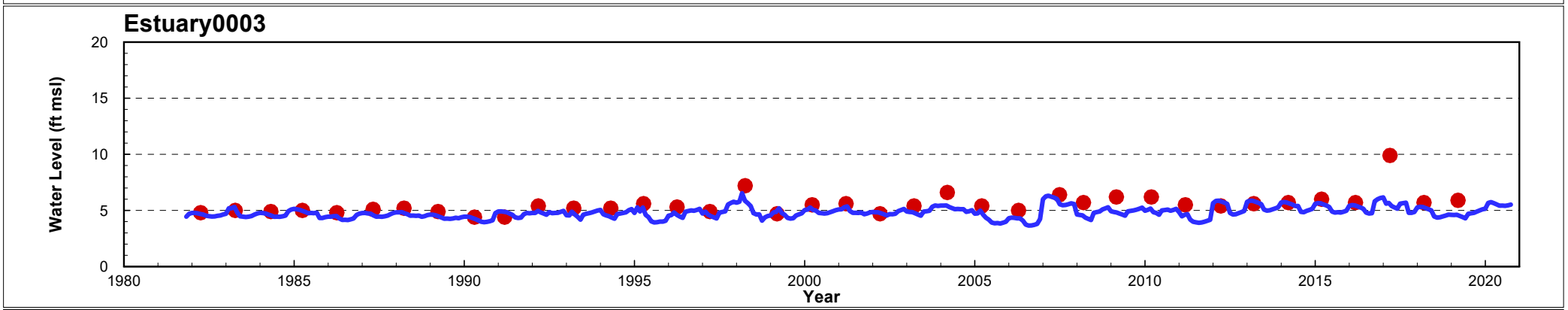
2020
Year


Estuary0003
Water Level (ft msl)
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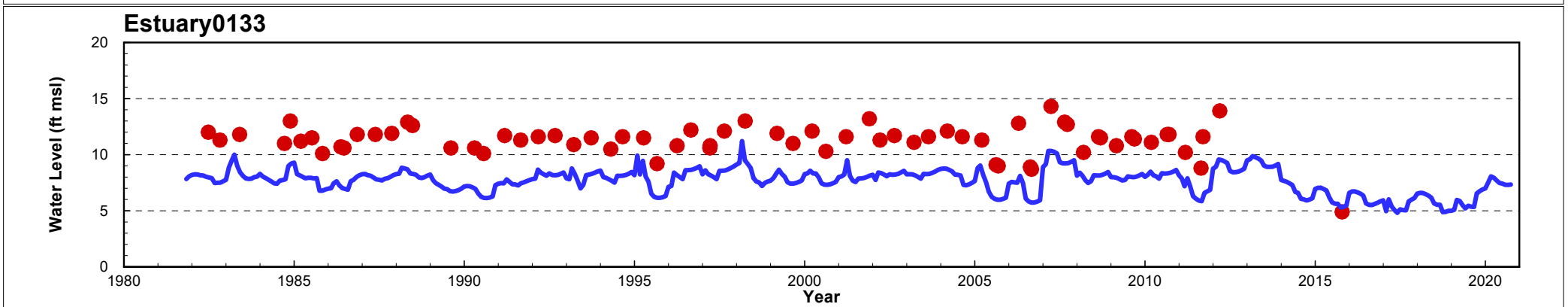
2010
2015
2020
Year


Estuary0133
Water Level (ft msl)
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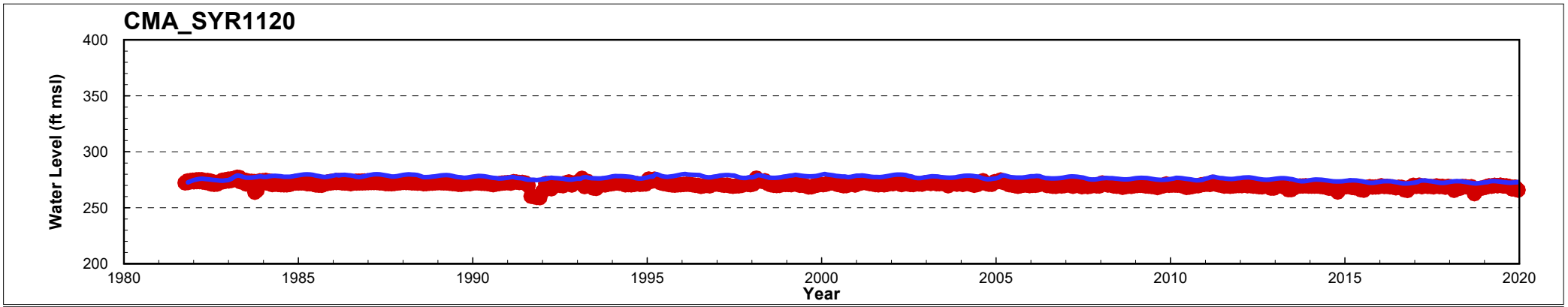
2015
2020
Year


CMA_SYR1120
Water Level (ft msl)
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1980
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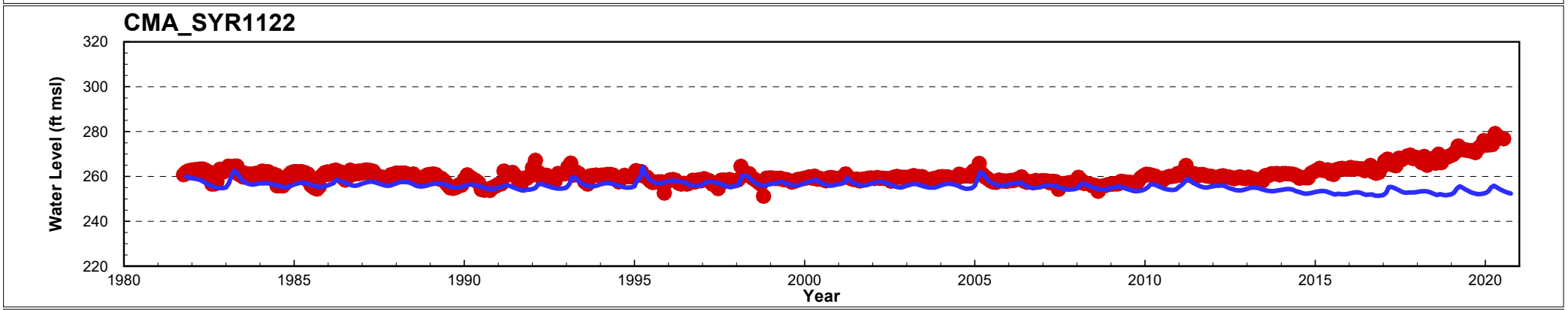
2010
2015
2020
Year


CMA_SYR1122
Water Level (ft msl)
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300
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240
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1980
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1990
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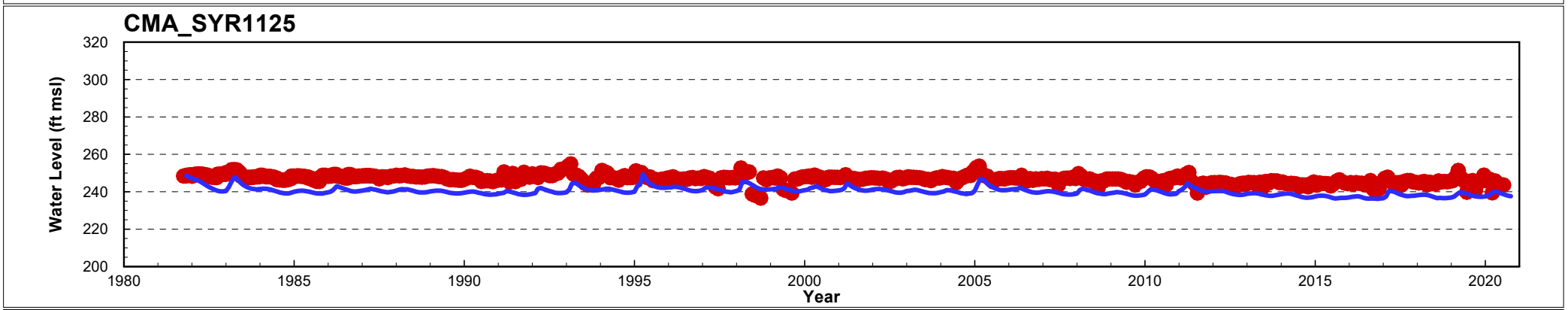
2005
2010
2015
2020
Year


CMA_SYR1125
Water Level (ft msl)
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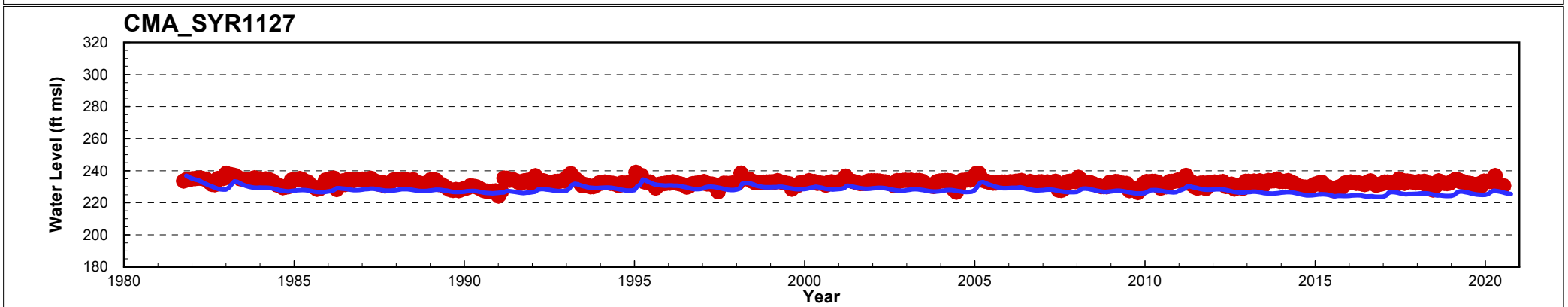
2015
2020
Year


CMA_SYR1127
Water Level (ft msl)
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1980
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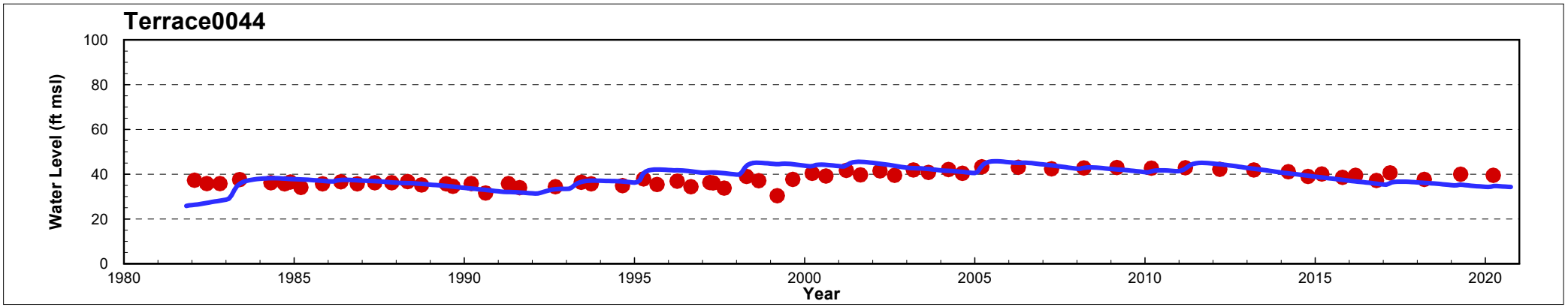
1990
1995
2000
2005
2010
2015
2020
Year


Terrace0044
Water Level (ft msl)
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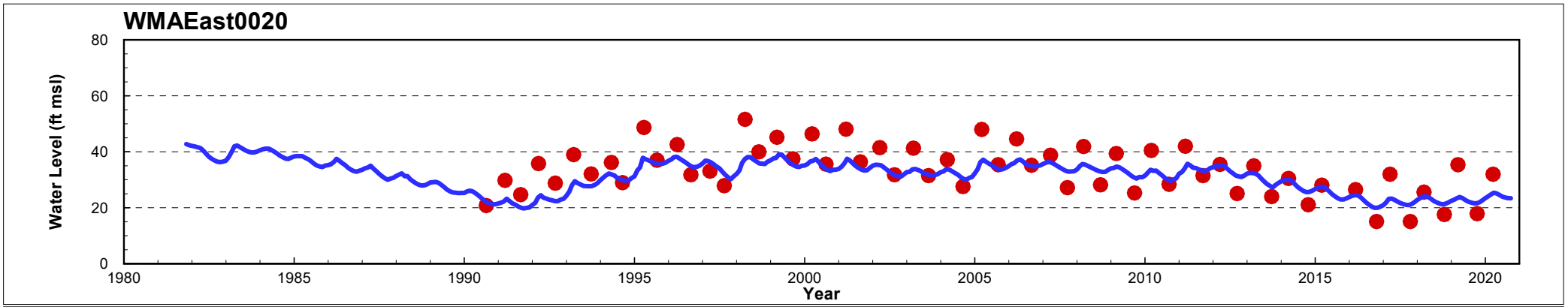
2010
2015
2020
Year


WMAEast0020
Water Level (ft msl)
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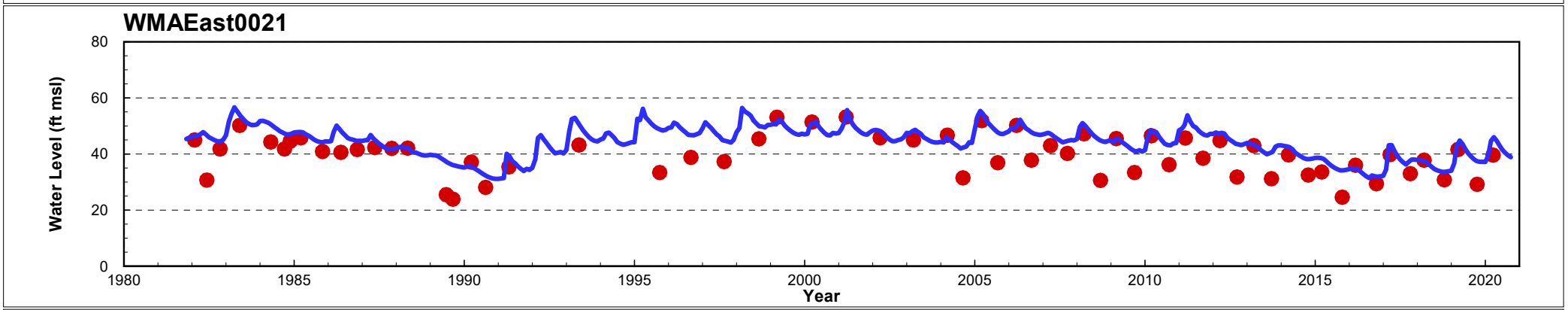
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0021
Water Level (ft msl)
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1980
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1995
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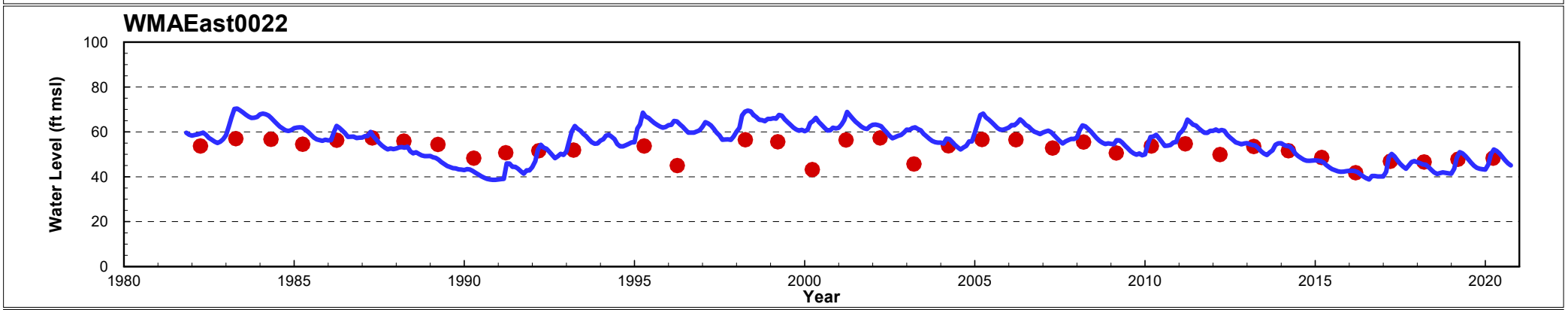
2010
2015
2020
Year


WMAEast0022
Water Level (ft msl)
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100
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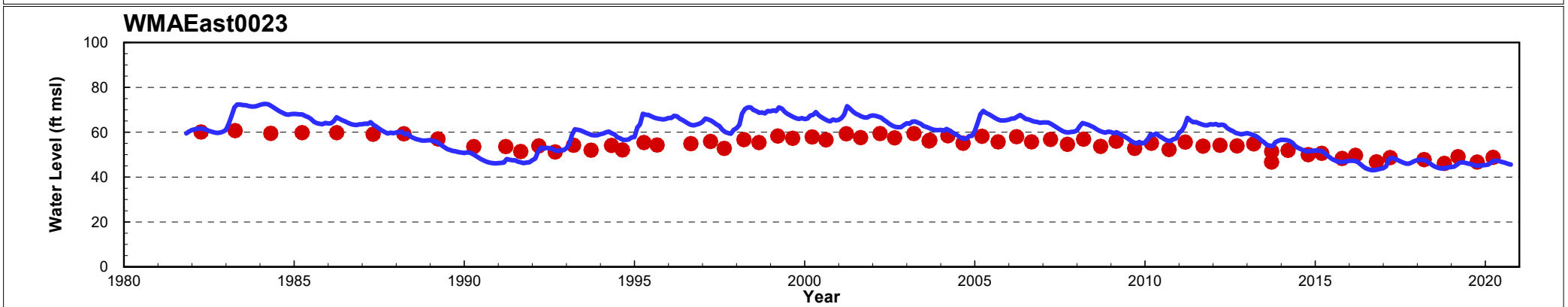
2010
2015
2020
Year


WMAEast0023
Water Level (ft msl)
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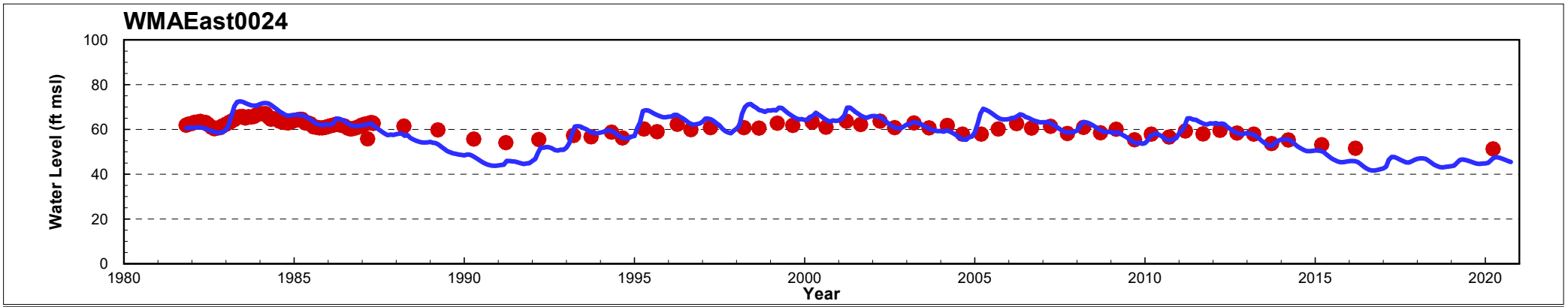
2010
2015
2020
Year


WMAEast0024
Water Level (ft msl)
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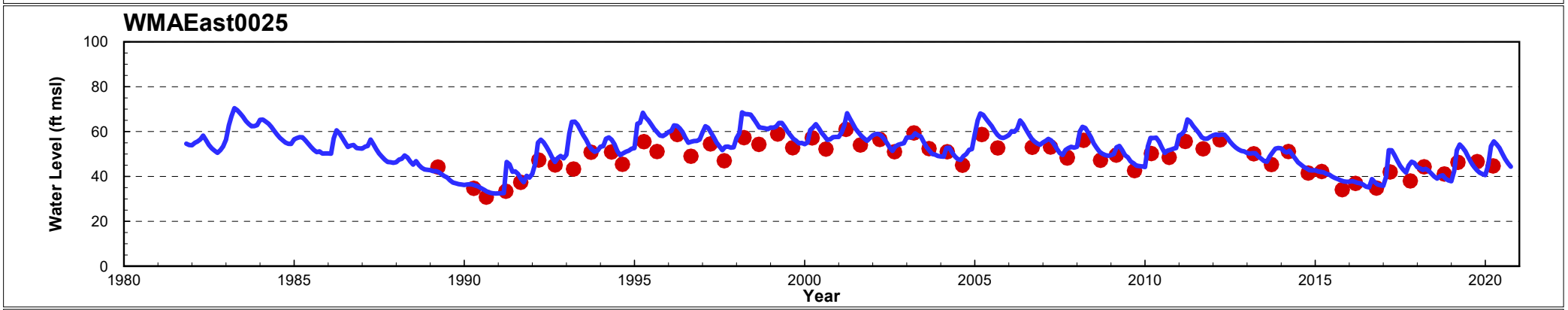
2020
Year


WMAEast0025
Water Level (ft msl)
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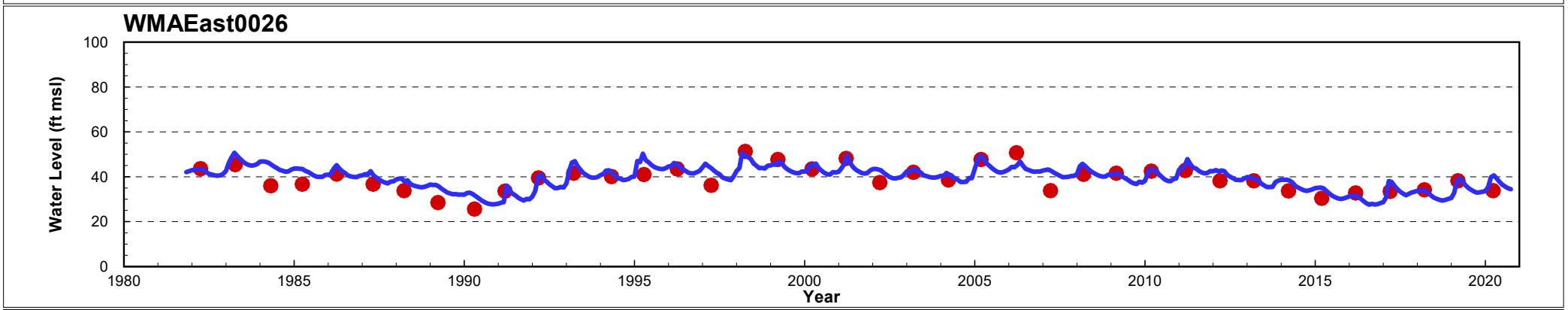
2020
Year


WMAEast0026
Water Level (ft msl)
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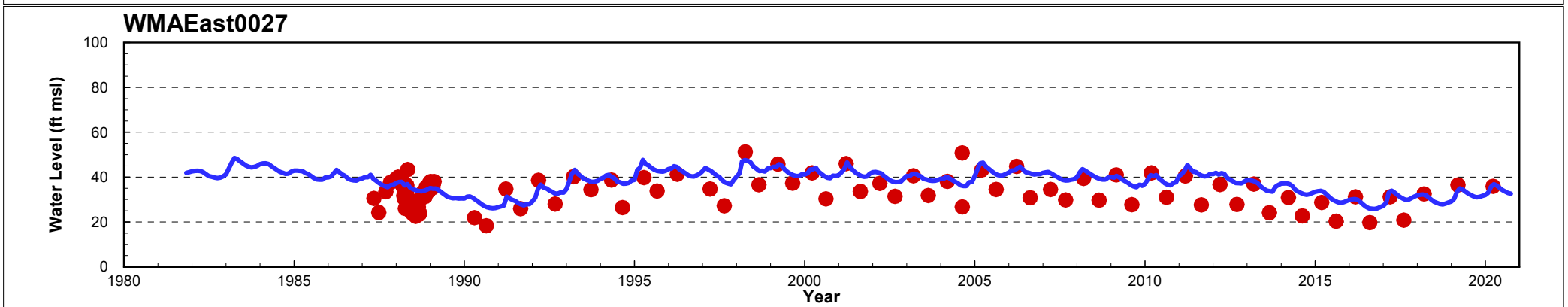
2015
2020
Year


WMAEast0027
Water Level (ft msl)
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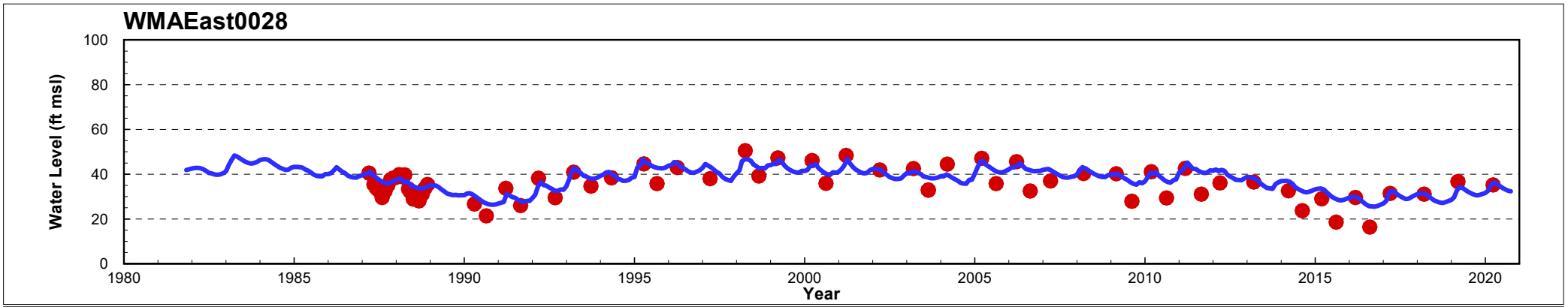
Year


WMAEast0028
Water Level (ft msl)
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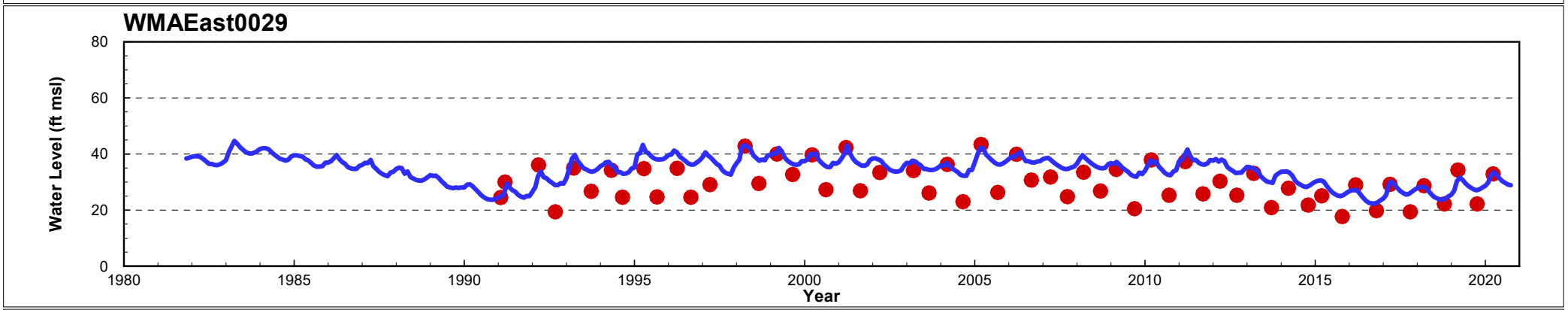
WMAEast0029
Water Level (ft msl)
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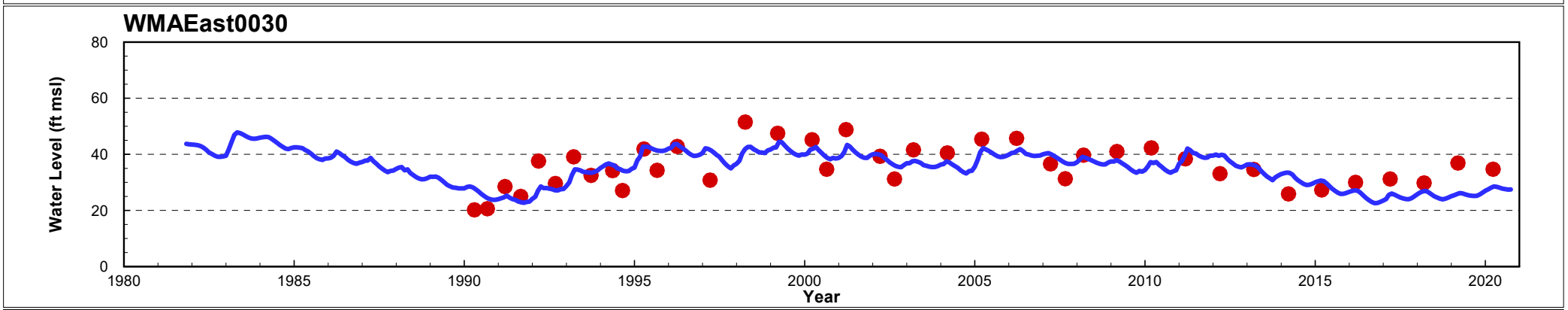
WMAEast0030
Water Level (ft msl)
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2020
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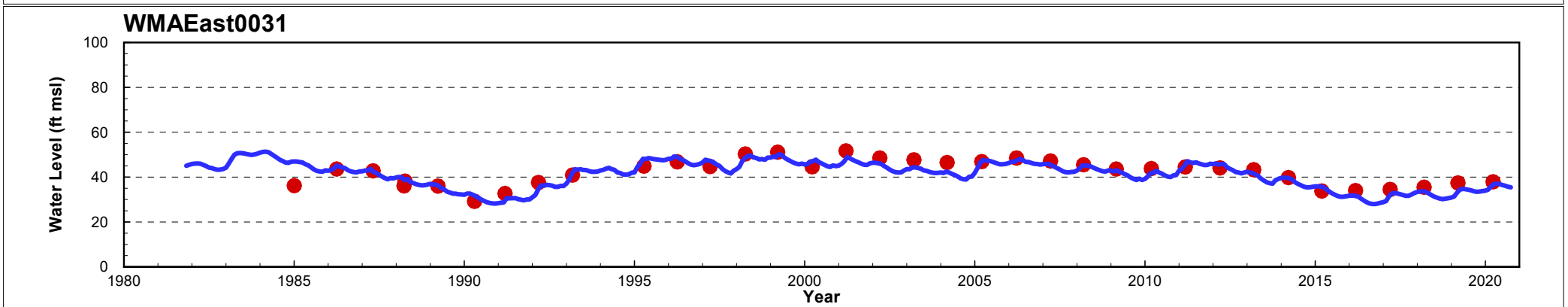
WMAEast0031
Water Level (ft msl)
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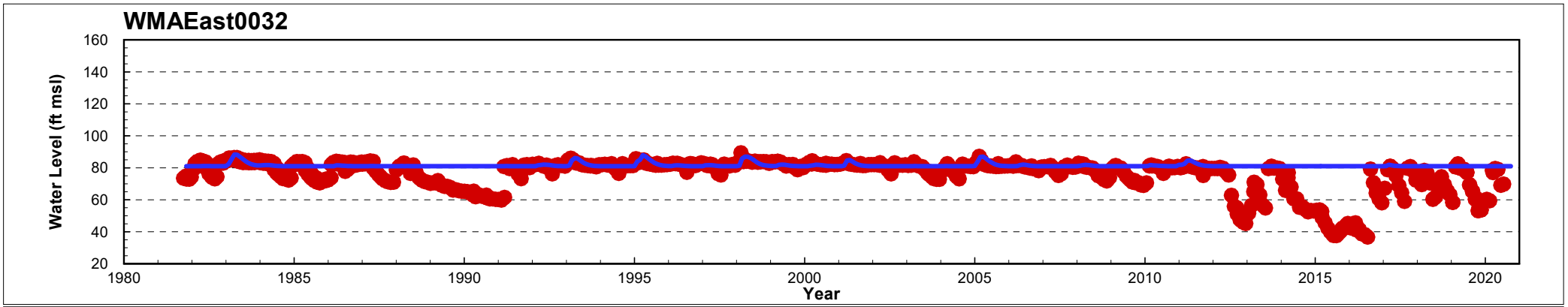
WMAEast0032
Water Level (ft msl)
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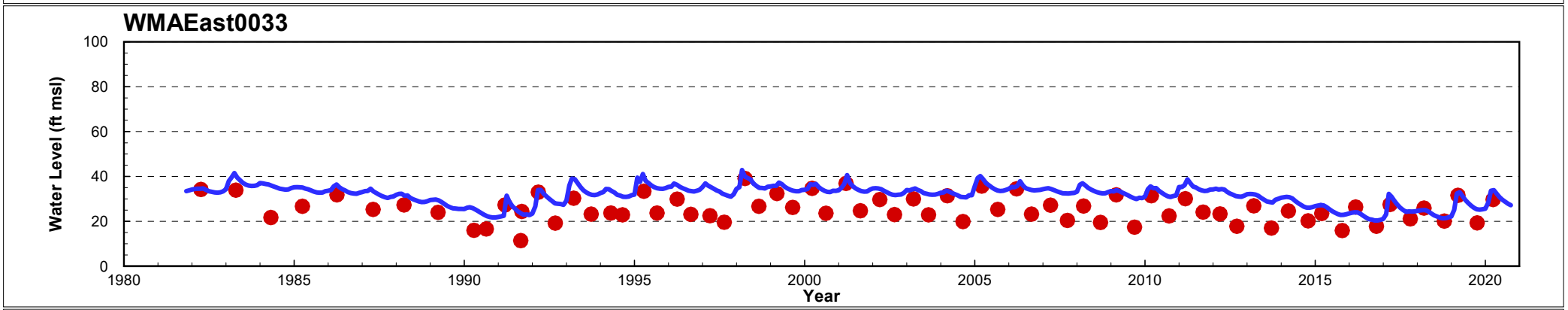
WMAEast0033
Water Level (ft msl)
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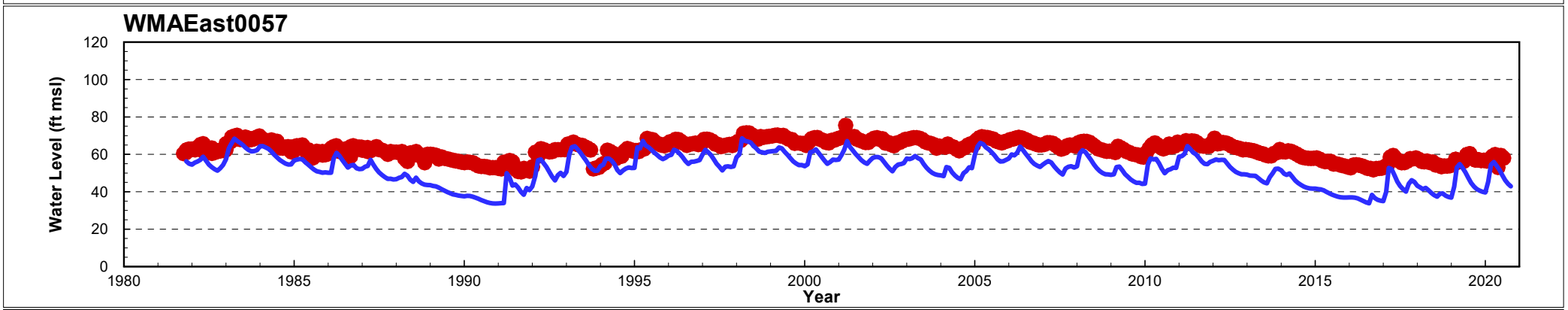
WMAEast0057
Water Level (ft msl)
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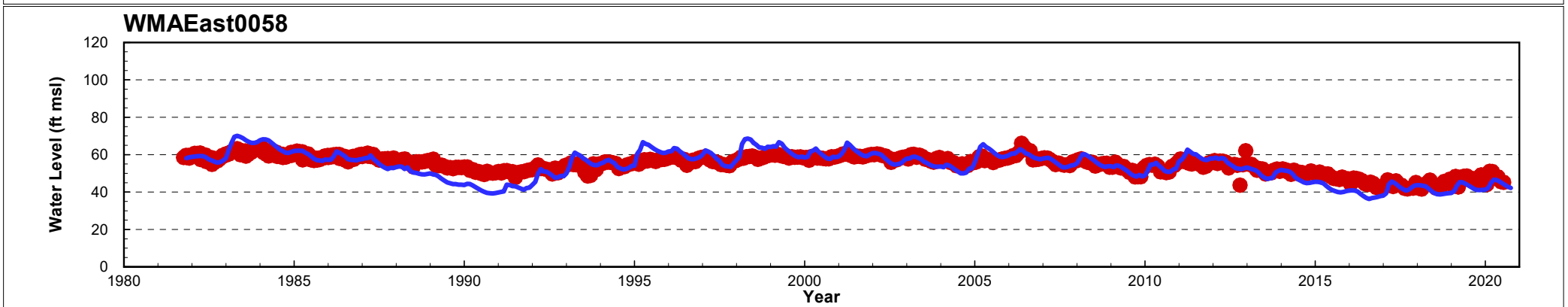
WMAEast0058
Water Level (ft msl)
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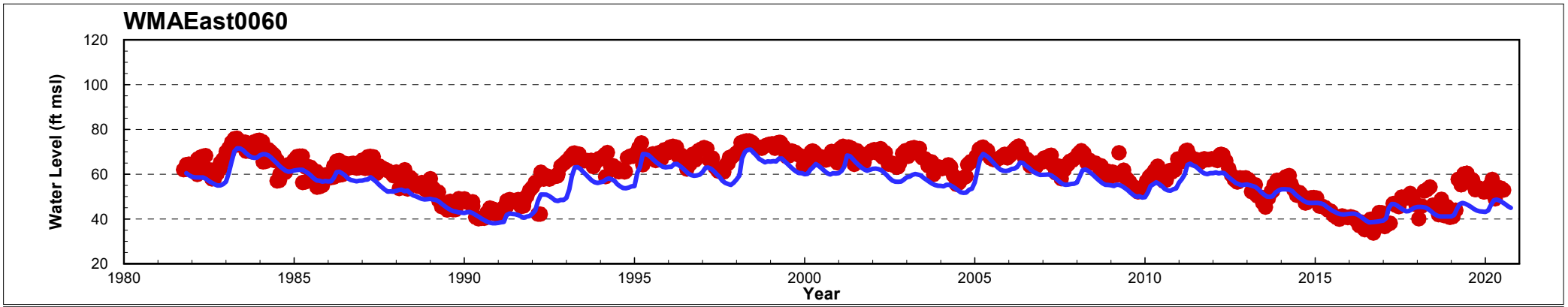
Year


WMAEast0060
Water Level (ft msl)
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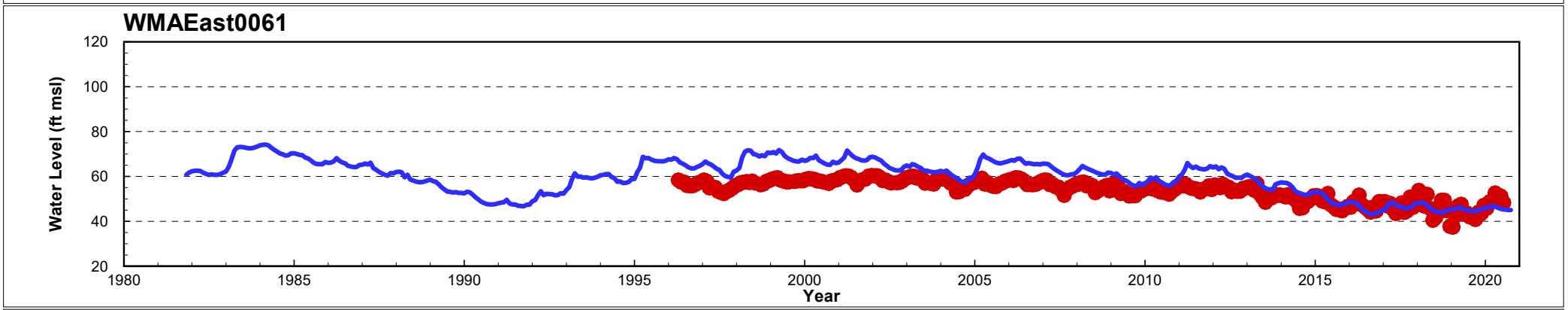
2020
Year


WMAEast0061
Water Level (ft msl)
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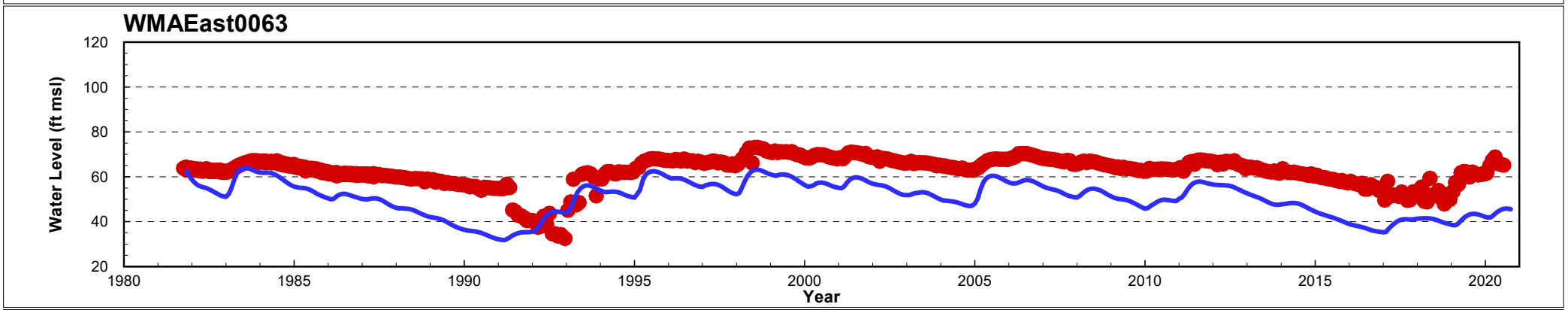
2020
Year


WMAEast0063
Water Level (ft msl)
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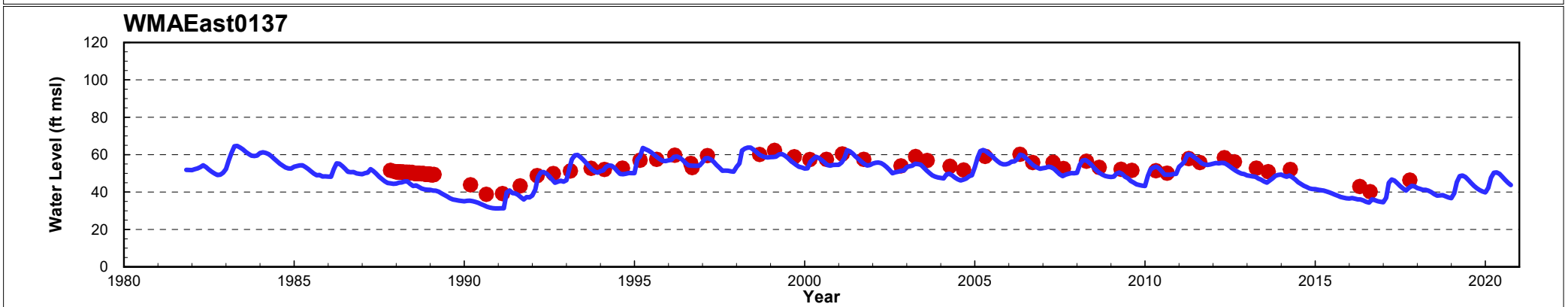
2020
Year


WMAEast0137
Water Level (ft msl)
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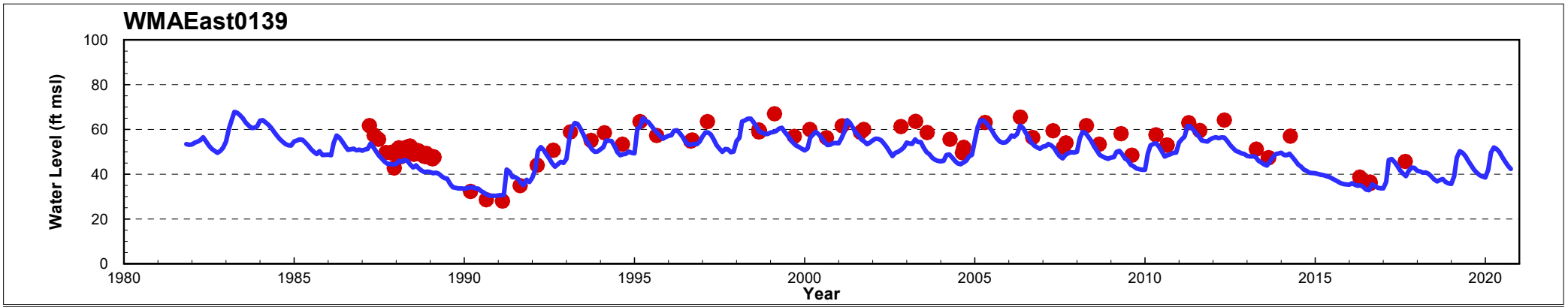
Year


WMAEast0139
Water Level (ft msl)
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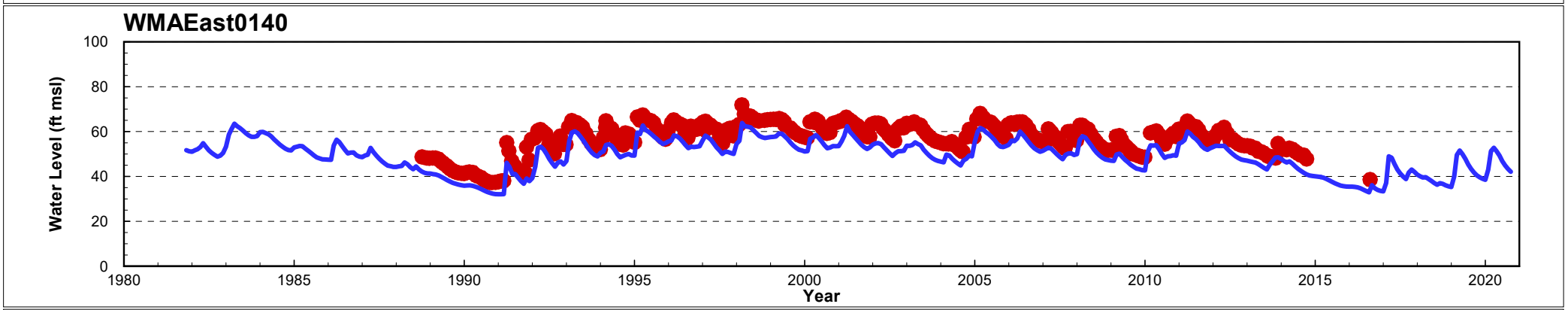
Year


WMAEast0140
Water Level (ft msl)
100
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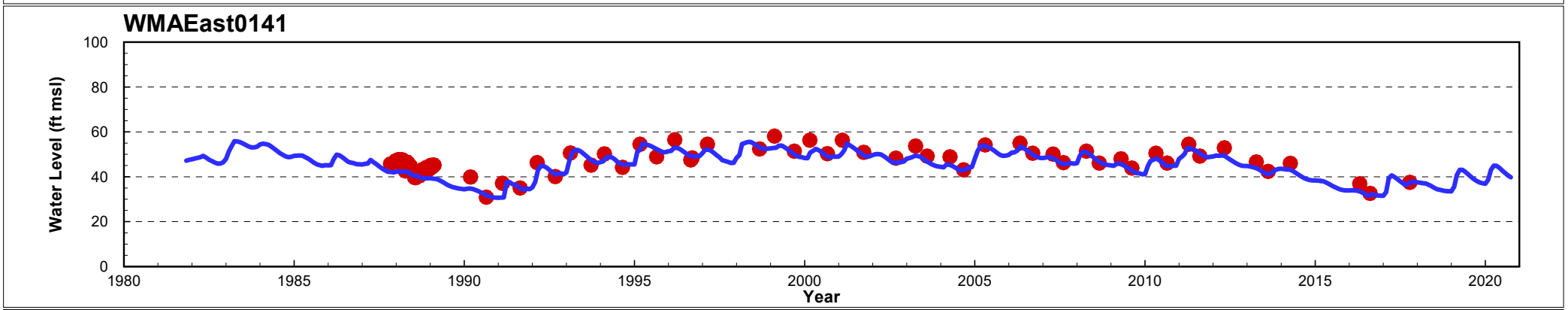
2020
Year


WMAEast0141
Water Level (ft msl)
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1980
1985
1990
1995
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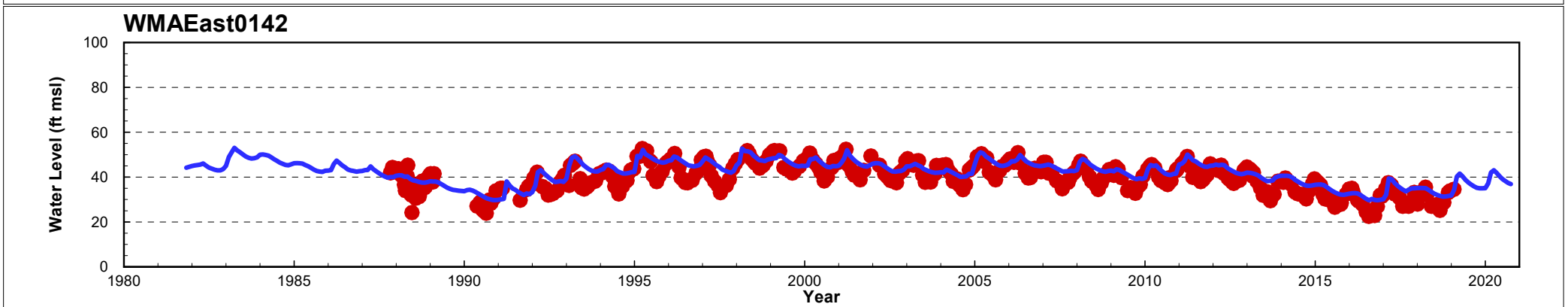
2010
2015
2020
Year


WMAEast0142
Water Level (ft msl)
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1980
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1990
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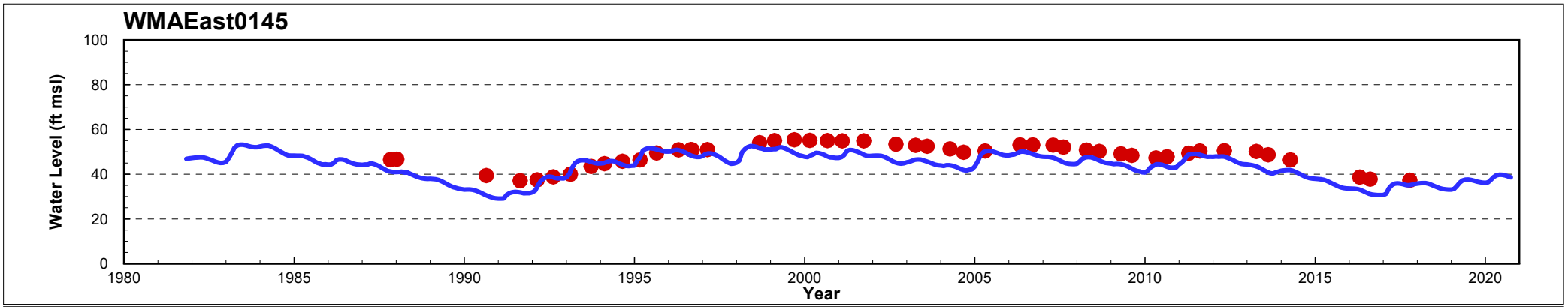
2010
2015
2020
Year


WMAEast0145
Water Level (ft msl)
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20
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1980
1985
1990
1995
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2010
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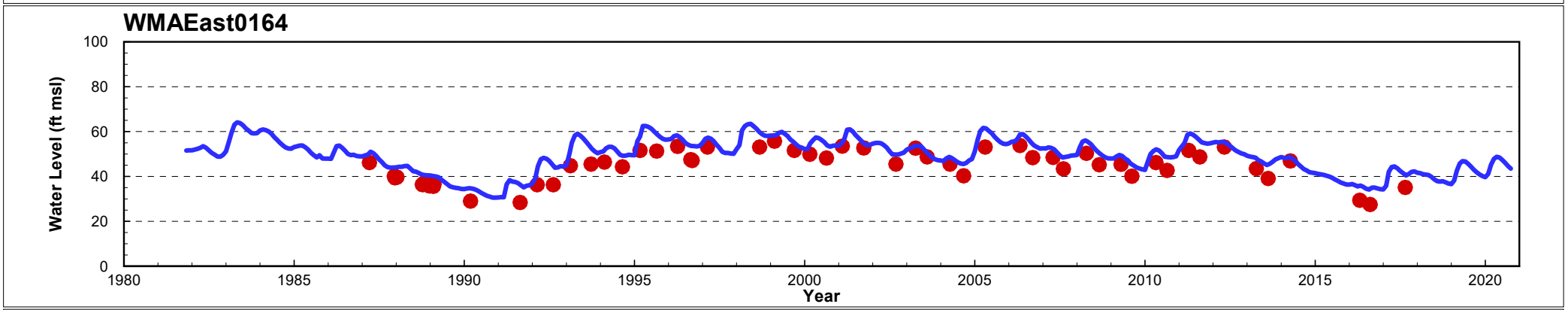
2020
Year


WMAEast0164
Water Level (ft msl)
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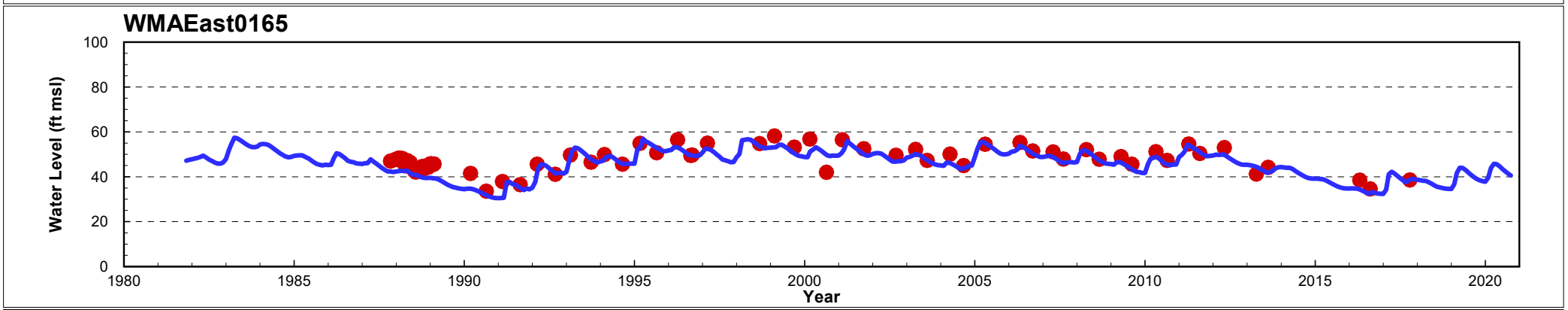
2020
Year


WMAEast0165
Water Level (ft msl)
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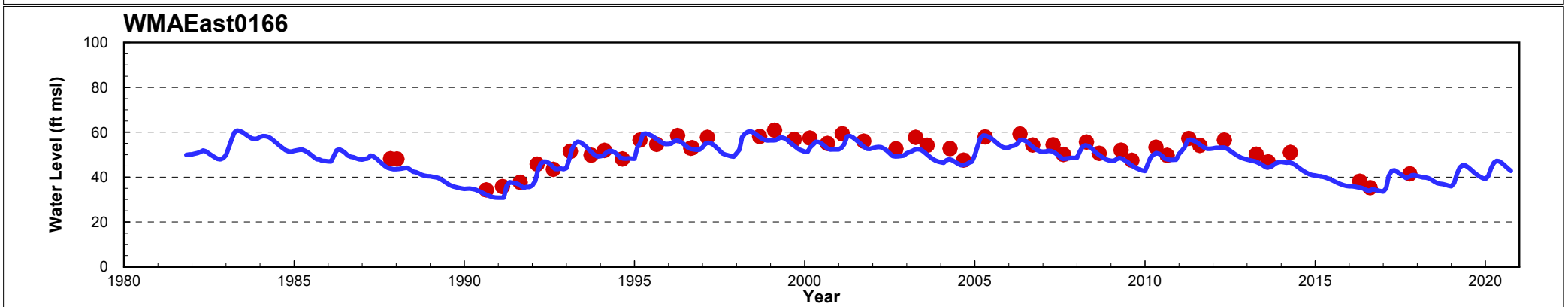
2020
Year


WMAEast0166
Water Level (ft msl)
100
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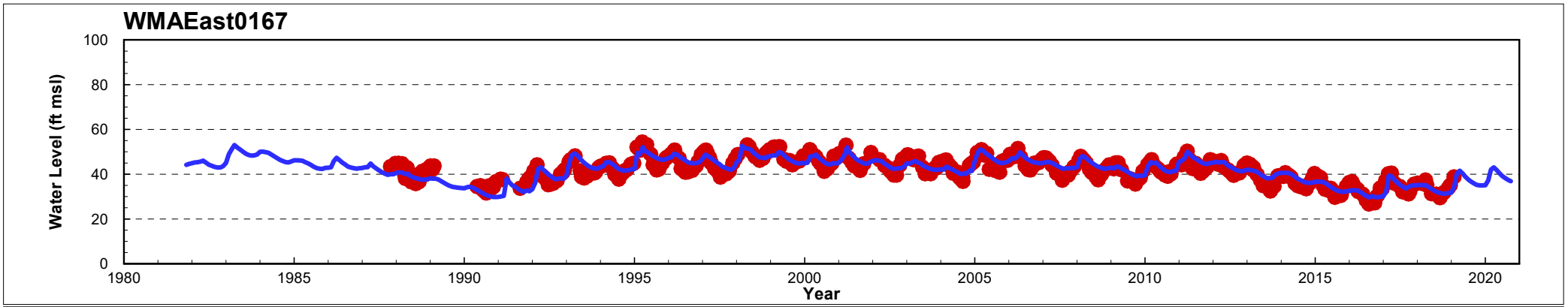
60
40
20
0
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year


WMAEast0167
Water Level (ft msl)
100
80
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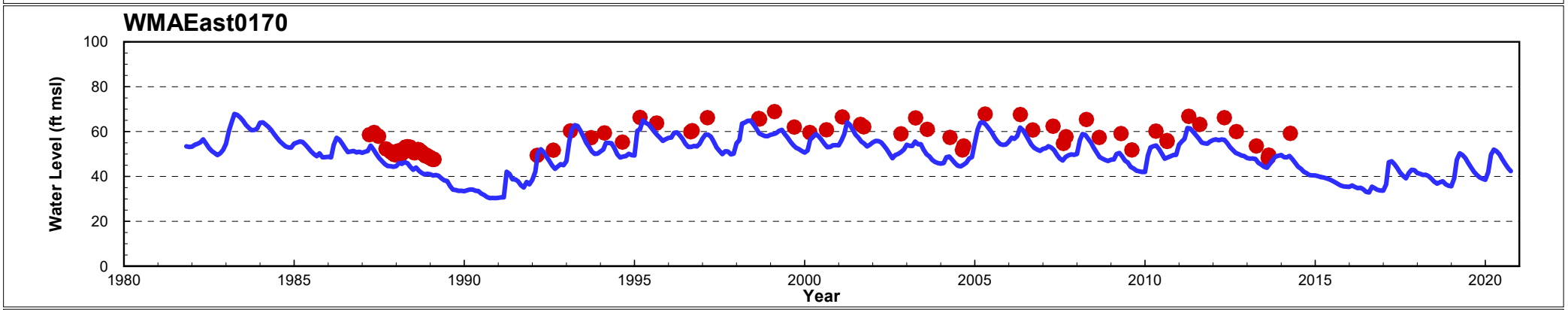
Year


WMAEast0170
Water Level (ft msl)
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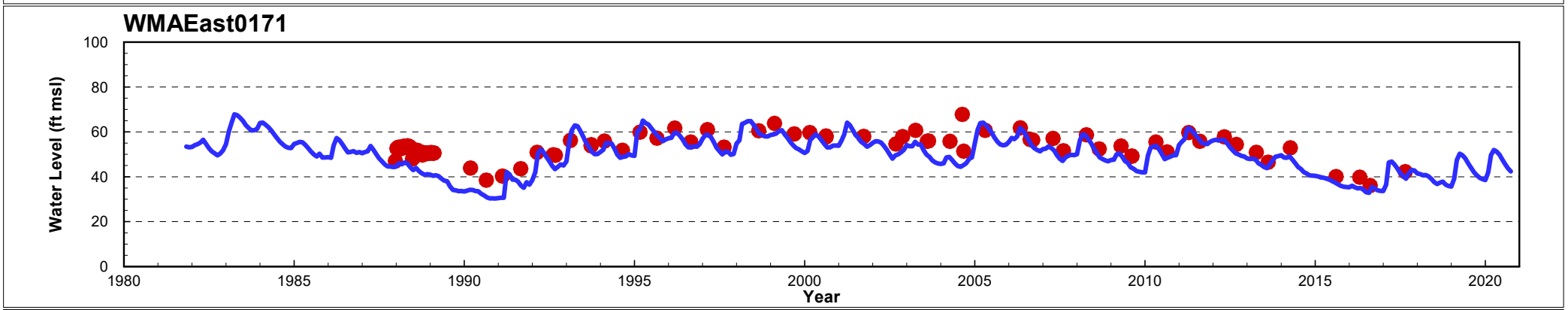
WMAEast0171
Water Level (ft msl)
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1980
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2010
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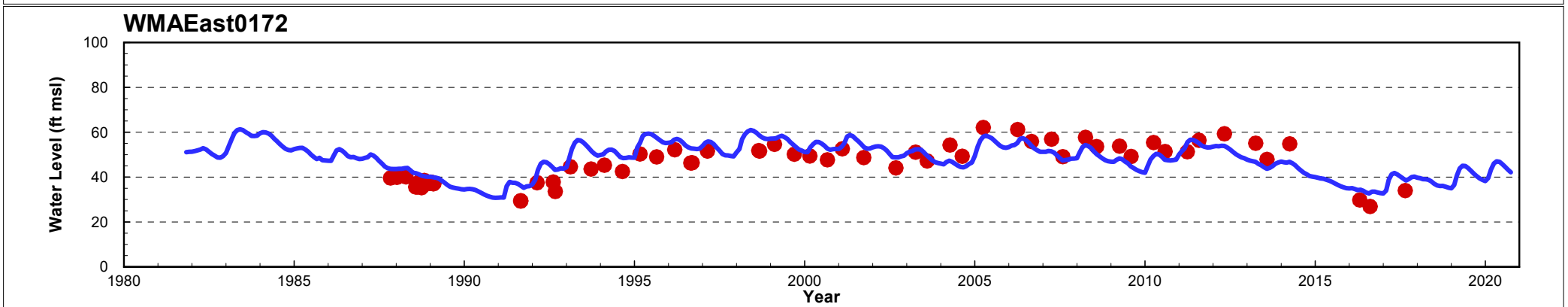
Year


WMAEast0172
Water Level (ft msl)
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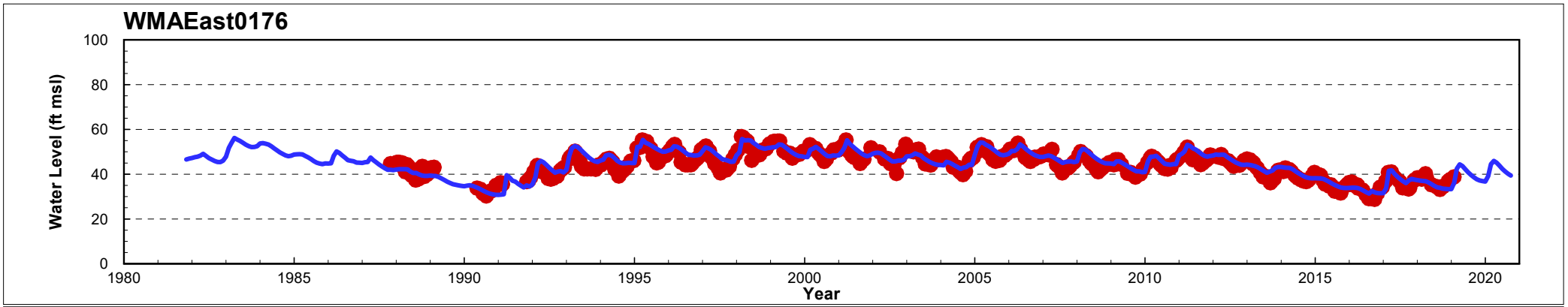
WMAEast0176
Water Level (ft msl)
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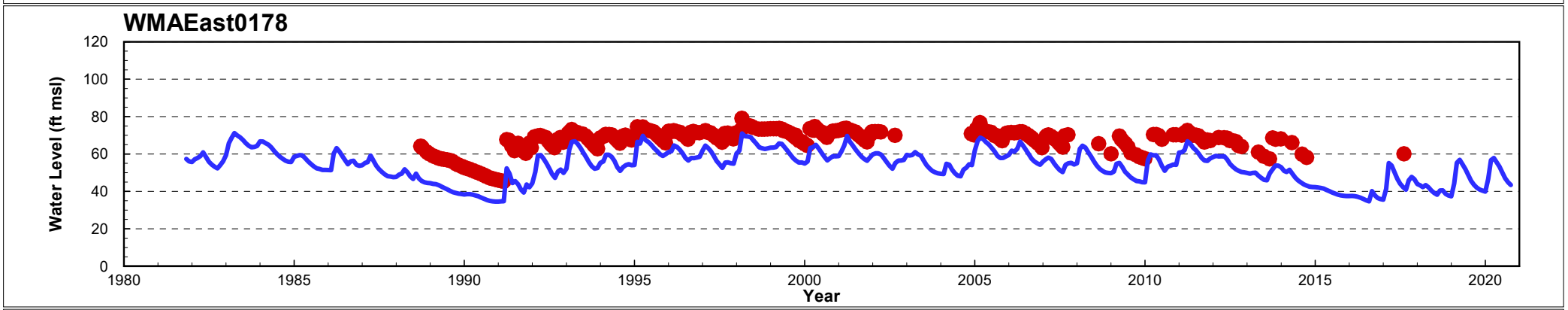
Year


WMAEast0178
Water Level (ft msl)
120
100
80
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1980
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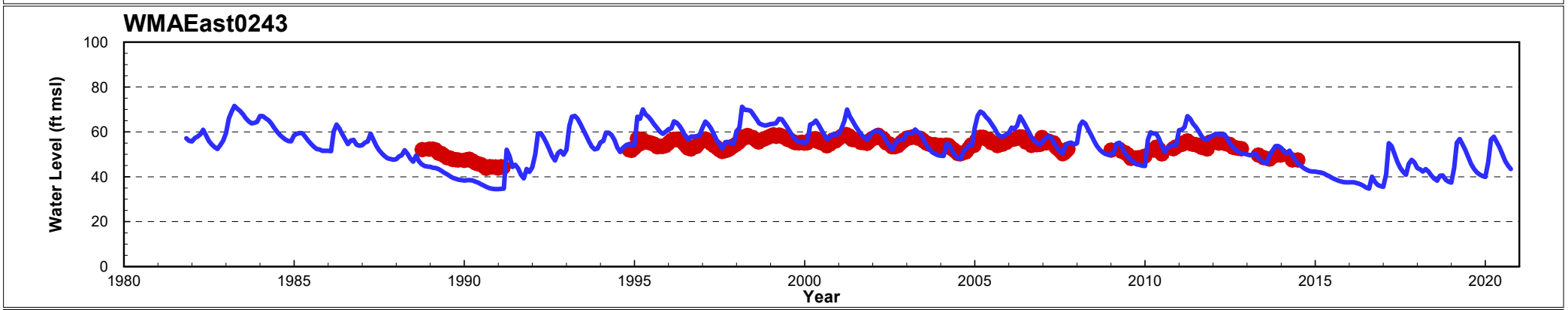
Year


WMAEast0243
Water Level (ft msl)
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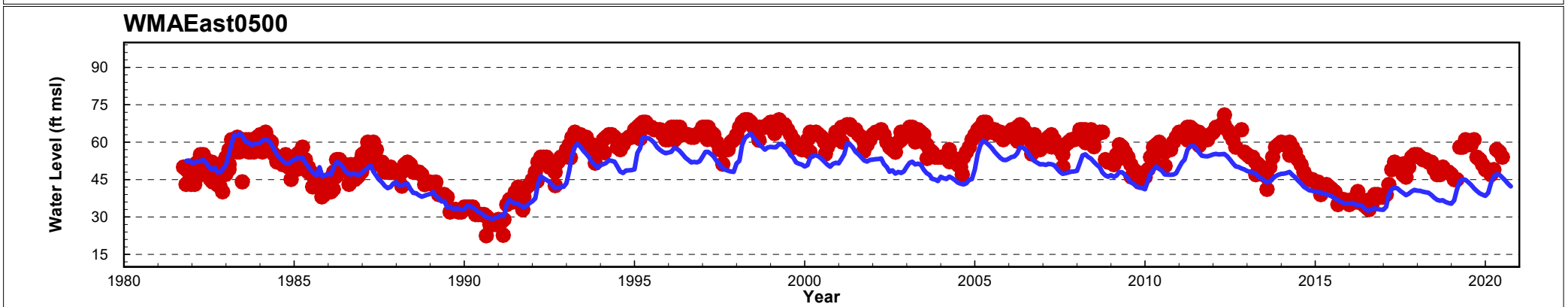
WMAEast0500
Water Level (ft msl)
90
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60
45
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15
1980
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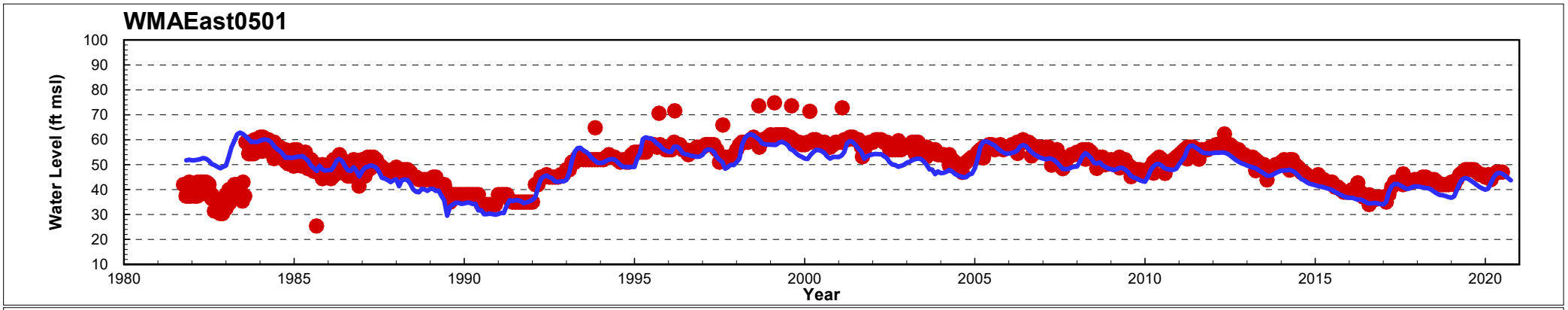
WMAEast0501
Water Level (ft msl)
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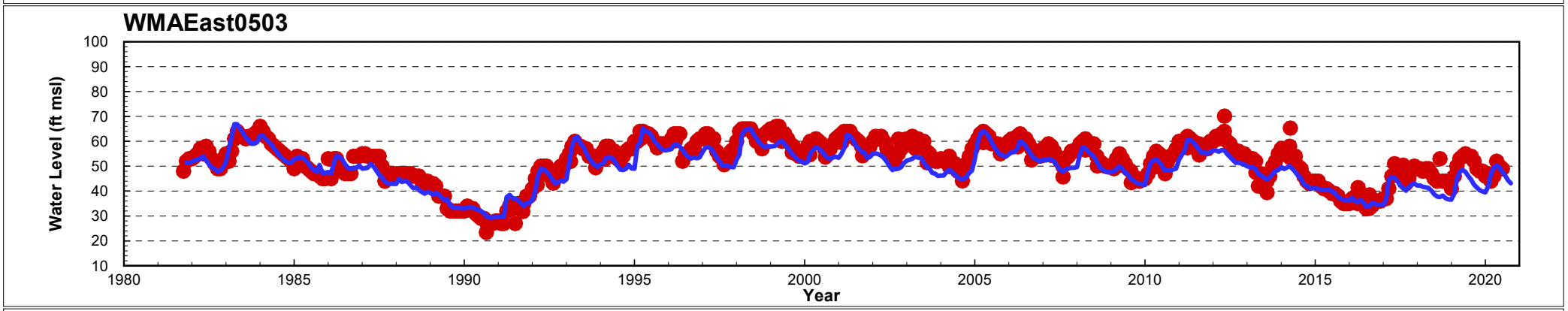
2020
Year


WMAEast0503
Water Level (ft msl)
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2010
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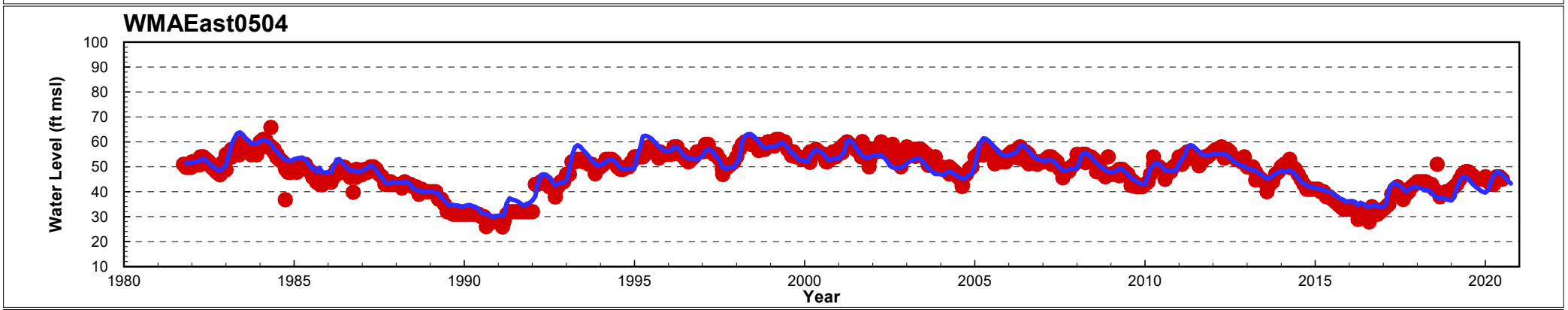
2020
Year


WMAEast0504
Water Level (ft msl)
100
90
80
70
60
50
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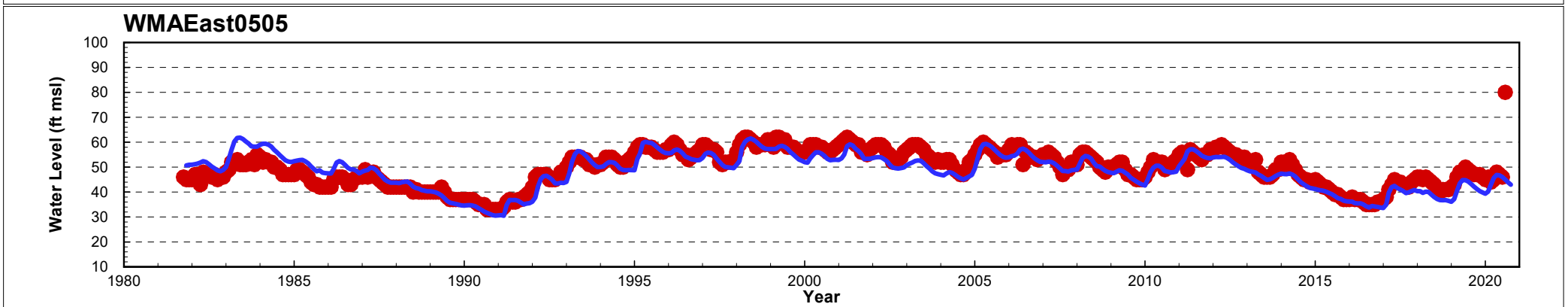
2020
Year


WMAEast0505
Water Level (ft msl)
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90
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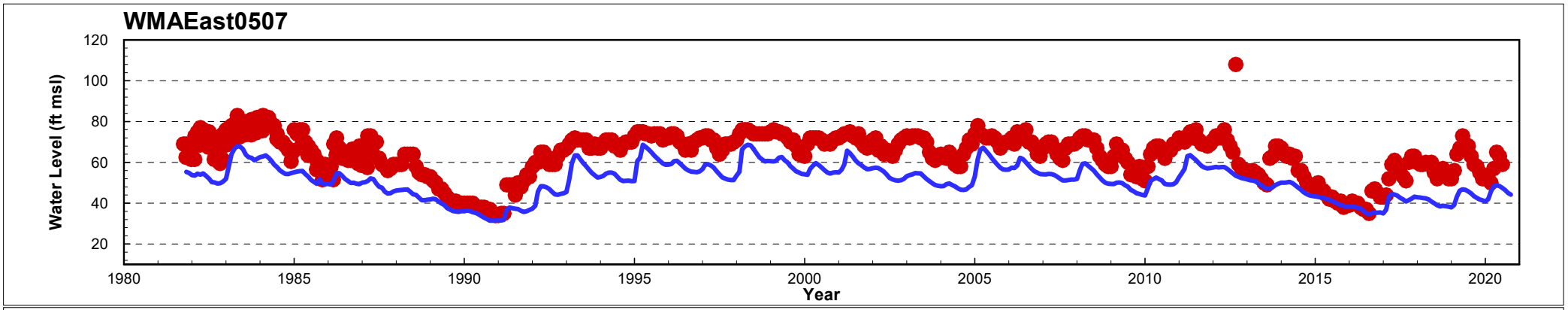
2020
Year


WMAEast0507
Water Level (ft msl)
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100
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1995
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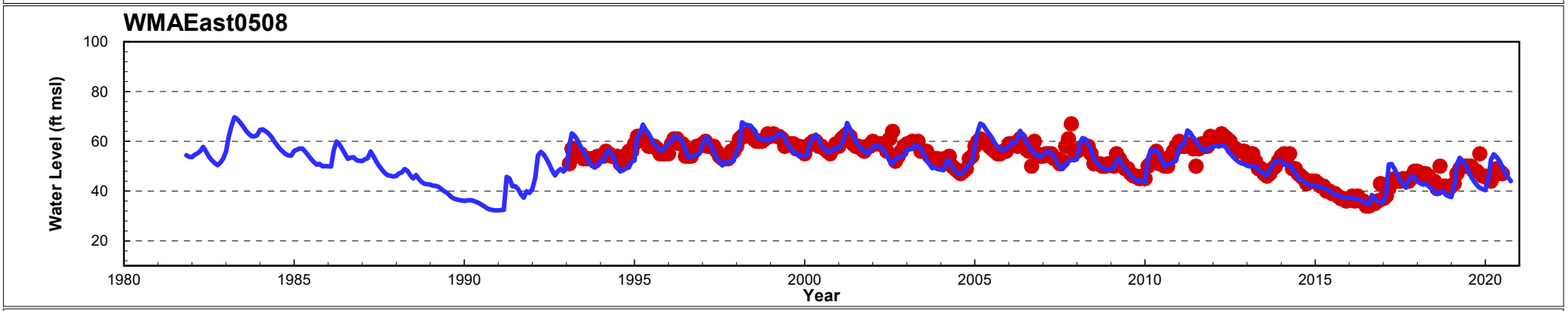
2010
2015
2020
Year


WMAEast0508
Water Level (ft msl)
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2020
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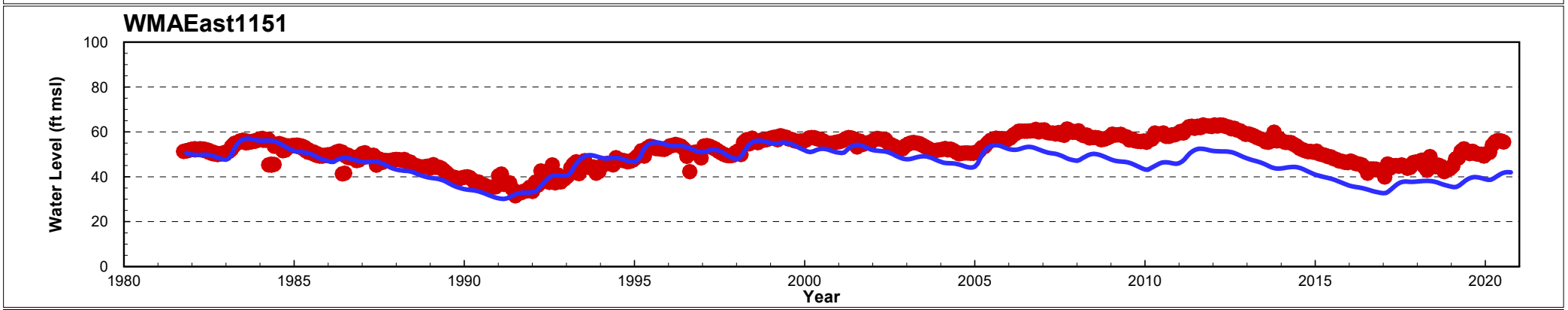
WMAEast1151
Water Level (ft msl)
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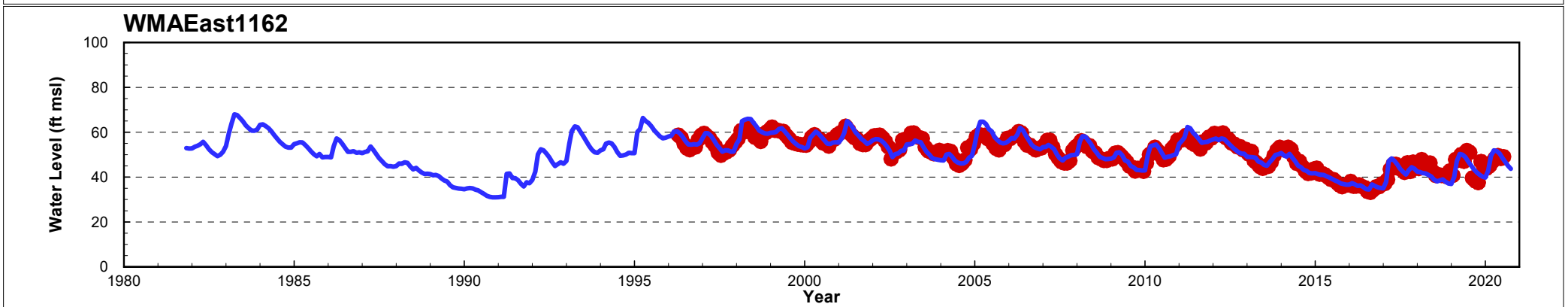
2010
2015
2020
Year


WMAEast1162
Water Level (ft msl)
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80
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20
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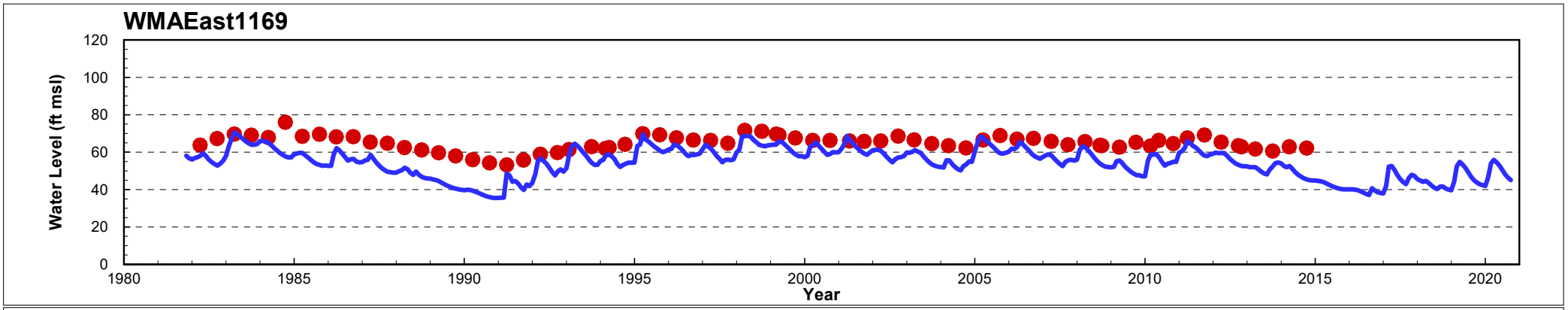
2015
2020
Year


WMAEast1169
Water Level (ft msl)
120
100
80
60
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1980
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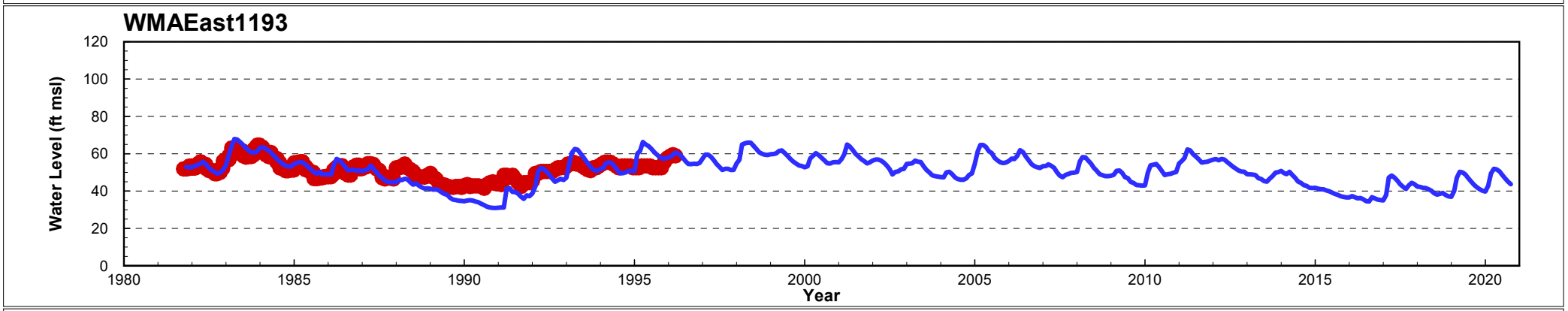
2020
Year


WMAEast1193
Water Level (ft msl)
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100
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1980
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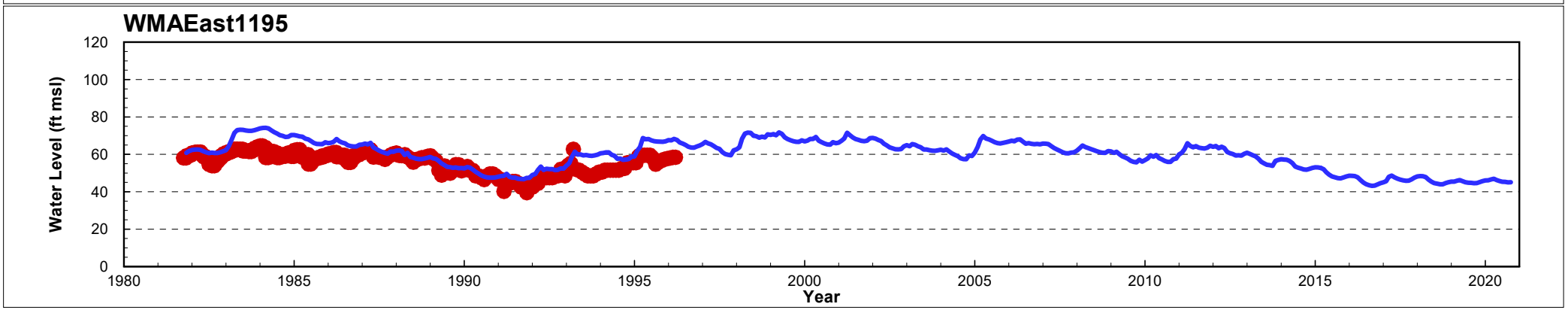
2020
Year


WMAEast1195
Water Level (ft msl)
120
100
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1980
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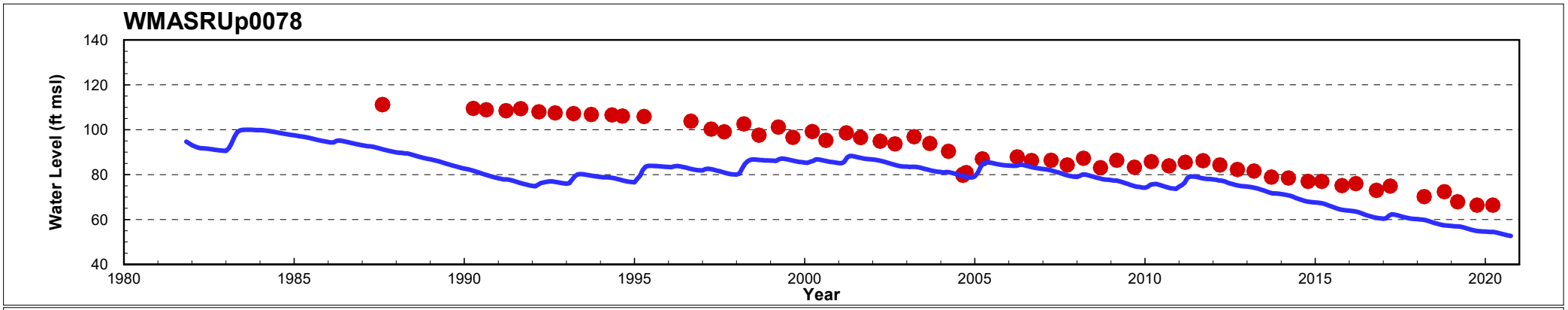
2020
Year


WMASRUp0078
Water Level (ft msl)
140
120
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1980
1985
1990
1995
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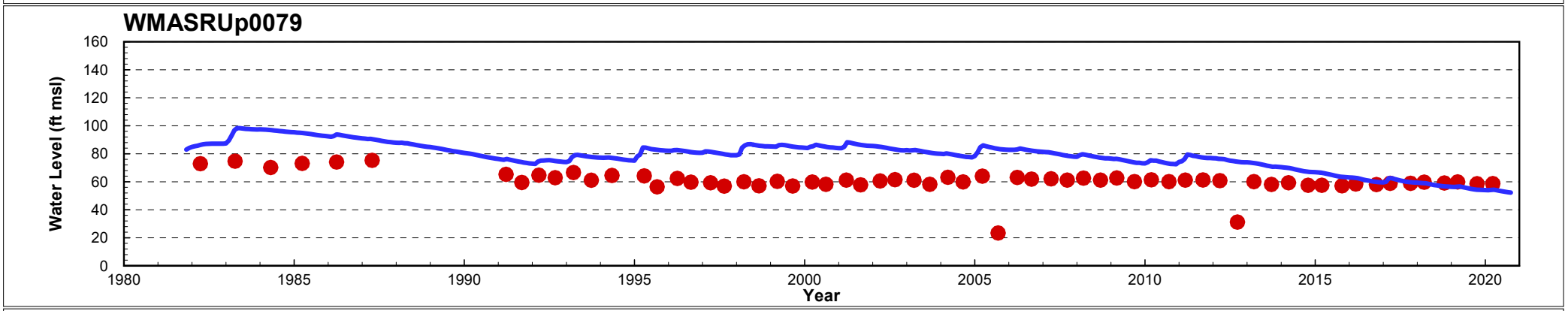
2010
2015
2020
Year


WMASRUp0079
Water Level (ft msl)
160
140
120
100
80
60
40
20
0
1980
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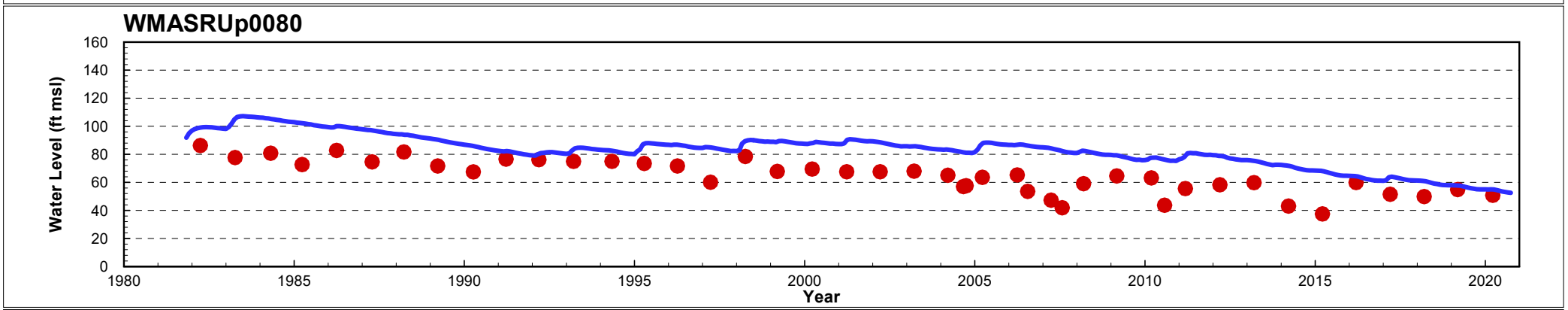
2010
2015
2020
Year


WMASRUp0080
Water Level (ft msl)
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1980
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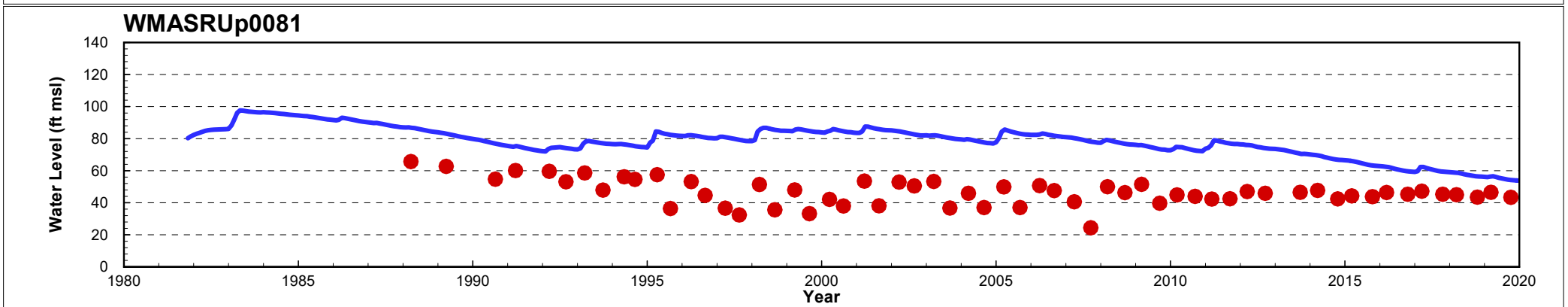
WMASRUp0081
Water Level (ft msl)
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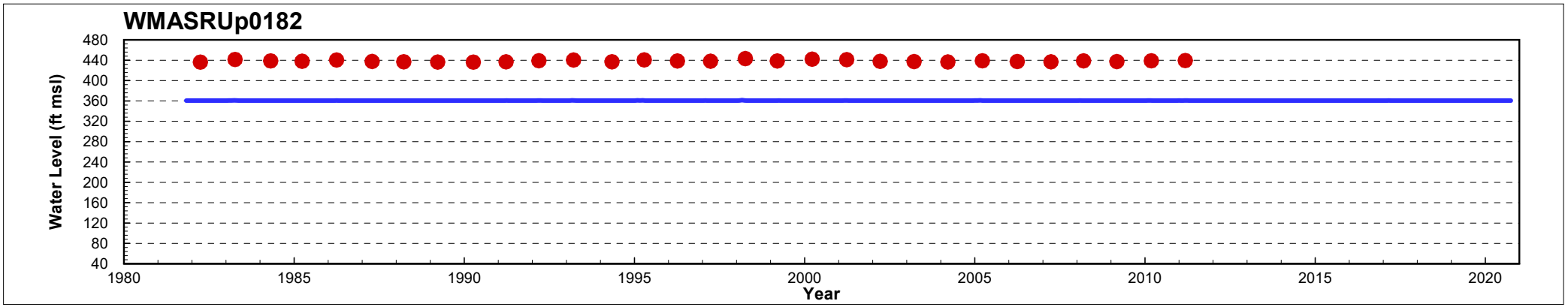
WMASRUp0182
Water Level (ft msl)
480
440
400
360
320
280
240
200
160
120
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2020
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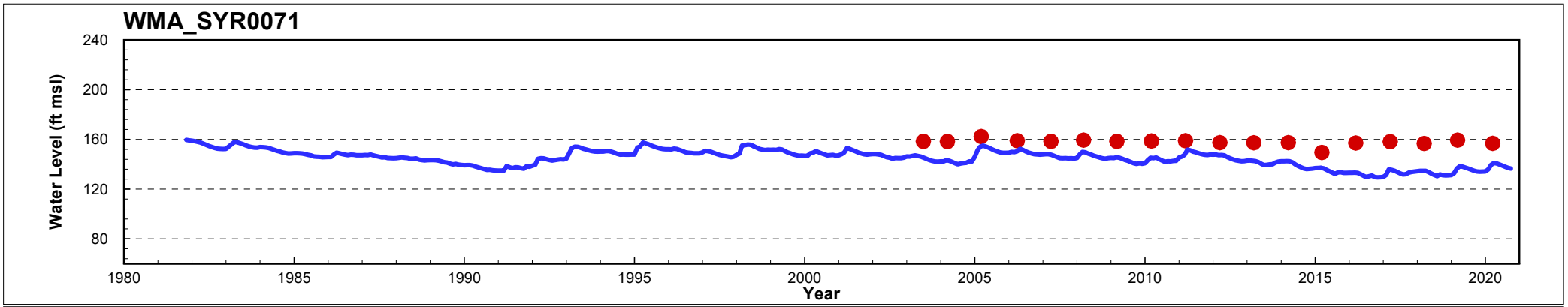
WMA_SYR0071
Water Level (ft msl)
240
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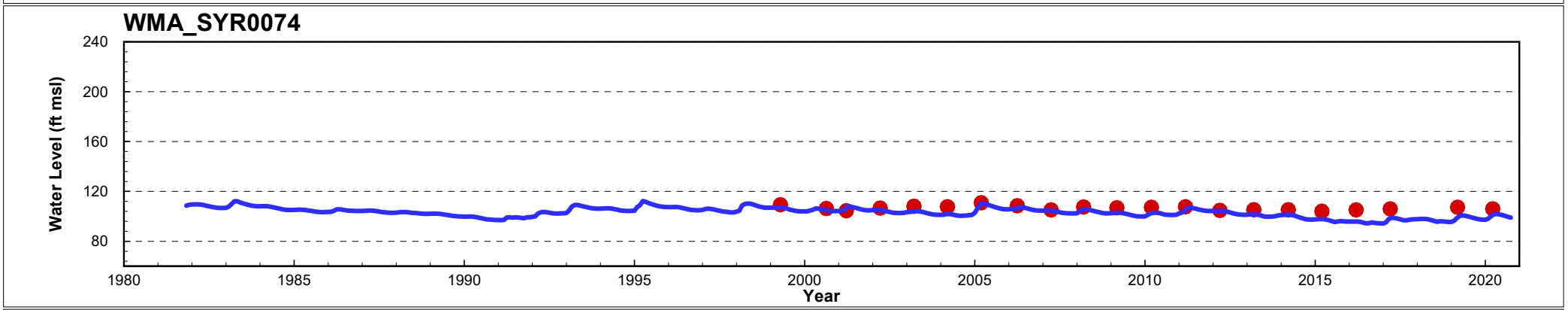
WMA_SYR0074
Water Level (ft msl)
240
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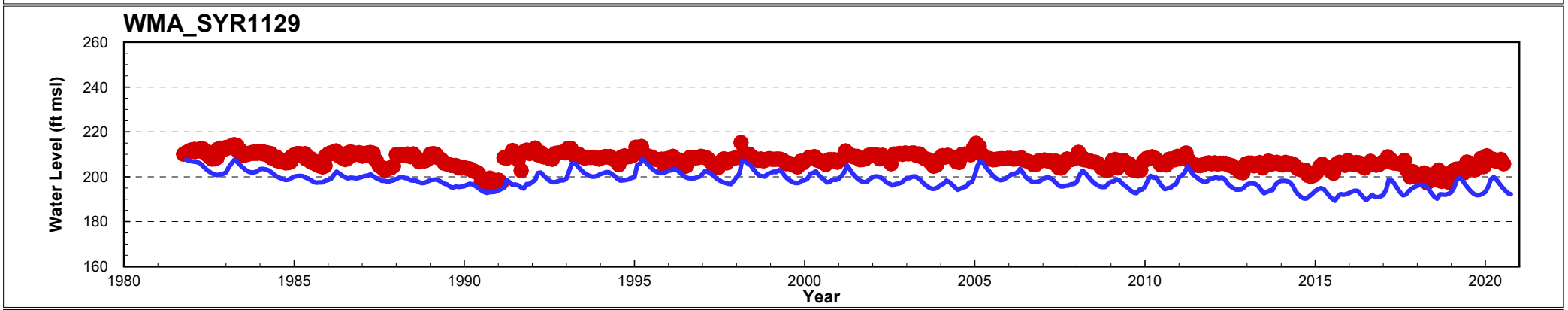
WMA_SYR1129
Water Level (ft msl)
260
240
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1980
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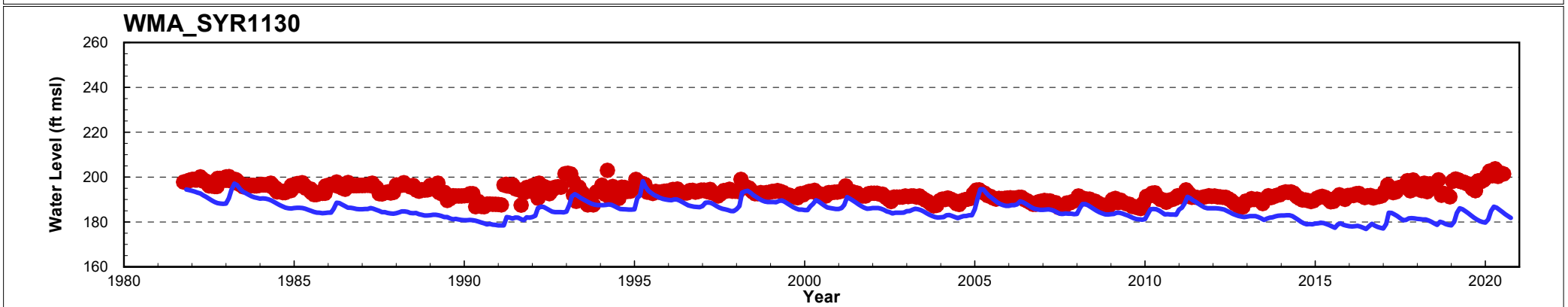
2020
Year


WMA_SYR1130
Water Level (ft msl)
260
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220
200
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160
1980
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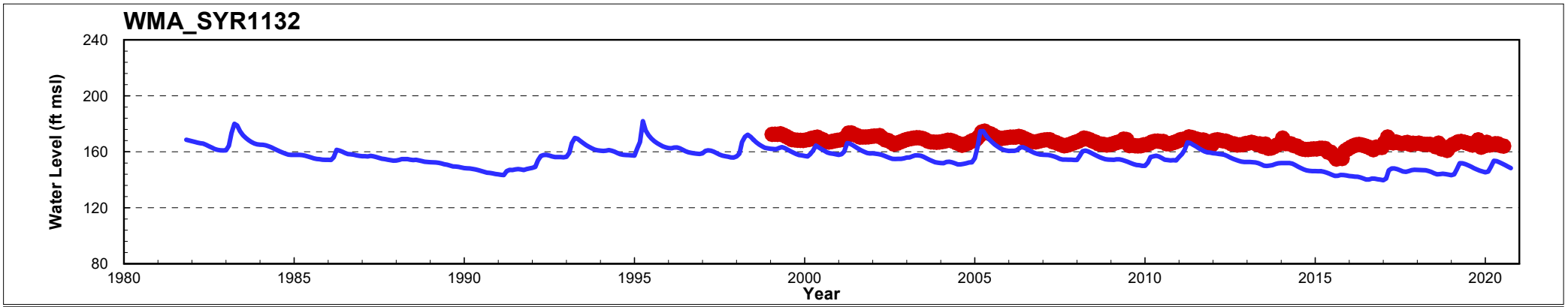
2020
Year


WMA_SYR1132
Water Level (ft msl)
240
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120
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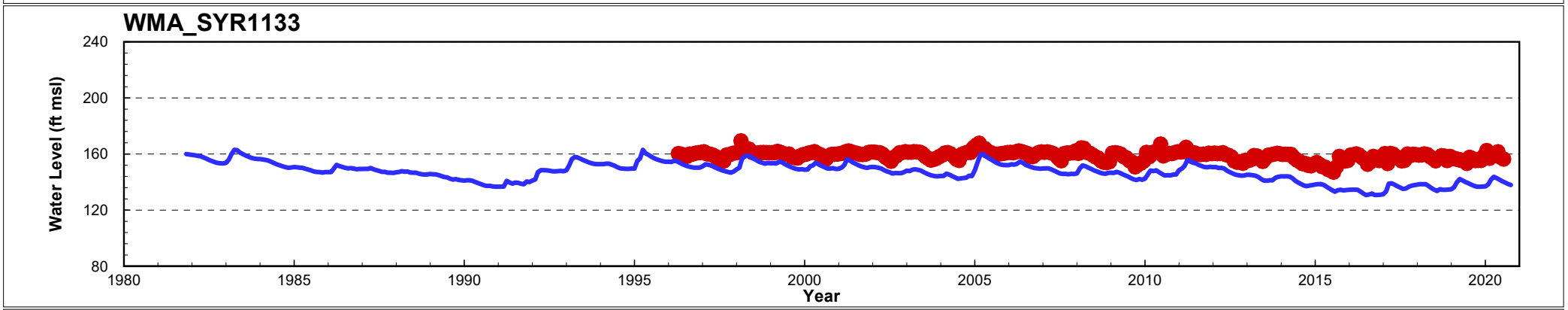
2020
Year


WMA_SYR1133
Water Level (ft msl)
240
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2010
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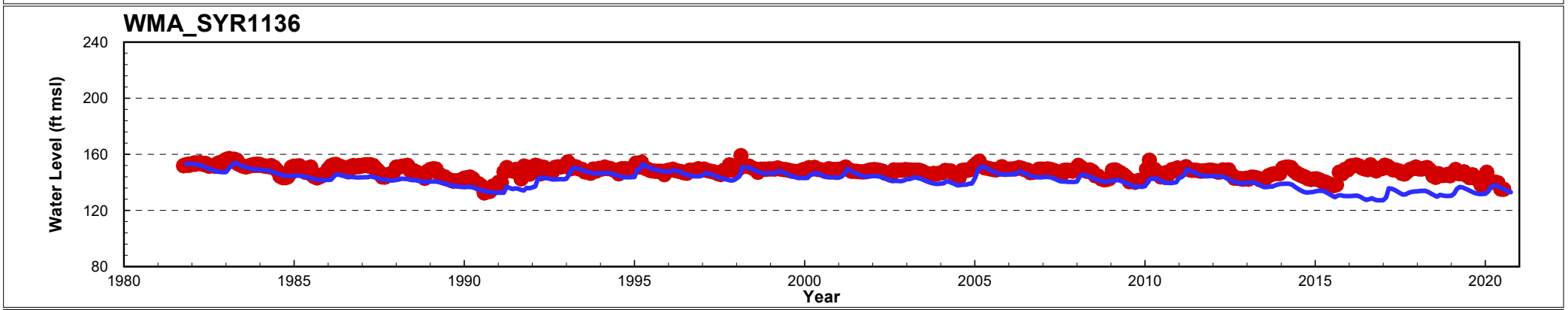
2020
Year


WMA_SYR1136
Water Level (ft msl)
240
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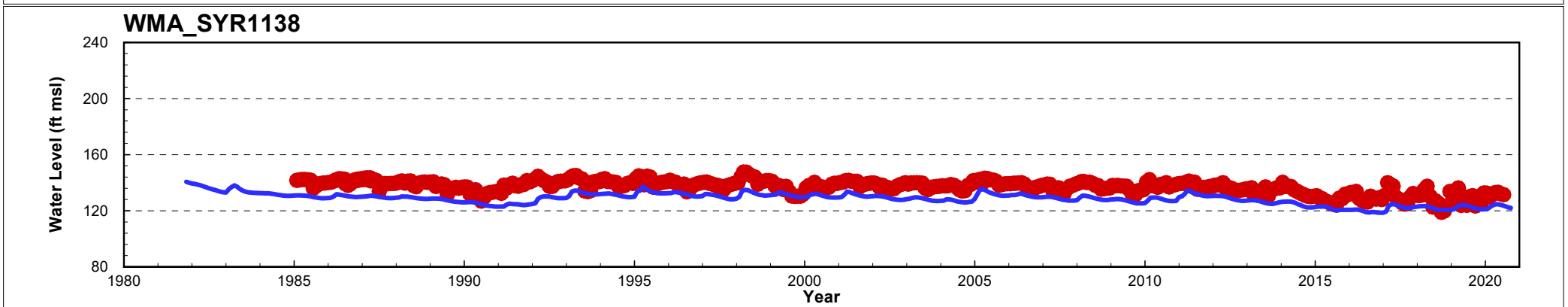
2020
Year


WMA_SYR1138
Water Level (ft msl)
240
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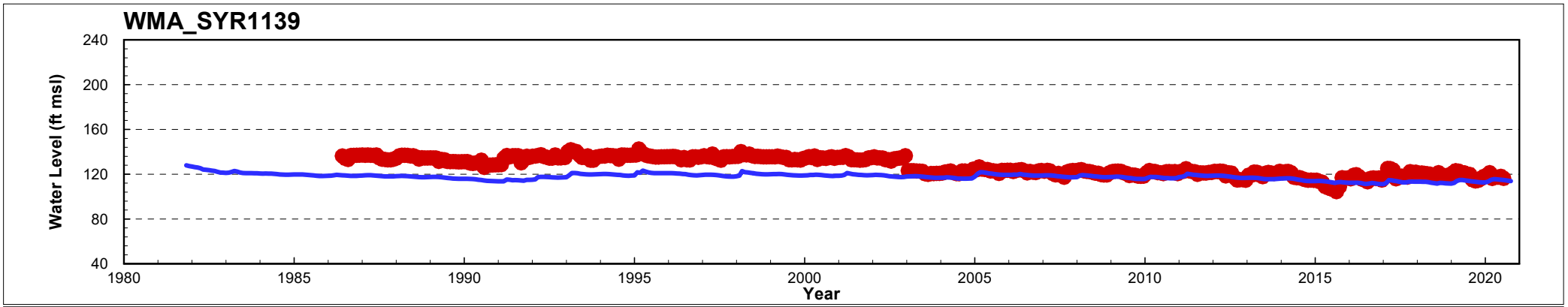
2020
Year


WMA_SYR1139
Water Level (ft msl)
240
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2020
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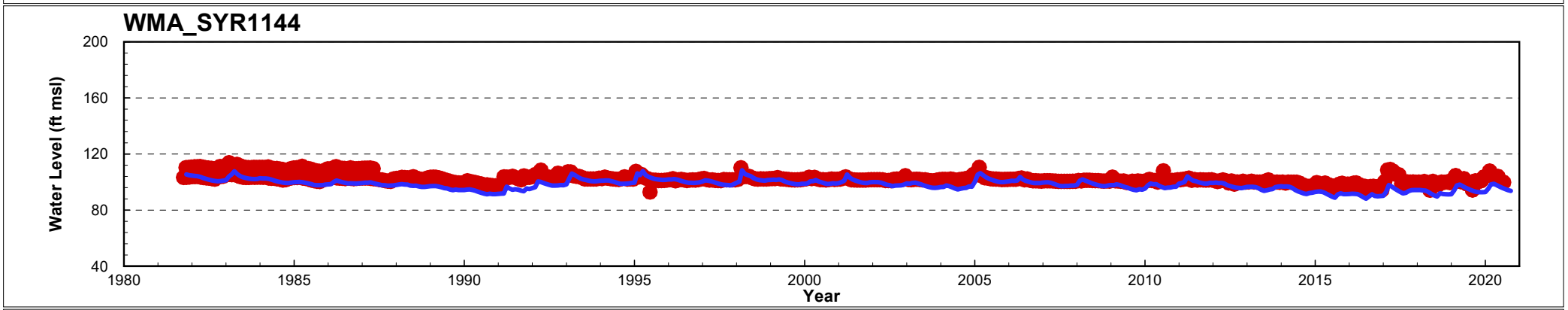
WMA_SYR1144
Water Level (ft msl)
200
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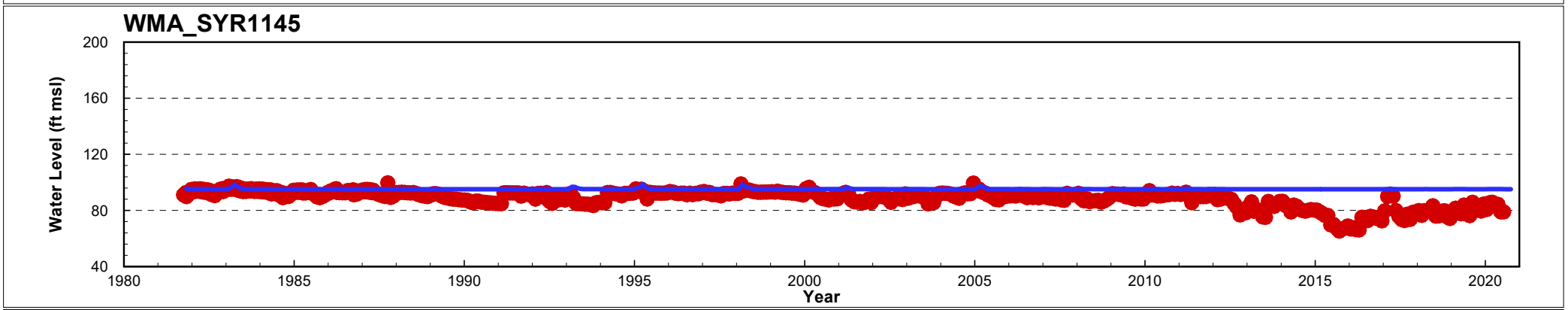
2020
Year


WMA_SYR1145
Water Level (ft msl)
200
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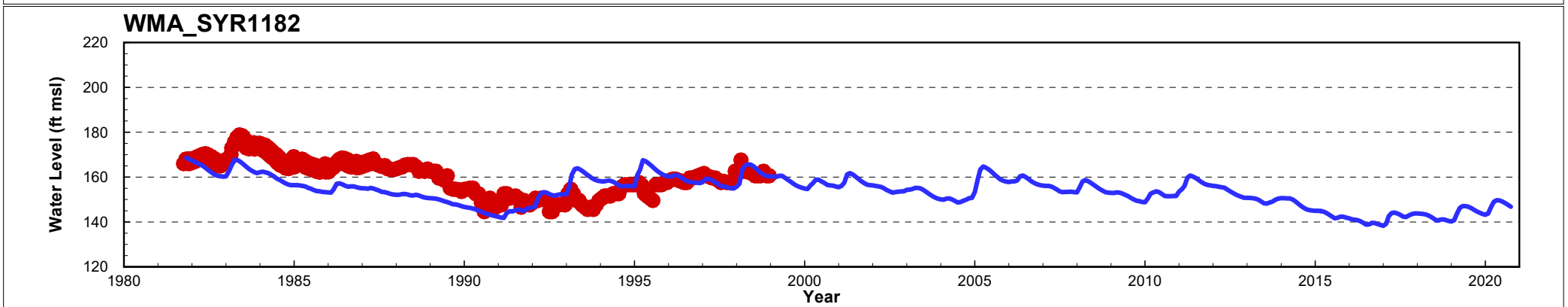
2020
Year


WMA_SYR1182
Water Level (ft msl)
220
200
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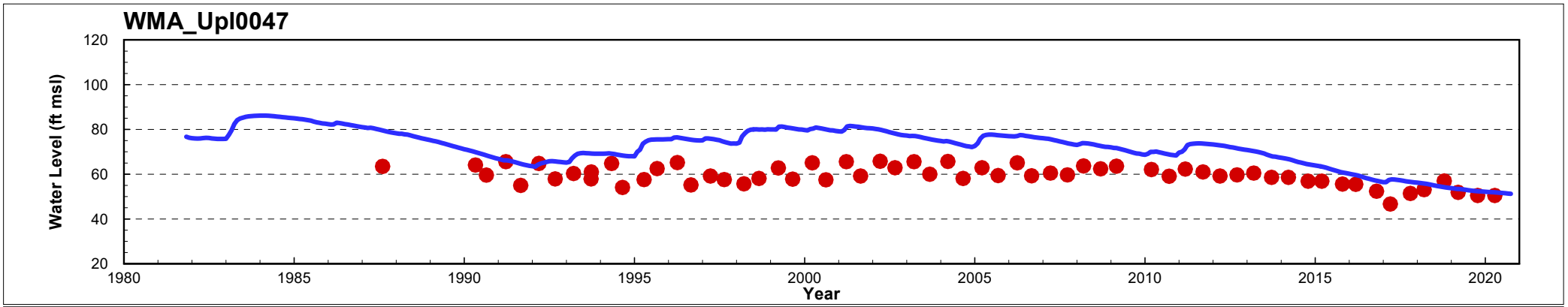
WMA_Upl0047
Water Level (ft msl)
120
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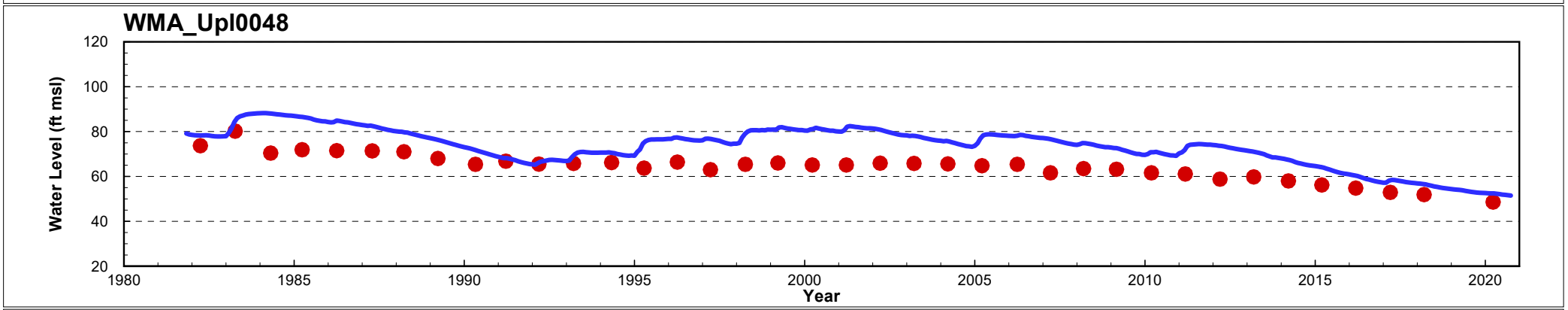
WMA_Upl0048
Water Level (ft msl)
120
100
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1985
1990
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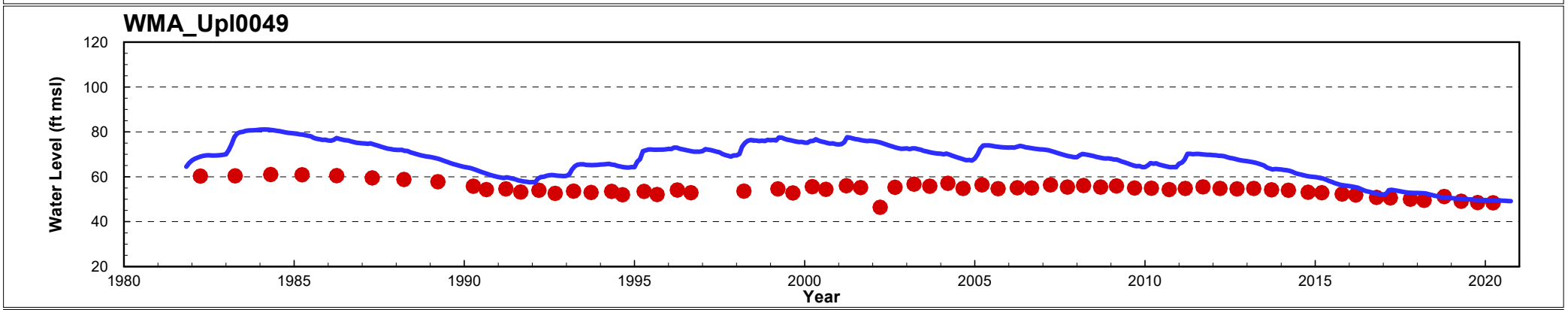
2020
Year


WMA_Upl0049
Water Level (ft msl)
120
100
80
60
40
20
1980
1985
1990
1995
2000
2005
2010
2015
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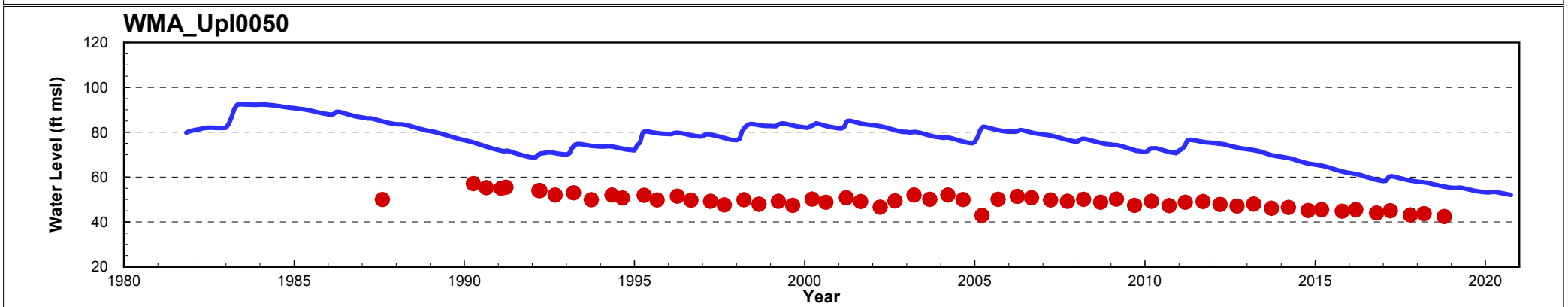
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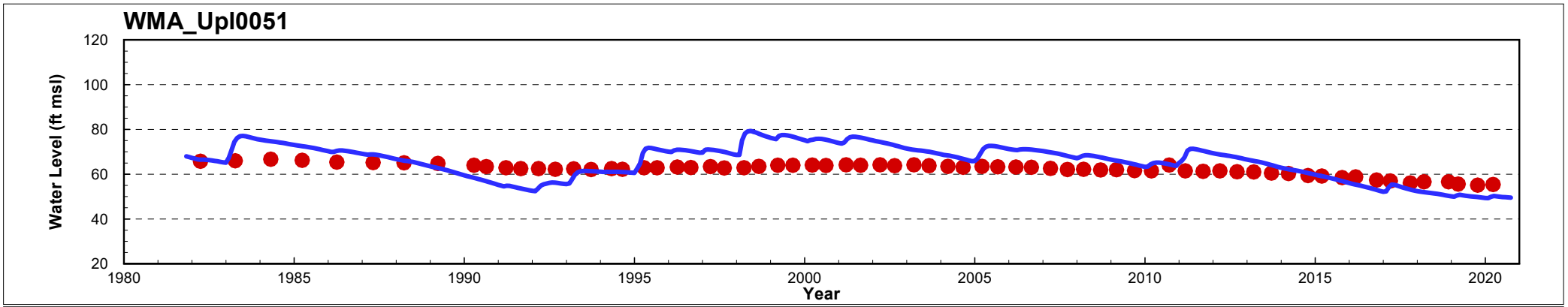
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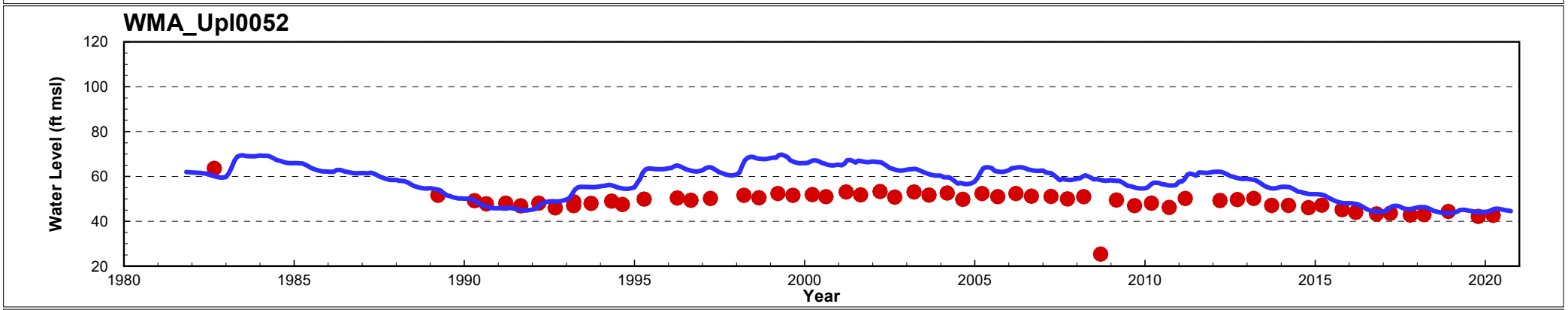
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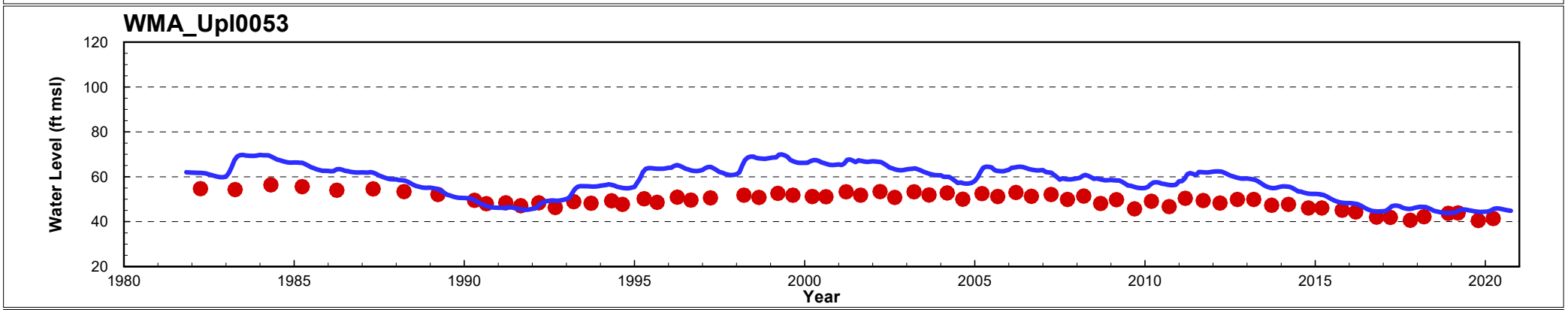
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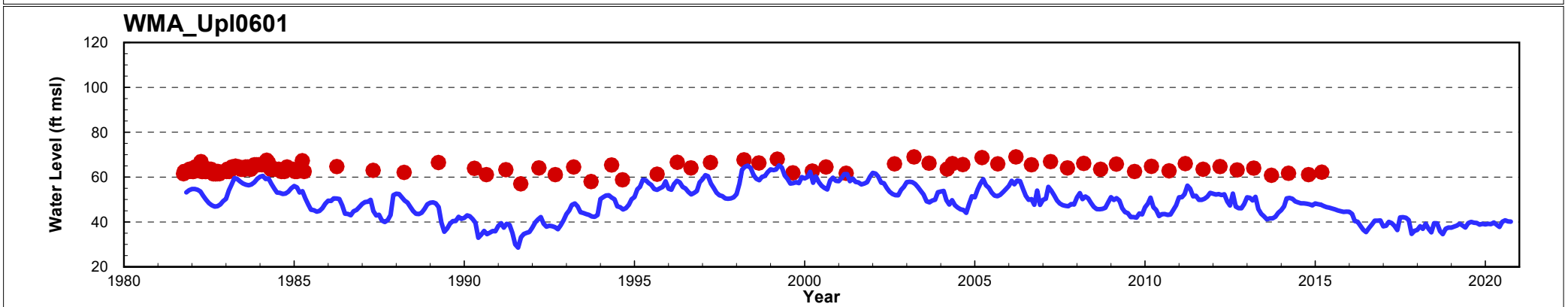
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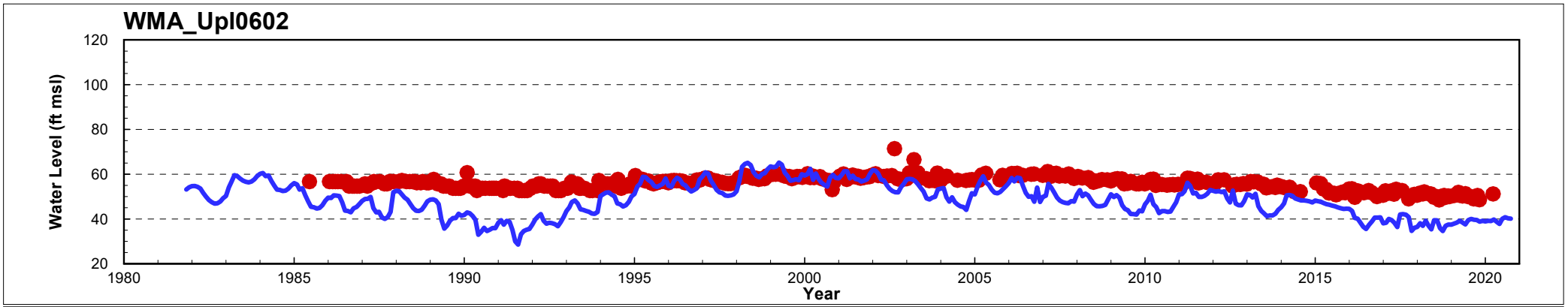
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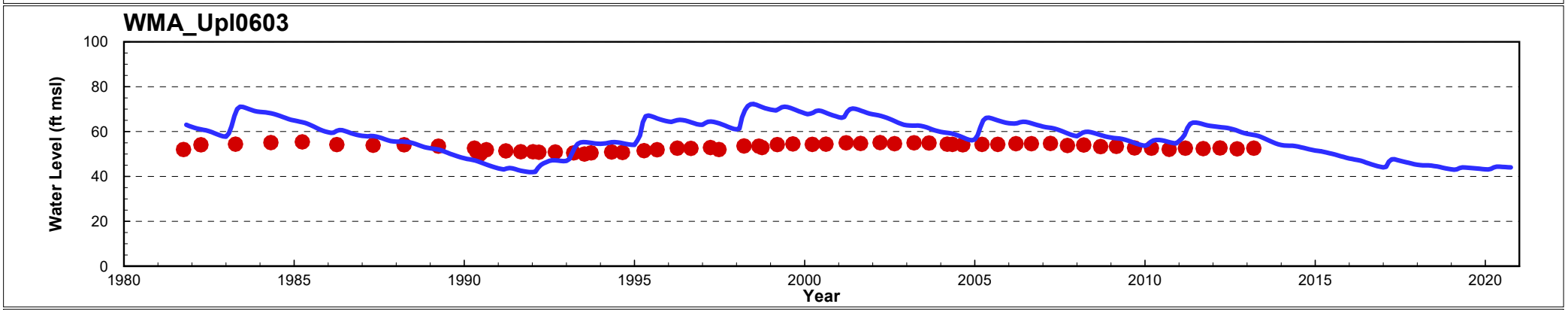
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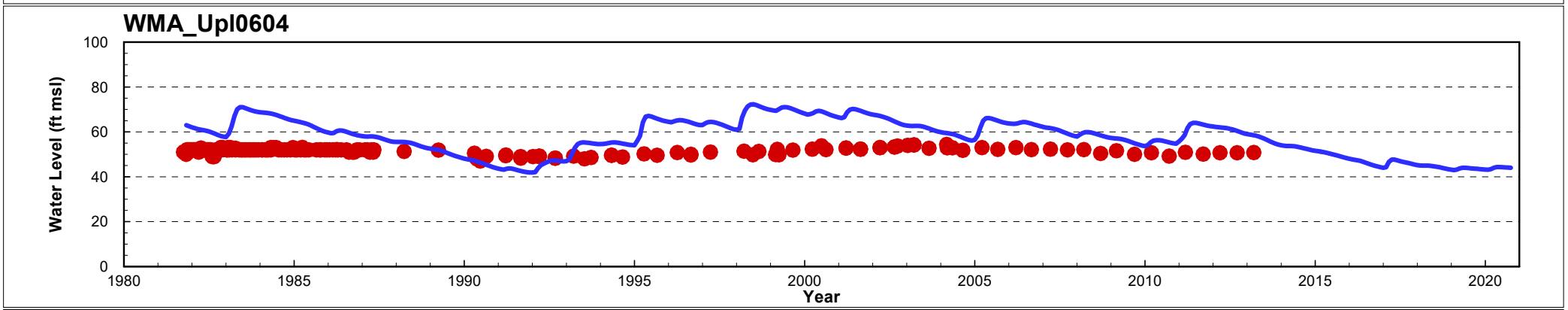
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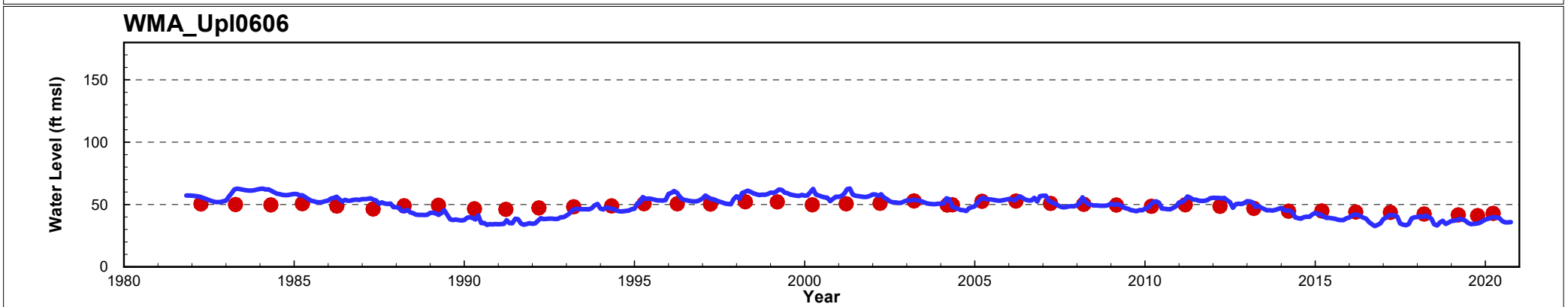
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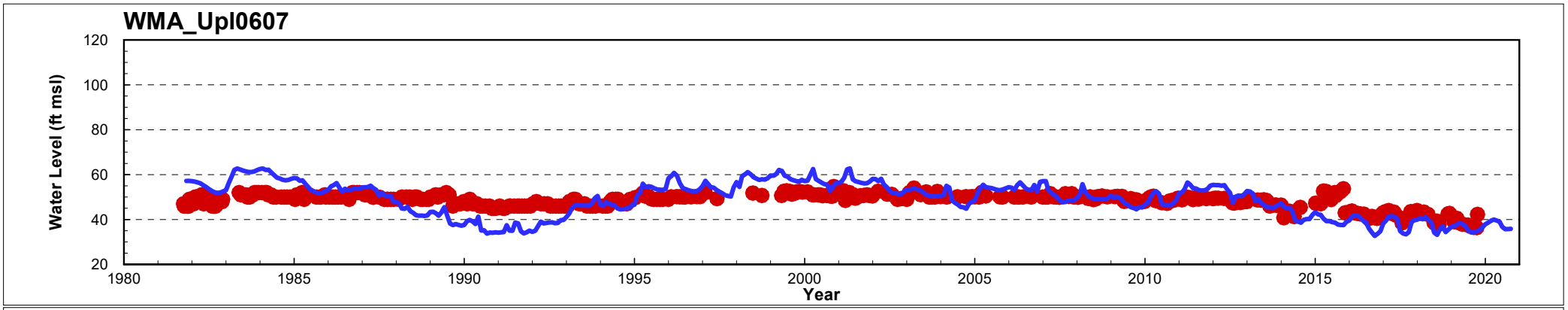
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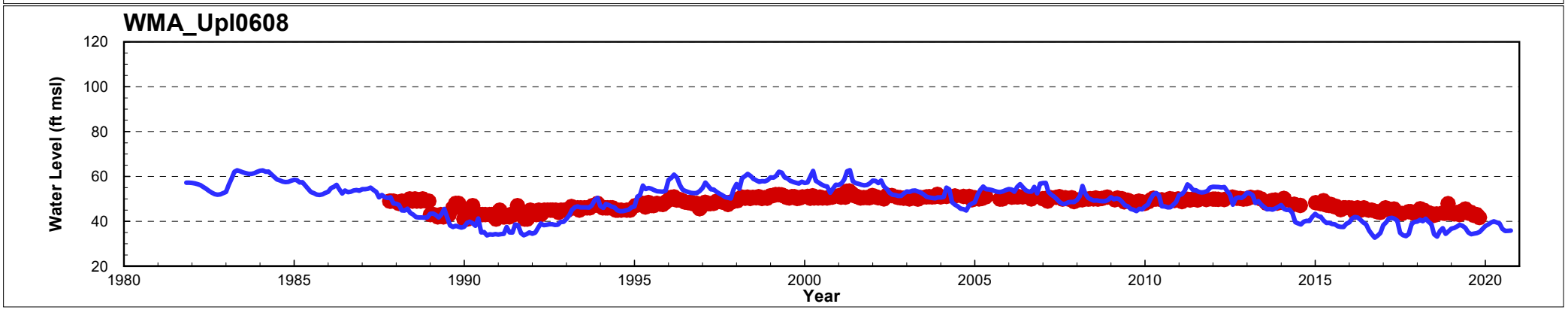
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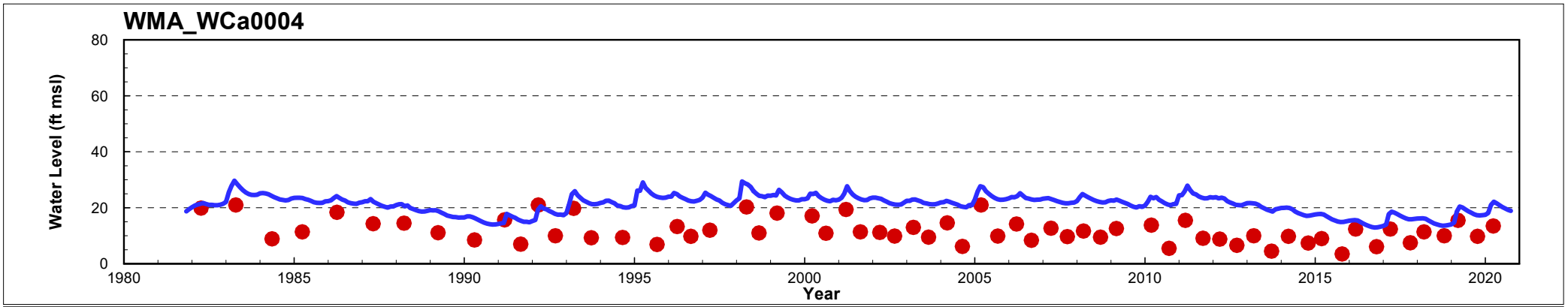
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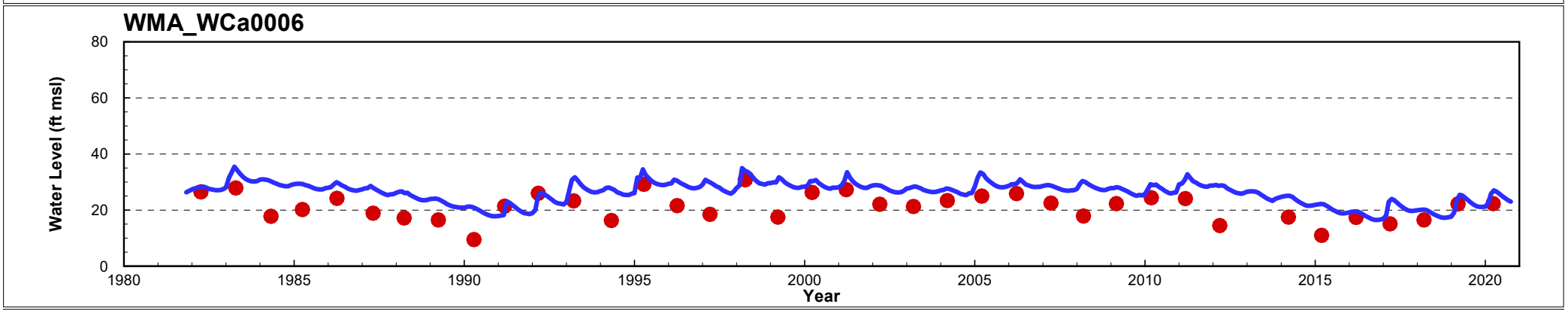
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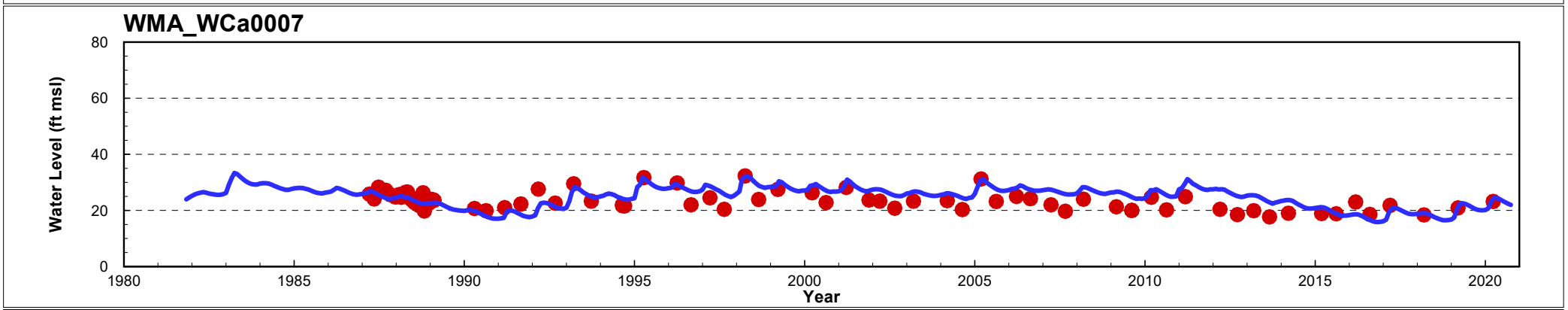
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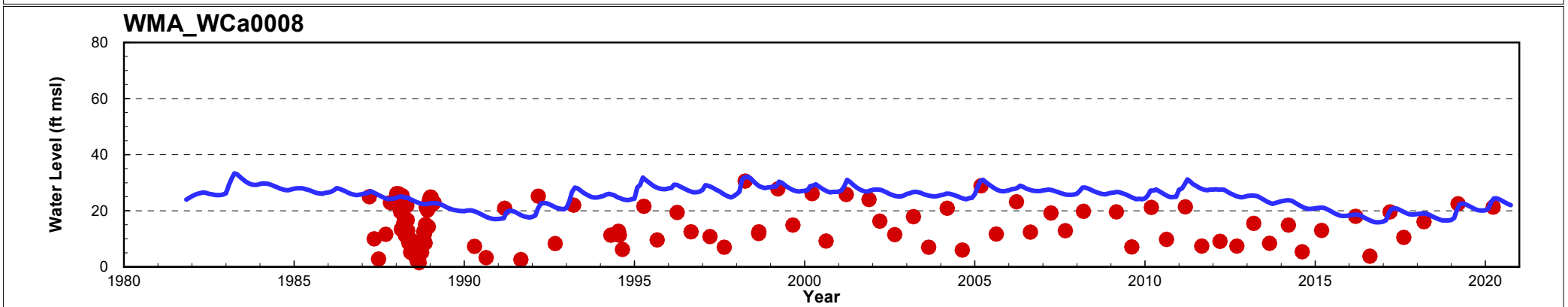
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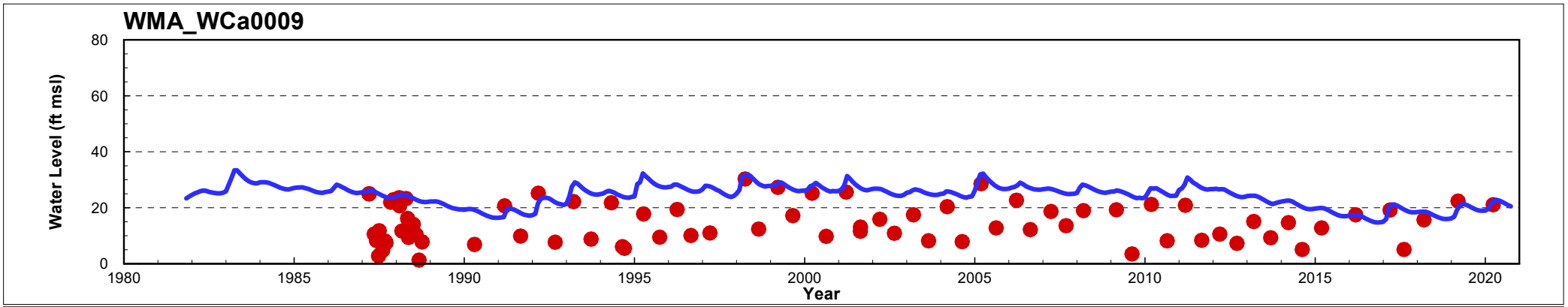
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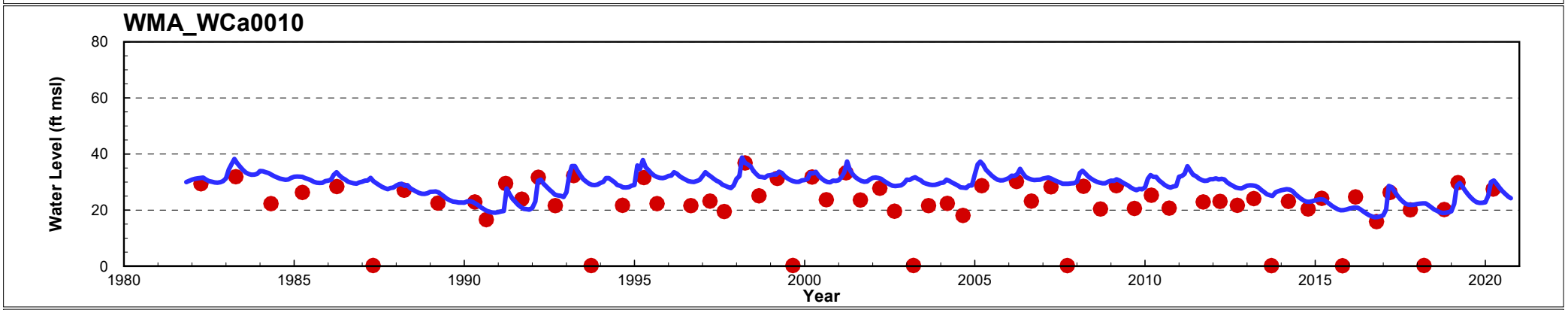
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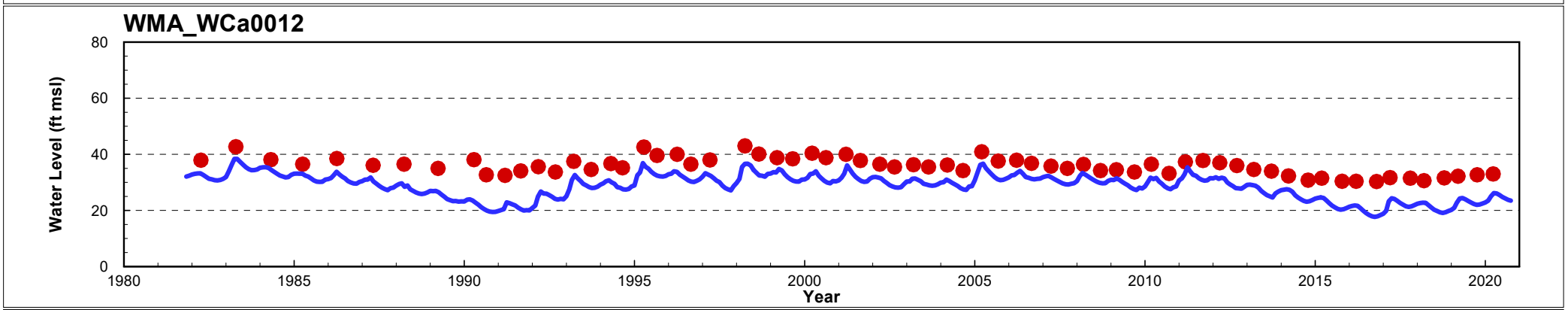
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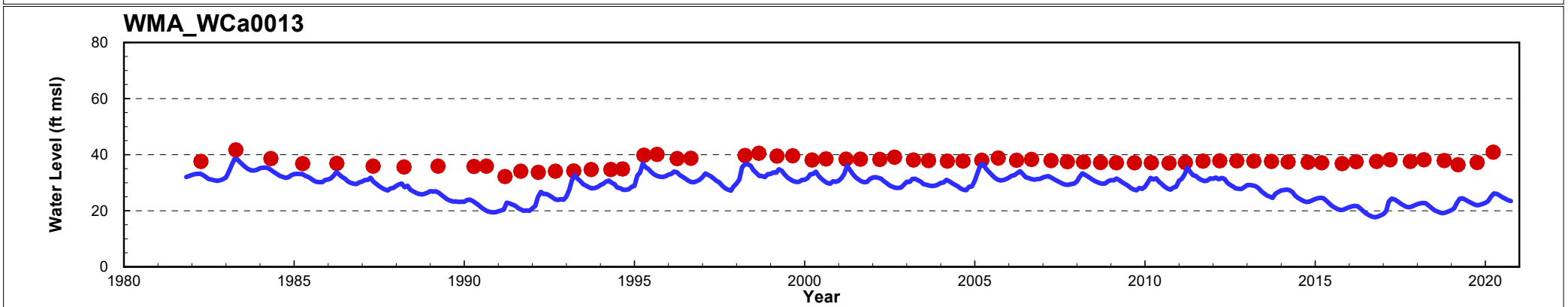
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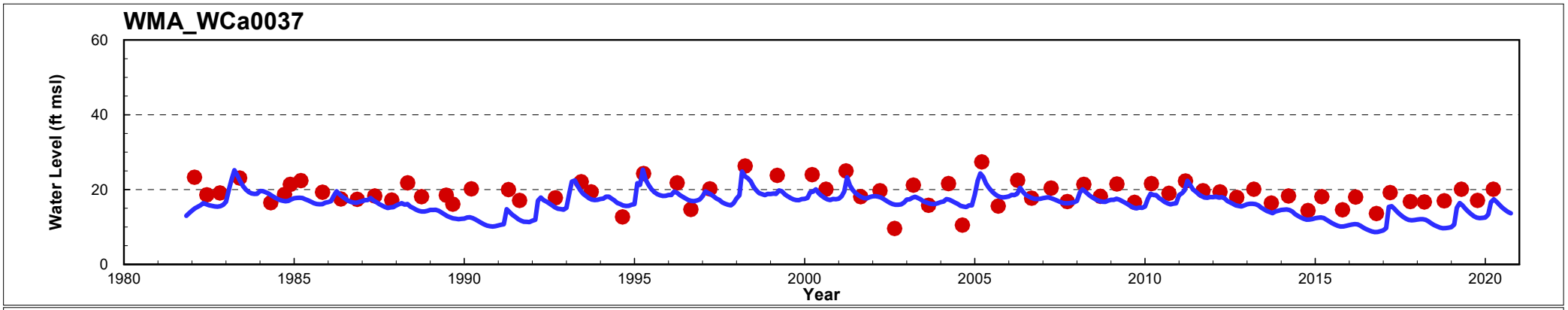
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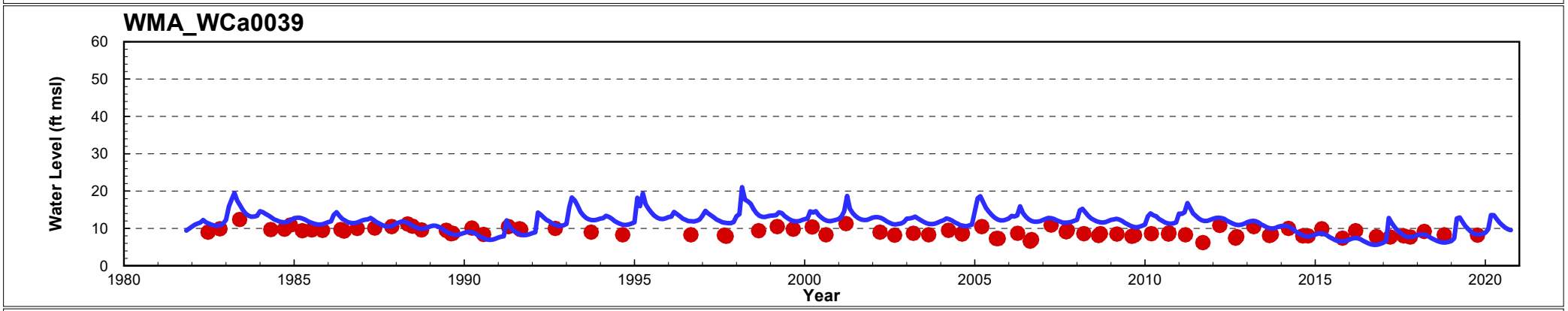
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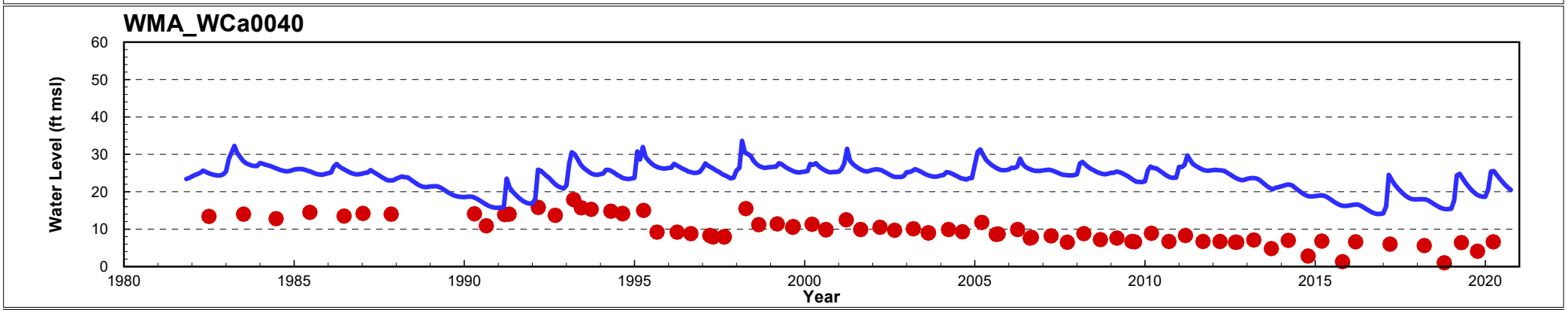
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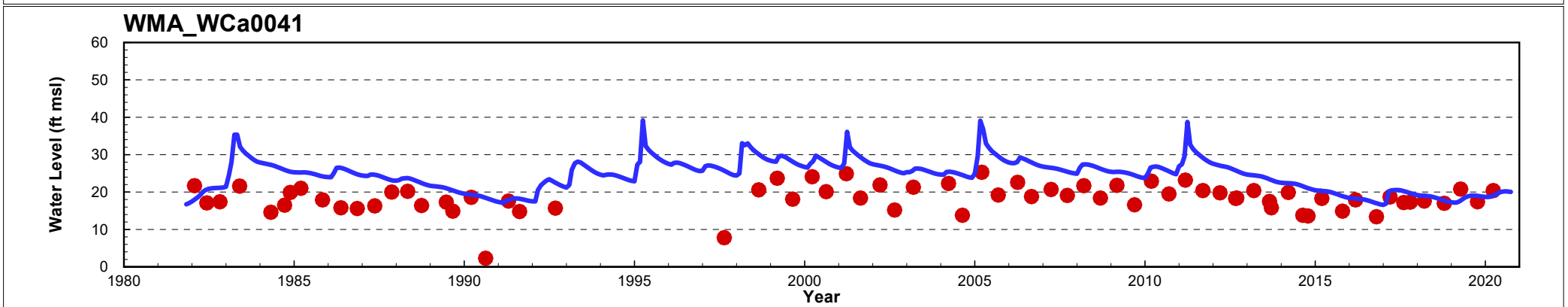
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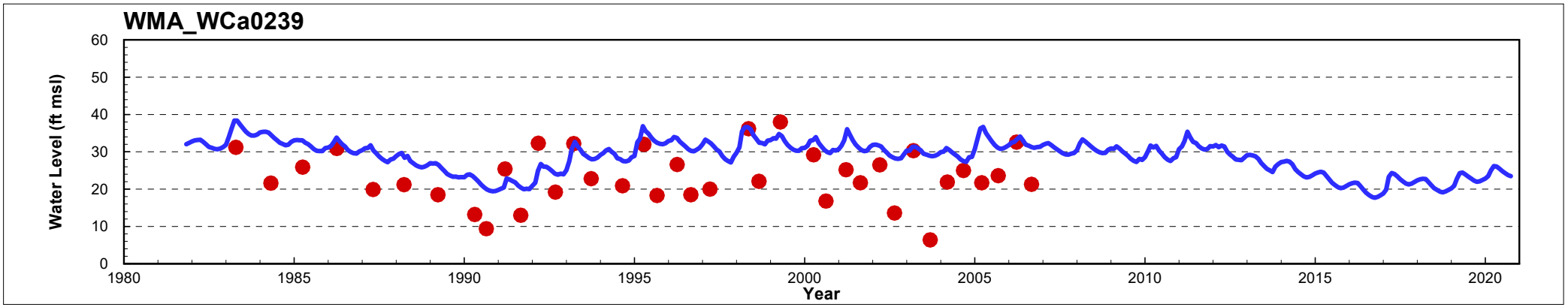
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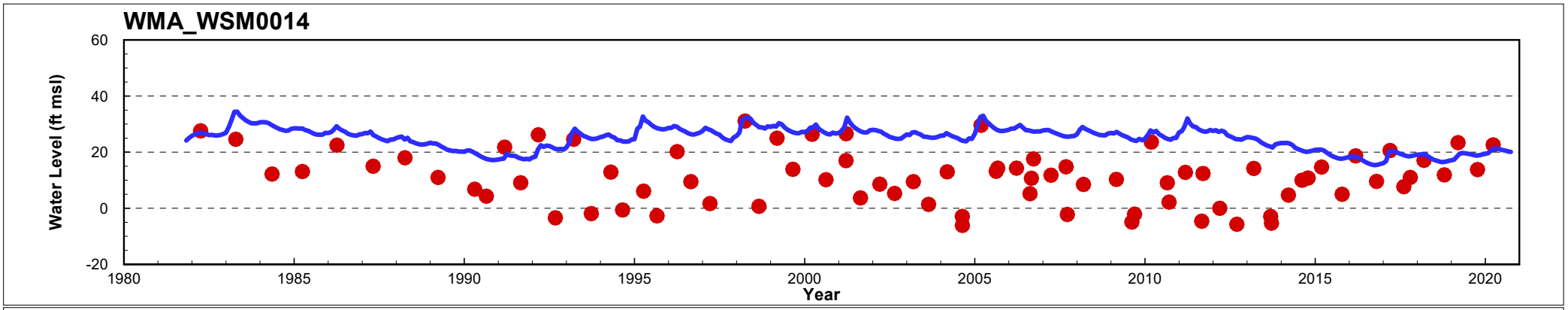
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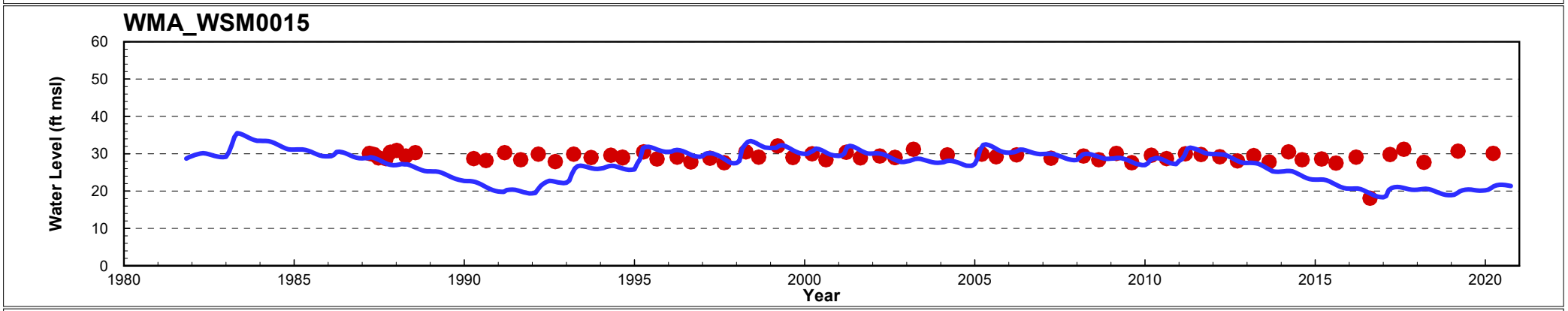
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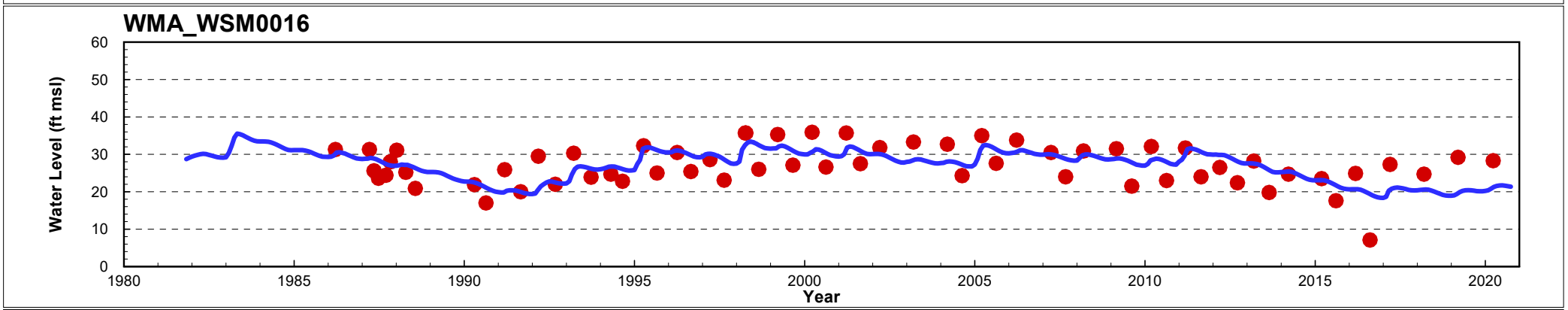
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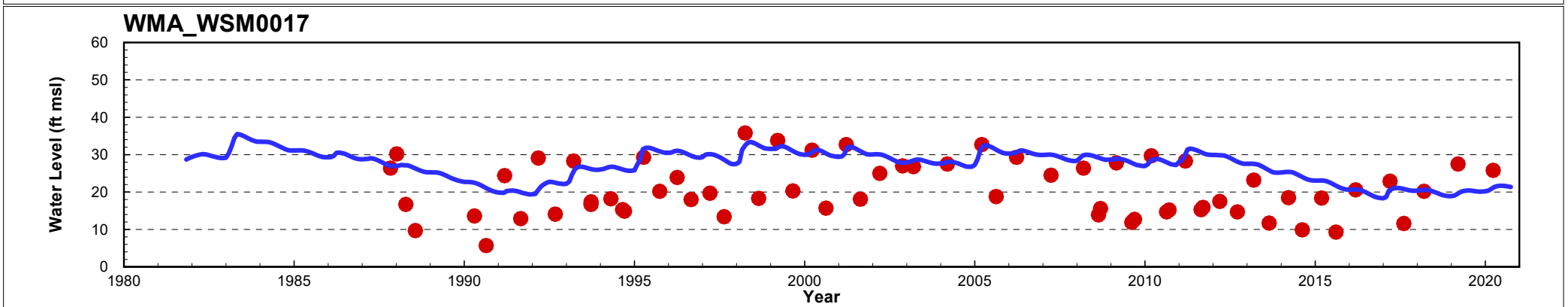
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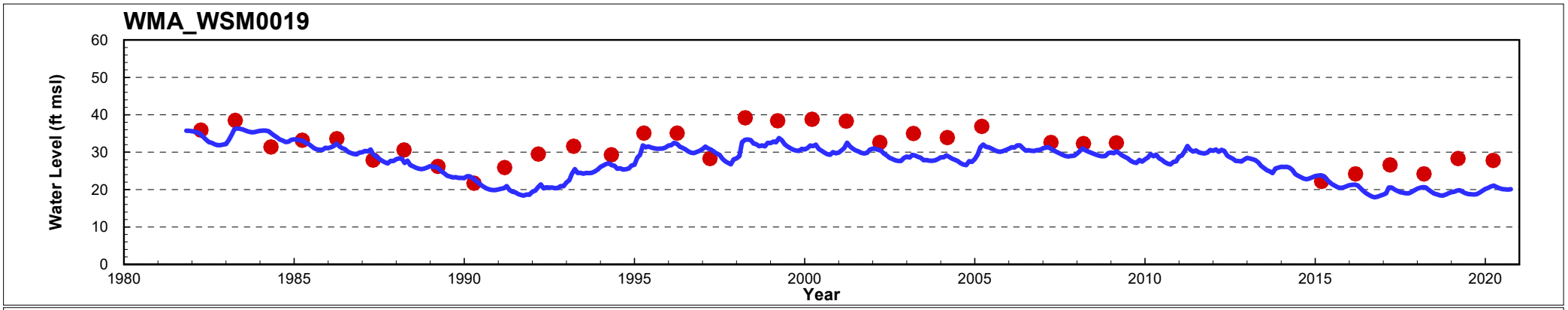
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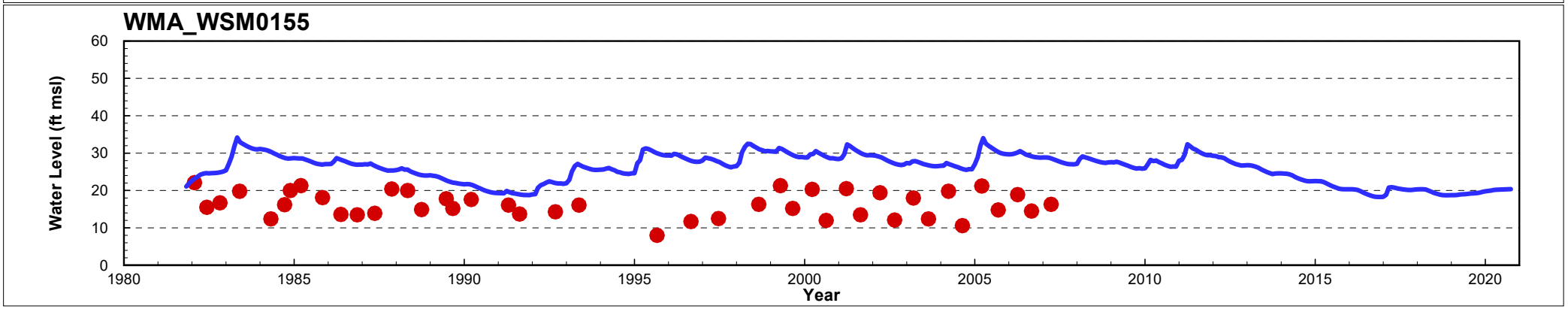
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Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3a-A:

California Statewide Groundwater Elevation Monitoring (CASGEM) Program Procedures for Monitoring Entity Reporting, Dated December 2010

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
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530-529-7344
staton@water.ca.gov

North Central Region Office
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West Sacramento, CA 95691
(916) 376-9657
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Fresno, CA 93726
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dmathis@water.ca.gov

Southern Region Office
Tim Ross
770 Fairmont Avenue
Suite 102
Glendale, CA 91203
(818) 500-1645 x278
tross@water.ca.gov

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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

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:

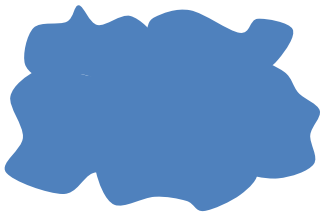
- Coordinate with DWR to establish a Monitoring Plan
- Conduct or coordinate the regular and systematic monitoring of groundwater elevations as specified in the Monitoring Plan
- Submit monitoring data to DWR in a timely manner

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:

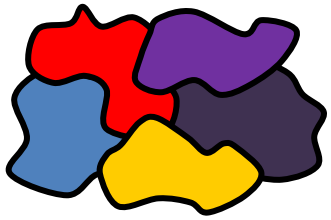
- A single Monitoring Entity that collects and reports groundwater elevation data for the entire basin (Scenario A);
- Multiple Monitoring Entities that collect and report groundwater elevation data for their portion of the basin (Scenario B); or

- 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

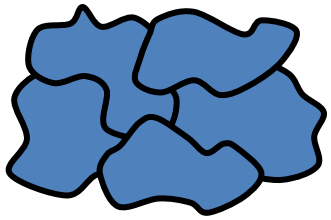


Figure 1. Illustration of possible Monitoring Entity scenarios for a monitored basin.

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.

Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-A:

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

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. The Appendix is organized into two sections: Upper Aquifer and Lower Aquifer.

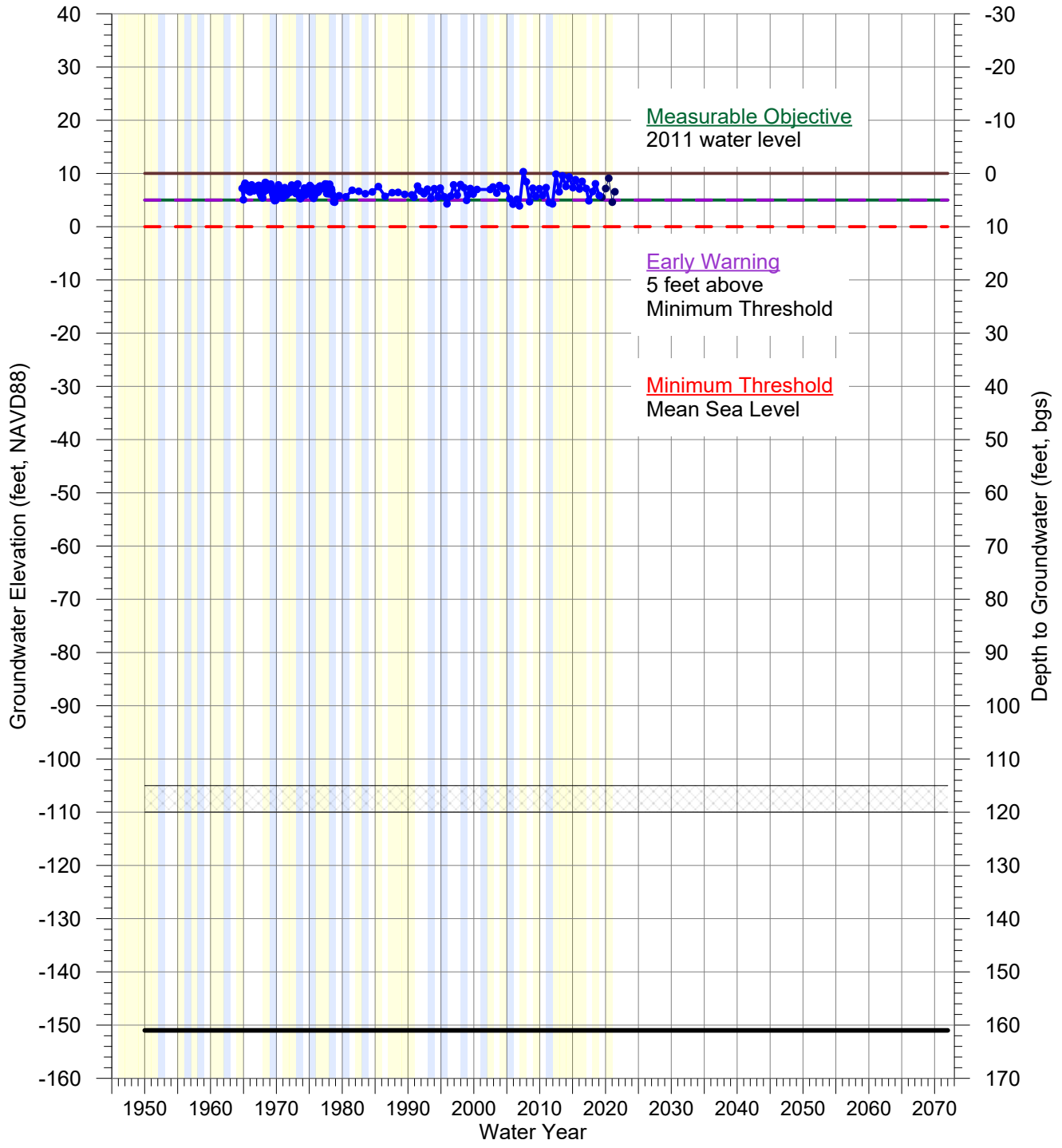
LIST OF ACRONYMS AND ABBREVIATIONS

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

FIGURE A1-01

CASGEM ID
25268
Voluntary

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



USGS (344114120353501)
County of Santa Barbara
Ground Surface (10 feet above mean sea level)
Depth of Well (161 feet)
Perforations 115-120 feet

DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

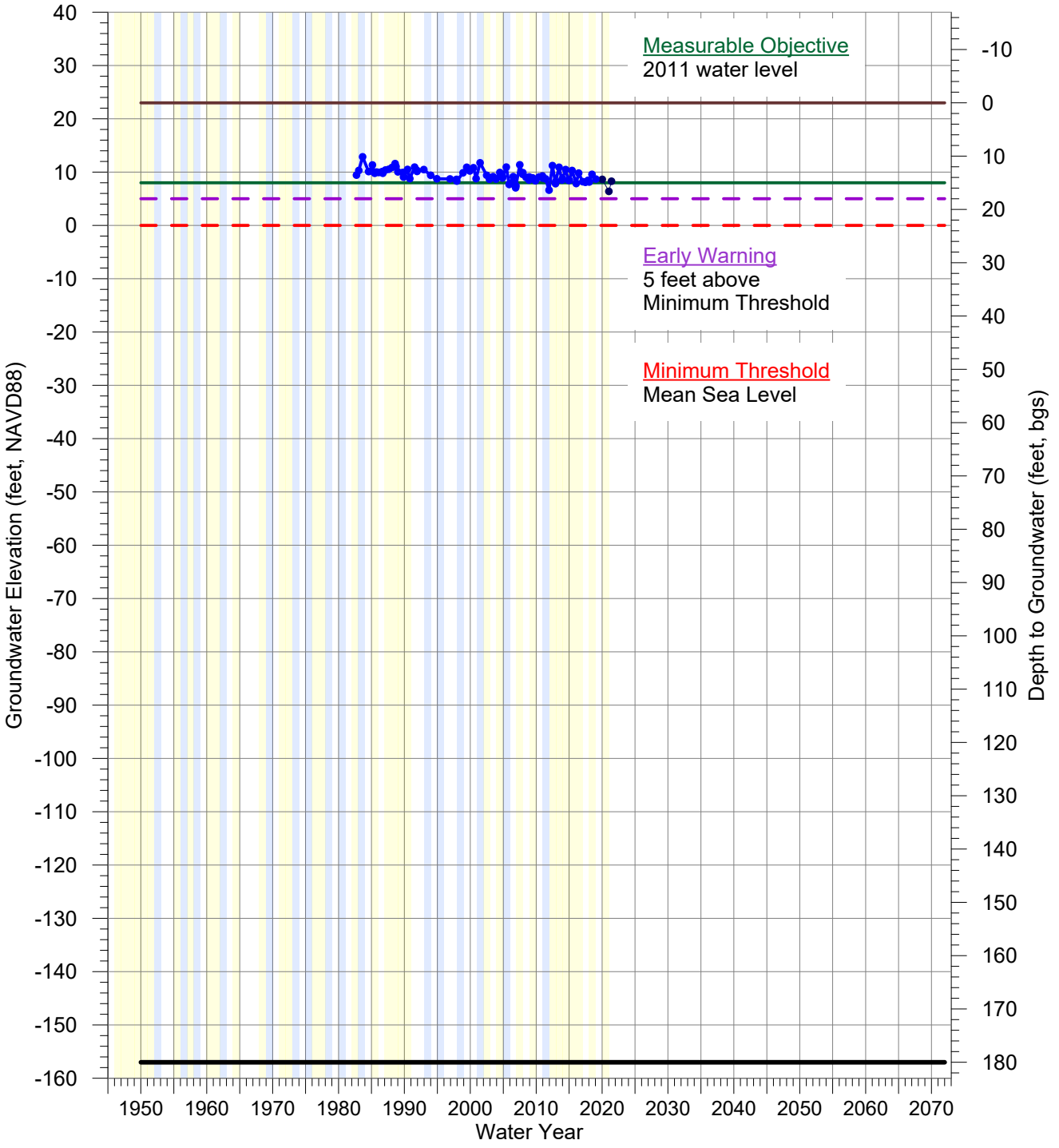
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-01 LP-U-S 2 17M1.grf 6/8/2021 M. McCammon

FIGURE A1-02

CASGEM ID
25271
Voluntary

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



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

DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

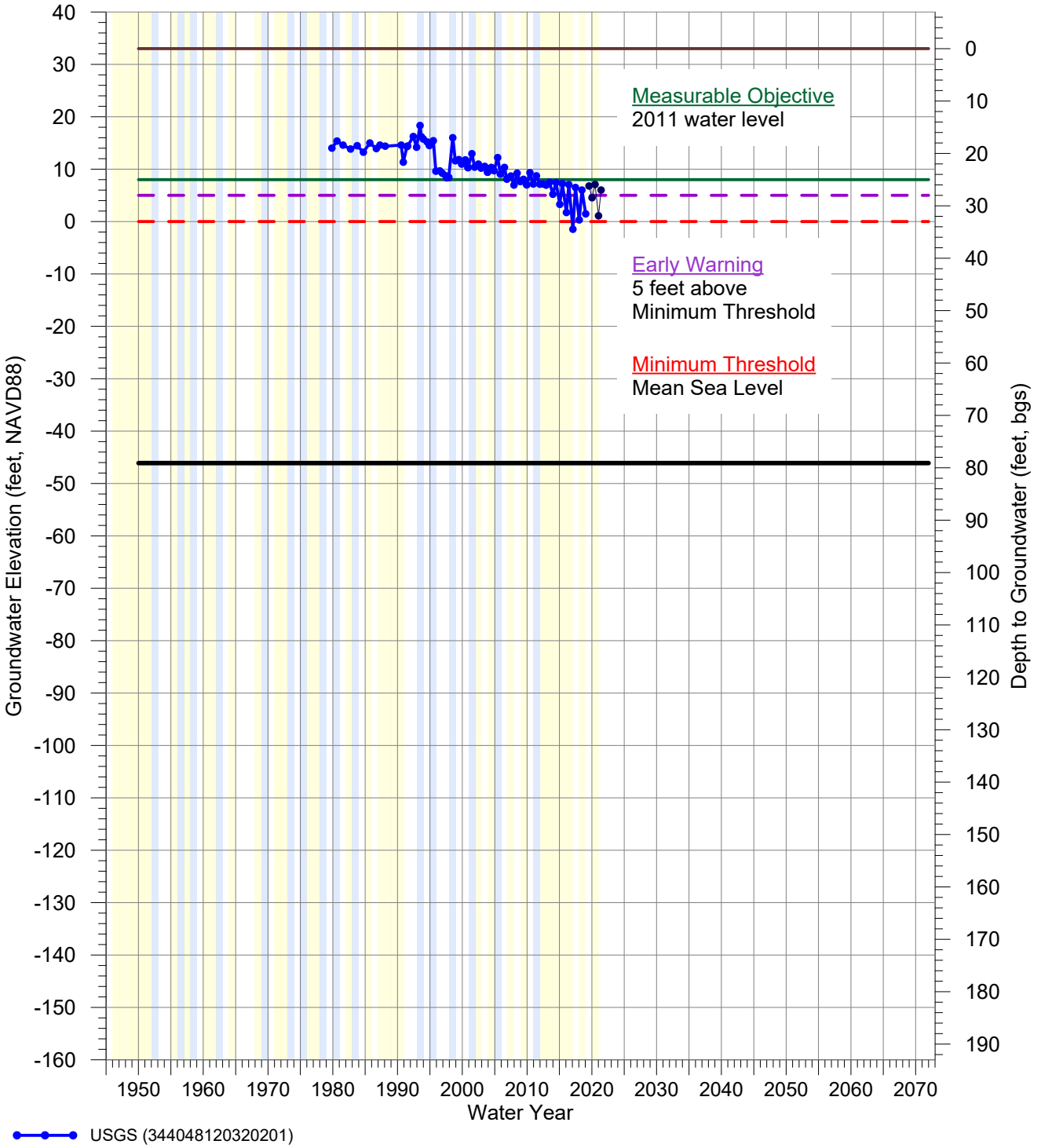
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-02 LP-U-S 39 21G2.grf 6/8/2021 M. McCammon

FIGURE A1-03

CASGEM ID
49171
Voluntary

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



USGS (344048120320201)
County of Santa Barbara
Ground Surface (33 ±20 feet above mean sea level)
Depth of Well (79.1 feet); Perforations TBD

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6/11/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

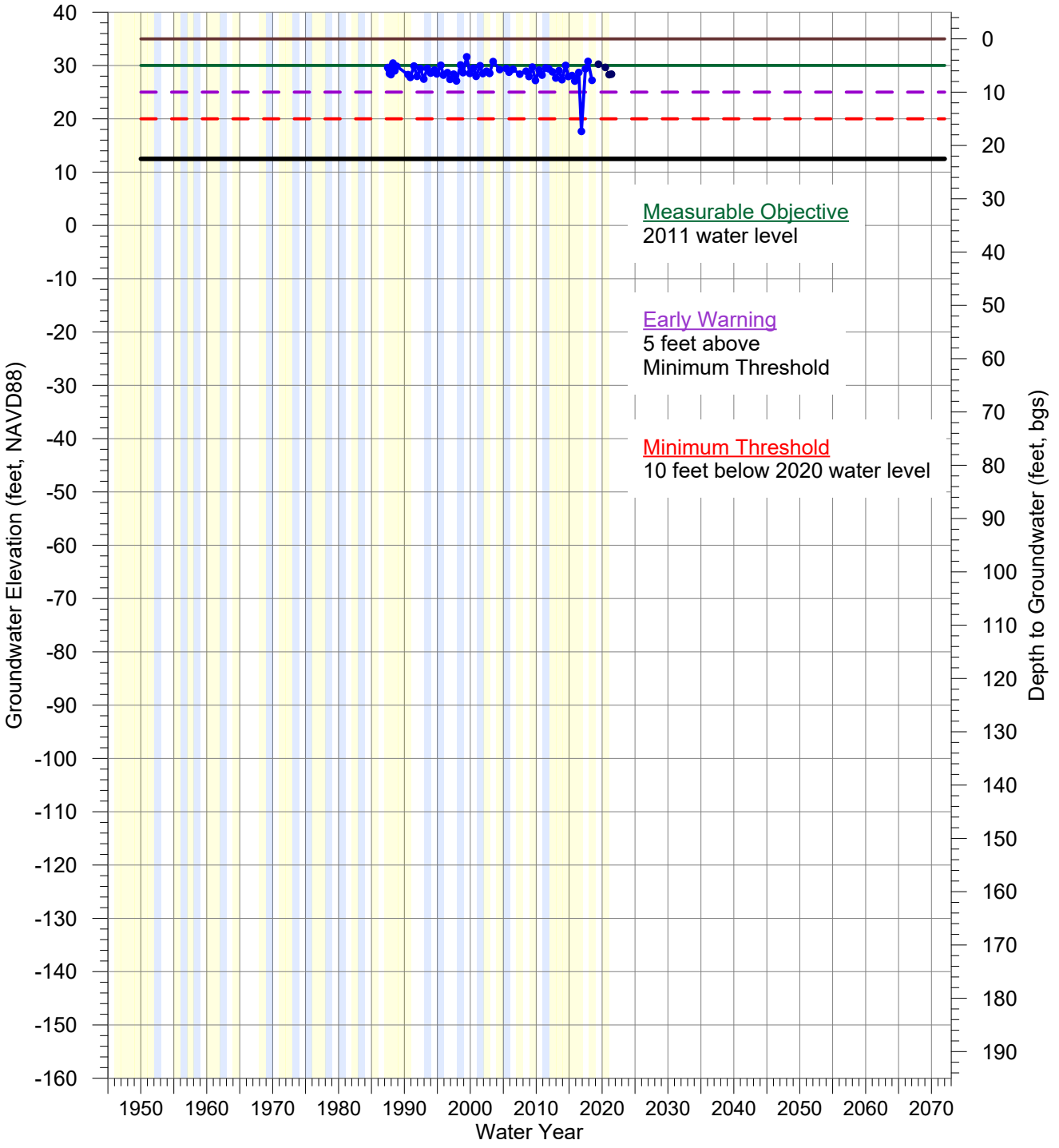
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-03 LP-U-S 40 23B2.grf 6/11/2021 M. McCammon

FIGURE A1-04

CASGEM ID
38297
Voluntary

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



USGS (343929120321001)
County of Santa Barbara
Ground Surface (35 feet above mean sea level)
Depth of Well (22.5 feet); Perforations TBD

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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

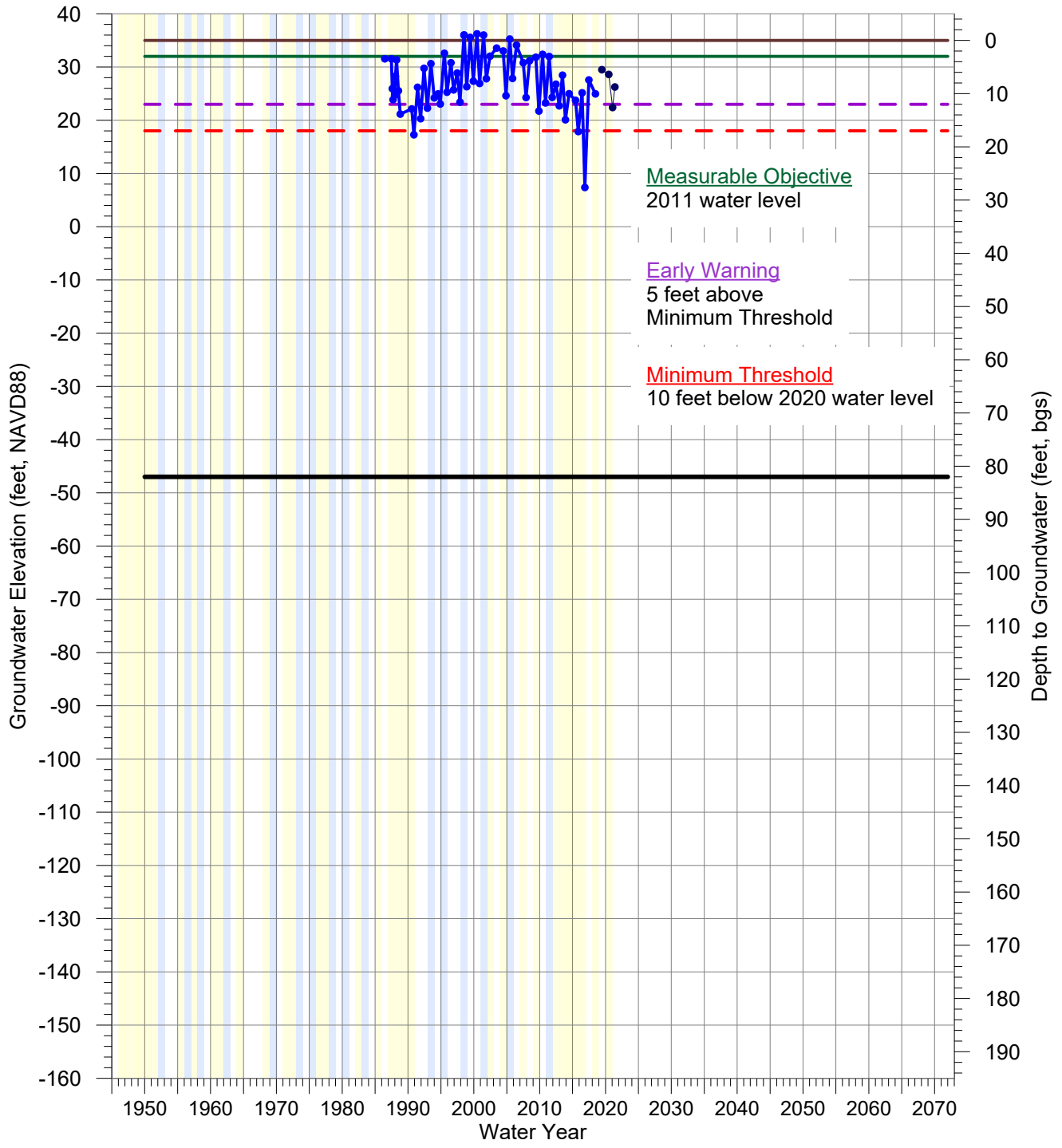
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-04 LP-U 15 26L1.grf 6/8/2021 M. McCammon

FIGURE A1-05

CASGEM ID
49162
Voluntary

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



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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

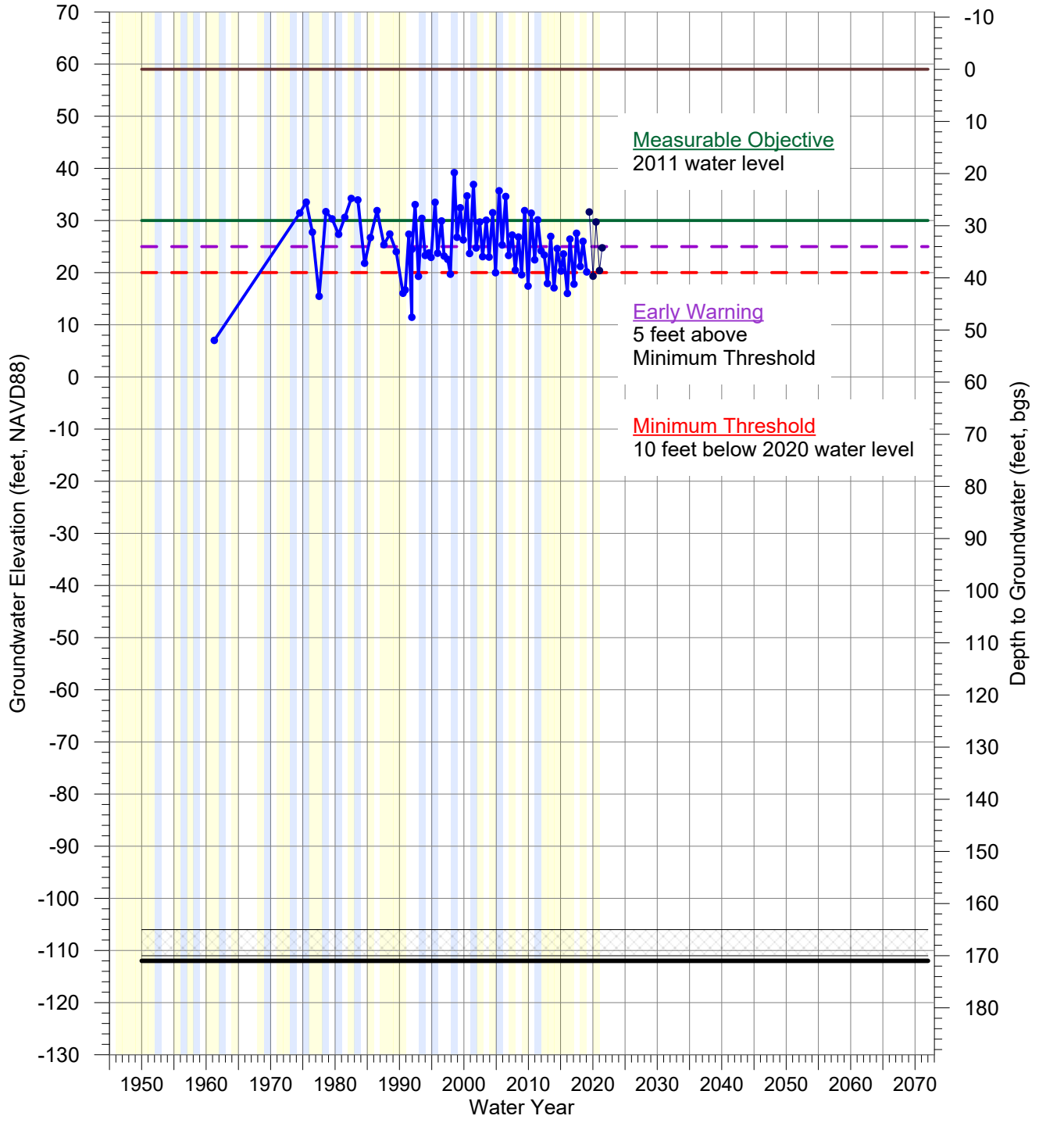
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-05 LP-U 16 26L2.grf 6/8/2021 M. McCammon

FIGURE A1-06

CASGEM ID
49146
Voluntary

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



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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

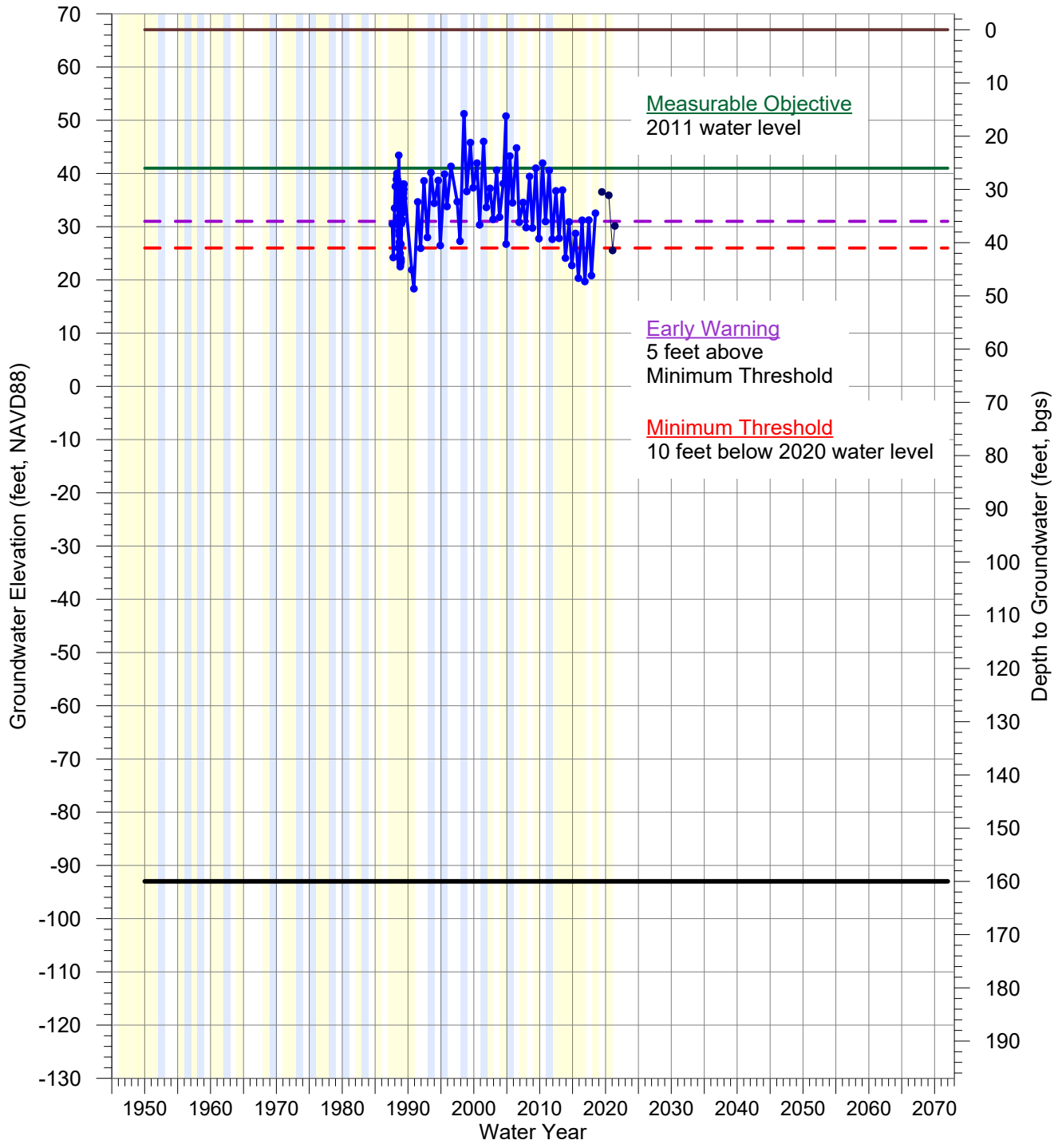
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-06 LP-U 33 24J4.grf 6/8/2021 M. McCammon

FIGURE A1-07

CASGEM ID
49148
Voluntary

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



USGS (343926120293001)
County of Santa Barbara
Ground Surface (67 feet above mean sea level)
Depth of Well (160 feet), Perforations TBD

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6/11/2021

STETSON ENGINEERS INC.

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

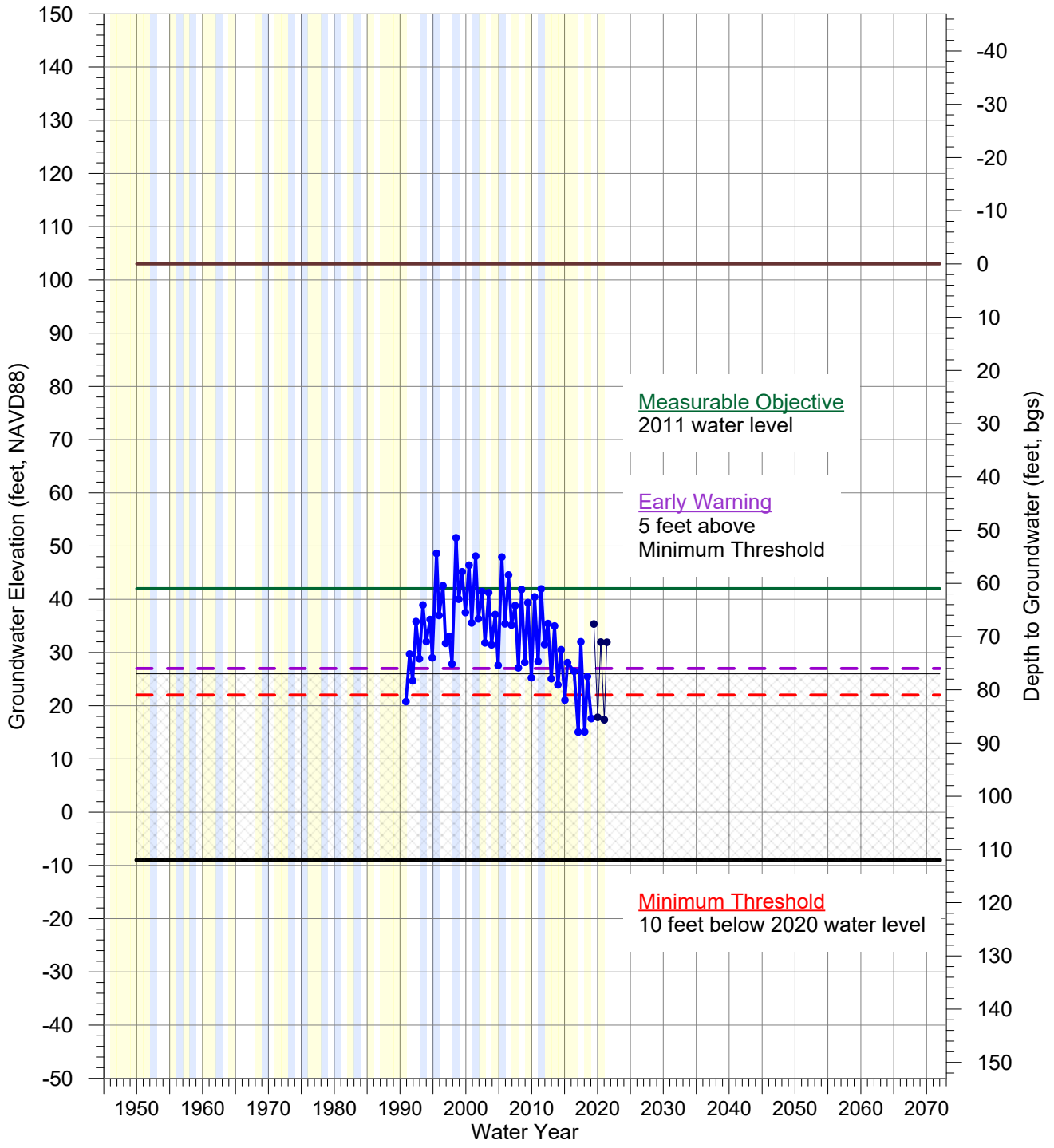
REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-07 LP-U 27 29N6.grf 6/11/2021 M. McCammon

FIGURE A1-08

WMA Representative Monitoring Well for Upper Aquifer (Lompoc Plain Subarea) 6N/34W-6C4



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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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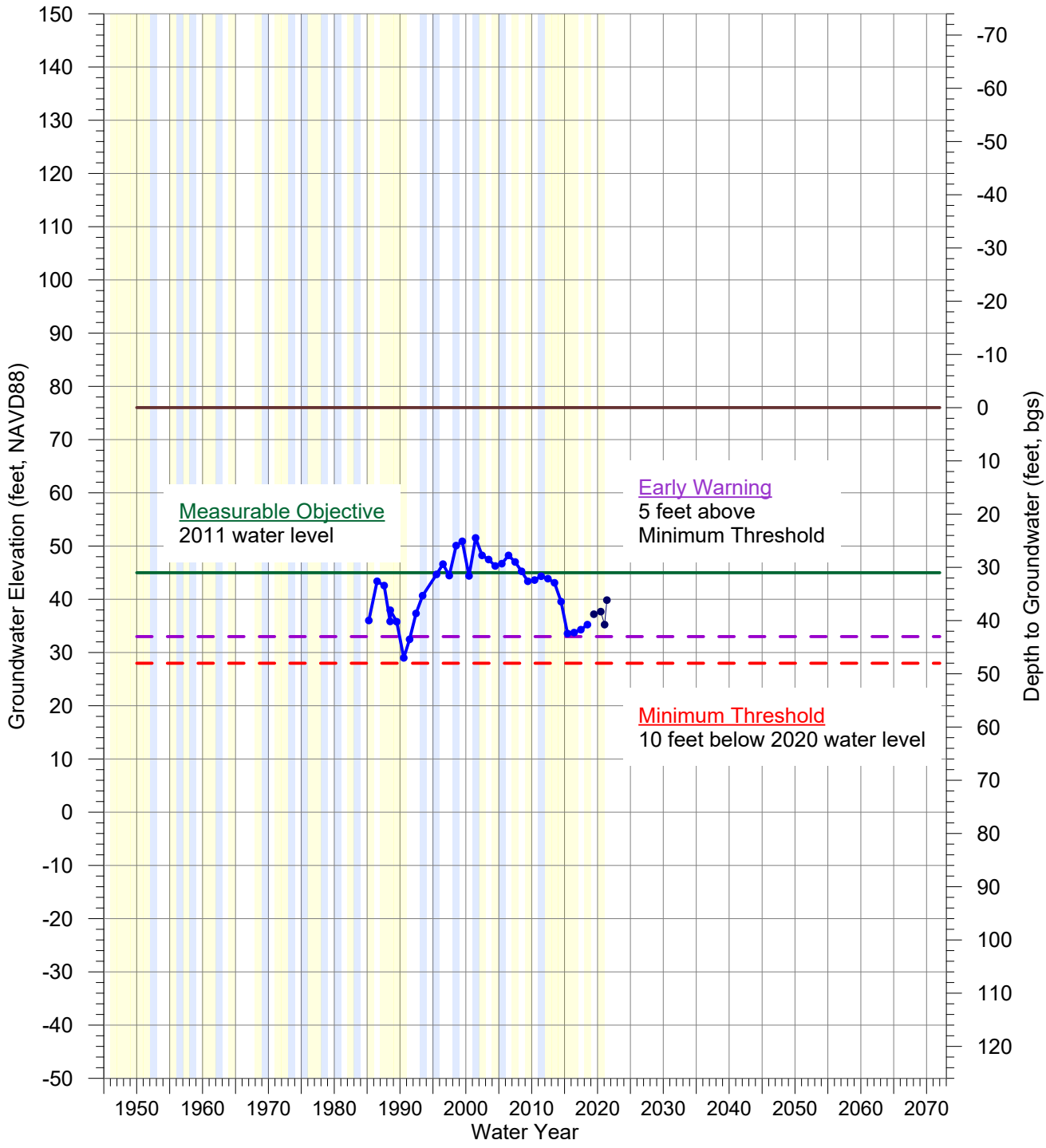
CASGEM ID
49151
Voluntary

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



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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

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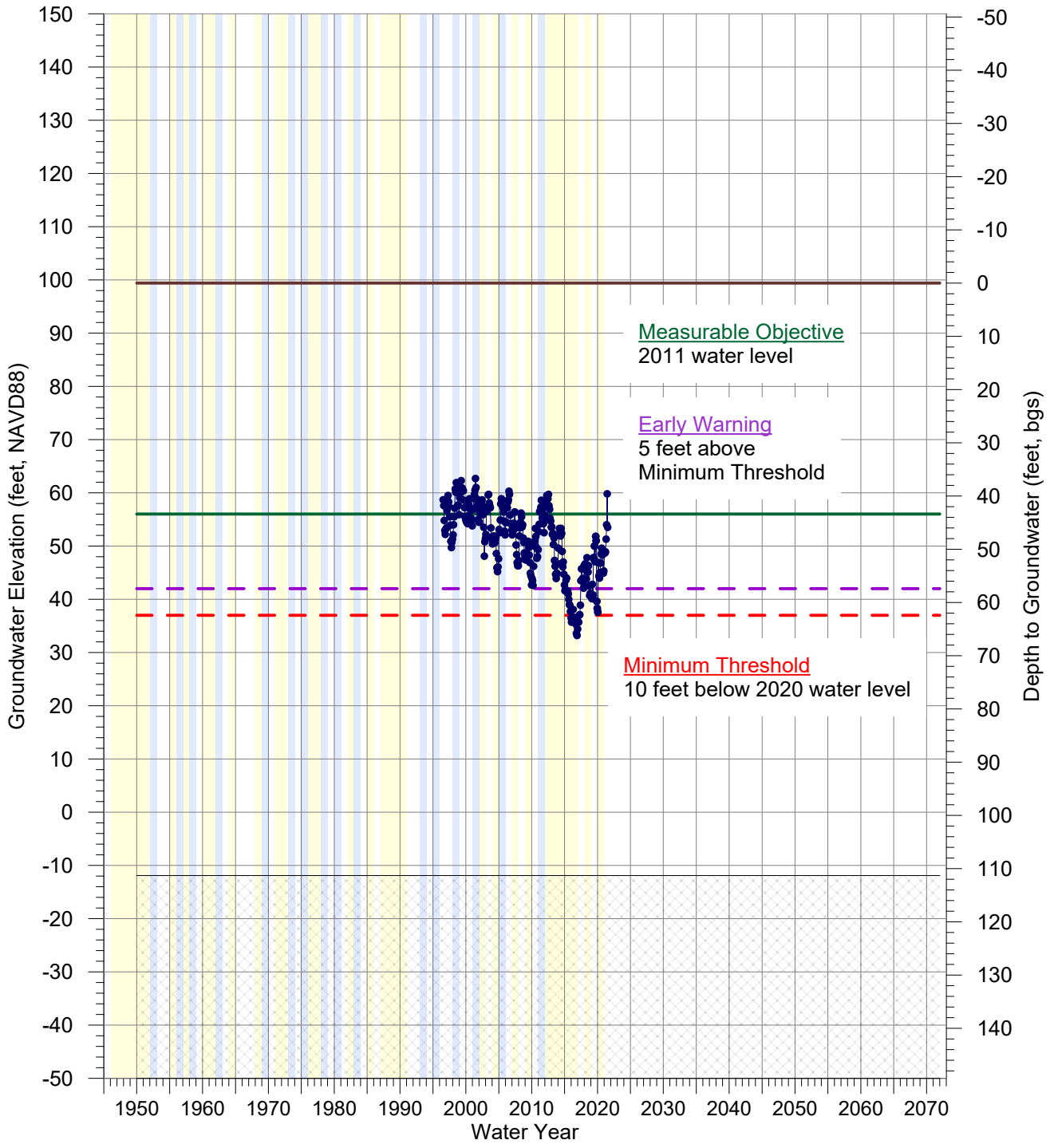
WMA Representative Monitoring Well for Upper Aquifer (Lompoc Plain Subarea) 7N/34W-27F9



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6/8/2021

STETSON ENGINEERS INC.

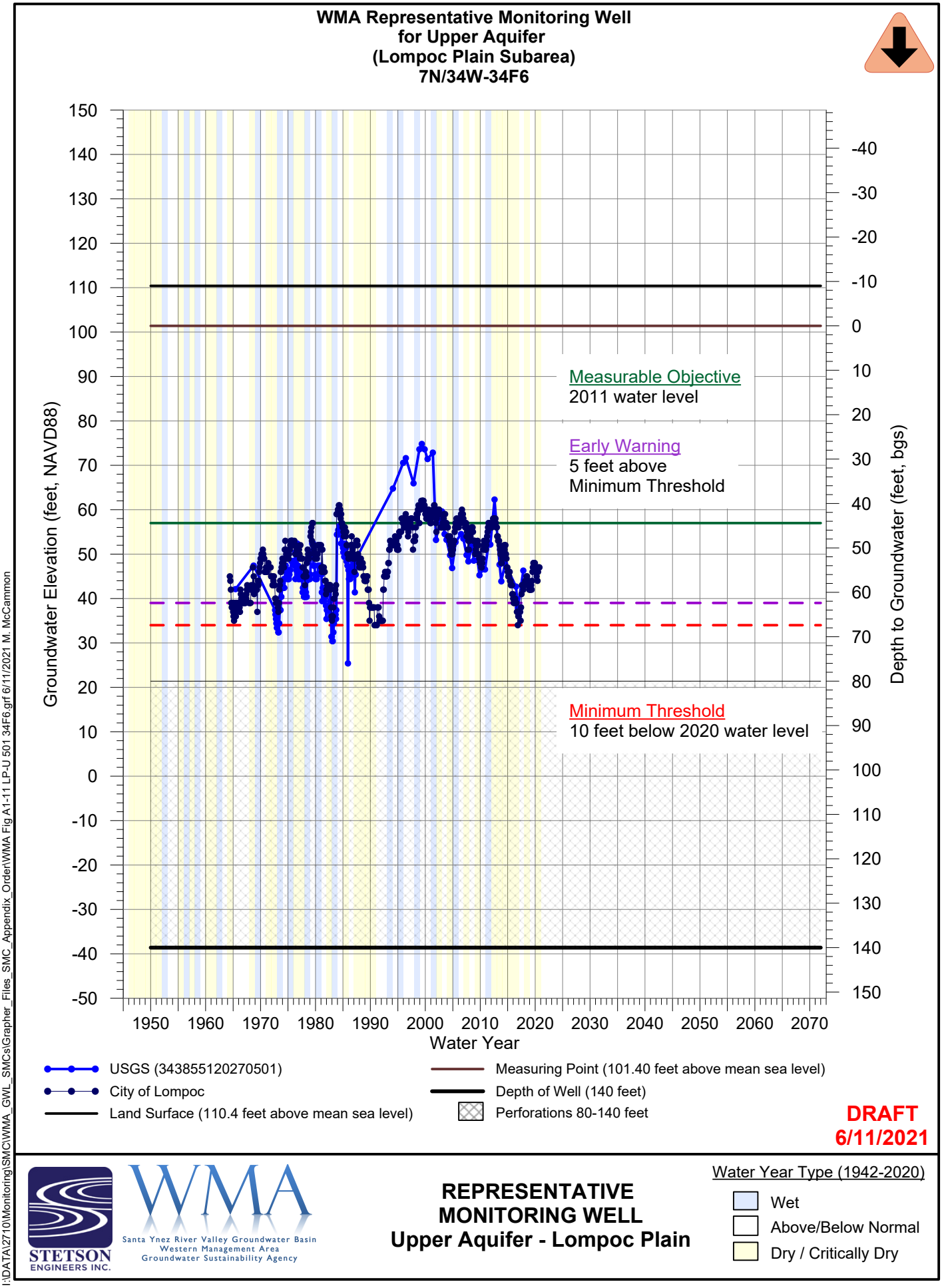
WMA
Santa Ynez River Valley Groundwater Basin
Western Management Area
Groundwater Sustainability Agency

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-10 LP-U 1162 27F9.grf 6/8/2021 M. McCammon

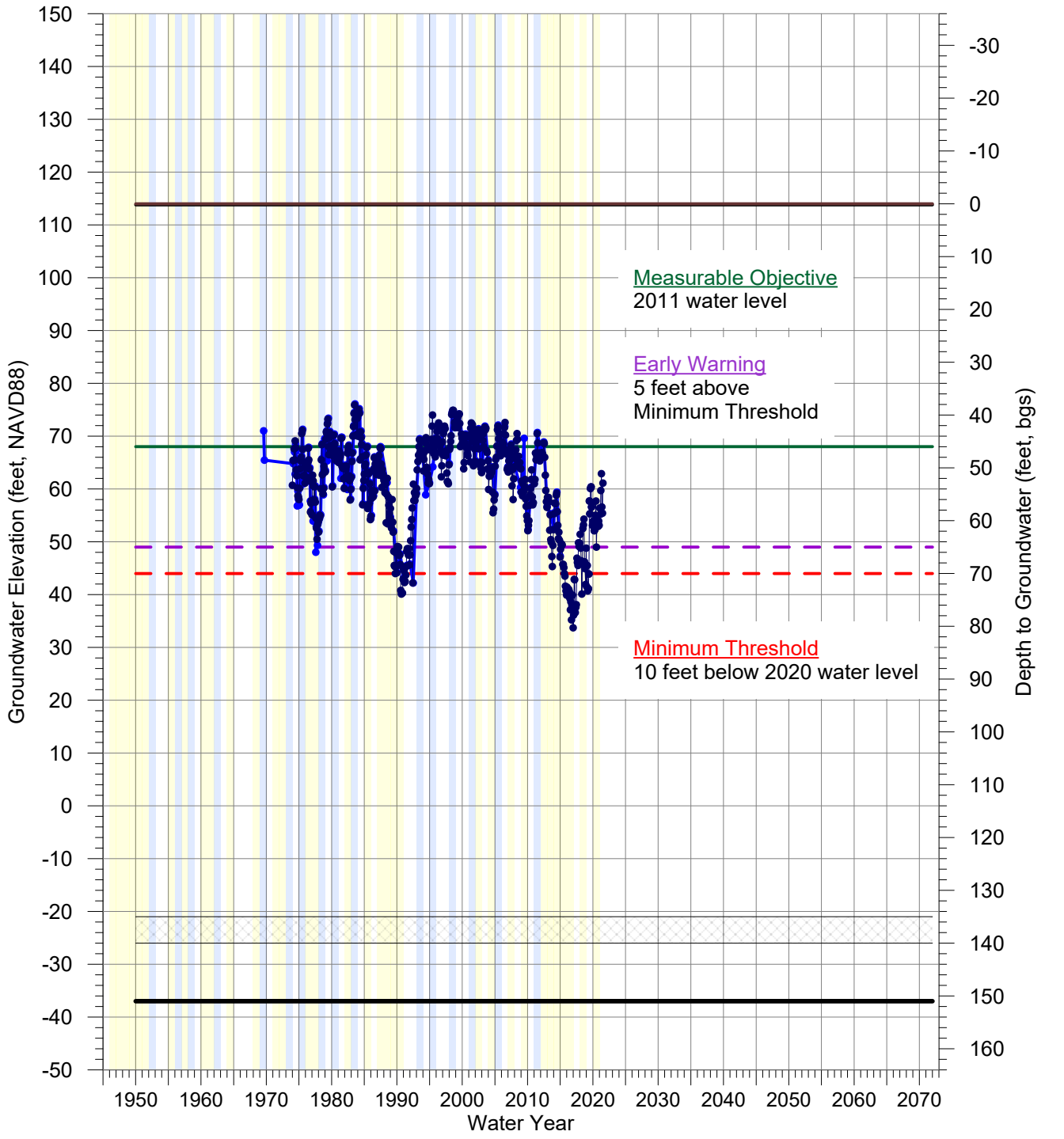
FIGURE A1-11



I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-11 LP-U 501 34F6.grf 6/11/2021 M. McCammon

FIGURE A1-12

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



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6/11/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

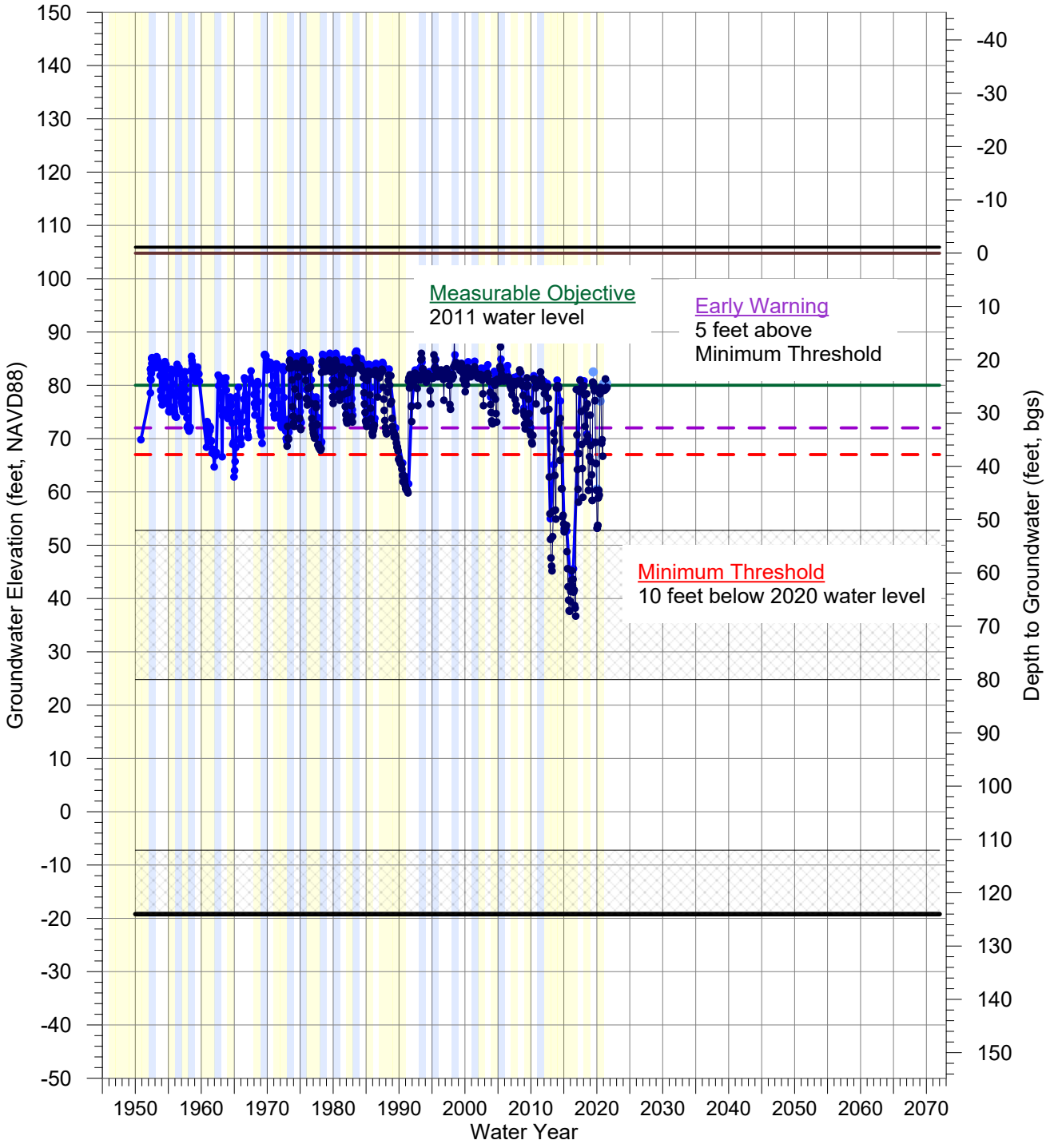
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-12 LP-U 60 26Q5.grf 6/11/2021 M. McCammon

FIGURE A1-13

CASGEM ID
49153
Voluntary

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



US Bureau of Reclamation
USGS (343924120254501)
County of Santa Barbara
Land Surface (105.9 feet above mean sea level)
Measuring Point (104.8 feet above mean sea level)
Depth of Well (124 feet)
Perforations 52-80; 112-124 feet

DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Upper Aquifer - Lompoc Plain

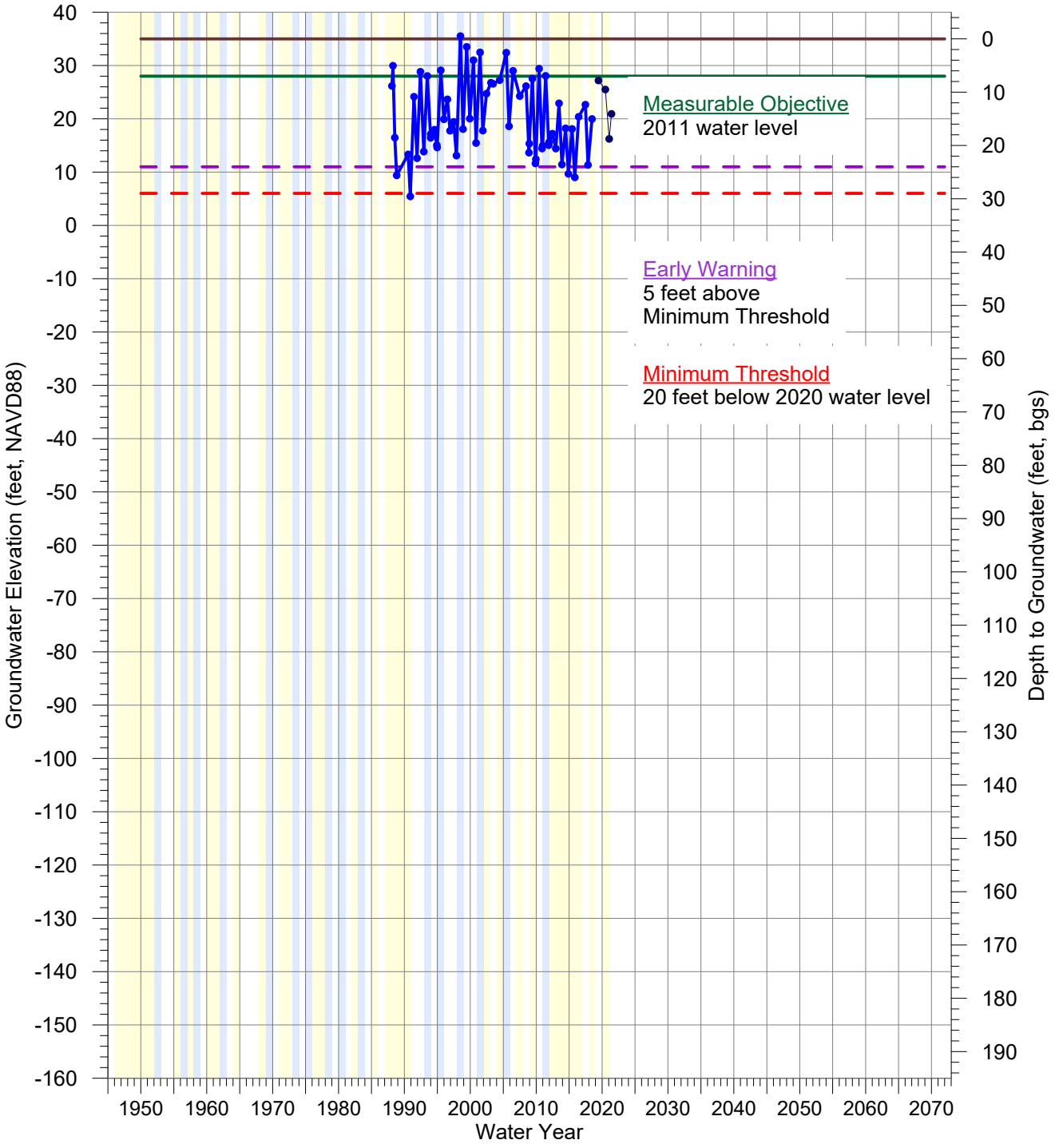
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A1-13 LP-U 32 35K9.grf 6/8/2021 M. McCammon

FIGURE A2-01

CASGEM ID
38298
Voluntary

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



USGS (343929120321004)
County of Santa Barbara
Ground Surface (35 feet above mean sea level)
Depth of Well (299 feet); Perforations TBD

DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

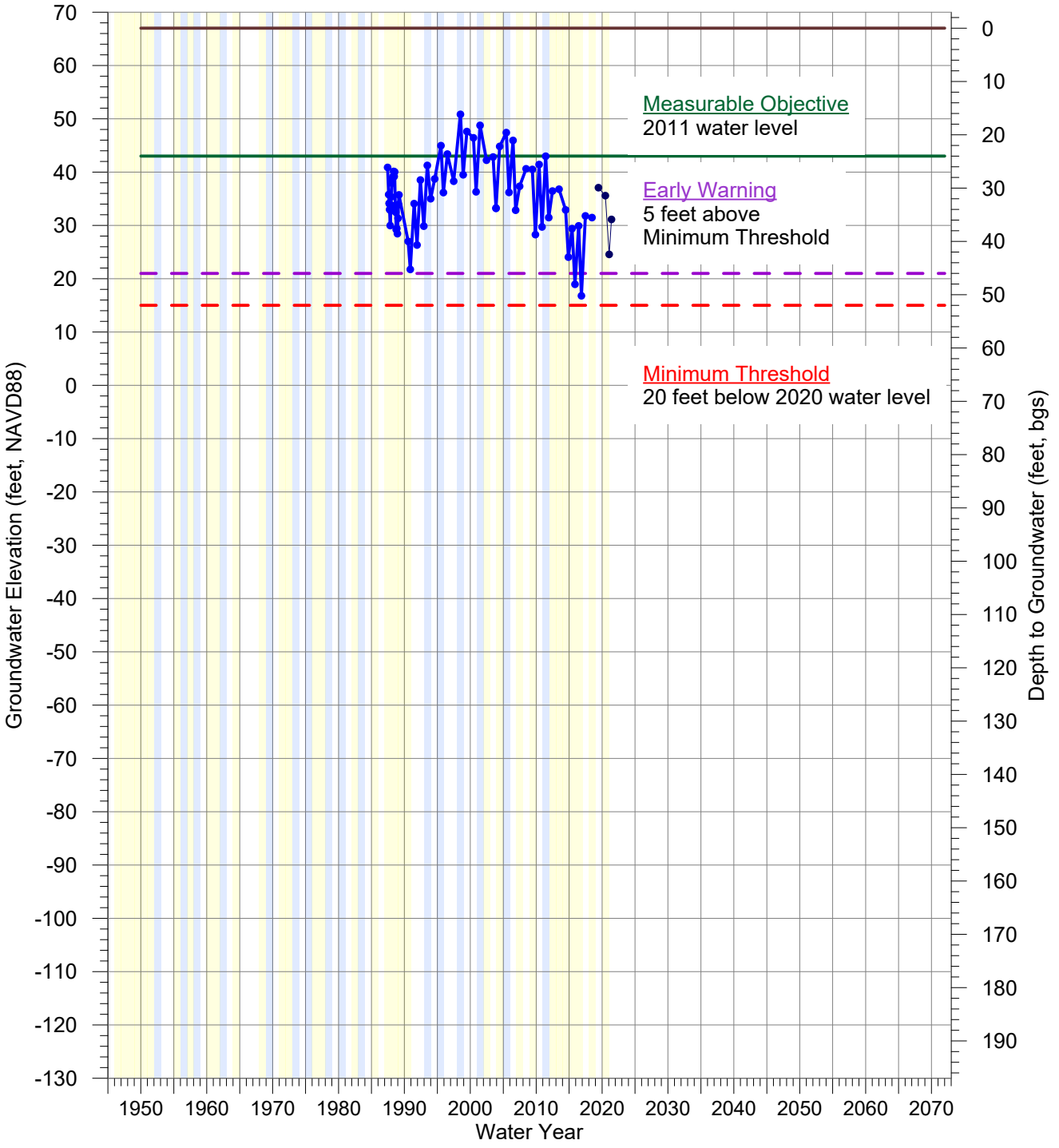
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-01 LP-L 17 26L4.grf 6/8/2021 M. McCammon

FIGURE A2-02

CASGEM ID
23538
Voluntary

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



USGS (343926120293002)
County of Santa Barbara
Ground Surface (67 feet above mean sea level)
Depth of Well (420 feet); Perforations TBD

DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

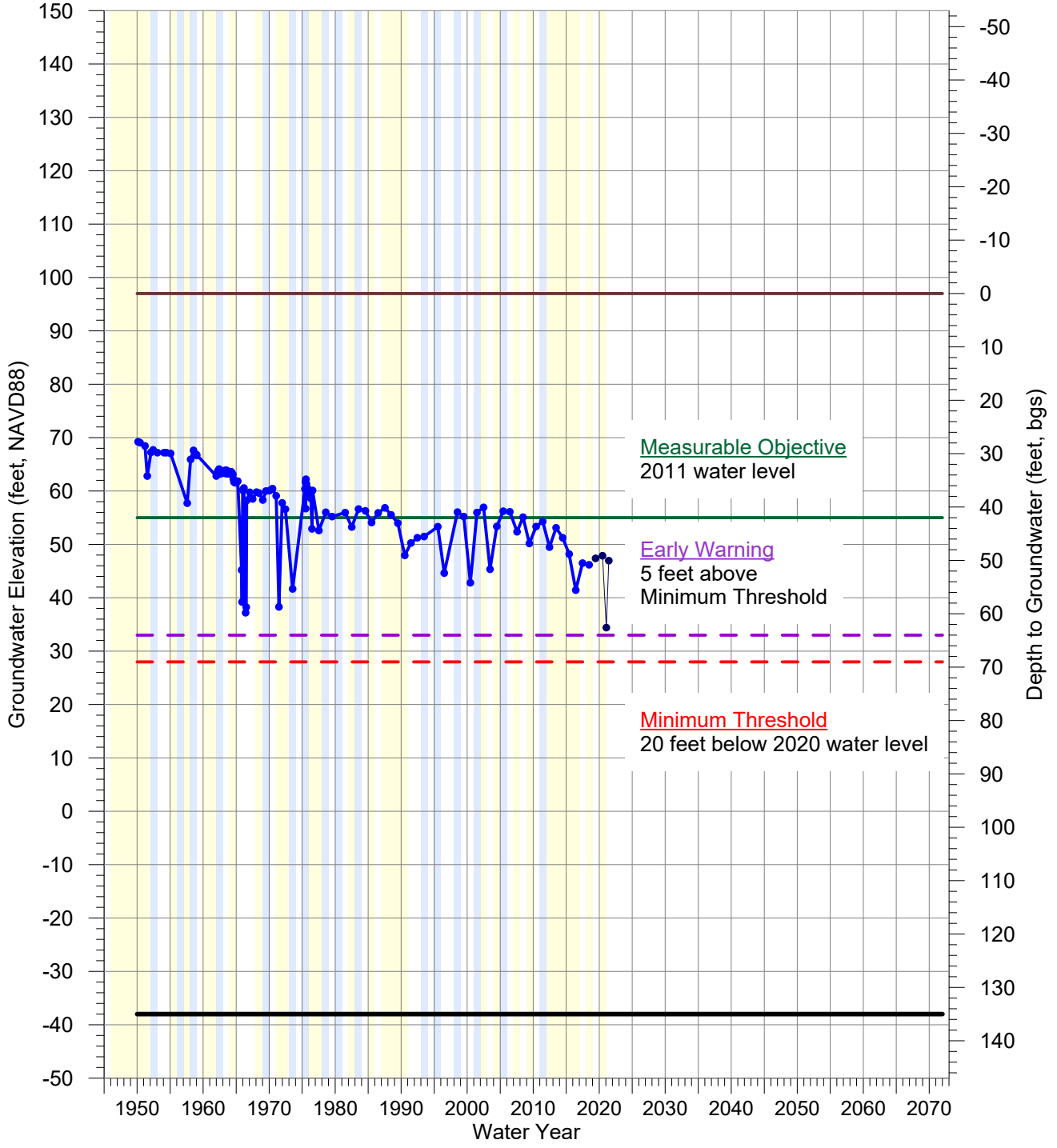
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-02 LP-L 28 29N7.grf 6/8/2021 M. McCammon

FIGURE A2-03

CASGEM ID
49155
Voluntary

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



DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

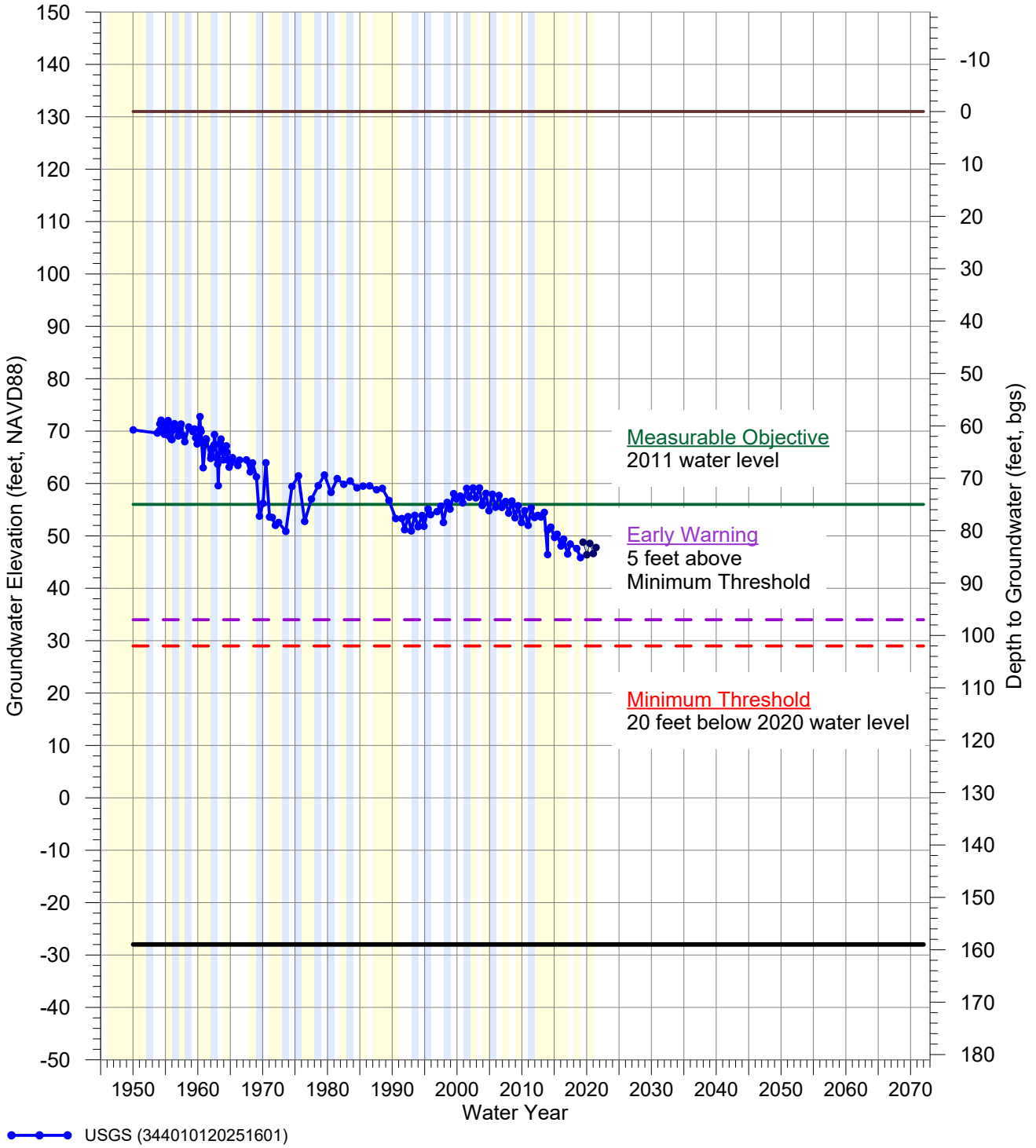
REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Plain

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-03 LP-L 22 22J6.grf 6/8/2021 M. McCammon

CASGEM ID
49156
Voluntary

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



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

**DRAFT
6/8/2021**

STETSON ENGINEERS INC.

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

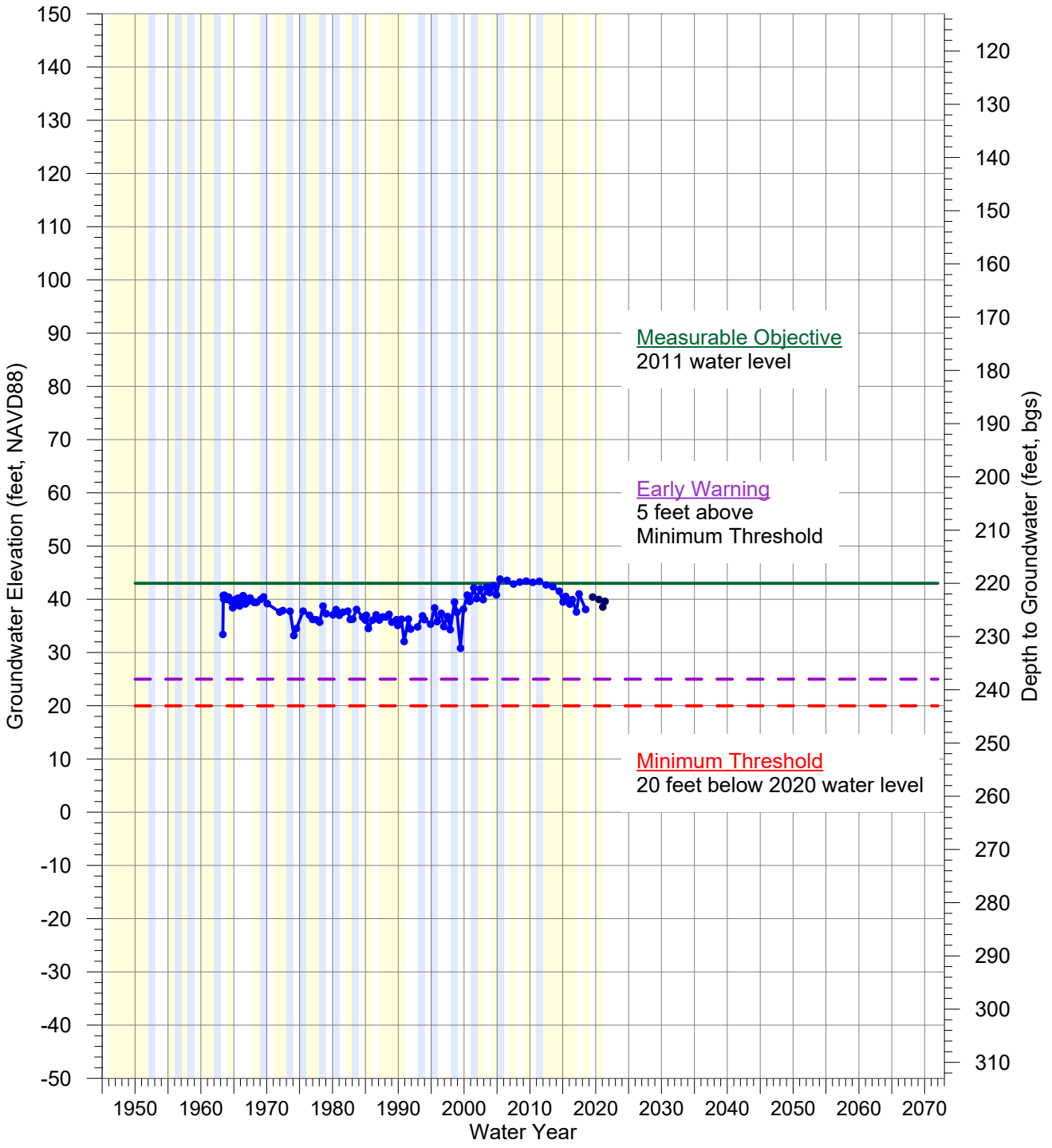
**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Lompoc Plain**

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-04 LP-L 23 24N1.grf 6/8/2021 M. McCammon

CASGEM ID
49168
Voluntary

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



- USGS (343923120332501)
- County of Santa Barbara
- Ground Surface (263 feet above mean sea level)
- Depth of Well (582 feet); Perforations TBD

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6/8/2021

STETSON ENGINEERS INC.

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

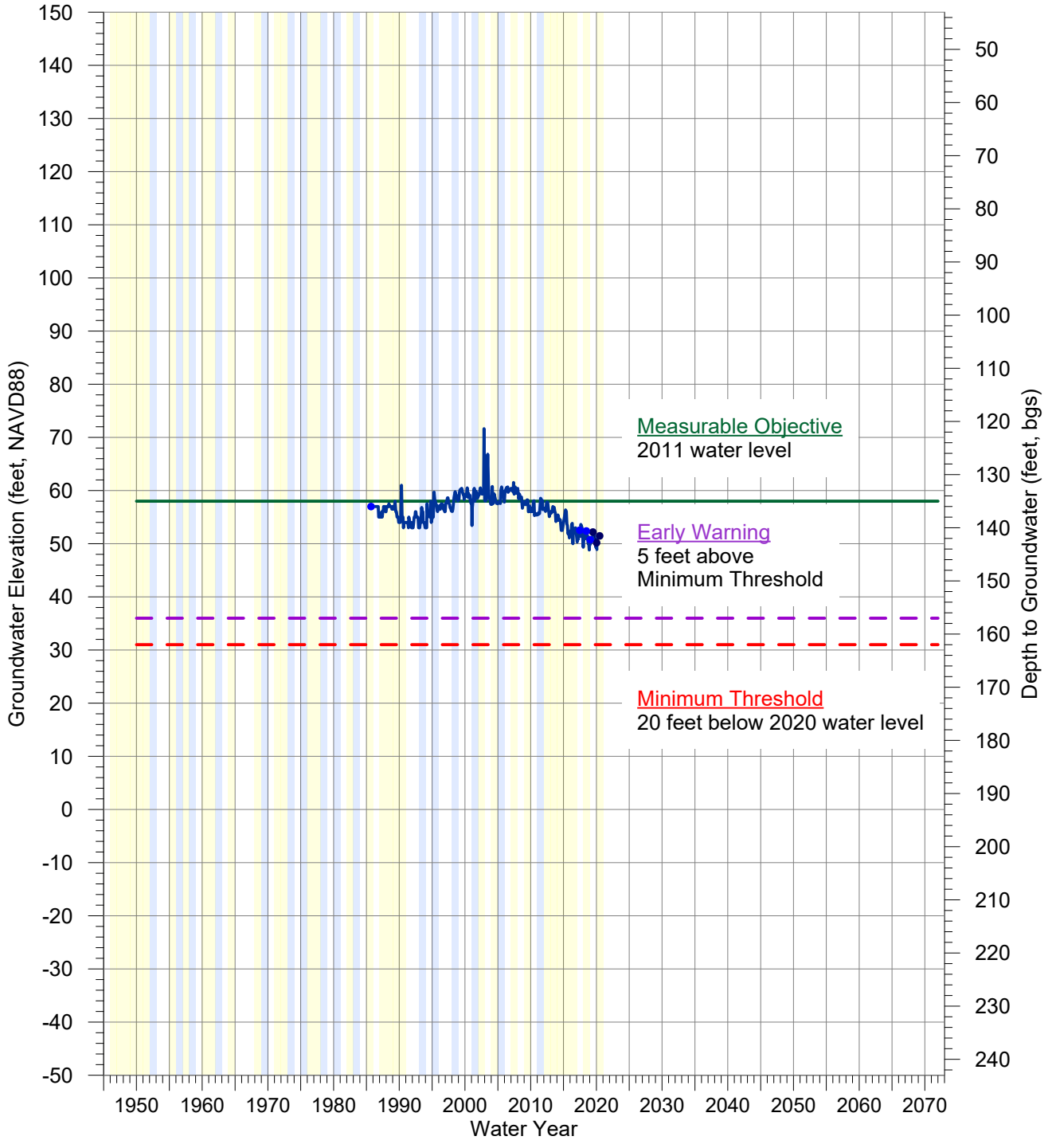
REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Terrace

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-05 LT-L 44 27P1.grf 6/8/2021 Stetson

FIGURE A2-06

WMA Representative Monitoring Well for Lower Aquifer (Lompoc Upland Subarea) 7N/34W-15D3



Vandenberg Village CSD
USGS (344142120272301)
County of Santa Barbara
Ground Surface (193 feet above mean sea level)
Depth of Well (683 feet); Perforations 458-683 feet

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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

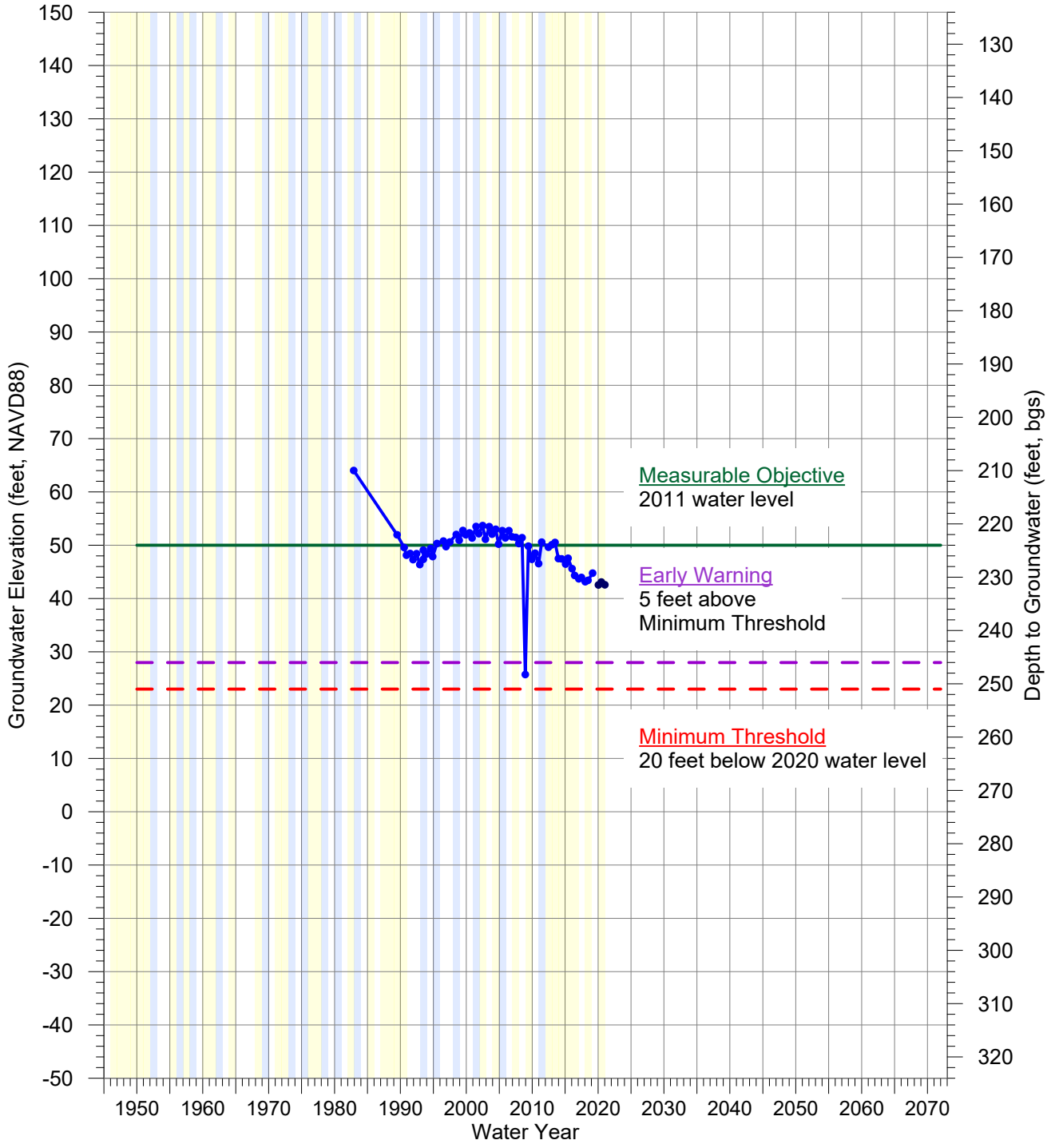
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-06 LU-L 602 15D3.grf 6/8/2021 M. McCammon

FIGURE A2-07

CASGEM ID
49142
Voluntary

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



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

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6/8/2021**

STETSON ENGINEERS INC.

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

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

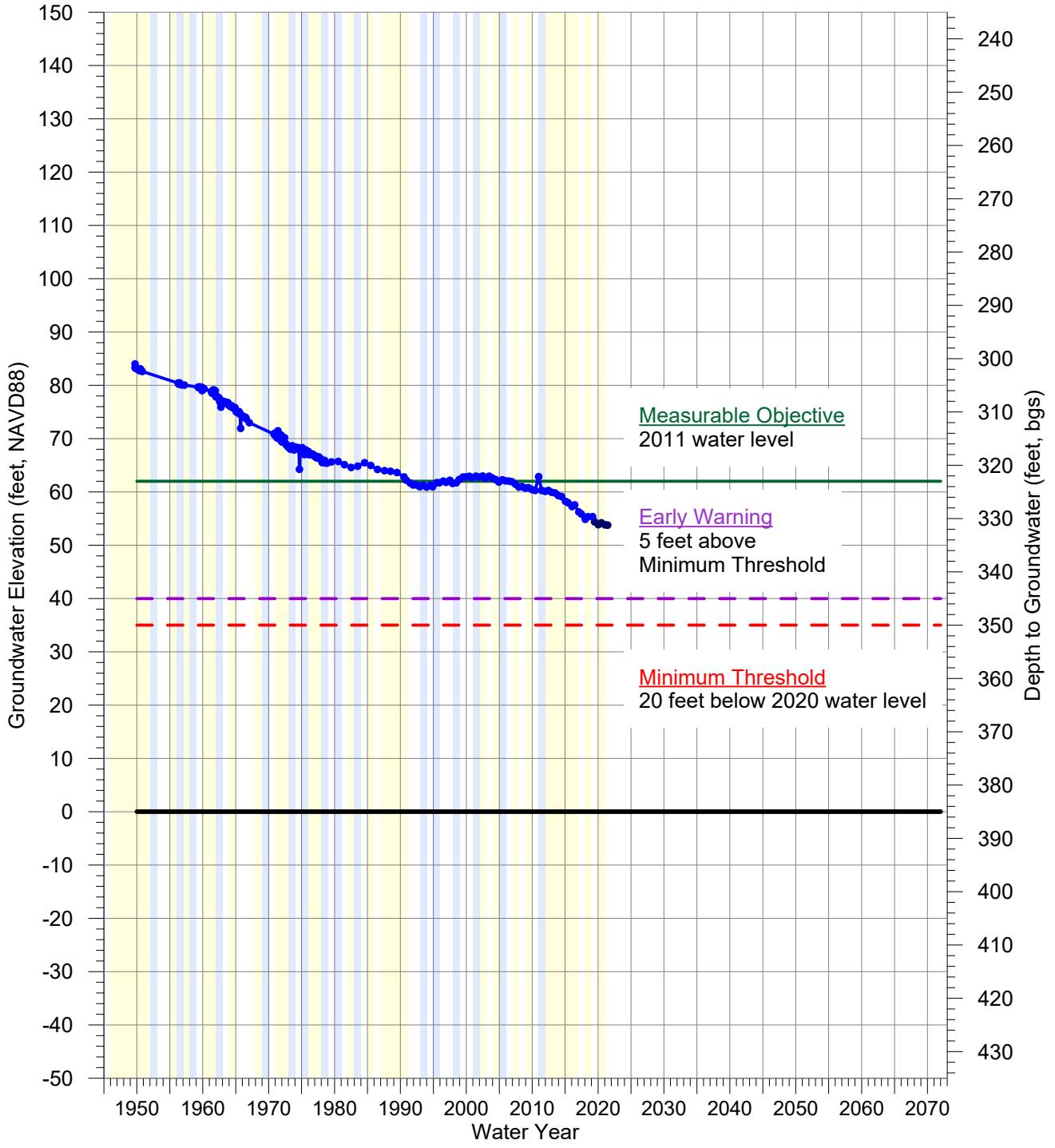
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-07 LU-L 52 14F4.grf 6/8/2021 M. McCammon

FIGURE A2-08

CASGEM ID
49139
CASGEM

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



DRAFT
6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

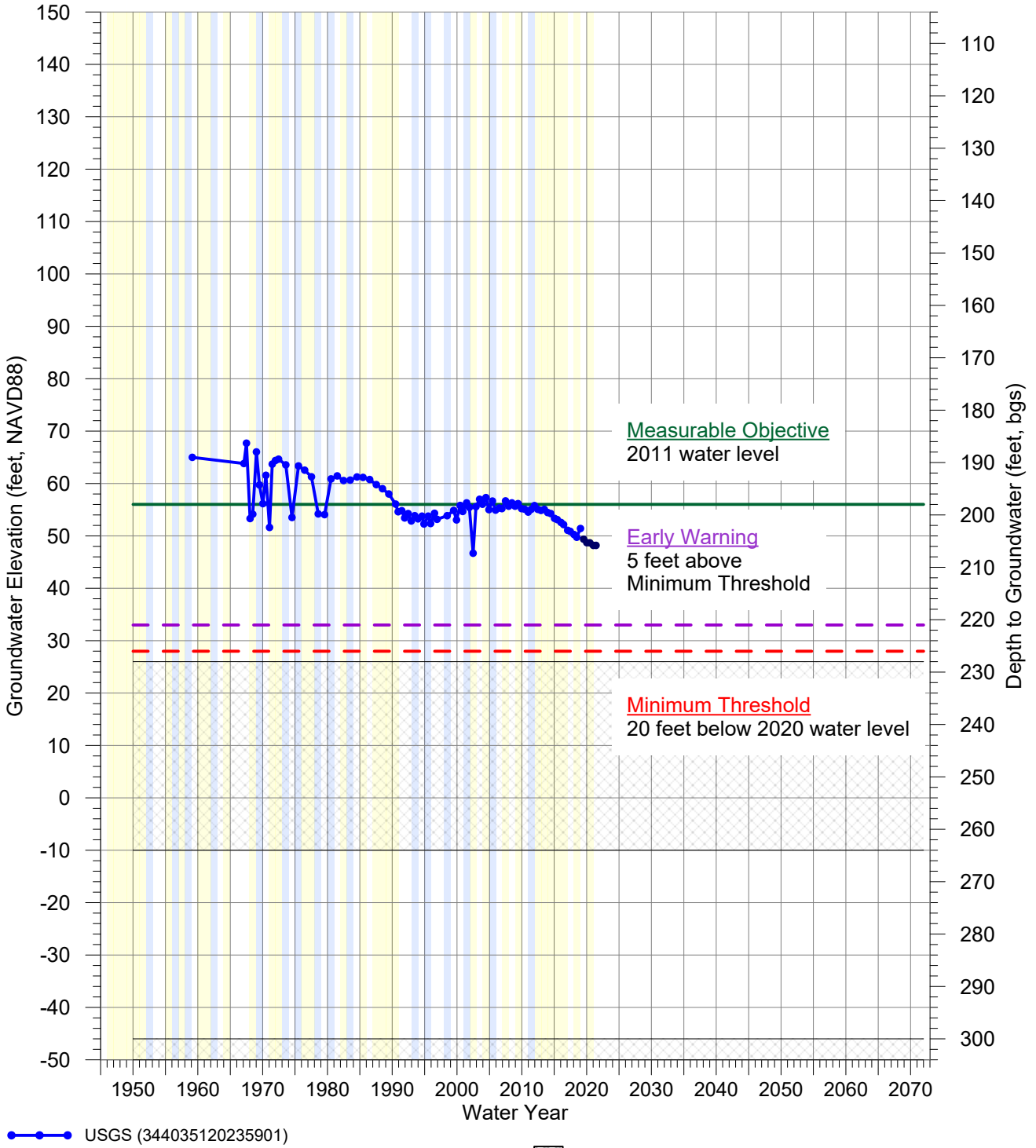
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-08 LU-L 51 12E1.grf 6/8/2021 M. McCammon

FIGURE A2-09

CASGEM ID
49143
Voluntary

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



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6/8/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL
Lower Aquifer - Lompoc Upland

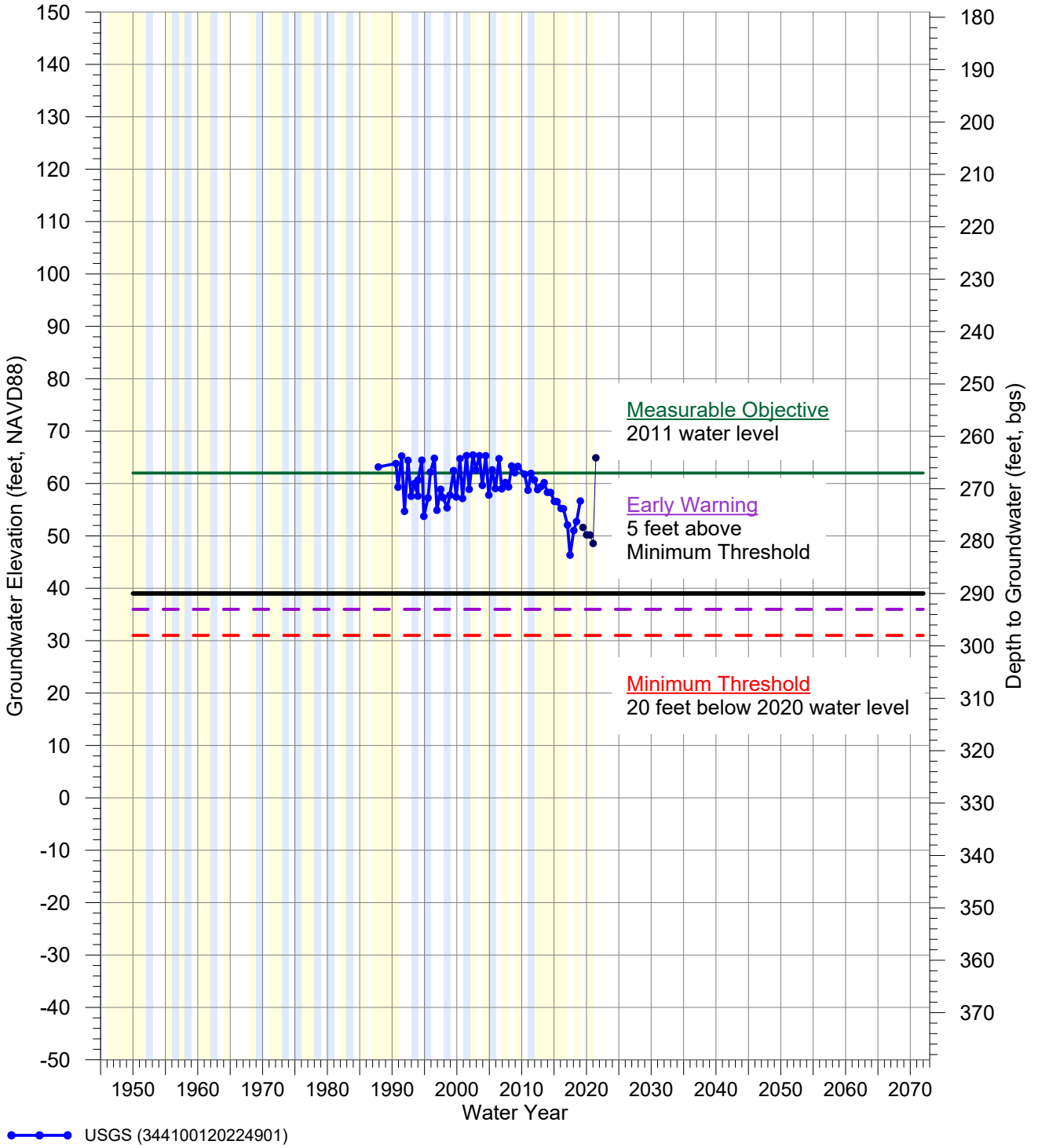
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-09 LU-L 49 19D1.grf 6/8/2021 M. McCammon

FIGURE A2-10

CASGEM ID
49144
Voluntary

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



USGS (344100120224901)
County of Santa Barbara
Ground Surface (329 feet above mean sea level)
Depth of Well (290 feet); Perforations TBD

**DRAFT
6/8/2021**

STETSON ENGINEERS INC.

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

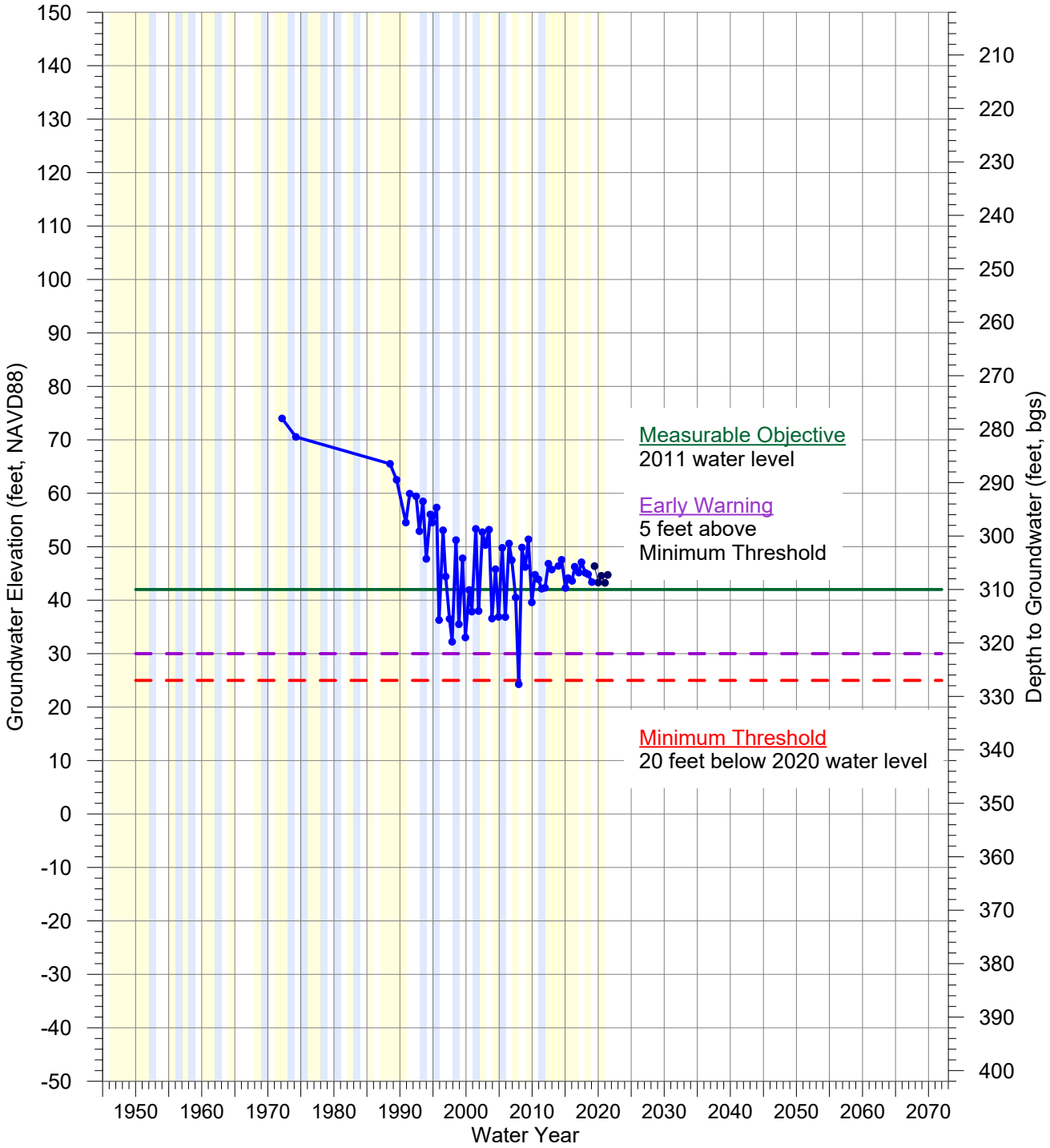
**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Lompoc Upland**

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-10 LU-L 47 17M1.grf 6/8/2021 M. McCammon

CASGEM ID
49129
Voluntary

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



**DRAFT
6/8/2021**

STETSON ENGINEERS INC.

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

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

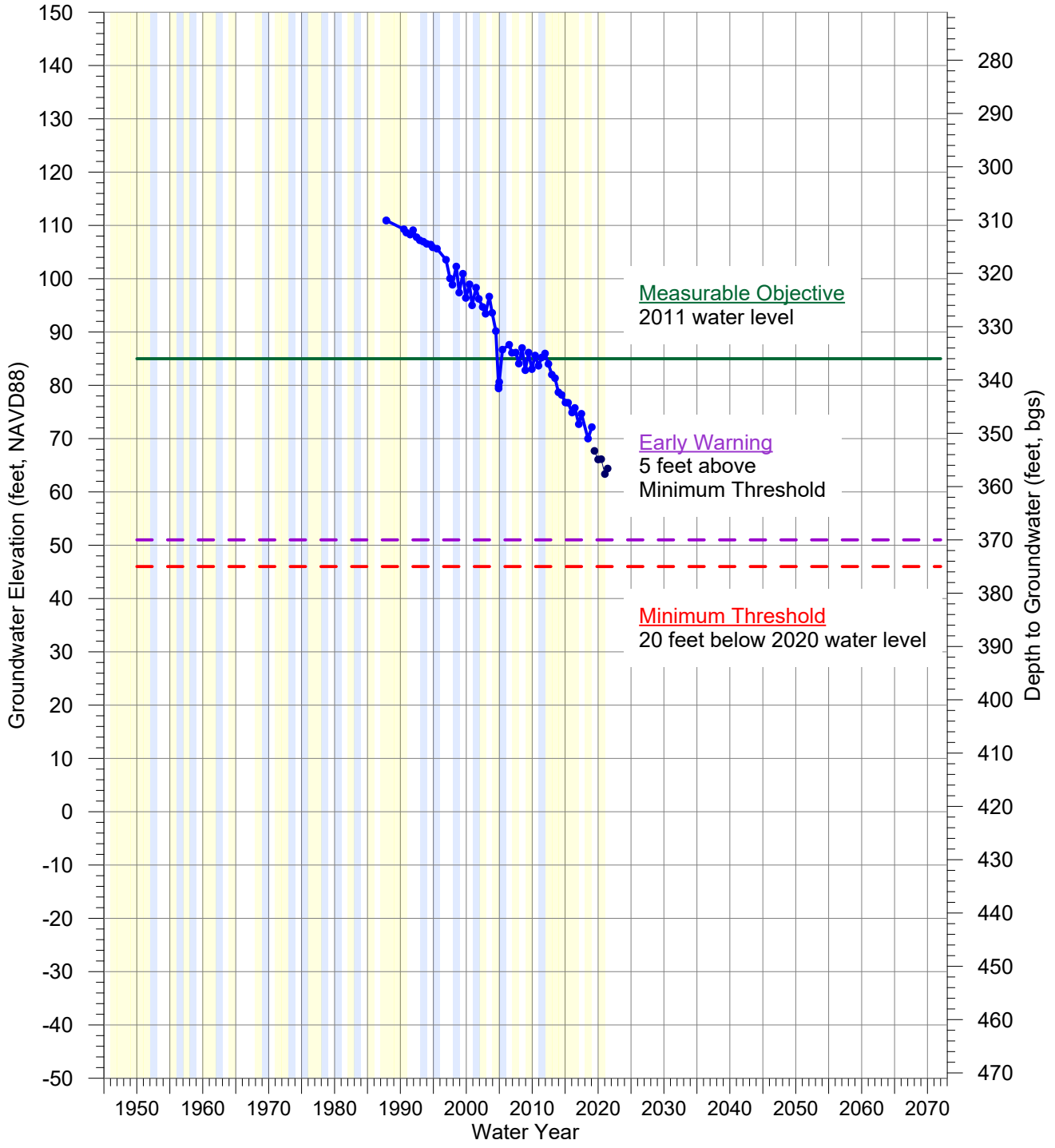
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-11 SR-L 81 28D3.grf 6/8/2021 M. McCammon

FIGURE A2-12

CASGEM ID
23686
Voluntary

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



USGS (344025120211501)
County of Santa Barbara
Ground Surface (421 feet above mean sea level)
Depth of Well (TBD); Perforations TBD

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6/8/2021**

STETSON ENGINEERS INC.

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

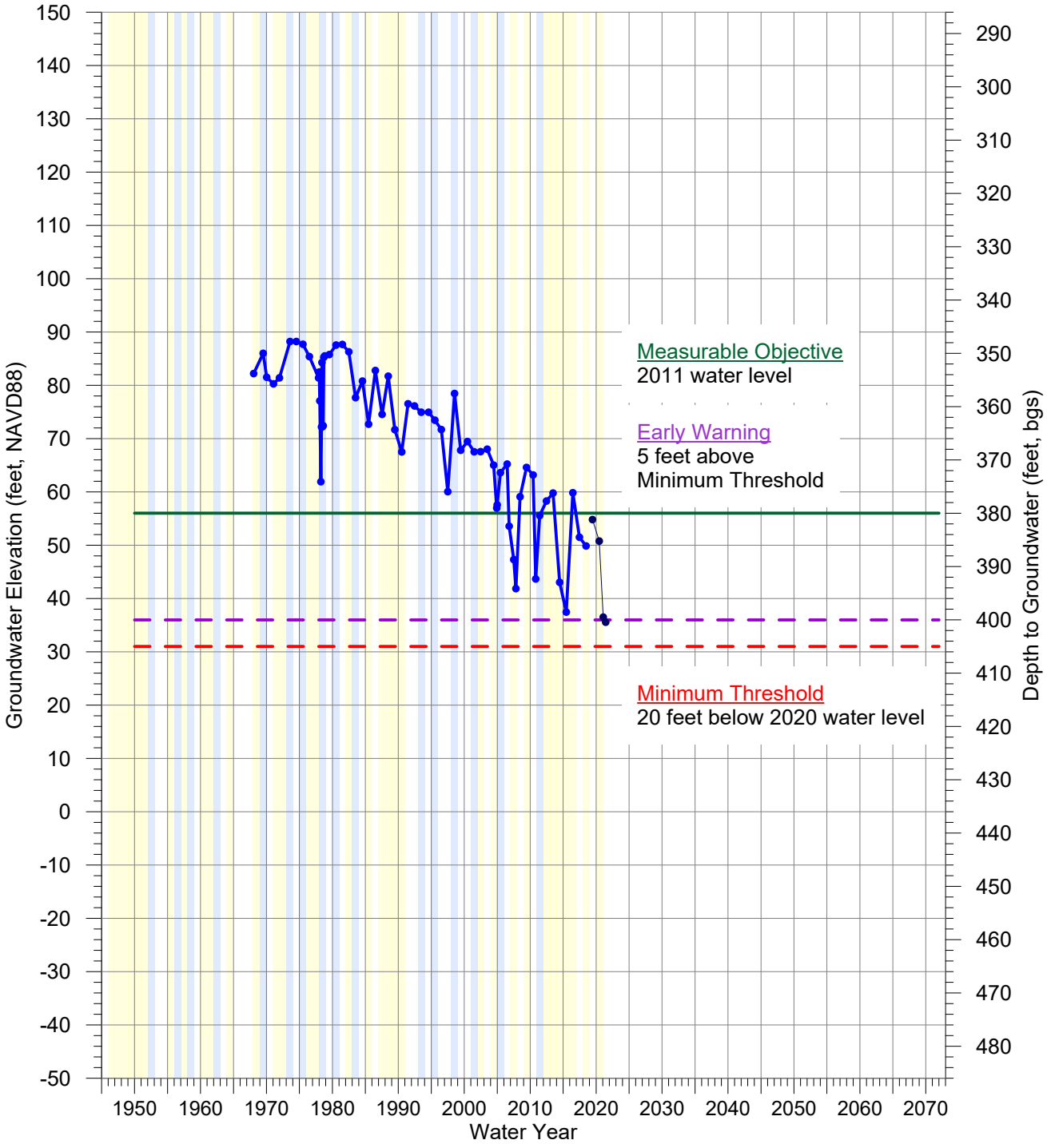
**REPRESENTATIVE
MONITORING WELL
Lower Aquifer - Santa Rita Upland**

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-12 SR-L 78 21G2.grf 6/8/2021 M. McCammon

CASGEM ID
49132
Voluntary

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



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

**DRAFT
6/8/2021**

STETSON ENGINEERS INC.

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

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

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

I:\DATA\2710\Monitoring\SMC\WMA_GWL_SMCs\Grapher_Files_SMC_Appendix_Order\WMA Fig A2-13 SR-L 80 27G1.grf 6/8/2021 M. McCammon

Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-B:

Stetson Engineers Draft Technical Memorandum Sustainable Management Criteria: WMA Groundwater Decline Analysis, Dated May 21, 2021

DRAFT TECHNICAL MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: milesm@stetsonengineers.com

TO:	GSA Agency Staff WMA Committee	DATE:	May 21, 2021
FROM:	SGMA Technical Committee, Stetson Engineers	JOB NO:	2710 - Santa Ynez SGMA
RE:	**DRAFT** Sustainable Management Criteria: WMA 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 1-1** 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.

[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 DWR website 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 Western Management Area (WMA) 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 1-1, 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 Lompoc, Vandenberg Village Community Services District, and Mission Hills Community Services District in the WMA) were explicitly included. **Figure 1-2** 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 aquifer associated with a particular well was determined using 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 WMA boundary were excluded.

In addition, the primary use of each well as Agricultural, Municipal[3], 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, broken down by each of the WMA subareas.

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 1-2.

Well Use	Lower Aquifer	Upper Aquifer	*Other Aquifer	WMA Total
Agriculture	47	63	12	122
Municipal	14	7	0	21
Domestic	94	28	12	134
Other	36	37	22	95
Total	191	135	46	372

[3] The term "Municipal" use means water use for public water supply, and is not strictly limited to wells used to supply the City of Lompoc, the sole municipality in the WMA.

*Other Aquifer: Wells in alluvium in WMA subareas other than the Lompoc Plain. This includes the Santa Ynez River Alluvium wells, and shallow wells in perched formations.

These counts are comparable to what the Santa Ynez River Water Conservation District (SYRWCD) well registry (Stetson, 2021). District zones include wells pumping groundwater from all aquifers. Zone B which includes the Lompoc Terrace, Lompoc Plain, and Lompoc Upland had 344 registered wells in 2020 and 348 in 2021. Zone F which is the Santa Rita Upland had 72 registered wells in 2020 and 77 in 2021.

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 Western 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 WMA there was generally fairly good coverage in terms of spring 2020 water levels in the Lower Aquifer to develop groundwater level contours. Areas of less coverage would include the portions of the Lompoc Upland, and most of the Lompoc Terrace. For this analysis, the elevations were interpolated into these areas, however this is an area of increased uncertainty in this analysis.

RESULTS

Two primary sets of wells were looked at and developed into figures for this report. A comparison of wells with perforations in the Lower Aquifer against lower aquifer water levels (Figures 2-1 through 2-8) and wells in Lompoc Plain with perforations in the Upper Aquifer (Figures 3-1 through 3-8).

WELLS PERFORATED IN LOWER AQUIFER

Figure 2-1 shows the depth from 2020 spring water levels to the top of well perforations for all of the 191 wells with perforations in the Lower Aquifer. Top of well perforations is 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 2-2 shows the same data as Figure 2-1, but focuses in on the top 100 feet. 126 of 191 (66%) of the wells in WMA Lower Aquifer wells are perforated in the top 100 feet.

Figure 2-3 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. 92 of the 191 (48%) WMA Lower Aquifer wells are in this top 50 feet.

Figure 2-4 shows depth from 2020 spring water levels to the top of well perforations and depth to the base of the well perforations for all 191 Lower Aquifer 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 2-5 is the same as Figure 2-4, but only for the 47 agricultural wells. 28 wells (60%) are perforated in the top 100 feet.

Figure 2-6 is the same as Figure 2-4, but only for the 14 municipal wells. 7 wells (50%) are perforated in the top 100 feet.

Figure 2-7 is the same as Figure 2-4, but only for the 94 domestic wells. 63 wells (67%) are perforated in the top 100 feet.

Figure 2-8 is the same as Figure 2-4, but only for the 36 other wells. 28 wells (78%) are perforated in the top 100 feet. 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.

WELLS PERFORATED IN UPPER AQUIFER, LOMPOC PLAIN

Figure 3-1 shows the depth from 2020 spring water levels to the top of well perforations for all of the 135 wells in the Lompoc Plain with perforations in the Upper Aquifer. 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 3-2 shows the same data as Figure 3-1, but focuses in on the top 100 feet. This is 84 of the 135 wells (62%).

Figure 3-3 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. Only 53 of the 191 (39%) of these Upper Aquifer wells are in this top 50 feet.

Figure 3-4 shows depth from 2020 spring water levels to the top of well perforations and depth to the base of the well perforations for all 135 Upper Aquifer 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 3-5 is the same as Figure 2-4, but only for the 63 agricultural wells. 27 wells (43%) are perforated in the top 100 feet.

Figure 3-6 is the same as Figure 2-4, but only for the 7 municipal wells. 7 wells (100%) are perforated in the top 100 feet.

Figure 3-7 is the same as Figure 2-4, but only for the 28 domestic wells. 20 wells (71%) are perforated in the top 100 feet.

Figure 3-8 is the same as Figure 2-4, but only for the 37 other wells. 30 wells (81%) are perforated in the top 100 feet. 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 B and F. This found that over the recent period (2005-2021), 13% to 15.5% of all of the registered wells were listed as inactive. While the SYRWCD well registry is for a different number of wells (425 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.

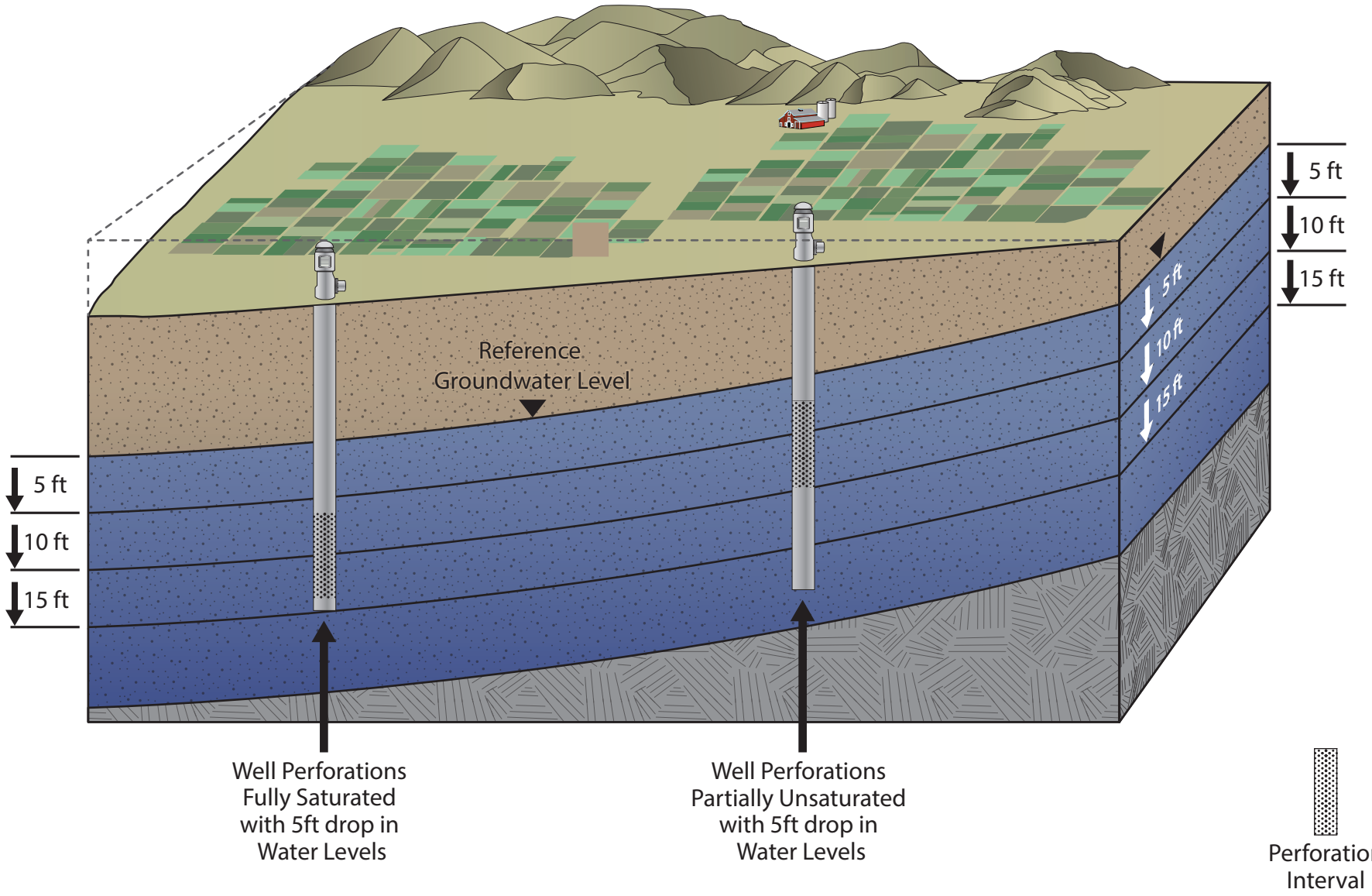
REFERENCES

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 Western 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.

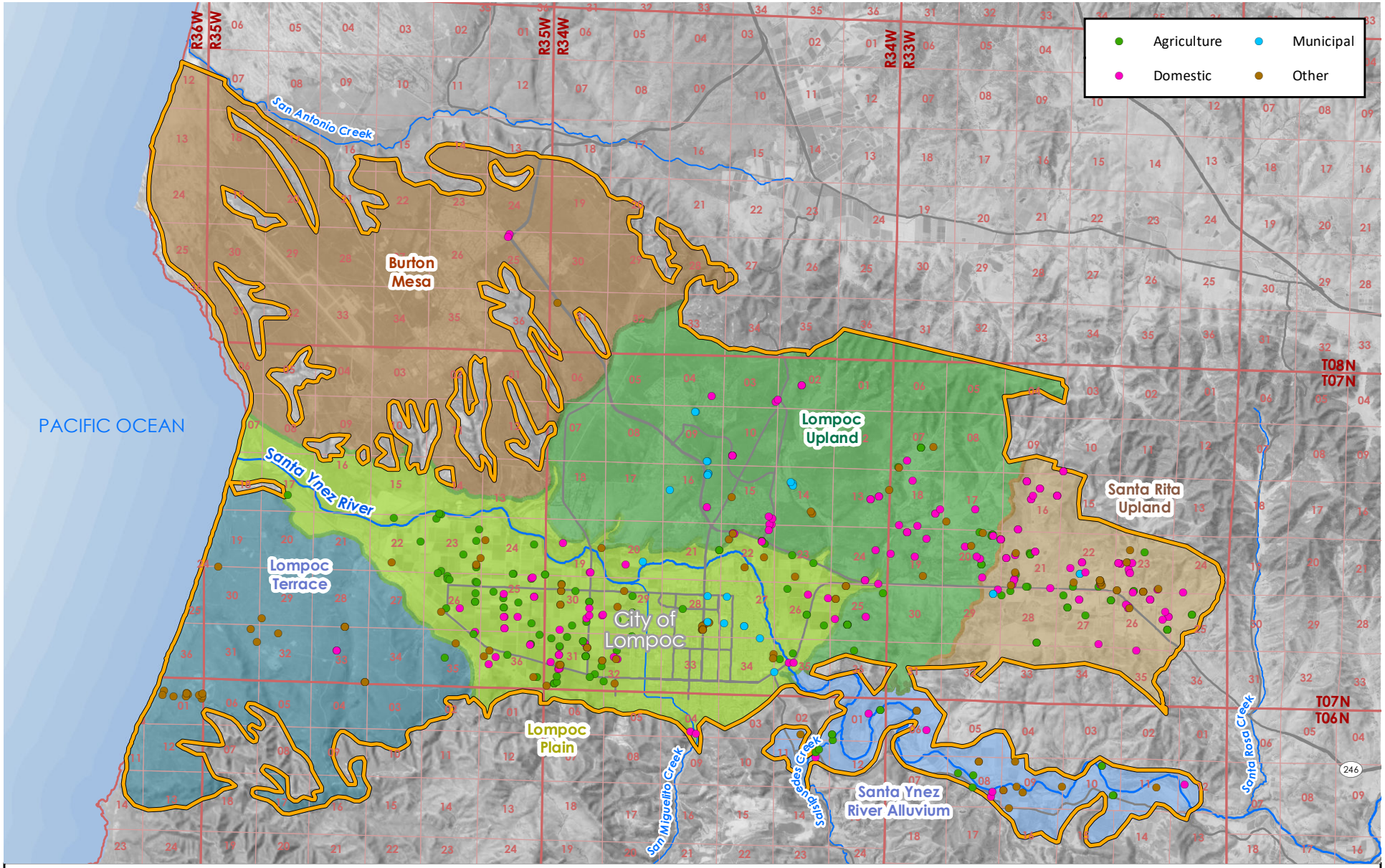
Stetson (2020) DRAFT Western Management Area Hydrogeologic Conceptual Model.



STETSON
ENGINEERS INC.

Analysis of Groundwater Level Decline
Effects on Wells

FIGURE 1-1



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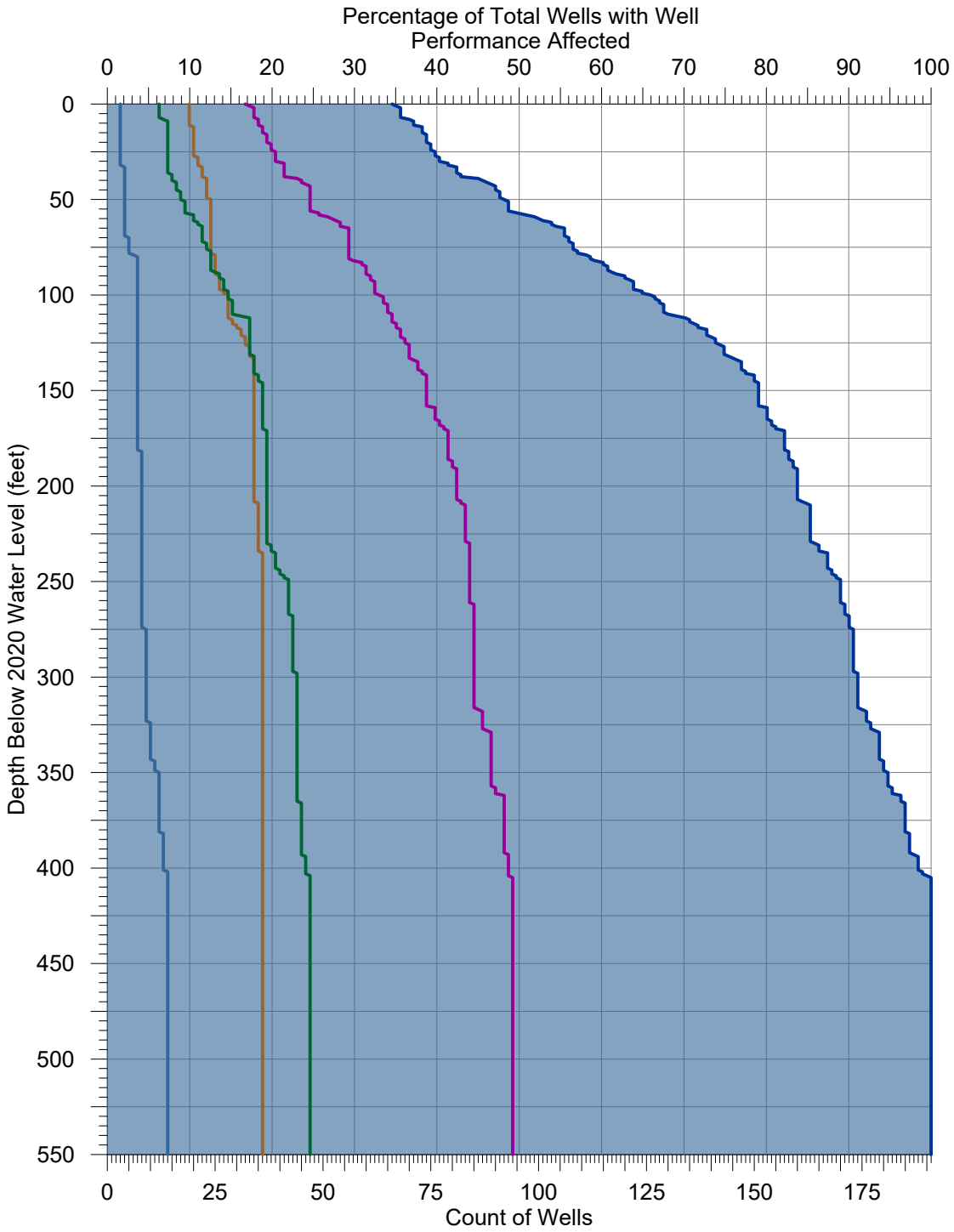
Groundwater Level Decline
Perforation Analysis Well Locations

0 1 2 Miles

N

FIGURE 1-2



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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 LOWER AQUIFER SPRING 2020 WATER DEPTH

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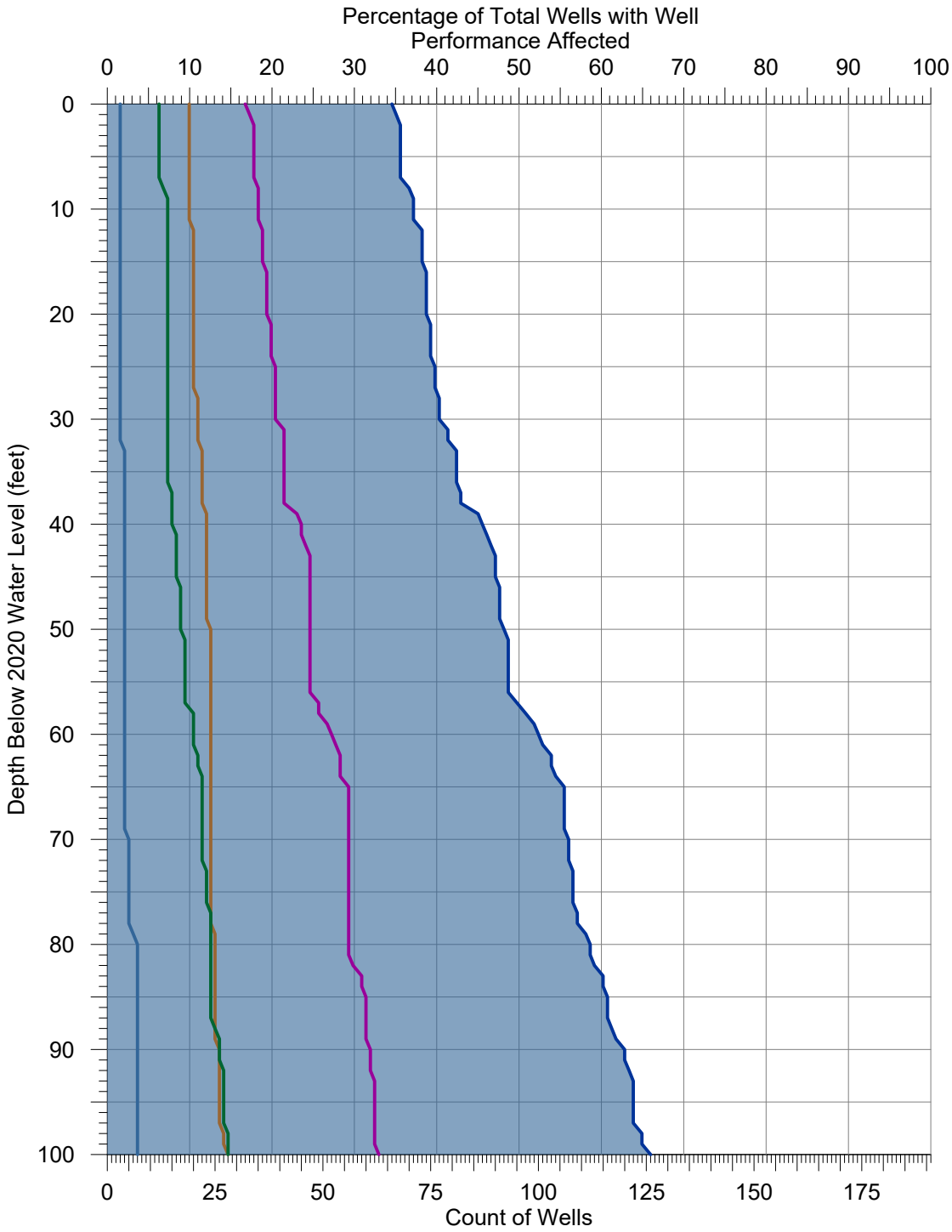

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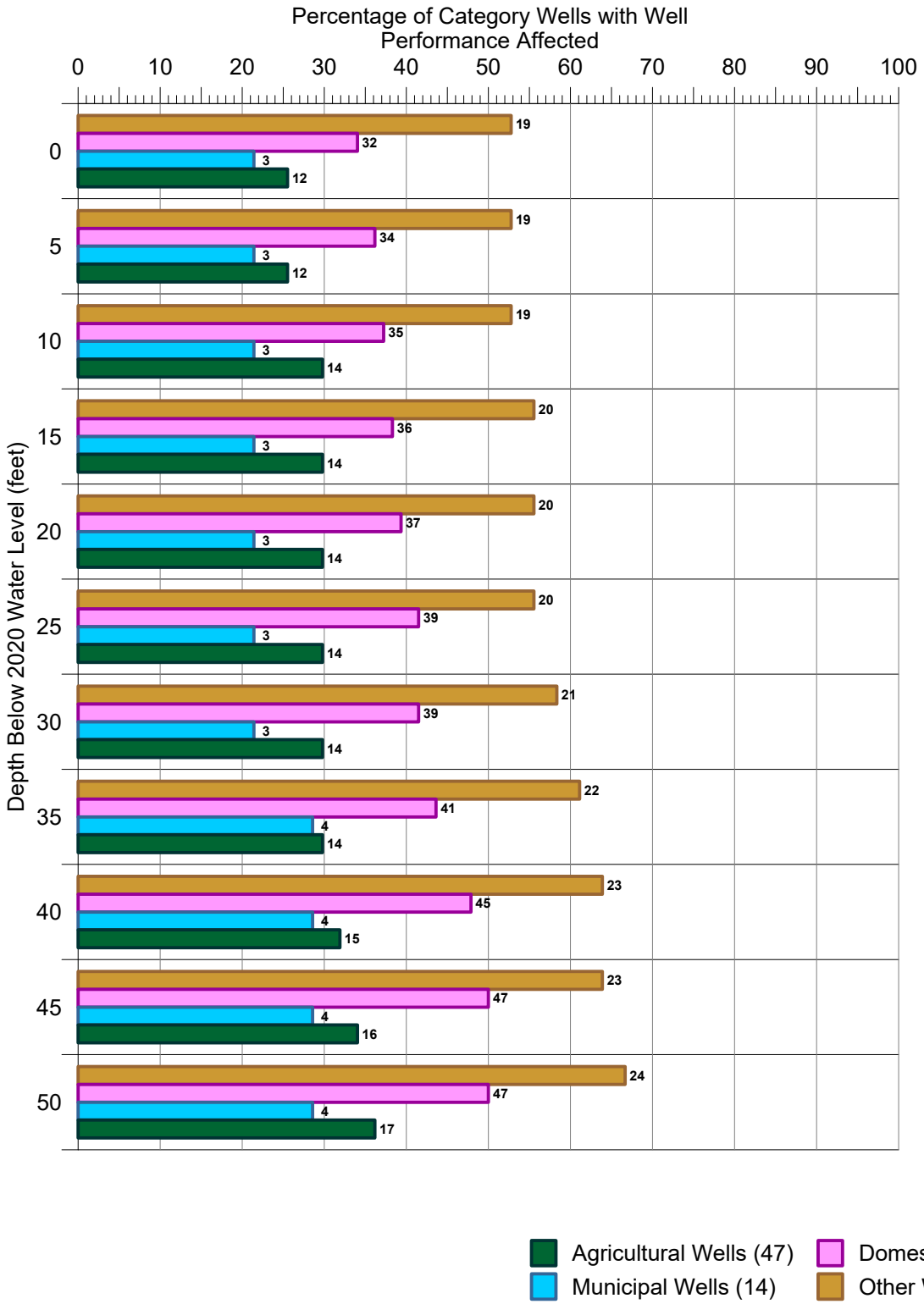
WELL PERFORATIONS RELATIVE TO LOWER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 2-02 WMA_LA_Perforation_Top_Analysis - 100ft.grf 5/19/2021 M. McCammon



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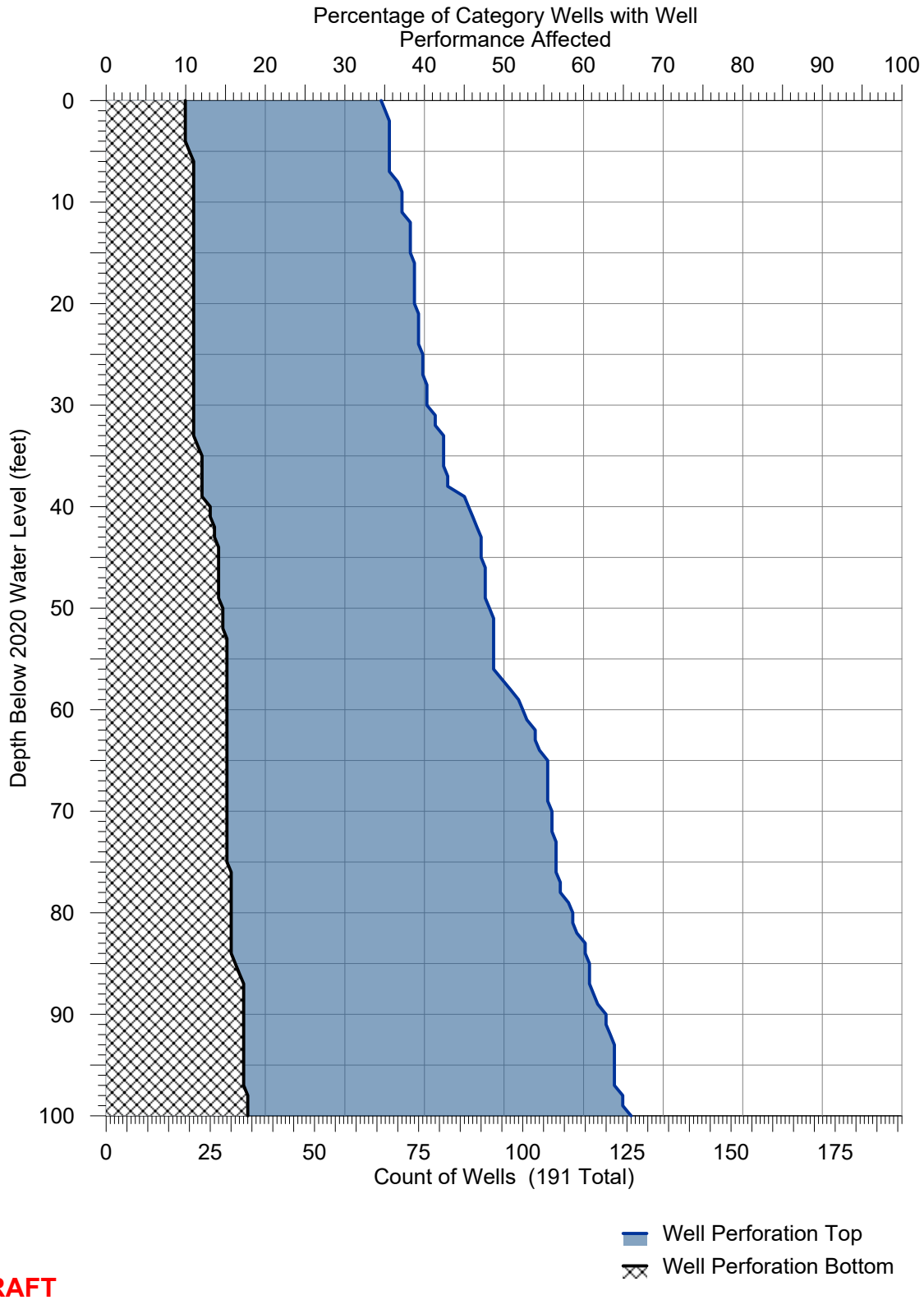
WELL PERFORATIONS RELATIVE TO LOWER AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 2-03 WMA_LA_Perforation_Top_Analysis_BAR.grf 5/19/2021 M. McCammon



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ALL WELLS
WELL PERFORATIONS RELATIVE TO
LOWER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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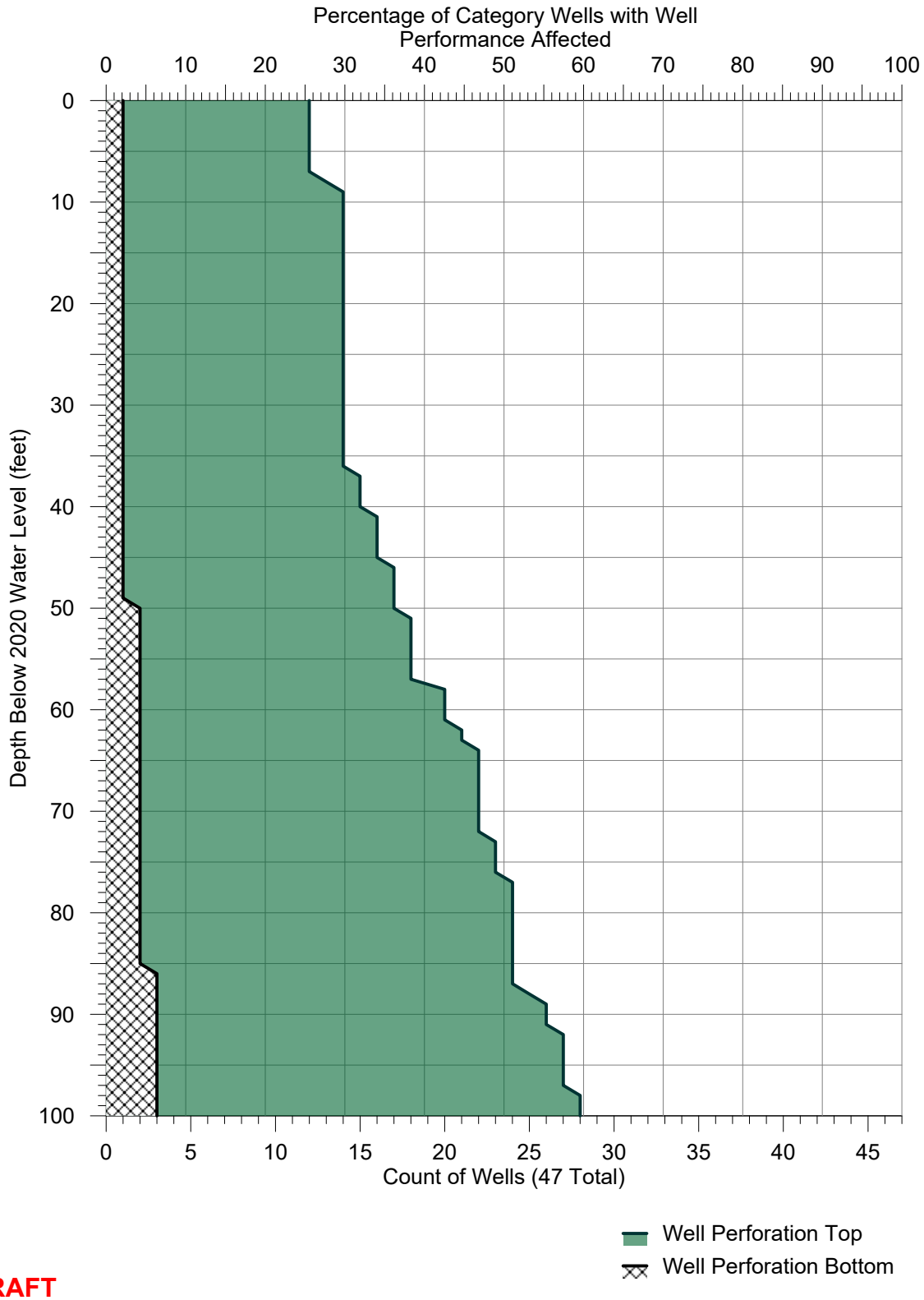

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AGRICULTURE WELLS
WELL PERFORATIONS RELATIVE TO
LOWER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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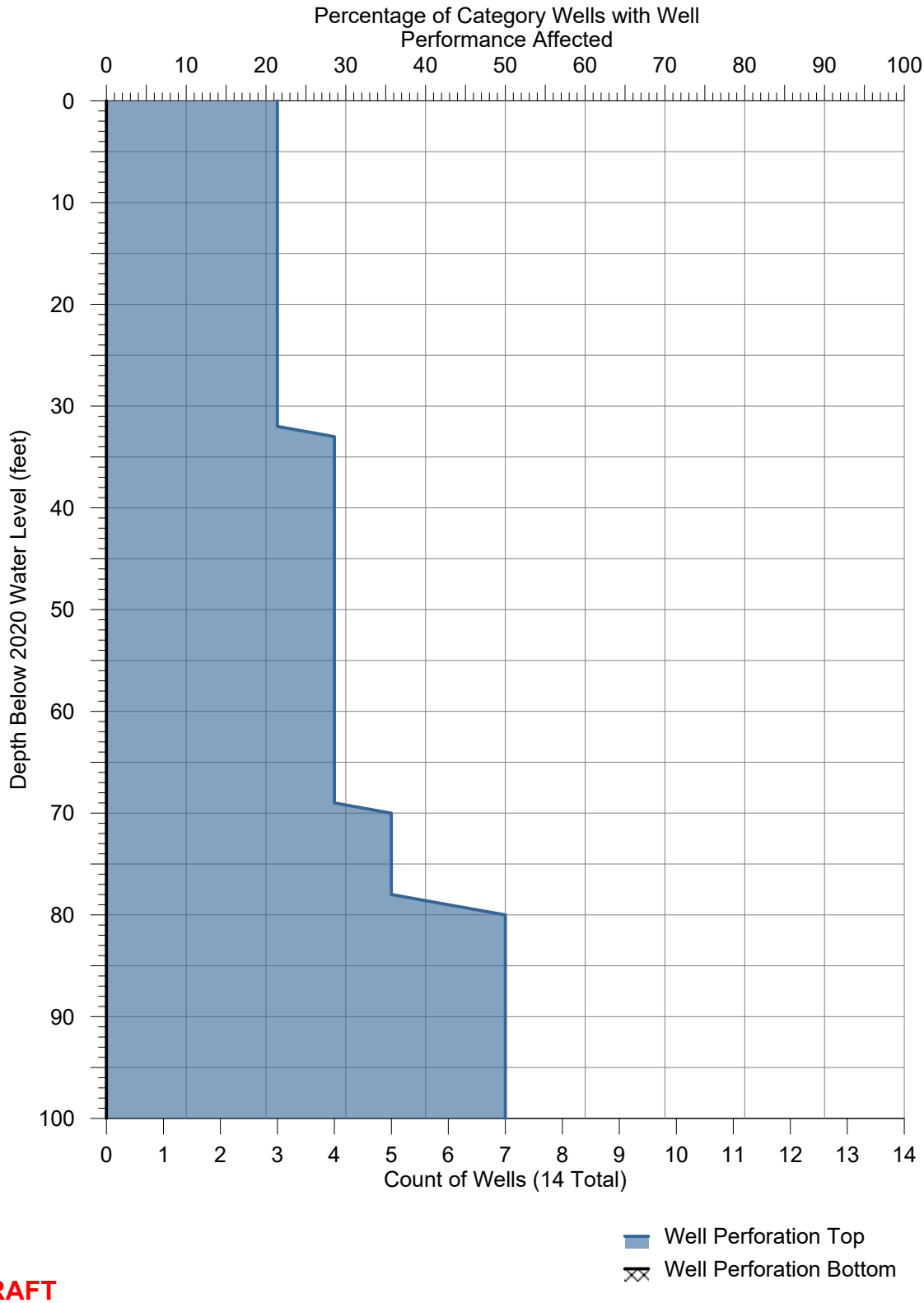

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MUNICIPAL WELLS
WELL PERFORATIONS RELATIVE TO
LOWER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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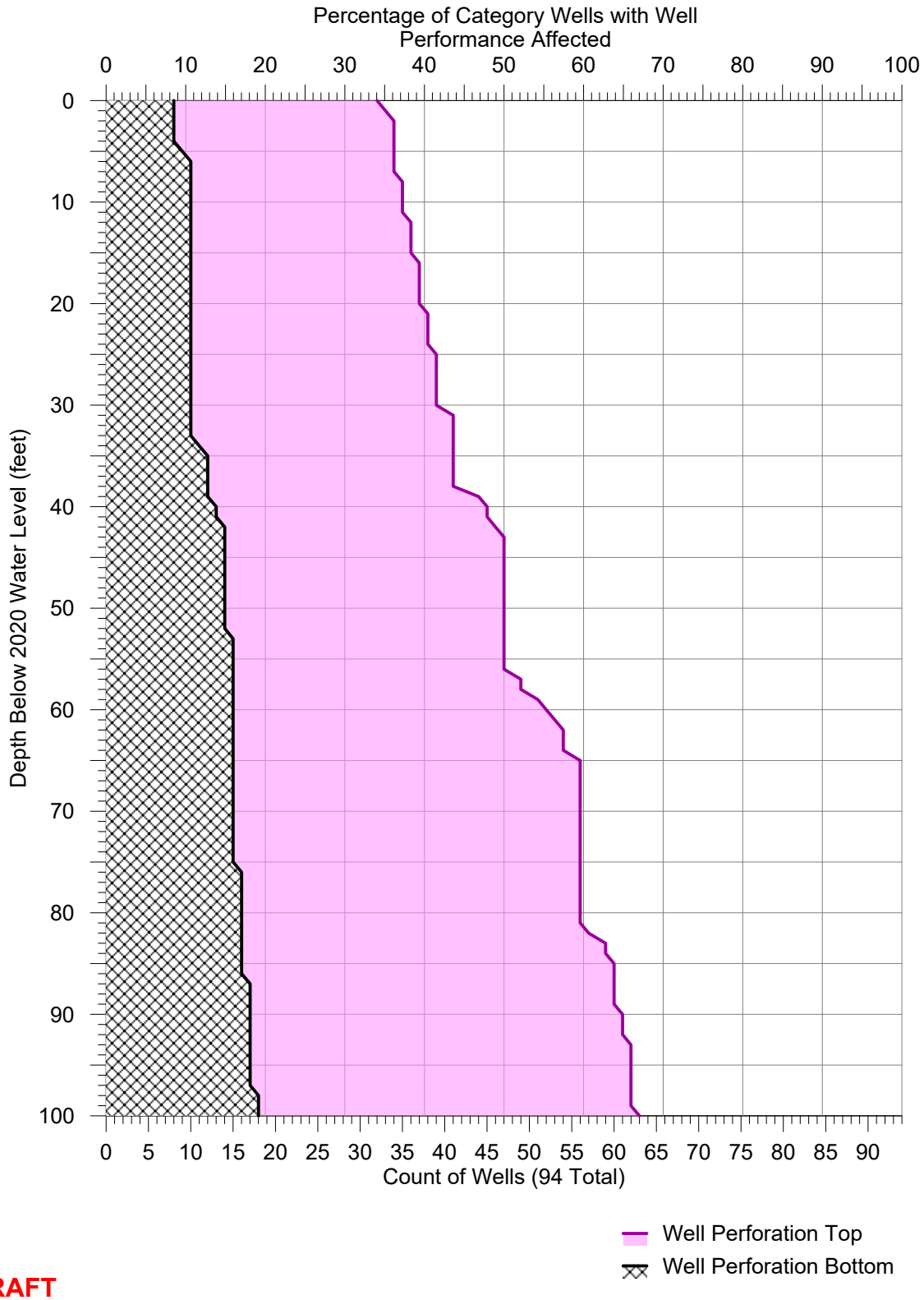

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DOMESTIC WELLS
WELL PERFORATIONS RELATIVE TO LOWER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

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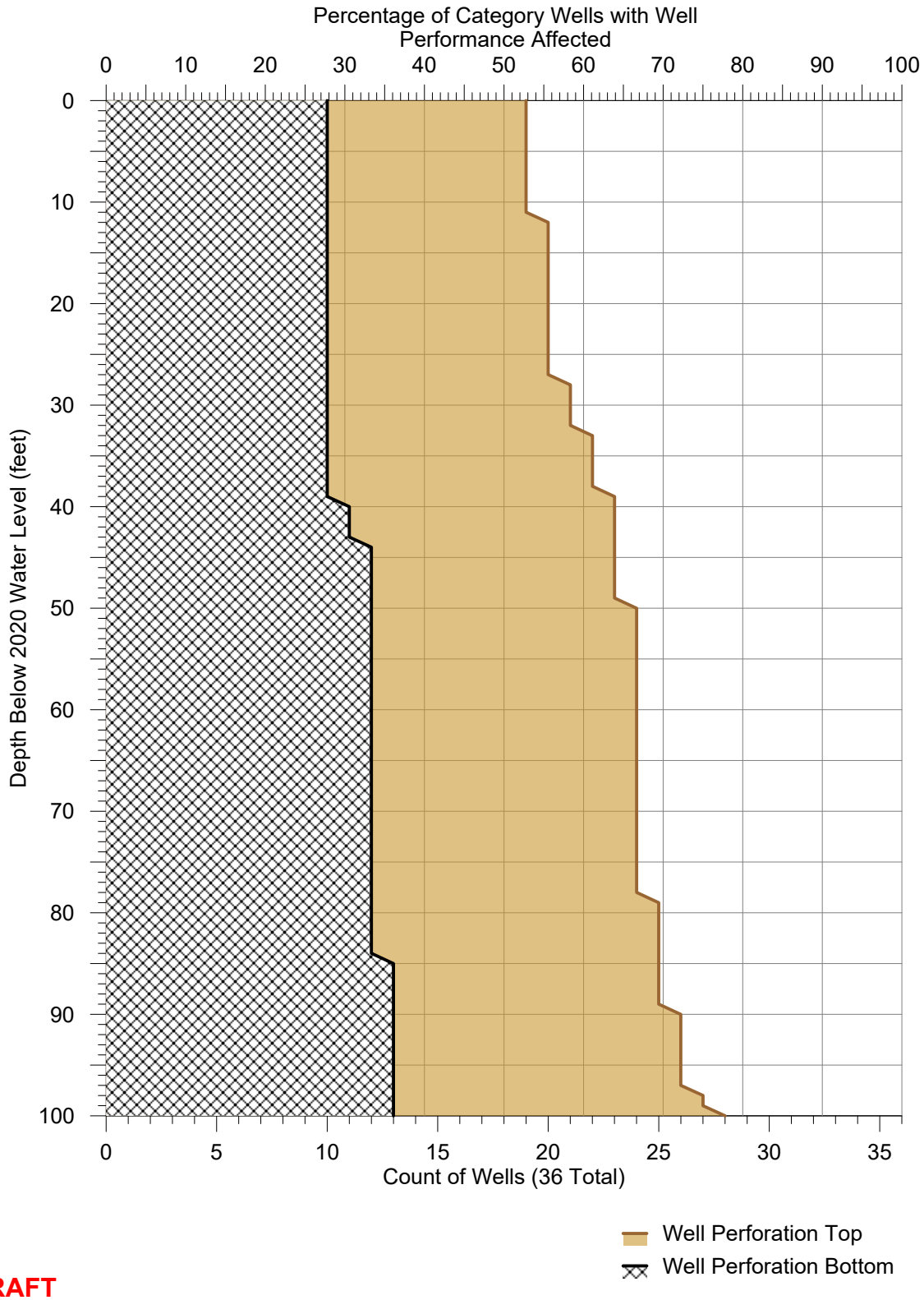

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Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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OTHER WELLS / UNKNOWN TYPE WELL PERFORATIONS RELATIVE TO LOWER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

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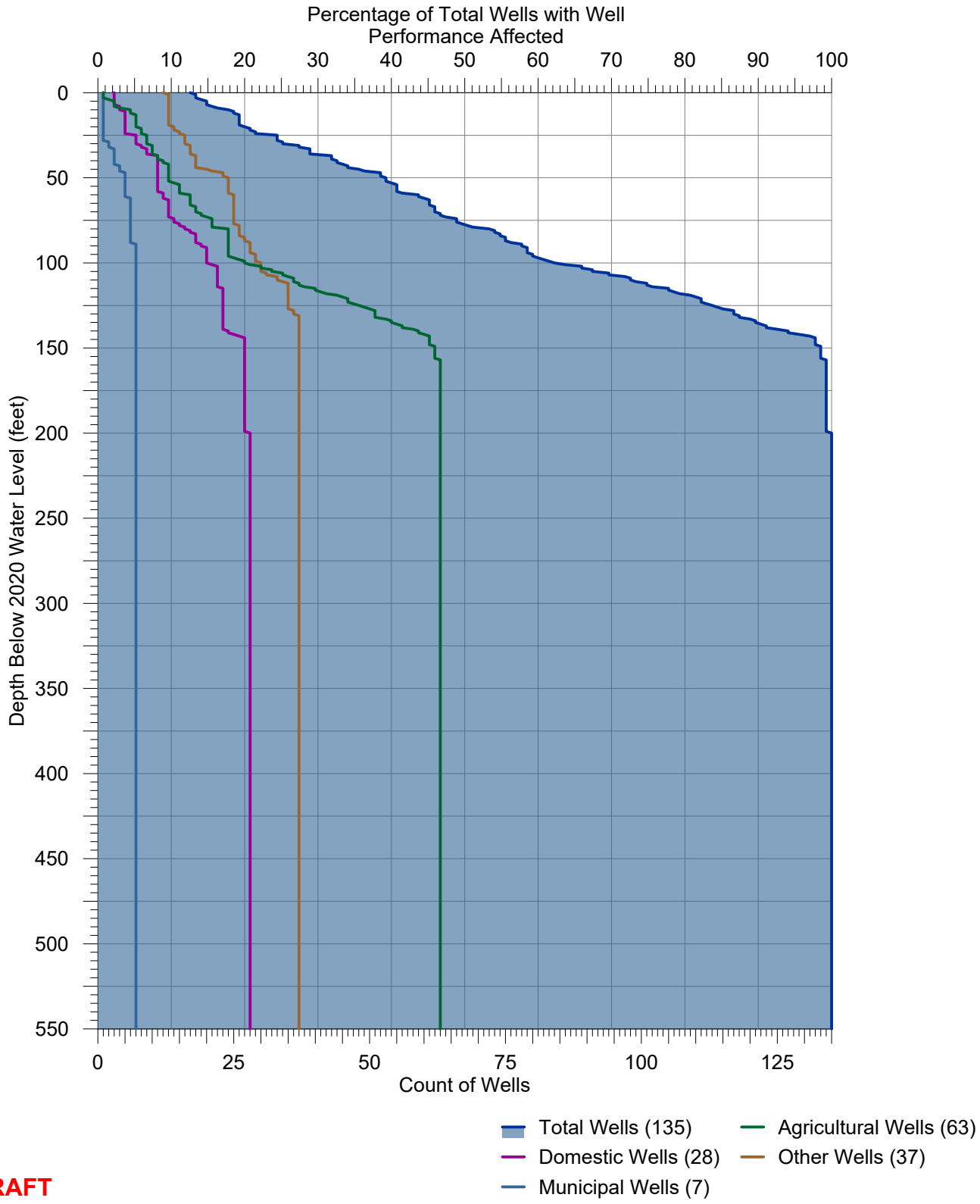

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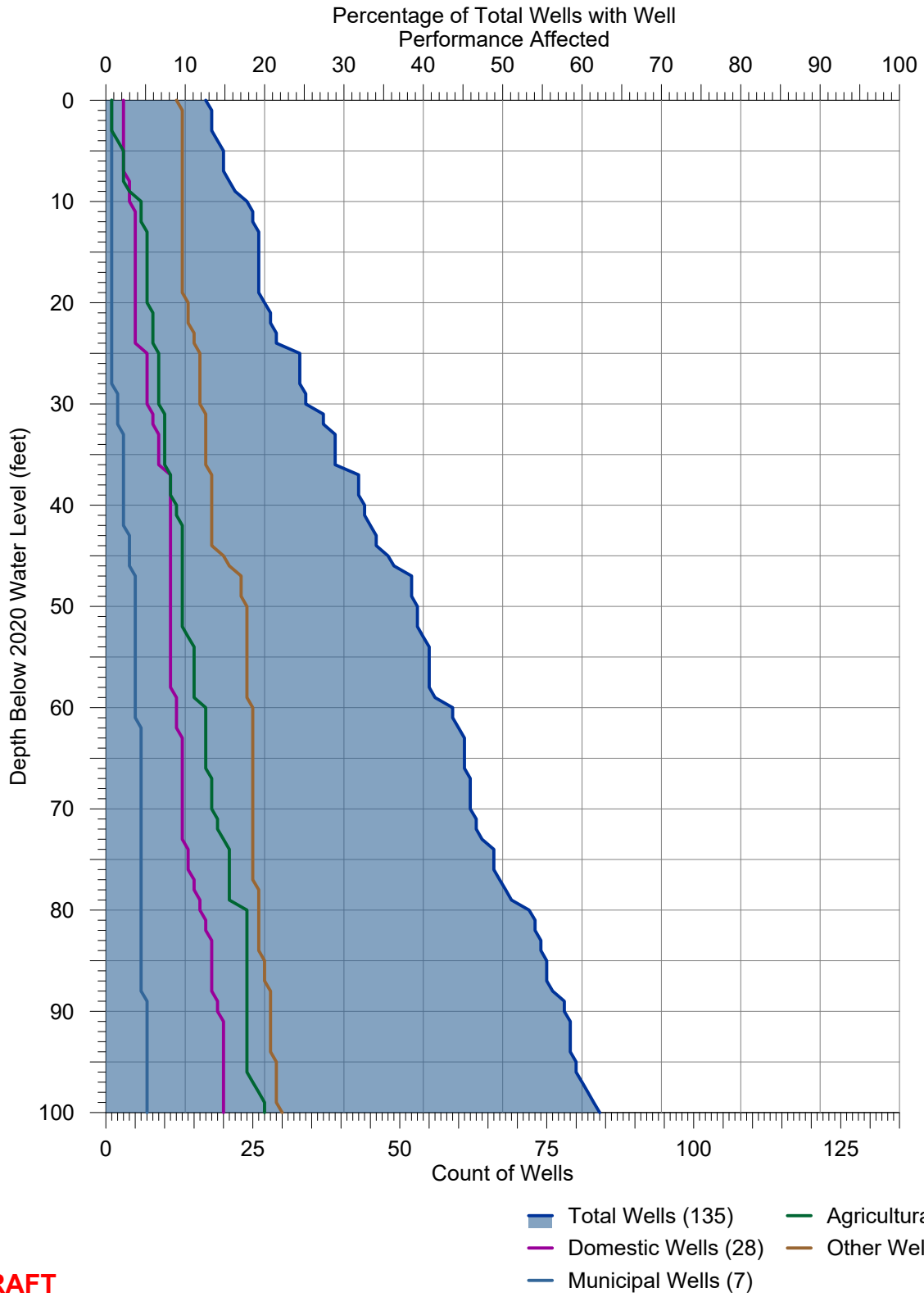
WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-01 WMA_UA_Perforation_Top_Analysis.grf 5/19/2021 M. McCammon



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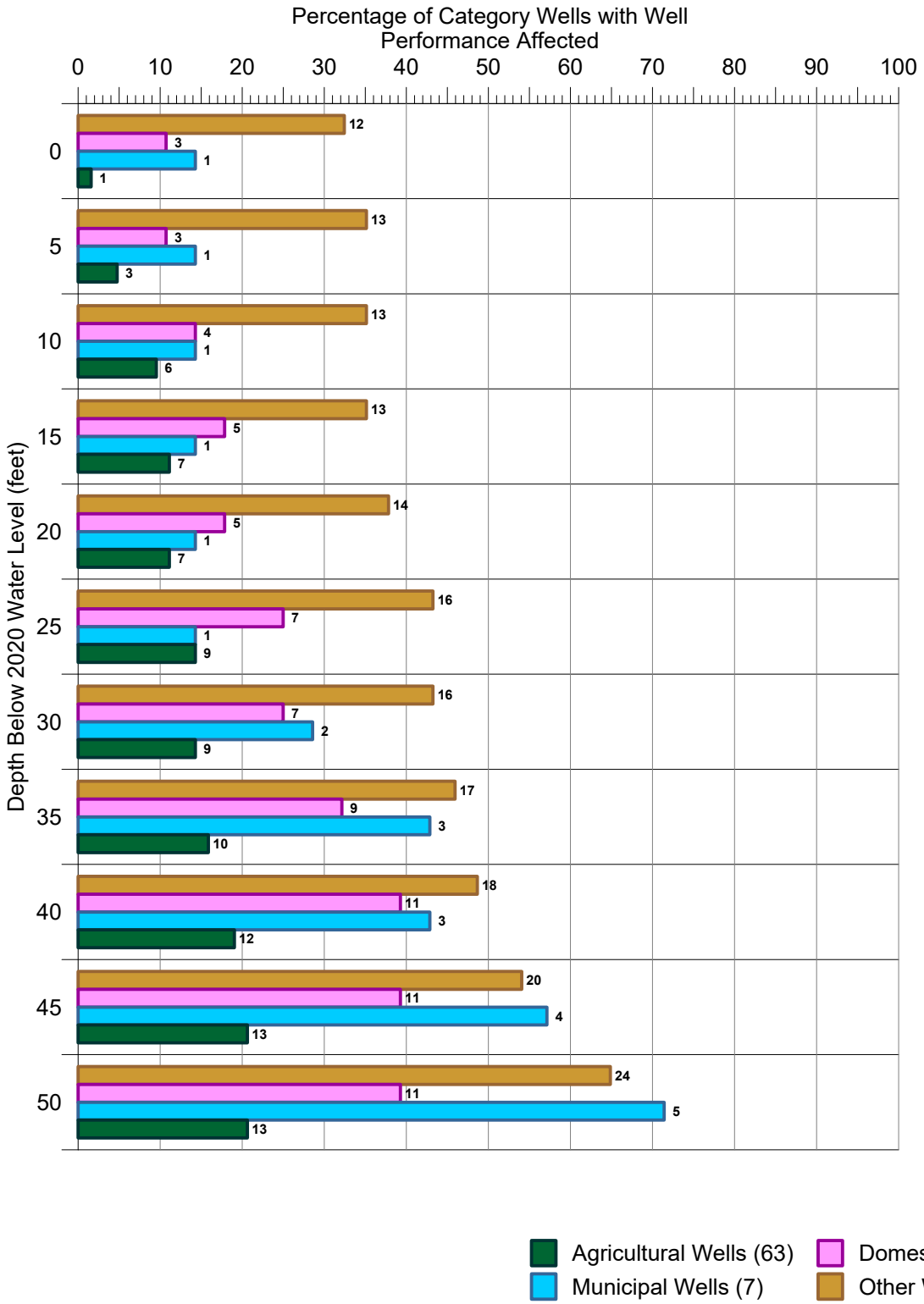
WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-02 WMA_UA_Perforation_Top_Analysis - 100ft.grf 5/19/2021 M. McCammon



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WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH (TOP 50 FT)

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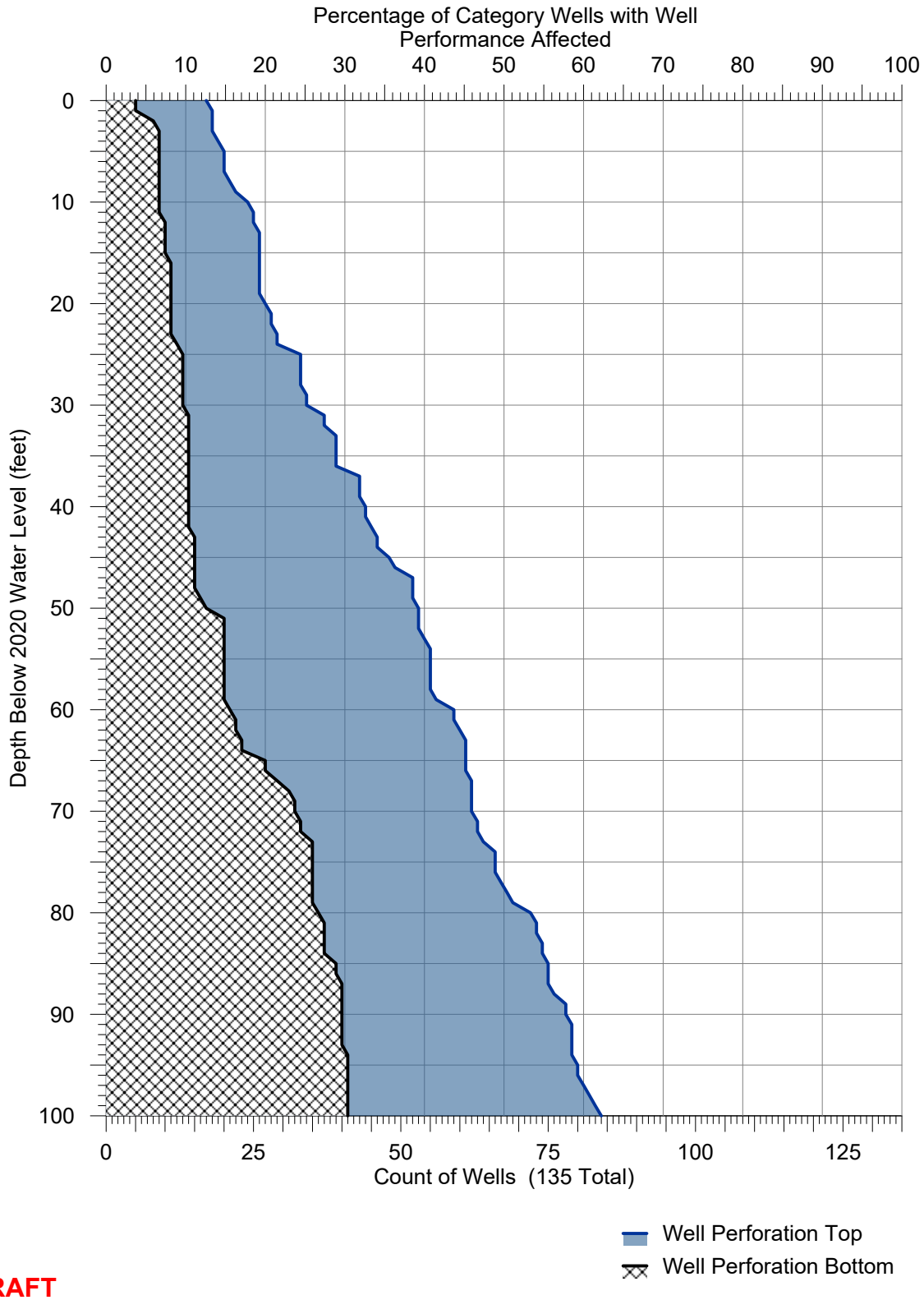

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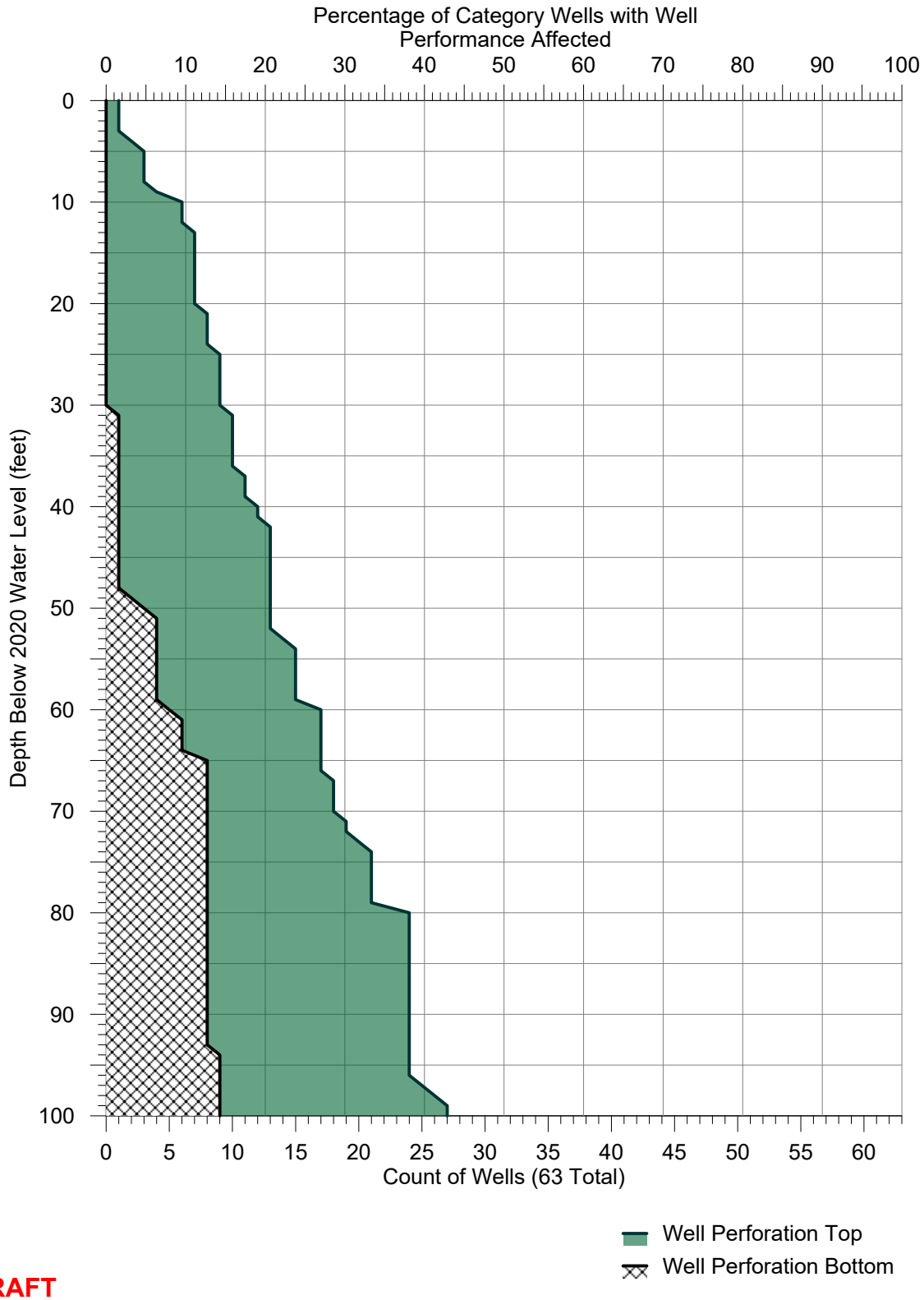
Groundwater Sustainability Agency

ALL WELLS
WELL PERFORATIONS RELATIVE TO
UPPER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-04 WMA_UA_Perforation_Analysis.grf 5/19/2021 M. McCammon



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AGRICULTURE WELLS
WELL PERFORATIONS RELATIVE TO
UPPER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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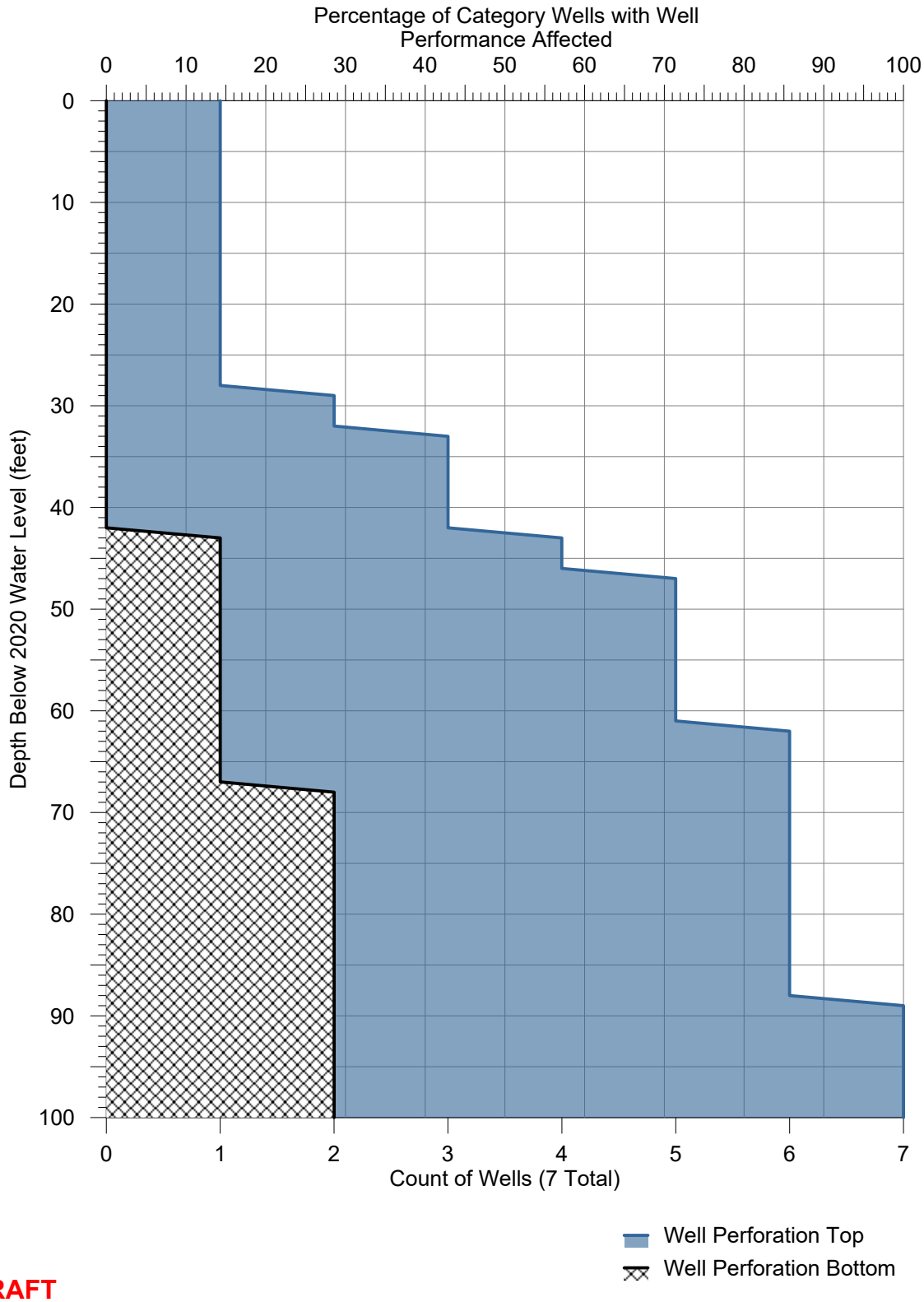

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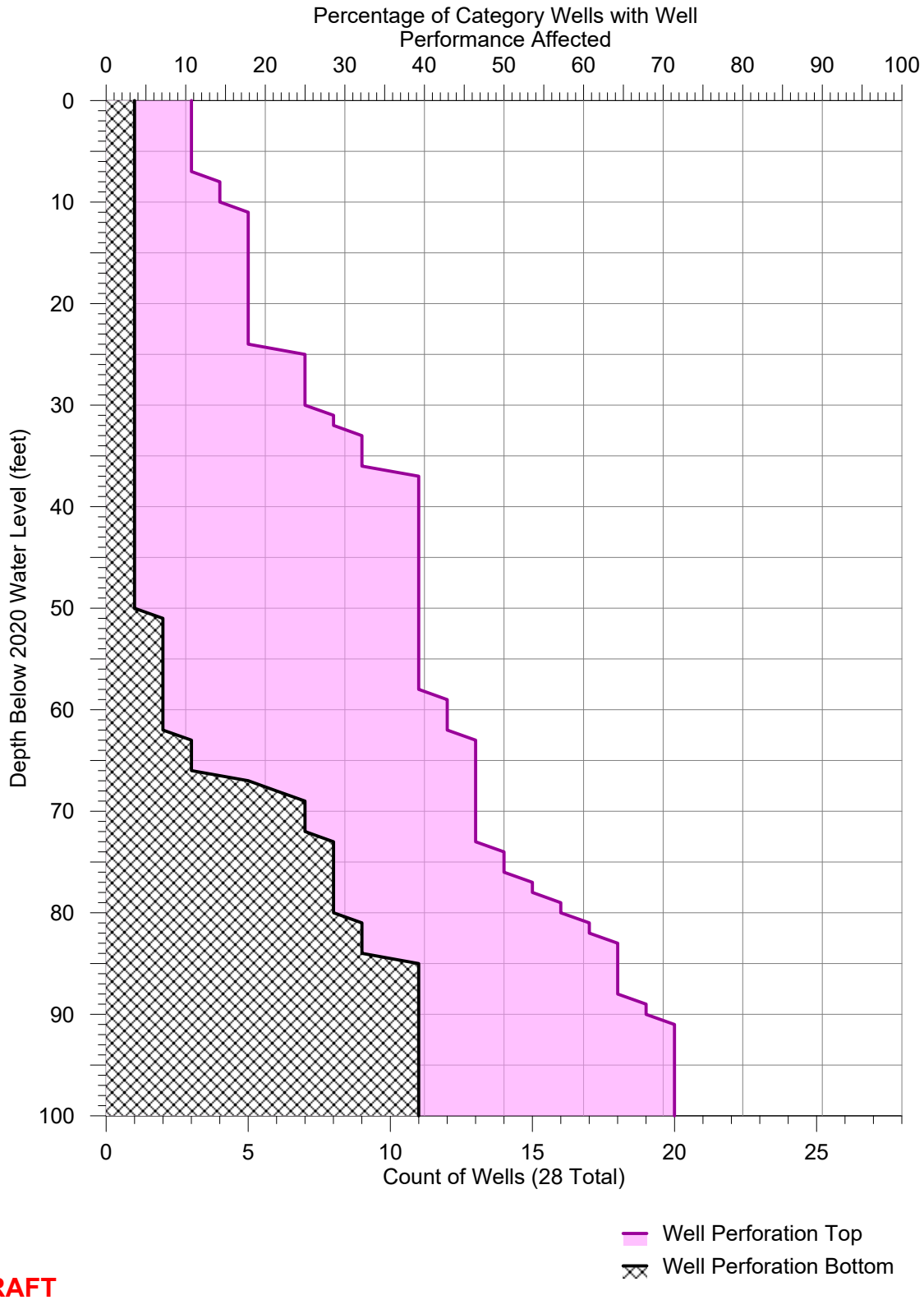
MUNICIPAL WELLS
WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-06 WMA_UA_Perforation_Analysis_Muni.grf 5/19/2021 M. McCammon

FIGURE 3-7



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Groundwater Sustainability Agency

DOMESTIC WELLS
WELL PERFORATIONS RELATIVE TO
UPPER AQUIFER SPRING 2020
WATER DEPTH (TOP 100 FT)

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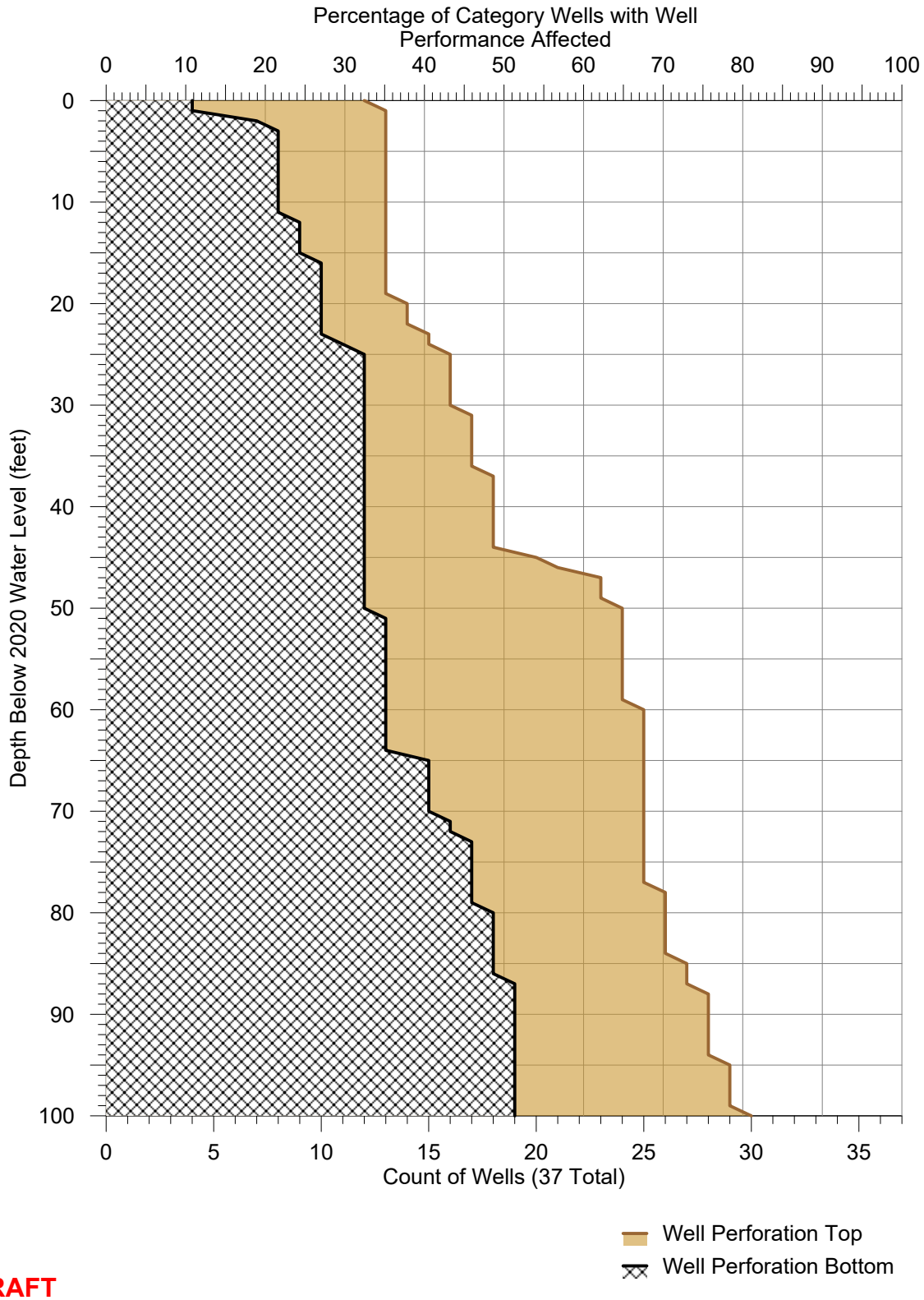

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Other = Well use not recorded on well log or used for observation/ cathodic protection only.

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OTHER WELLS / UNKNOWN TYPE WELL PERFORATIONS RELATIVE TO UPPER AQUIFER SPRING 2020 WATER DEPTH (TOP 100 FT)

I:\DATA\2710\Analyses\2021-05 SMC GWL Decline\Data_Table\Fig 3-08 WMA_UA_Perforation_Analysis_Other.grf 5/19/2021 M. McCammon

Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-C:

Time Series Chloride Graphs for Assessing Seawater Intrusion, Western Management Area

APPENDIX 3B-C: TIME SERIES CHLORIDE GRAPHS FOR ASSESSING SEAWATER INTRUSION

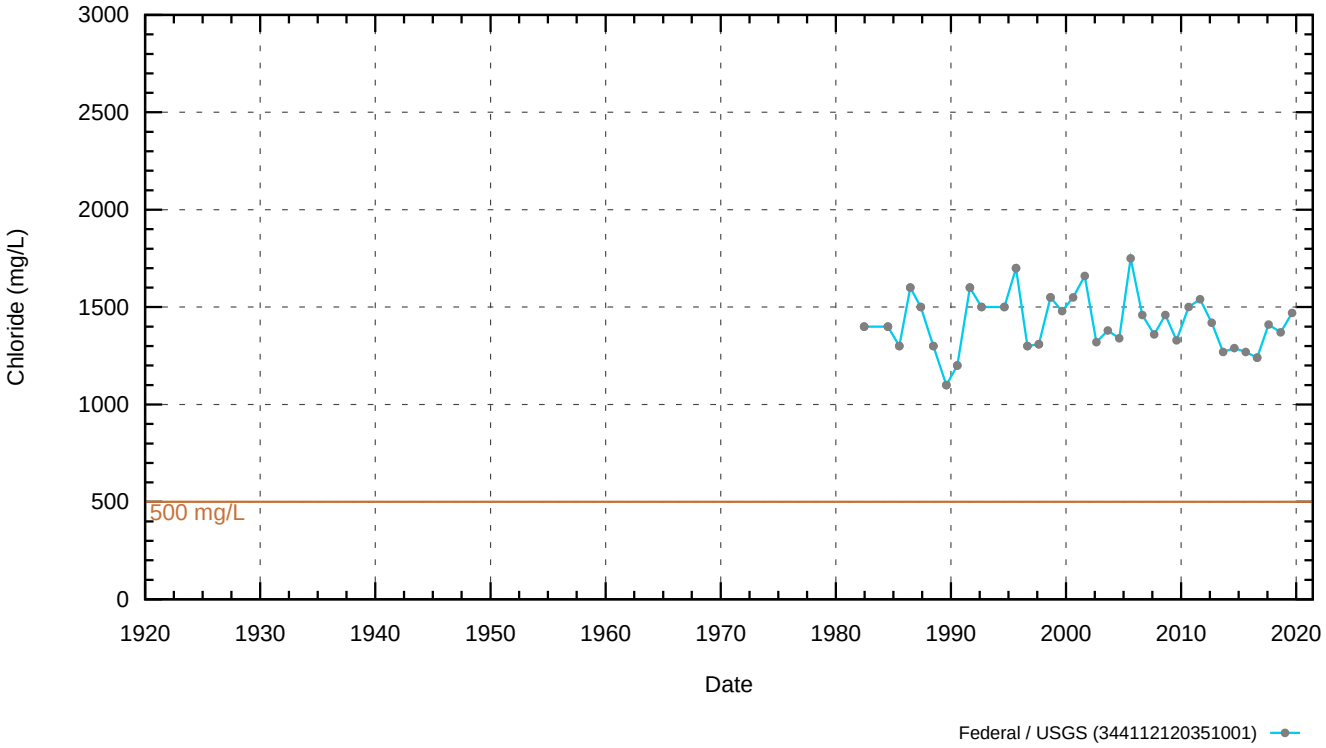
This appendix includes concentration time series graphs of chloride at representative wells for measuring potential seawater intrusion. Concentrations of chloride at particular wells are used to determine the location of the chloride isocontour. Movement of the chloride isocontour inland (i.e. increases in chloride at wells) is an indicator of seawater intrusion. The location of the 500 mg/L isocontour is the minimum threshold for this suitability indicator.

LIST OF ACRONYMS AND ABBREVIATIONS

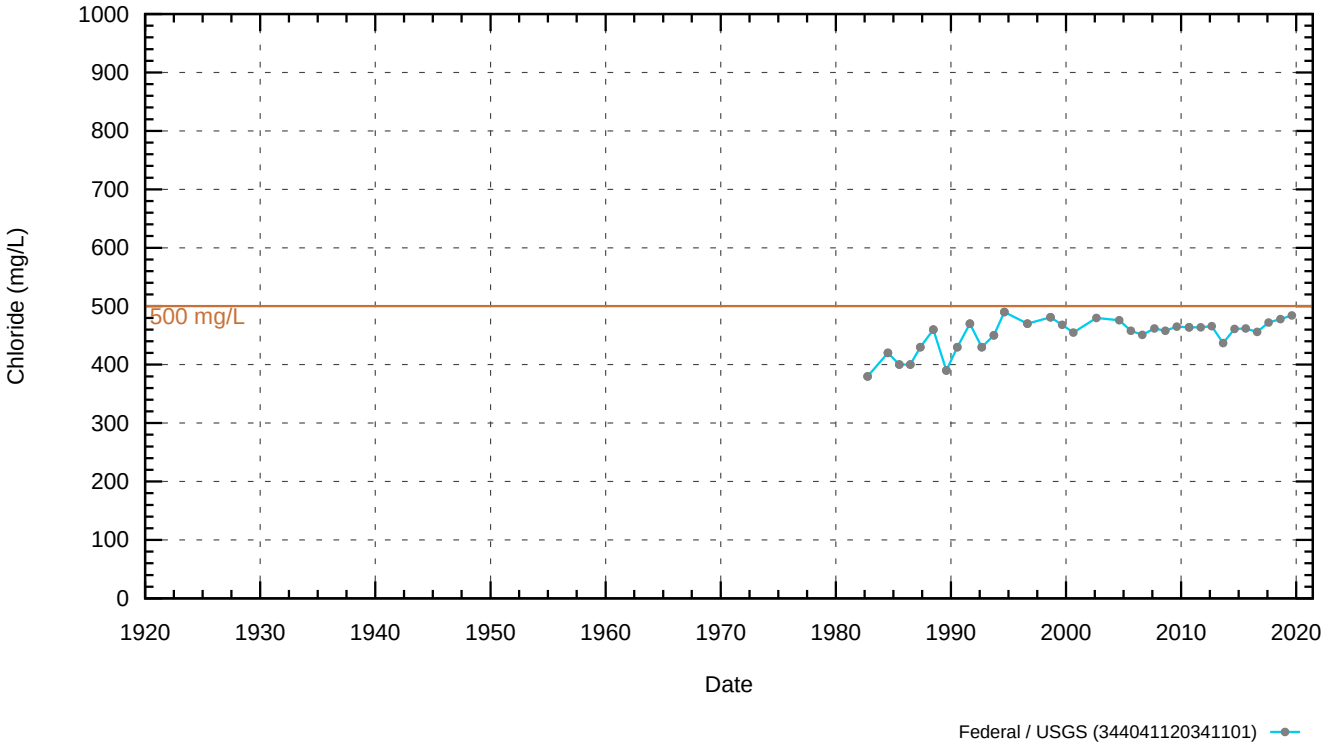
mg/L	milligrams per liter
USGS	United States Geologic Surveys
WMA	Western Management Area

Seawater Intrusion - Chloride

7N/35W-17K20 (DBID 1)
Upper Aquifer



7N/35W-21G2 (DBID 39)
Upper Aquifer



Seawater Intrusion - Chloride

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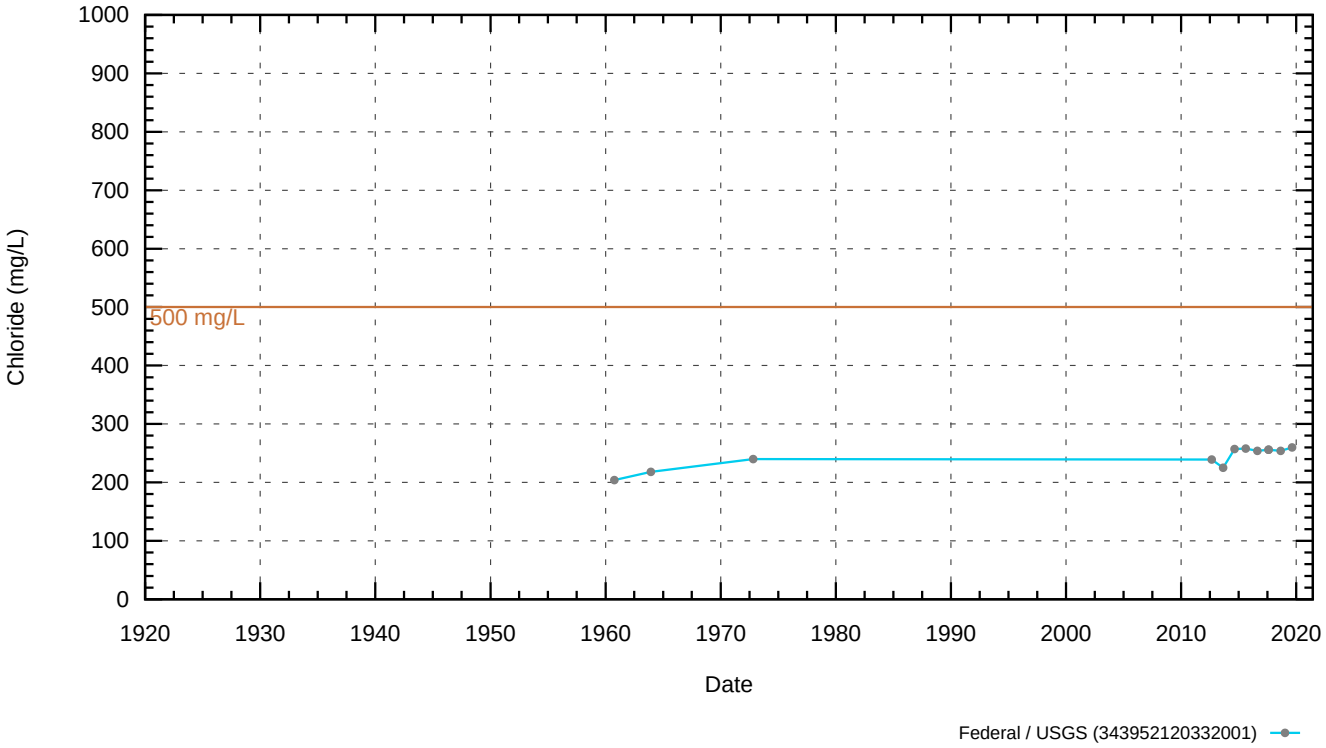
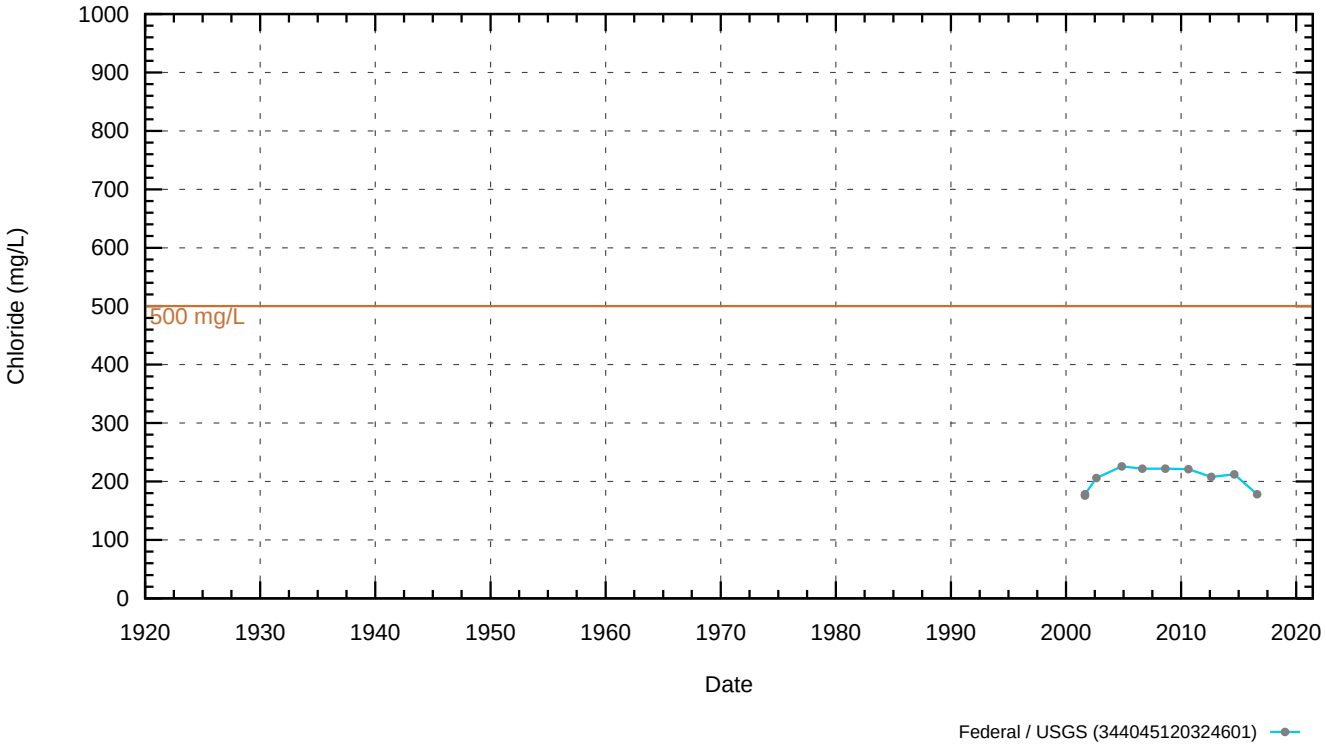
Upper Aquifer



7N35W-22A03 (DBID 300)
Upper Aquifer



Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-D:

Time Series Graphs for Assessing Degraded Groundwater Quality, Western Management Area

APPENDIX 3B-D: 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)
- Boron (B)
- Sodium (Na)
- Nitrate as Nitrogen (NO_3 as N) with logarithmic scale

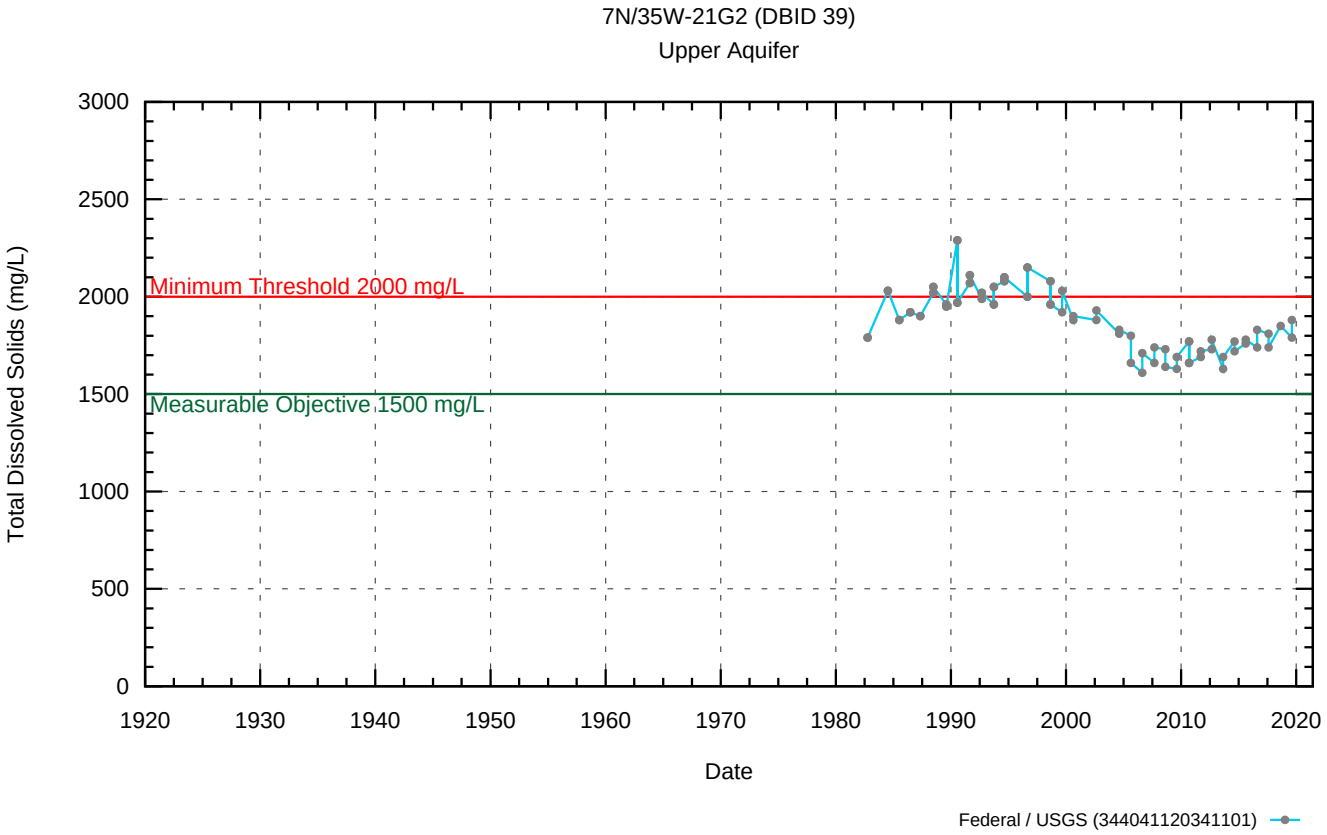
Null values are not plotted. Particular wells may not have historical measuments for all constituents.

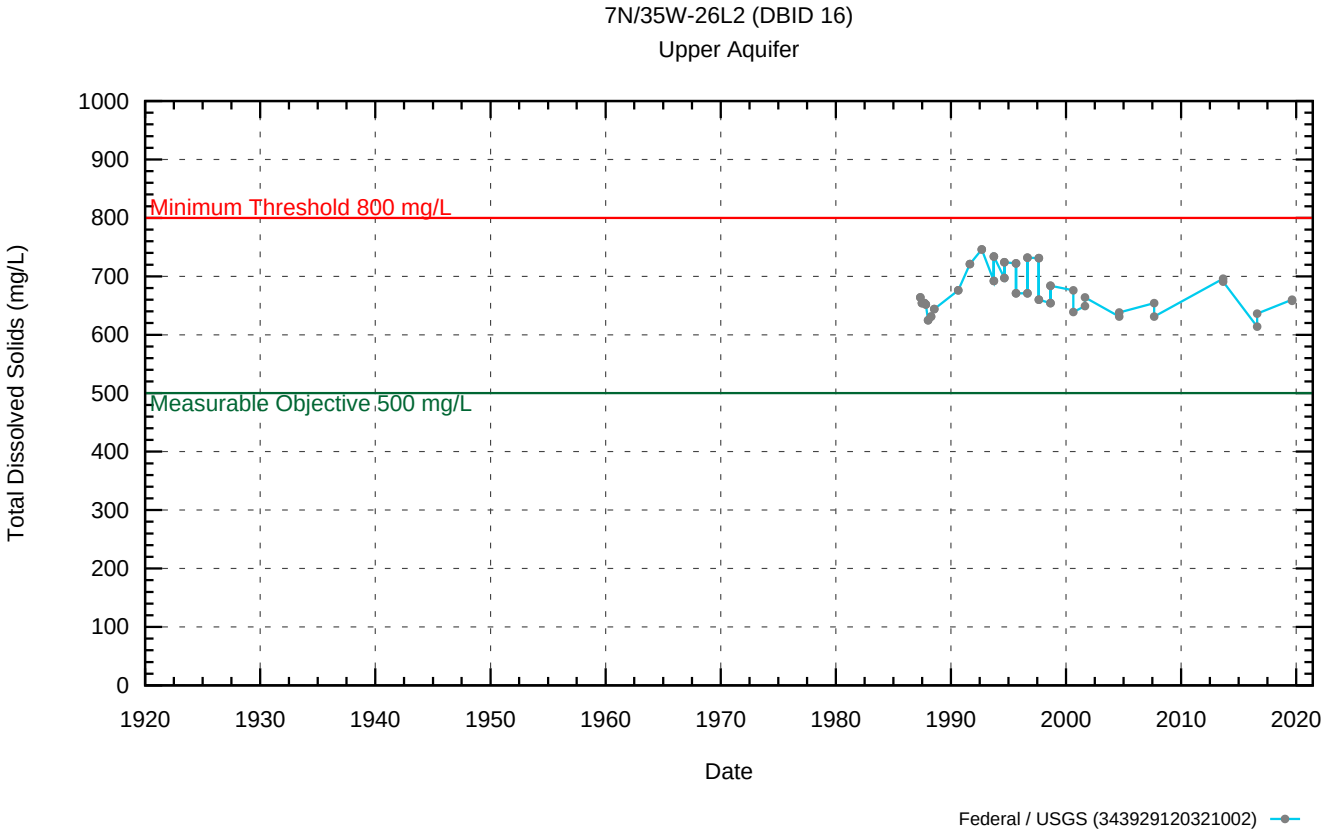
For Nitrate a logarithmic scale is used. Reporting source of value is shown. Values of Nitrate as Nitrate were converted to their Nitrogen composition. Values of Nitrate and Nitrite as Nitrogen (NO_3+NO_2 as N) are also included on graphs.

LIST OF ACRONYMS AND ABBREVIATIONS

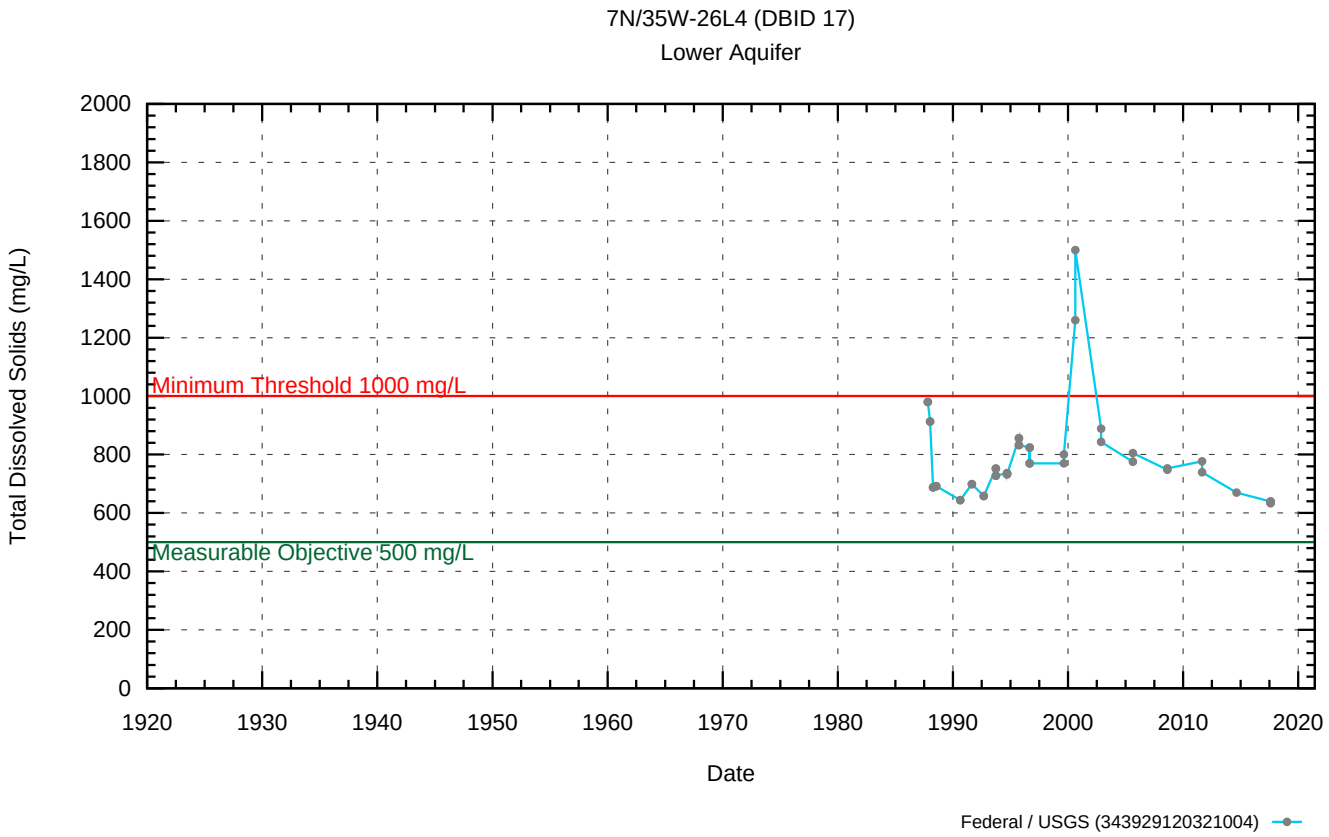
BGS	below ground surface
CASGEM	California Statewide Groundwater Elevation Monitoring
FT	feet
NAVD88	North American Vertical Datum of 1988
USBR	United States Bureau of Reclamation
USGS	United States Geologic Survey
WL	Water Level
WMA	Western Management Area

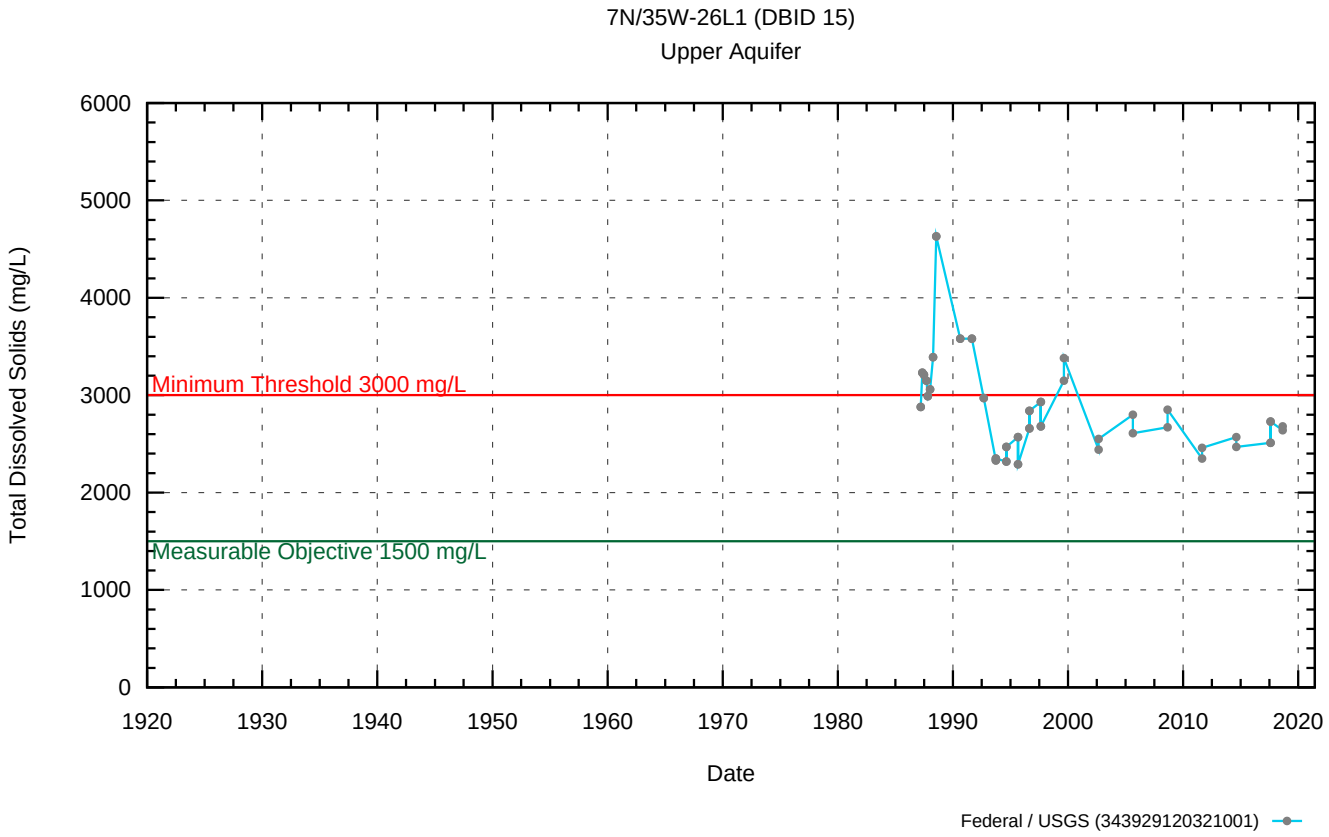
WMA: Lompoc Plain - Total Dissolved Solids



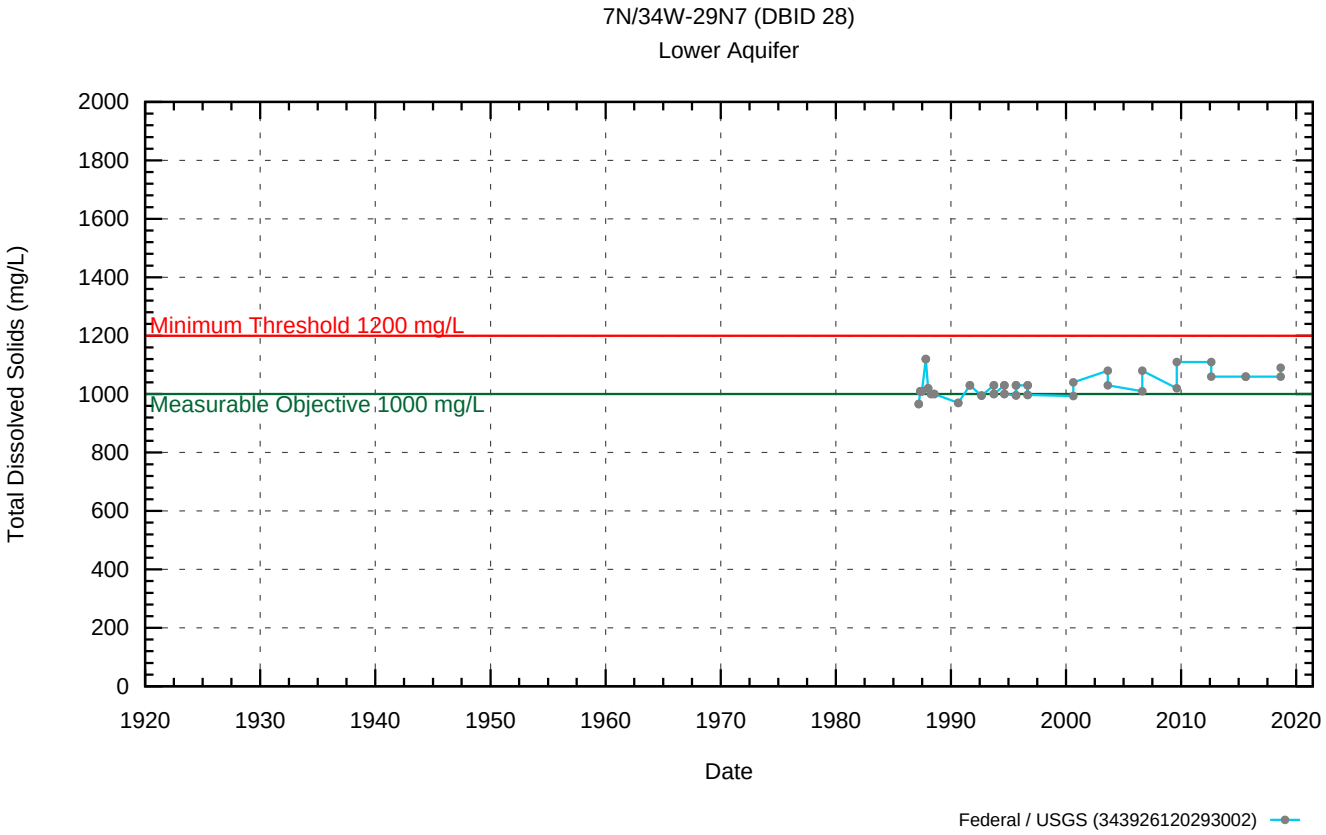


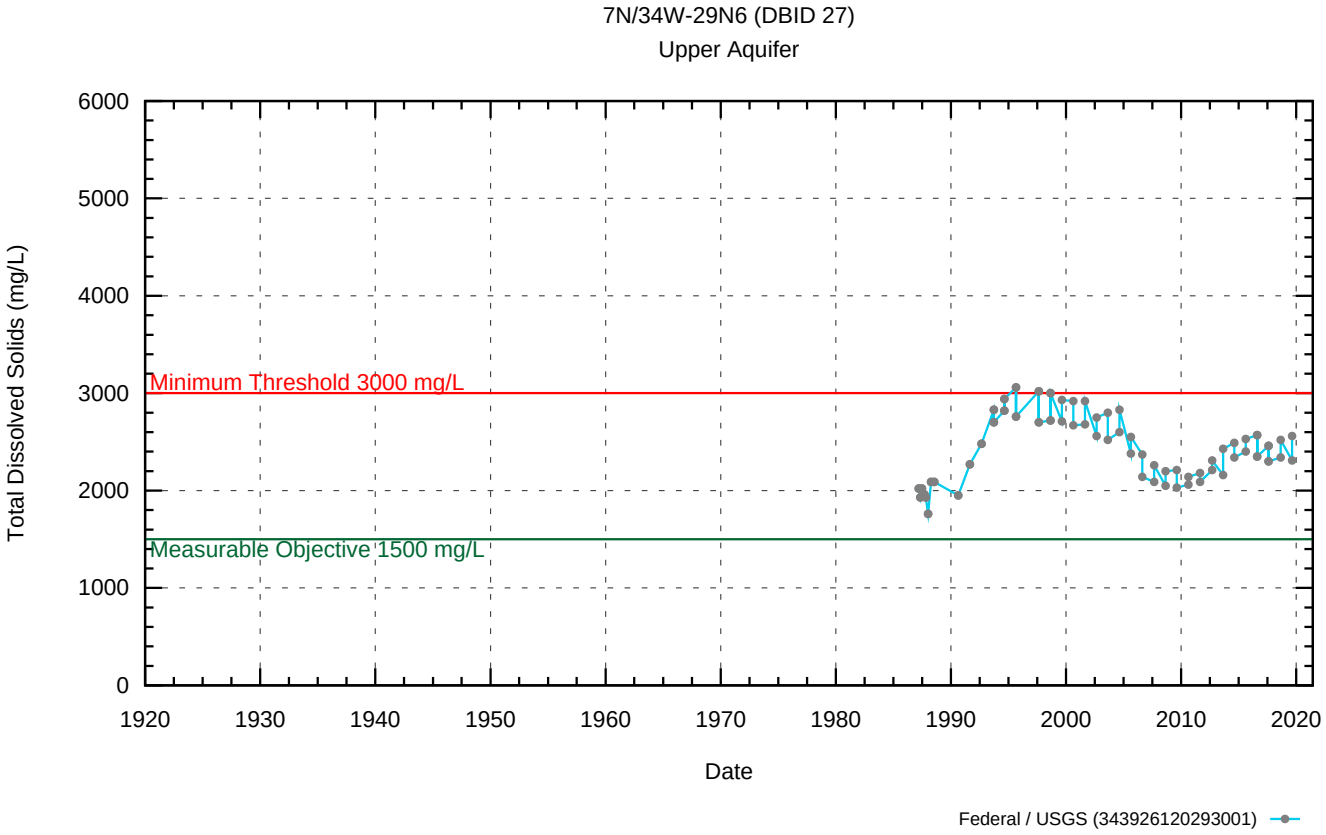
WMA: Lompoc Plain - Total Dissolved Solids





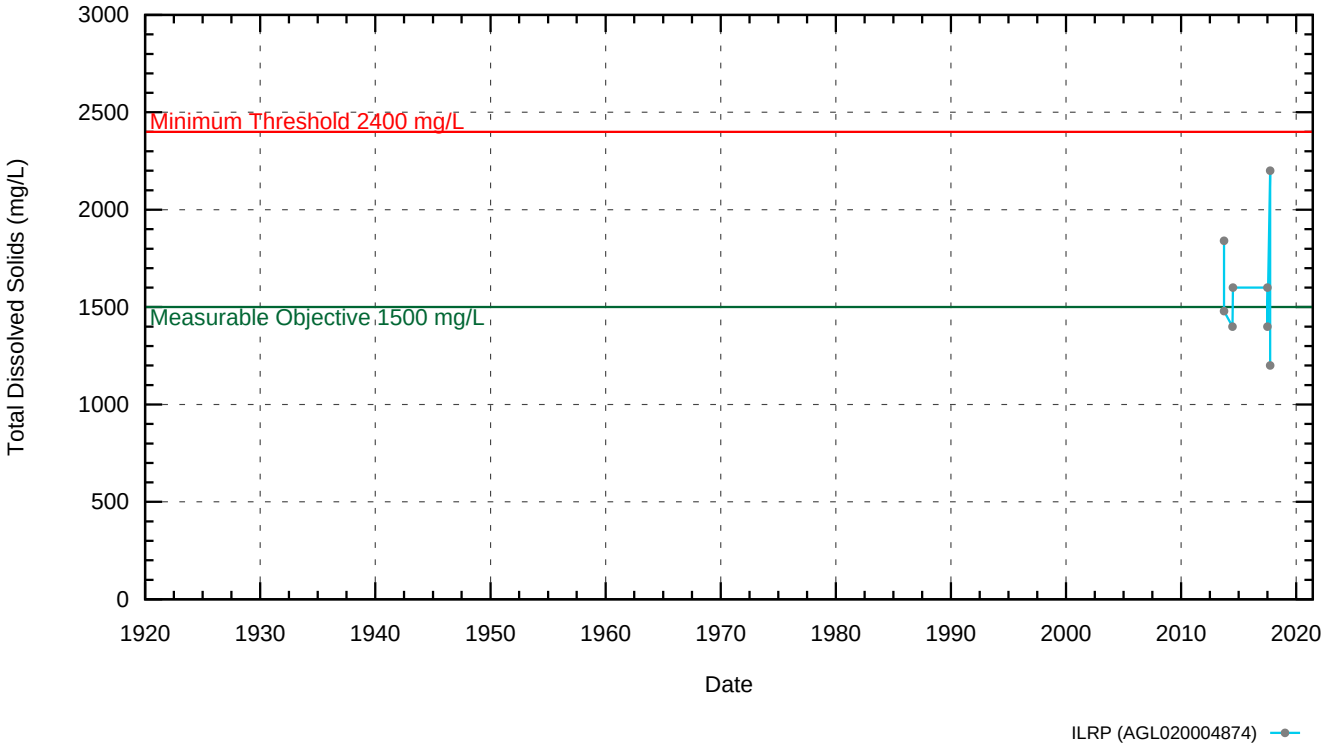
WMA: Lompoc Plain - Total Dissolved Solids



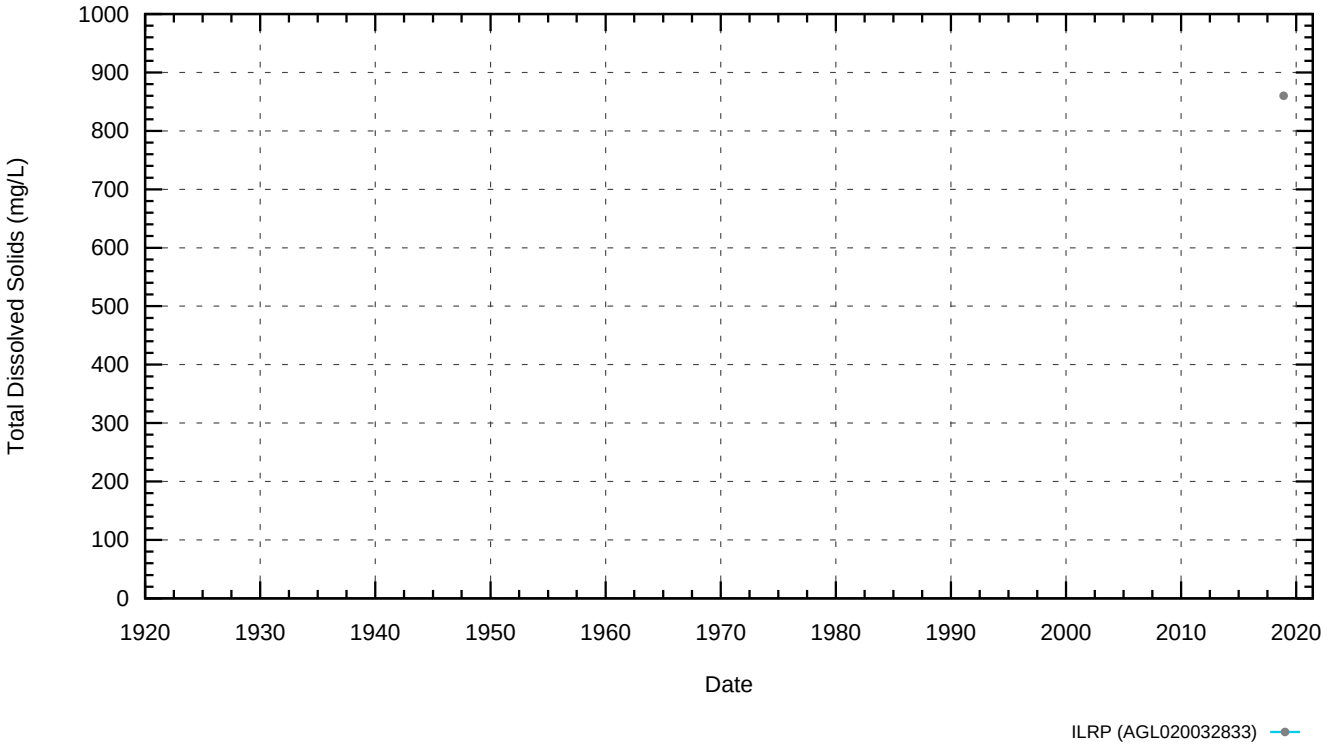


WMA: Lompoc Plain - Total Dissolved Solids

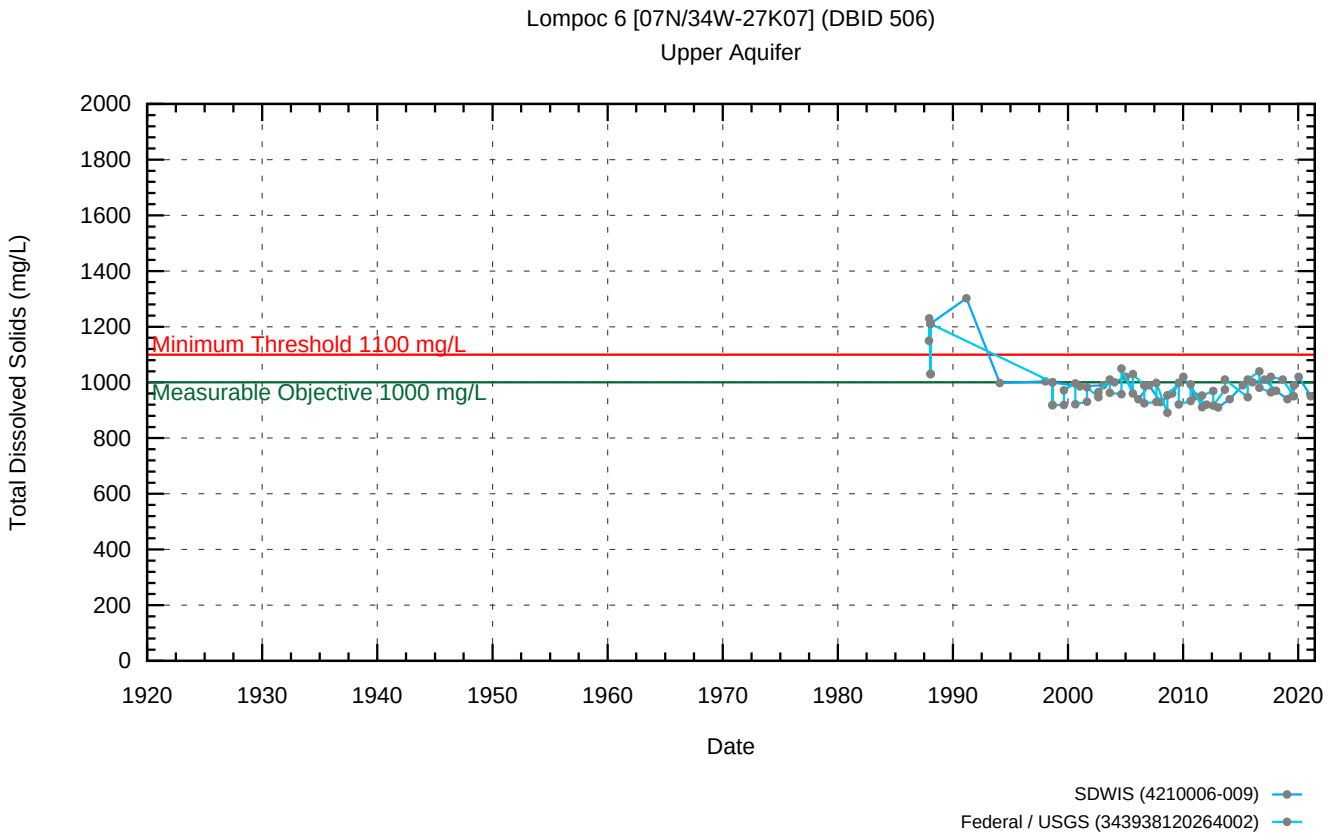
AGL020004874 (DBID 3150)
Upper Aquifer

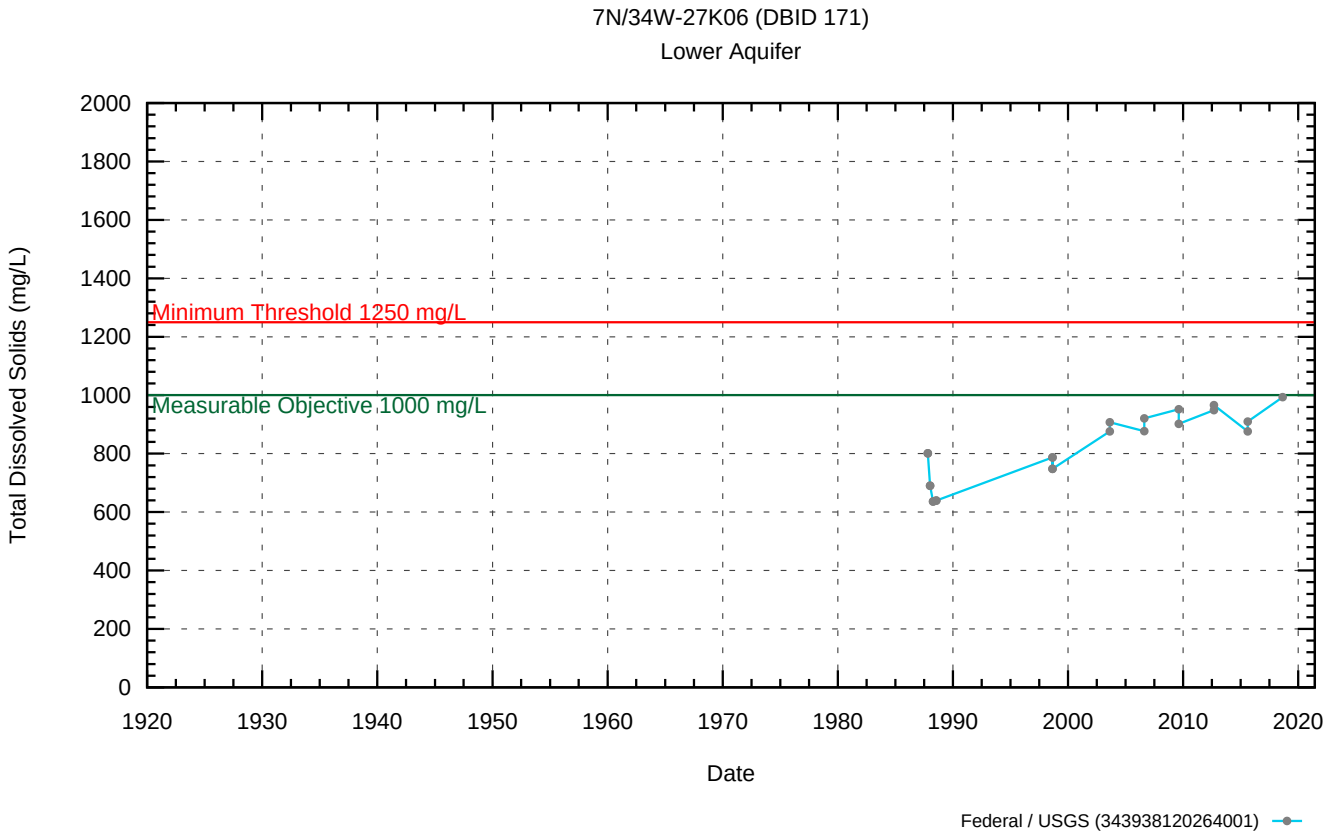


AGL020032833 (DBID 3040)
Lower Aquifer

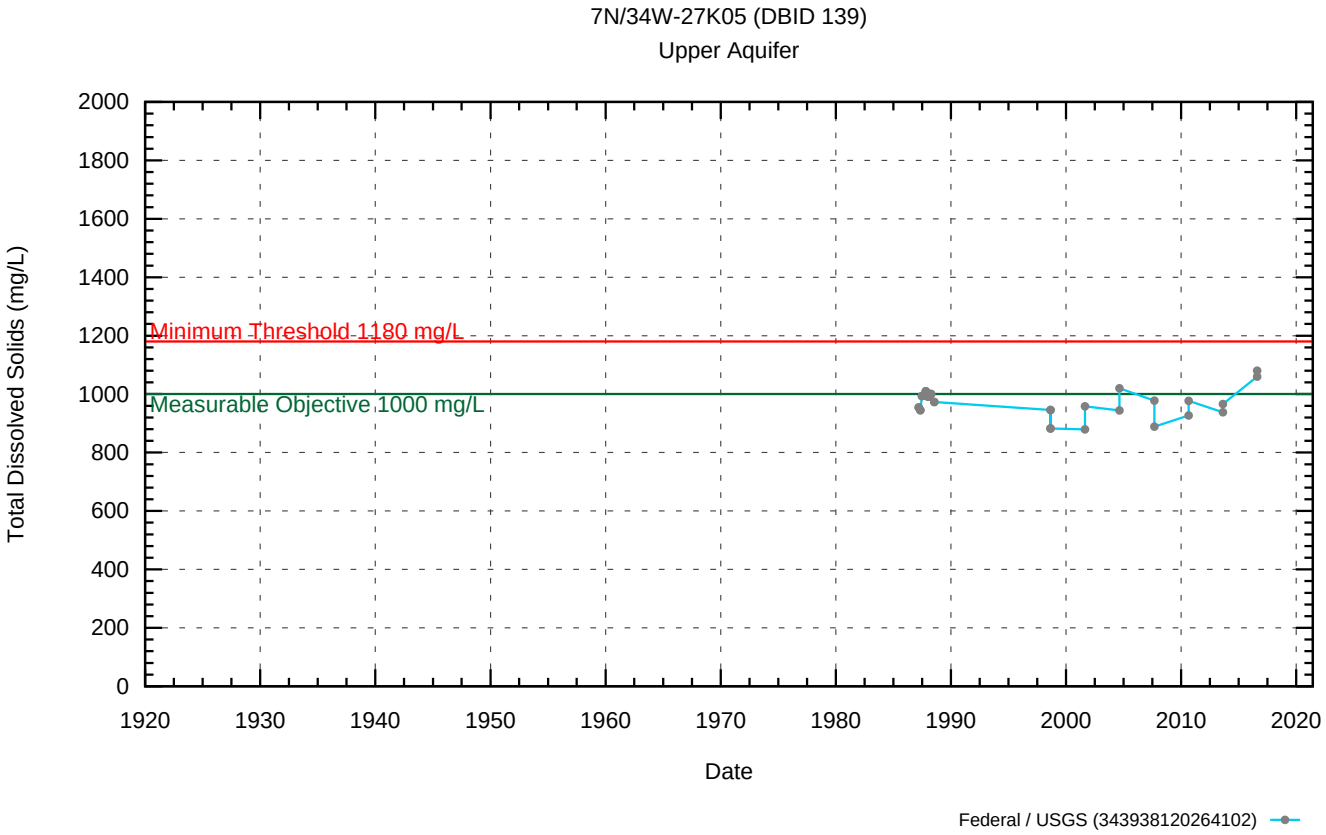


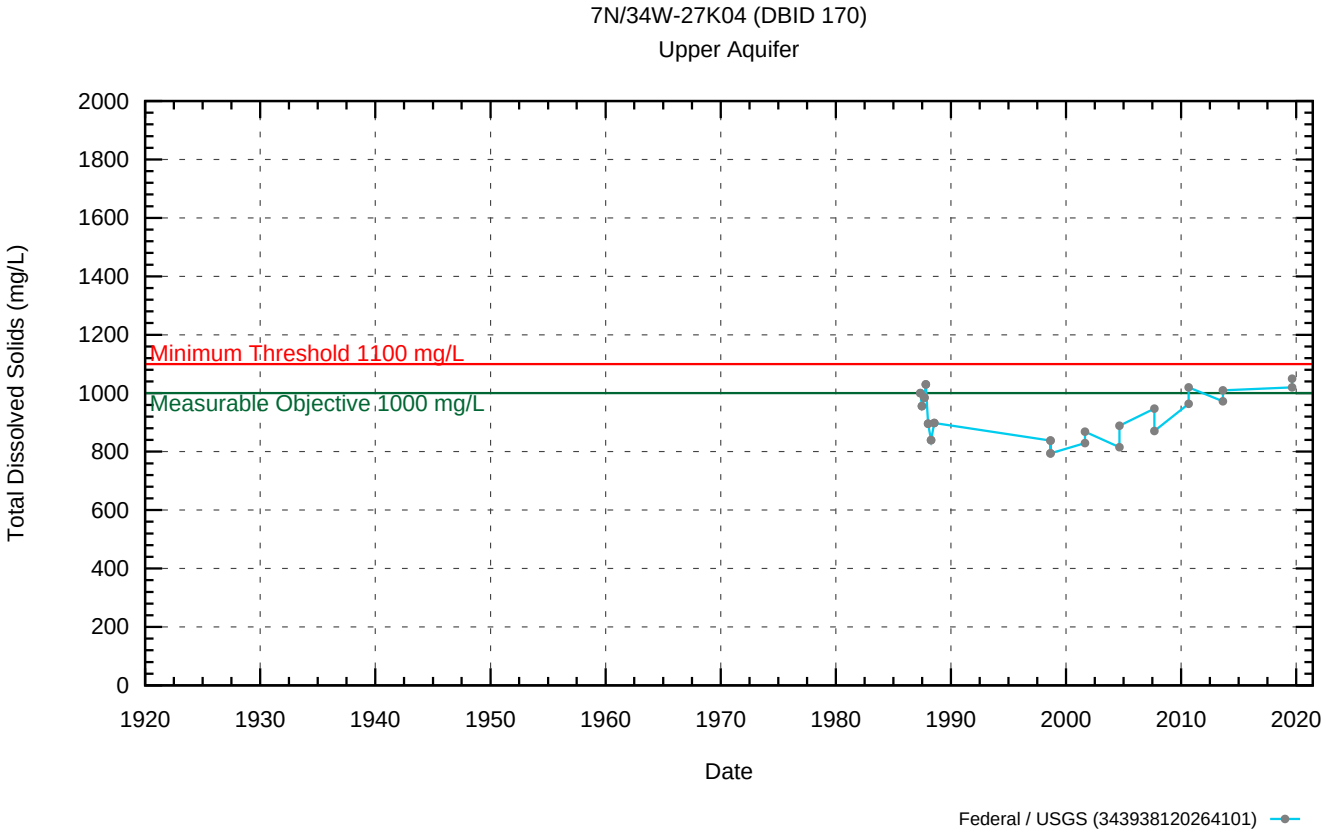
WMA: Lompoc Plain - Total Dissolved Solids



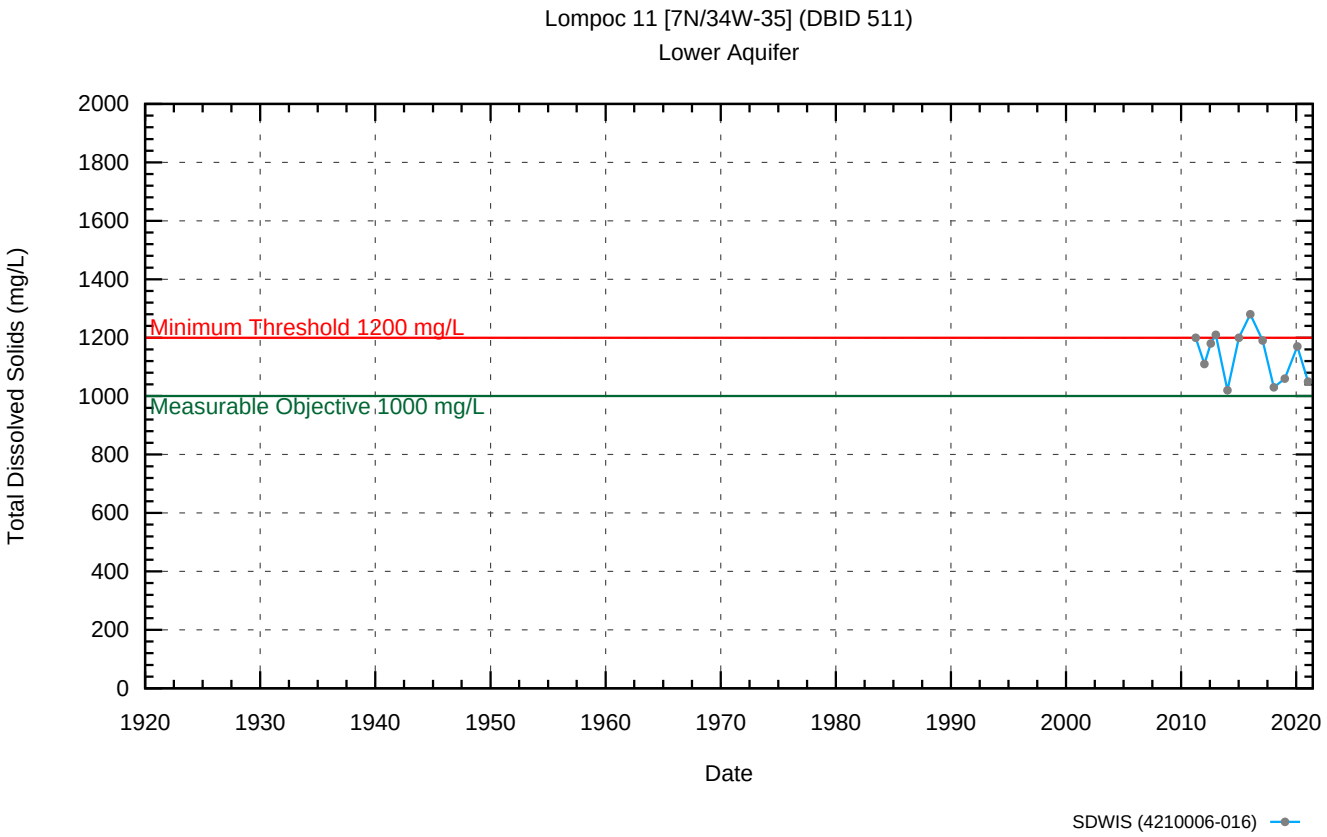


WMA: Lompoc Plain - Total Dissolved Solids



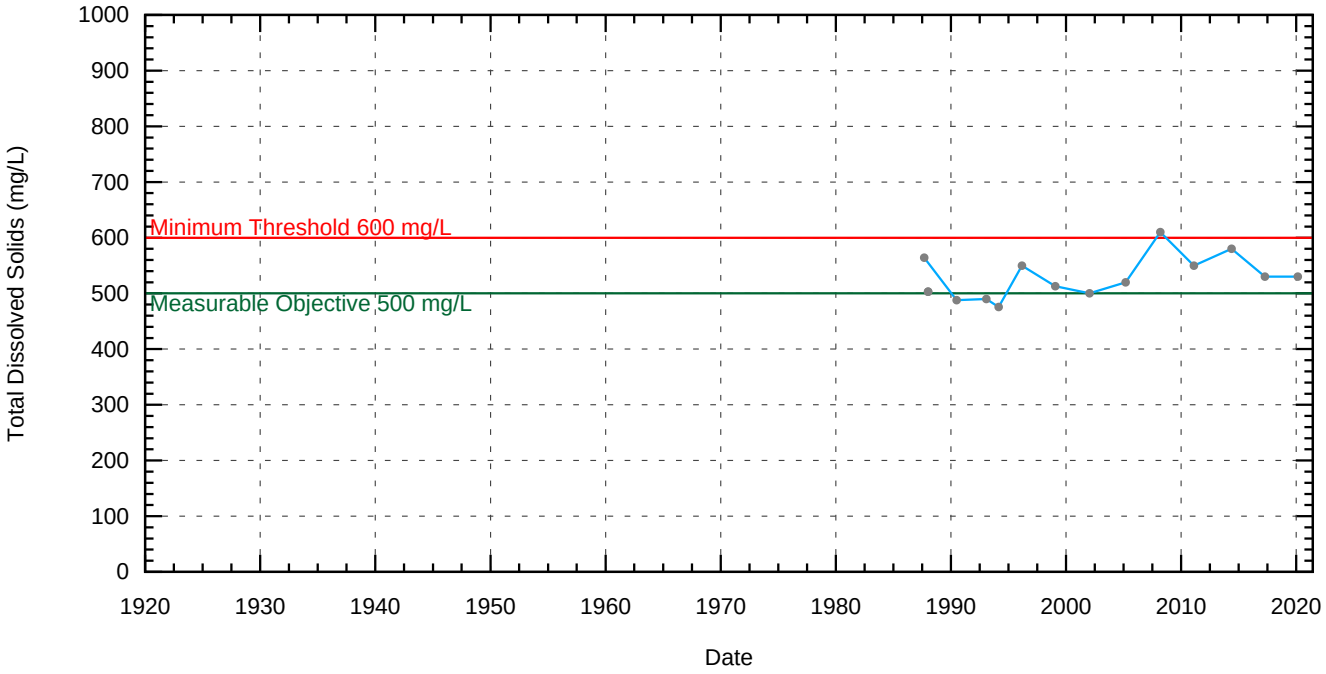


WMA: Lompoc Plain - Total Dissolved Solids

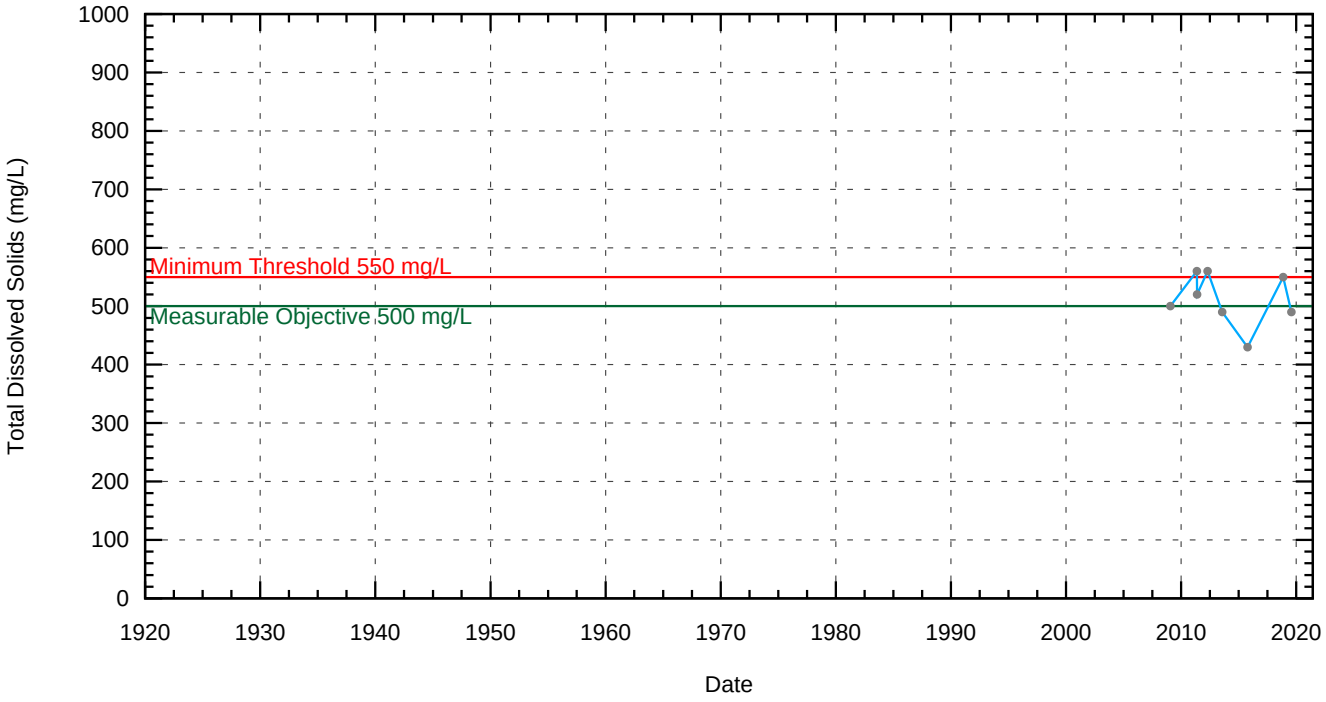


WMA: Lompoc Uplands - Total Dissolved Solids

VVCSD 3B [7N/34W-15E3] (DBID 608)
Lower Aquifer

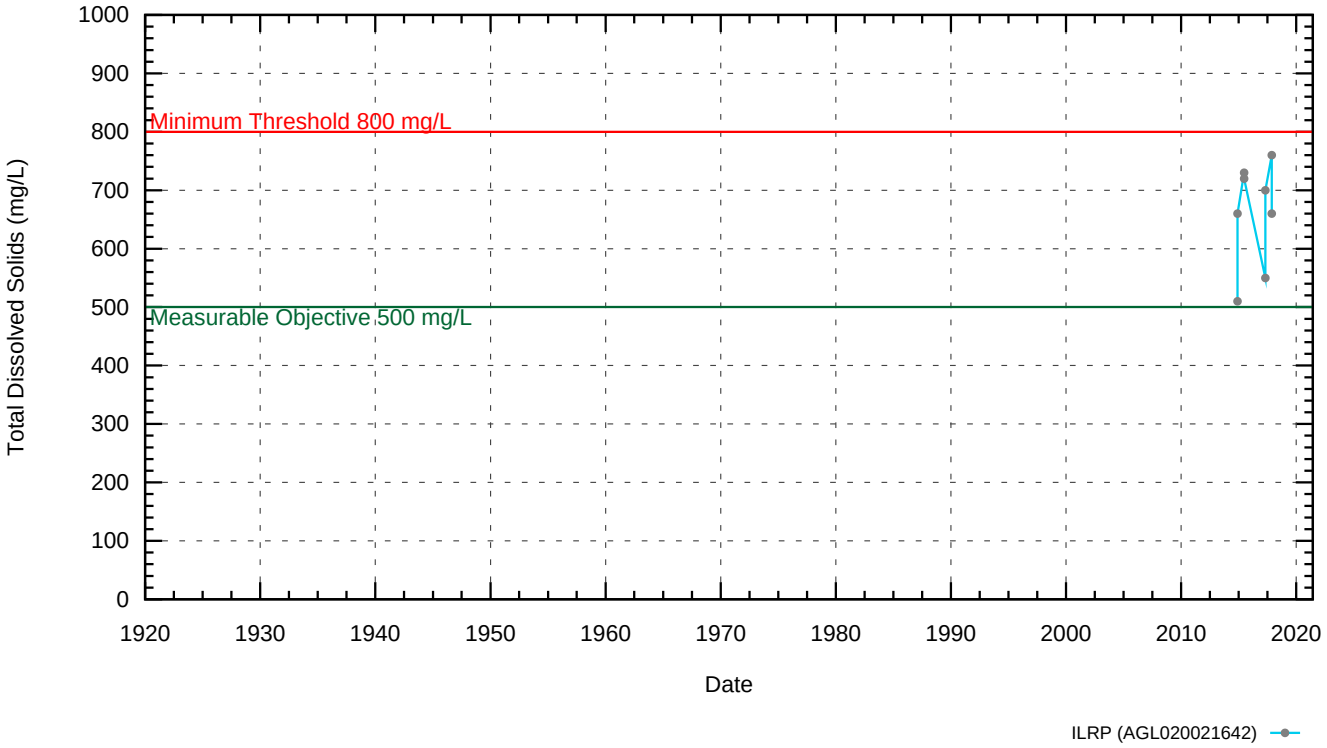


MH CSD 7 (DBID 706)
Lower Aquifer

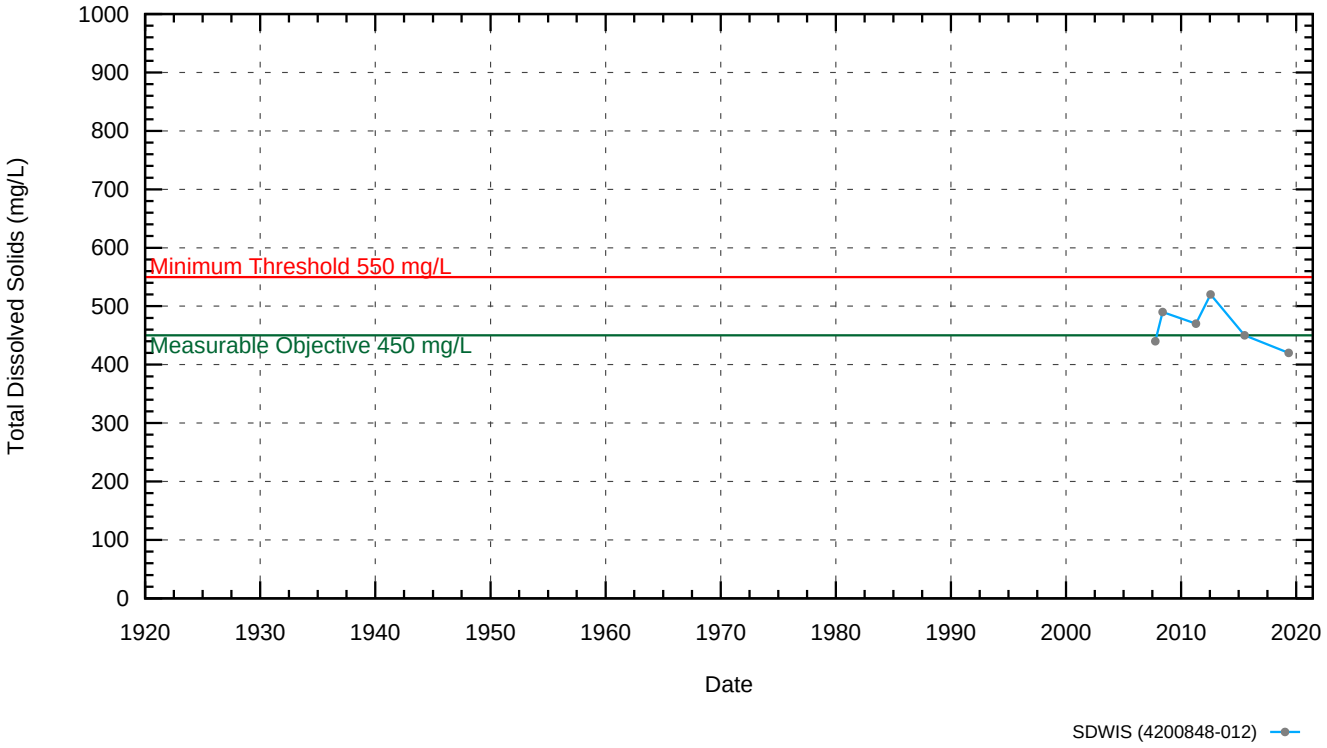


WMA: Santa Rita Uplands - Total Dissolved Solids

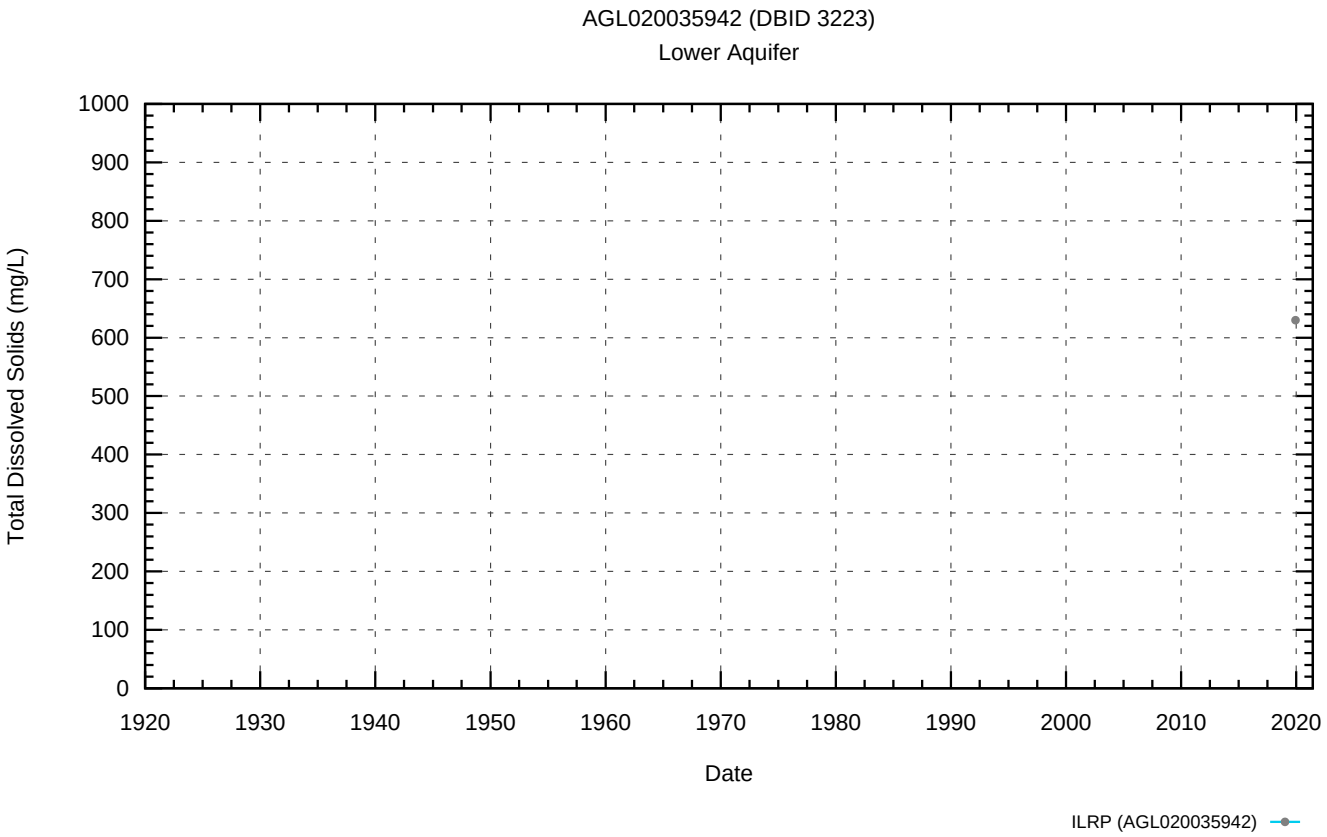
AGL020021642 (DBID 3172)
Lower Aquifer



Vista Hills MWC #4 (DBID 1304)
Lower Aquifer

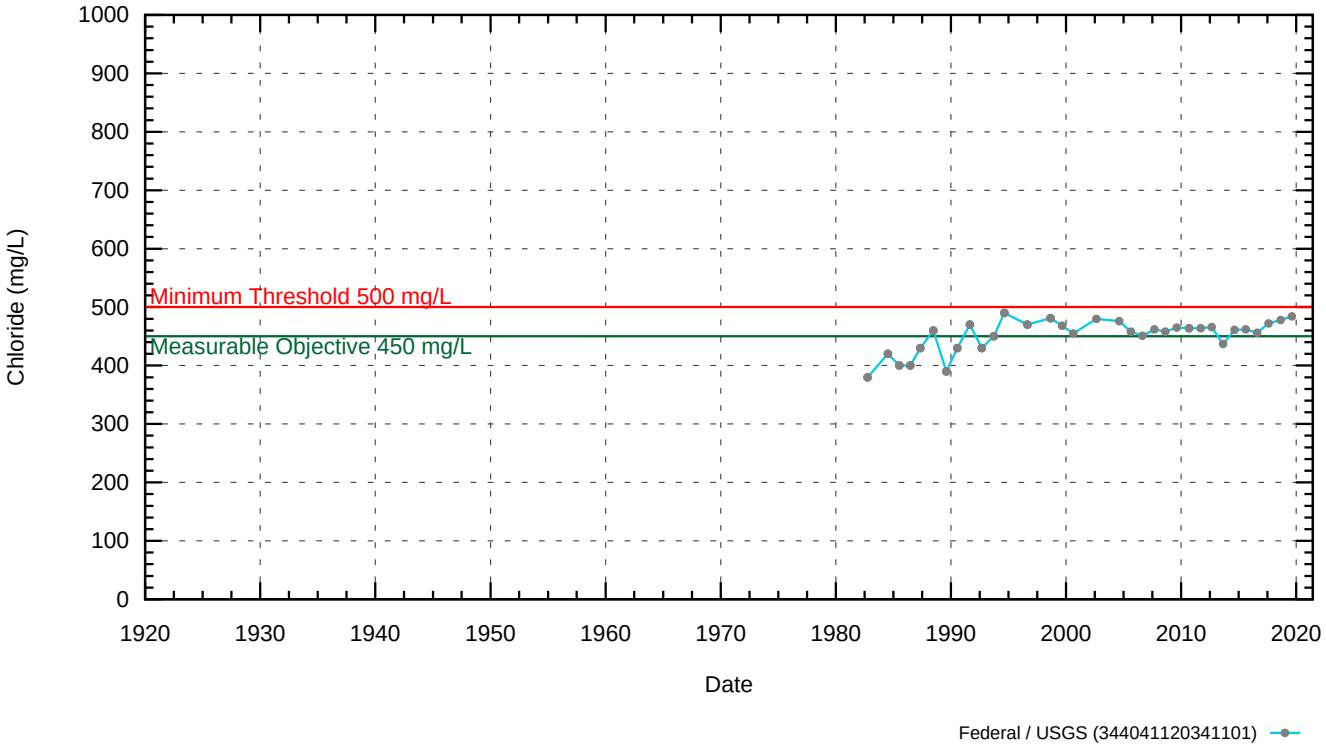


WMA: Santa Rita Uplands - Total Dissolved Solids

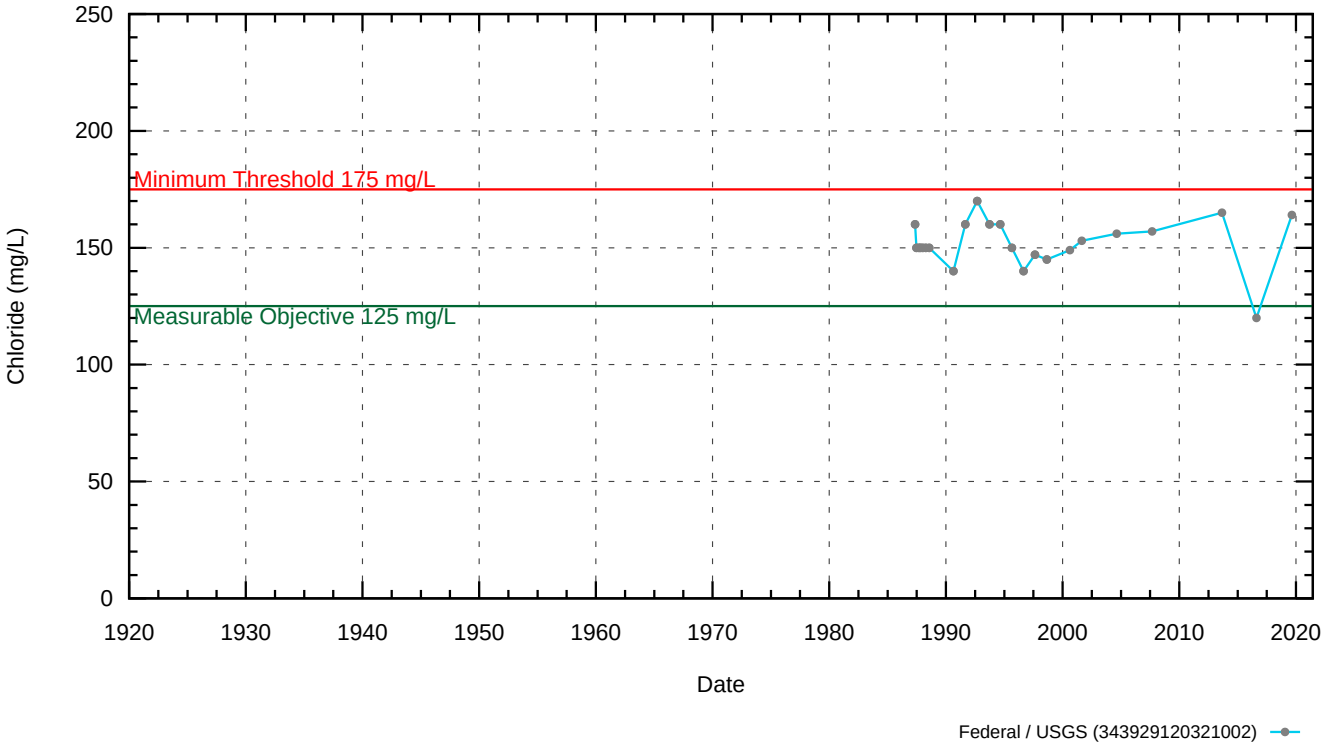


WMA: Lompoc Plain - Chloride

7N/35W-21G2 (DBID 39)
Upper Aquifer

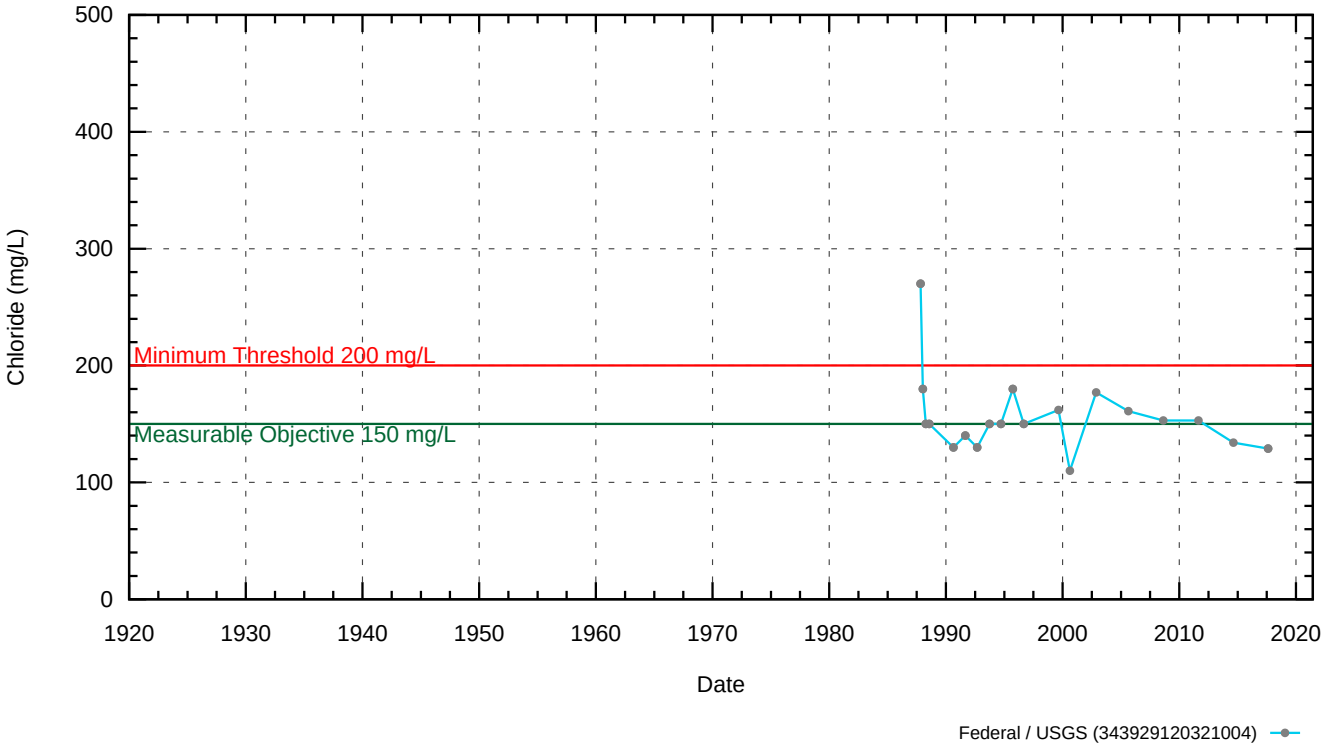


7N/35W-26L2 (DBID 16)
Upper Aquifer

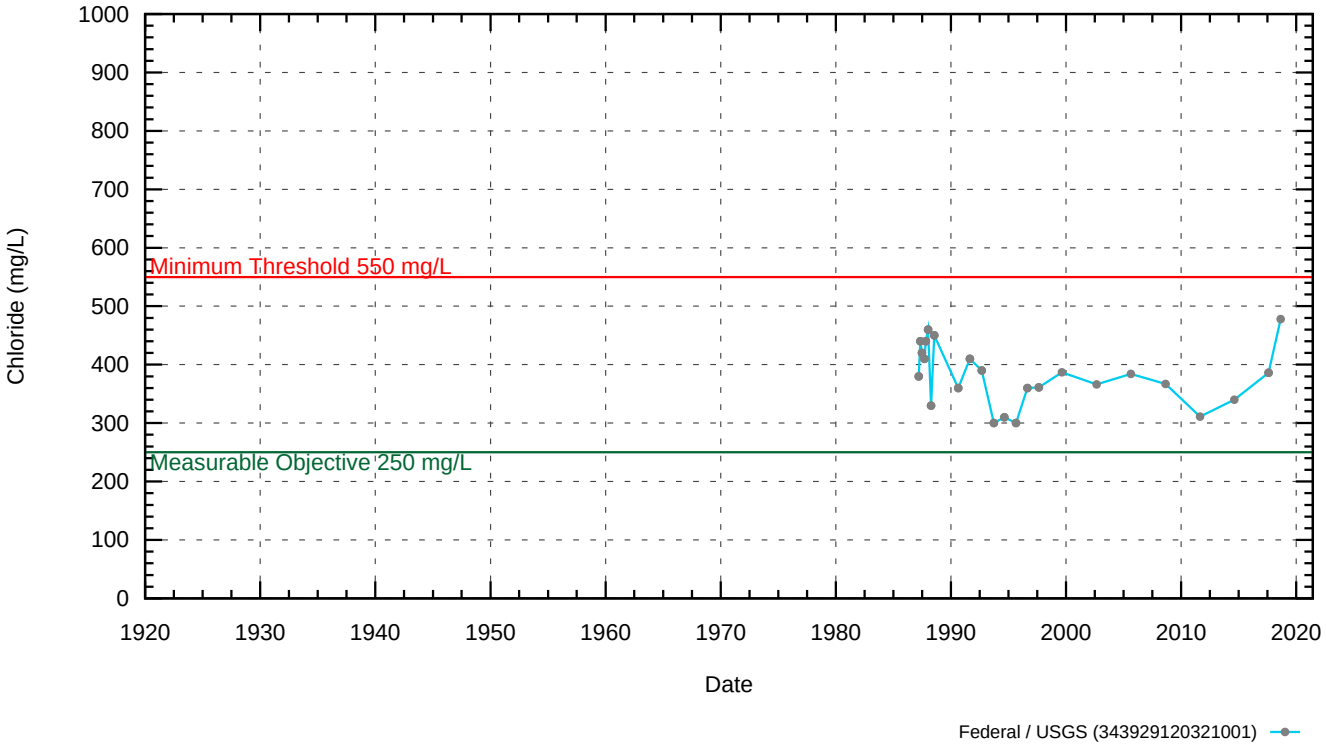


WMA: Lompoc Plain - Chloride

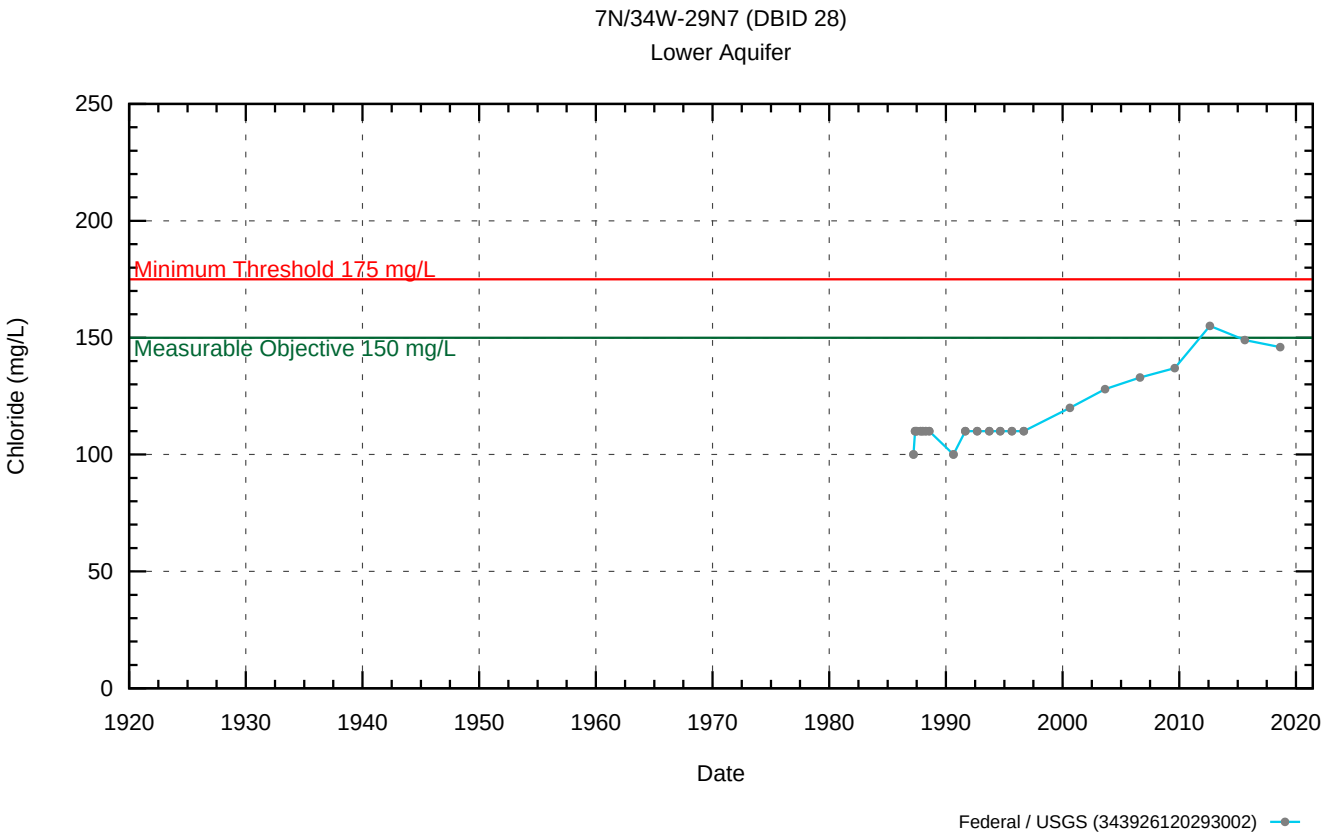
7N/35W-26L4 (DBID 17)
Lower Aquifer

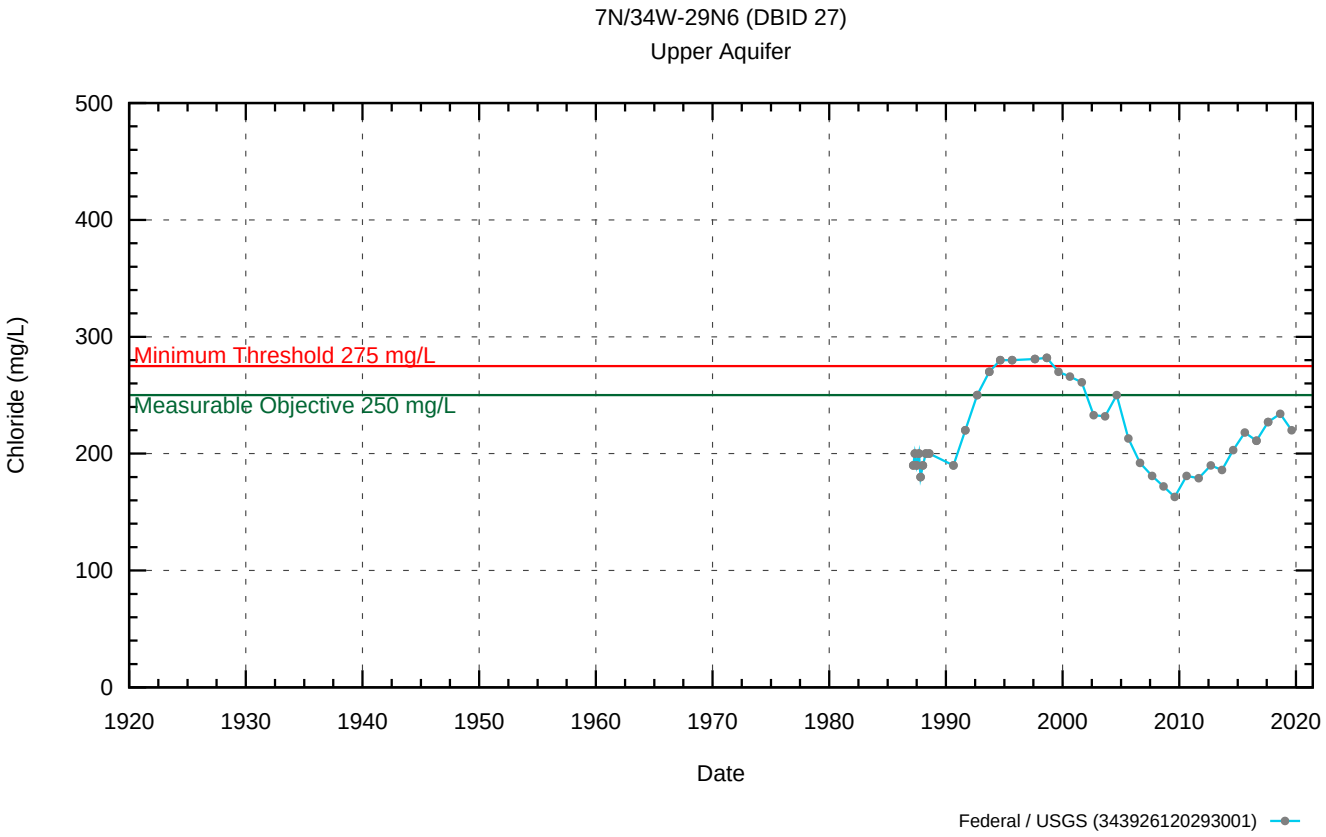


7N/35W-26L1 (DBID 15)
Upper Aquifer



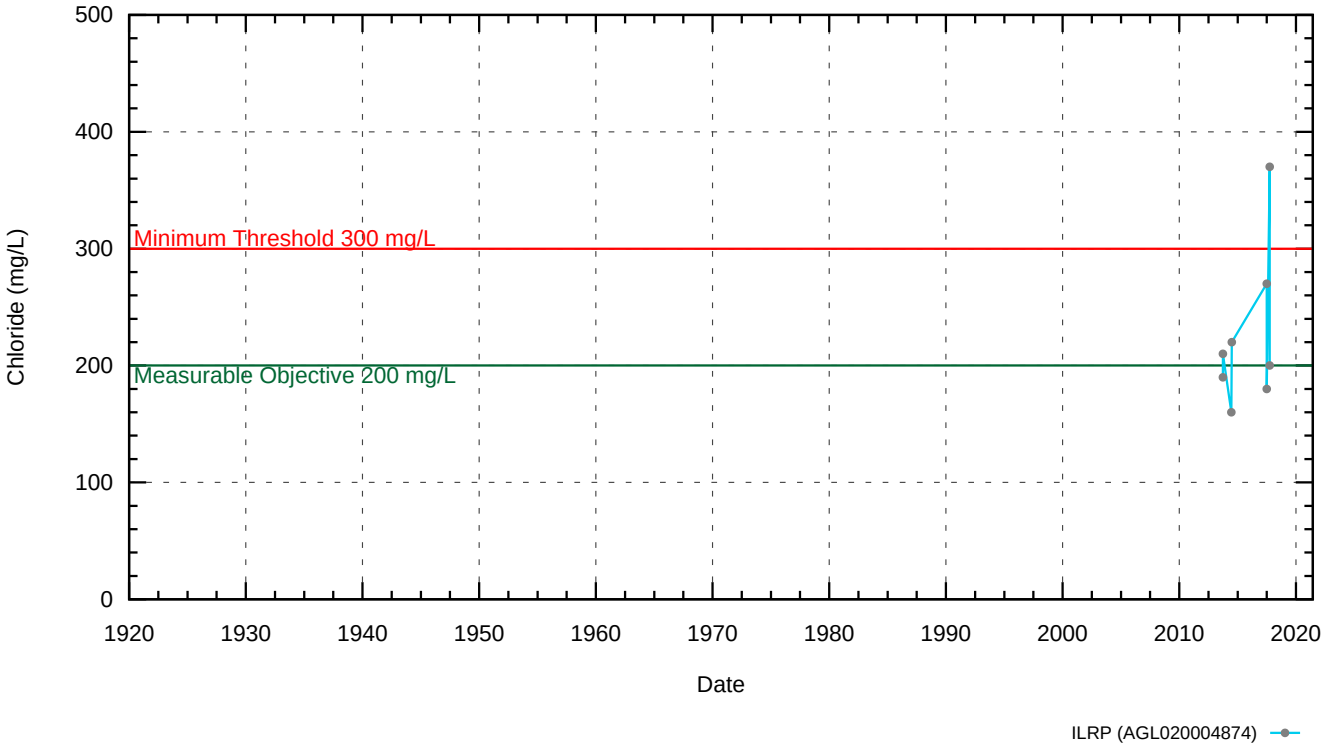
WMA: Lompoc Plain - Chloride



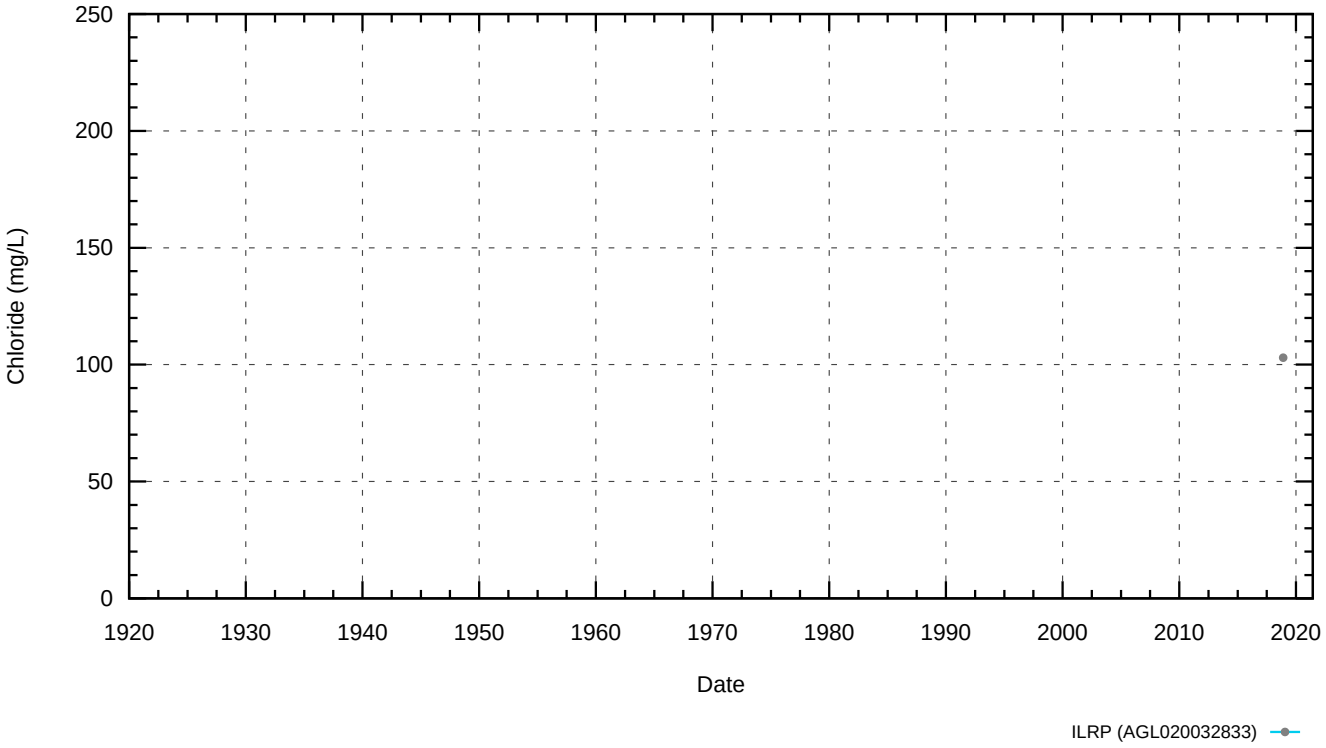


WMA: Lompoc Plain - Chloride

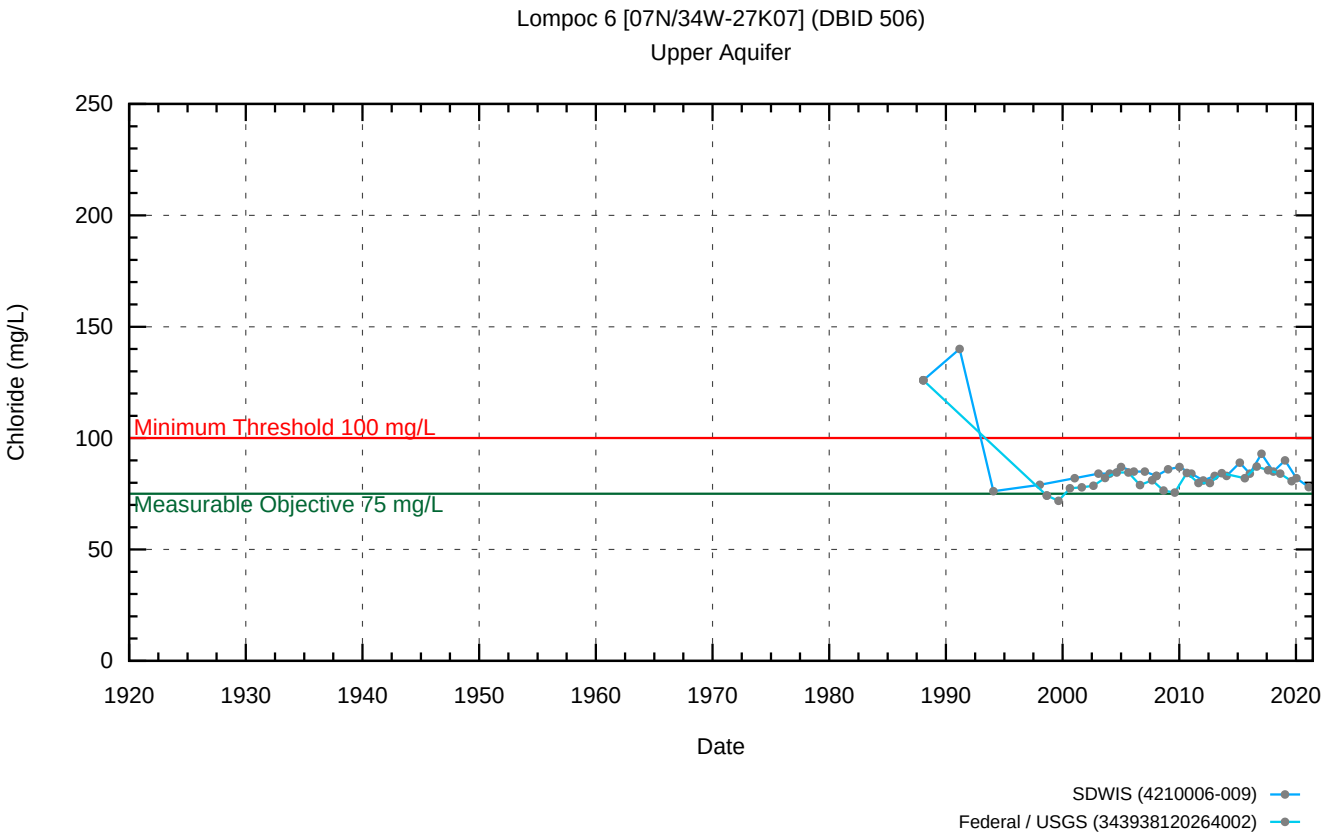
AGL020004874 (DBID 3150)
Upper Aquifer

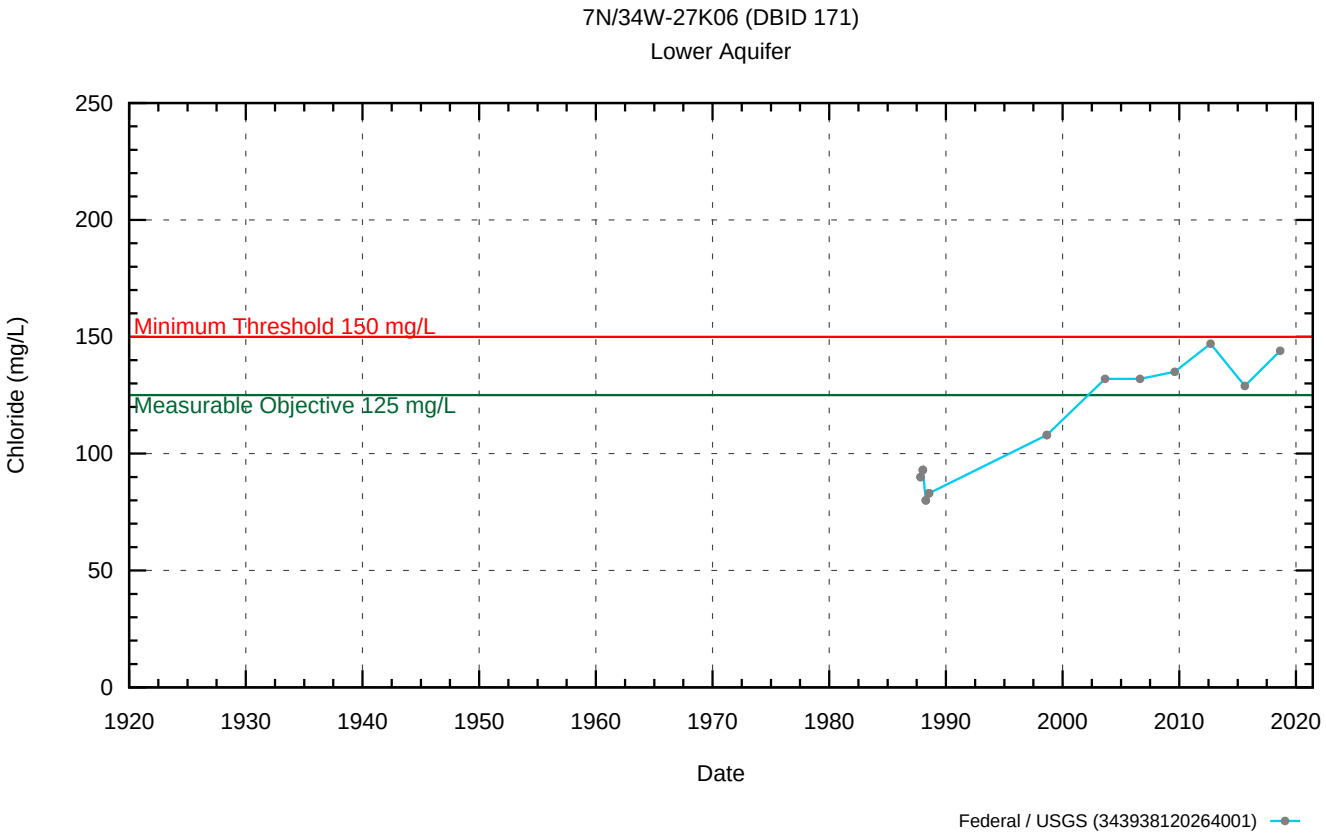


AGL020032833 (DBID 3040)
Lower Aquifer



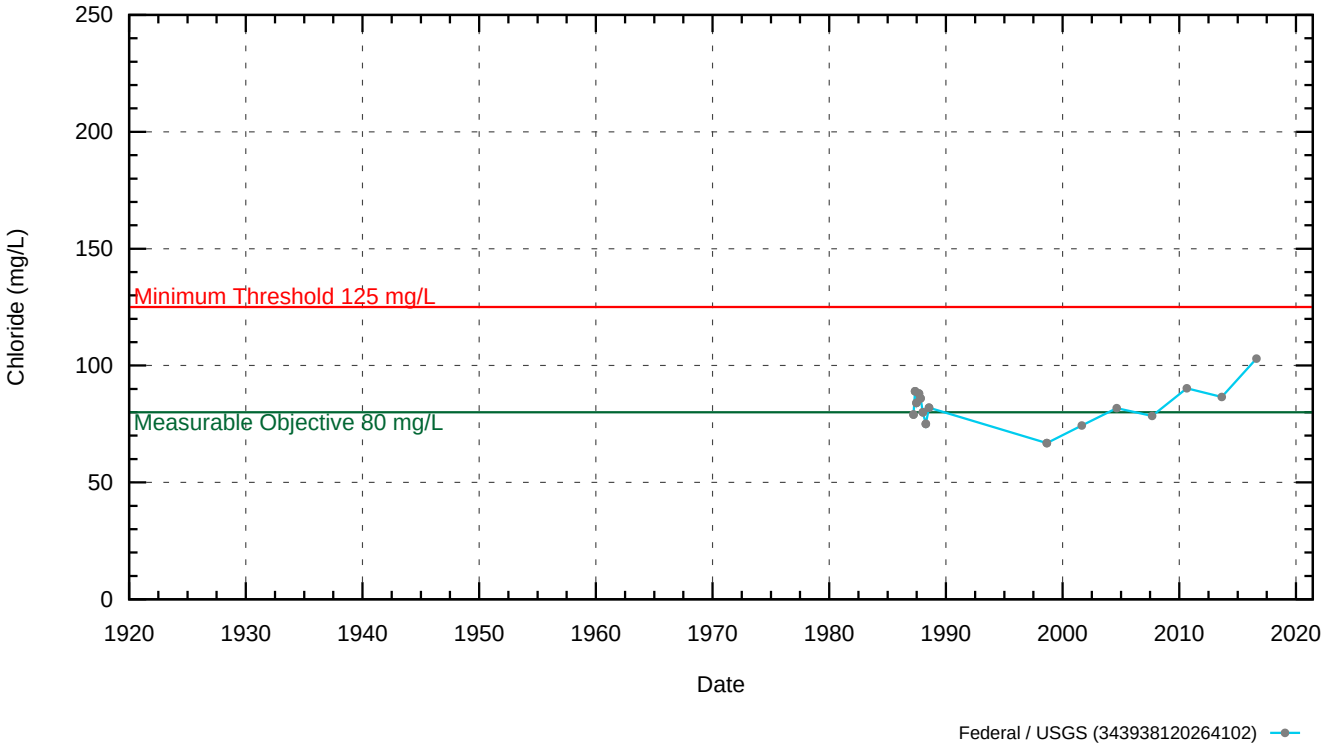
WMA: Lompoc Plain - Chloride



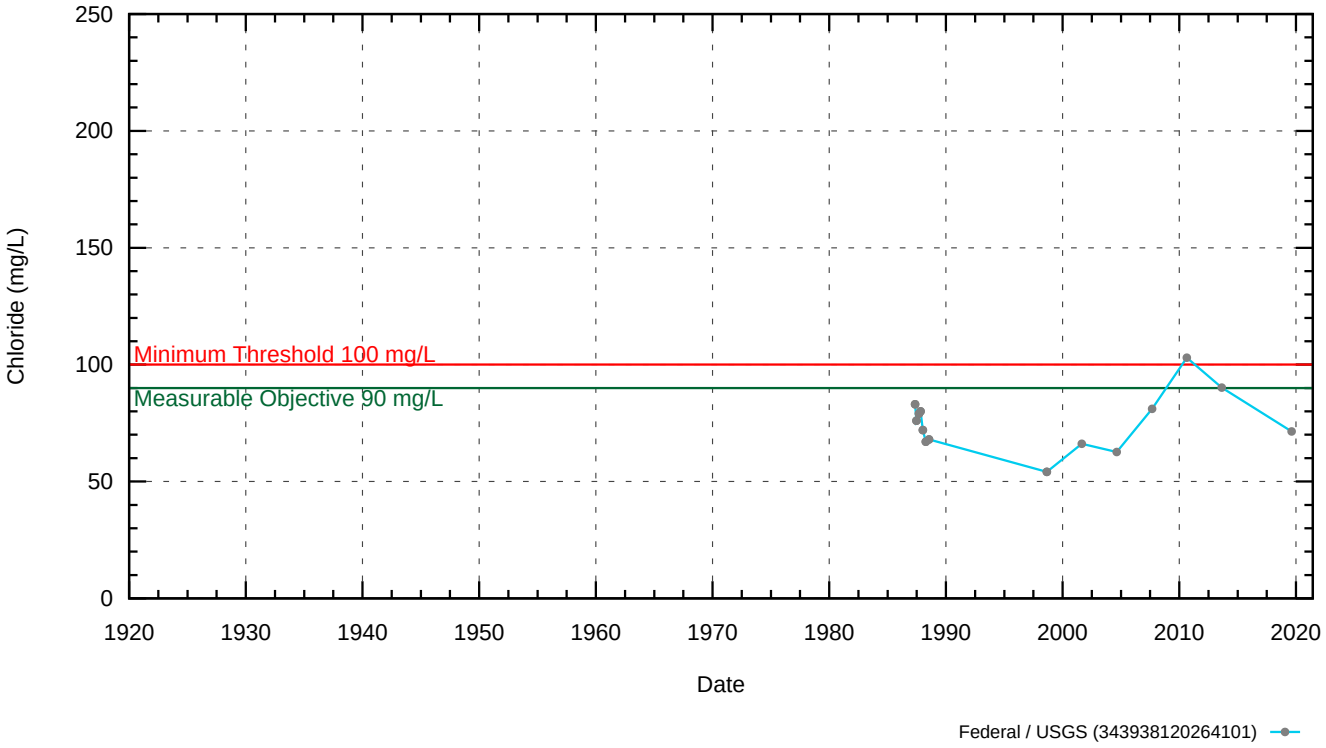


WMA: Lompoc Plain - Chloride

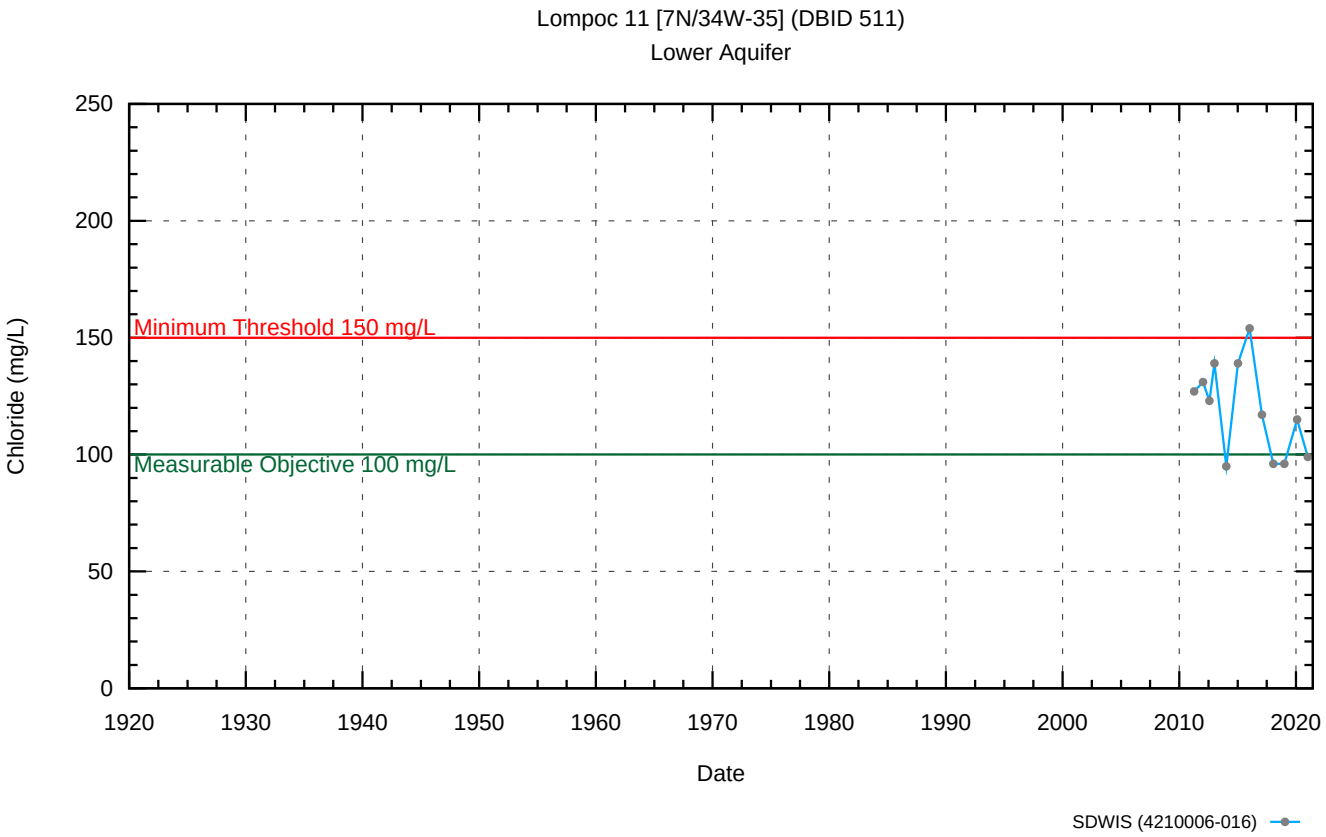
7N/34W-27K05 (DBID 139)
Upper Aquifer



7N/34W-27K04 (DBID 170)
Upper Aquifer

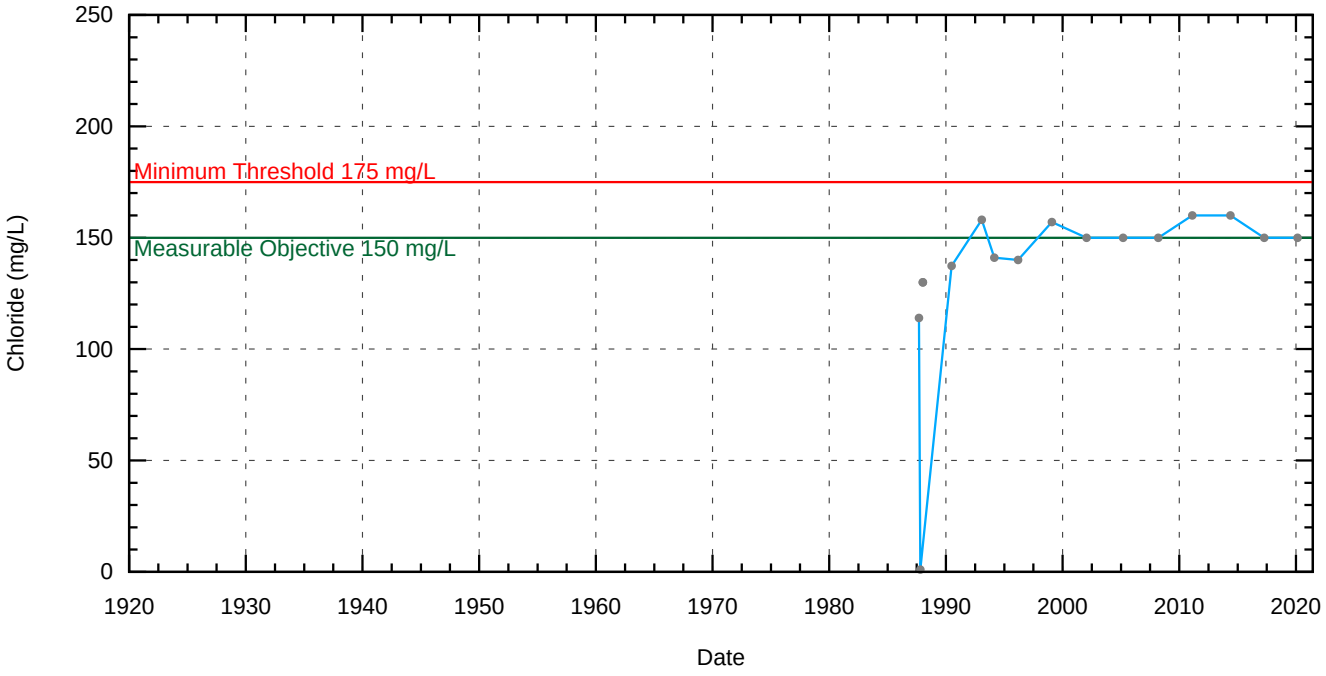


WMA: Lompoc Plain - Chloride

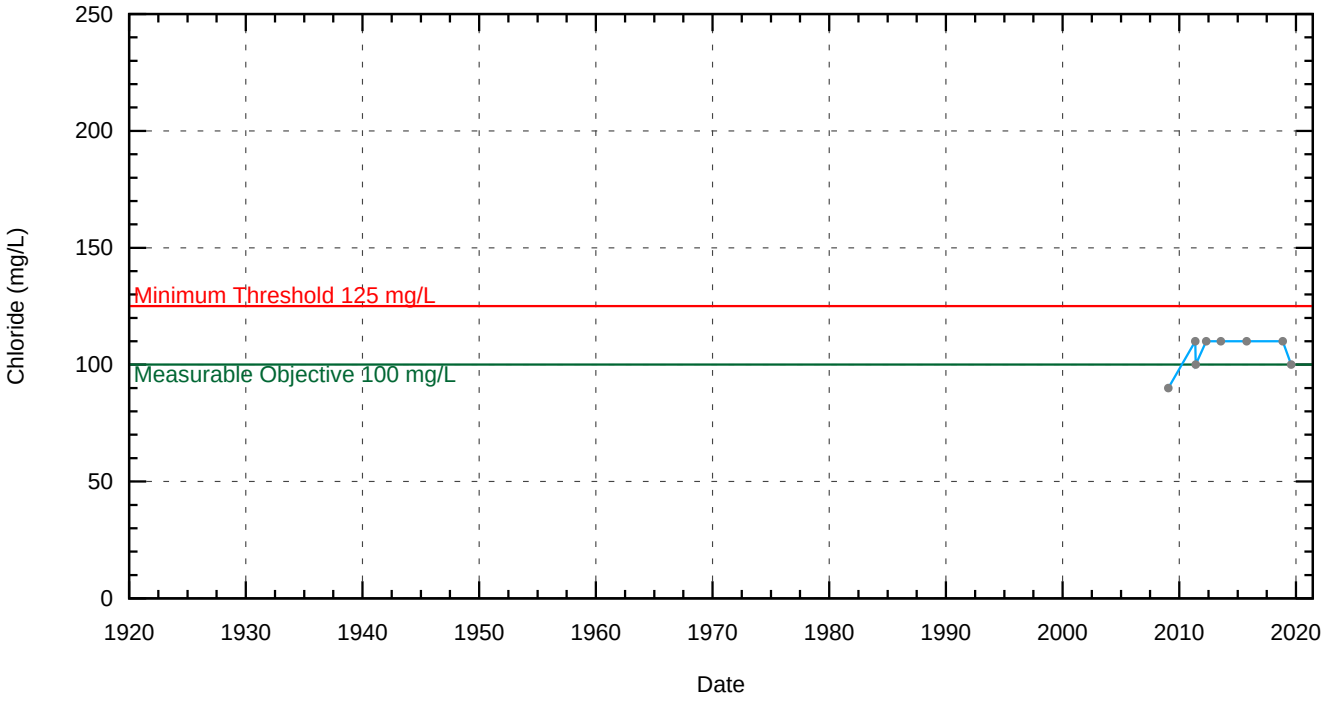


WMA: Lompoc Uplands - Chloride

VVCSD 3B [7N/34W-15E3] (DBID 608)
Lower Aquifer

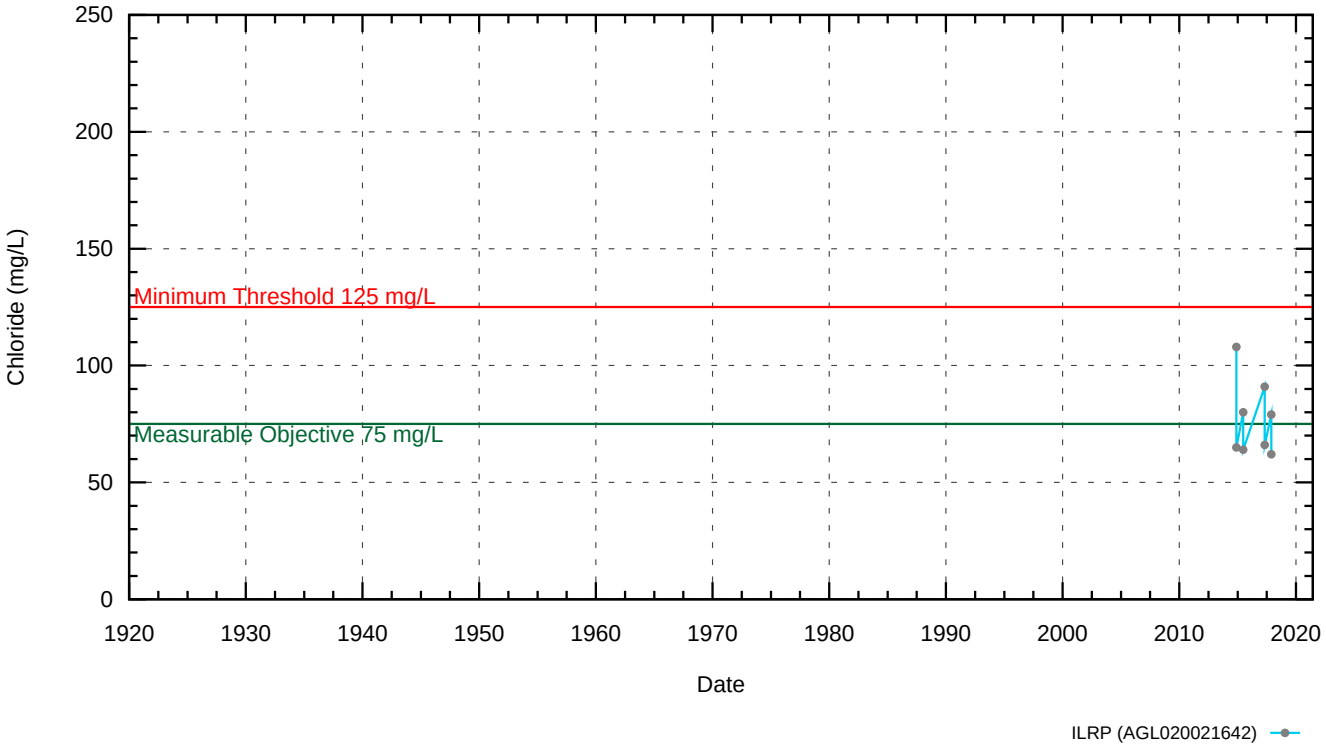


MH CSD 7 (DBID 706)
Lower Aquifer

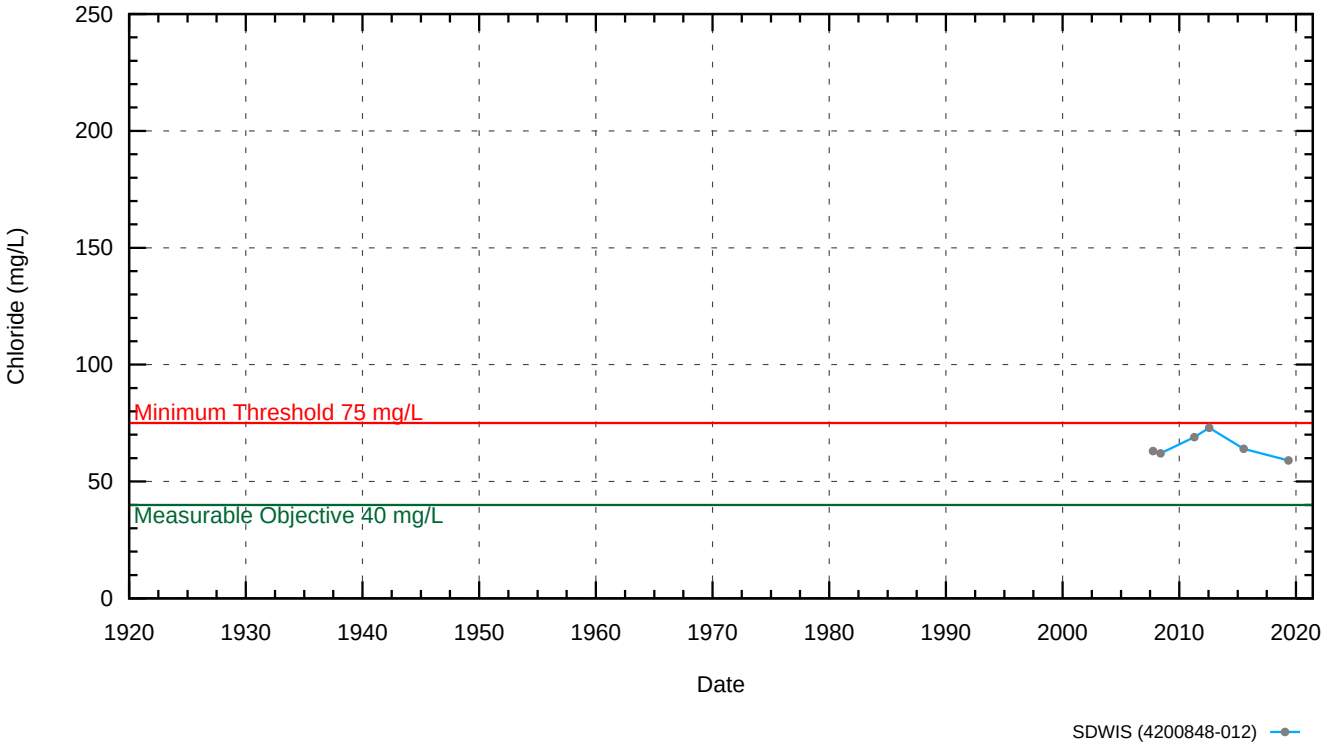


WMA: Santa Rita Uplands - Chloride

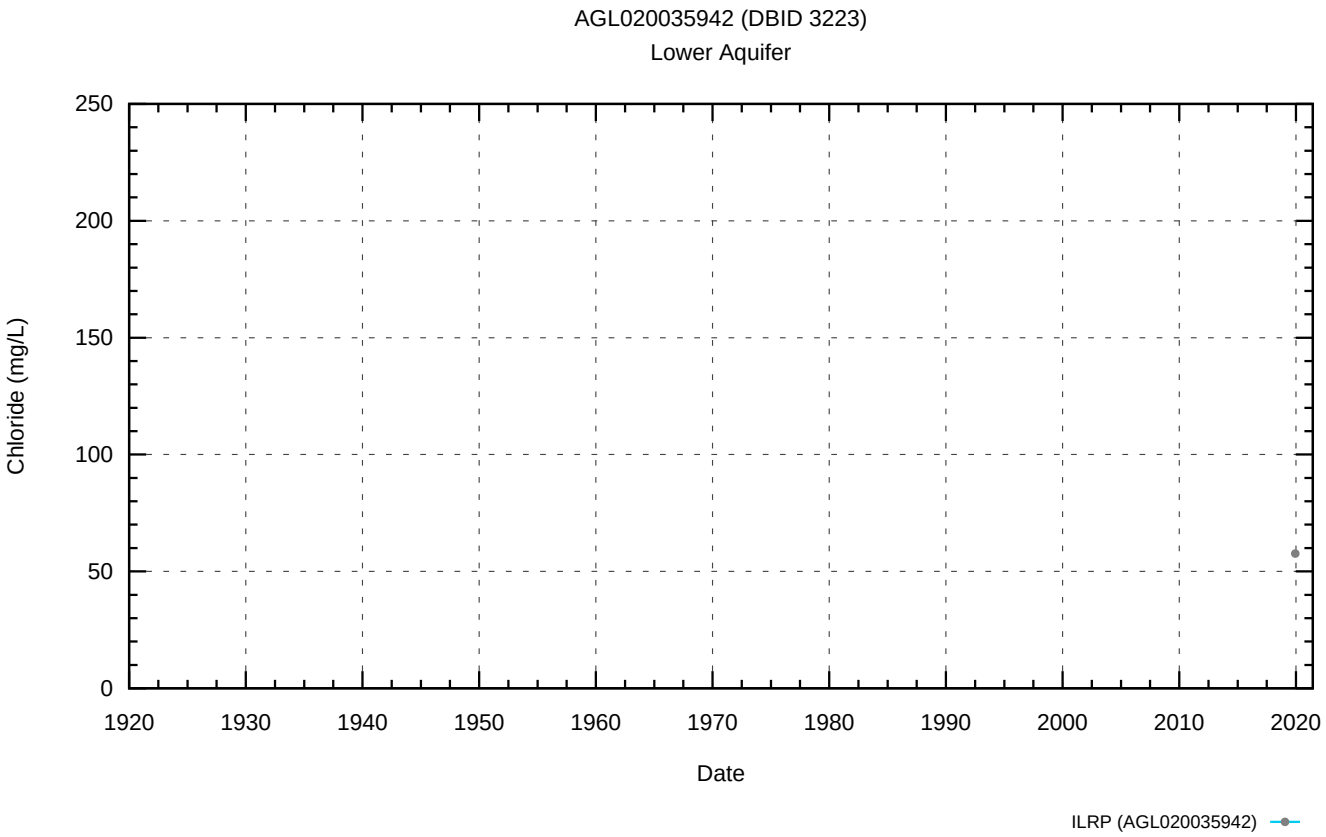
AGL020021642 (DBID 3172)
Lower Aquifer



Vista Hills MWC #4 (DBID 1304)
Lower Aquifer

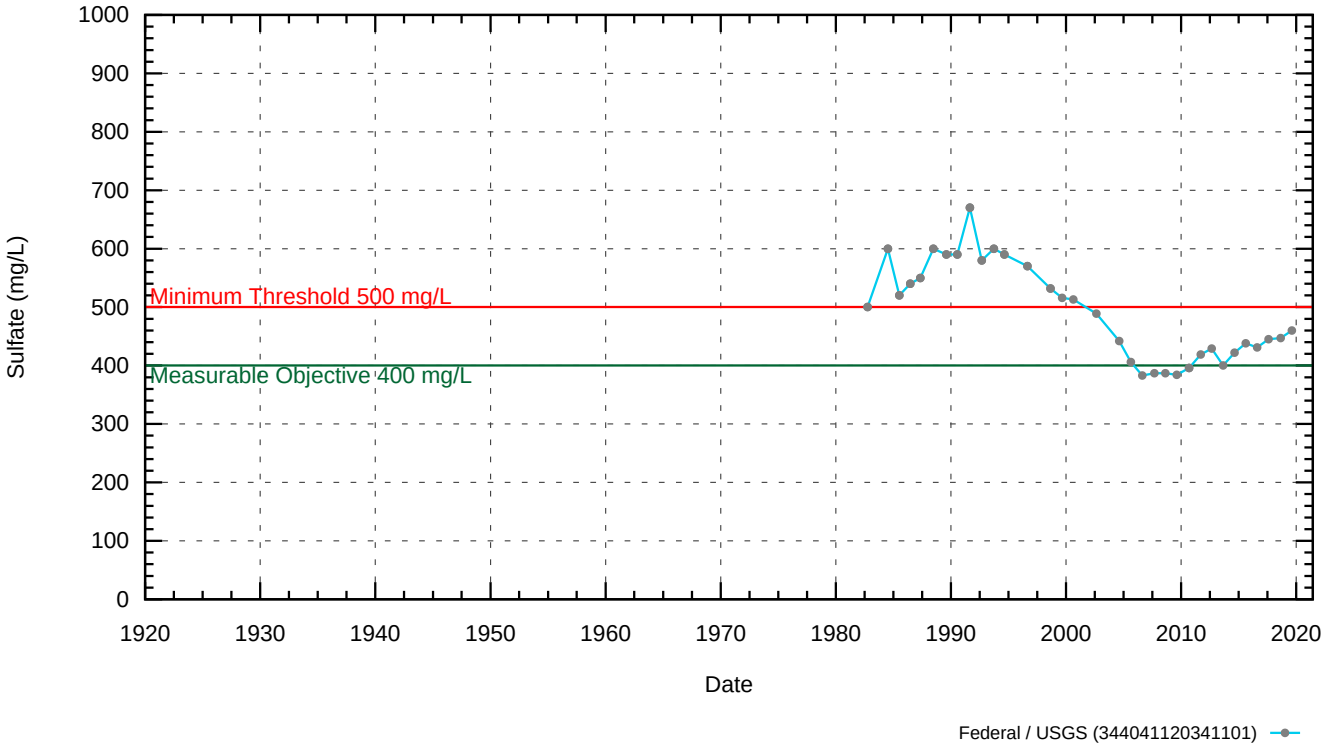


WMA: Santa Rita Uplands - Chloride

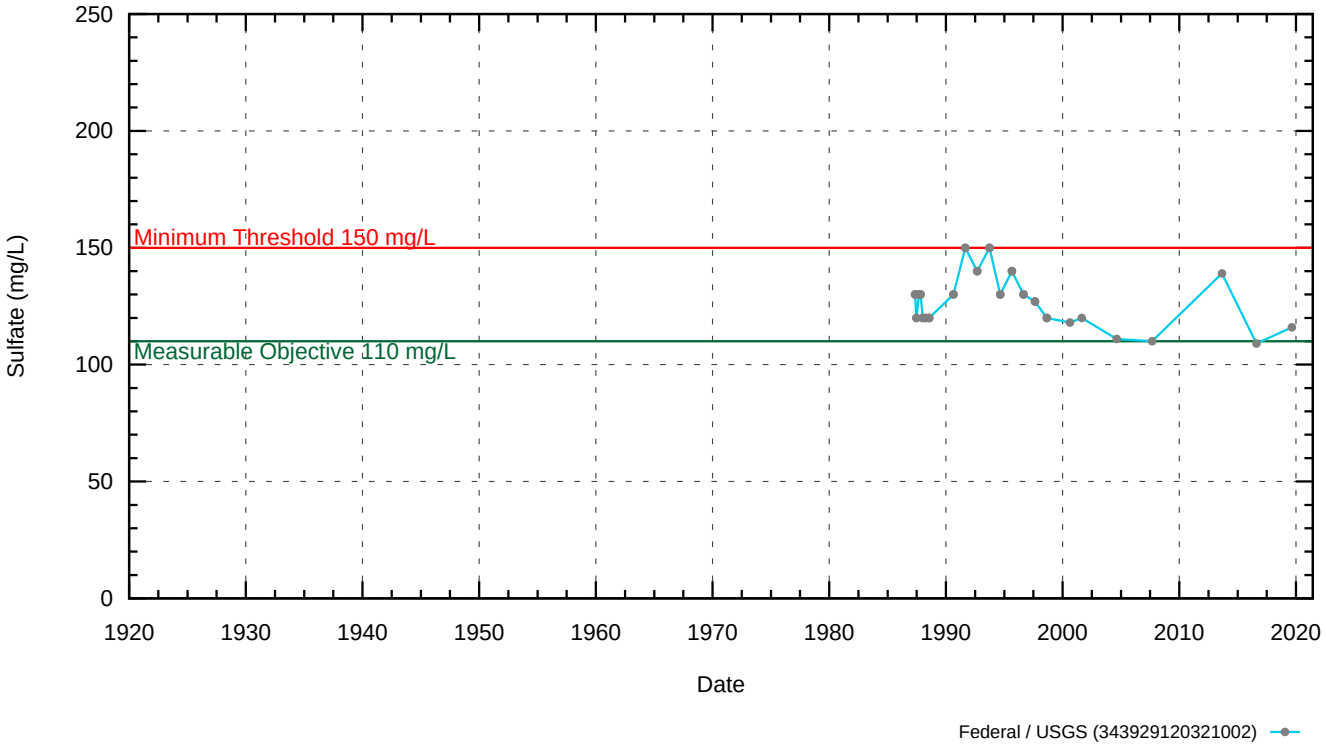


WMA: Lompoc Plain - Sulfate

7N/35W-21G2 (DBID 39)
Upper Aquifer

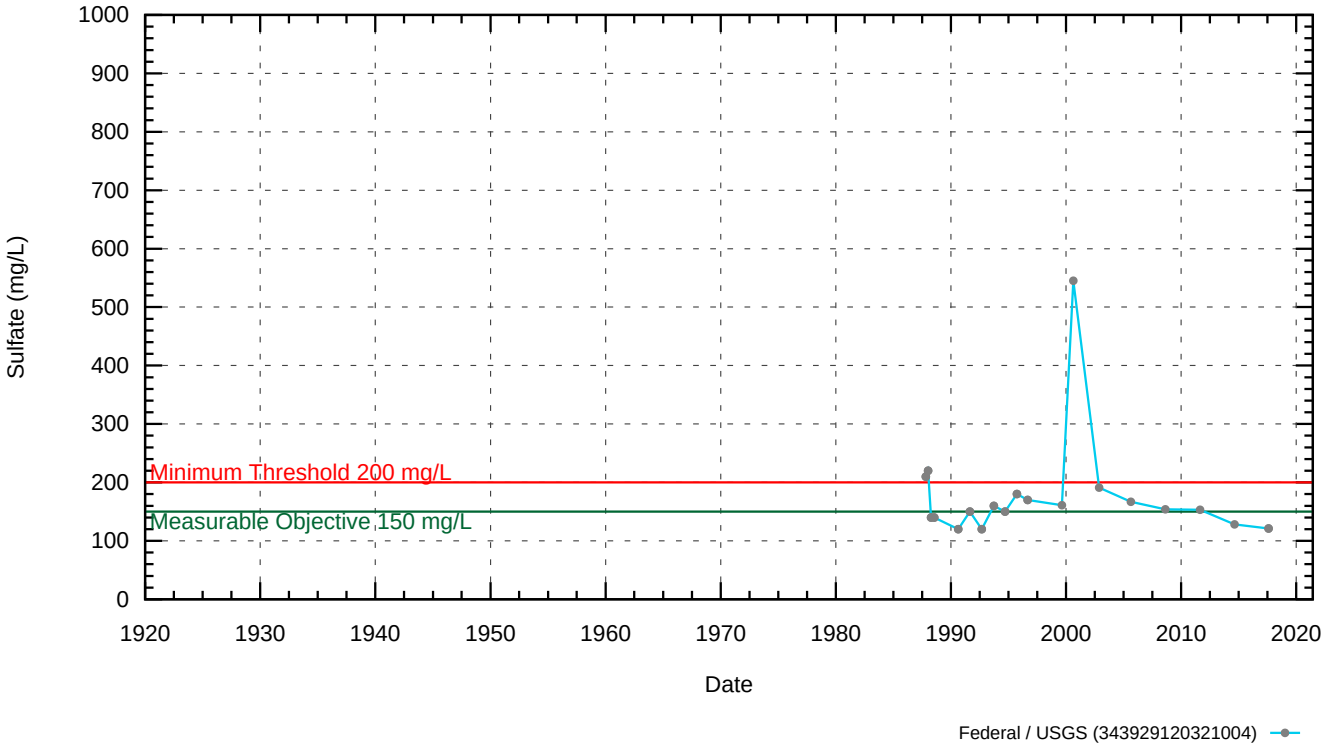


7N/35W-26L2 (DBID 16)
Upper Aquifer

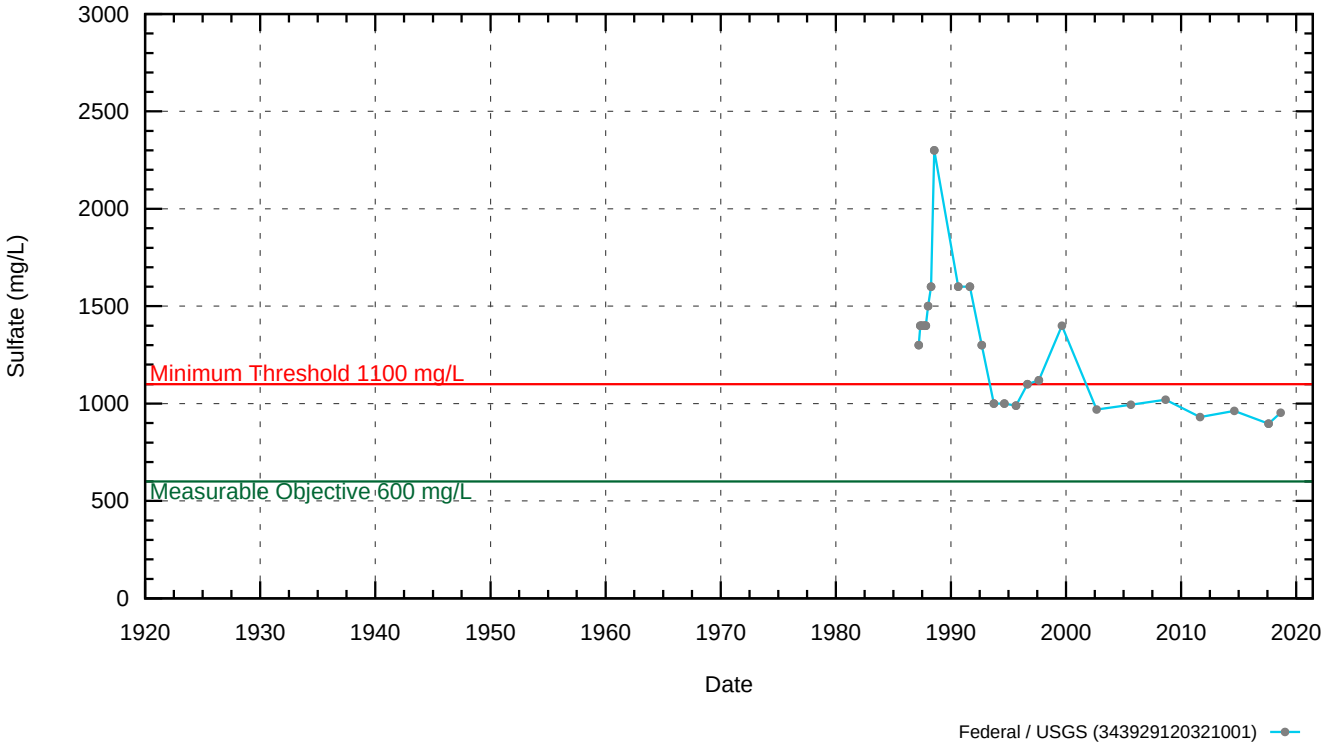


WMA: Lompoc Plain - Sulfate

7N/35W-26L4 (DBID 17)
Lower Aquifer

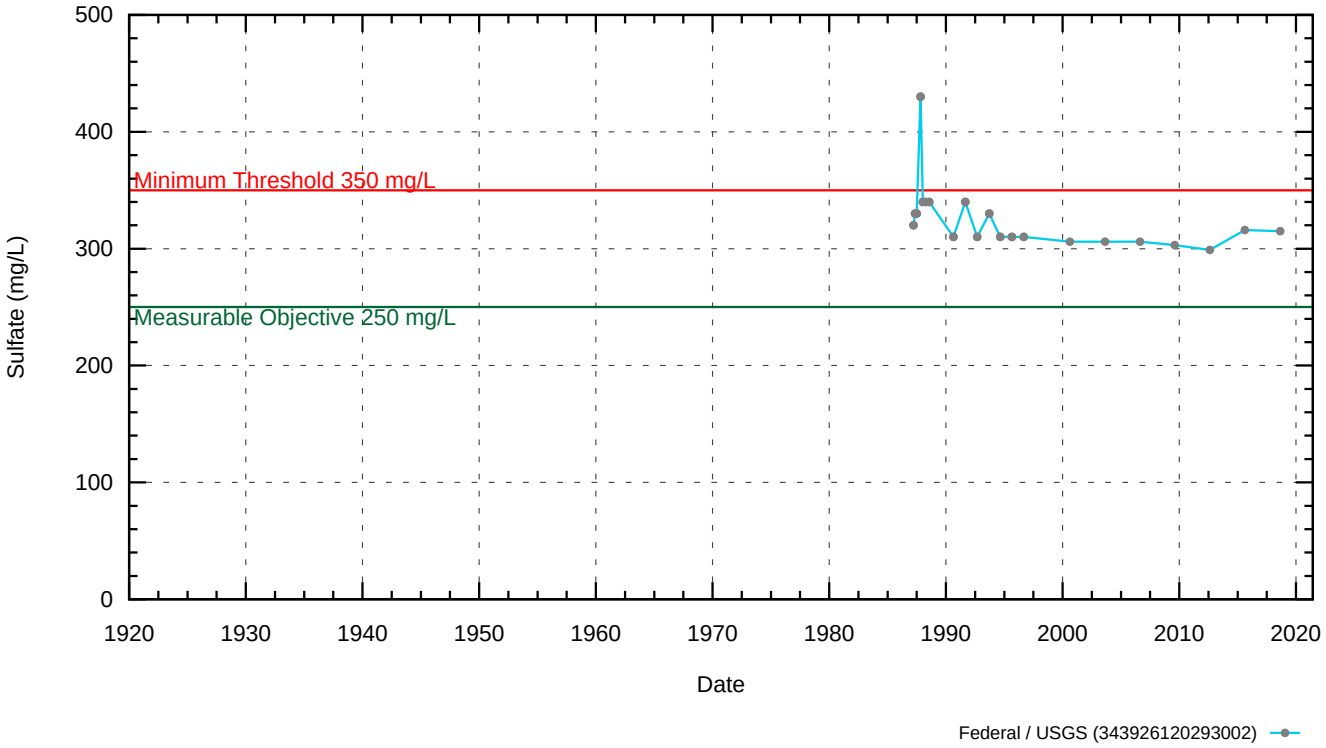


7N/35W-26L1 (DBID 15)
Upper Aquifer

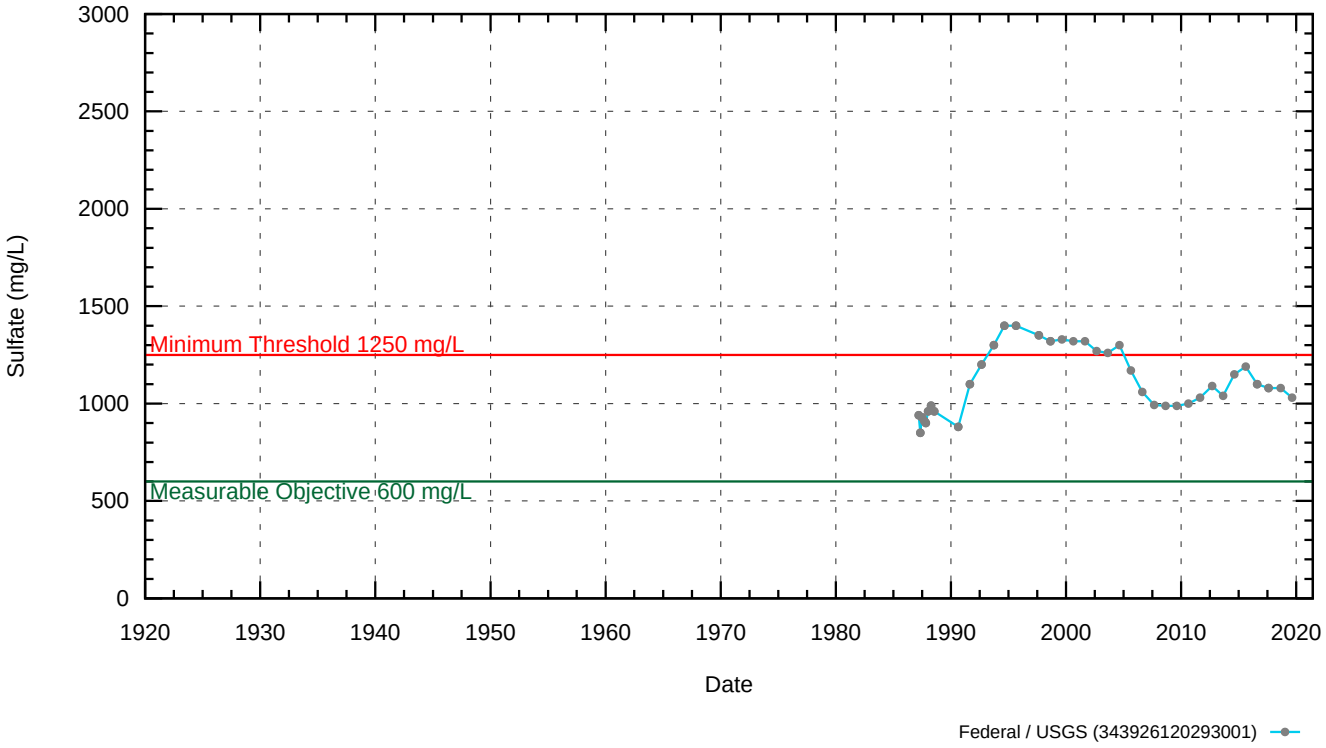


WMA: Lompoc Plain - Sulfate

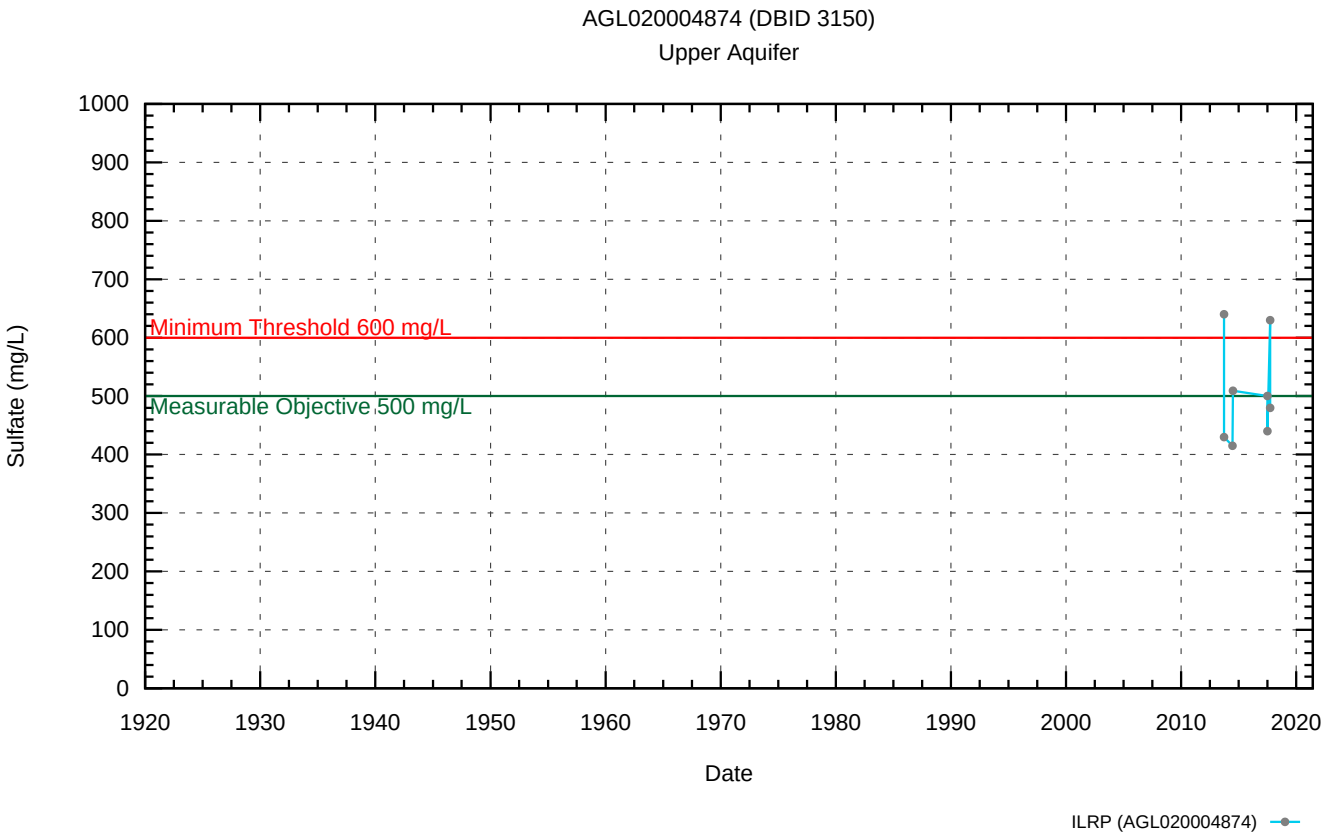
7N/34W-29N7 (DBID 28)
Lower Aquifer

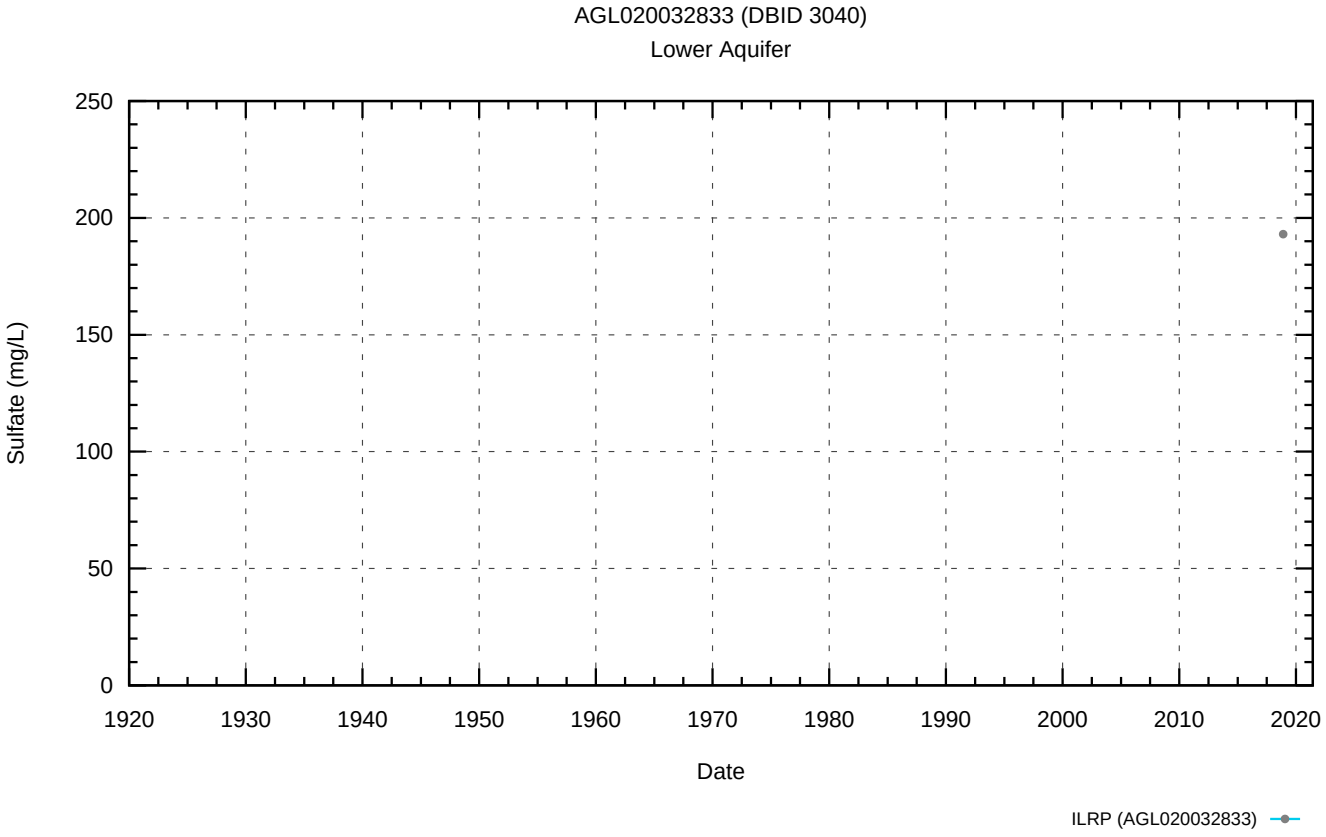


7N/34W-29N6 (DBID 27)
Upper Aquifer



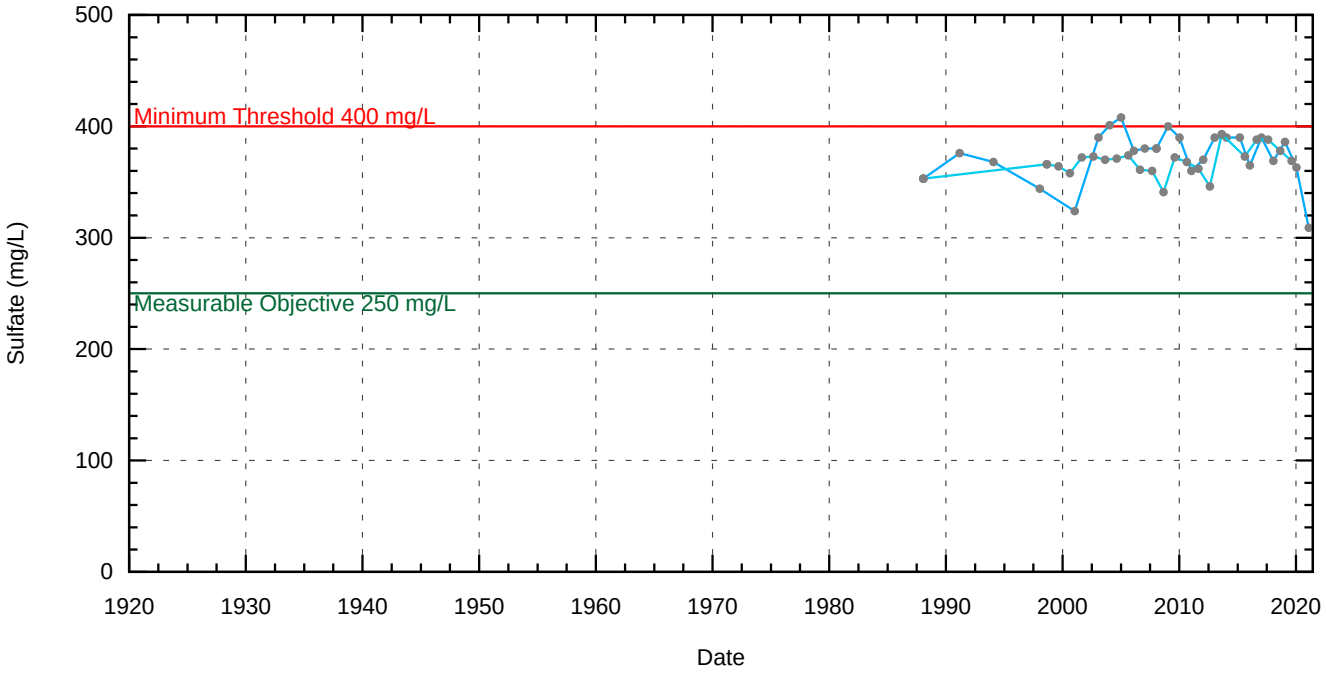
WMA: Lompoc Plain - Sulfate



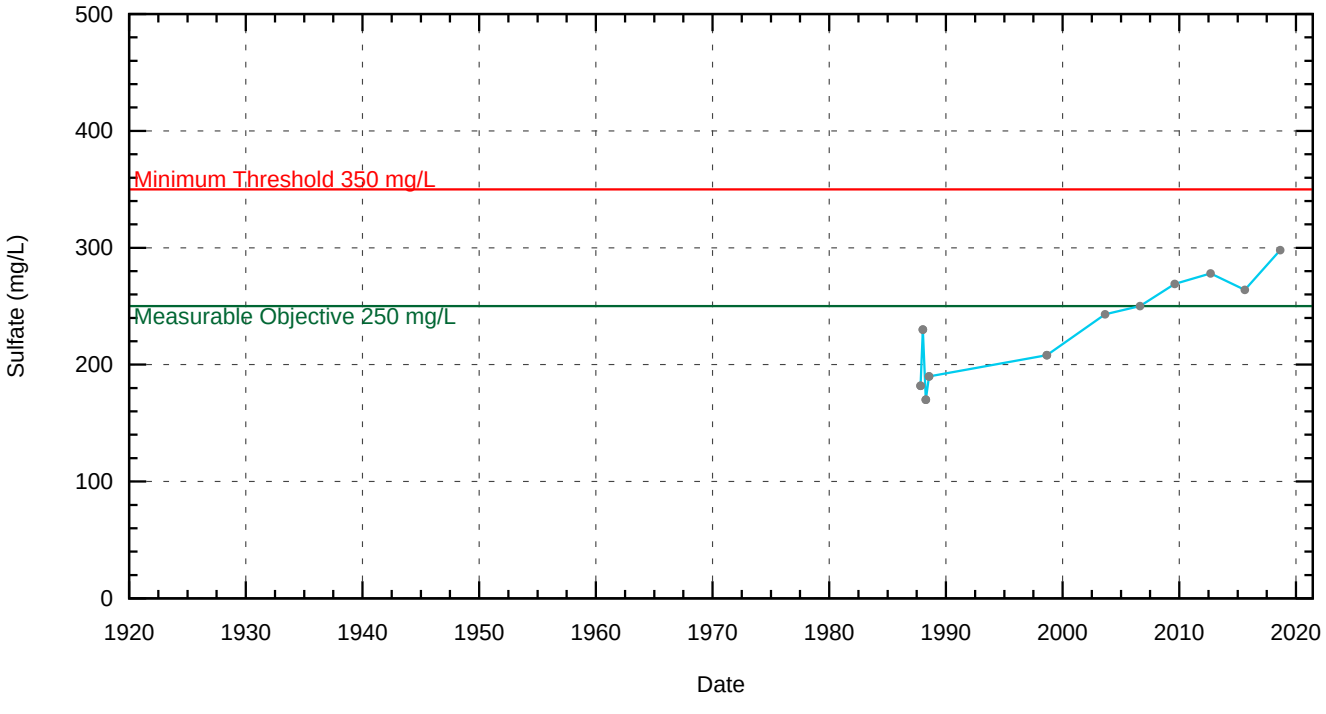


WMA: Lompoc Plain - Sulfate

Lompoc 6 [07N/34W-27K07] (DBID 506)
Upper Aquifer

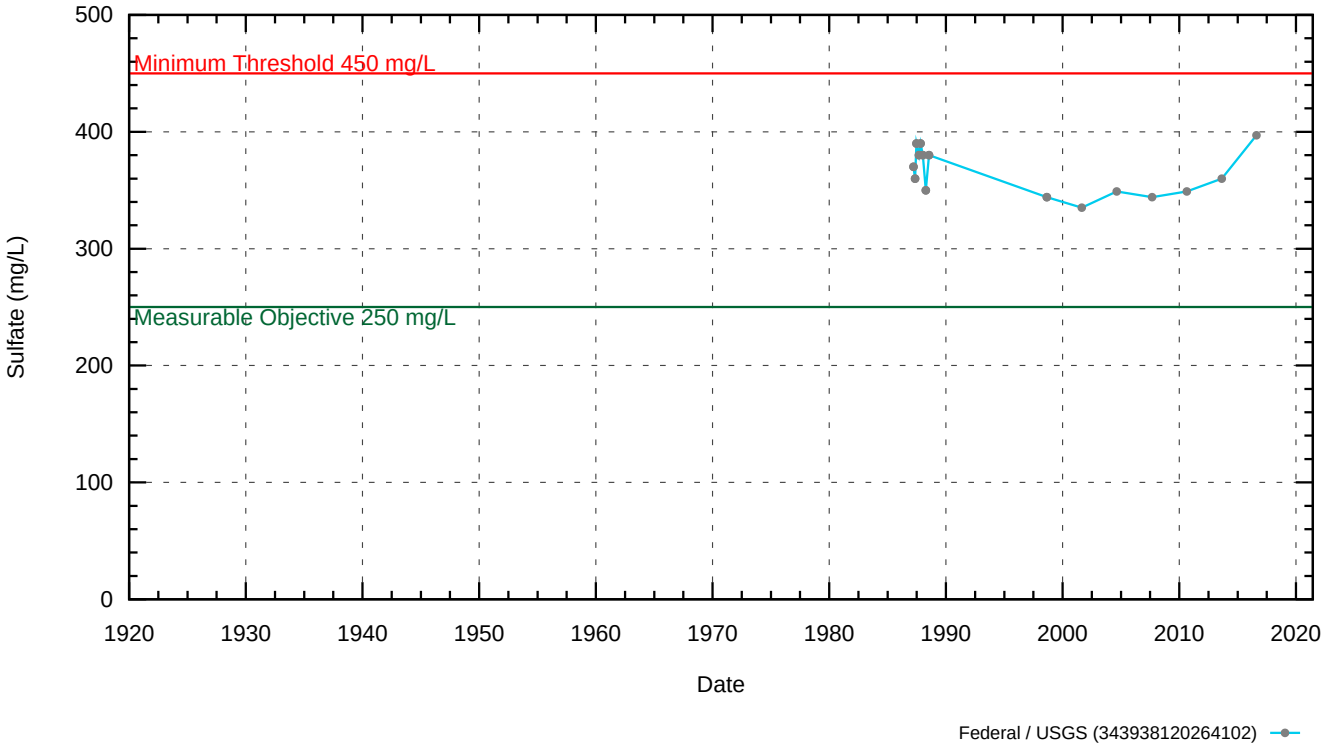


7N/34W-27K06 (DBID 171)
Lower Aquifer

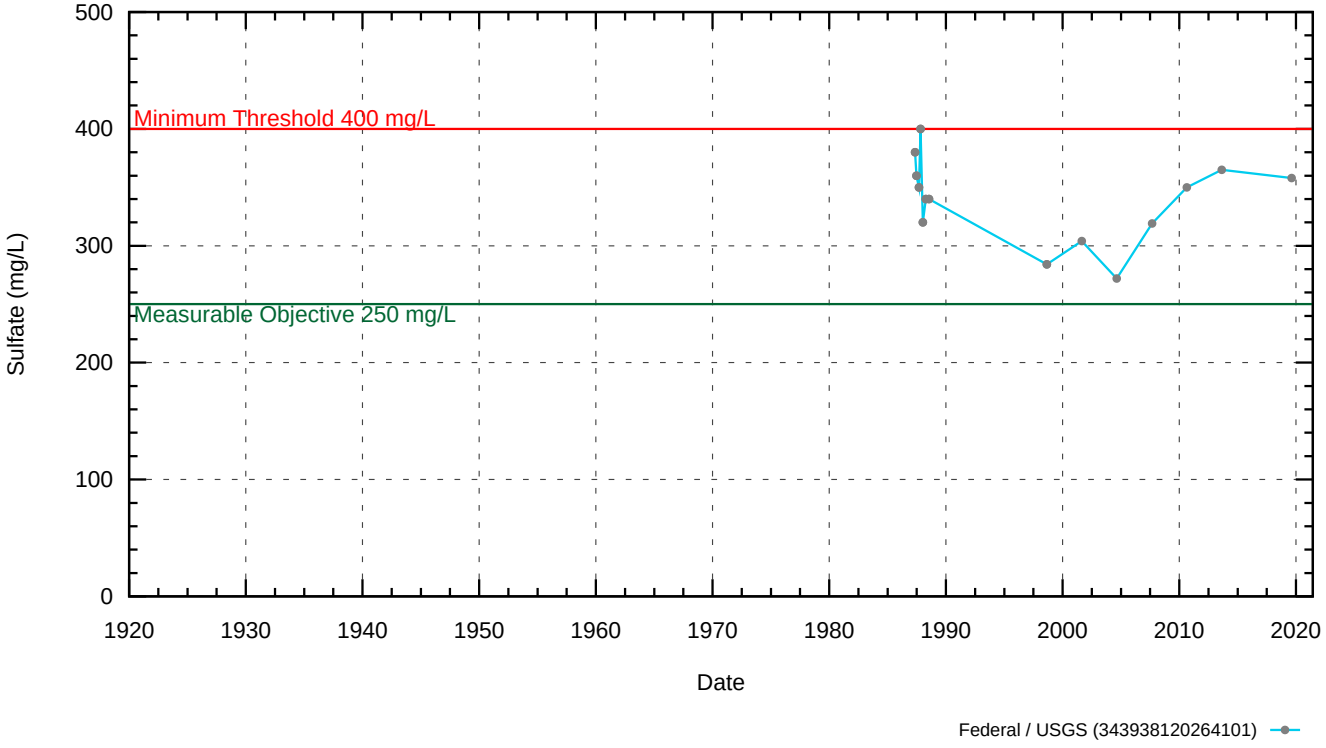


WMA: Lompoc Plain - Sulfate

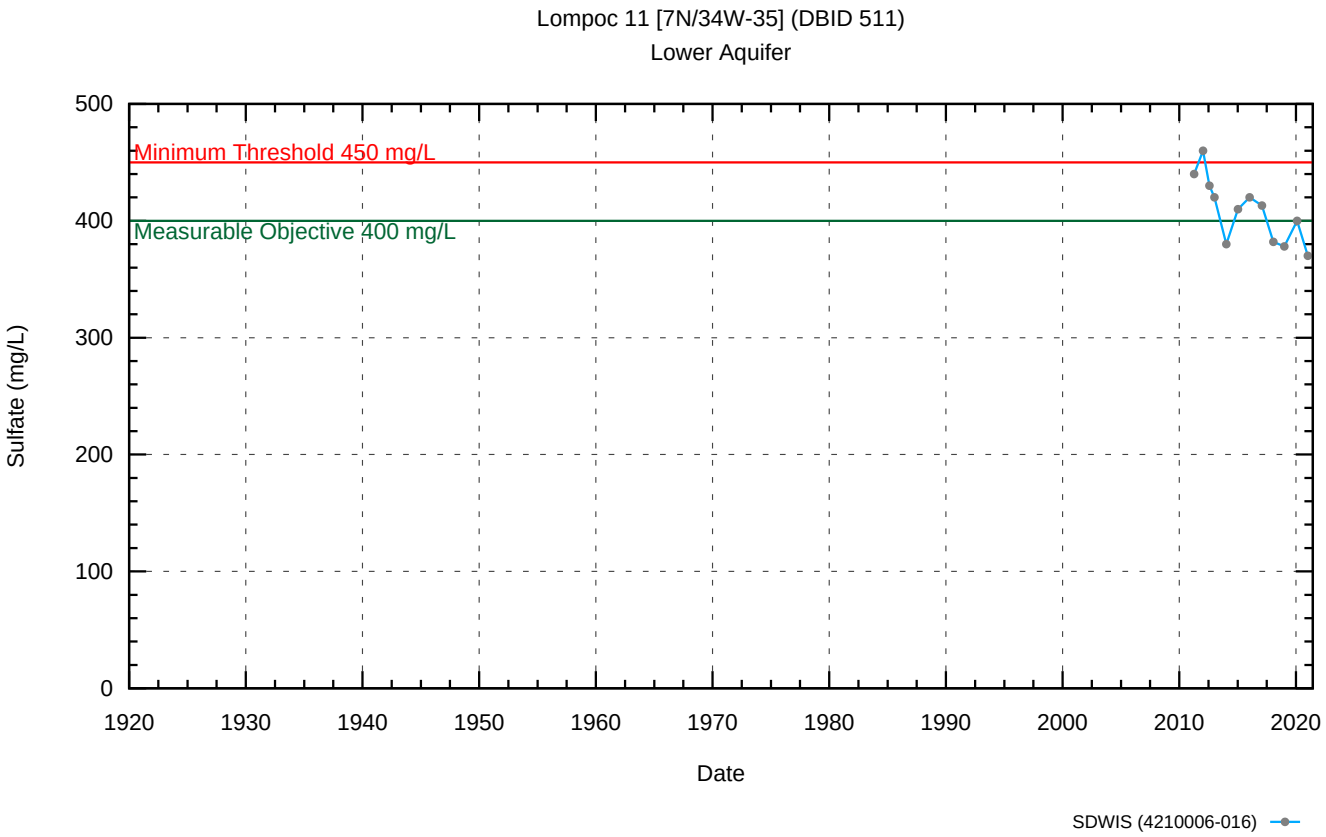
7N/34W-27K05 (DBID 139)
Upper Aquifer



7N/34W-27K04 (DBID 170)
Upper Aquifer

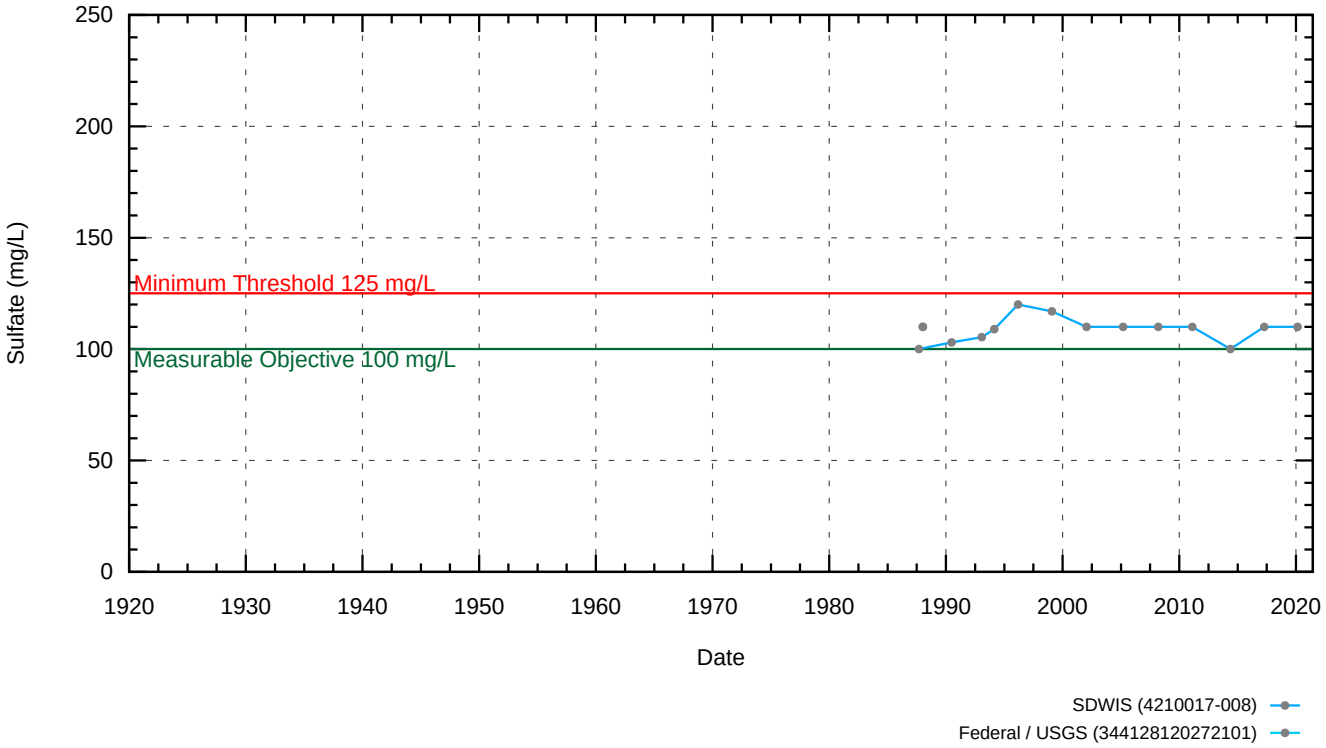


WMA: Lompoc Plain - Sulfate

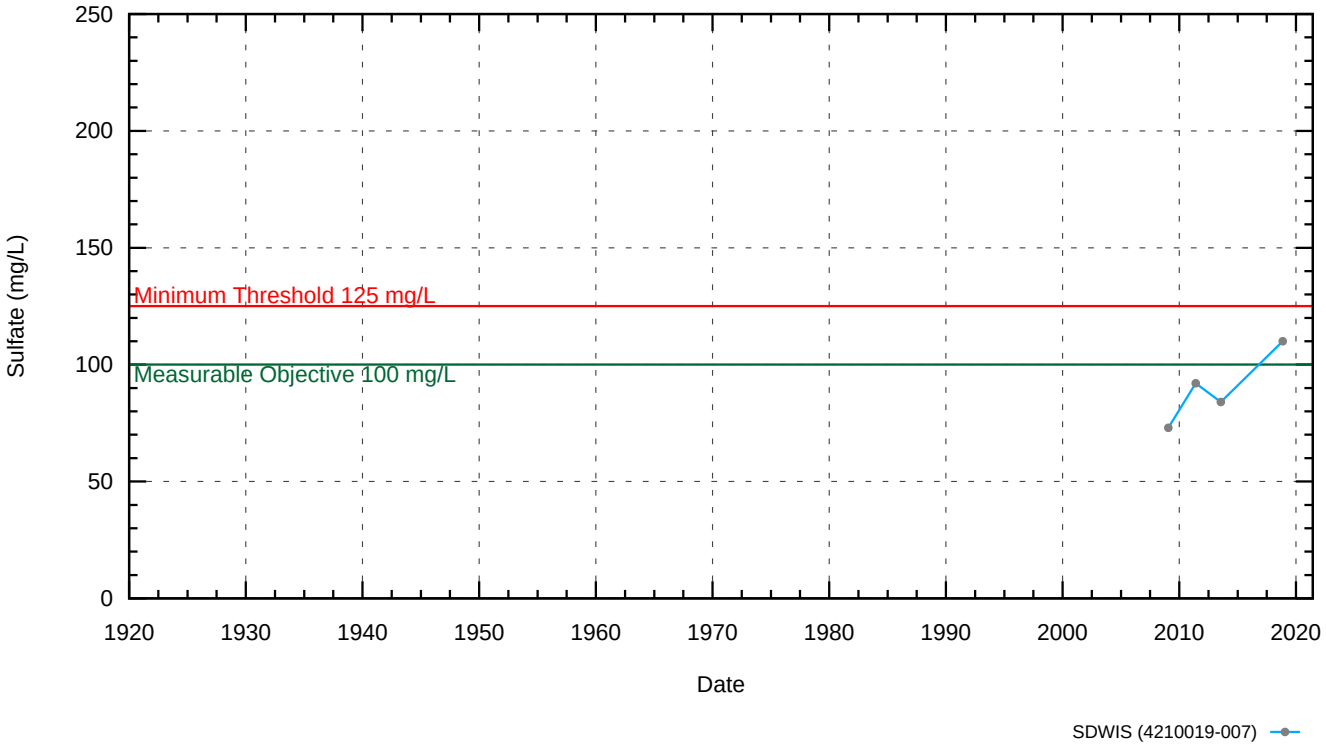


WMA: Lompoc Uplands - Sulfate

VVCSD 3B [7N/34W-15E3] (DBID 608)
Lower Aquifer

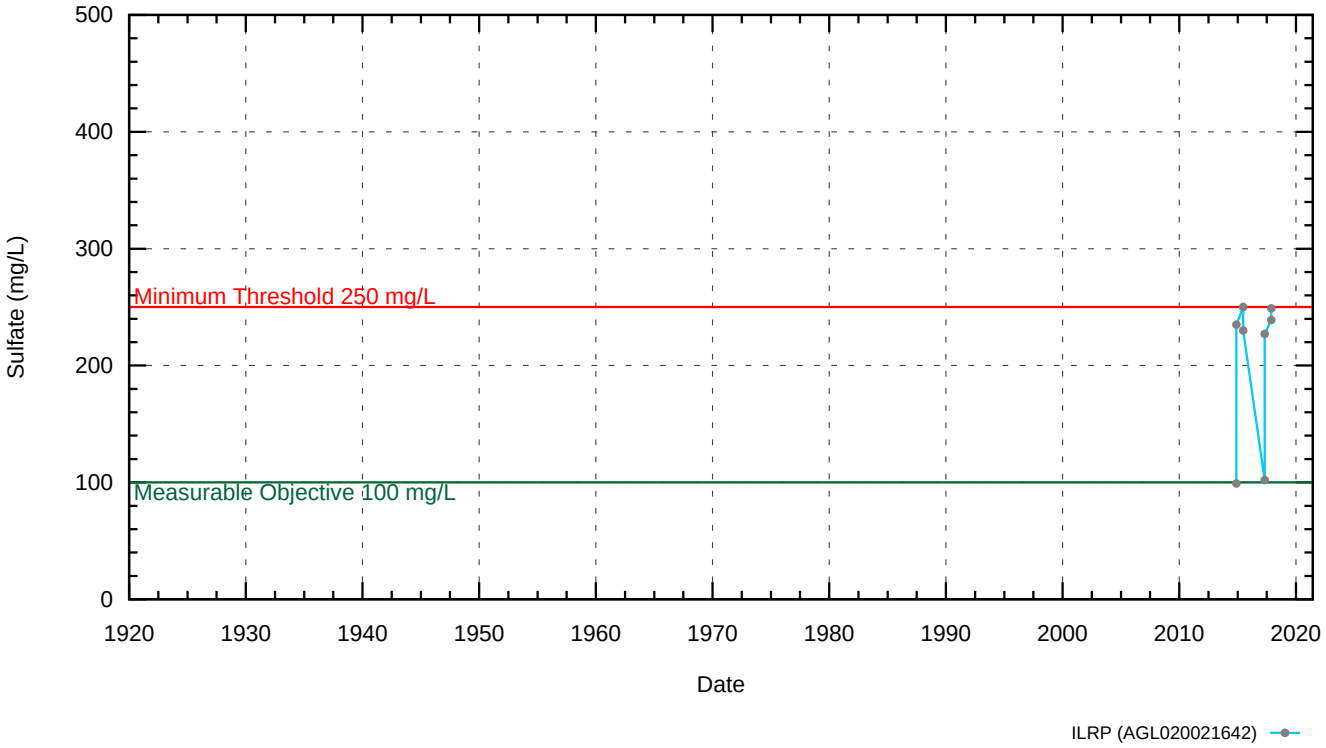


MH CSD 7 (DBID 706)
Lower Aquifer

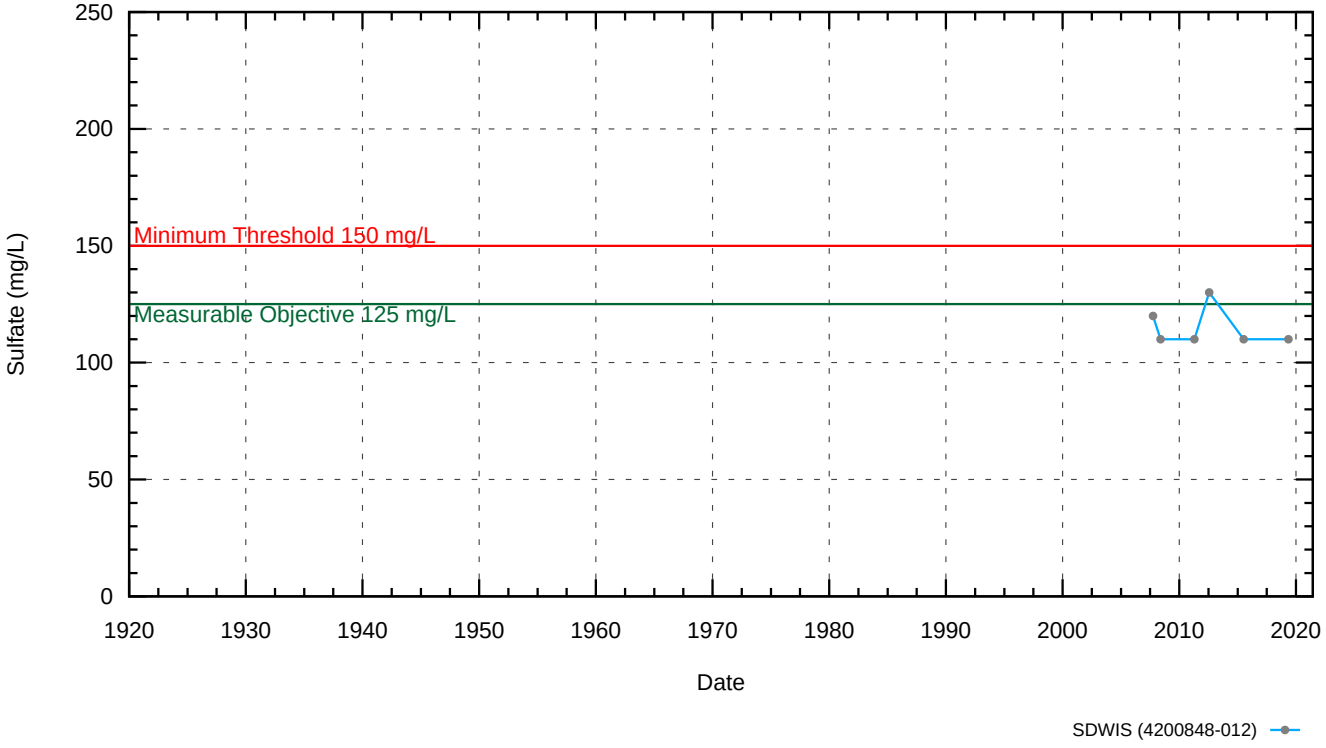


WMA: Santa Rita Uplands - Sulfate

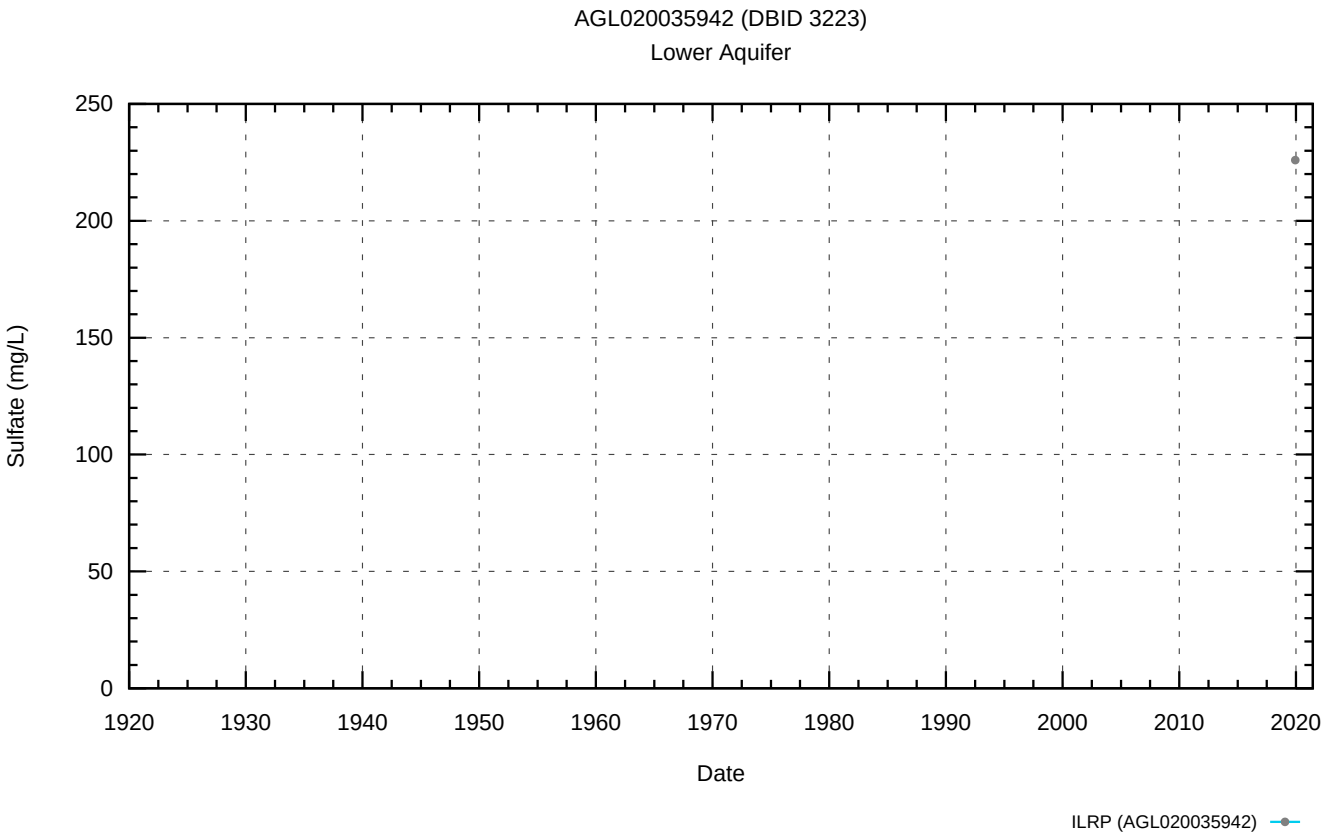
AGL020021642 (DBID 3172)
Lower Aquifer



Vista Hills MWC #4 (DBID 1304)
Lower Aquifer

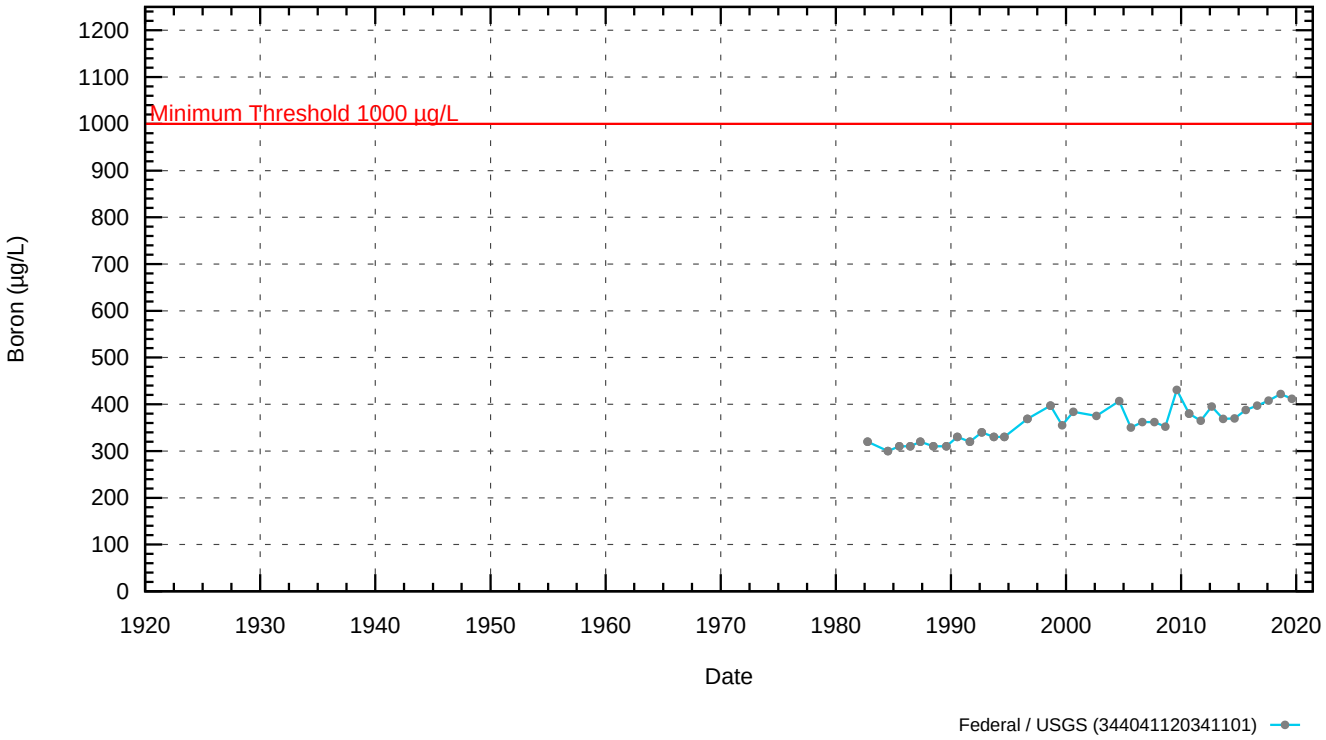


WMA: Santa Rita Uplands - Sulfate

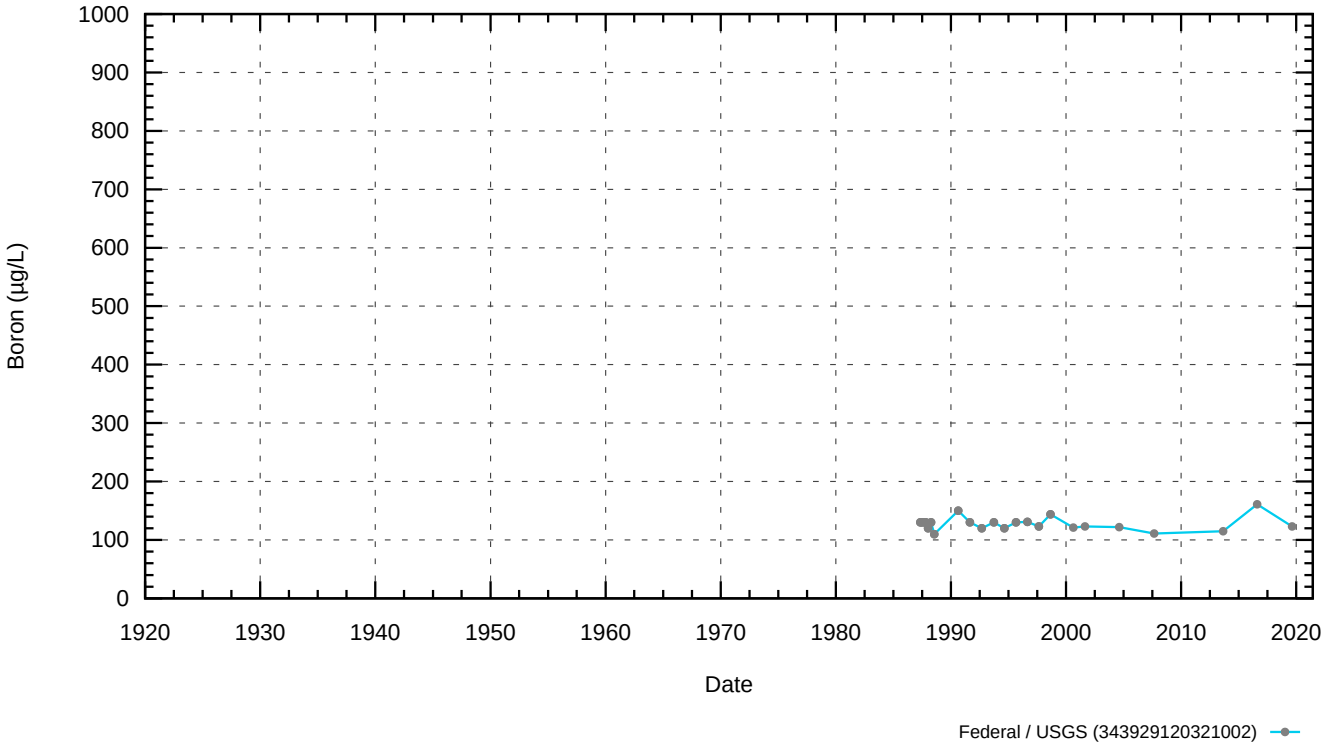


WMA: Lompoc Plain - Boron

7N/35W-21G2 (DBID 39)
Upper Aquifer

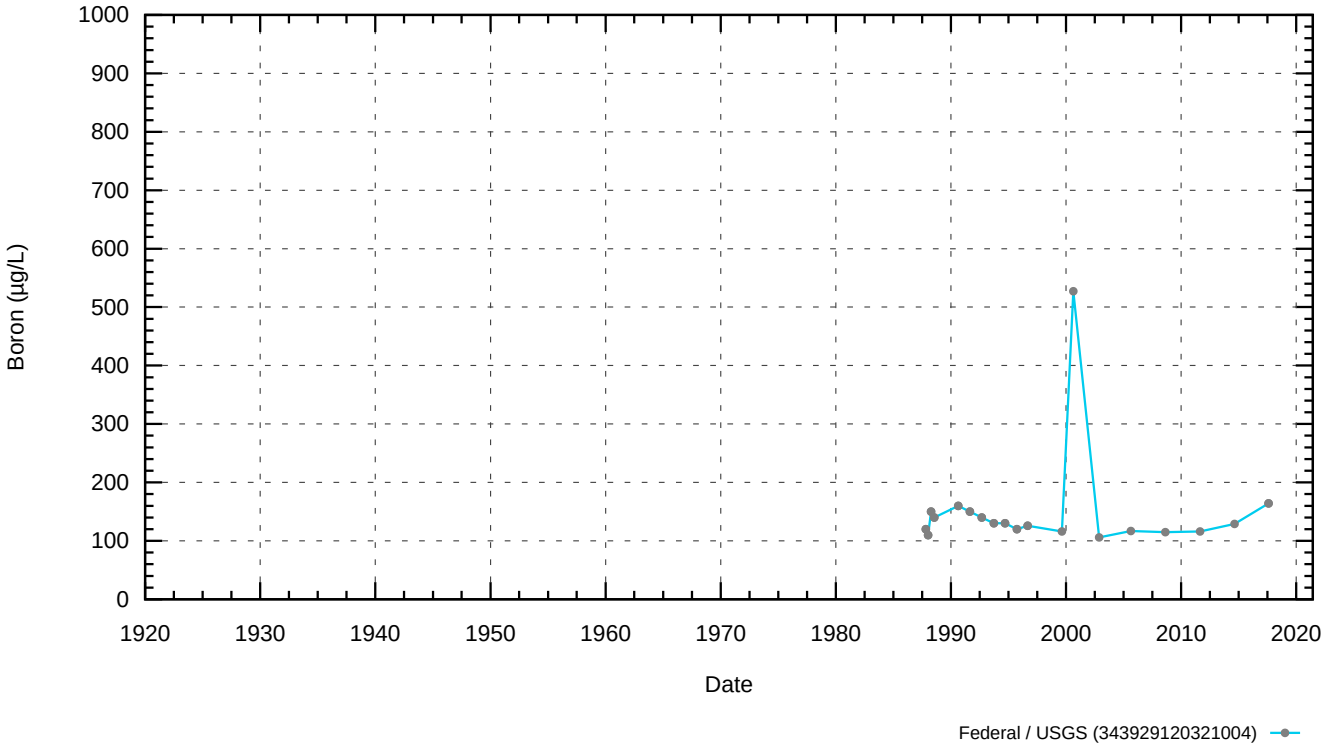


7N/35W-26L2 (DBID 16)
Upper Aquifer

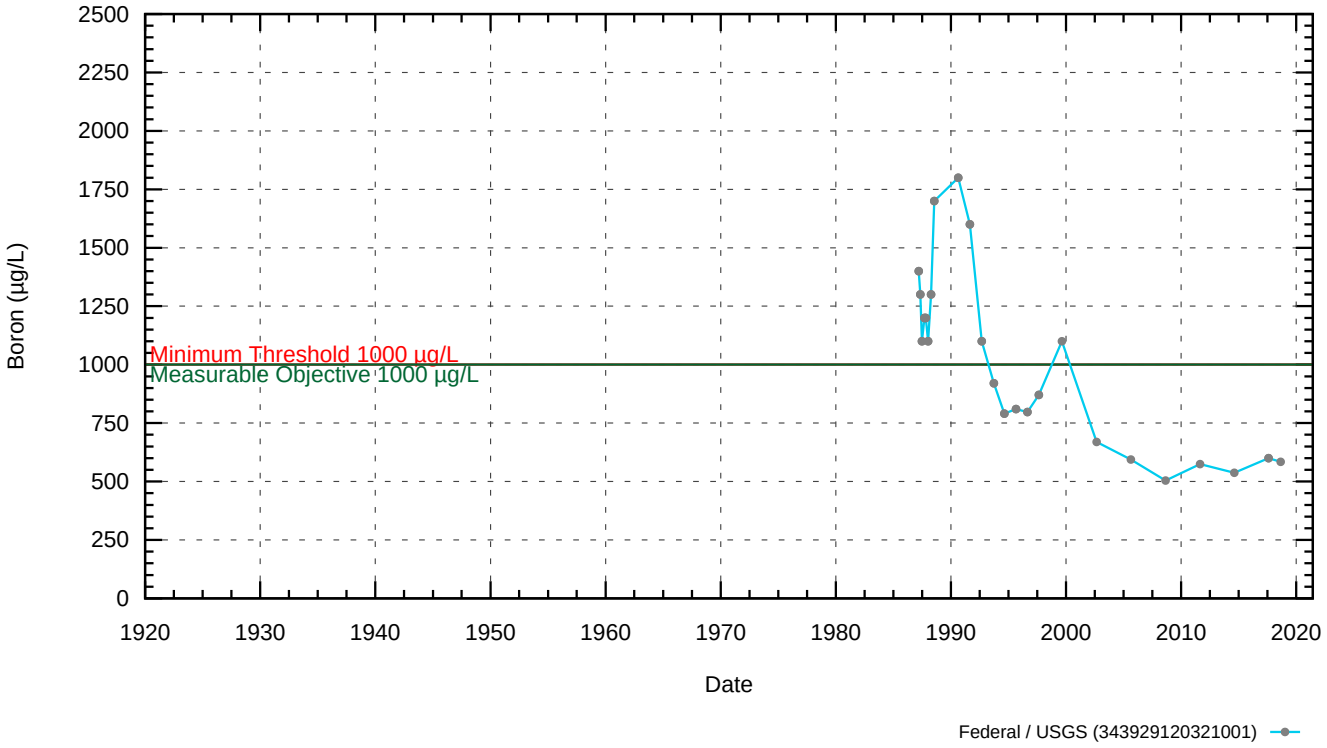


WMA: Lompoc Plain - Boron

7N/35W-26L4 (DBID 17)
Lower Aquifer

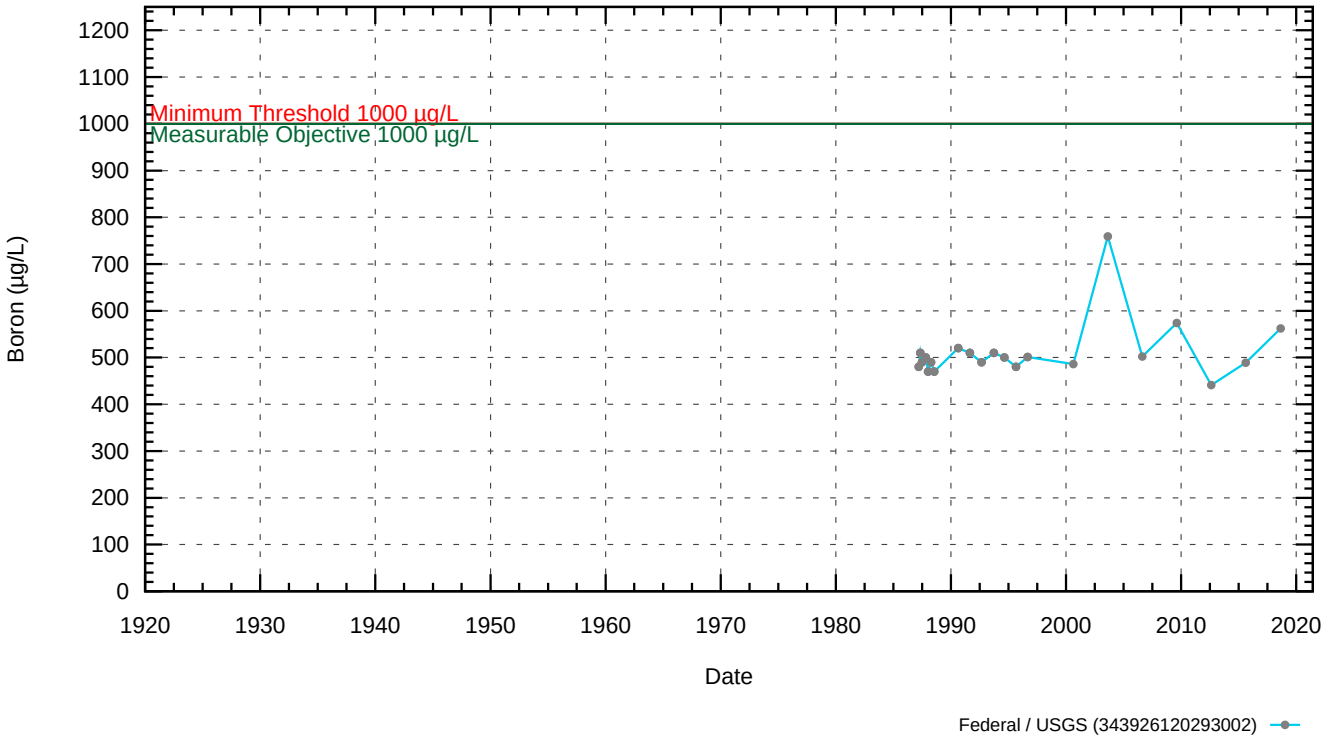


7N/35W-26L1 (DBID 15)
Upper Aquifer

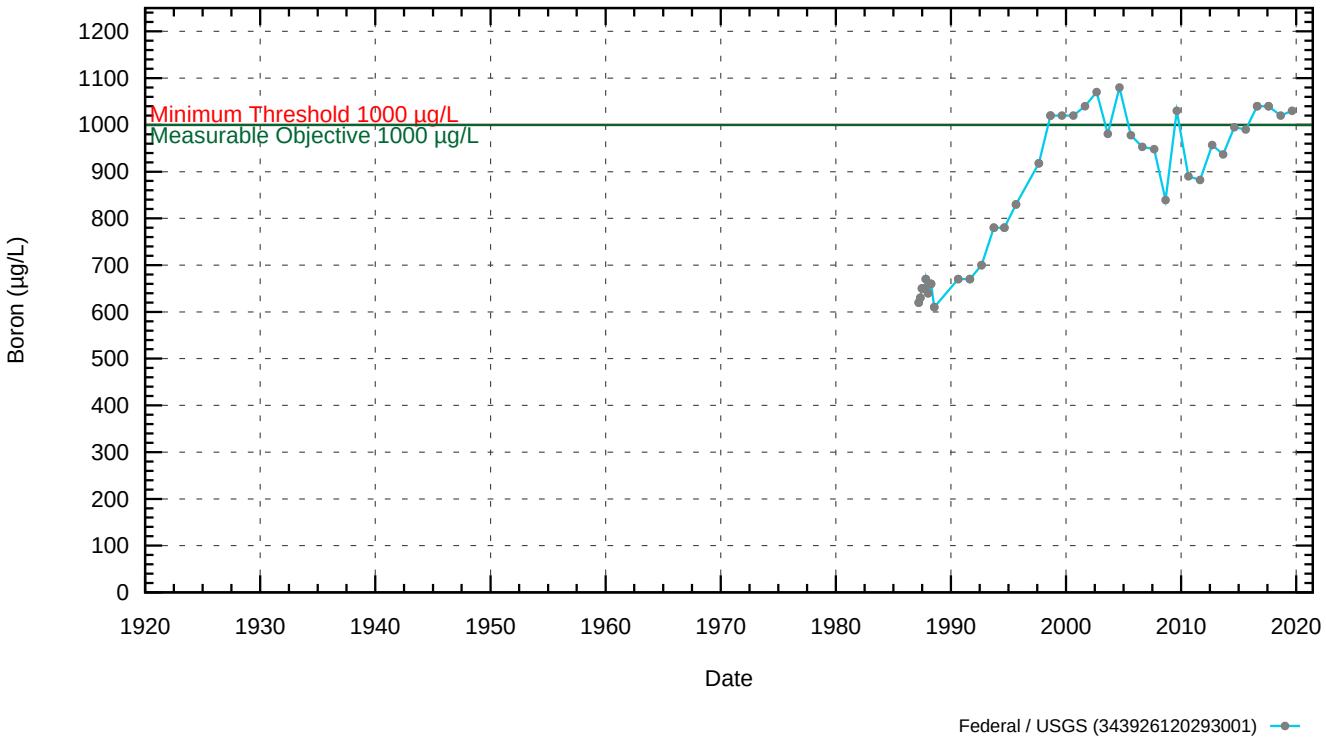


WMA: Lompoc Plain - Boron

7N/34W-29N7 (DBID 28)
Lower Aquifer

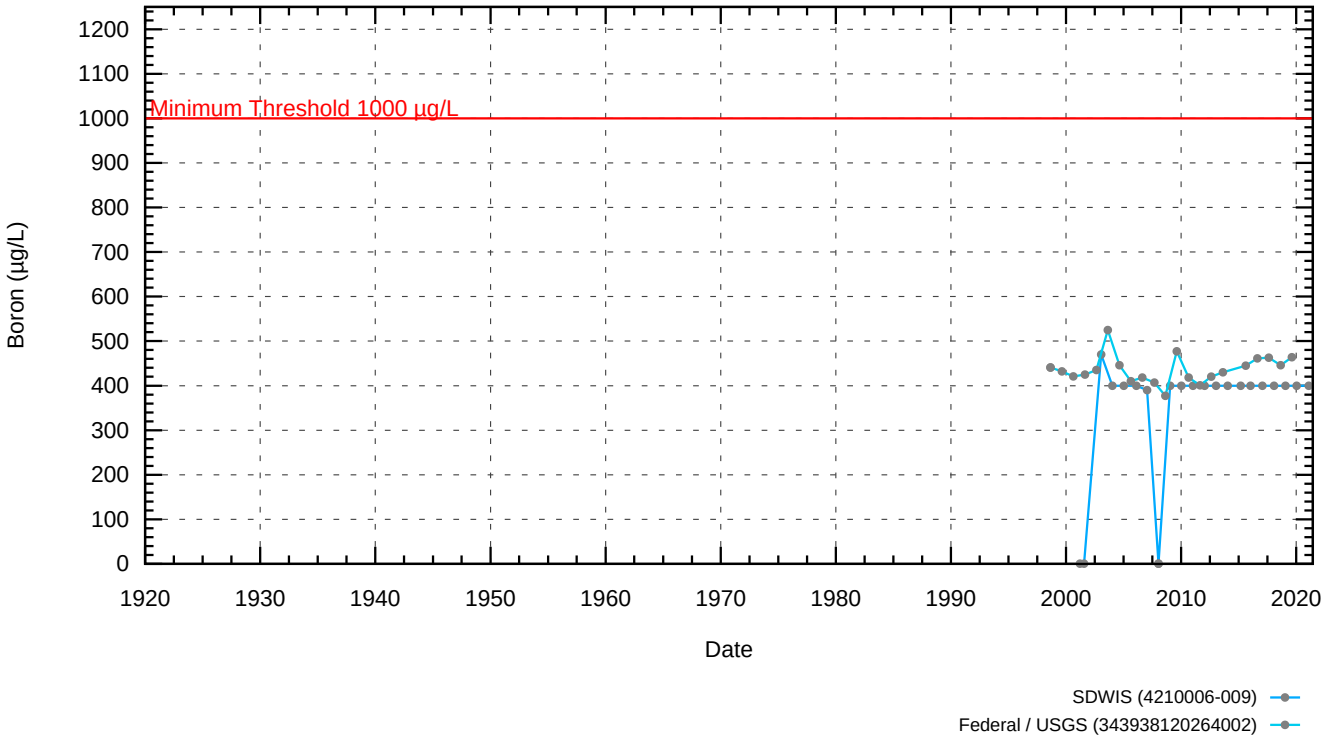


7N/34W-29N6 (DBID 27)
Upper Aquifer

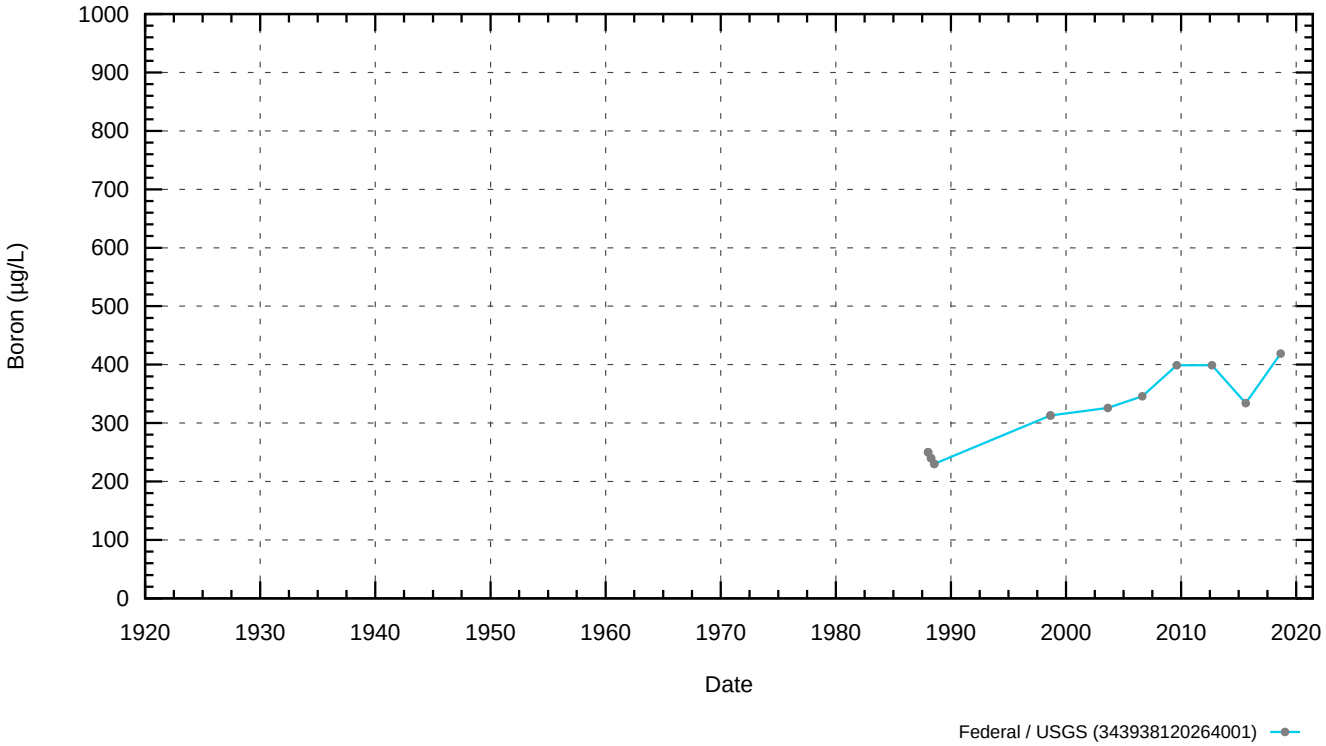


WMA: Lompoc Plain - Boron

Lompoc 6 [07N/34W-27K07] (DBID 506)
Upper Aquifer

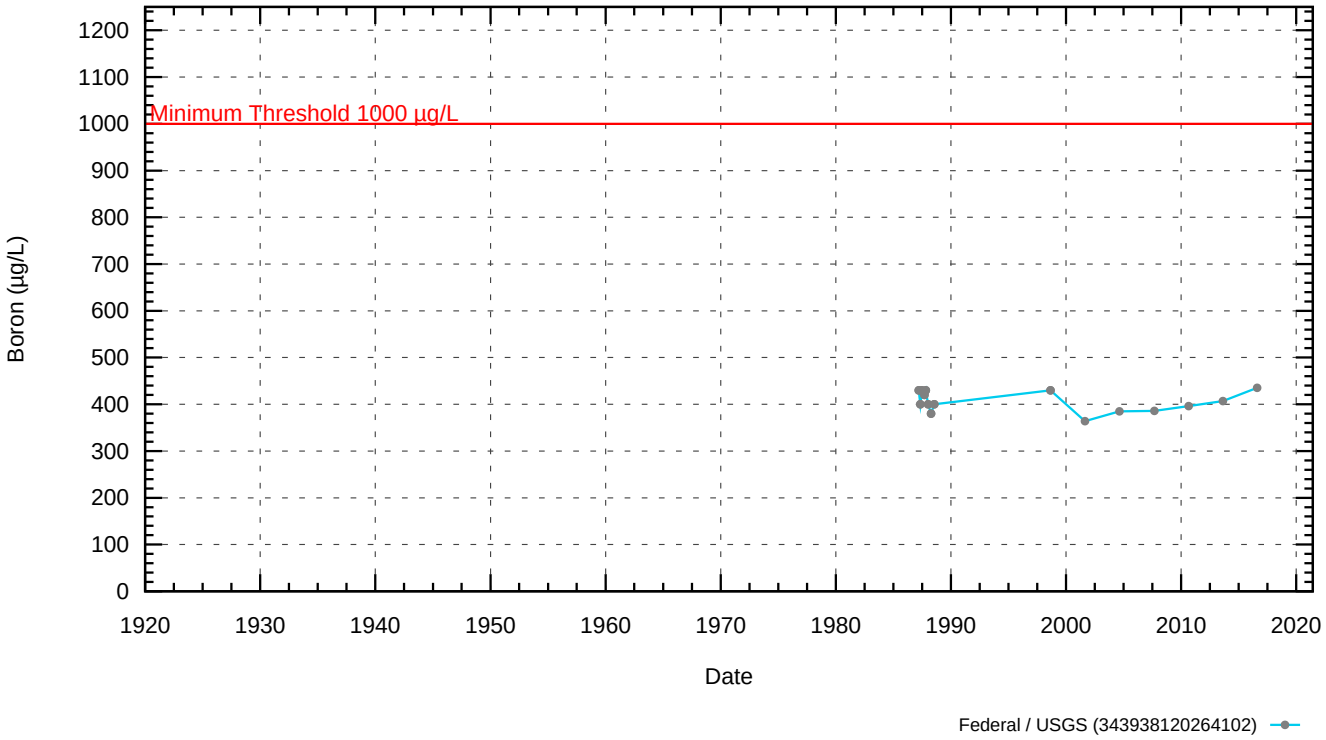


7N/34W-27K06 (DBID 171)
Lower Aquifer



WMA: Lompoc Plain - Boron

7N/34W-27K05 (DBID 139)
Upper Aquifer



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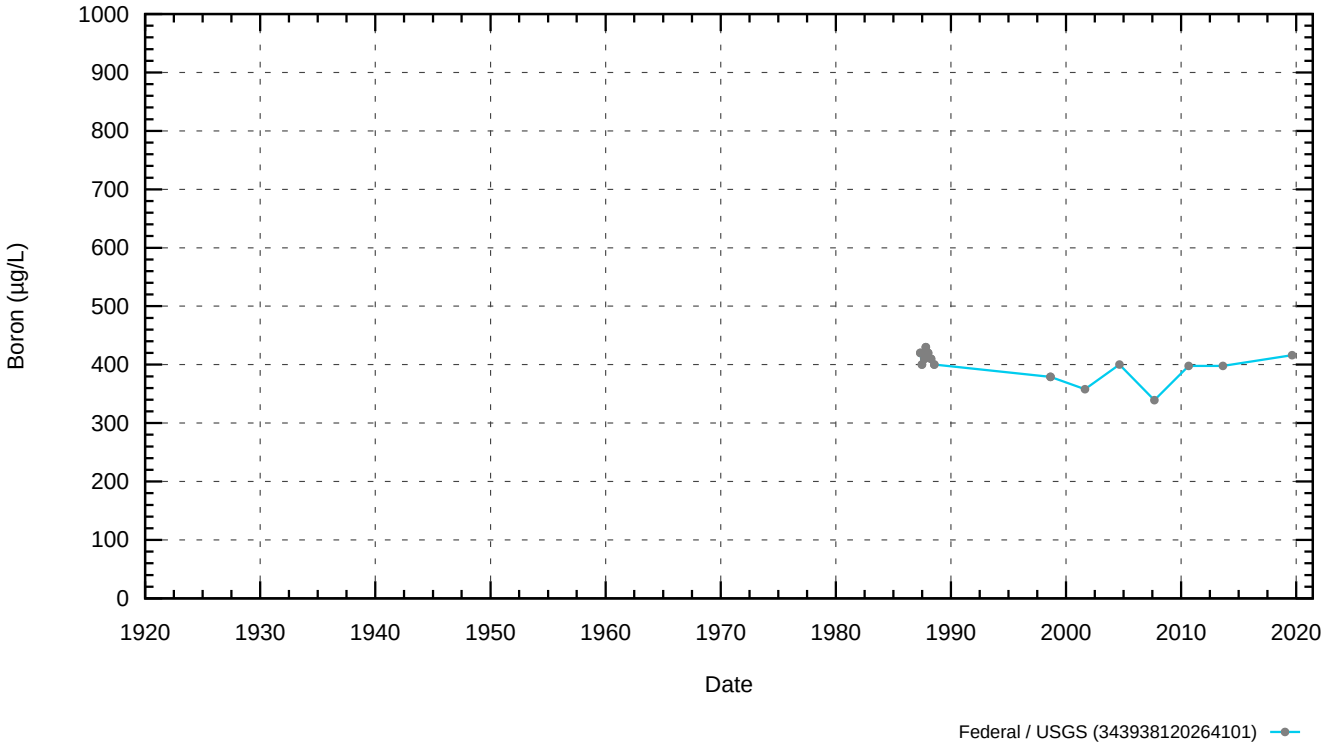
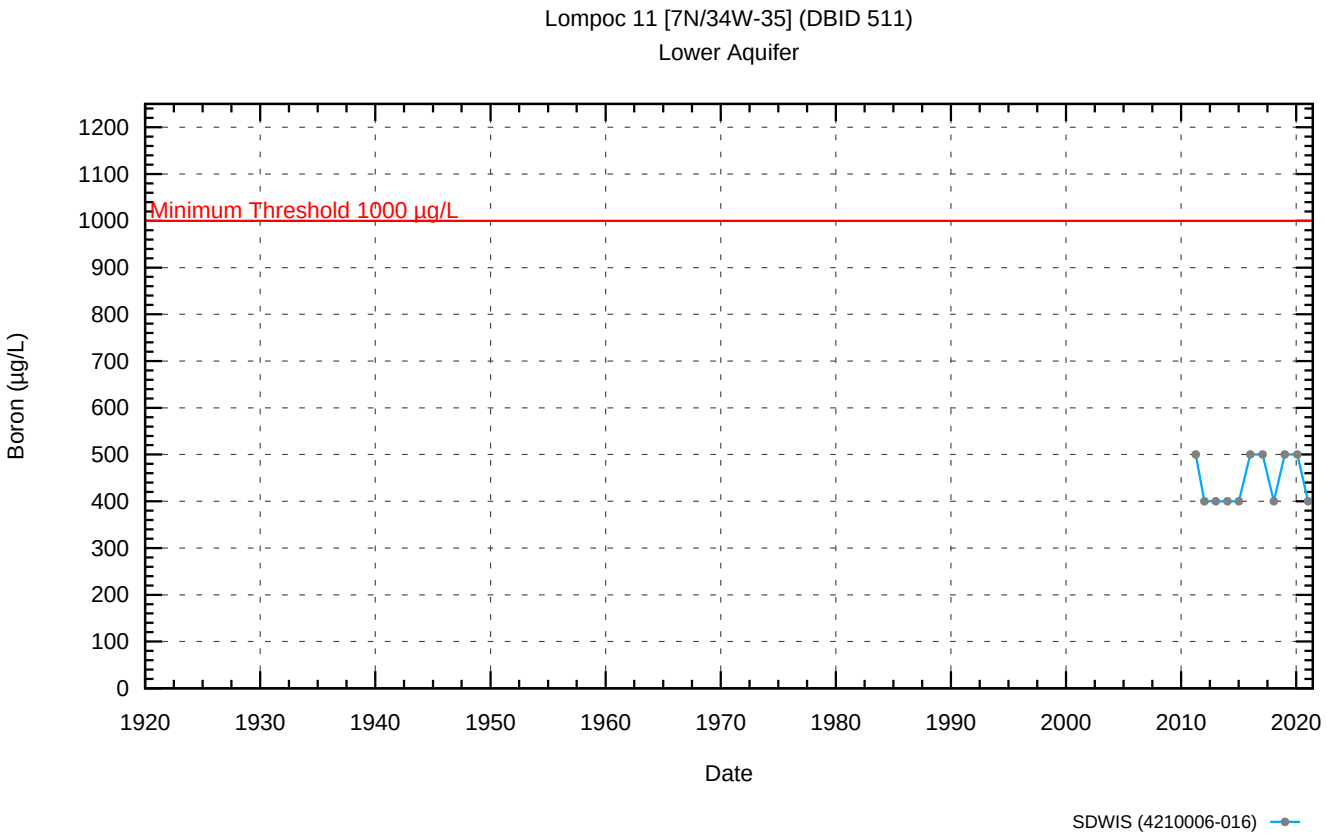
Upper Aquifer

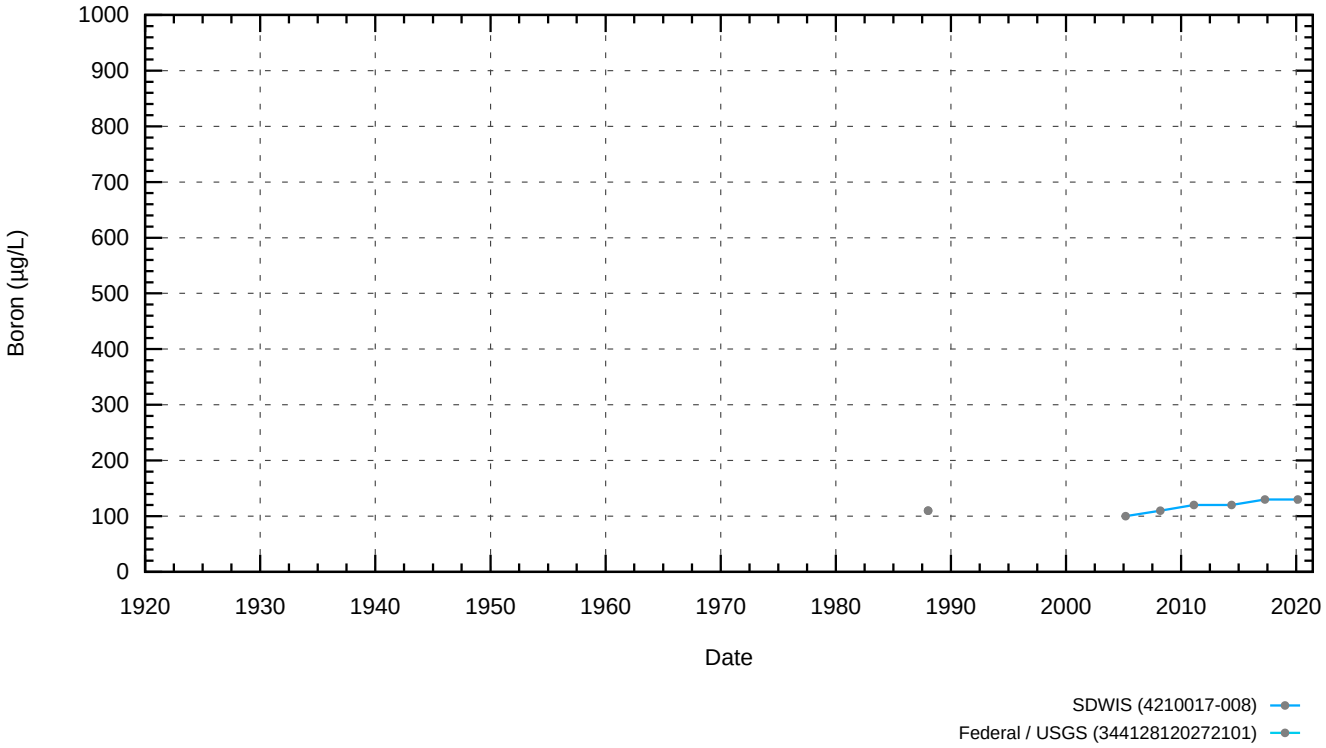


WMA: Lompoc Plain - Boron

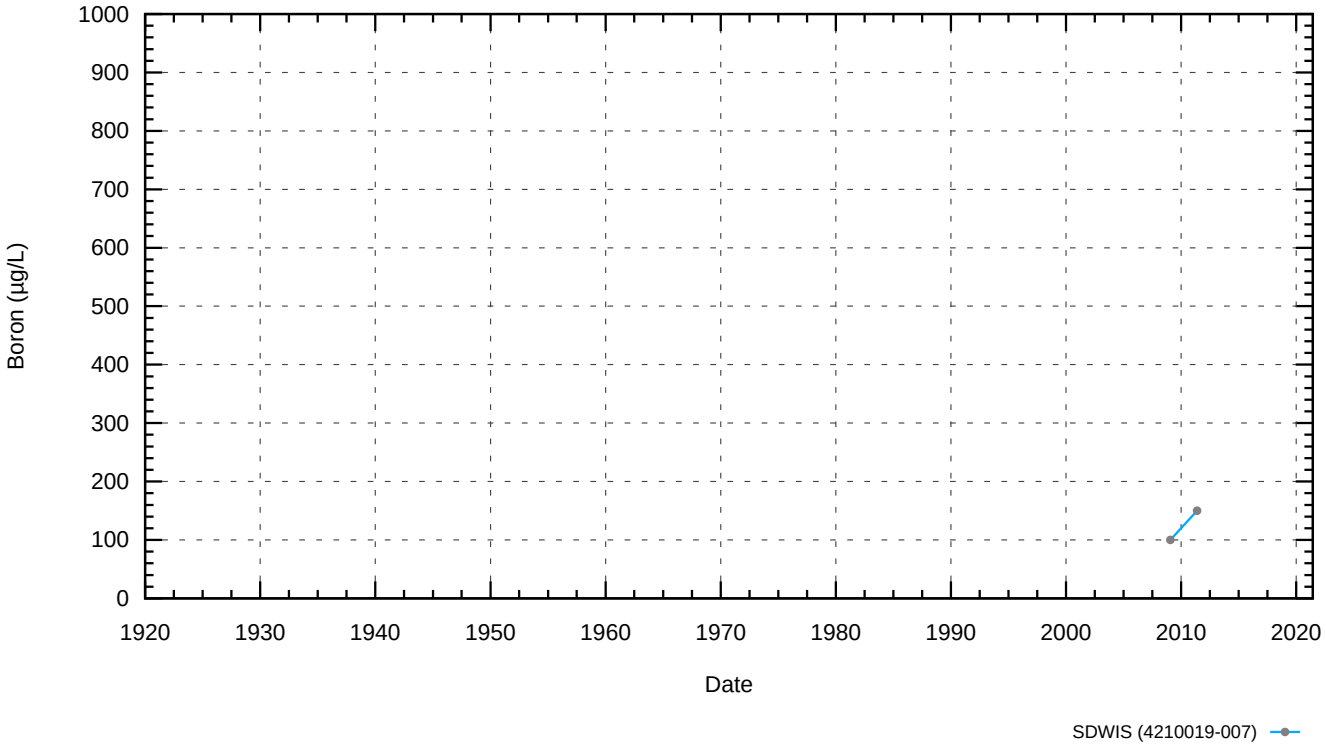


WMA: Lompoc Uplands - Boron

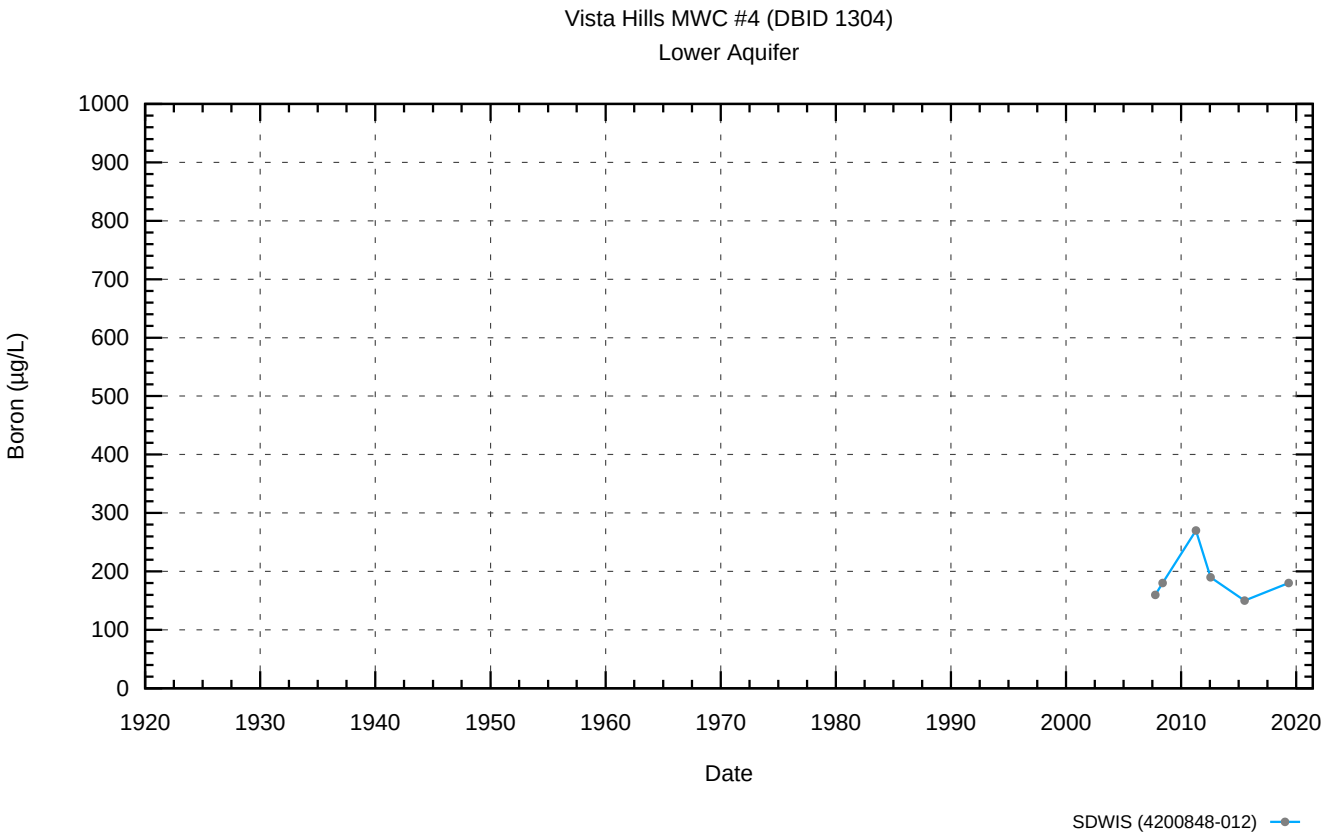
VVCSD 3B [7N/34W-15E3] (DBID 608)
Lower Aquifer



MH CSD 7 (DBID 706)
Lower Aquifer

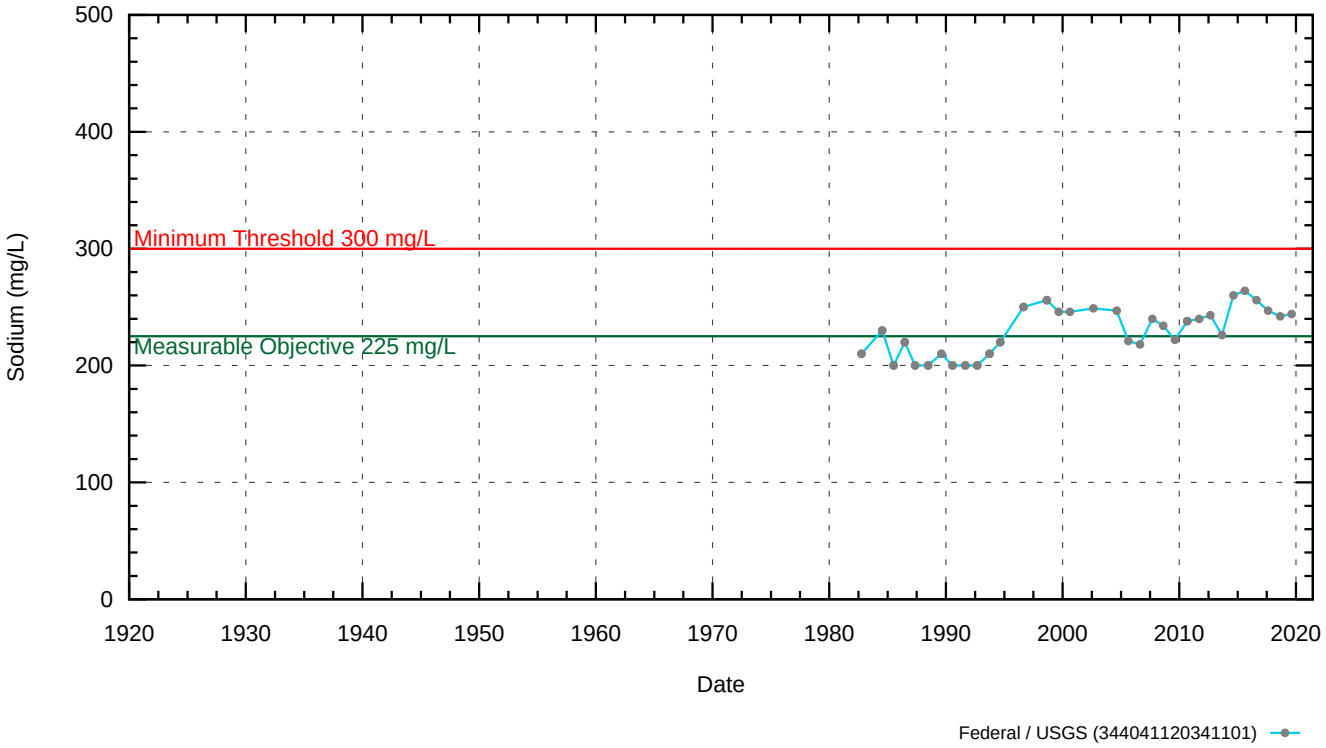


WMA: Santa Rita Uplands - Boron

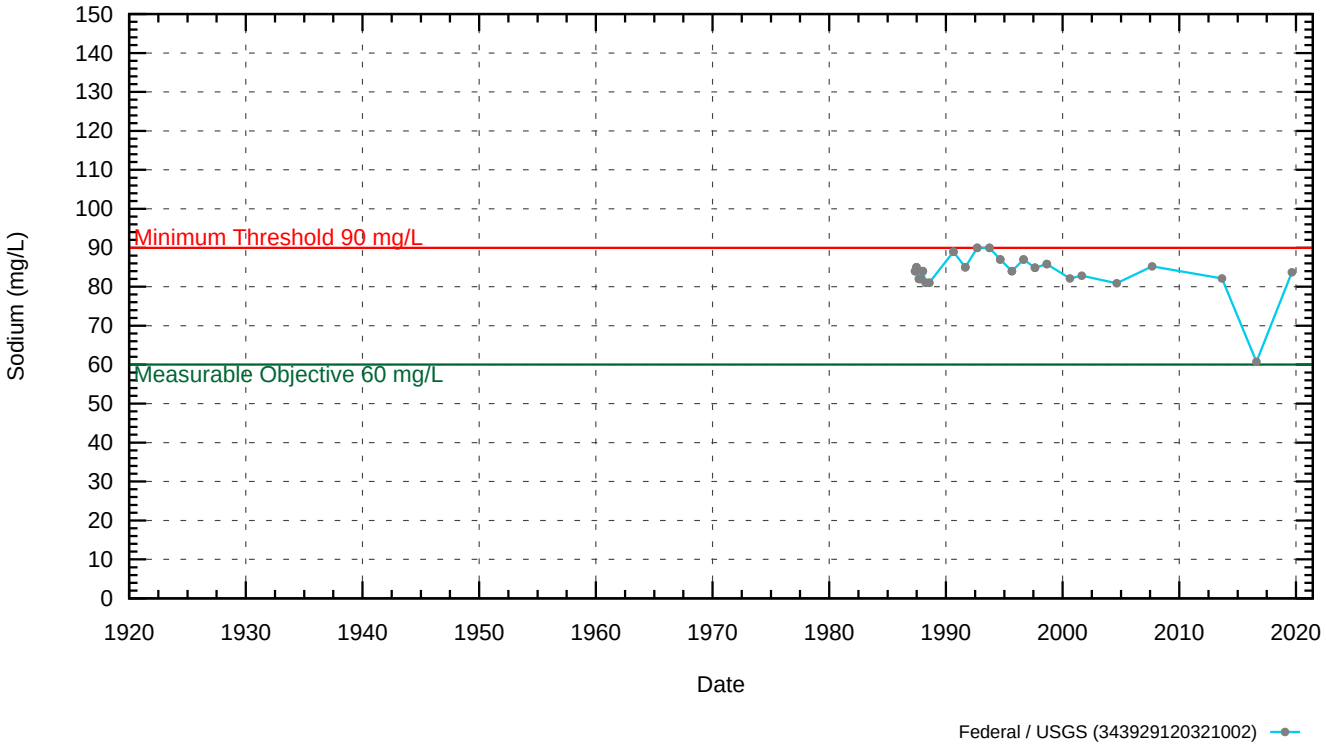


WMA: Lompoc Plain - Sodium

7N/35W-21G2 (DBID 39)
Upper Aquifer

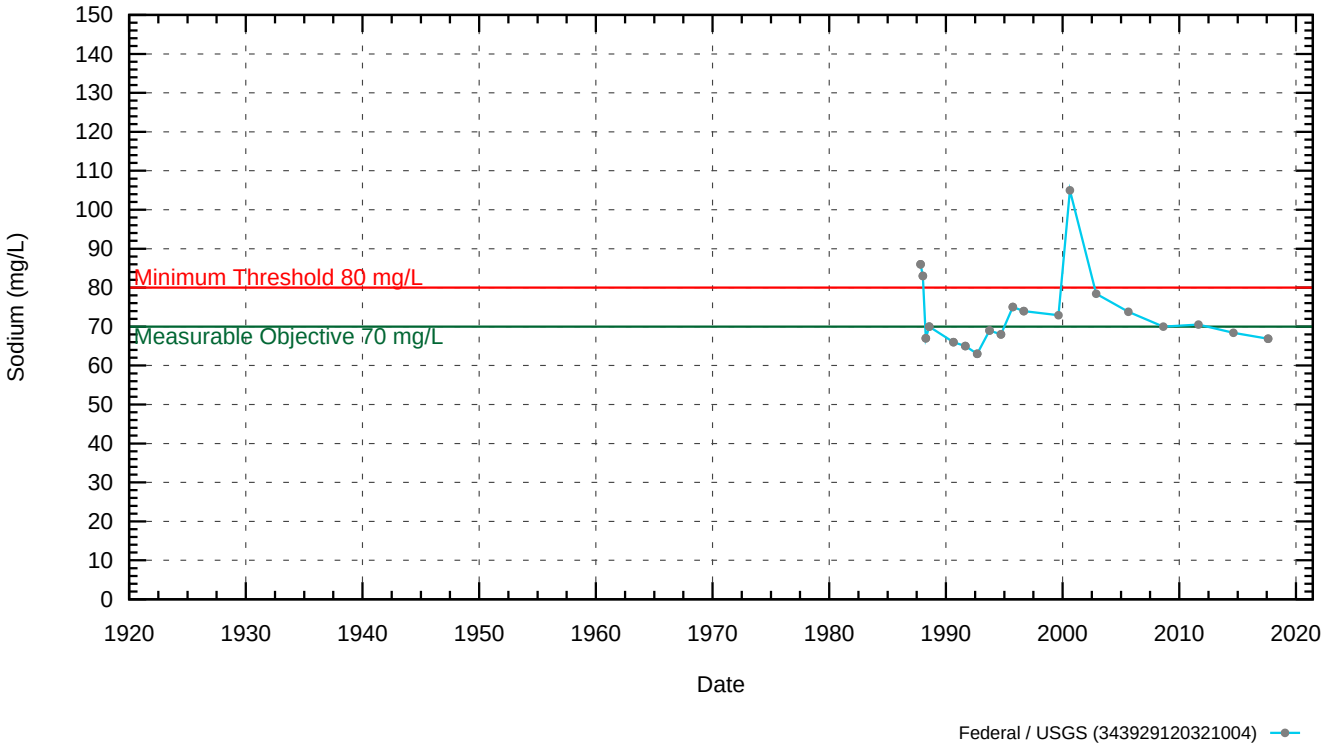


7N/35W-26L2 (DBID 16)
Upper Aquifer

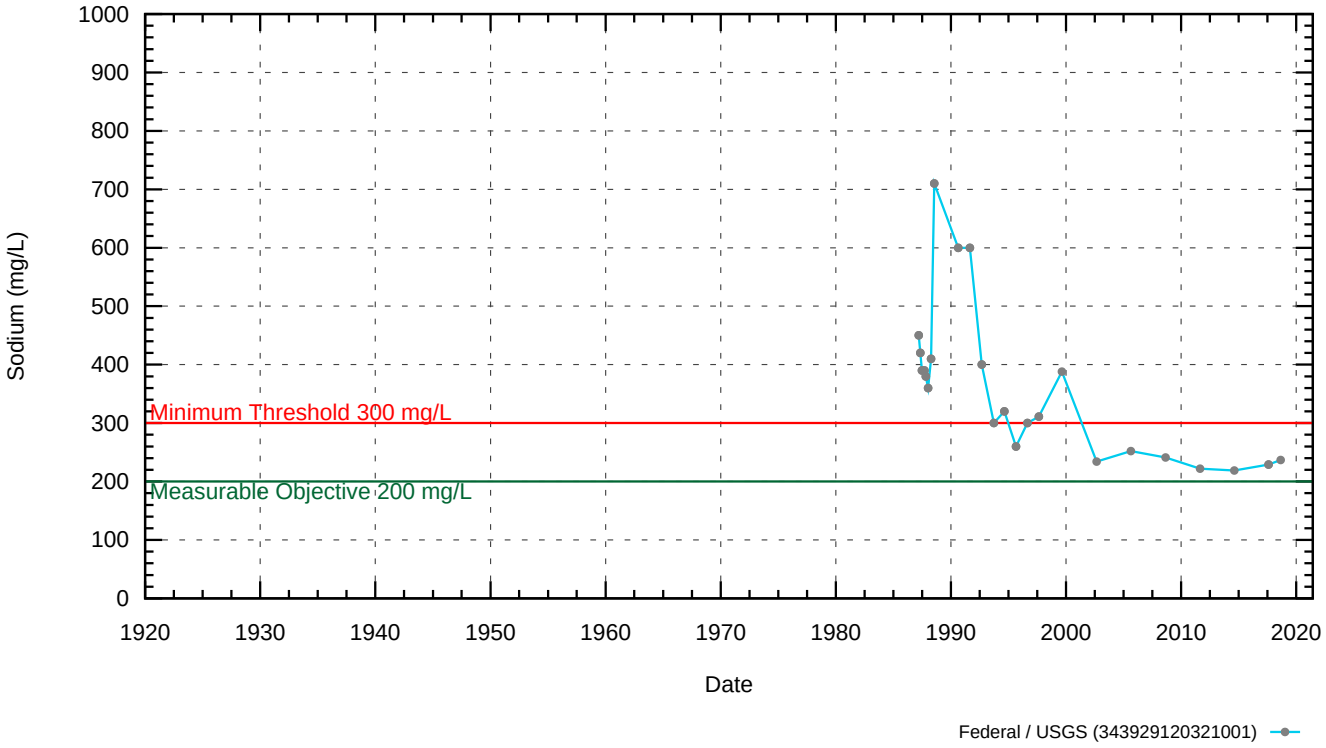


WMA: Lompoc Plain - Sodium

7N/35W-26L4 (DBID 17)
Lower Aquifer

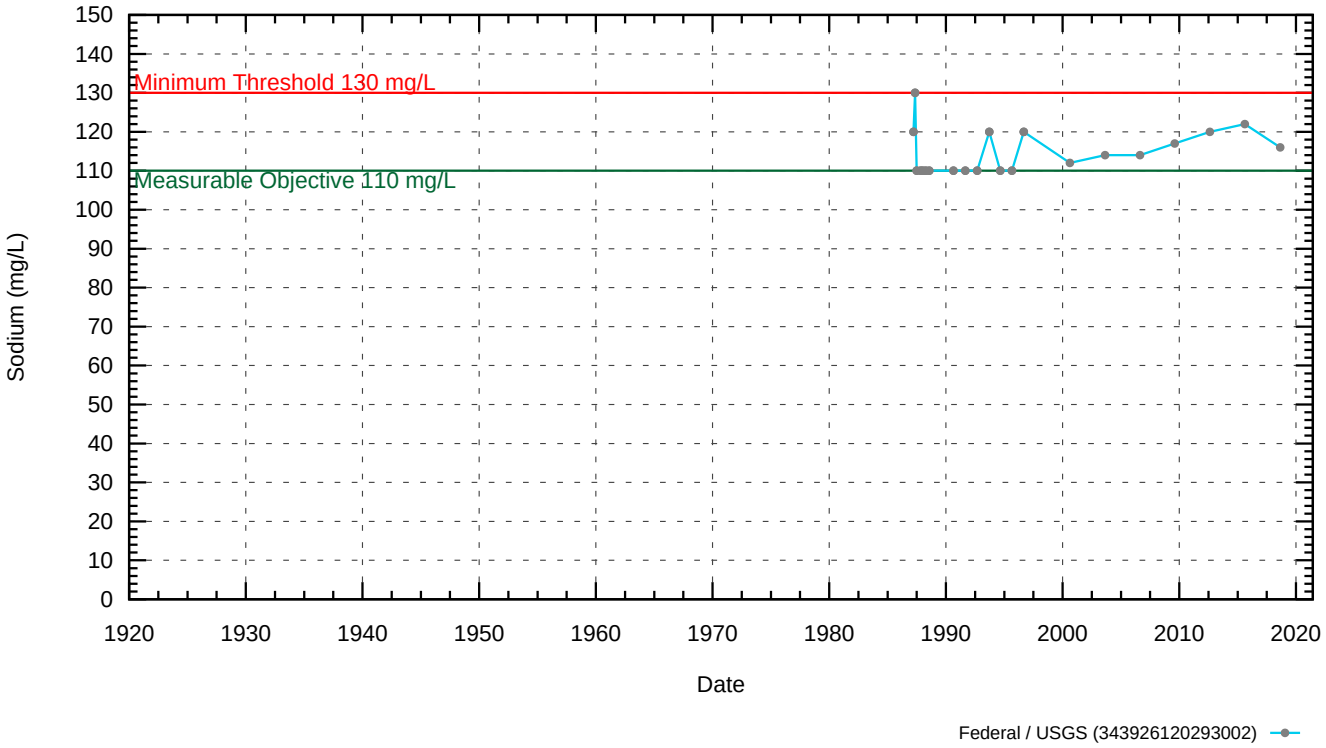


7N/35W-26L1 (DBID 15)
Upper Aquifer

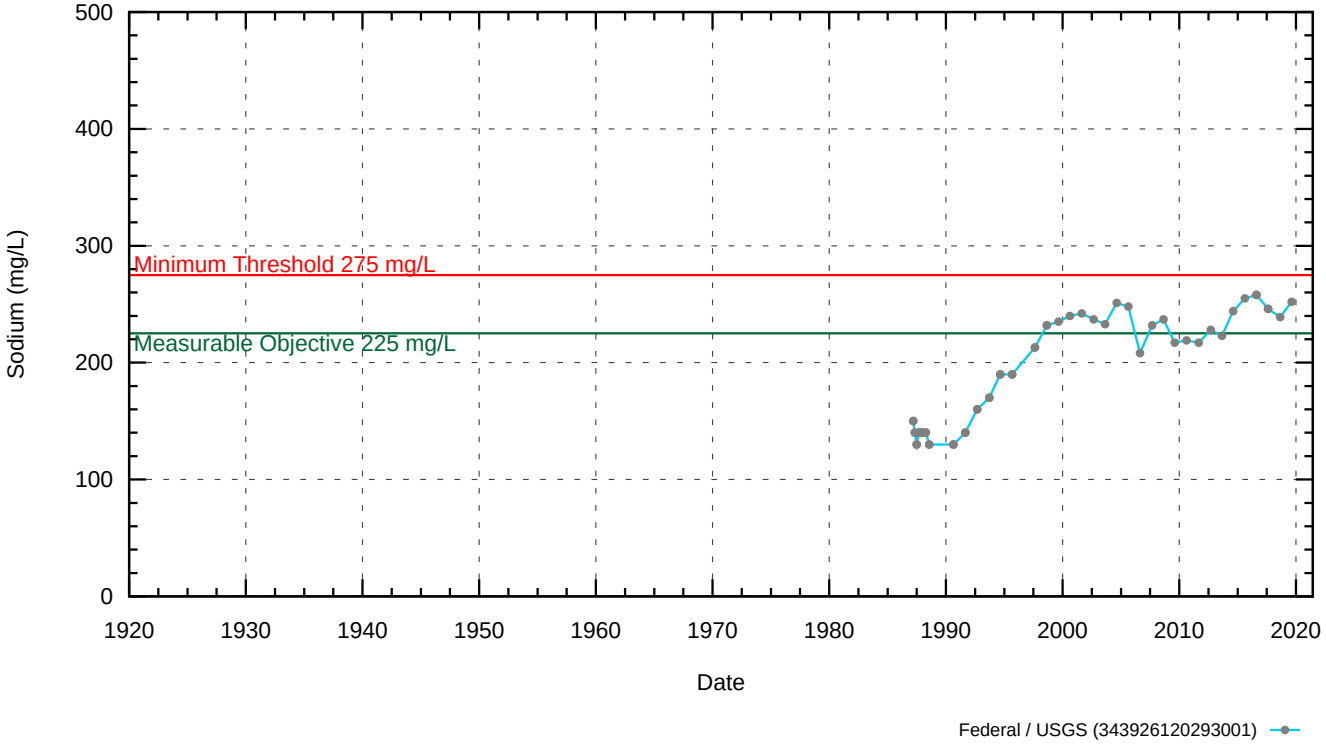


WMA: Lompoc Plain - Sodium

7N/34W-29N7 (DBID 28)
Lower Aquifer

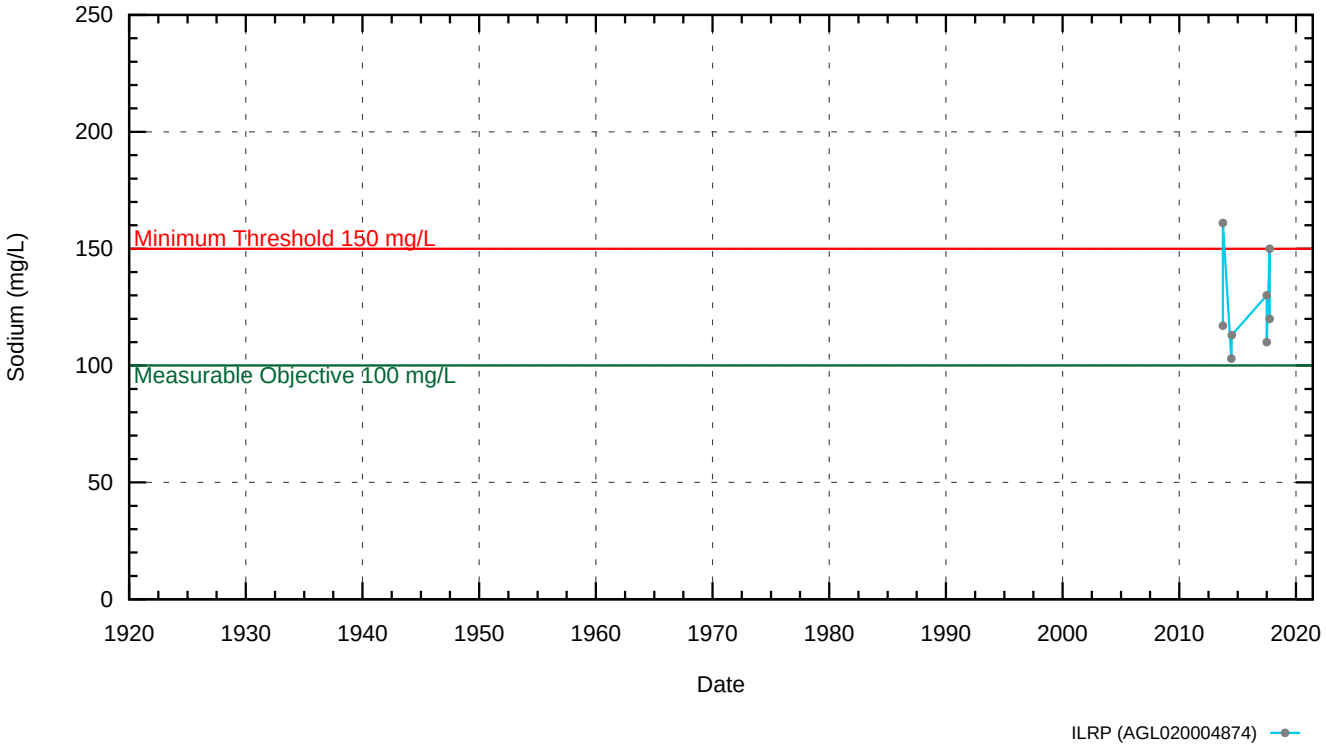


7N/34W-29N6 (DBID 27)
Upper Aquifer

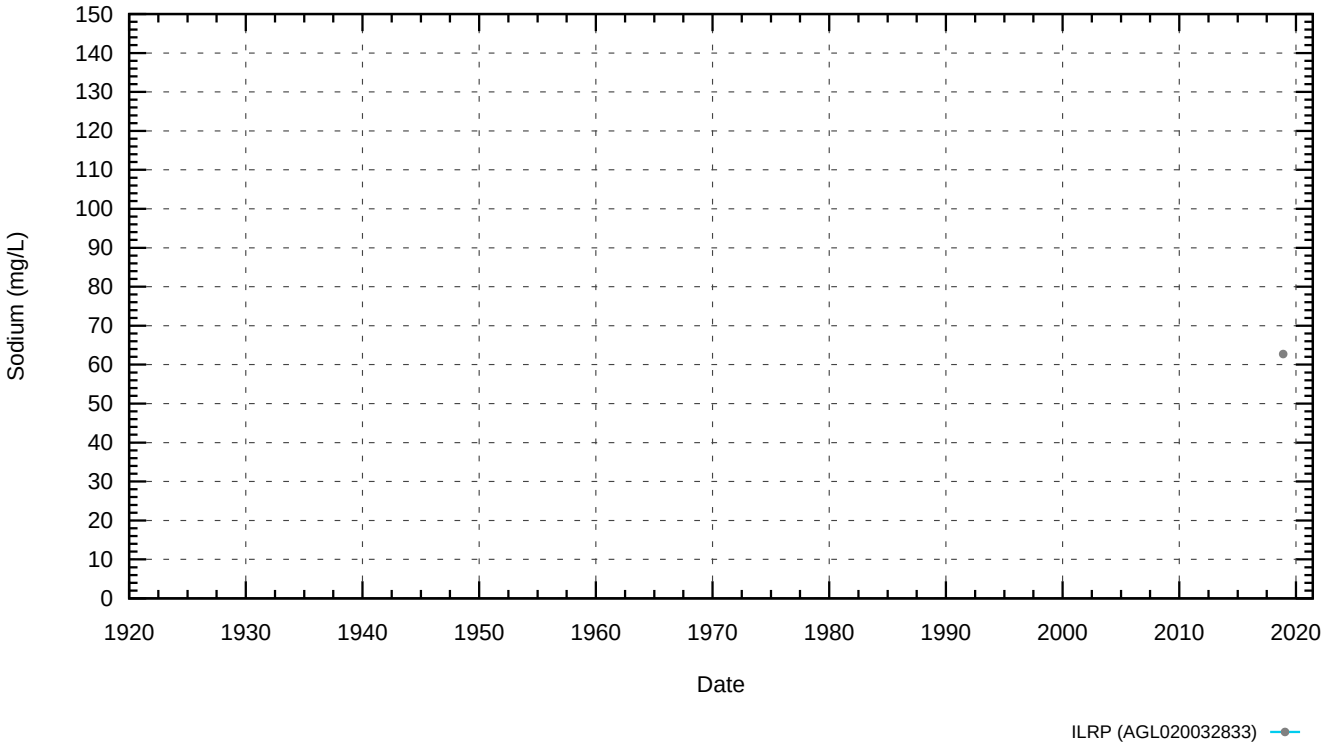


WMA: Lompoc Plain - Sodium

AGL020004874 (DBID 3150)
Upper Aquifer

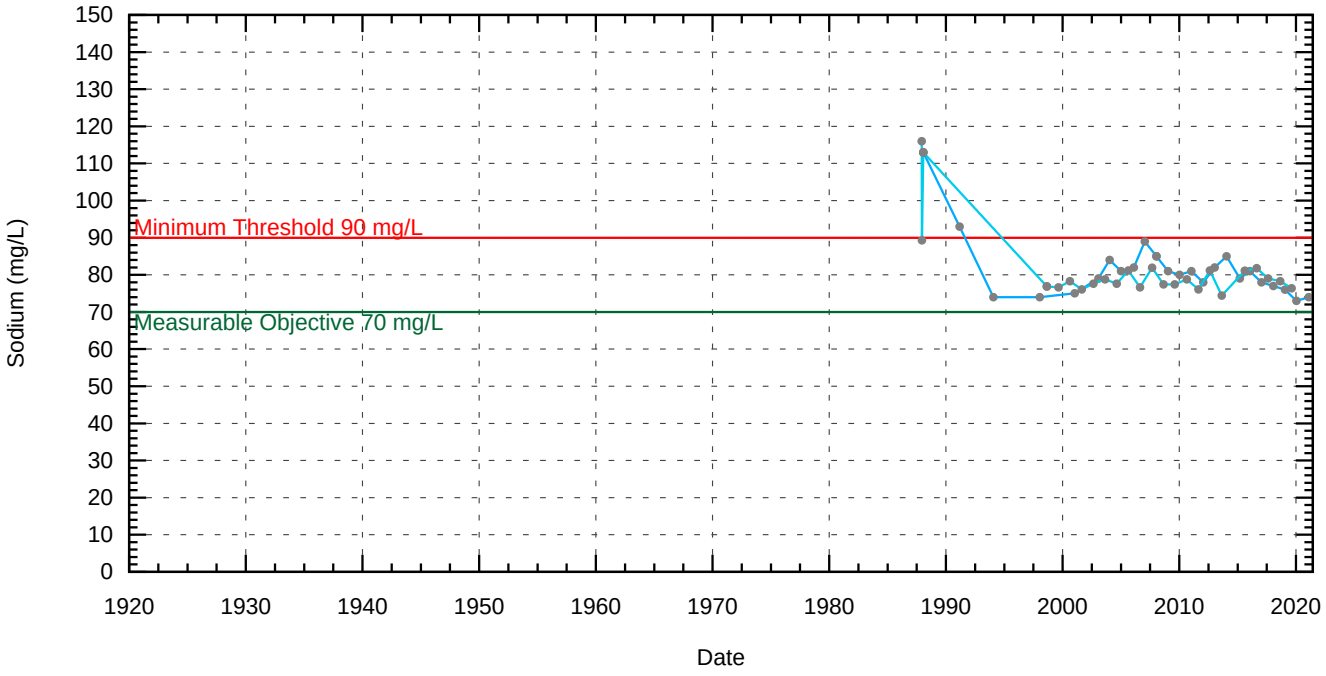


AGL020032833 (DBID 3040)
Lower Aquifer



WMA: Lompoc Plain - Sodium

Lompoc 6 [07N/34W-27K07] (DBID 506)
Upper Aquifer



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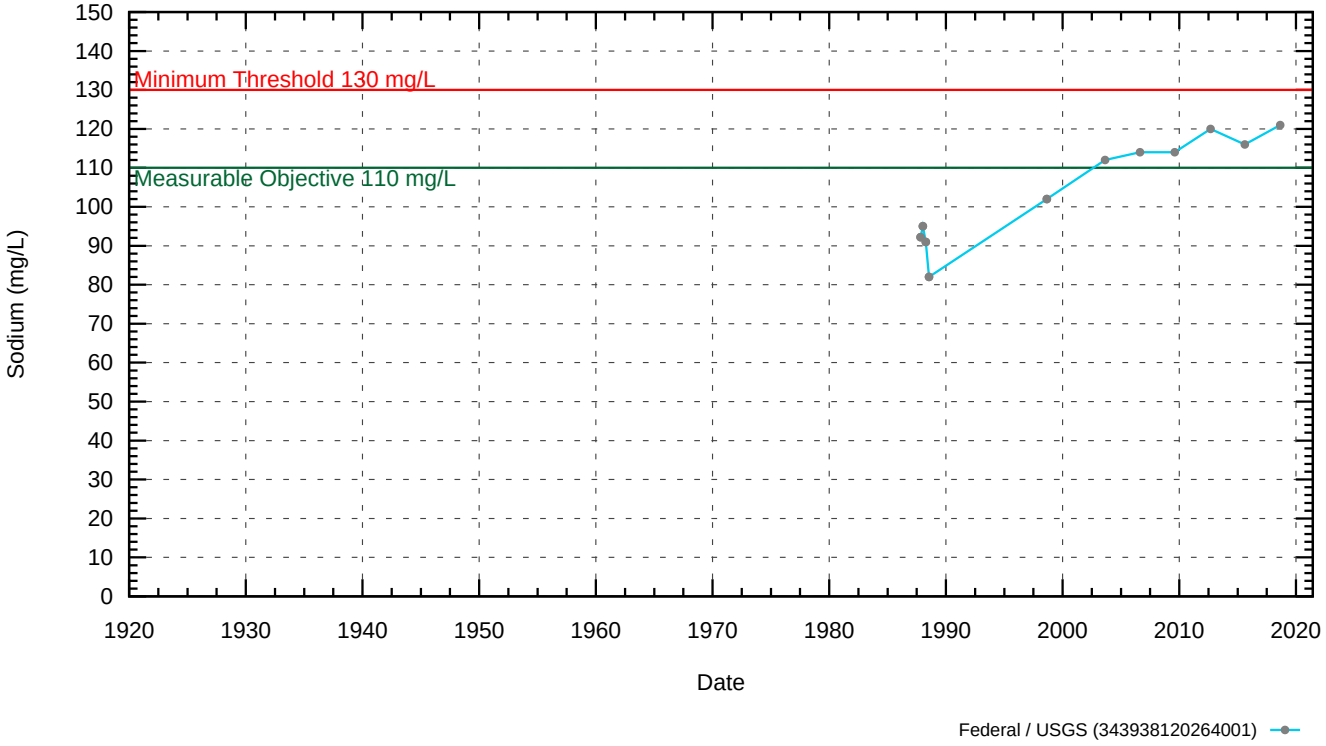
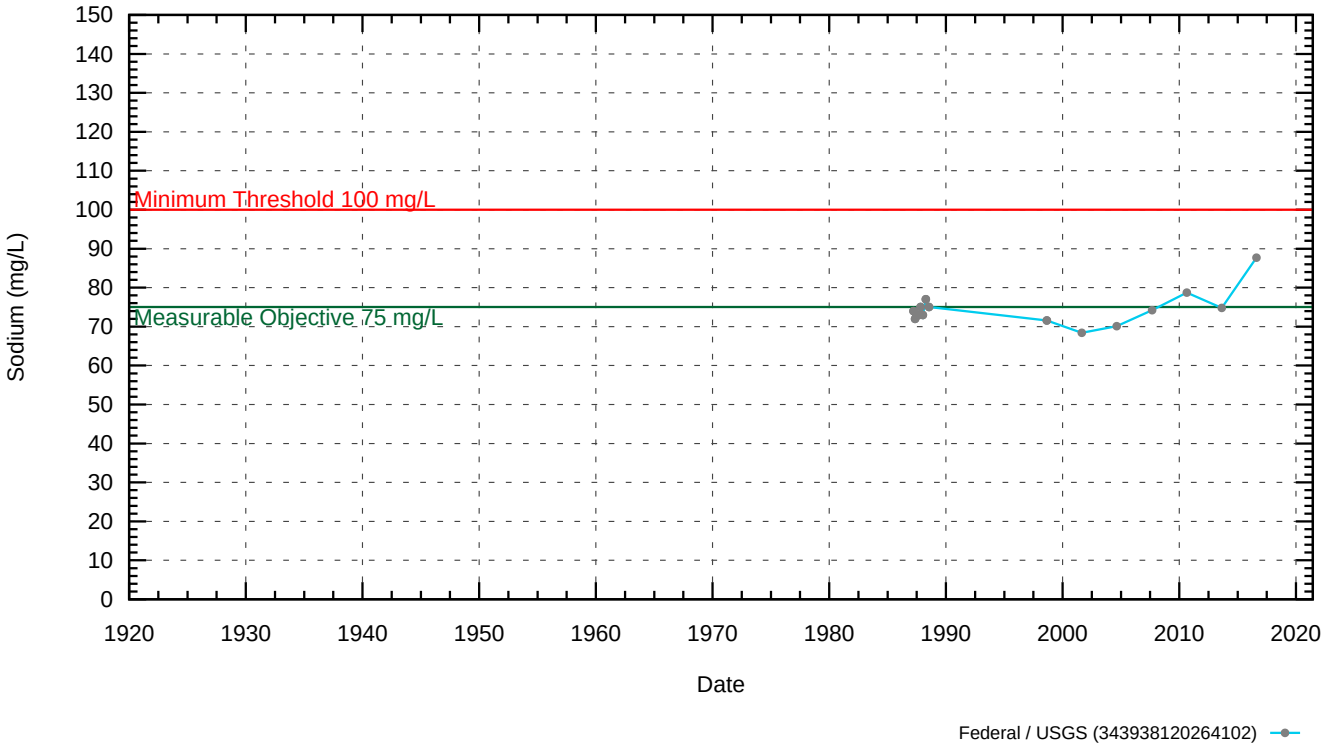
Lower Aquifer



WMA: Lompoc Plain - Sodium

7N/34W-27K05 (DBID 139)
Upper Aquifer



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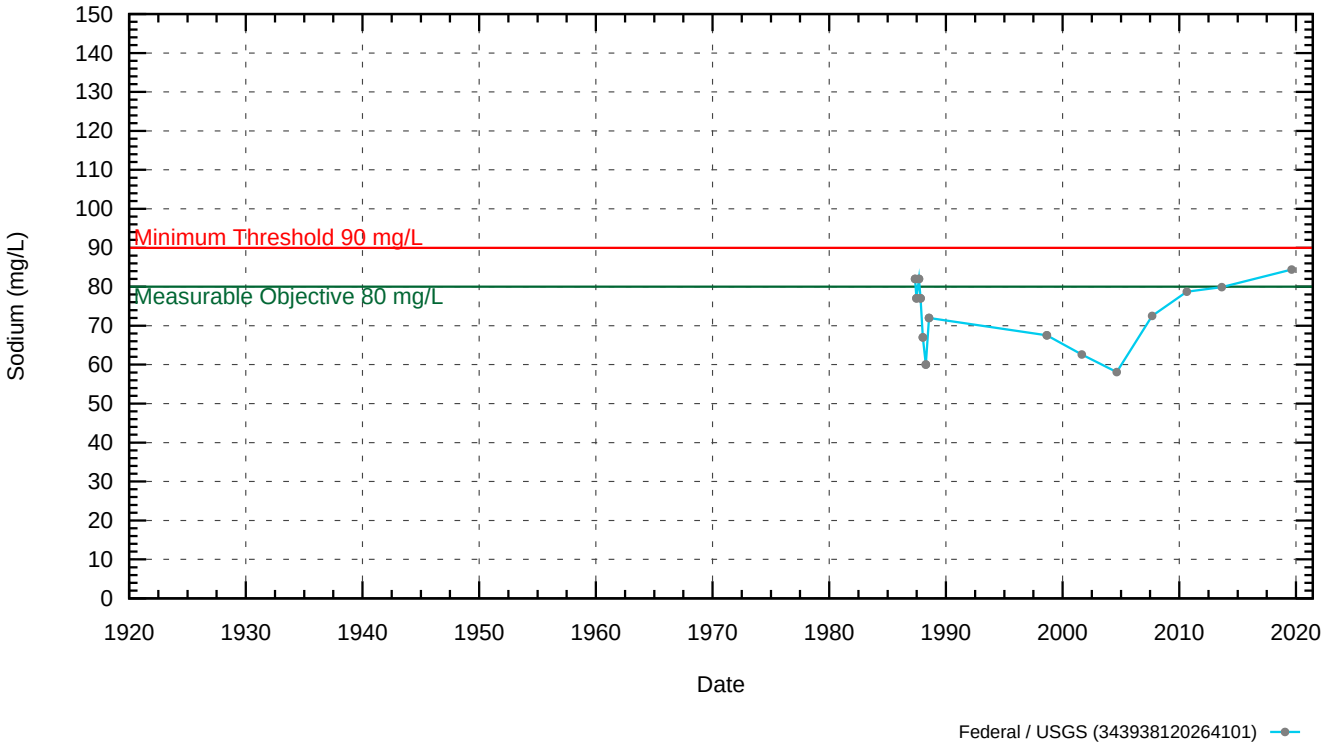
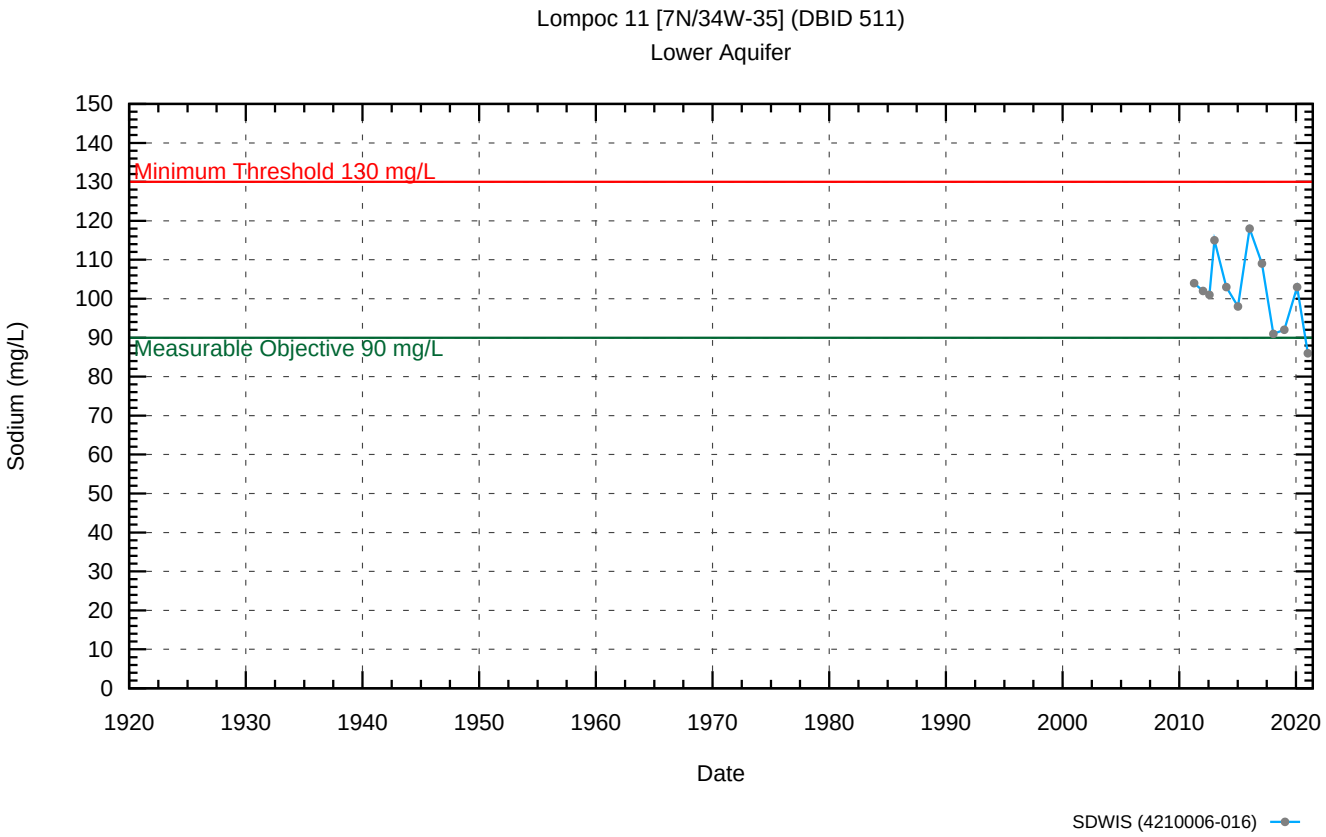
Upper Aquifer

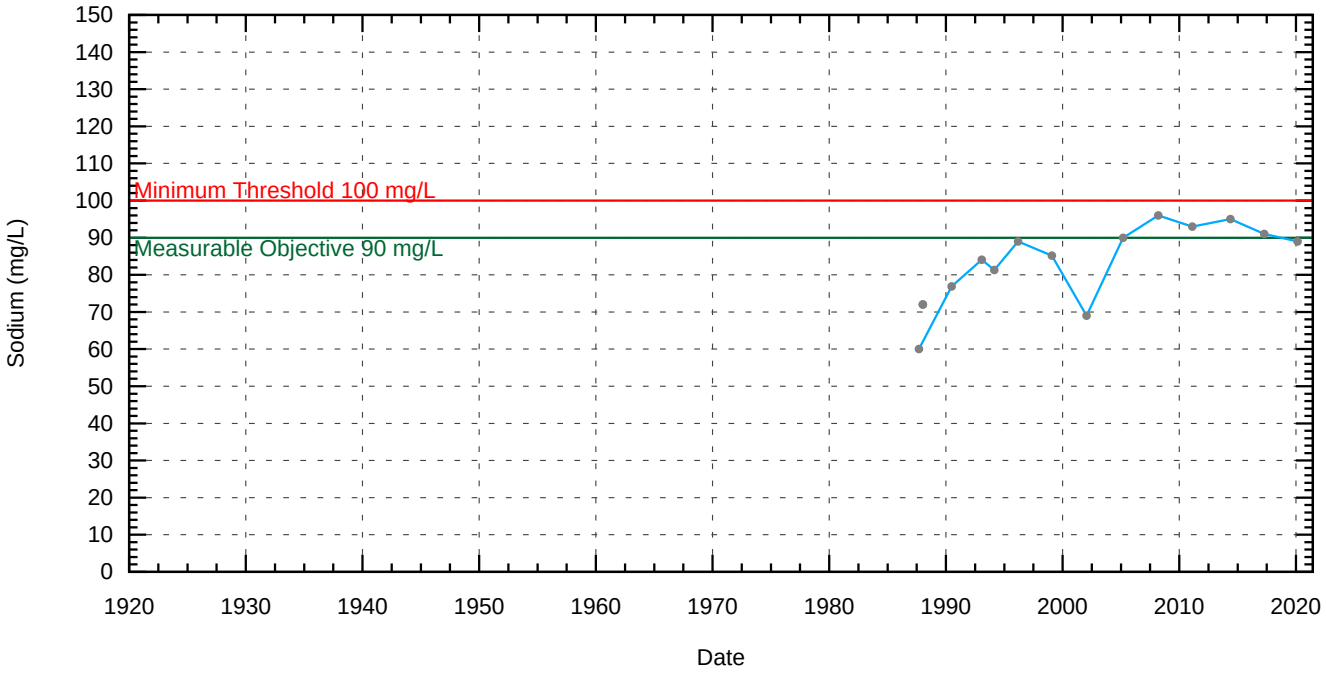


WMA: Lompoc Plain - Sodium

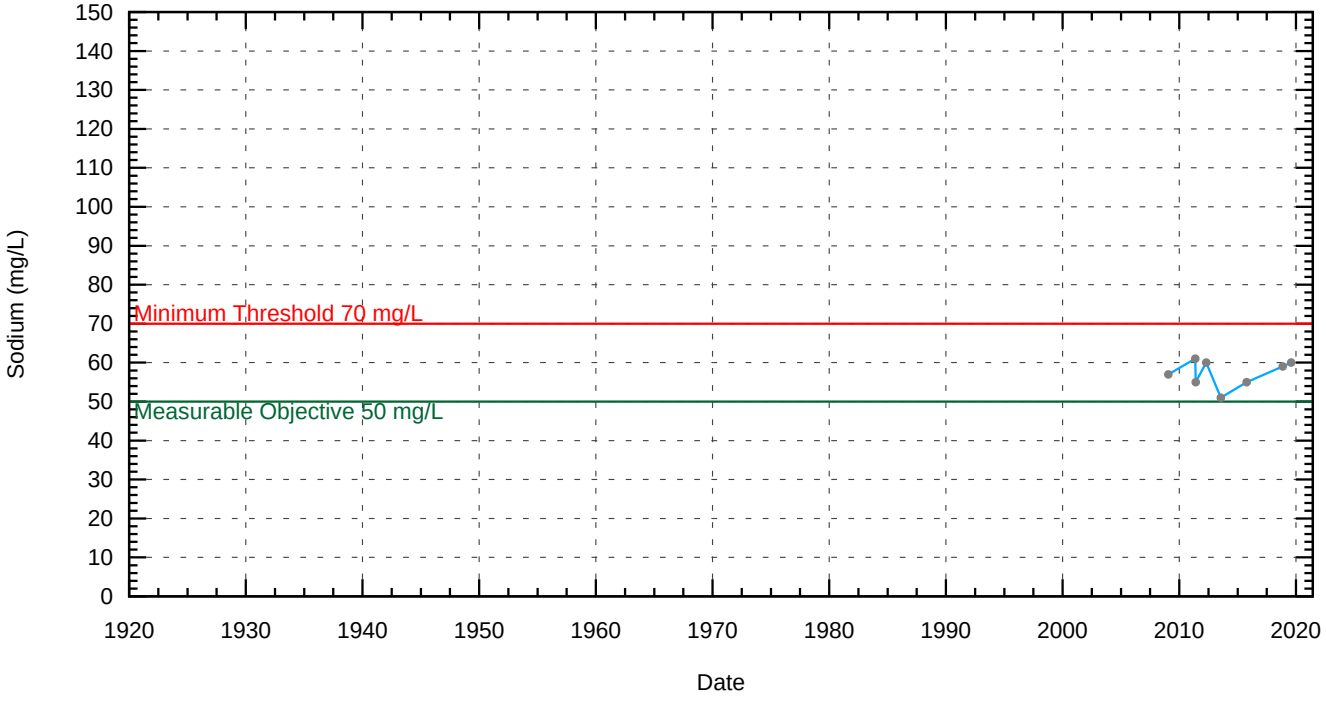


WMA: Lompoc Uplands - Sodium

VVCSD 3B [7N/34W-15E3] (DBID 608)
Lower Aquifer

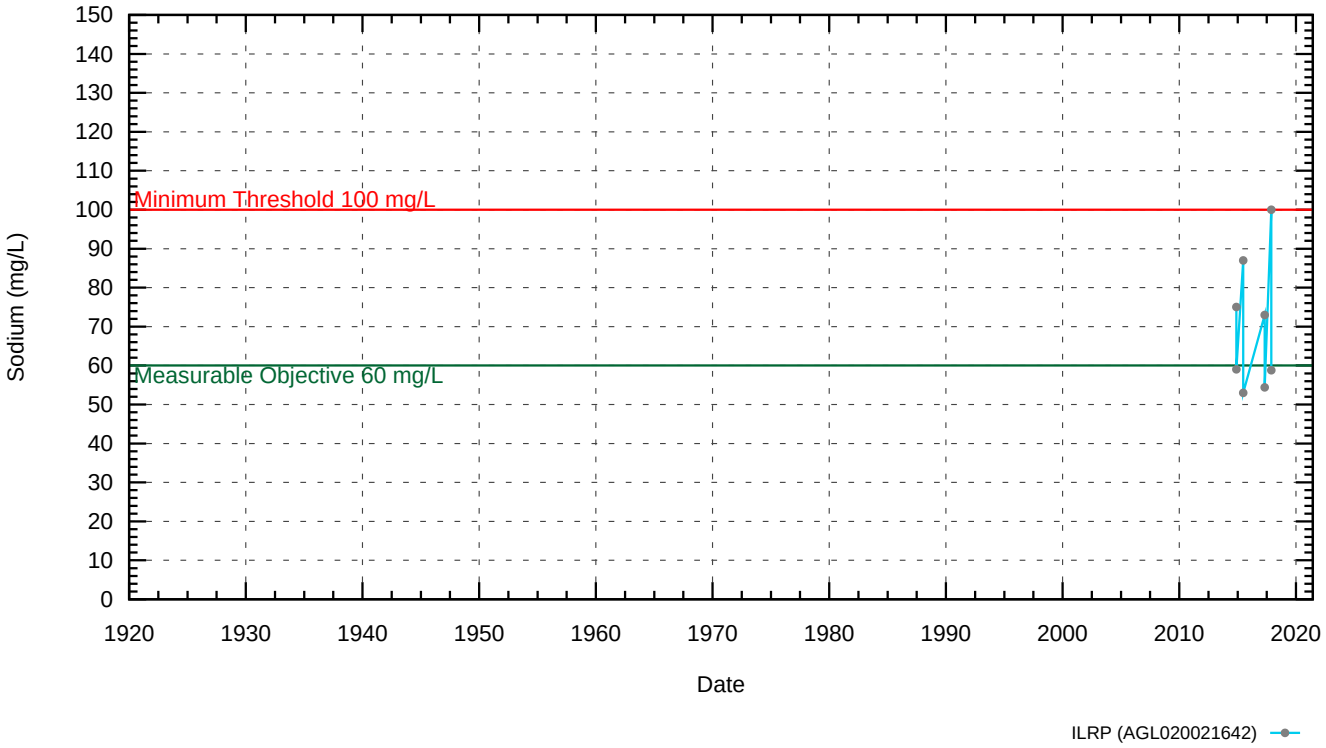


MH CSD 7 (DBID 706)
Lower Aquifer

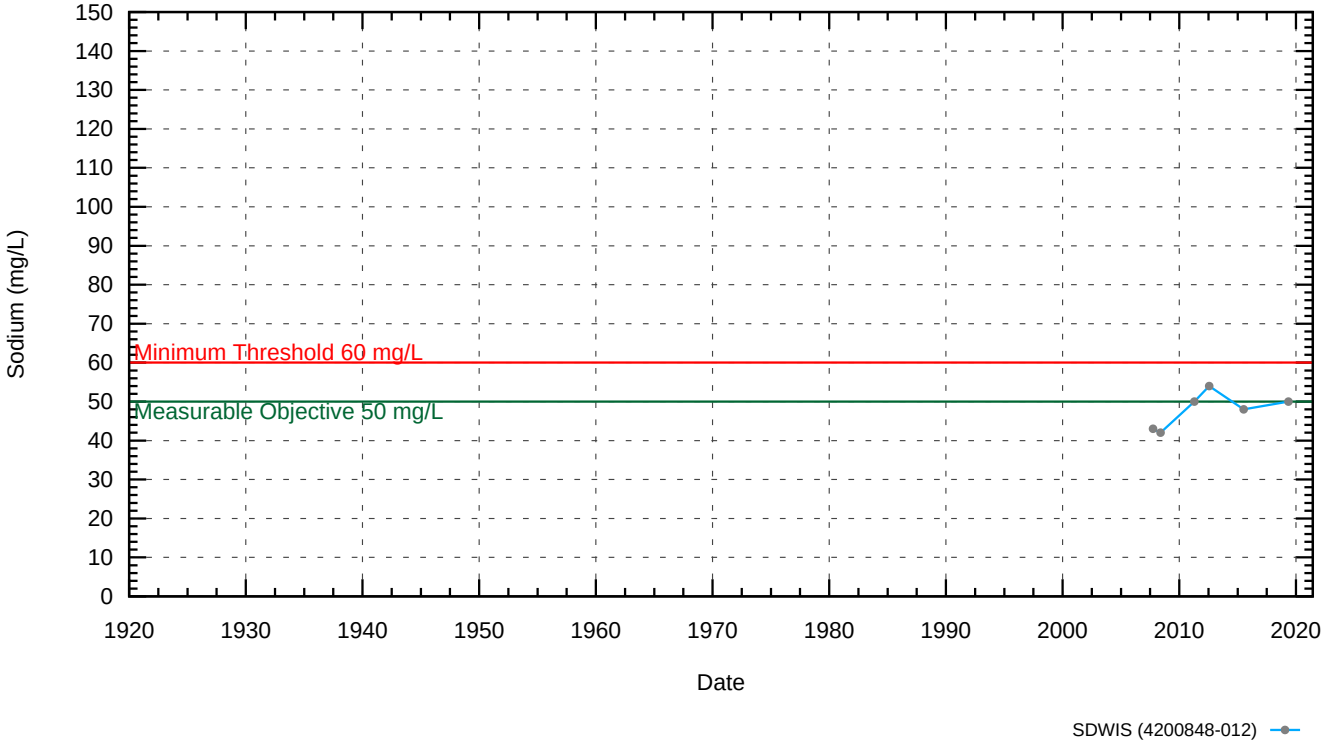


WMA: Santa Rita Uplands - Sodium

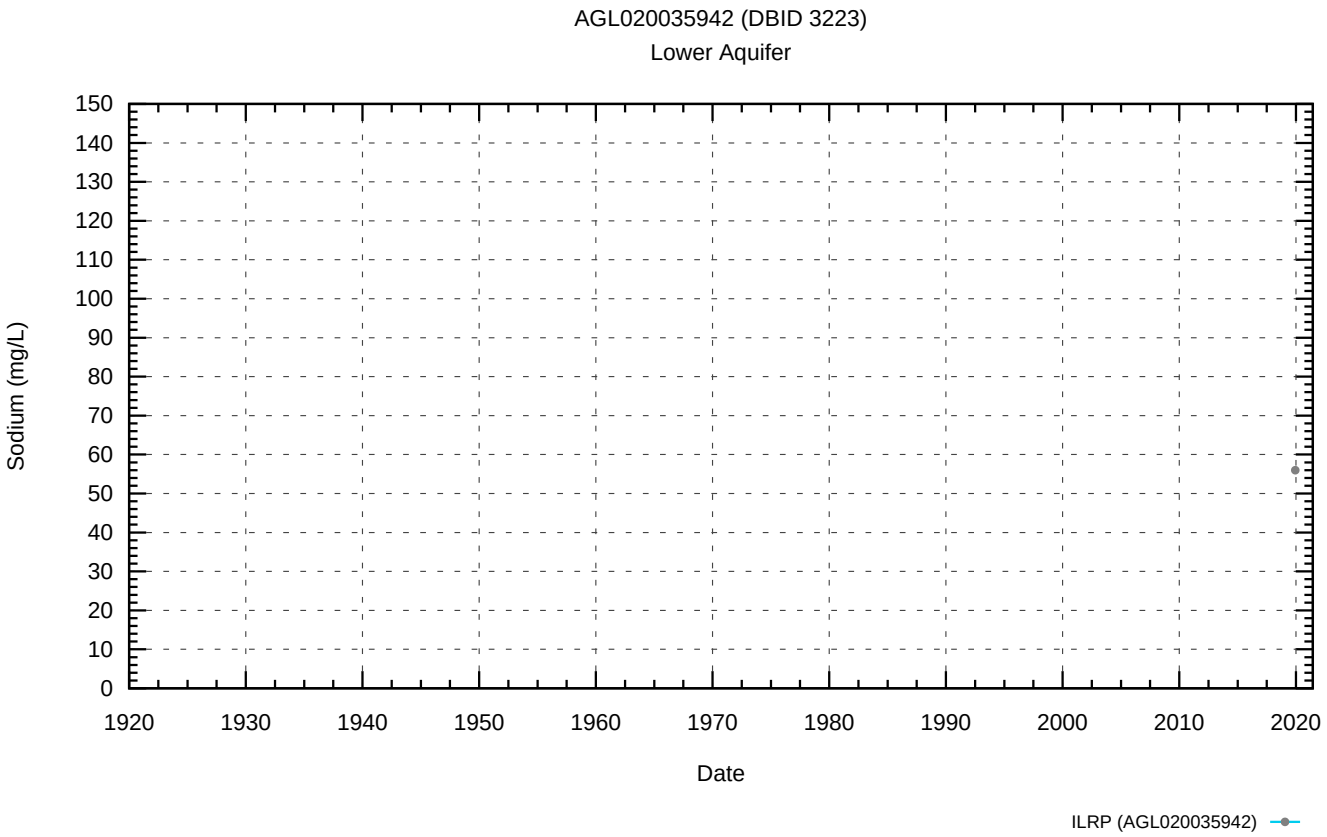
AGL020021642 (DBID 3172)
Lower Aquifer



Vista Hills MWC #4 (DBID 1304)
Lower Aquifer

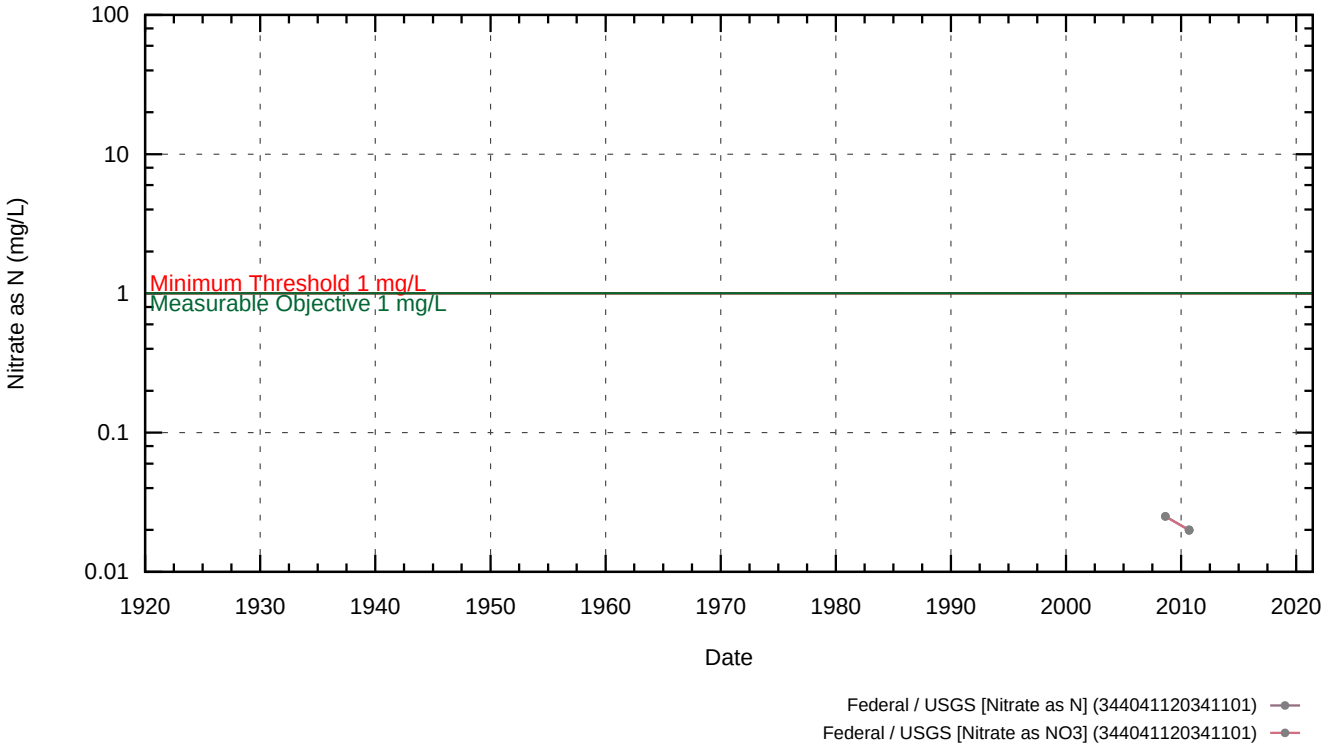


WMA: Santa Rita Uplands - Sodium

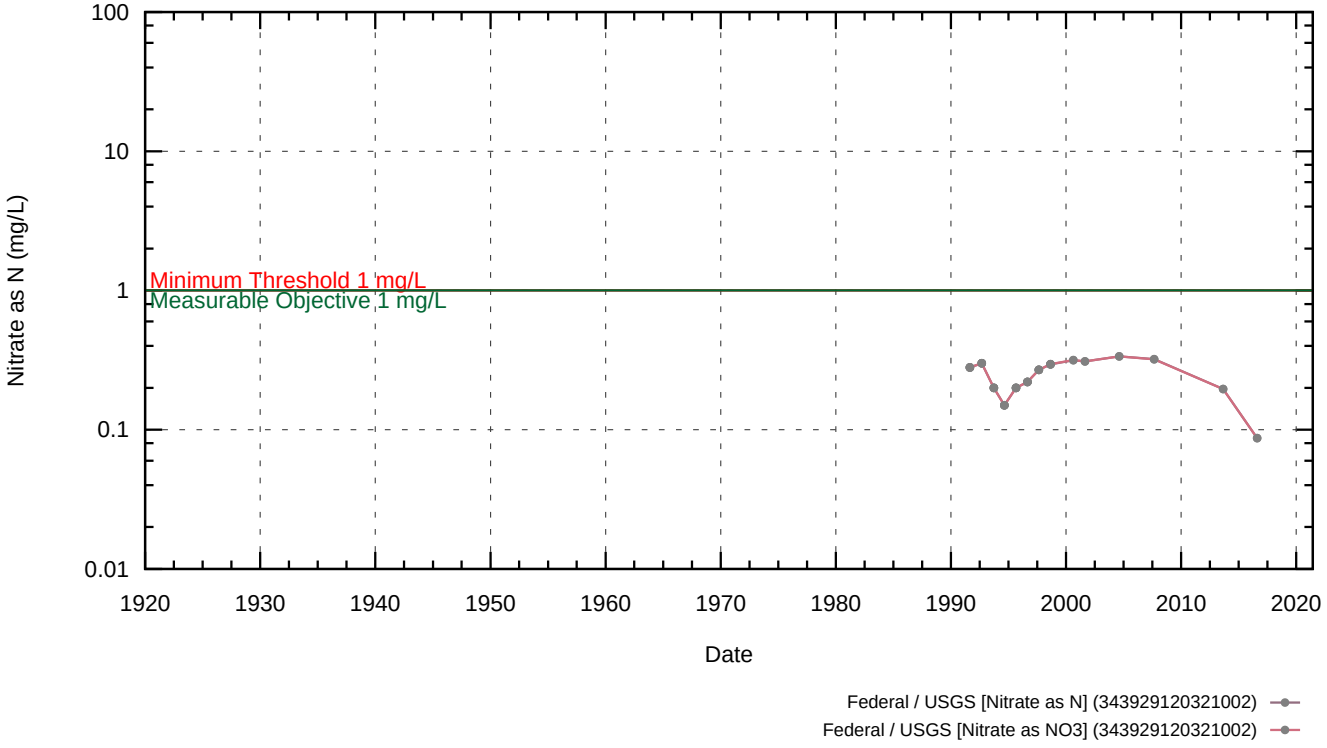


WMA: Lompoc Plain - Nitrate

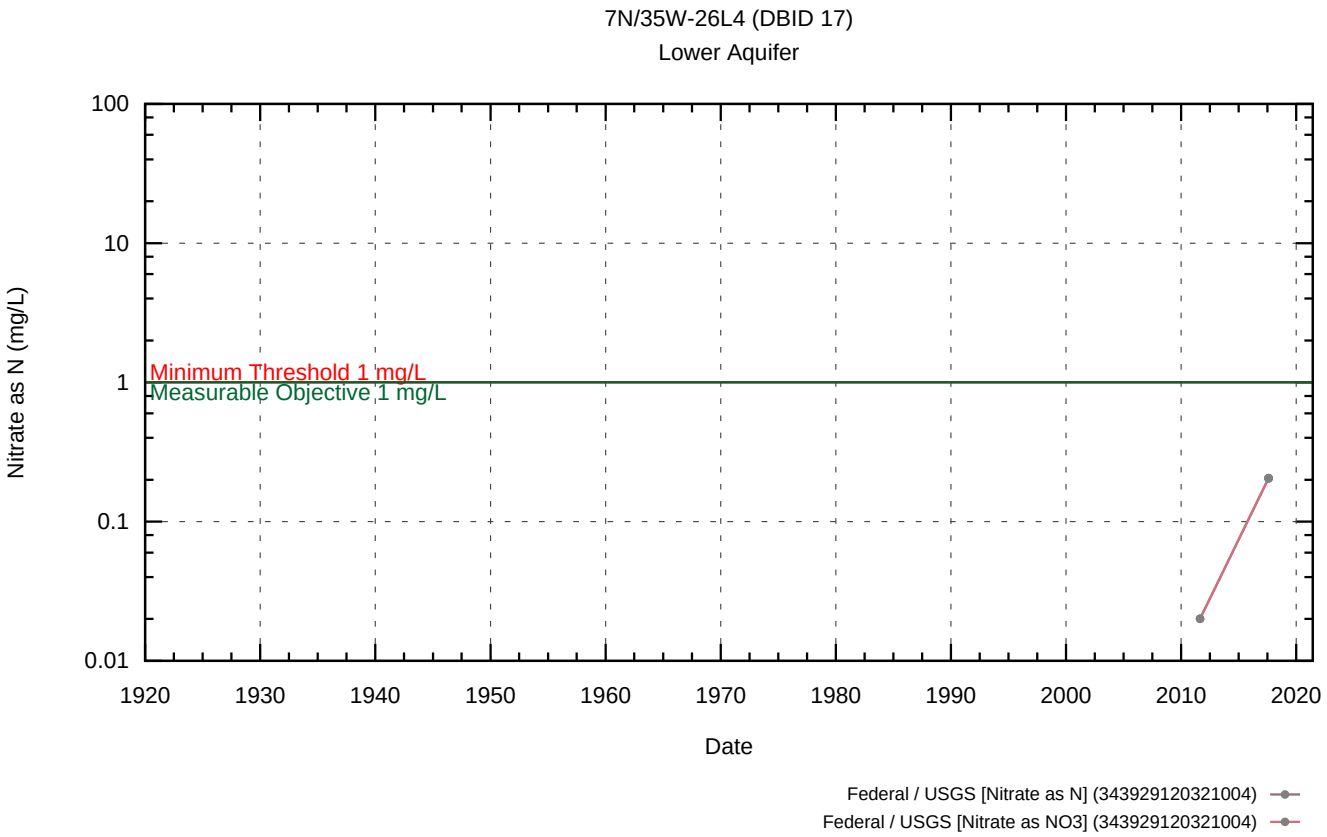
7N/35W-21G2 (DBID 39)
Upper Aquifer

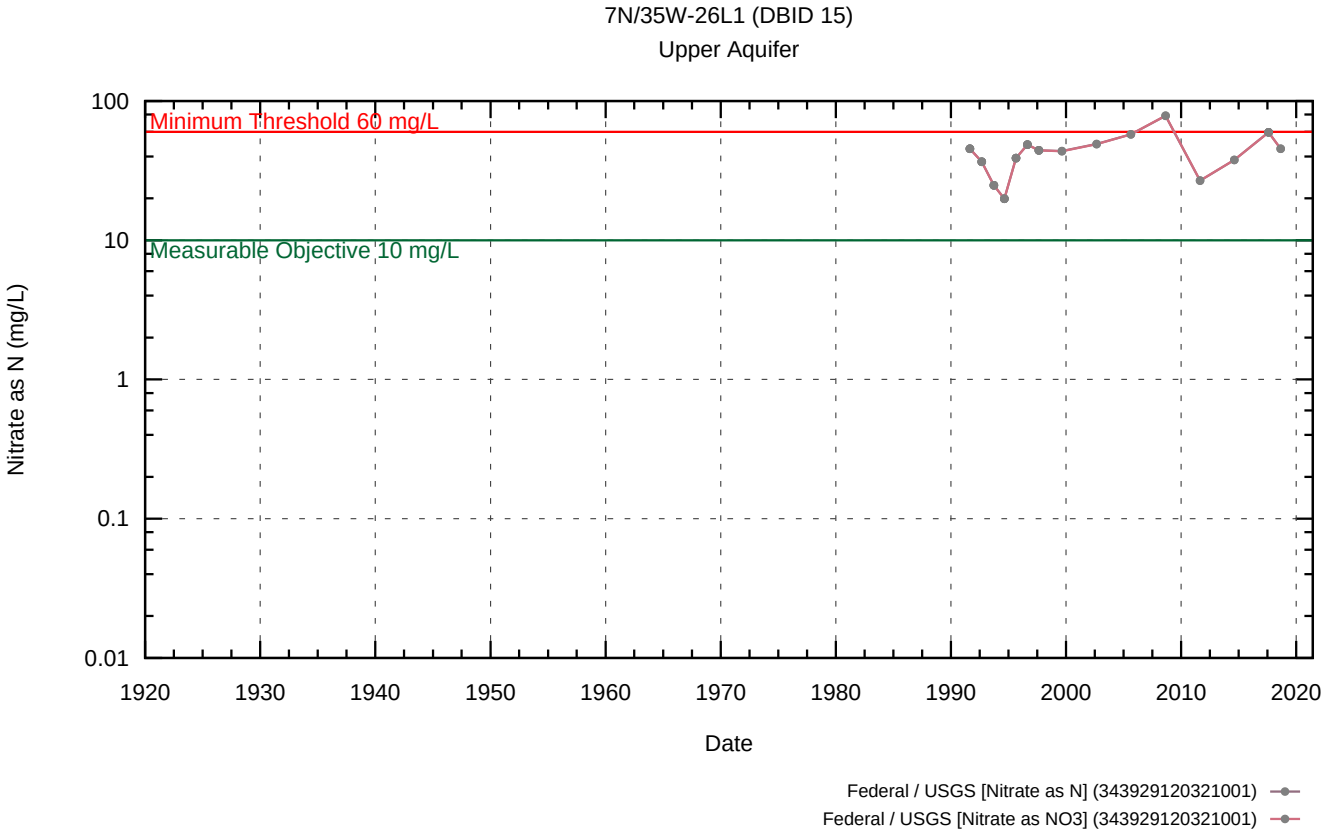


7N/35W-26L2 (DBID 16)
Upper Aquifer

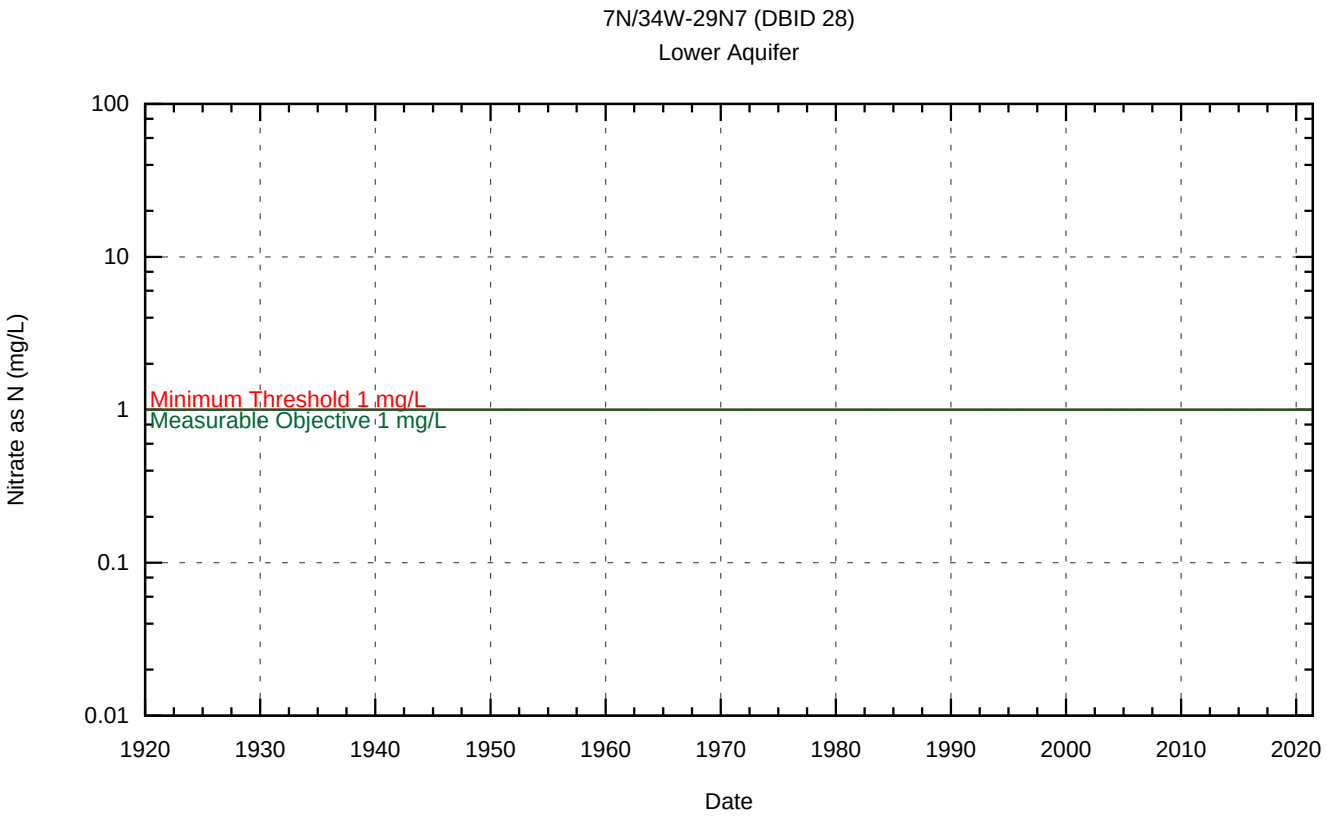


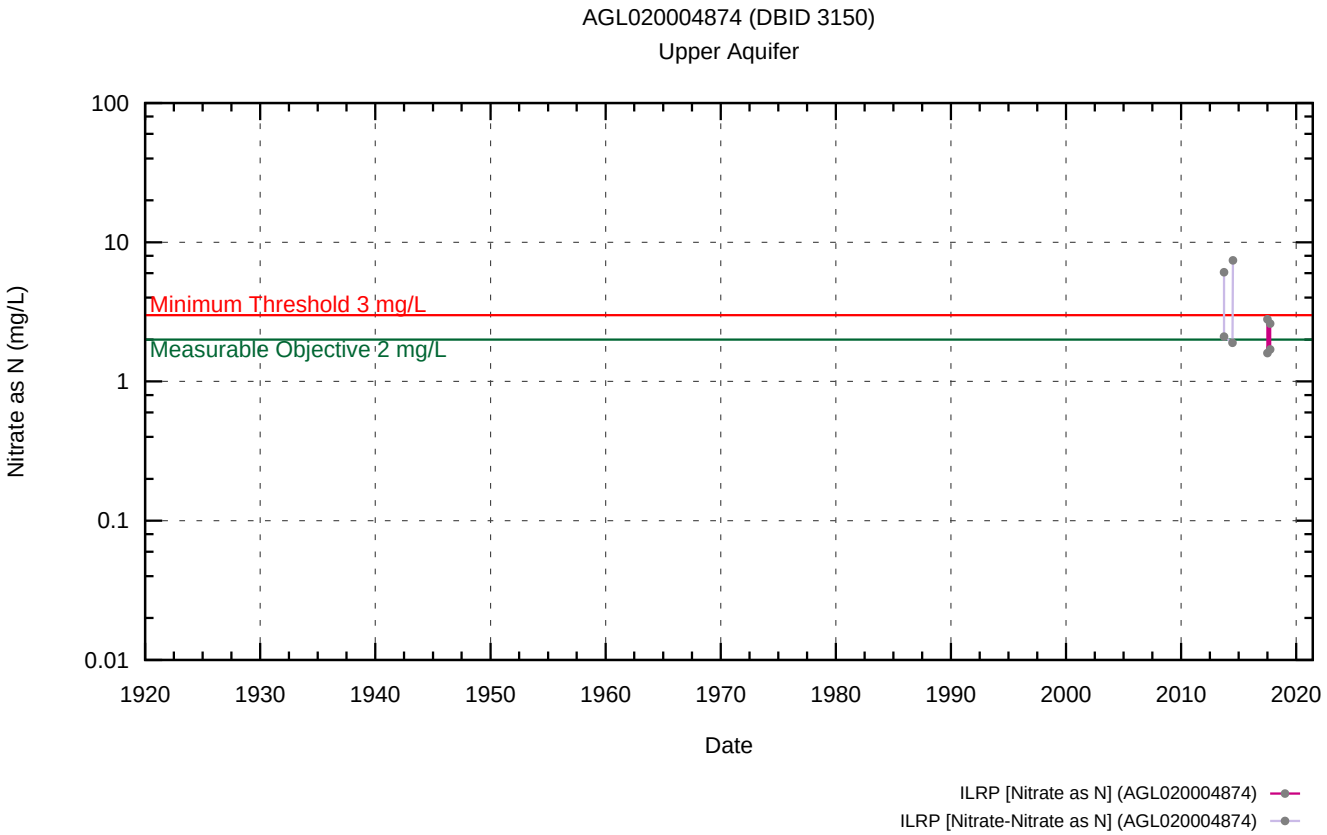
WMA: Lompoc Plain - Nitrate





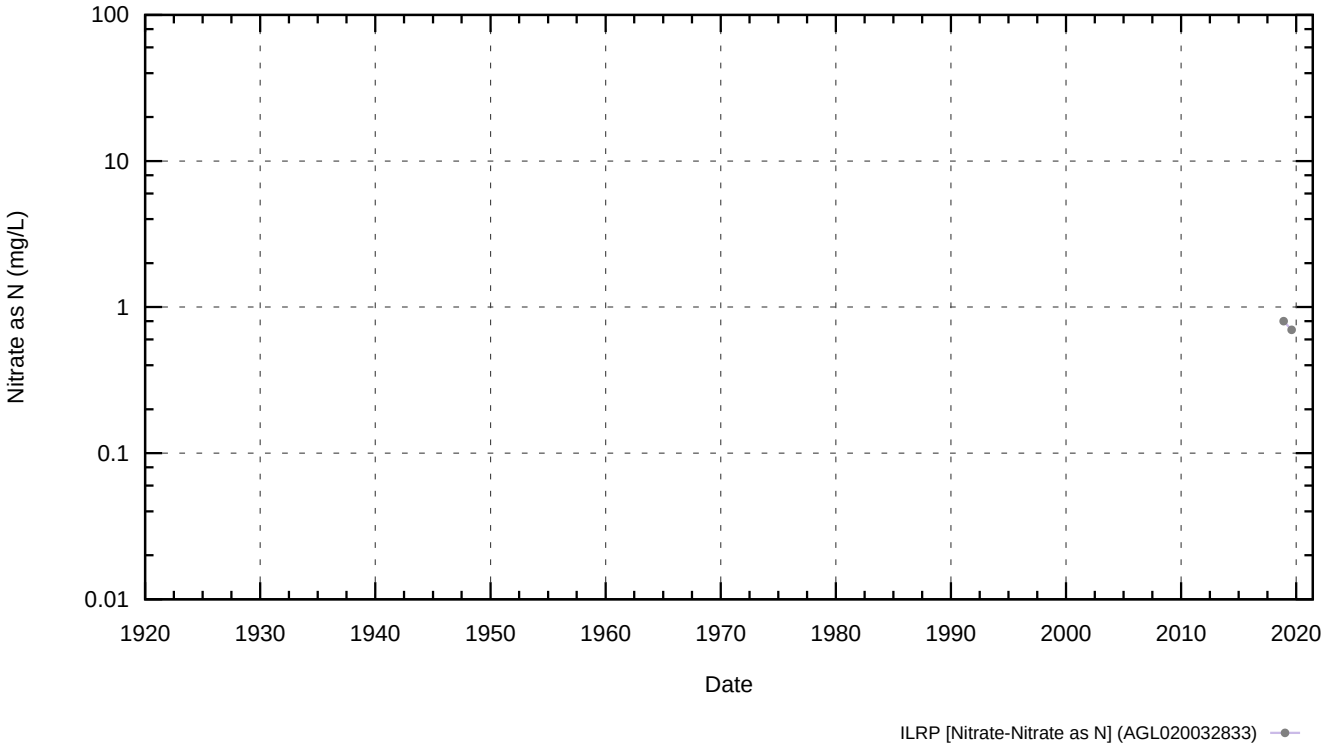
WMA: Lompoc Plain - Nitrate



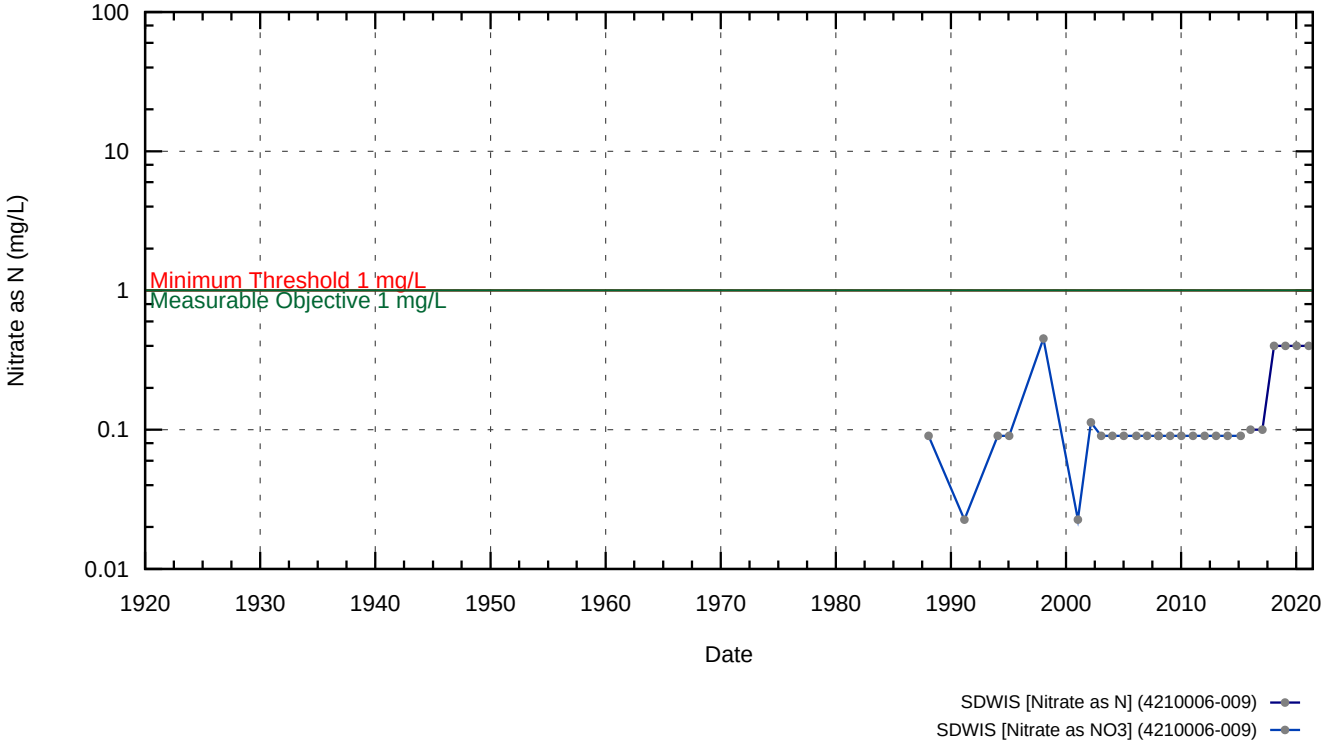


WMA: Lompoc Plain - Nitrate

AGL020032833 (DBID 3040)
Lower Aquifer



Lompoc 6 [07N/34W-27K07] (DBID 506)
Upper Aquifer



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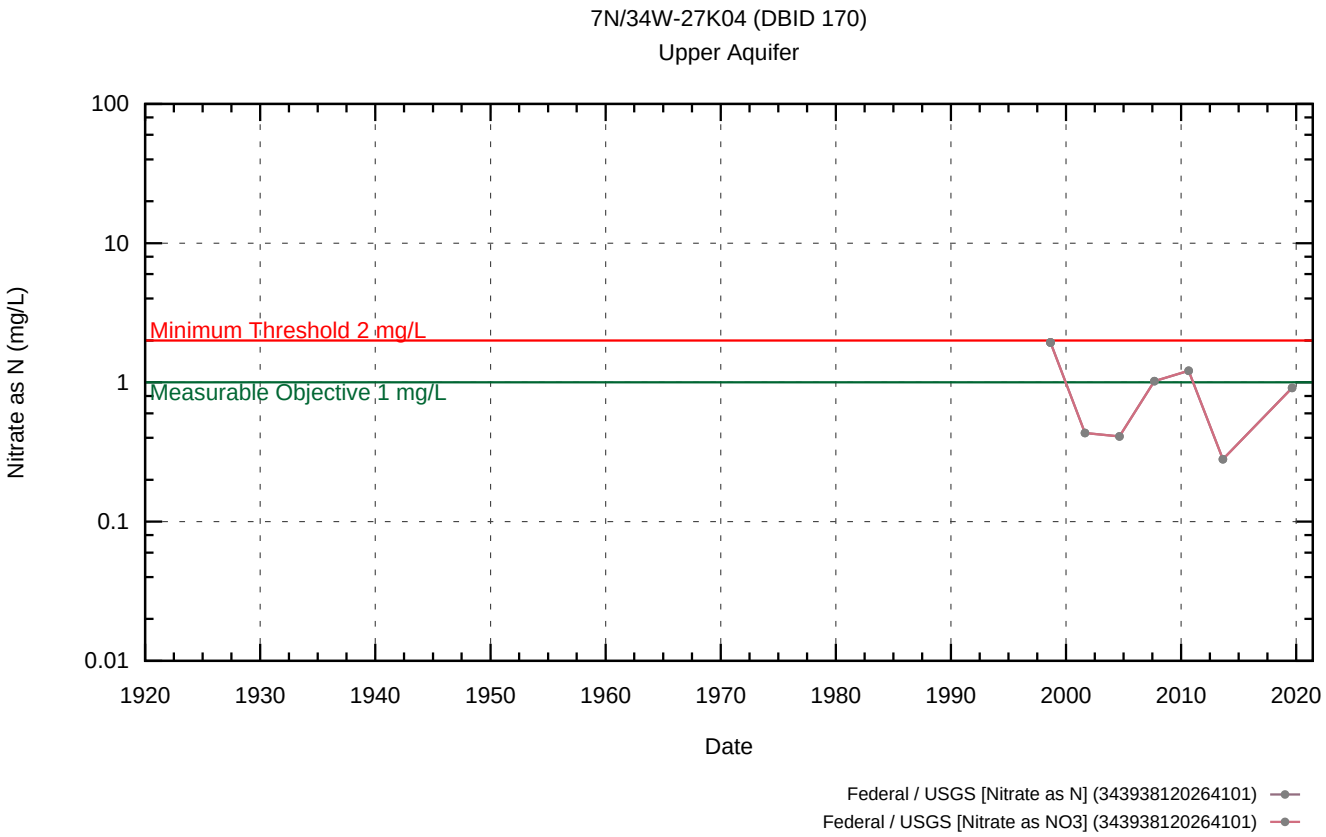
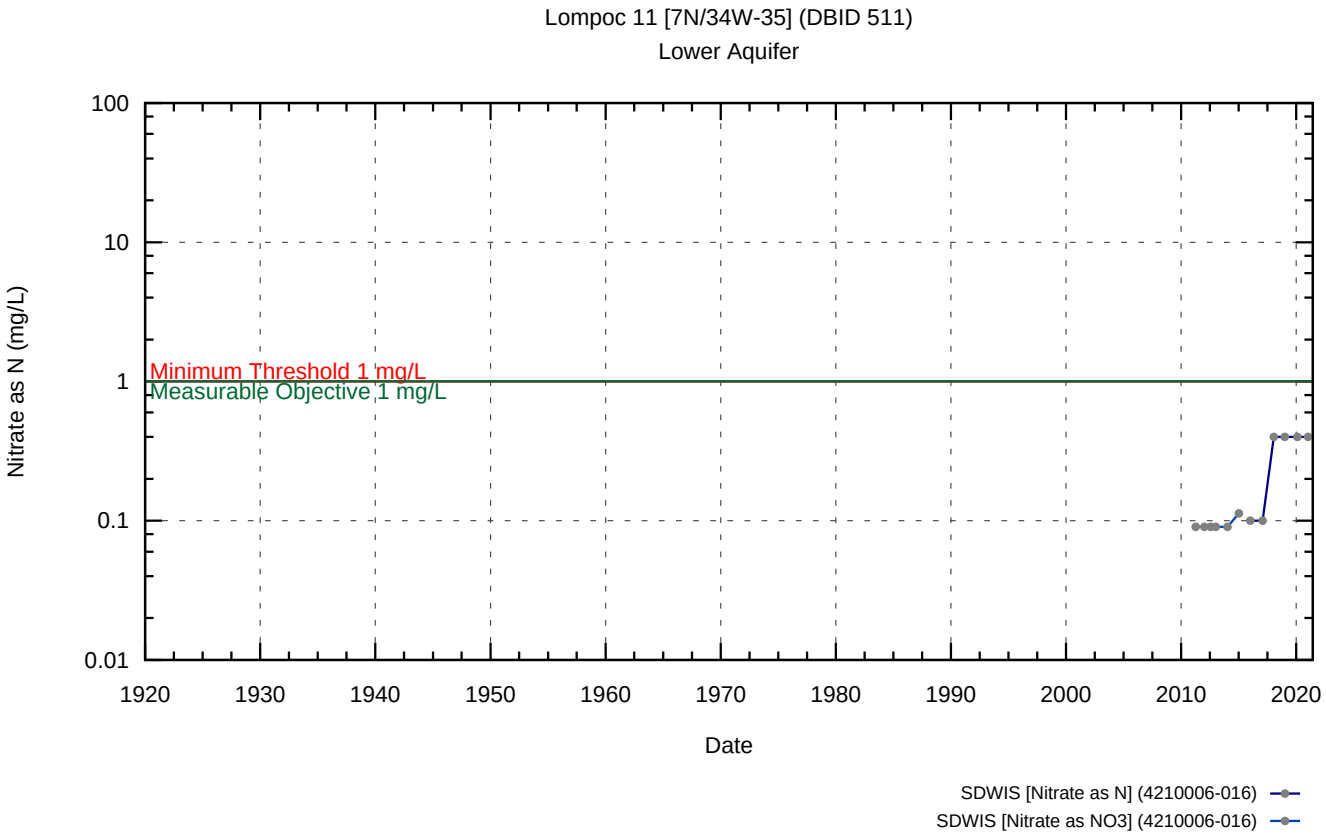
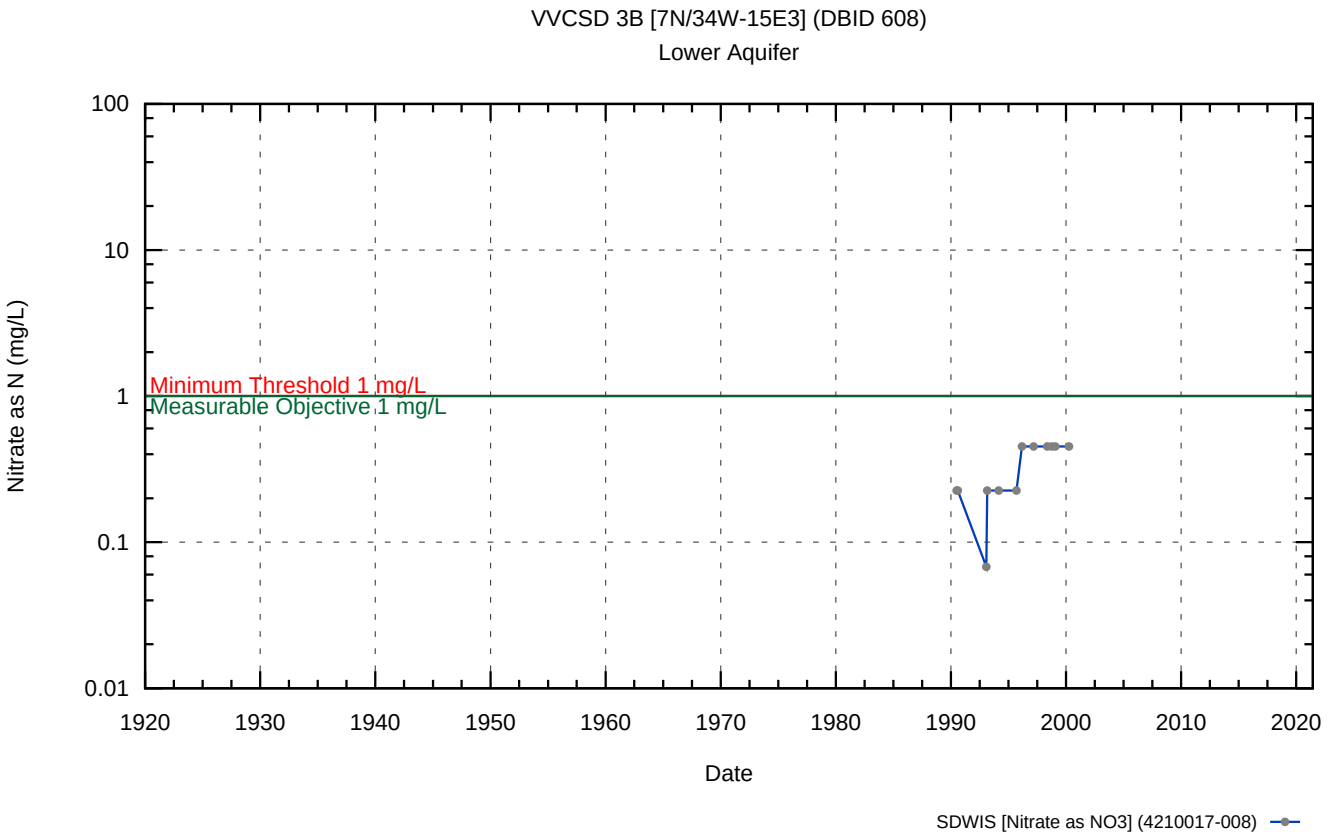
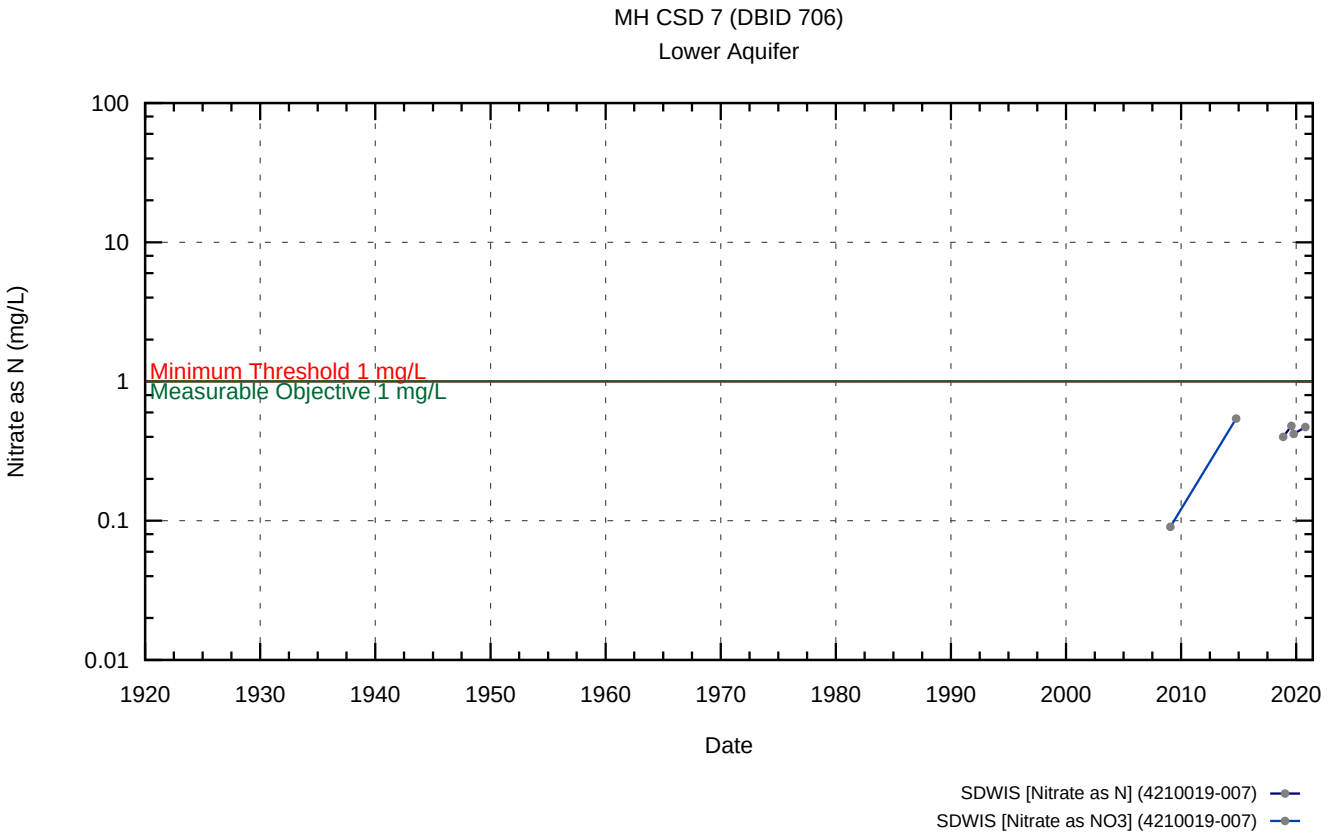




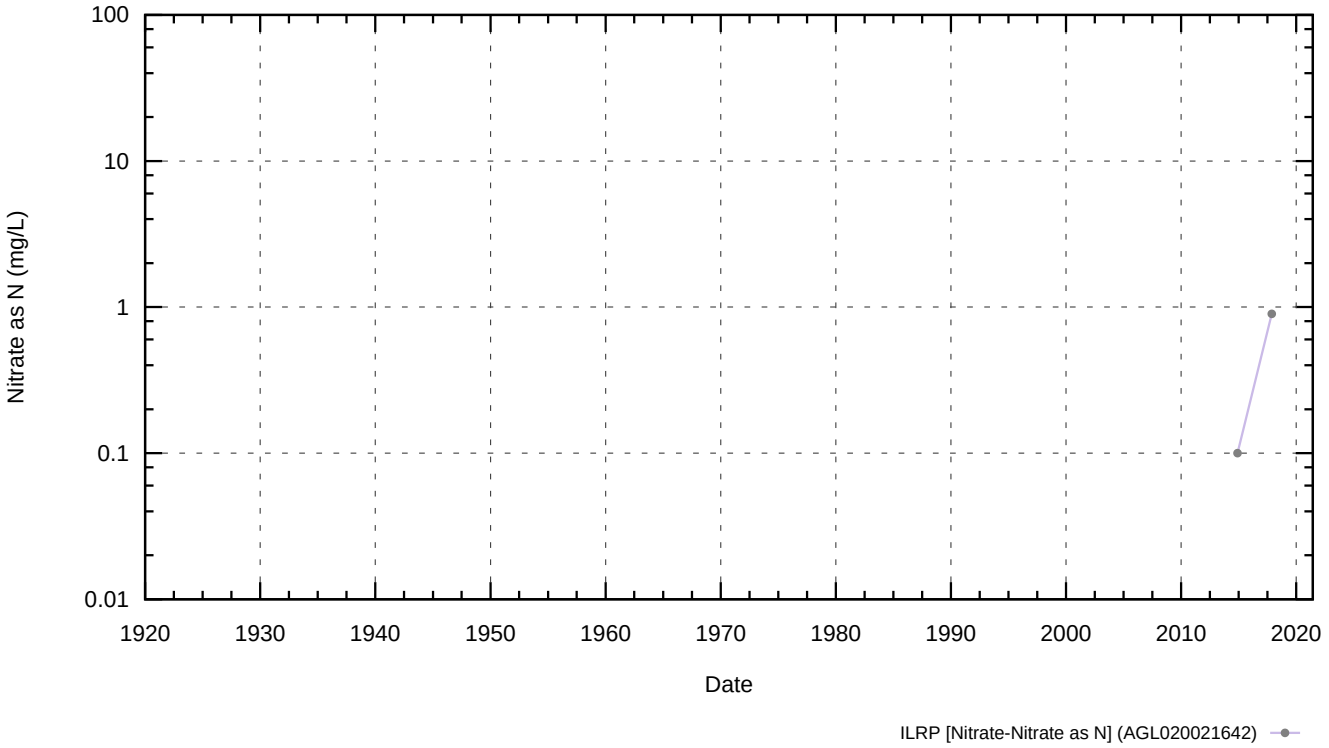
WMA: Lompoc Uplands - Nitrate



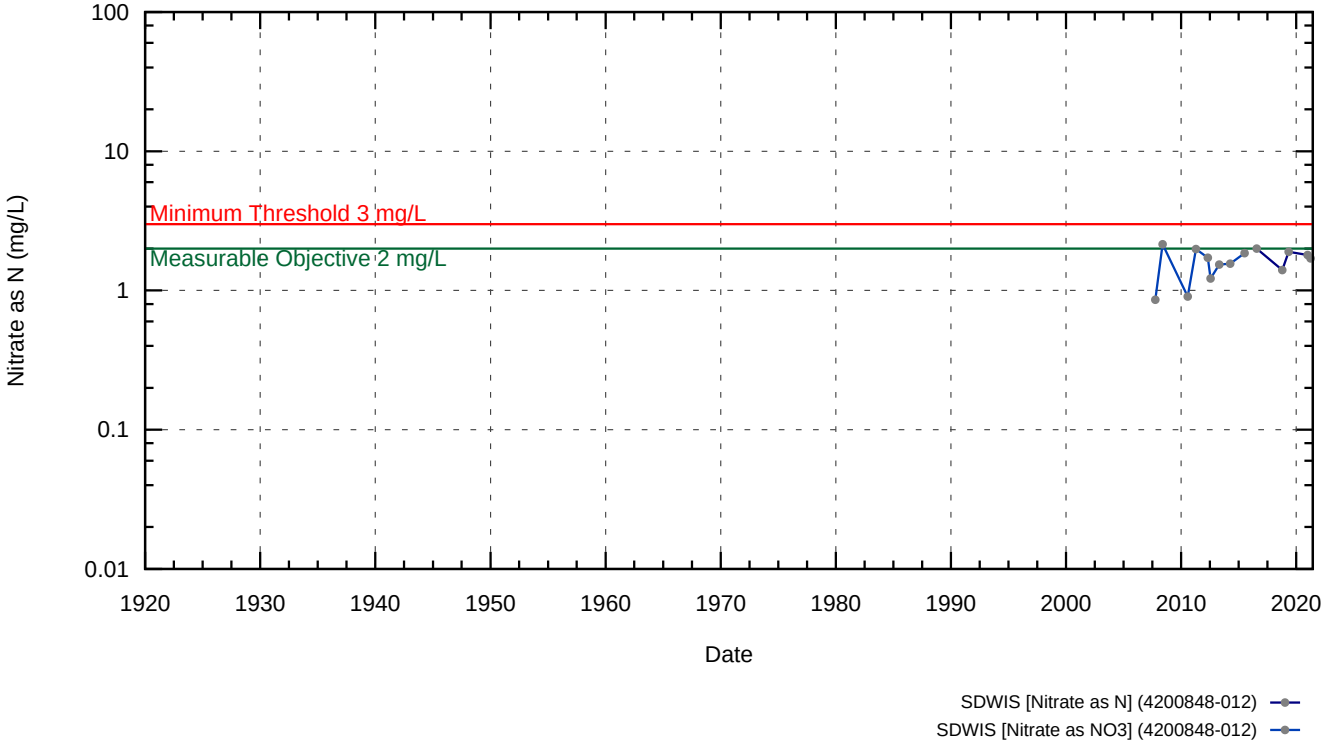


WMA: Santa Rita Uplands - Nitrate

AGL020021642 (DBID 3172)
Lower Aquifer



Vista Hills MWC #4 (DBID 1304)
Lower Aquifer



Chapter 3 – Monitoring Networks and Sustainable Management Criteria

Appendix 3b-E:

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

APPENDIX 3B-E:

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.

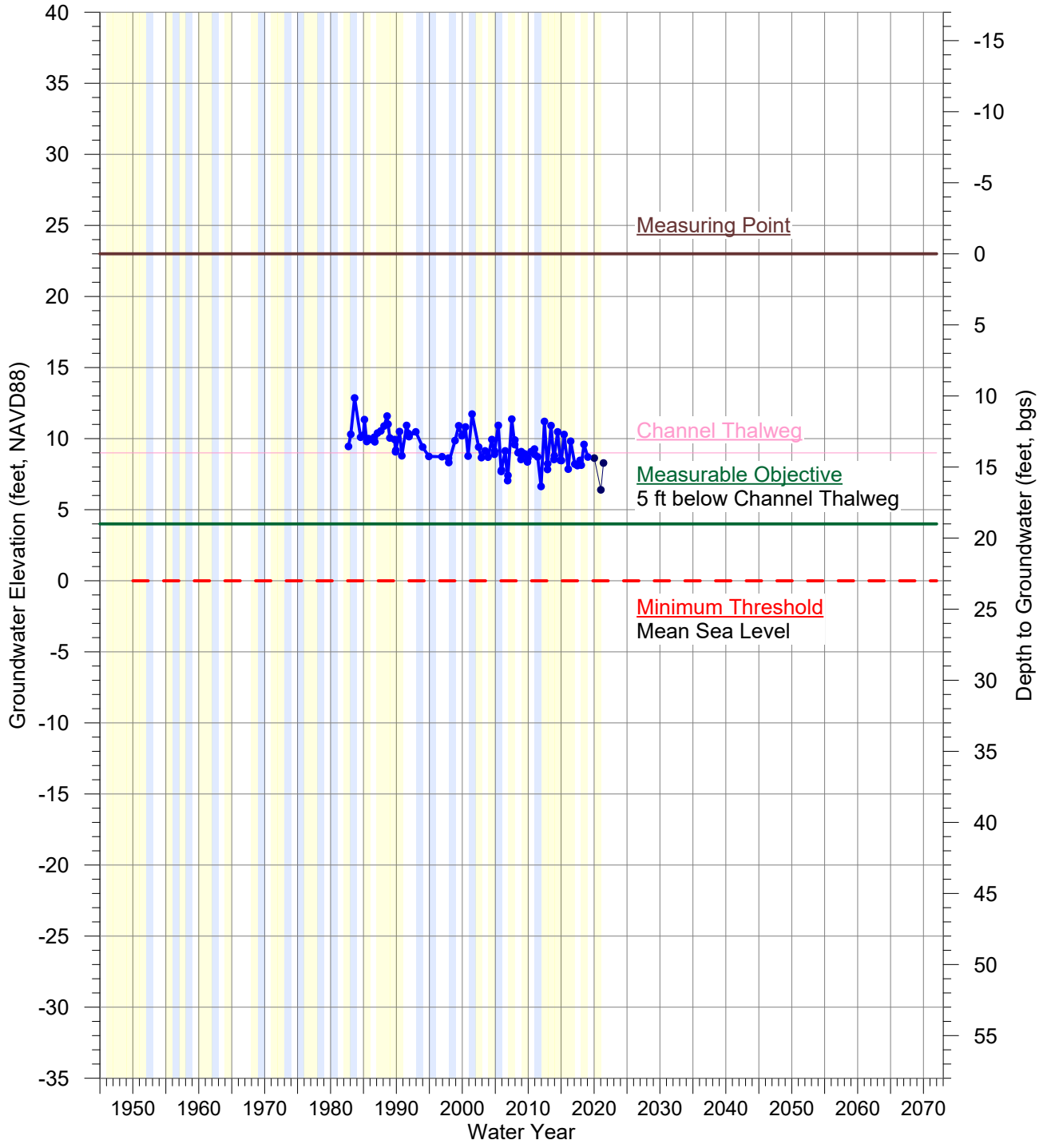
LIST OF ACRONYMS AND ABBREVIATIONS

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

FIGURE E-01

CASGEM ID
49153
Voluntary

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



DRAFT
8/27/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

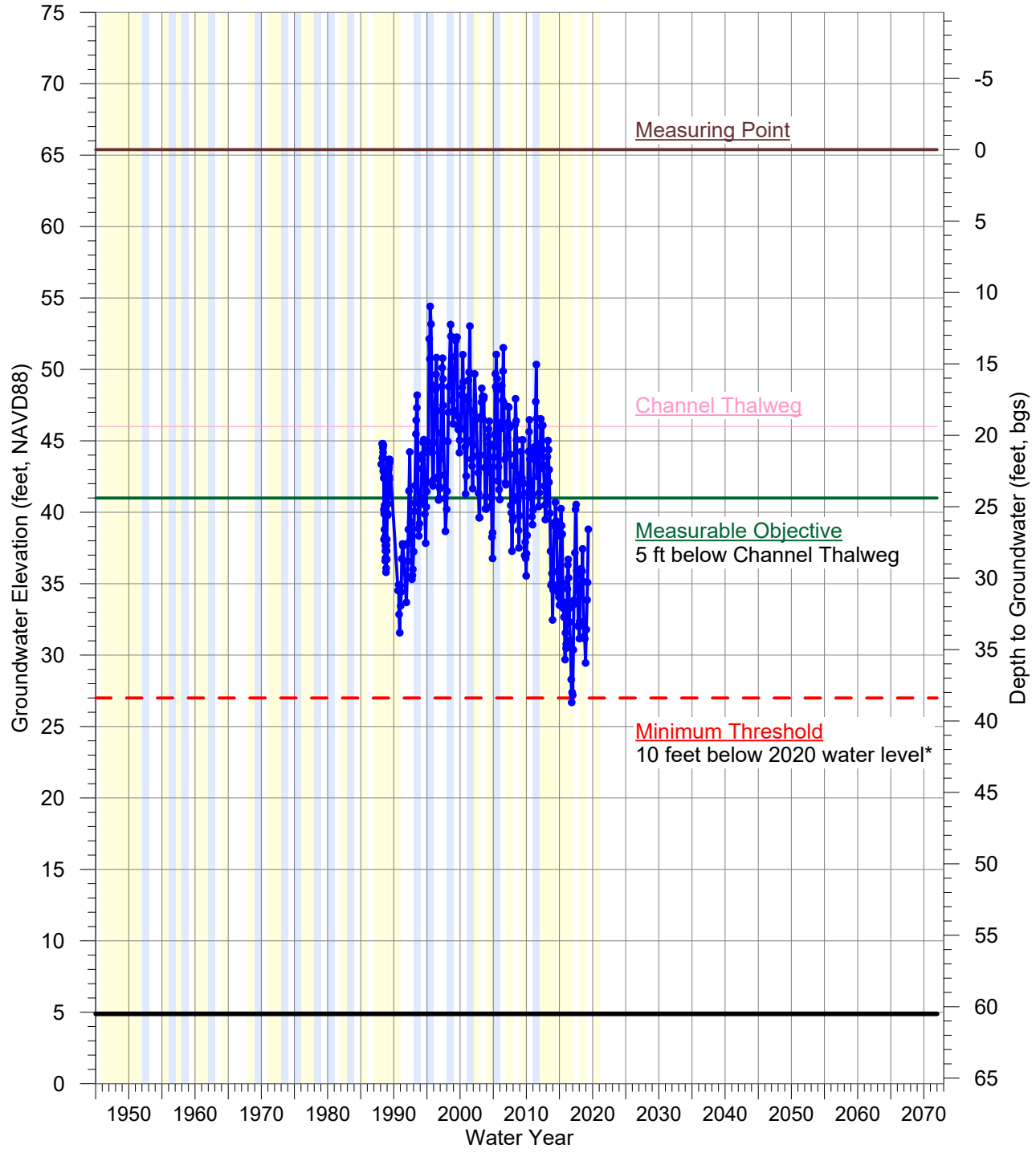
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2710\Monitoring\SMC\GDE\WMA_GDE_Hydrograph_Grapher\WMA Fig E-01 LP-U-S 39 21G2.grf 8/27/2021 M. McCammon

FIGURE E-02

CASGEM ID
25271
Voluntary

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



* No water level measurments in 2020, estimate based on 2019 water levels

DRAFT
8/27/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

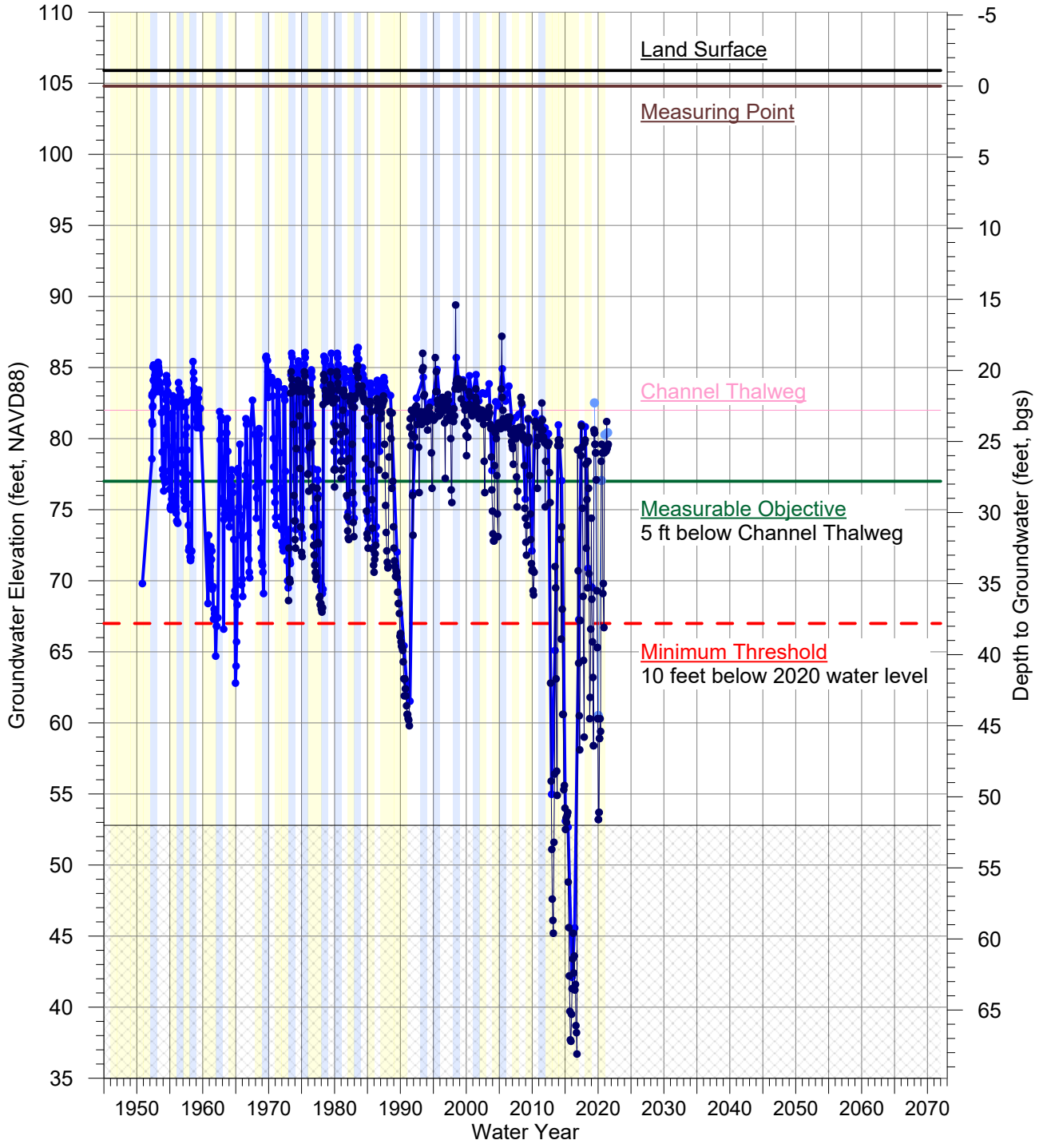
Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2710\Monitoring\SMC\GDE\WMA_GDE_Hydrograph_Grapher\WMA Fig E-02 LP-U 167 29F2.grf 8/27/2021 M. McCammon

FIGURE E-03

CASGEM ID
36328
Voluntary

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



US Bureau of Reclamation
USGS (343924120254501)
County of Santa Barbara

Land Surface (105.9 feet above mean sea level)
Measuring Point (104.8 feet above mean sea level)
Depth of Well (124 feet)
Perforations 52-80; 112-124 feet

DRAFT
8/27/2021

STETSON ENGINEERS INC.

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

REPRESENTATIVE MONITORING WELL ASSESSING SURFACE WATER DEPLETION

Water Year Type (1942-2020)
- Wet
- Above/Below Normal
- Dry / Critically Dry

F:\DATA\2710\Monitoring\SMC\GDE\WMA_GDE_Hydrograph_Grapher\WMA Fig E-03 LP-U 32 35K9.grf 8/27/2021 M. McCammon

Public Comments

Appendix PC-A:

Public Comments

APPENDIX PC-A:
PUBLIC COMMENTS

This appendix will include "Comments regarding the Plan received by the Agency and a summary of any responses by the Agency" (23 CCR § 354(c)).

As described in the main text, the Agency (the WMA GSA) solicited public comments supporting draft documents. This request for comments included outreach to specific identified stakeholder groups, running the Citizens Advisory Group (CAG), newsletters released through multiple channels, press releases, and development and implementation of a communications website.

Comments including on draft documents as well as on this Plan (the GSP) are made available on the WMA GSP Communication Website:

https://www.santaynezwater.org/western-gsa

Comments 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. 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.