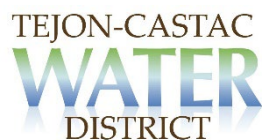
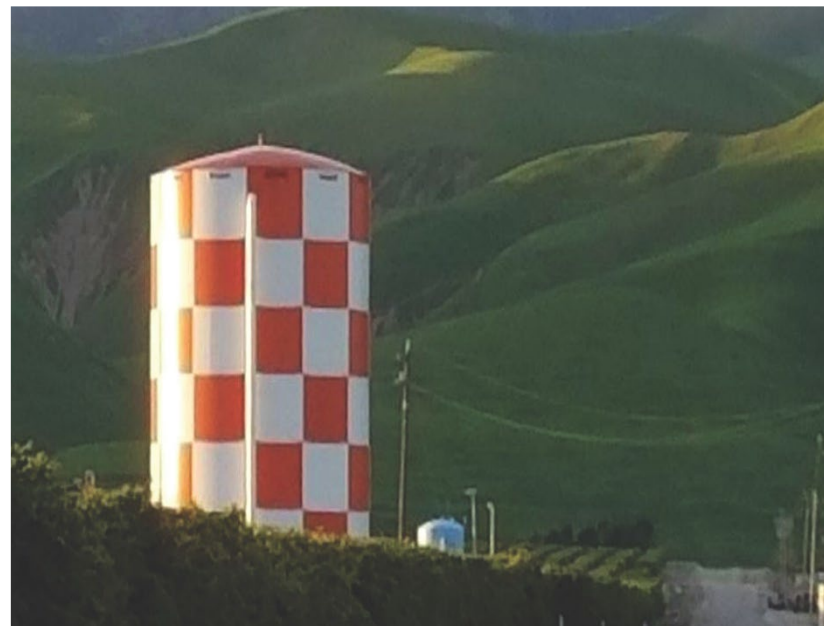


June 2022

# South of Kern River Groundwater Sustainability Plan

Executive Summary

**PUBLIC DRAFT**



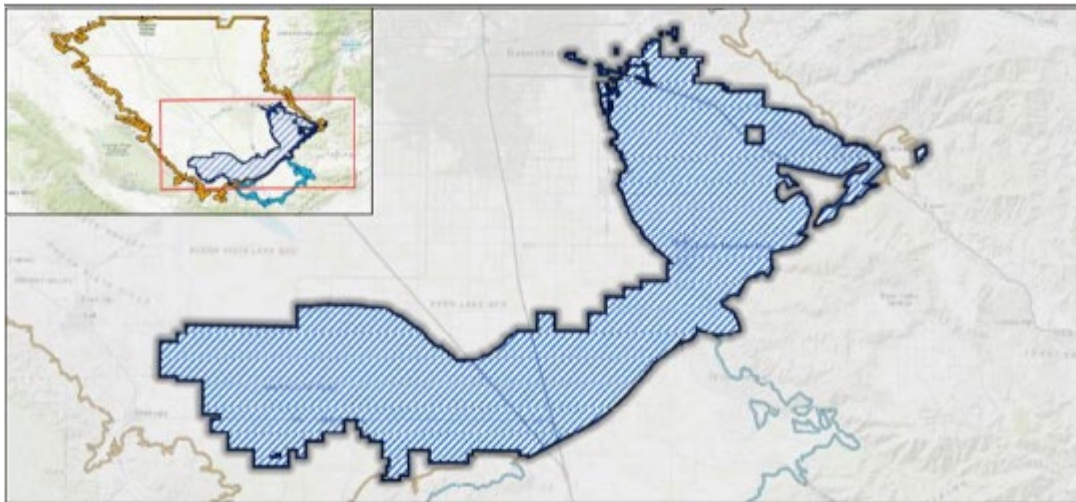


## EXECUTIVE SUMMARY

23 CCR § 354.4(a)

### ES.1. Introduction

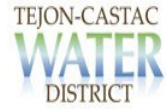
On 16 September 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) for the primary purpose of achieving and maintaining sustainability within the state’s high and medium priority groundwater basins. Key tenets of SGMA are preservation of local control, use of best available data and science, and active engagement and consideration of all beneficial uses and users of groundwater. As such, SGMA empowers certain local agencies to form Groundwater Sustainability Agencies (GSAs) for the purpose of managing basins sustainably through the development and implementation of Groundwater Sustainability Plans (GSPs). Under SGMA, GSPs must contain certain elements, the most significant of which include: a Sustainability Goal; a description of the area covered by the GSP (“Plan Area”); a description of the Basin Setting, including hydrogeologic conceptual model, historical and current groundwater conditions, and a water budget; locally-defined sustainability criteria; monitoring networks and protocols for sustainability indicators; and a description of projects and/or management actions that will be implemented to achieve or maintain sustainability. SGMA also requires a stakeholder outreach plan to ensure that all beneficial uses and users of groundwater are given the opportunity to provide input into the GSP development and implementation process.



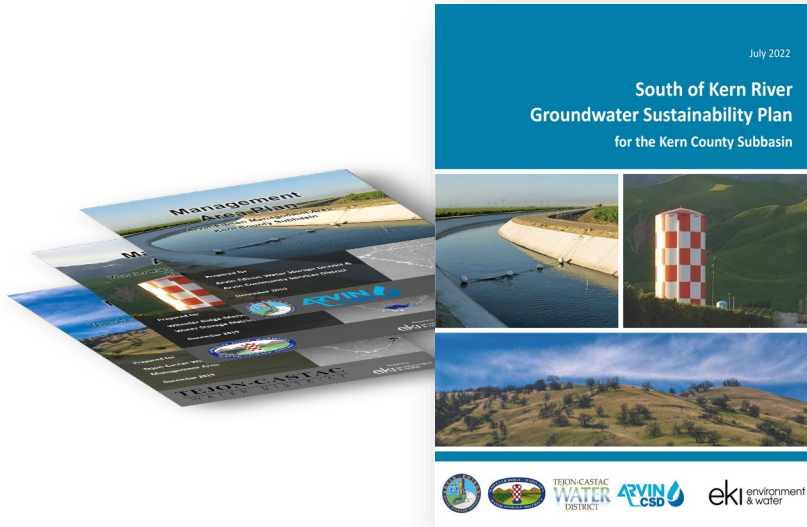
**SOKR GSP Plan Area**

The Kern County Subbasin (Department of Water Resources [DWR] Basin No. 5-022.14; referred to herein as the “Kern Subbasin” or “Basin”) is one of 21 basins and subbasins identified by the DWR as being critically overdrafted, a designation that triggers an accelerated timetable for GSP development by 2020 and achievement of sustainability by 2040.

This South of Kern River (SOKR) GSP has been jointly prepared by the Arvin GSA, the Wheeler Ridge-Maricopa GSA, the Tejon-Castac Water District (TCWD) GSA, and Arvin Community Services District (ACSD)



as an amended GSP (i.e., as a synthesis of three of the Management Area Plans that were originally submitted as part of the Kern Groundwater Authority GSP in January 2020) for submission to DWR in response to their 28 January 2022 letter entitled *Incomplete Determination of the 2020 Groundwater Sustainability Plans Submitted for the San Joaquin Valley – Kern County Subbasin*. The SOKR GSP has been developed to meet SGMA regulatory requirements<sup>1</sup> while reflecting local needs and preserving local control over water resources. The SOKR GSP is coordinated with the other GSPs for the Basin to collectively comply with SGMA. Together, these documents (i.e., the six GSPs and the Coordination Agreement constituting the “Kern Subbasin Plan”) provide a path to maintain the long-term sustainability of the Basin’s groundwater resources now and into the future.



***The SOKR GSP Synthesizes Three Management Area Plans into a Single GSP that has been Coordinated with the other Basin GSPs***

It is recognized that additional, more recent data (i.e., through 2022) are available at the time of preparation of this amended SOKR GSP. However, as the SOKR GSP does not constitute a five-year update to a GSP, but rather a response to the DWR determination letter, those additional data are not incorporated herein, with minor exceptions.

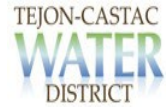
**ES.2. Sustainability Goal**

The Basin-wide Sustainability Goal adopted by all Basin GSAs, is as follows:

“The sustainability goal of the Kern County Subbasin is to:

- Achieve sustainable groundwater management in the Kern County Subbasin through the implementation of projects and management actions at the member agency level of each GSA
- Maintain its groundwater use within the sustainable yield of the basin.
- Operate within the established sustainable management criteria, which are based on the collective technical information presented in the GSPs in the Subbasin.
- Implement projects and management actions that include a variety of water supply development and demand management actions.

<sup>1</sup> Regulations for GSP development are contained within Title 23 of the California Code of Regulations (CCR) Division 2 Chapter 1.5 Subchapter 2.



- Collectively bring the Subbasin into sustainability and to maintain sustainability over the implementation and planning horizon.

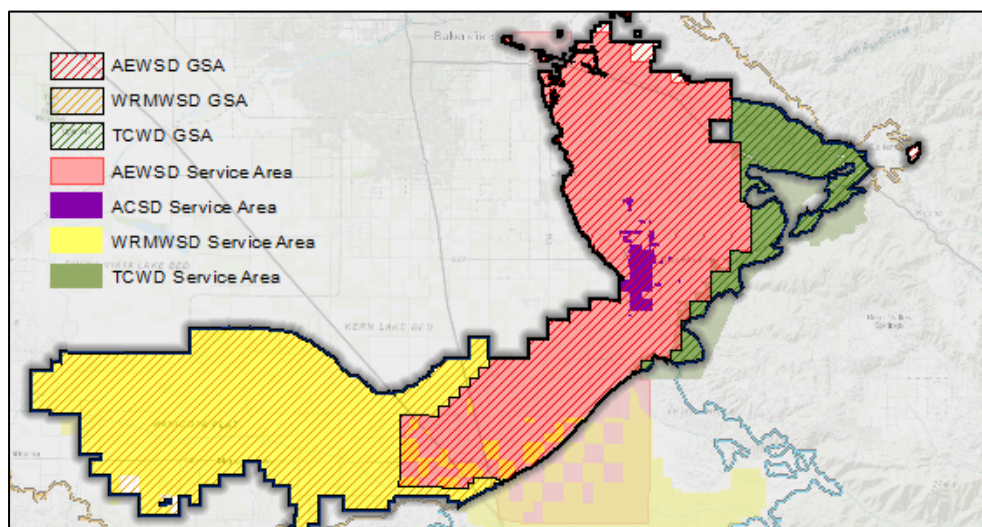
Further, the sustainability goal includes a commitment to monitor and report groundwater conditions, as required by [the Sustainable Groundwater Management Act] SGMA, and to continue coordination among all GSAs in the [Basin] to identify the potential for, or presence of, undesirable results and actions to prevent undesirable results. The coordination process established in the development of this [Groundwater Sustainability Plan] GSP and memorialized in the Coordination Agreement will ensure that the [Basin] is managed as a shared groundwater resource and that the districts within the [Basin] work collaboratively towards achieving and maintaining sustainable groundwater use.”

In addition, each SOKR GSA has developed a local Sustainability Goal to support SGMA implementation within their respective Management Areas.

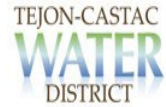
**ES.3. Plan Area**

The Arvin GSA, Wheeler Ridge-Maricopa GSA, TCWD GSA, and ACSD have entered into a Memorandum of Agreement (MOA) that establishes a governance structure for how the GSAs will cooperate and coordinate in exercising their authorities under SGMA to develop and implement a joint GSP, i.e. the SOKR GSP, that covers the collective area within their GSA boundaries, and in other matters related to sustainable groundwater management . Pursuant to the SOKR MOA, each agency has designated representatives to participate in the SOKR GSP Executive Committee which, with the support of the agencies’ respective staff and consultants, is responsible for guiding the joint development and implementation of the SOKR GSP in a manner that is coordinated with the other Basin GSAs/GSPs to achieve sustainable groundwater management in accordance with SGMA and implementing regulations.

To facilitate the implementation of the SOKR GSP, the Plan Area is divided into three management areas that coincide with the portions of the Basin that underlie each SOKR GSA. These management areas, which together cover the entire SOKR GSP Area, include the Arvin-Edison Management Area, Wheeler Ridge-



**SOKR GSP Management Areas are Coincident with the GSA Areas**



Maricopa Management Area, and Tejon-Castac Management Area. Lands within the Arvin-Edison Water Storage District (AEWSD), Wheeler Ridge-Maricopa Water Storage District (WRMWS) and TCWD service areas that are located outside the Kern Subbasin in the adjacent White Wolf Subbasin are managed under a separate GSP developed and adopted by the White Wolf GSA. Under the SOKR MOA, each GSA is responsible for implementing the SOKR GSP within its management area. In addition, the SOKR GSP Executive Committee may recommend measures to be implemented in the event insufficient or unsatisfactory progress is being made in implementing the GSP within the Plan Area to satisfy the requirements of the Act.

*Arvin-Edison Management Area*

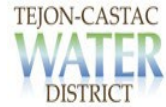
The Arvin-Edison Management Area is located in the southeastern portion of the Kern Subbasin and encompasses 105,630 acres of the AEWSD service area that is not overlapped by the urbanized East Niles Community Services District (ENCSD); the area of overlap between AEWSD and ENCSD is managed under a separate GSP prepared by the Kern River GSA. Most lands within the Arvin-Edison Management Area are developed for irrigated agriculture, which use a combination of imported surface water provided by AEWSD and groundwater from AEWSD and/or private wells as water supply. AEWSD has a water supply contract with the Friant Division of the Central Valley Project and has invested considerably over the years in water management programs (additional supplies) and infrastructure to import, convey, recharge/recover, and distribute water to its customers and partners. Through its conjunctive management of water supplies, AEWSD has provided a substantial net benefit to groundwater conditions within its service area.

The City of Arvin (population of approximately 21,000) is located in the west-central portion of the Arvin-Edison Management Area and is served with municipal and industrial (M&I) water supply by ACSD. The source for this M&I water supply is local groundwater. Several other small public water systems exist within the Arvin-Edison Management Area, most serving small populations of residents/customers or employees at various industrial/food processing facilities. Several domestic wells are also understood to supply drinking water to rural residents. Most of the Arvin-Edison Management Area is designated by the United States Census Bureau as a Disadvantaged Community (DAC) or Severely Disadvantaged Community (SDAC). The City of Arvin is classified as an SDAC. The active participation of ACSD, whose customers are the residents of the City of Arvin, in the preparation of this SOKR GSP is just one way in which the interests of DACs have been considered herein.

*Wheeler Ridge-Maricopa Management Area*

The Wheeler Ridge-Maricopa Management Area is located in the southern-southeastern portion of the Kern Subbasin and encompasses 91,430 acres of the WRMWS service area. The Wheeler Ridge-Maricopa Management Area includes all WRMWS lands within the Basin except for 2,809 acres that overlap the West Kern Water District (WKWD) and lands that overlap with the AEWSD service area. For purposes of SGMA monitoring and management, WRMWS and AEWSD have agreed that the Arvin GSA will cover the overlap areas between the two districts.

Irrigated agriculture is the primary land use within the Wheeler Ridge-Maricopa Management Area, followed by idle/non-irrigated lands. Agricultural water demands are met with surface water imported by WRMWS and/or groundwater depending on location within the Management Area. WRMWS has a contract for 197,088 acre-feet per year (AFY) of Table A water from the State Water Project through the



Kern County Water Agency (KCWA) that is delivered to agricultural water users for irrigation within its surface water service area. The remainder of the Wheeler Ridge-Maricopa Management Area relies solely on groundwater to meet demands. The potable consumption of groundwater in the Wheeler Ridge-Maricopa Management Area is limited to a small number of domestic wells.

**Tejon-Castac Management Area**

The Tejon-Castac Management Area is located in the southeastern portion of the Kern Subbasin and encompasses approximately 19,280 acres of the TCWD service area. The Tejon-Castac Management Area is bounded to the west and north by the TCWD administrative/jurisdictional boundary and to the east and south by the boundaries of the Kern Subbasin and the White Wolf Subbasin, respectively. The Tejon-Castac Management Area is located directly to the east of the Arvin-Edison Management Area.

Within the Tejon-Castac Management Area land cover is predominantly grassland/herbaceous with lesser amounts of shrub/scrub, and the predominant land use is livestock grazing. Groundwater is used to meet limited demands associated with domestic and industrial uses.

**South of the Kern River (SOKR) Sustainable Groundwater Management Act (SGMA) Stakeholder Workshop**

**Topic:** SOKR Groundwater Sustainability Plan (GSP) Update - Kern County Subbasin  
**When:** Tuesday, June 7<sup>th</sup>, 2022 @ 10:00 am  
**Where:** Arvin-Edison Water Storage District Headquarters - Pump Shop  
 20401 East Bear Mountain Boulevard, Arvin, California 93203  
 Or Virtually: <https://us06web.zoom.us/j/83559831177?pwd=UFlhO0VVEVXVVEJlZkE3VnZlTG9kZz09>  
 or Call in: +1 669 900 6833  
 Meeting ID: 835 5983 1177 Password: 715425

You are invited by the Arvin Groundwater Sustainability Agency (GSA), Wheeler Ridge-Maricopa GSA, Tejon-Castac Water District GSA (collectively, the "SOKR GSAs"), and Arvin Community Services District to attend a public workshop on Tuesday, June 7<sup>th</sup>, 2022, from 10:00 am to 12:00 pm to discuss the development of an amended Groundwater Sustainability Plan (the "SOKR GSP") for the area covered by the SOKR GSAs in the Kern County Subbasin (Basin).

The SOKR GSAs will provide an overview of the current SGMA process in the Basin, including the California Department of Water Resources (DWR) review of the 2020 Kern Subbasin Plan. This workshop will also include a presentation on the current status of the SOKR GSP development in response to the DWR comments. We will also look ahead toward next steps for SOKR GSP development and submittal. More information can be found at each of the SOKR GSAs' websites.

If you are planning to attend this workshop, please RSVP to Sherry Jauch at (661) 854-5573 or [arvined@aebsd.org](mailto:arvined@aebsd.org) by Thursday, June 2<sup>nd</sup>. Thank you and we look forward to seeing you at the workshop.

**Key SGMA elements:**

- Basins must be managed by GSAs
  - The SOKR GSAs were formed in March 2021
- GSAs must develop GSPs; amended GSPs for the Kern County Subbasin are due July 27<sup>th</sup>, 2022
  - The SOKR GSAs are working to combine and revise chapters of the Management Area Plans they developed in 2020 as part of the Kern Groundwater Authority (KGA) GSP into a separate and comprehensive SOKR GSP that addresses DWR's comments and is coordinated with other Basin GSPs.
- Basins must achieve clearly-defined sustainability criteria within 20 years of GSP adoption
  - Performance assessment: The SOKR GSP will demonstrate a plan for achieving sustainability and will be updated and reviewed every five years.

**SOKR GSP Area Within the Kern County Subbasin**

**SOKR GSA Areas**

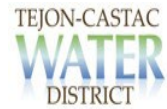
*Preliminary - Subject to Revision*

***The SOKR GSAs Hosted Multiple Public Forums where the SOKR GSP was Discussed***

**ES.4. Stakeholder Outreach Efforts**

A Stakeholder Communication and Engagement Plan (SCEP) was completed by each SOKR GSA to fulfill notice and communication requirements in order to achieve active engagement and input of beneficial users of groundwater within the SOKR GSP Area as part of SGMA implementation. The goal of the outreach efforts described in each SCEP is to encourage open and transparent engagement by diverse stakeholders. Public participation has been welcomed throughout the SOKR GSP development<sup>2</sup> and amendment process. Venues for stakeholder engagement and input have included: Stakeholder Workshops, the Board meetings of each SOKR GSA, and ACSD Board Meetings. Other SGMA-related outreach to SOKR GSP Area stakeholders has included: distribution and collection of a Stakeholder Survey and an Agriculture-specific Stakeholder Survey, various letters from the SOKR GSAs to landowners, and small group or one-on-one meetings between the staff of the SOKR GSAs and interested parties. The SOKR GSAs have also conducted extensive coordination with the other GSAs in the Kern Subbasin.

<sup>2</sup> In 2020 AEWSD, WRMWS and TCWD developed Management Area Plans that were incorporated into the KGA GSP for the 2020 submittal after extensive public review and engagement. As part of the response to DWR comments, the three MAPs have been amended and synthesized into the SOKR GSP, which has also included a public engagement process.



## ES.5. Hydrogeologic Conceptual Model

The SOKR GSP Area is located in the southeastern portion of the Kern Subbasin, south of the Kern River. The Kern Subbasin occupies a large structural trough filled with thick sedimentary deposits of continental and marine origin. The “principal aquifer” is defined in the SOKR GSP Area as the aquifer materials encountered within the depths of production wells in the area and is comprised of fluvial and alluvial deposits of Miocene to Recent age. In the western portion of the SOKR GSP Area, a regional clay layer (the “E”-Clay) is found at intermediate depths and creates more confined conditions in the underlying sediments. Aquifer conditions in general are more unconfined to semi-confined in the shallower and eastern areas and more confined in the deeper and western areas. Several faults are present in the SOKR GSP Area, including the White Wolf Fault that forms the southern boundary of the Kern Subbasin and the Edison Fault near the northern boundary. Both faults appear to affect groundwater flow as evidenced by higher groundwater levels on their upgradient sides.

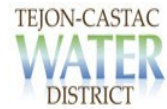
## ES.6. Existing Groundwater Conditions

Information on groundwater conditions within the SOKR GSP Area is presented with respect to the six “Sustainability Indicators” defined under SGMA, which include the following:

- Chronic lowering of groundwater levels
- Reduction in groundwater storage
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletion of interconnected surface water

**Water Levels:** Groundwater levels within the SOKR GSP Area are presented using contour maps depicting recent (2015) seasonal high (spring) and seasonal low (fall) conditions, as well as hydrographs from representative wells throughout the SOKR GSP Area that have extended historical records. The available data indicate groundwater flow directions are generally from the surrounding uplands towards the Basin, from south to north across the White Wolf Fault, and from west to east in the west/central portion of the SOKR GSP Area. Relative highs and lows appear to be controlled, at least in part, by the distribution of groundwater pumping versus surface water deliveries. Depths to groundwater in spring 2015 range from approximately 150 to over 500 feet below ground surface (ft bgs), indicating that connections to surface water and the existence of groundwater dependent ecosystems (GDEs) are unlikely. Hydrographs show the long-term positive effects of AEWSD’s and WRMWS’s surface water importation in raising groundwater levels, tempered by the effects of the recent severe droughts.

**Groundwater Storage:** Changes in groundwater storage over selected time periods of interest were analyzed by comparing water levels at the beginning and the end of several different periods, and also show the positive impacts of AEWSD’s and WRMWS’s surface water importation and the variability caused by wet and dry climate periods. Spatially, the changes in storage are more positive in the Surface Water Service Areas within each Management Area compared to areas that rely solely on groundwater for supply.



**Water Quality:** Agricultural use is by far the dominant beneficial use within the SOKR GSP Area, and groundwater quality is generally suitable for agricultural uses. Drinking water is also a beneficial use, and in some instances nitrate, arsenic, total dissolved solids (TDS), sulfate, boron, iron and manganese have been detected in groundwater (legacy and naturally occurring) within or near the SOKR GSP Area at concentrations above drinking water standards and/or agricultural water quality goals. However, no relationship has been observed between water level trends (as a surrogate for groundwater recharge or pumping) and water quality. Monitoring efforts under the SOKR GSP will include routine collection of water quality data from wells within and adjacent to the SOKR GSP Area for periodic review and trend analysis to inform GSP implementation and other Basin-wide SGMA implementation efforts.

ACSD is actively addressing elevated arsenic levels in some of its production wells through its Arsenic Mitigation Project that involves rehabilitating and/or replacing impacted wells. ACSD also provides arsenic-free water from filling stations at selected locations and has installed a treatment system for a well impacted by a newly-regulated chemical, 1,2,3-Trichloropropane (1,2,3-TCP). Ongoing and future water quality monitoring efforts throughout the SOKR GSP Area will allow for further evaluation of these constituents and improve understanding of the potential nexus between groundwater levels and quality.

**Land Subsidence:** Some amount of land subsidence has been documented within the SOKR GSP Area over both historical and recent timeframes. Subsidence due to aquitard depressurization following groundwater withdrawal tends to be greater in the areas that rely solely on groundwater for water supply and are underlain by a greater proportion of fine-grained deposits. Subsidence has the potential to affect Regional Critical Infrastructure (i.e., the California Aqueduct) within the Wheeler Ridge-Maricopa Management Area and Management Area Critical Infrastructure including gravity-driven water conveyance systems (canals) within the Arvin-Edison Management Area. Subsidence and related impacts are being actively monitored and managed by the SOKR GSAs, in coordination with Basin-wide efforts.

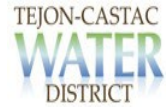
**Interconnected Surface Waters:** Due to the great depth to groundwater in the principal aquifer (i.e., greater than 150 ft bgs in the Arvin-Edison and Wheeler Ridge-Maricopa Management Areas) and/or the undeveloped nature of the land uses (e.g., in the Tejon-Castac Management Area) available data indicate there are no interconnected surface water systems within the SOKR GSP Area that are or will be affected by groundwater extraction.

**Seawater Intrusion:** The SOKR GSP Area is located far from coastal areas. As a result, seawater intrusion is not considered to be an issue for this Basin and the SOKR GSP Area.

## ES.7. Water Budget

For the Kern Subbasin as a whole, the GSAs coordinated on two basin-wide water budget approaches: (1) development of a numerical model based on the California Central Valley Groundwater/Surface Water Simulation Model (C2VSim) to estimate the Basin-wide water budget, and (2) development of a "Checkbook" water accounting approach that estimates supply, demand, and shortages using certain management assumptions. In addition, on a local Management Area basis within the SOKR GSP Area, spreadsheet water budget models were developed and calibrated to observed water level/storage changes to provide locally-refined water budget information for all of the timeframes required by SGMA. Each water budgeting methodology includes data gaps and has varying degrees of accuracy and/or reliability. As part of SOKR GSP implementation, these methodologies and estimates will be refined as additional information is developed in accordance with the Basin Coordination Agreement.





The results of the Basin-wide model show that the Basin, as a whole, has a total storage deficit of approximately -324,326 AFY over the baseline period (i.e., 1994-2015). Based on application of the Checkbook approach, the SOKR GSAs (including associated un-districted “white” lands) collectively account for approximately -30,748 AFY of that baseline deficit.

Water budget information under projected (future) conditions was also developed using the calibrated spreadsheet water budget models, with DWR-provided inputs for climate variables (i.e., adjusted precipitation and evapotranspiration) and water supply assumptions (i.e., changes to imported water supplies). The projected water budget assesses the magnitude of the net water supply deficit under future conditions that would need to be addressed through Projects and Management Actions (P/MAs) to prevent Undesirable Results and achieve the Sustainability Goal. Consistent with the Basin-wide efforts, three projected water budget scenarios were developed for this analysis: a Baseline Scenario, a 2030 Climate Change Scenario, and a 2070 Climate Change Scenario. The projected deficit under the 2030 Climate Change Scenario (-52,130 AF) was used as the basis to develop P/MAs for the SOKR GSP Area.

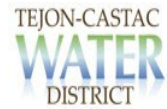
Period / Scenario	Entire SOKR GSP Area		
	Basin-wide Numerical Model	Local Analytical Spreadsheet Model	Basin-wide “Checkbook” Water Accounting Approach
Historical Period (Water Year [WY] 1995 – 2014)	9,594	7,325	NA
Current Period (WY 2015)	-174,983	-204,458	NA
Projected Period (50 years; 2021 – 2070) Baseline w/o Projects	-2,747	-10,080	<b>-30,748</b>
Projected Period (50 years; 2021 – 2070) 2030 Climate Change w/o Projects	-10,870	<b>-52,130</b>	NA
Projected Period (50 years; 2021 – 2070) 2030 Climate Change w/ Projects	38,764	1,281	NA
Projected Period (50 years; 2021 – 2070) 2070 Climate Change w/o Projects	-28,047	-90,664	NA
Projected Period (50 years; 2021 – 2070) 2070 Climate Change w/ Projects	NA	-930	NA

***The SOKR GSAs Have Identified Projects and Management Actions to Address the Projected Deficit***

**ES.8. Sustainable Management Criteria**

Sustainable Management Criteria (SMCs) are the metrics by which groundwater sustainability is judged under SGMA. Key terms related to SMCs under SGMA include the following:

- **Undesirable Results:** Undesirable Results are the significant and unreasonable occurrence of conditions, for any of the six Sustainability Indicators defined under SGMA, that adversely affect beneficial uses and users in the Basin. Definitions of Undesirable Results for the Basin have been developed through a coordinated effort of the Basin GSAs.



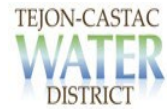
- **Minimum Thresholds:** Minimum Thresholds (MTs) are the numeric criteria for each Sustainability Indicator that, if exceeded in a locally defined combination of monitoring sites, may constitute an Undesirable Results for that indicator. Where appropriate, the MTs for the Sustainability Indicators have been set using groundwater levels as a proxy.
- **Measurable Objectives:** Measurable Objectives (MOs) are a specific set of quantifiable goals for the maintenance or improvement of groundwater conditions. MOs use the same units and metrics as the MTs and are thus directly comparable.
- **Interim Milestones:** Interim Milestones are a set of target values representing measurable groundwater conditions in increments of five (5) years over the 20-year statutory deadline for achieving sustainability.

Chronic Lowering of Groundwater Levels is arguably the most fundamental Sustainability Indicator for the SOKR GSP, as it influences several other key Sustainability Indicators, including Reduction of Groundwater Storage and Land Subsidence. The SMCs for Chronic Lowering of Groundwater Levels were developed through temporal analysis of long-term groundwater level data at representative wells with long-term records and generalized into zones. These generalized MTs were evaluated against known well depths to assess potential impacts on local beneficial users (i.e., potential dewatering of shallow wells with attendant mitigation procedures). The process for developing the MTs and MOs and the results were presented on multiple occasions in public meetings to allow for stakeholder input.

Significant Groundwater Storage exists within the SOKR GSP Area, and it is estimated that it would take decades of zero recharge to deplete the usable storage under current extraction rates. As such, it was determined to be sufficiently protective to define the SMCs for Reduction of Groundwater Storage based on the use of SMCs for Chronic Lowering of Groundwater Levels as a proxy.

Following a systematic approach to identify constituents warranting SMCs for Degraded Water Quality, SMCs are defined for arsenic at ten water quality representative monitoring sites (RMS) in the Arvin-Edison Management Area, including three RMS from the ACSD public supply well network (Wells #14, #16, and #17), and at nine water quality RMS within the Wheeler Ridge-Maricopa Management Area. The SMCs are tied to regulatory water quality standards – the MT is set at either the California Maximum Contaminant Level (MCL) of 10 micrograms per liter (ug/L) arsenic, or for wells already in exceedance of the MCL at the SGMA-effective date, at the pre-SGMA baseline arsenic concentration plus 5 ug/L. The MO is set to 75% of the MCL (7.5 ug/L) at the three RMS within the ACSD well network, and for all other RMS the MO is set at the MCL or the pre-SGMA baseline arsenic concentrations, whichever is greater. Degraded Water Quality SMCs were not defined for the Tejon-Castac Management Area, as water quality is not a concern for the agricultural and industrial use of the single well with significant pumping. Numerous other regulatory programs address water quality, in addition to SGMA (e.g., Irrigated Lands, CVSALTS, etc.). Further, a causal nexus between measured constituent concentrations and water levels and groundwater management actions within the Management Areas has not been established based on available data. On-going monitoring for all potential constituents of concern will continue, and if a nexus between these constituent concentrations and water levels and groundwater management actions is established, then the SMCs for water quality will be revisited.

SMCs for Land Subsidence are defined with consideration of Regional and Management Area Critical Infrastructure within the SOKR GSP area. In the Arvin-Edison Management Area, SMCs are based on



observed rates of subsidence from ground-based surveys collected along AEWSD’s canal, recharge basin, and well infrastructure between 2014 and 2018. The MT defined as the extent of subsidence, in inches, that would occur if the maximum observed subsidence rate between 2014 – 2018 were to continue through 2040, and the MO is defined as the amount of land subsidence that would occur if the maximum observed subsidence rates (2014 – 2018) were to continue through 2030 and then cease. The rationale is that such subsidence has been historically managed by AEWSD through maintenance and improvements to its facilities (e.g., increasing additional freeboard to its canals), and AEWSD could likely continue to manage/mitigate further subsidence if it were to occur at similar or lower rates. Within the Wheeler Ridge-Maricopa Management Area, land subsidence SMCs are defined with consideration of historical and recent subsidence rates measured by DWR along the California Aqueduct. MTs are defined as the extent of subsidence that would cause a 75 percent (%) reduction in available freeboard above the DWR’s design criterion for lined freeboard height, based on averages of monitoring benchmark points within each Aqueduct pool. The MO is defined as a subsidence extent that is half of the MT extent, and based on a decelerating rate of subsidence reaching zero by 2040. Within the Tejon-Castac Management Area, because subsidence has not been an issue historically and there is no significant groundwater development other than a single agricultural/industrial well, land subsidence is unlikely to occur and no SMCs are currently defined. A basin-wide subsidence monitoring program is also being developed and will be implemented.

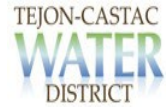
As discussed above, Depletion of Interconnected Surface Water has not been observed within the SOKR GSP Area and is not applicable due to the great depths to groundwater in the principal aquifer. Likewise, Seawater Intrusion does not exist within the Kern Subbasin. Therefore, consistent with the rest of the Basin, no SMCs for these Sustainable Indicators are defined in the SOKR GSP.

Based on the available data, groundwater conditions within the SOKR GSP Area have been maintained above the respective SMCs, indicative of sustainable management and absence of Undesirable Results.

### ES.9. Monitoring Network

The objective of the SGMA Monitoring Networks defined in the SOKR GSP is to (continue to) collect sufficient data to allow for assessment of the Sustainability Indicators relevant to the SOKR GSP Area, and potential impacts to the beneficial uses and users of groundwater. The proposed SGMA Monitoring Network was developed to ensure sufficient spatial distribution and spatial density. In the Arvin-Edison Management Area, the SGMA network consists of 16 representative monitoring sites (RMS) for groundwater levels and (by proxy) groundwater storage, ten (10) RMS for monitoring groundwater quality, and five (5) RMS for monitoring land subsidence. In the Wheeler Ridge-Maricopa Management Area, the SGMA network consists of 14 RMS for groundwater levels and (by proxy) groundwater storage, nine (9) RMS for monitoring groundwater quality, and 40 RMS for monitoring land subsidence. In the Tejon-Castac Management Area, the SGMA network consists of one RMS for groundwater levels and (by proxy) groundwater storage.

The SGMA Monitoring Networks for the SOKR GSP Area supplement other monitoring networks and programs in the Basin such as DWR’s California Statewide Groundwater Elevation Monitoring (CASGEM) program, Irrigated Lands Regulatory Program (ILRP), Central Valley-Salinity Alternatives for Long-term Sustainability (CV-SALTS), KCWA semiannual groundwater monitoring program, etc., and Basin-wide monitoring networks related to SGMA compliance such as the Basin’s land subsidence network.



Data collected from the SGMA Monitoring Networks for the SOKR GSP Area will be uploaded to the Data Management System (DMS) maintained for the Basin and reported to the DWR in accordance with the Monitoring Protocols developed for the Basin as described in the Coordination Agreement. In addition, local data will be stored and managed in the local Management Area-specific DMSs that are maintained by each GSA. Additional data collected as part of AEWSD’s, WRMWS’s, TCWD’s and ACSD’s other regular monitoring programs may be used in conjunction with data collected from the SGMA Monitoring Networks to comply with GSP Emergency Regulations regarding Annual Reporting or as otherwise deemed necessary or appropriate for the SOKR GSP Area.

### ES.10. Projects and Management Actions

Achieving sustainability in the SOKR GSP Area will require implementation of P/MAs to address projected water budget deficits that contribute to groundwater level and storage declines and land subsidence, and also to address water quality impacts. As such, the SOKR GSAs have developed a portfolio of P/MAs, each with specific expected benefits, implementation triggers, and costs. A preliminary “glide path” has been developed that will result in closing the baseline and projected “deficits”<sup>3</sup> of approximately -30, 748 AFY and -52,130 AFY by 2040, respectively.

Accelerated implementation of P/MAs could be triggered if MTs for Chronic Lowering of Groundwater Levels are exceeded in more than 20% of RMS defined within the Arvin-Edison and Wheeler-Ridge Management Areas or at the one RMS defined within the Tejon-Castac Management Area.

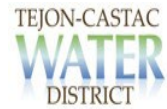
The supply augmentation and demand reduction P/MAs identified by the SOKR GSAs comprise a diverse portfolio of options that can be implemented as necessary to achieve sustainability from a total water quantity and water quality perspective. Simulation results from the projected P/MAs across the Basin utilizing the Basin-wide numerical model indicate that P/MA implementation along the planned glide path will successfully achieve sustainability and avoid Undesirable Results for Groundwater Levels (and by proxy for the other applicable Sustainability Indicators) throughout the SOKR GSP Area.



***The SOKR GSAs are Actively Implementing the P/MAs Identified in the SOKR GSP***

The implementation glide path identified by the SOKR GSAs provides a general guide to how quickly these benefits are to be realized. To date the SOKR GSAs have taken action on multiple P/MAs (e.g., development of new recharge basins), however, the exact schedule and order of

<sup>3</sup> The net deficit to be addressed by the 2040 GSP implementation deadline is the estimated deficit under the 2030 Climate Change scenario.



implementation for the others has yet to be determined. Further analysis will be conducted to prioritize the P/MAs in consideration of factors including permitting, engineering feasibility, cost effectiveness, need to prevent particular Undesirable Results, funding opportunities, etc. In general, P/MAs being considered for implementation will be discussed during regular Board Meetings of each SOKR GSA, which are noticed and open to the public. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

### ES.11. GSP Implementation

Key SOKR GSP implementation activities that will be performed by the SOKR GSAs through 2025 include:

- Monitoring and data collection;
- P/MA prioritization and implementation;
- Policy development to support GSP implementation;
- Technical and non-technical coordination with other water management entities in the Basin;
- Continued outreach and engagement with stakeholders;
- Annual reporting;
- Enforcement and response actions, as necessary; and
- Evaluation and updates, as necessary, of the SOKR GSP as part of the required periodic evaluations (i.e., “five-year updates”).

Collectively, the GSP Implementation Activities described herein demonstrate the SOKR GSAs have been actively implementing specific P/MAs, policies, and programs to sustainably manage groundwater resources for all beneficial uses and users of groundwater and continue to meet the Sustainability Goal defined for their respective Management Areas within the Basin.

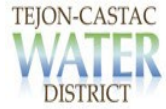
### ES.12. GSP Implementation Costs and Funding

Costs to implement the SOKR GSP can be divided into three categories, as follows:

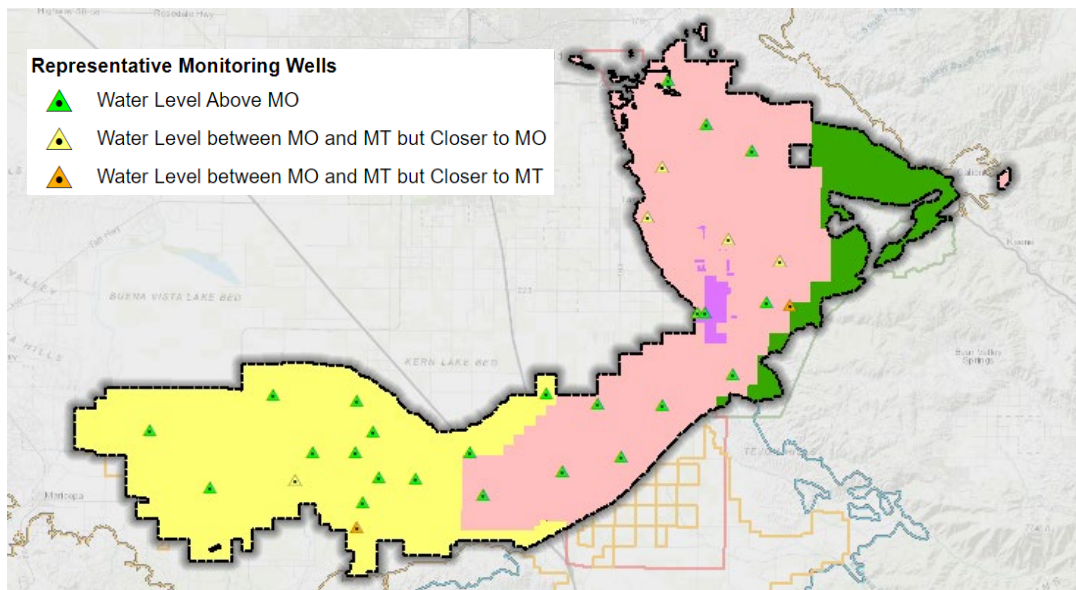
- Costs of local groundwater management activities within each Management Area;
- Each of the SOKR GSAs’ proportional share of costs for Basin-wide groundwater management activities; and
- Costs to implement P/MAs, including capital/one-time costs and ongoing costs.

Sources of funding for SGMA compliance activities will include primarily regular fees and assessments from customers and rate payers. This primary source of revenue will be supplemented to the greatest extent possible through loans and grants, and possibly by imposition of additional fees to further incentivize demand management practices. Any actions to establish fees or charges will be undertaken pursuant to applicable laws and regulations (e.g., Proposition 218 and related laws). Conclusion

The passage of SGMA in 2014 ushered in a new era of mandatory groundwater management in California’s most intensively used groundwater basins. The law was followed by promulgation of a robust regulatory framework for GSA formation and GSP development and implementation. The law and regulations emphasize the use of best available science, local control and decision making, and active engagement of affected stakeholders. Given the magnitude of the groundwater management issues facing California, and the relative speed and broad scope of recent legislative and administrative actions taken to address those



issues, implementing SGMA presents significant challenges for local agencies and groundwater users alike. Achieving and maintaining sustainability in the face of uncertain future water supply conditions while addressing and balancing the needs of all beneficial uses and groundwater users will require significant effort, creative solutions, and unprecedented collaboration. As the implementing agencies within the SOKR GSP Area, the Arvin GSA, Wheeler Ridge-Maricopa GSA, TCWD GSA and ACSD are committed to working together to address these challenges in a manner that protects the interests of local landowners and constituents, in close coordination with other Basin GSAs. Based on the available data, groundwater conditions within the SOKR GSP Area have been maintained above the respective SMCs, indicating sustainable management and avoidance of Undesirable Result



***Recent Groundwater Level Data (Spring 2021) Indicates that the SOKR GSP Area Continues to Achieve Sustainable Management.***



TEJON-CASTAC  
**WATER**  
DISTRICT

