SAN GORGONIO PASS SUBBASIN WY2022 ANNUAL REPORT

MARCH 2023

Prepared for:

San Gorgonio Pass
Groundwater Sustainability Agency

Prepared by:

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Sacramento, California

Executive Summary

In 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to continued overdraft of California's groundwater resources. The San Gorgonio Pass (SGP) Subbasin (7-021.04) is one of several alluvial basins and subbasins identified by the California Department of Water Resources (DWR) as being in a medium-priority subbasin in Bulletin 118 (2003). Beginning in 2015, Groundwater Sustainability Agencies (GSAs) within the SGP Subbasin formed to address the long-term reliability of groundwater through the development a single Groundwater Sustainability Plan (GSP)[1]. The SGP Subbasin GSP (SGP GSP) was developed in a coordinated fashion by the Desert Water Agency GSA, San Gorgonio Pass GSA, and Verbenia GSA with the goal of achieving sustainability for the SGP Subbasin as a whole. The SGP GSP was adopted by the respective GSAs and submitted to DWR on January 25, 2022, ahead of the January 31, 2022, deadline.

The SGP GSP jurisdiction includes the Desert Water Agency GSA, San Gorgonio Pass GSA, and Verbenia GSA. Desert Water Agency GSA consists of the Desert Water Agency. San Gorgonio Pass GSA consists of Banning Heights Mutual Water Company (MWC), the City of Banning, Cabazon Water District (WD) and San Gorgonio Pass Water Agency (SGPWA). Verbenia GSA consists of Mission Springs WD and SGPWA. The three GSAs have cooperatively worked together to coordinate SGP GSP development. The SGP Subbasin includes a portion of an adjudicated area, known as the Beaumont Basin, that resides outside the Plan Area. Since it was previously adjudicated, the portion of the Beaumont Basin located in the SGP Subbasin is not subject to SGMA regulations and data for the Beaumont Basin is not included in this Annual Report.

The SGP Subbasin Water Year 2022 (WY2022) Annual Report has been prepared for the entire Subbasin and is in compliance with SGMA[2]. WY2022 includes the period from October 1, 2021, through September 30, 2022.

The data presented in this Annual Report indicate that the three GSAs were in compliance with the Sustainable Management Criteria included in the GSP. Groundwater levels were above the specific minimum threshold in all nine of the representative monitoring wells, which addresses the groundwater level, groundwater storage, and interconnective surface water sustainability indicators. Groundwater quality at the representative monitoring wells did not exceed the specified measurable objectives and minimum thresholds. Observed subsidence was at essentially non-detectable levels. The three GSAs in the SGP Subbasin are beginning to implement GSP elements, including monitoring, public outreach and development of implementation plans for projects and management actions to maintain long term groundwater sustainability.

[1] San Gorgonio Pass Subbasin, Groundwater Sustainability Plan, January 2022.
[2] California Code of Regulations (CCR) Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 7 Annual Reports and Periodic Evaluations by the Agency

California Code of Regulations - GSP Regulation Sections	Annual Report Elements	Section(s) and page numbers(s) where requirements for Annual Report elements are included
Article 7	**Annual Reports and Periodic Evaluations by Agency**	
§ 356.2	**Annual Reports**	
	Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:	
	(a) General information, including an executive summary and a location map depicting the basin covered by the report.	Executive Summary and General Information **Figure 1-1** (Pages ES-2 through 1-3)
	(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:	--
	(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:	--
	(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.	Groundwater Elevation Data **Figure 2-1, Figure 2-2, Figure 2-3, Figure 2-4** (Pages 2-2 through 2-6)
	(B) Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.	**Figure 2-5** through **Figure 2-13** (Pages 2-8 through 2-12)
	(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.	Groundwater Extraction Data **Figure 3-1, Table 3-1, Table 3-2** (Pages 3-2 through 3-3)
	(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.	Surface Water Supply **Table 4-1** (Page 4-1)
	(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.	Total Water Use **Table 5-1** (Page 5-1)
	(5) Change in groundwater in storage shall include the following:	--
	(A) Change in groundwater in storage maps for each principal aquifer in the basin.	Change in Groundwater Storage, **Figure 6-1, Table 6-1** (Pages 6-1 through 6-2)
	(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.	Change in Groundwater Storage **Figure 6-1, Figure 6-2, Table 6-1** (Pages 6-1 through 6-2)
	(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.	Plan Implementation (Pages 7-1 through 7-2)

Abbreviations and Acronyms

AF	Acre-Foot
CCR	California Code of Regulations
COB	City of Banning
DWR	Department of Water Resources
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IM	Interim Milestones
IRWM	Integrated Regional Water Management
M&I	Municipal and Industrial
MO	Measurable Objective
Morongo Tribe, MBMI	Morongo Band of Mission Indians
MT	Minimum Threshold
MWC	Mutual Water Company
Plan Area	Area of GSP Jurisdiction
SGMA	Sustainable Groundwater Management Act
SGP	San Gorgonio Pass
SGPWA	San Gorgonio Pass Water Agency
SMC	Sustainable Management Criteria
SWP	State Water Project
SWN	State Well Number
Subbasin	San Gorgonio Pass Subbasin
SWRCB	State Water Resources Control Board
USGS	United States Geologic Survey
WD	Water District
WY2021	Water Year 2021
WY2022	Water Year 2022

This annual report is broken into the following seven sections:

1. General Information
2. Groundwater Elevation Data
3. Groundwater Extraction Data
4. Surface Water Supply
5. Total Water Use
6. Change in Groundwater Storage
7. Plan Implementation

1 General Information

The GSAs of the SGP Subbasin have collaborated to prepare this Annual Report for WY2022 defined as the period from October 1, 2021, to September 30, 2022, in compliance with the SGMA[3]. The California Code of Regulations Title 23 Section 356.2 outlines the annual report's required content. Data and conditions for previous water years can be found in previous Annual Reports. The conditions of the SGP Subbasin for WY 2022 are included in this Annual Report. For groundwater hydrographs, information is provided back to WY2015 as required by SGMA for groundwater elevation hydrographs.

The SGP Subbasin (DWR Basin 7-021.04) is located in Southern California between the San Bernardino Mountains to the north, the San Jacinto Mountains to the south, Coachella Valley to the east and San Bernardino Valley to the west. The SGP Subbasin adjoins the San Timoteo Groundwater Subbasin to the west and the Indio Subbasin to the east. The SGP Subbasin boundaries generally correspond to the DWR's California's Groundwater Bulletin 118.

The GSP jurisdiction (Plan Area) includes the Desert Water Agency GSA, San Gorgonio Pass GSA, and Verbenia GSA. Desert Water Agency GSA consists of the Desert Water Agency. San Gorgonio Pass GSA consists of Banning Heights MWC, the City of Banning (or COB), Cabazon Water District and San Gorgonio Pass Water Agency (SGPWA). Verbenia GSA consists of Mission Springs Water District and SGPWA. The three GSAs worked cooperatively to coordinate GSP development. The SGP Subbasin includes a portion of an adjudicated area, known as the Beaumont Basin, that resides outside the Plan Area. Since it was previously adjudicated, the portion of the Beaumont Basin located in the SGP Subbasin is not subject to SGMA regulations and data for the Beaumont Basin is not included in this Annual Report. The SGP Subbasin, and the three GSAs it contains, are shown in **Figure 1-1.**

The Plan Area includes approximately 13,211 acres of land, or 37 percent of the SGP Subbasin, within the federally recognized Morongo Band of Mission Indians (Morongo Tribe or MBMI) dominion. The Morongo Tribe is not required to comply with SGMA; however, the entire SGP Subbasin will be evaluated for sustainability, including influences from the Morongo Tribe's groundwater management to the extent those data are available.

[3] California Code of Regulations (CCR) Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 7 Annual Reports and Periodic Evaluations by the Agency

Much of the SGP Subbasin is undeveloped open space. There are limited rural residential properties, with most of the domestic water use occurring within residential communities such as the City of Banning, Cabazon Water District, Banning Heights, and the residences within MBMI. The City of Banning, the community of Cabazon, and MBMI are the primary areas of development within the Plan Area. The urban development within the SGP Subbasin includes residential neighborhoods, as well as commercial lands for such uses as retail outlets and the Morongo Casino, Resort & Spa, industrial areas, and municipal facilities such as schools and the police department.

Groundwater is a key component of overall water supplies in the SGP Subbasin. Banning Heights MWC is the only water user in the SGP Subbasin known to be supplied with surface water, via Whitewater River Flume diversions. However, the August 2020 Apple Fire damaged critical infrastructure, resulting in a temporary reliance on emergency groundwater supplied by the City of Banning. Municipal and Industrial (M&I) water use, which is the primary water use in the SGP Subbasin, occurs primarily within the City of Banning and local communities that predominantly use groundwater to meet those demands. The largest M&I use area in the SGP Subbasin, based on 2020 population estimates from the U.S. Census Bureau, is the City of Banning (population 29,505)[4]. Smaller communities in the SGP Subbasin include Cabazon, Banning Heights, Palm Springs Crest, and the residential community within MBMI.

[4] City of Banning 2020 population estimate (as of April 1, 2020):
U.S. Census Bureau QuickFacts: Banning city, California

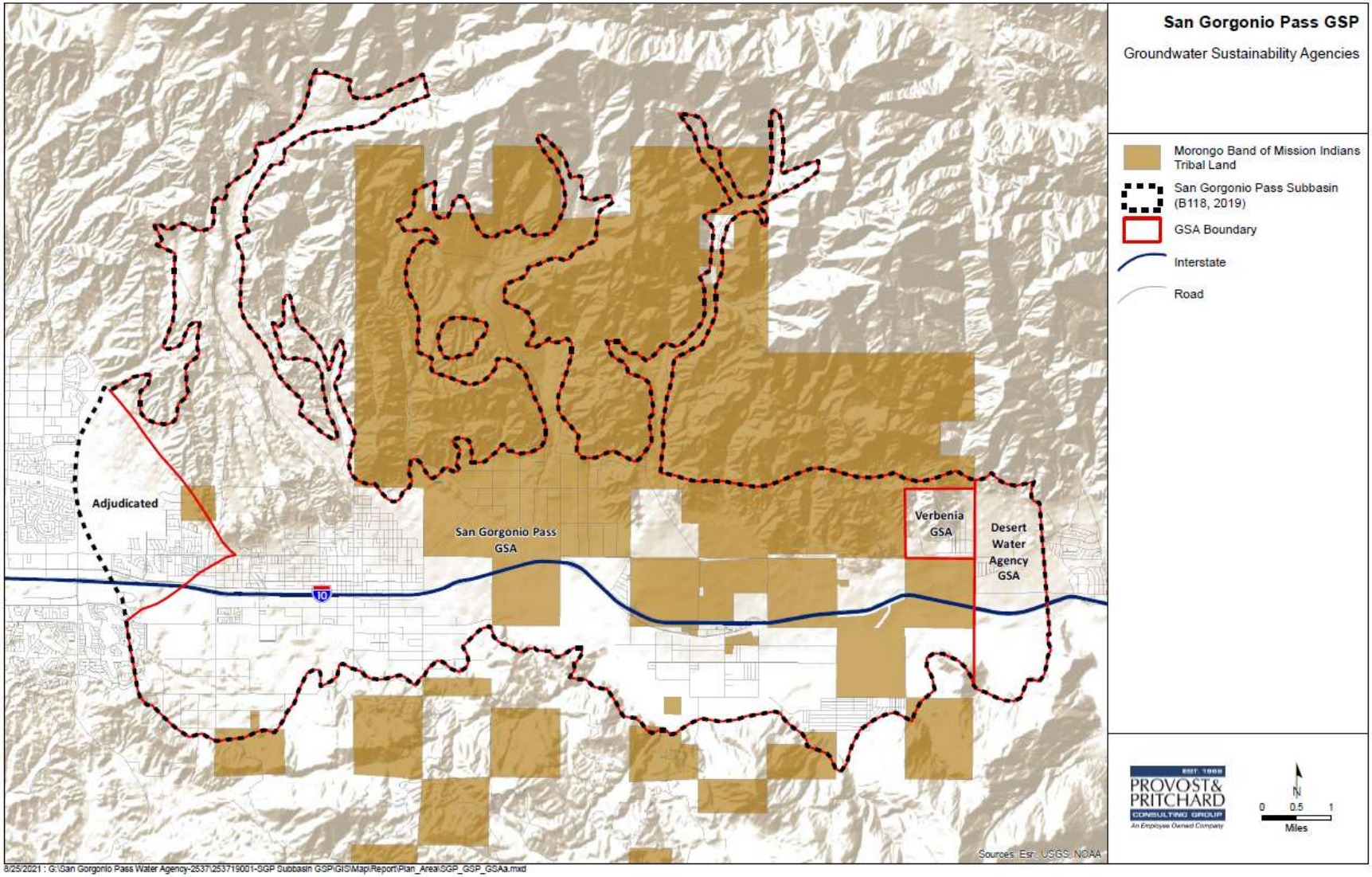

Figure 1-1 - San Gorgonio Pass Subbasin and Groundwater Sustainability Agencies

2 Groundwater Elevation Data

Groundwater elevation data are presented as groundwater level contour maps and groundwater level hydrographs.

Groundwater surface elevation contour maps were prepared from groundwater elevation data collected from wells in the SGP Subbasin's water purveyors and publicly available resources, such as the United States Geologic Survey (USGS). The contour maps illustrate the seasonal high and seasonal low conditions in the principal aquifer in the SGP Subbasin during Water Year 2022. In the SGP Subbasin, the seasonal high is normally defined as any groundwater level measurement recorded between February and April (labeled Spring) and seasonal low is defined as any groundwater level measurement recorded in September or October (labelled Fall). While these are the preferred time periods for seasonal high and low, water level data during those defined periods is occasionally not available and, in those instances, data for the most proximate available time period is sometimes used. Any water level measurements not occurring within the preferred time period have been highlighted in light red on the contour maps. While water agencies in the SGP Subbasin sometimes collect water level measurements from pumping or recently pumped wells, only static water level measurements were used for the contour maps and hydrographs shown on the following pages as **Figure 2-1** through **Figure 2-13**.

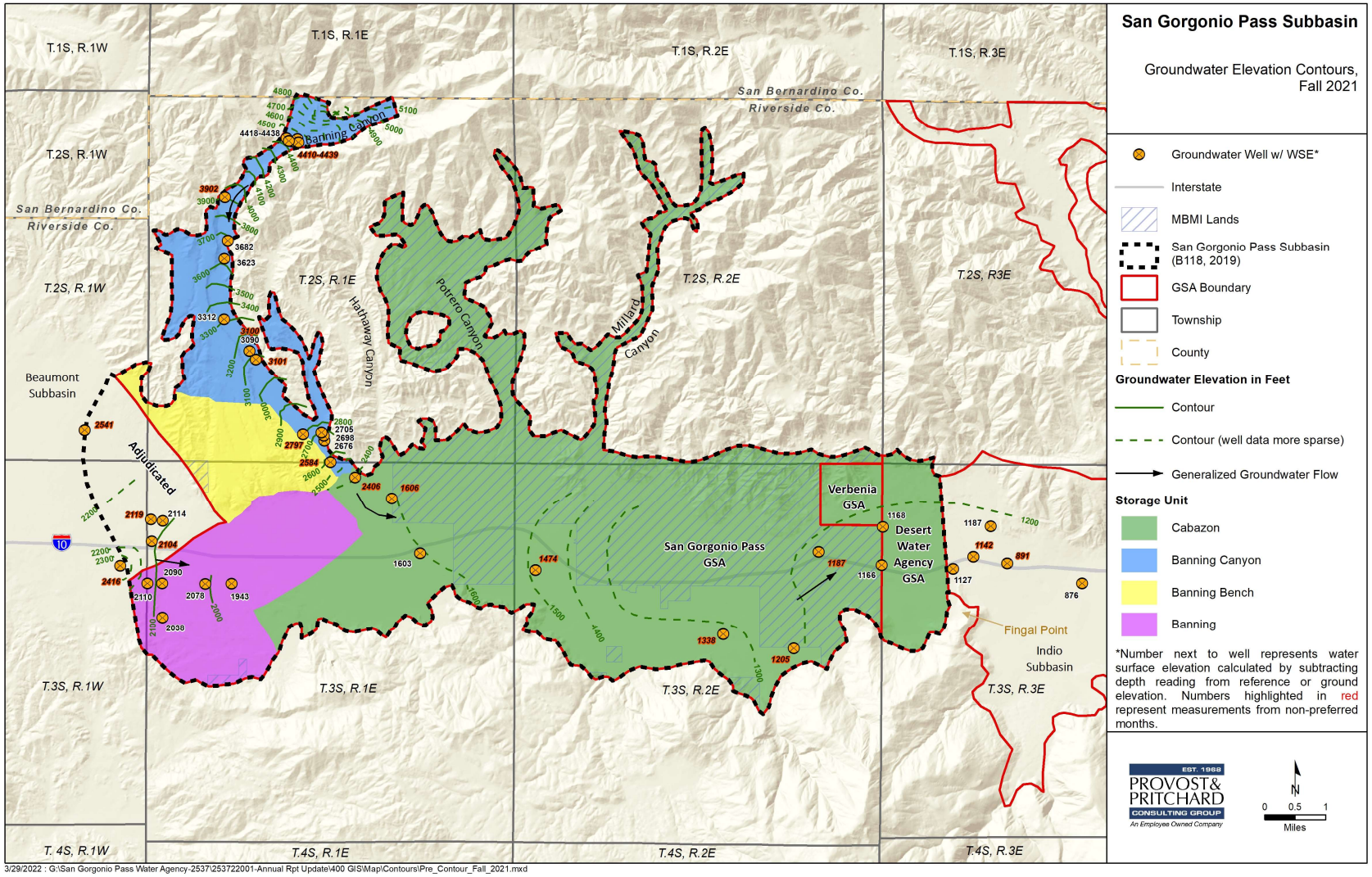

Figure 2-1 - Fall 2021 Groundwater Level Contours

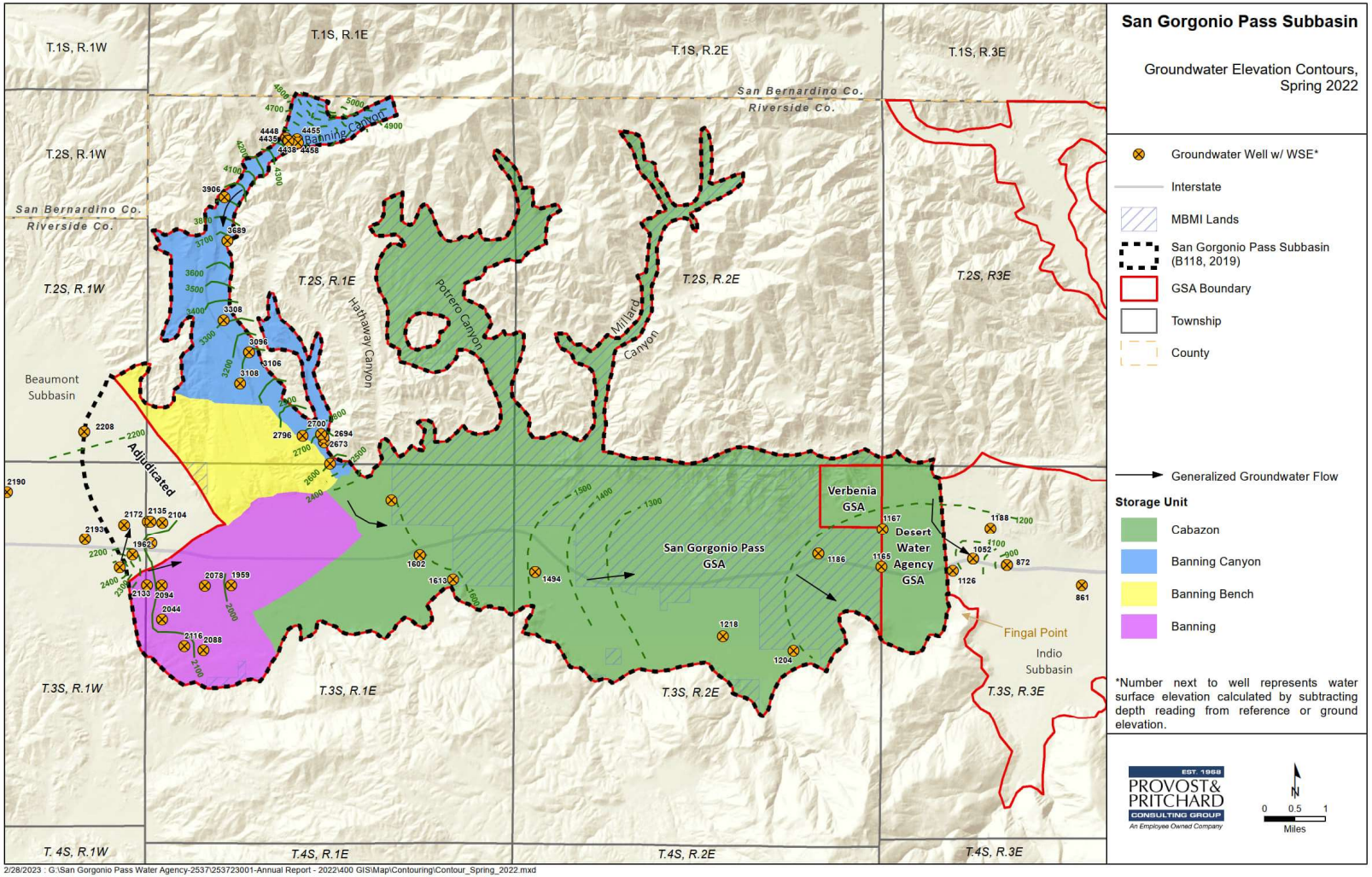

Figure 2-2 - Spring 2022 Groundwater Level Contours

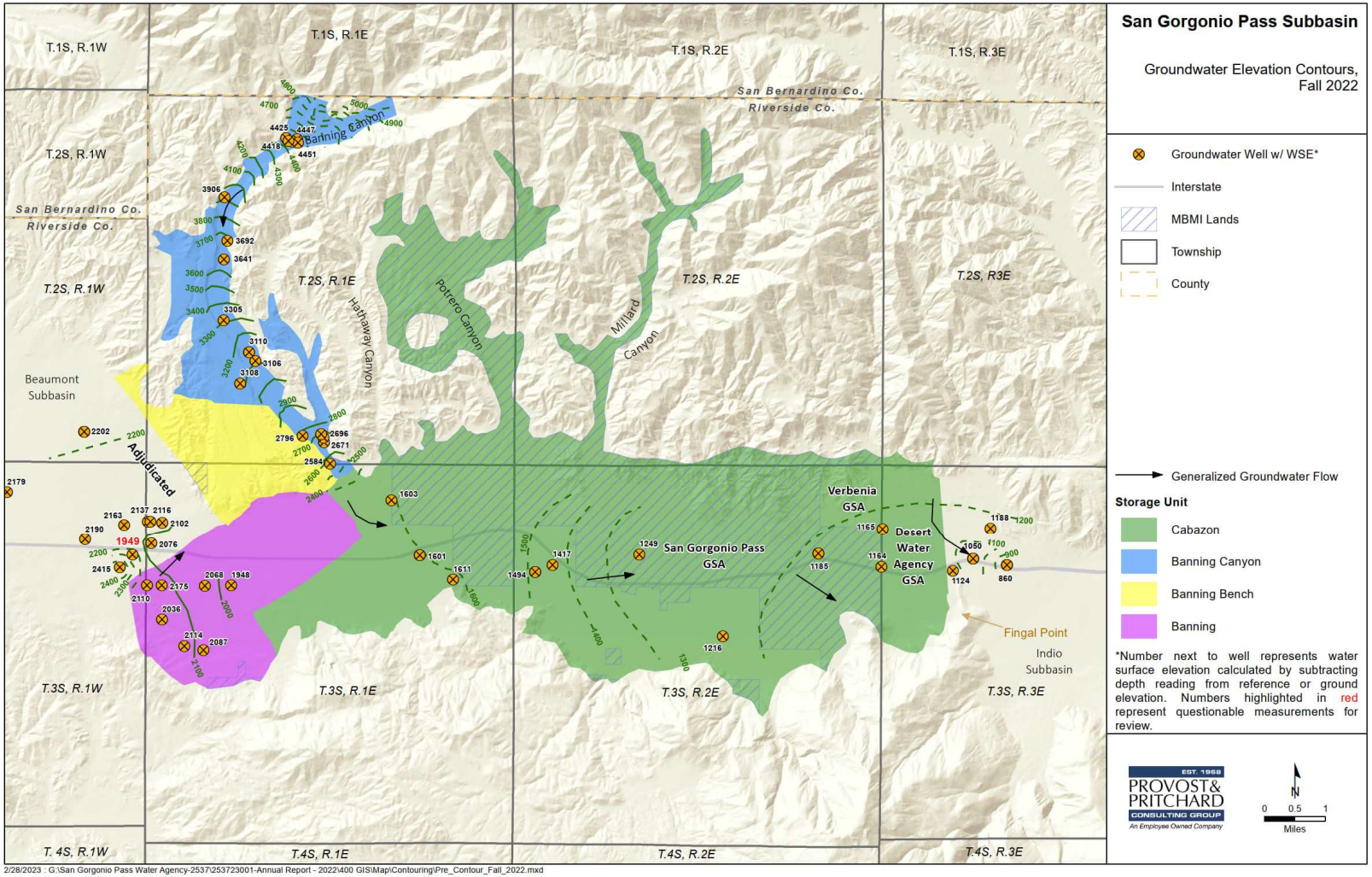

Figure 2-3 - Fall 2022 Groundwater Level Contours

Hydrographs of static groundwater elevations, including historical data through WY2022, are included below for each well in the SGP Subbasin's representative monitoring network for the chronic lowering of groundwater levels sustainability indicator. The location of wells in the representative monitoring network are shown in **Figure 2-4.**

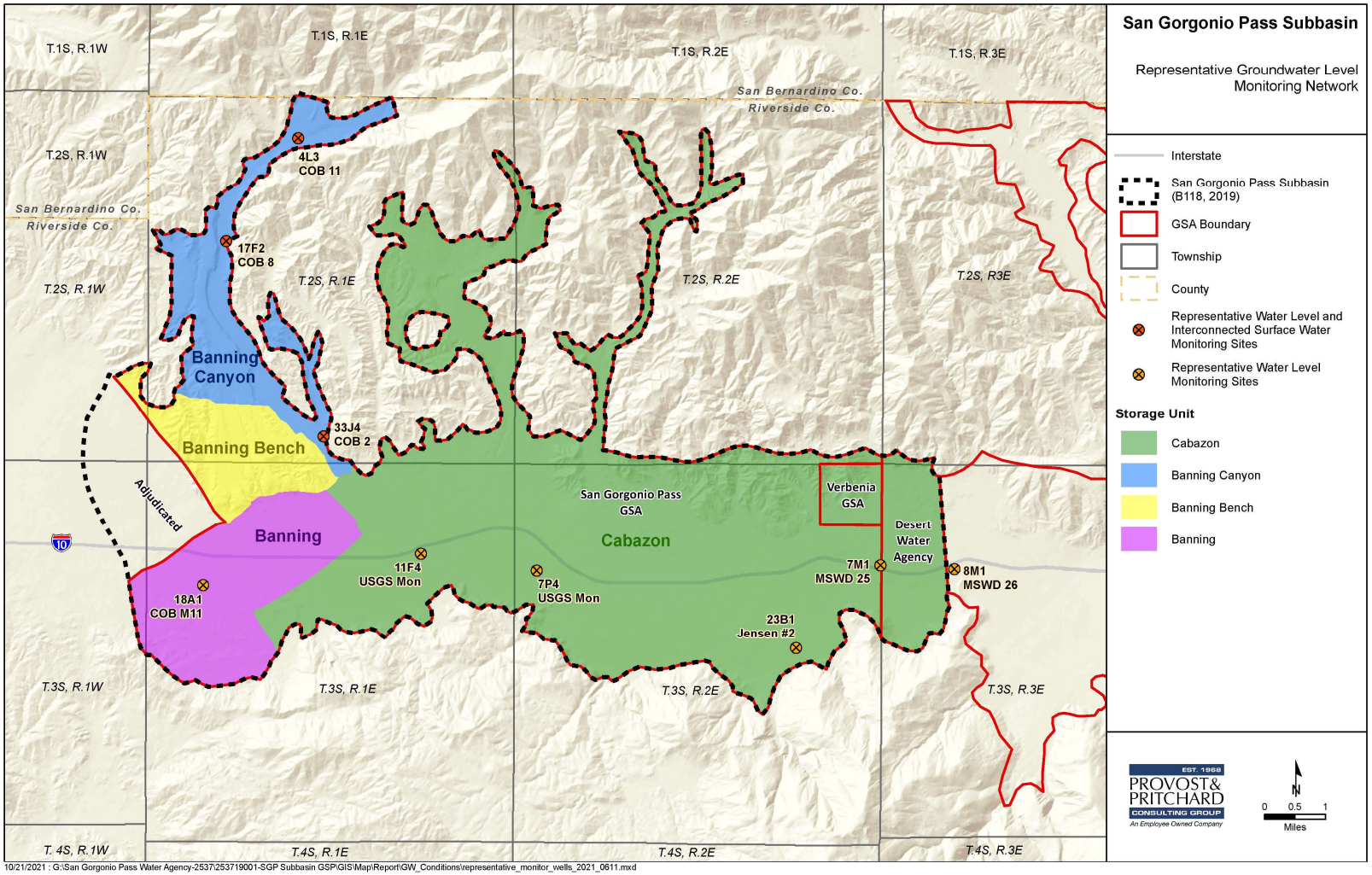

Figure 2-4 - Representative Monitoring Wells Locations

The hydrographs in **Figure 2-5** through **Figure 2-13** show groundwater level measurements since SGMA was enacted in 2015, along with Sustainable Management Criteria (SMC) through the first Interim Milestone period (2027). The SMC consist of the minimum thresholds (MT), the measurable objective (MO) and interim milestones (IM). The MT represent a point in the basin that, if exceeded, may cause undesirable results in the SGP Subbasin. The MO are a kind of warning indication, providing a guide towards meeting a basin's sustainability that provides operational flexibility for overall basin management. The IT are defined at five-year increments to indicate a pathway towards maintaining sustainability by 2042.

SGMA requires an indication of the water year types for groundwater basins. For the SGP Subbasin, the water year types were directly taken from the DWR January 2021 report, "Water Year Type Dataset Development Report" for Hydrologic Code 18100201(the Whitewater River watershed) as available. The 2021 DWR report includes years from 1931-2018. Year Types for 2019 through 2022 were estimated based on data from the Tahquitz Creek gage (USGS Gage Number 10258000) which measures flow on a watershed without significant upstream development with a long historical record that is located downstream of the SGP Subbasin in the Whitewater River watershed. As defined in the January 2021 report, there are five water year types – Wet, Above Normal, Below Normal, Dry and Critical. While water year types may be a useful guide in many California watersheds, as discussed later, they did not appear to be a meaningful predictor of groundwater conditions for the SGP Subbasin.

Table 2-1 – San Gorgonio Subbasin Water Year Types

Year	Water Year Type
2015	Below Normal
2016	Below Normal
2017	Wet
2018	Above Normal
2019	Wet
2020	Above Normal
2021	Critical
2022	Critical

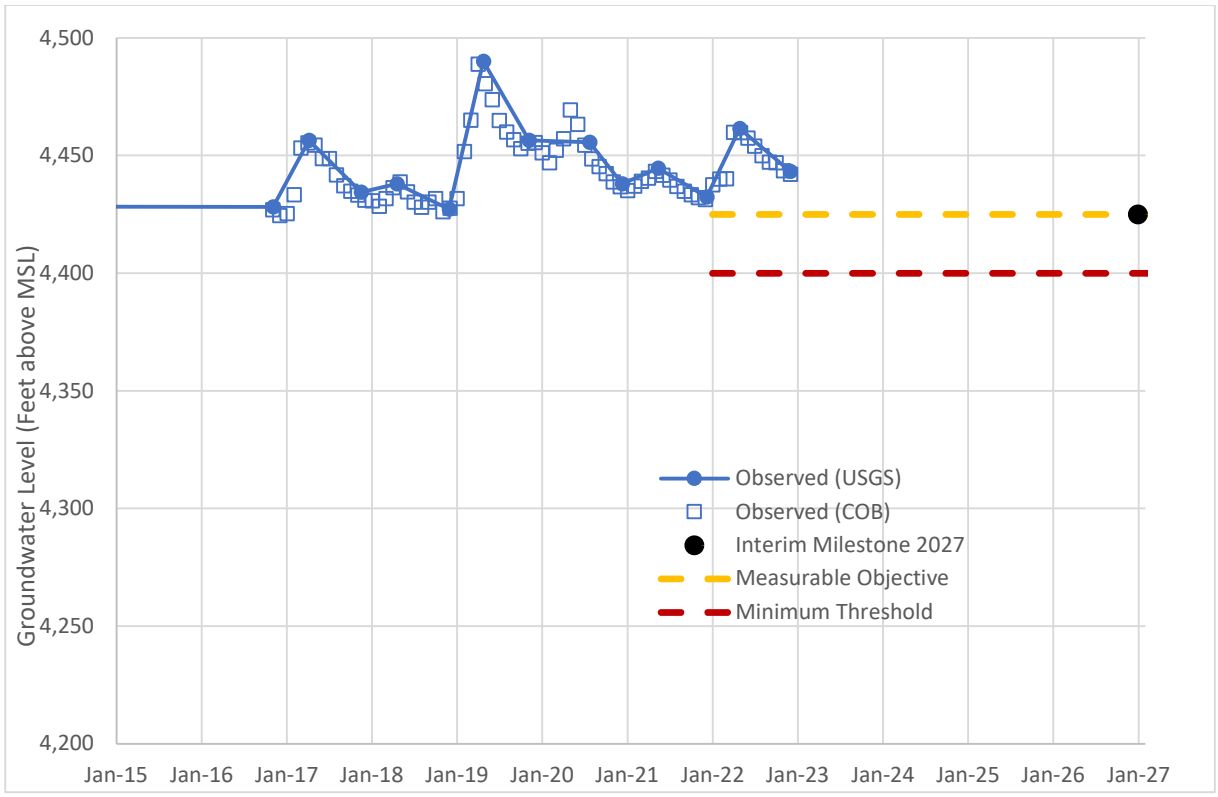

Figure 2-5 - Well 4L3 (COB #11) Historical Groundwater Levels and Sustainable Management Criteria

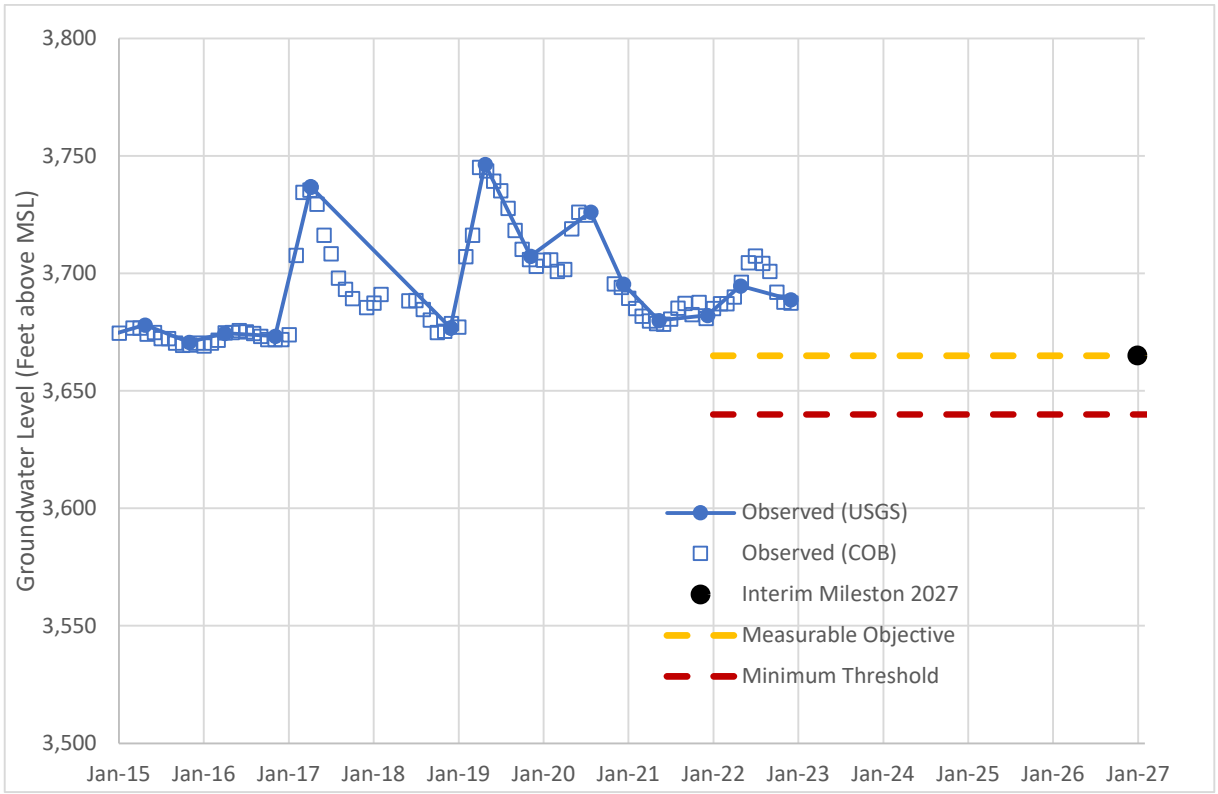

Figure 2-6 - Wells 17F2 (COB #8) - Historical Groundwater Levels and Sustainable Management Criteria

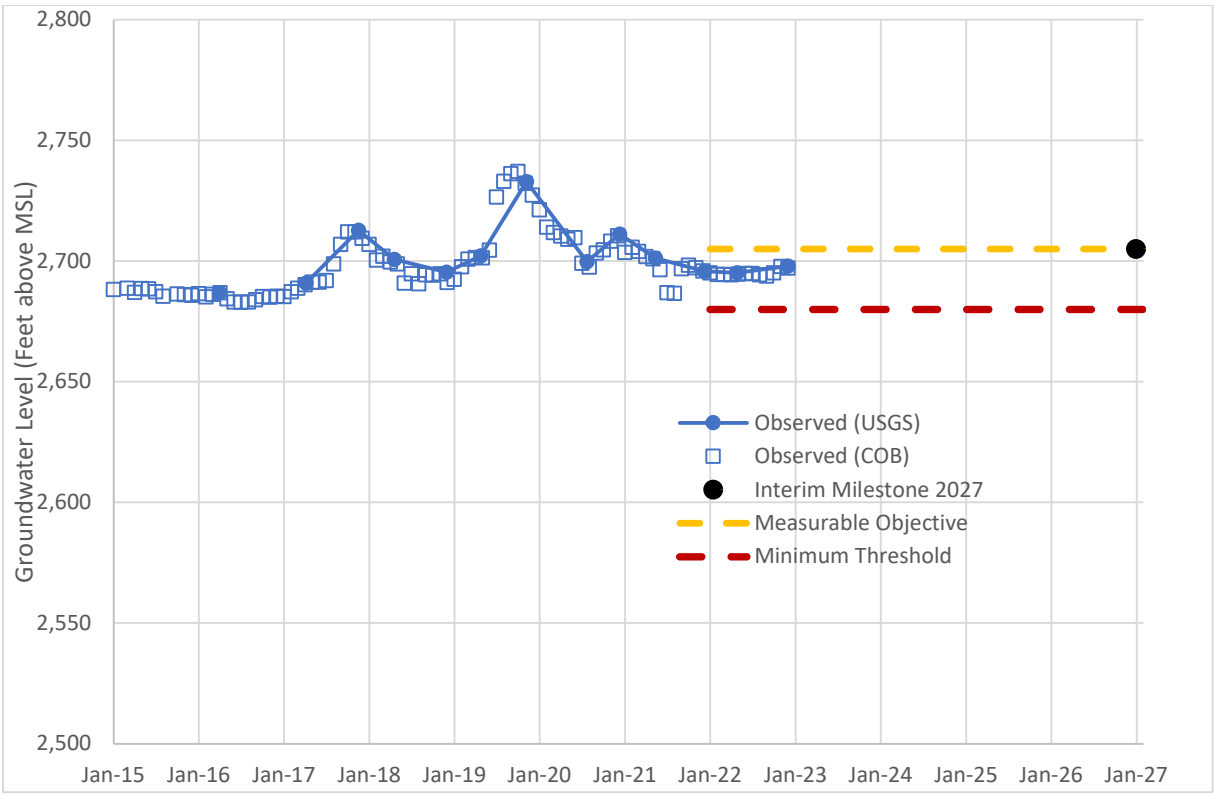

Figure 2-7 - Well 33J4 (COB #2) - Historical Groundwater Levels and Sustainable Management Criteria

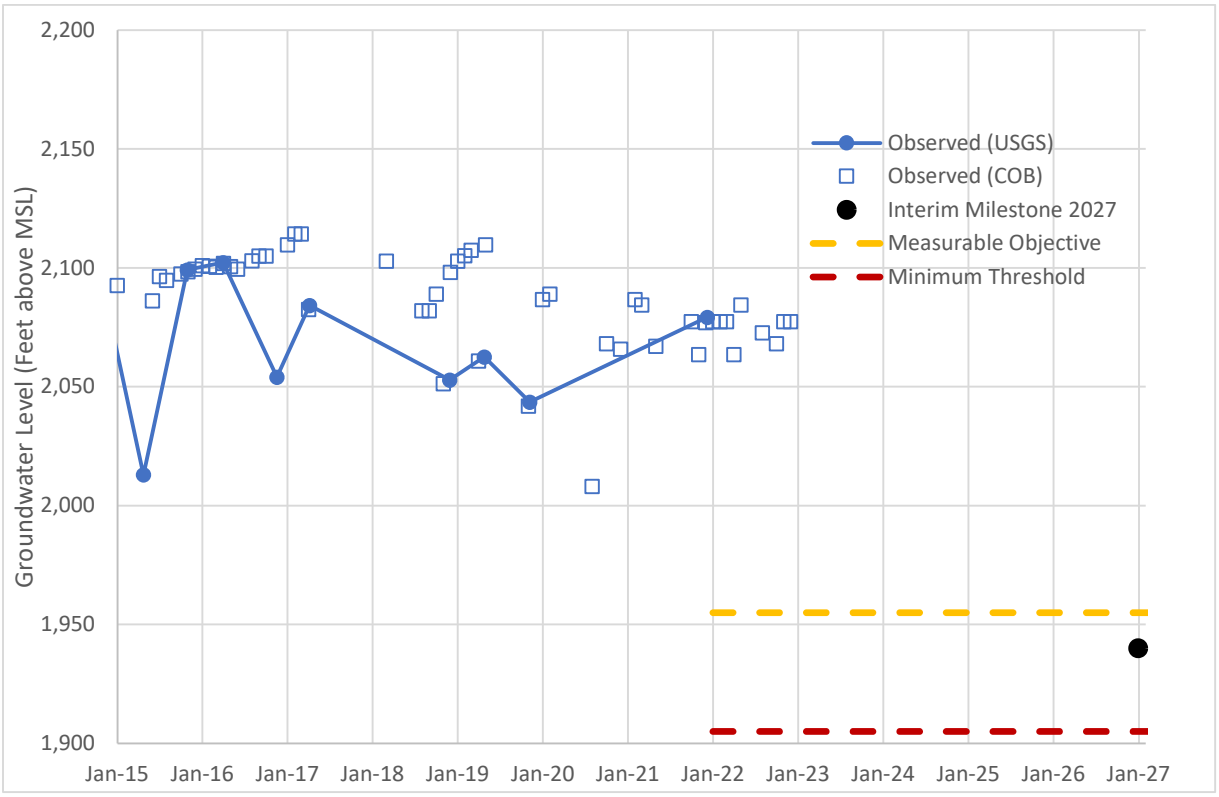

Figure 2-8 - Well 18A1 (COB #M11) - Historical Groundwater Levels and Sustainable Management Criteria

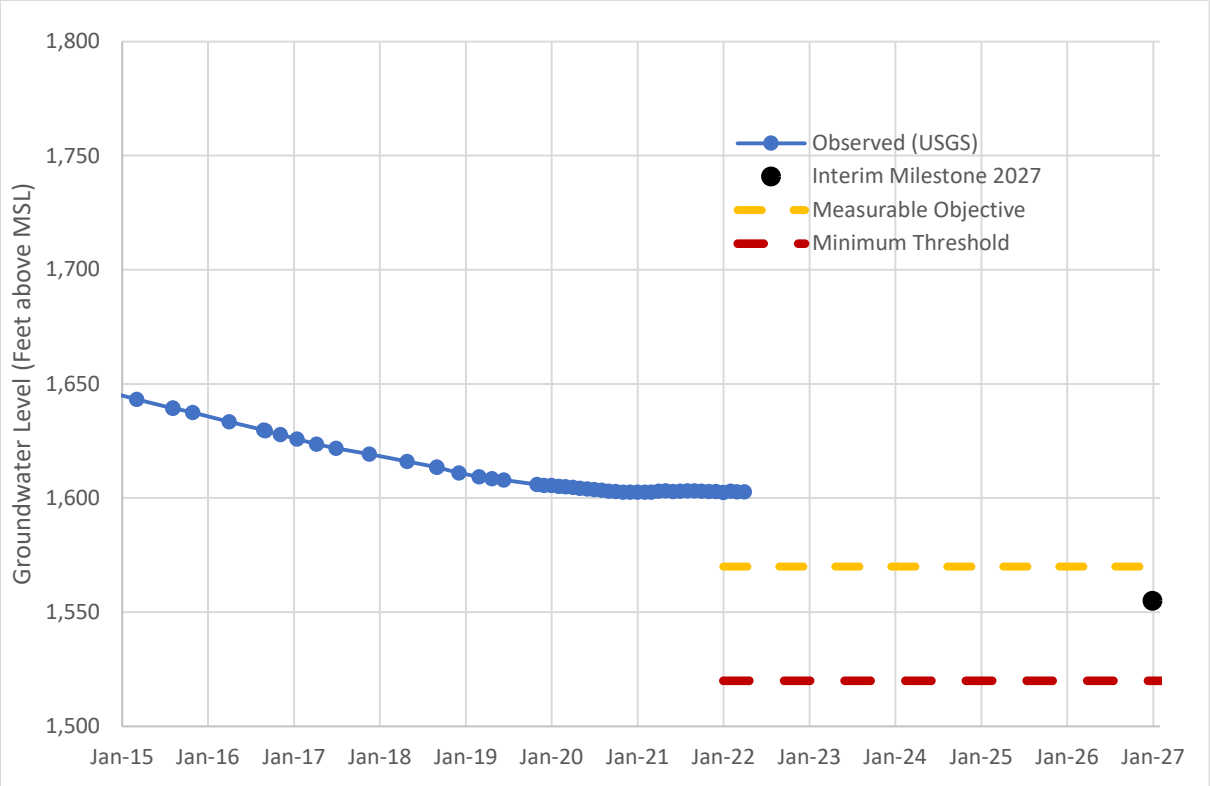

Figure 2-9 - Well 11F4 - Historical Groundwater Levels and Sustainable Management Criteria

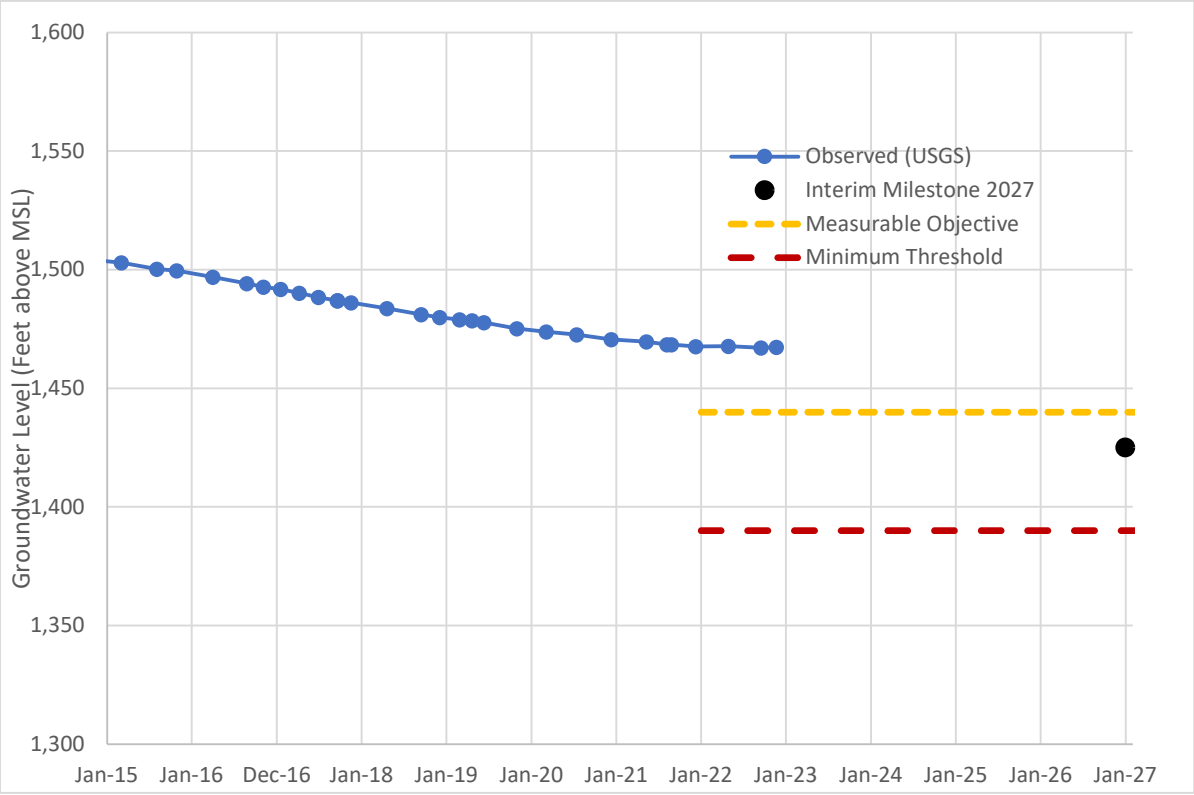

Figure 2-10 - Well 7P4 - Historical Groundwater Levels and Sustainable Management Criteria

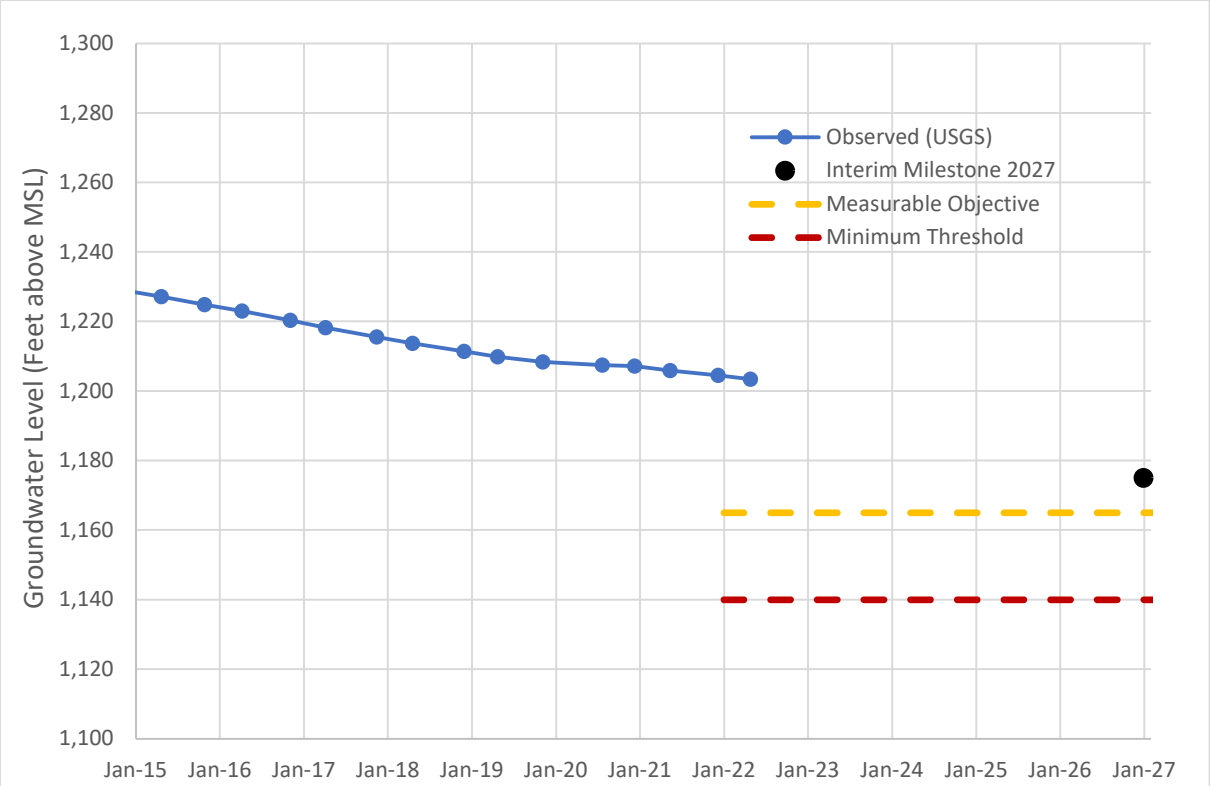

Figure 2-11 - Well 23B1 (Jensen #2) - Historical Groundwater Levels and Sustainable Management Criteria

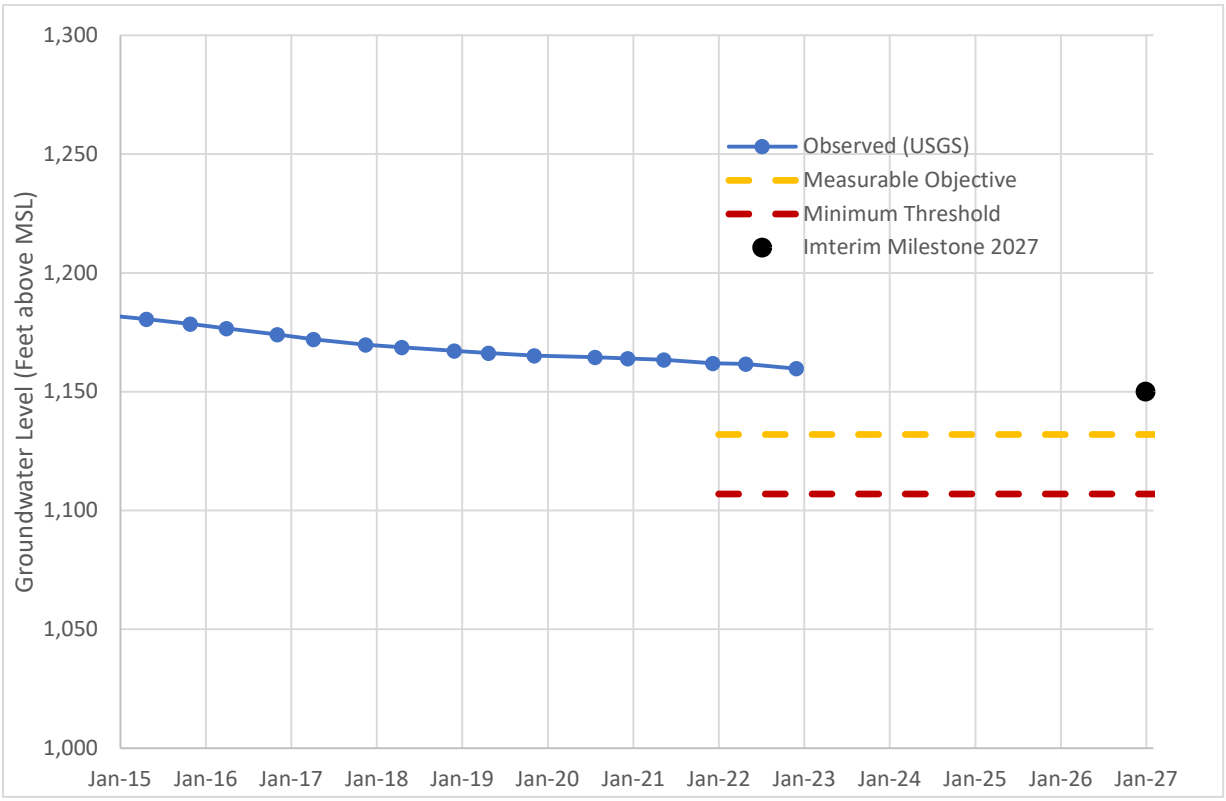

Figure 2-12 - Well 7M1 (MSWD #25) - Historical Groundwater Levels and Sustainable Management Criteria

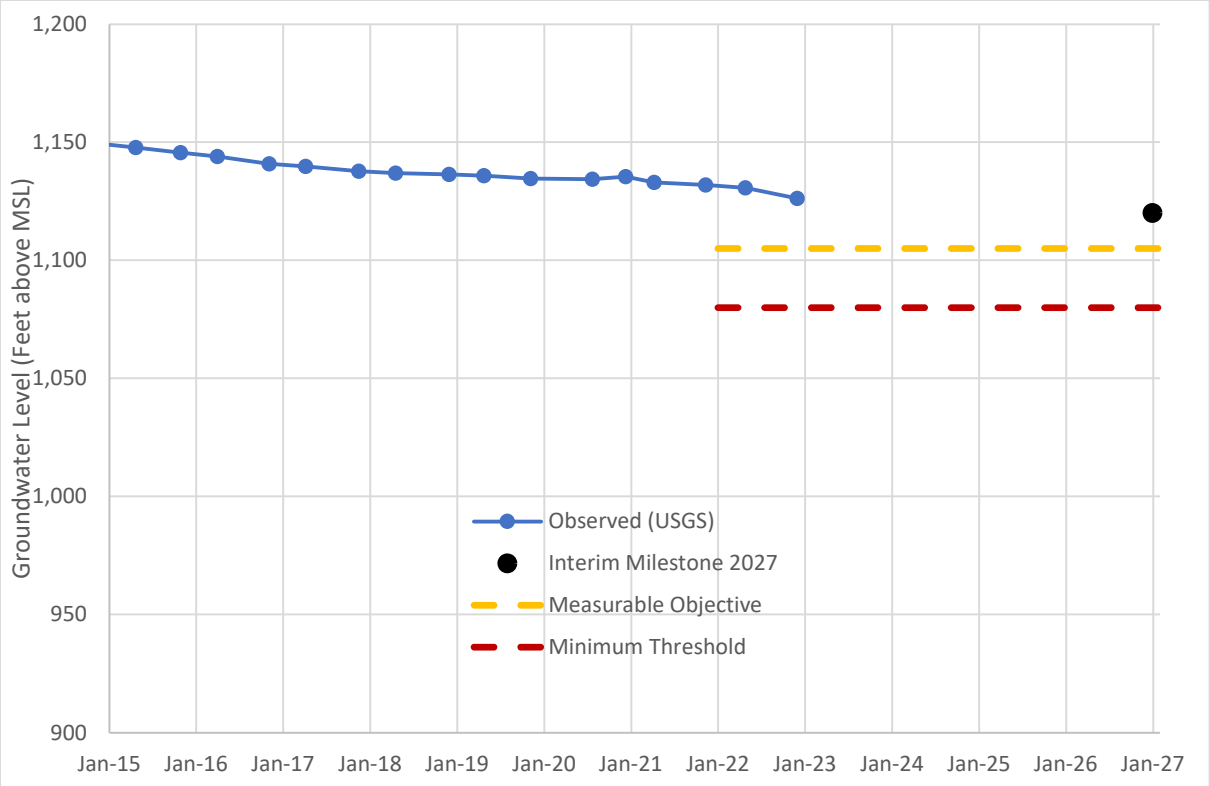

Figure 2-13 - Well 8M1 (MSWD #26) - Historical Groundwater Levels and Sustainable Management Criteria

As shown in the hydrographs in **Figure 2-5** through **Figure 2-13**, groundwater levels in all parts of the SGP Subbasin were above the Minimum Thresholds specified in the GSP. With one exception (Well 33J4), all the SGP Subbasin hydrographs for representative monitoring wells have water levels for Water Year 2022 that are also above the 2027 Interim Milestone and the Measurable Objective. Water levels in the mid and upper Banning Canyon Storage Unit (Wells 4L3 and 17F2) showed continued seasonal variations without a long-term trend.

Water levels in the Banning Canyon (Figure 2-5 through **Figure 2-7**) had increases in the wet water year types of 2017 and 2019. The other years in the period of 2015 through 2022 did not show any distinct impact of water year types. Only one of the representative monitoring wells, Well 33J4 (COB #2) had water levels that fell below the 2027 Interim Milestone and the Measurable Objective. The lower water levels in Well 33J4 (COB #2) are consistent with pre-SGMA water levels in the lower portion of the Banning Canyon. The lower portion of the Banning Canyon has very shallow depths to water and a thin groundwater aquifer that is actively managed by pumping from the City of Banning to maintain water levels in a very narrow operational zone that is above the Minimum Threshold for Well 33J4 (COB #2). While Well 33J4 (COB#2) occasionally had water levels above the Measurable Objective during high runoff periods, water levels there have commonly been below the Measurable Objective historically and that trend is likely to continue.

Water levels in the Banning Storage Unit (**Figure 2-8**) appear to show two ranges in water levels – one higher range that likely reflects static water level measurements without pumping impacts and a lower range that likely reflects periods when pumping had recently occurred or was occurring in nearby production wells. The five wells (**Figure 2-9** through **Figure 2-13**) in the Cabazon Storage Unit appear to show a flattening of the declining trend that those wells had shown since about 1998. The hydrographs for both the Banning and Cabazon Storage Units did not show any clear relationship to water year types. The trends in both those storage units appear to be insensitive to identified water year types.

3 Groundwater Extraction Data

Groundwater extraction data for Water Year (WY) 2022, shown in **Table 3-1** and **Table 3-2** are a combination of direct measurements and estimates from water purveyors in the three GSAs in the SGP Subbasin. For WY2022, most of the groundwater extraction data are directly measured from metered pumps by the primary production agencies in the SGP Subbasin – the City of Banning, Cabazon Water District, and Mission Springs Water District. The accuracy of measurements from these three districts varies by well but is believed to be accurate to within five percent or less. Other smaller water users in the SGP Subbasin (Robertson Ready Mix, Banning Heights MWC and Summit Cemetery District) report their water use to SGPWA annually as required by the groundwater recordation program based on unknown measurement methods.

The largest other water user in the SGP Subbasin is the MBMI. MBMI provides water supplies for residential use on its reservation properties, a Casino and Hotel, as well as other industrial uses from sources in Potrero Canyon, the Cabazon Storage Unit, and the Millard Canyon. As a sovereign entity, MBMI is not subject to SGMA, is not required to report its water use and has not voluntarily provided water use information. Estimates for MBMI pumping were taken from background material prepared for the 2018 San Gorgonio Integrated Regional Water Management (IRWM) Water Supply Reliability Study (Woodard and Curran, 2018). Based on Appendix A of the San Gorgonio IRWM Water Supply Reliability Report, MBMI groundwater use in 2016 was approximately 1,007 acre-feet for water use in residential areas and at the Morongo Casino and Hotel. In addition, there was an estimated 696 acre-feet of use at the Arrowhead Water Bottling Plant. Pumping for the MBMI was assumed to occur in Potrero Canyon and in the Cabazon Storage Unit. Pumping in Potrero Canyon was assumed as approximately 650 acre-feet per year based on relative size and watershed area to the Millard Canyon, which has had reported diversions averaging approximately 700 acre-feet per year. The remaining estimated 357 acre-feet per year of MBMI pumping (1,007 acre-feet (AF) less 650 AF Potrero Canyon supply) is assumed to occur in the Cabazon Storage Unit. As described in the SGP GSP, pumping by MBMI from various sources is assumed to be based on water rights from the Whitewater River Decree, State Water Resources Control Board (SWRCB) water rights, and the MBMI share of percolating groundwater in the SGP Subbasin.

The groundwater extraction estimates in the SGP Subbasin fluctuate within a small range from year to year, with minimal variation due to water year type or other factors.

Figure 3-1 shows the general location and volume of groundwater extractions within each of the GSAs and the MBMI during WY2022. In some cases, the extractions occur within one GSA and are used in another GSA within the same storage unit.

In WY2022, it was noticed that USGS and DWR boundaries differed with respect to the edge between the SGP and adjudicated Beaumont Basins. For now, the COB well in question (SWN 3S/1E-18D1, COB # M7) was retained in the calculations as it had been included in prior years; consistent with current DWR boundaries. During the 5-year GSP update, these boundaries will be investigated in further detail to reach a consensus regarding the boundaries and the wells that should be included on either side.

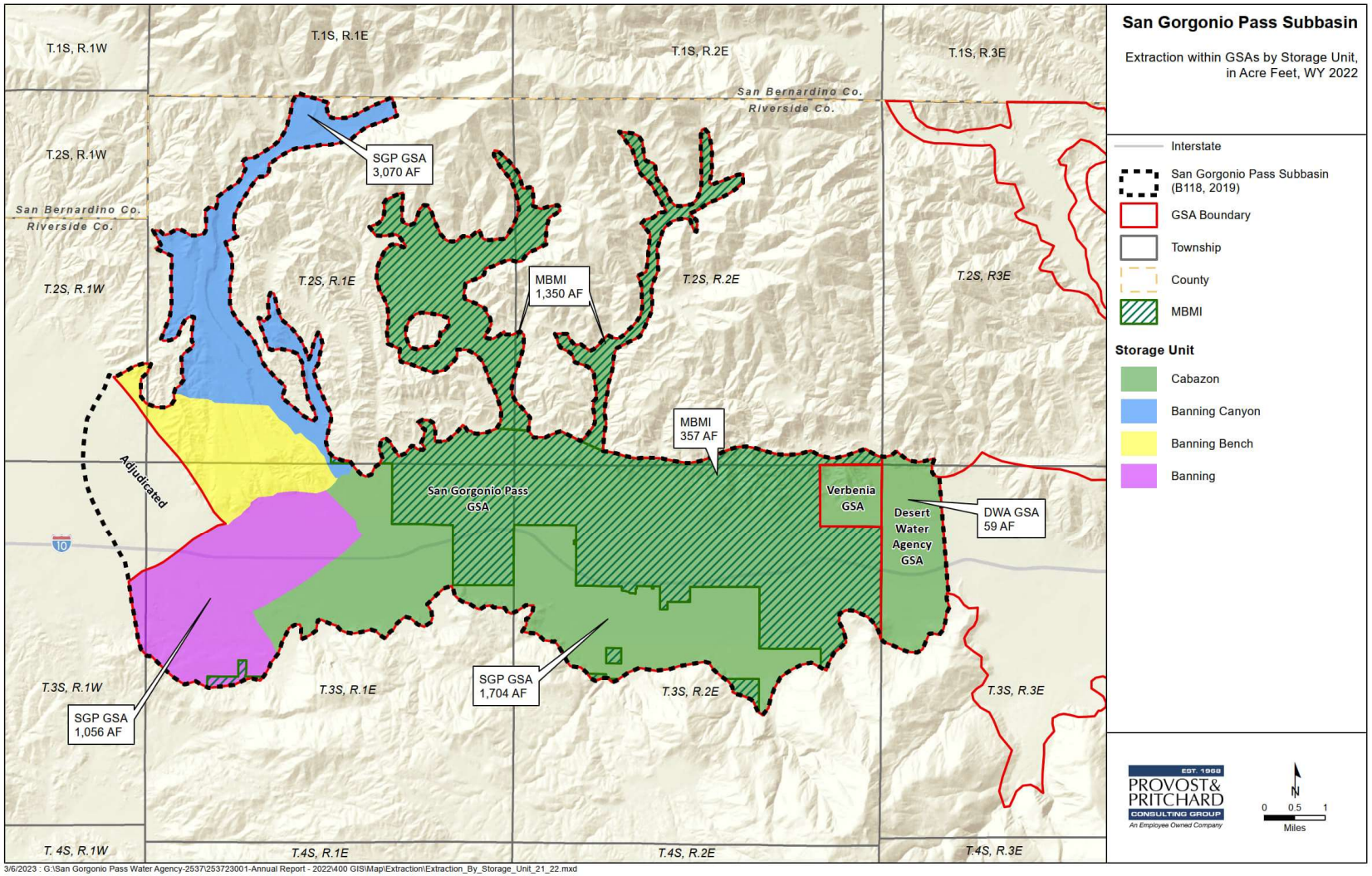

Figure 3-1 - Extraction by Storage Unit in Acre Feet, WY 2022

Table 3-1 - Extraction by Storage Unit in Acre Feet, WY 2022

Agency	Storage Unit	WY 2022
Total SGP Subbasin	Banning Canyon	3,070
	Other Canyons (Millard and Potrero)	1,350
	Banning	1,056
	Cabazon	2,120
	Total	7,596
City of Banning	Banning Canyon	2,984
	Banning	1,056
	Cabazon	504
	Total	4,544
MBMI	Millard Canyon	700
	Potrero Canyon	650
	Cabazon	357
	Total	1,707
MSWD	Cabazon	59
Robertsons Ready Mix	Cabazon	669
Cabazon WD	Cabazon	531
Banning Heights MWC	Banning Canyon	21
Summit Cemetery District	Banning Canyon	65

Table 3-2 - Groundwater Extraction Measurement Methods

Agency	Period	Method	Accuracy
City of Banning	2022	Direct Measurement	+/- 5%
Cabazon WD	2022	Direct Measurement	+/- 5%
Mission Springs WD	2022	Direct Measurement	+/- 5%
Morongo Band of Mission Indians	2022	Estimate	Unknown
Robertsons Ready Mix	2022	Average of 2019-2021	Unknown
Banning Heights MWC	2022	Average of 2019-2021	Unknown
Summit Cemetery District	2022	Average of 2019-2021	Unknown

4 Surface Water Supply for Recharge

The following surface water supply data are a combination of direct measurements and estimates from each of the three GSAs in the SGP Subbasin.

While SGPWA and DWA provide for State Water Project (SWP) recharge to support water use in the SGP Subbasin, the recharge facilities for both of those agencies are located outside of the SGP Subbasin itself. SGPWA recharges SWP water at Noble Creek in the adjacent Beaumont basin, which improves groundwater gradients at the boundary with the SGP Subbasin and enhances groundwater flows into the SGP Subbasin. The Desert Water Agency recharges SWP water at the Whitewater Recharge Basins just east of the boundary between the SGP Subbasin and the Indio Subbasin. The Desert Water Agency recharge adjacent to the SGP Subbasin improves groundwater gradients at the SGP Subbasin-Indio Subbasin boundary and provides improved groundwater conditions within the SGP Subbasin. While the SGP Subbasin indirectly benefits from these recharge operations in adjacent groundwater basins, there is no direct recharge of SWP water within the SGP Subbasin.

The only historical surface water supply within the SGP Subbasin is water diverted from the Whitewater River watershed into the SGP Subbasin for direct use by Banning Heights MWC and indirect use by the City of Banning. Estimates of the amount of this supply are indirect. The facilities used for the Whitewater River watershed diversion were rendered unusable by the Apple Fire of August 2020 and no surface water supplies have been available since then.

Table 4-1 – WY2022 Surface Water Supply, San Gorgonio Pass Subbasin

Surface Water Source	WY 2022 Total
Local Supplies	0
Total	**0**

5 Total Water Use

Total water use by water use sector and supply is shown in **Table 5-1**. The data presented in **Table 5-1** is a summation of data from the GSP storage units and incorporates a variety of methods for data calculation and estimation. Note that the total water use values presented in **Table 5-1** are not consumptive; there is a material return flow component included. In other words, this table indicates the total applied water use and the net water use (without return flow) would be lower. These data are a combination of direct measurements and estimates from each of the three GSAs in the SGP Subbasin, as well as estimates for MBMI. Several types of water use (Agricultural, Managed Wetlands, Managed Recharge, Native Vegetation and Outside Subbasin) do not occur in the SGP Subbasin and are not included in **Table 5-1**.

Total water use is relatively consistent for Water Year 2022 as compared to other recent water years. Data for WY2019 through WY2021 is available in the WY2021 annual report[5].

Table 5-1 – WY 2022 Total Water Use, San Gorgonio Pass Subbasin

Summary of Total Water Use (Acre-Feet)			
Total Water Use	**WY 2022** Critical Year Type	**Measurement Method**	**Measurement Accuracy (%)**
Urban/Domestic			
Groundwater	6,231	Measured/Estimate	Refer to Table 3-2
Surface Water	0	Estimate	+/- > 10%
Total	**6,231**	**Estimate**	**Unknown**
Industrial			
Groundwater	1,365	Estimate	Refer to Table 3-2
Surface Water	0	Estimate	Unknown
Total	**1,365**	**Estimate**	**Unknown**
Total			
Groundwater	7,596	Measured/Estimated	Refer to Table 3-2
Surface Water	0	Estimate	Unknown
Total	**7,596**	**Estimate**	**Unknown**

[5] Water Year 2021 Annual Report. San Gorgonio Pass Subbasin Groundwater Sustainability Agency (as of 1 April, 2023): https://www.sgpgsas.org/wp-content/uploads/2022/04/7-021.04_WY_2021.pdf

6 Change in Groundwater Storage

The change in groundwater storage in this Annual Report uses consistent computation methods for the three storage units (Banning Canyon, Banning and Cabazon) based on groundwater elevation maps. Storage change was computed based on groundwater contour maps and specific yield. For this computation, average changes in water levels (taken from the contour maps in **Figure 2-1** to **Figure 2-3** were tabulated by computation areas and were then multiplied by the surface area and specific yield to determine the volume of storage change.

Table 6-1 shows the annual and cumulative change in groundwater storage for Water Years 2015 through 2022.

Table 6-1 - Annual and Cumulative Change in Storage from 2015 to 2022, San Gorgonio Pass Subbasin

Year	Annual Change in Storage (Acre-Feet)	Cumulative Change in Storage (Acre-Feet)
2015	-16,661	-16,661
2016	-19,385	-36,046
2017	-5,535	-41,581
2018	-13,259	-54,840
2019	4,745	-50,095
2020	-10,190	-60,285
2021	-6,267	-66,552
2022	-9,838	-76,390

Figure 6-1 shows annual change in groundwater stored by water year type with cumulative change in groundwater storage at the SGP Subbasin level as calculated using the methods previously described. As with the SGP GSP base period analysis, there was minimal variation in groundwater storage trends depending on the water year types.

Figure 6-2 compares annual change in groundwater storage with annual groundwater extraction estimates. As indicated in the SGP GSP, groundwater extractions comprise a relatively small quantity in comparison to the total outflows (including water use and subsurface outflow) in the SGP Subbasin.

Groundwater extractions did not vary significantly from year to year and groundwater storage changes appear to depend on underlying longer term hydrologic conditions. Furthermore, since 2015, the Subbasin, and to a great extent the state of California, have experienced a series of very dry years. The short record of 2015 forward shows a continued decrease in cumulative change in groundwater storage, but the models have a longer base period that show the basin increasing during prior wet periods. As wet periods of hydrology are experienced in the future, these trends are expected to show a more similar variation to historical patterns with both increases and decreases in cumulative change in storage.

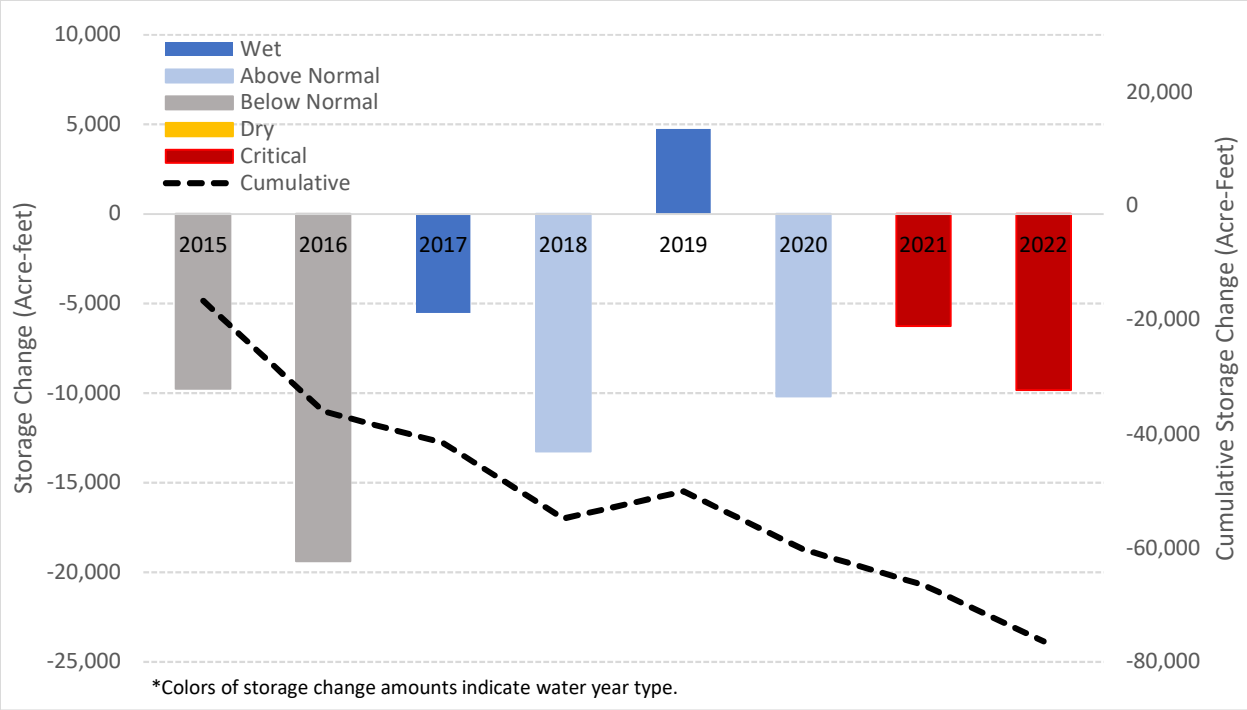

Figure 6-1 –Annual Change in Storage and Cumulative Change in Storage, 2015 to 2022*

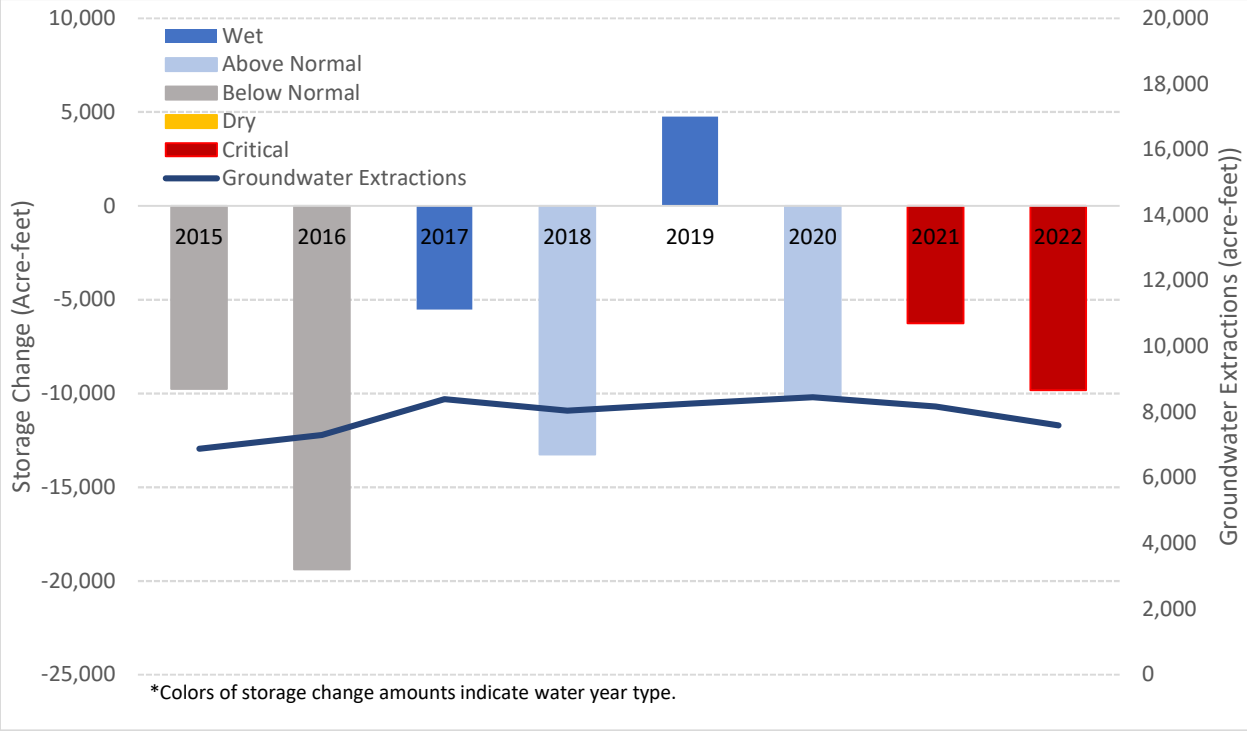

Figure 6-2 – Groundwater Extraction and Annual Change in Storage, WY2015 to WY2022*

7 Plan Implementation

This section describes progress made by the SGP GSAs toward implementing the SGP GSP, including progress towards achieving interim milestones and the implementation of projects and management actions. While significant implementation of the GSP did not occur during WY2022, owing to the fact that the SGP GSP was not adopted until WY2022, some progress was realized.

The SGP GSP includes several planned and possible projects and management actions to be implemented. Initial implementation work anticipated for the upcoming water year 2023 includes project development and design, gathering of information to fill data gaps and continued stakeholder outreach and engagement. The City of Banning adopted an updated Urban Water Management Plan in June 2020 that provides for increased water conservation that will reduce groundwater use. Other communities within the SGP Subbasin are also implementing water conservation measures that will support groundwater sustainability. During recent years, including WY 2021 and WY 2022, water purveyors in the SGP Subbasin have also implemented water shortage contingency plans that are a tool for conserving water and reducing water losses during drought conditions.

SGPWA, on behalf of the SGP GSAs, has initiated an evaluation of the potential for additional conveyance and recharge facilities to directly deliver SWP water to the SGP Subbasin. SGPWA and Desert WA are planning participants in the Delta Conveyance Facility Project which would provide increased delivery reliability and efficiency. SGPWA and Desert WA are also planning participants in the Sites Reservoir Project which would provide additional water supplies. Both the Delta Conveyance Facility and the Sites Reservoir projects would improve overall water supply conditions and serve as components of Projects #3, #4, and #5 as presented in the SGP GSP.

In December 2022, SGPWA submitted an application for funding to DWR for construction of four monitoring wells within the SGP. The four monitoring wells would address two of the data gaps identified in the SGP GSP in the Banning Bench and Banning Storage Units. Two of the monitoring wells would be installed at the boundary of the Banning Storage Unit and the adjudicated Beaumont Basin to provide data on the level of hydraulic connection at that boundary and information to support improving estimates of subsurface boundary flow. The other two monitoring wells would be installed at the interface between the Banning Bench and the Banning Canyon storage unit to identify subsurface flows between the two storage units and to support evaluation of groundwater management options in the Banning Bench storage units. If the grant application is awarded, the four monitoring wells would be constructed in 2023 and water level data would be available to support the GSP five-year review in 2027.

Hydrographs, included as **Figure 2-5** through **Figure 2-13** for all representative monitoring wells in the groundwater levels monitoring network for the SGP Subbasin, show groundwater elevations along with their associated minimum thresholds and measurable objectives. As shown in these hydrographs, actual water level conditions at representative monitoring wells have been maintained at levels that are higher than the SGP GSP-specified minimum thresholds. The hydrographs also show that all but one of the

representative monitoring wells have water levels that are higher than the measurable objective and the Interim Milestones specified in the SGP GSP.

Groundwater quality data for the representative groundwater quality monitoring network retrieved for Water Year 2022 is summarized in **Table 7-1**. Based on these data, no measurements were observed that exceeded the measurable objective or minimum threshold for the five representative groundwater quality monitoring sites in the SGP Subbasin.

Table 7-1 - Groundwater Quality Representative Monitoring Wells WY 2022

	Nitrate as NO3 (mg/L as N)		TDS	
State Well Number	**Average**	**# of Samples**	**Average**	**# of Samples**
02S01E17M001S	0.36	2	140	1
03S01E18A001S	1.05	2	180	1
03S02E07K001S	2.30	1	N/A	N/A
03S02E09E001S	1.60	1	220	1
03S03E07D001S	0.95	1	N/A	N/A
Measurable Objective	8.0		800	
Minimum Threshold	10.0		1,000	

Observed groundwater subsidence data, as reported by the TRE ALTAMIRA InSAR16 analysis[6], was reviewed for the SGP Subbasin. The observed groundwater subsidence data indicated that subsidence in the SGP Subbasin was in the range of -0.1 to 0.1 feet range of vertical displacement for Water Year 2022, which is the smallest amount of change reported. In essence, this indicates that subsidence is not detectable.

In summary, the SGP Subbasin GSAs have maintained water level, water quality, and subsidence conditions that are consistent with the measurable objectives and show continuing sustainable groundwater conditions. The SGP Subbasin GSAs have also initiated planning for projects and management actions that will maintain sustainable groundwater within the SGP Subbasin through the implementation period.

[6] https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence