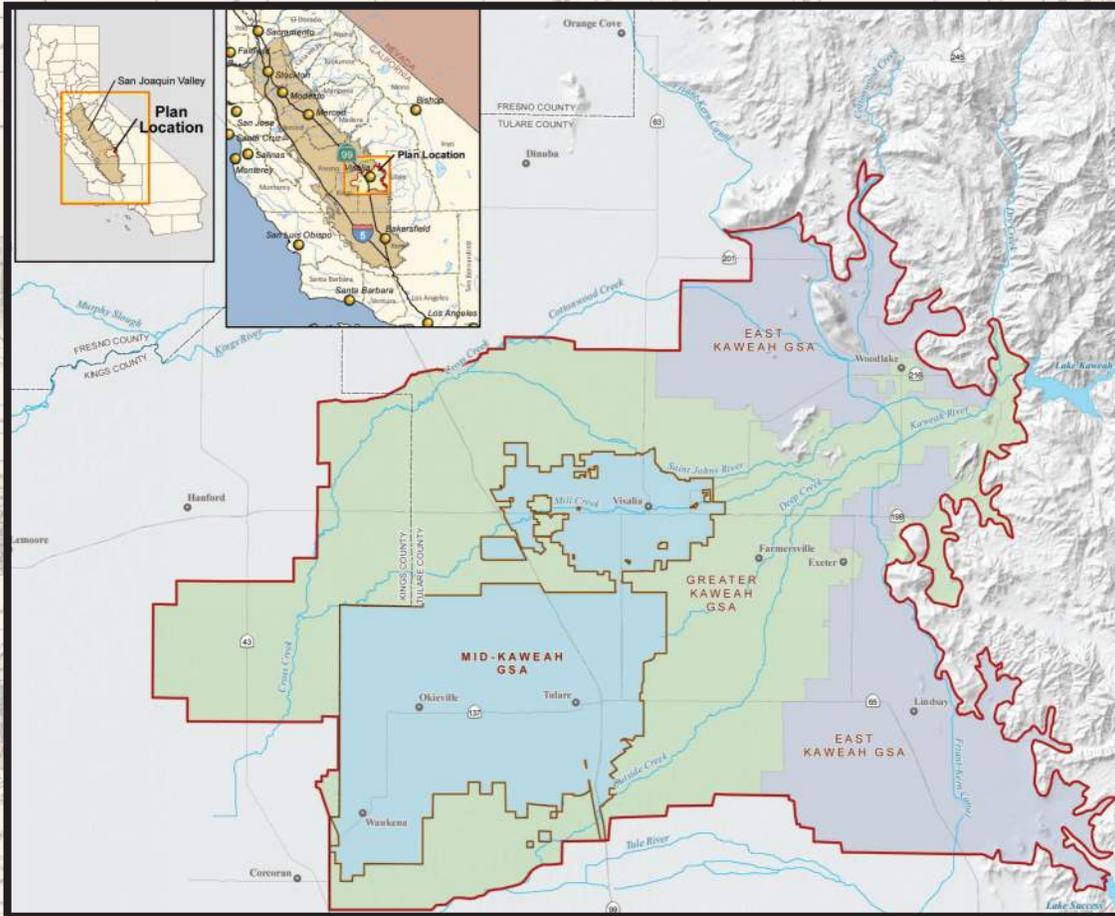




GREATER KAWEAH GROUNDWATER SUSTAINABILITY AGENCY



2022 First Amended Groundwater Sustainability Plan

GREATER KAWEAH GROUNDWATER SUSTAINABILITY AGENCY

July 27, 2022

*Prepared under the Kaweah Subbasin Coordination Agreement with
Mid-Kaweah GSA and East Kaweah GSA*

2022 First Amended Groundwater Sustainability Plan

July 27, 2022

Submitted to:
Greater Keweenaw Groundwater Sustainability Agency

2022 First Amended Groundwater Sustainability Plan

Revisions prepared by:



In association with:



2020 Groundwater Sustainability Plan

Prepared by:



Basin Setting developed under the direction of GEI and GSI Professional Geologists.

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Executive Summary

23 Cal. Code Regs. § 354.4 General Information

Each Plan shall include the following general information: (a) An executive summary written in plain language that provides an overview of the Plan and description of groundwater conditions in the basin.

This Groundwater Sustainability Plan (GSP) provides revisions to the process and methodology applied to the chronic lowering of groundwater level sustainable management criteria (SMC) for the San Joaquin Valley - Kaweah Subbasin (Subbasin). The revisions are in response to the California Department of Water Resources (DWR) incomplete determination of the three GSPs submitted in January 2020. The three GSPs are being implemented by three Groundwater Sustainability Agencies (GSAs) covering the entirety of the Subbasin

DWR provided a staff report with a statement of findings explaining the incomplete determination for the Kaweah Subbasin GSPs. The staff report states, “The Plan does not define sustainable management criteria... in the manner required by SGMA and the GSP Regulations”. DWR’s findings referred to the following three deficiencies:

- 1. The GSPs do not set sustainable management criteria for chronic lowering of groundwater levels in the manner required by SGMA and the GSP Regulations.*
- 2. The GSPs do not set sustainable management criteria for subsidence in the manner required by SGMA and the GSP Regulations.*
- 3. The GSPs do not consistently identify interconnected surface water systems, or the quantity and timing of depletion of those systems due to groundwater use. The GSPs do not consistently define sustainable management criteria for depletion of interconnected surface water in the manner required by the GSP Regulations.*

The GSAs are given up to 180-days from the receipt of DWR’s staff report to address the deficiencies. The revisions responding to the deficiencies are primarily being addressed in the Kaweah Subbasin Coordination Agreement Appendix 6 as well as in Section 3 (Sustainability Goal), Section 5 (Sustainable Management Criteria), and Section 7 (Projects and Management Actions) of this GSP.

The Greater Kaweah Groundwater Sustainability Agency (GKGSA) has prepared this GSP to comply with the Sustainable Groundwater Management Act of 2014 (SGMA) for a portion of the Kaweah Subbasin. The remainder of the subbasin will be addressed by GSPs for the East Kaweah GSA and the Mid-Kaweah GSA. **Figure ES-1** shows the location of these GSAs and GSAs in the adjacent subbasins. One or more GSP is required by SGMA for medium- and high-priority subbasins, including management criteria, to achieve the sustainable use of the groundwater resource. The Kaweah Subbasin is classified as high-priority, according to California Water Code § 10933 (b) and has been designated a critically overdrafted by DWR. This latter designation required submittal of the initial GSP to DWR by January 31, 2020.

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Section 1 Introduction

Section 1 provides introductory information about the GKGSA and its jurisdictional area, including land use, water use, wells, and other characteristics, outreach to stakeholders, and the organization of the GSP.

The Kaweah Subbasin (No. 5-22.11 per DWR Bulletin 118, 2003, 2016) occupies approximately 700 square miles within the larger San Joaquin Valley Basin and is situated primarily within Tulare County with a small portion in eastern Kings County. The region is a prime agricultural area in the Central Valley and home to numerous small towns and communities, as well as the larger cities of Tulare and Visalia. Surface water supplies consist of the local Kaweah River system, as well as the Friant Unit of the Central Valley Project (CVP). Conjunctive-use recharge operations have utilized these water supply sources for several decades.

The GKGSA is a Joint Powers Authority (JPA) and is comprised of five agencies, including

- Kaweah Delta Water Conservation District (KDWCD)
- County of Tulare
- Kings County Water District (KCWD)
- Lakeside Irrigation Water District (LIWD)
- St. Johns Water District (SJWD)

In addition, California Water Service Company joined the GKGSA under a Memorandum of Agreement. **Figure ES-2** shows the location of these agencies as well as other related agencies. The Board of Directors is comprised of the above agencies plus a representative from both the Rural Communities Committee and the Stakeholder Committee.

The GKGSA jurisdictional area is approximately 340 square miles (50% of the subbasin) and is situated across the subbasin, from an apex on the eastern side where the Kaweah River enters the subbasin to the western side. The East Kaweah GSA area is located on the eastern flank of the subbasin and is bisected by GKGSA. The Mid-Kaweah GSA area is located within the central to western side of the subbasin and is surrounded by GKGSA, except for a portion of its western boundary.

KDWCD is the primary local agency that measures groundwater levels at numerous wells within the GKGSA area along with DWR for the California Statewide Groundwater Elevation Monitoring (CASGEM) program. KDWCD has also established land subsidence monitoring stations throughout the subbasin.

General plans have been prepared by Tulare and Kings Counties and by the Cities of Exeter, Farmersville, and Woodlake. These plans promote the conservation of water and the protection of the quantity and quality of groundwater in their respective areas. The GKGSA will support these polices and work for improvements, as necessary, during the implementation of the GSP.

Public outreach was included in the development of the GSP to address the interests of beneficial uses and users of groundwater. GKGSA conducted a voluntary online survey of users and held

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focused meetings with various organizations during 2019 as well as conducting regular meetings of the Board of Directors, the Technical Advisory Committee, the Rural Communities Committee, and the Stakeholders Committee.

Section 2 Basin Setting

Section 2 provides summary information for the GKGSA portion of the basin setting, which was developed for the entire subbasin and presented in **Appendix 2A**. The basin setting is comprised of a hydrogeologic conceptual model, groundwater conditions, and a water budget.

In general, groundwater flows across the GKGSA in a southwesterly direction and to local cones of depression during the irrigation season. A single aquifer is present in the eastern half of the subbasin but is split into two aquifers by the Corcoran Clay in the western half. The vertical flow gradient is from shallow to deep conditions. Groundwater quality data are available for public water supply wells across the GKGSA area and from a limited sampling of domestic wells. Several legacy constituents of concern were identified due to concentrations near maximum contaminant levels (MCLs) or due to increasing trends in concentration, most notably arsenic, nitrate, certain volatile organics, and 1,2,3-trichloropropane (1,2,3 TCP).

Land subsidence has occurred throughout much of the GKGSA area, and the Kaweah Subbasin in general but data are limited in scale and frequency. The largest amounts of subsidence occurred along the western and southwestern portions of the GKGSA area. Greater amounts of subsidence are believed to have occurred beyond the Kaweah Subbasin to the west and south. Subsidence will occur when groundwater extraction decreases the water pressure in the aquifers (sand and gravel layers) and causes groundwater to flow out of the aquitards (clay layers). The lower water pressure in the clay layers allows the clay layers to compress which results in land subsidence. Sudden and variable land subsidence can damage infrastructure, including roads, bridges, canals, pipelines, and buildings. As much as 10 feet of subsidence has occurred in the northwestern GKGSA area since 1950 and as much as 20 feet in the southwestern GKGSA area.

Groundwater levels throughout the majority of the Kaweah Subbasin do not appear to support Interconnected Surface Waters or Groundwater Dependent Ecosystems (GDEs). However, data availability are limited at this time and additional work is proposed under a new work plan included in the Management Actions Section 7.3 to better understand interconnected surface water presence and nexus of depletions due to groundwater pumping, if any.

A water budget was developed for a 21-year period (1997-2017) and provides estimates of the physical net movement of water in and out of the GKGSA area on an annual basis, based on a 3-dimensional groundwater water model that was calibrated for the subbasin. During that period, average groundwater storage was estimated to be a net loss of 34.6 thousand acre-feet (TAF) per year due to a combination of natural percolation, water management activities within the GKGSA, and influences from neighboring GSAs both in the Kaweah Subbasin and in neighboring subbasins. The range of storage change was -337 to 512 TAF per year during water year conditions that varied from the most-dry to most-wet with a median index that could be classified as moderately dry.

Section 3 Sustainability Goal and Undesirable Results

Section 3 provides the Sustainability Goal and defines the undesirable results for the sustainability indicators (five of six) for the Kaweah Subbasin. These overarching definitions were developed by the three GSAs and are fundamental to the Coordination Agreement between the GSAs in their sustainable management of their groundwater resources. Four sustainability indicators were clearly applicable to the Kaweah Subbasin, including chronic lowering of groundwater levels, reduction in groundwater storage, degraded water quality, and land subsidence. Seawater intrusion is clearly not applicable to the Kaweah Subbasin because Pacific Ocean is located over 80 miles to the west on the opposite side of the Coast Range. Interconnected surface water has significant data gaps for understanding the presence of any interconnection and corresponding nexus to depletions caused by groundwater pumping. A work plan to fill data gaps and further investigate potential interconnected surface water will be implemented and further with a target of having a better understanding and data set by the 2025 GSP update.

Section 4 Monitoring Network

Section 4 provides information on the monitoring network for surface water flow, groundwater levels, groundwater quality, and land subsidence for the GKGSA area. The network includes 27 surface water gages along the rivers and major creeks, approximately 40 representative wells for groundwater levels, 80 public water supply wells for groundwater quality, and 25 land subsidence stations.

Section 5 Sustainable Management Criteria

Section 5 provides sustainable management criteria (SMC) for the GKGSA area, including numeric values for minimum thresholds (MTs) and measurable objectives (MOs) at the various monitoring locations of groundwater levels, storage, quality, subsidence, and with this 2022 revision, preliminary SMC for interconnected surface waters. Section 5 also includes selection of interim milestones for the various indicators. As discussed above, SMCs were not developed for seawater intrusion due to the vast distance from the Pacific Ocean.

The groundwater SMCs were developed to protect relevant and applicable beneficial uses and users of groundwater in the Subbasin. Beneficial users of groundwater are domestic pumpers, disadvantaged communities, small water systems (2-14 connections), municipal water systems (>14 connections), and agricultural pumpers. Understanding the types of users and their access to groundwater is the first step taken to inform what the GSAs and their stakeholder groups consider significant and unreasonable impacts to those users. Since wells are how users access groundwater, the approach used to develop SMC is based on estimated water supply well depths. The depth of wells across the Subbasin varies by depth to groundwater and beneficial user type. Because of well depth variability, the Subbasin (and thereby the GKGSA) was subdivided into analysis zones based on GSP management areas, clusters of beneficial user types, aquifers, and available completed well depth data. Completed well depth statistics inform significant and unreasonable groundwater levels, with the SMC being based on protecting greater than the 90th percentile of all beneficial uses and users. These 90th percentile protection groundwater levels were then compared to the 2020 GSP which used groundwater level trends for 2006 to 2016 projected into the future and the respective 2030- and 2040-projected potentiometric maps. In most cases this trend analysis resulted in higher

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elevations for MTs, potentially providing more protection than the estimated 90th percentile groundwater levels. Inclusive of these SMC, the Subbasin and GKGSA are committing to a Mitigation Program to mitigate certain impacts to active wells as groundwater levels transition to a more sustainable long-term condition. MOs were set on the basis of providing for five (5) years of drought storage prior to reaching MT levels. An undesirable result will be recognized if one-third of groundwater levels across the Kaweah Subbasin exceed the MT.

SMCs for groundwater storage were set for the entire GKGSA, based on the potentiometric maps for 2017, representative well MOs, and representative well MTs. The volume difference between the 2017 and MT map times the specific yield produced the MT for groundwater storage and the MO was produced similarly using the 2017 and MO maps.

For groundwater quality SMCs, the Maximum Contaminant Level (MCL) or the Agriculture Water Quality Objective (WQO) was the basis for the MTs for 10 primary constituents, including arsenic, chromium-VI, sodium, chloride, nitrate, perchlorate, total dissolved solids, tetrachloroethene, dibromochloropropane, and 1,2,3-TCP. The choice of the MCL or the WQO will be based on the primary use of the groundwater. The MOs were set at 75% of the MCL or WQO. GKGSA will track these constituents at the public supply wells and alert the well owners if a result exceeds the respective MO and will factor the circumstance into its periodic evaluation of overall groundwater conditions. However, GKGSA does not believe it is responsible to address such an exceedance given the pre-existing water quality issues within the subbasin unless the exceedance can be shown to be related to SGMA implementation of projects or management actions.

For the subsidence SMC, an estimate of the total future subsidence was estimated and evaluated by developing a tabular 1-D analysis using historical groundwater levels, review of historical subsidence measurements, and estimates of clay percentages in various portions of the Subbasin. The analysis resulted in a range of subsidence rates that increase heading from east to west across the Subbasin and GKGSA. The estimated total subsidence and subsidence rate from this analysis were compared to potential impacts to various local land infrastructure. Impacting the ability to deliver surface water through the Friant-Kern Canal and local delivery facilities, reducing flood control capacity in waterways, and potentially causing well collapse, amongst other impacts, could be significant and unreasonable impacts that lead to undesirable results in the area. The resulting MT to be protective of surface infrastructure were no more than 9-feet of total subsidence and not more than 0.67 feet/year. The Measurable Objective for subsidence is zero subsidence.

For the interconnected surface water SMC, there are data gaps that challenge the full understanding of the location and nexus to groundwater pumping. To gain a better understanding of this indicator and fill data gaps, the GKGSA has developed a work plan to implement ahead of the 2025 GSP update. The focus of this study will be in areas where depth to groundwater has been within 30 feet or where there has been little to no data in the upper reaches of waterways in the eastern portion of the Subbasin. Increased losses in waterways due to groundwater pumping are potential significant and unreasonable impacts to beneficial uses/users as it reduces the ability to deliver surface water. Surface water deliveries are heavily relied upon in this conjunctive use aquifer. From local experience, typical losses are on the order of 30%. In dry years losses tend to increase. As a starting point, the GKGSA is proposing that beyond 50% losses in the channels due to groundwater pumping hampers the ability to deliver and spread surface water and is thereby the initial MT for

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this indicator. However, the work plan will aim to better understand the potential locations of interconnected surface waters as well as if any depleting reaches are linked to groundwater pumping versus other impacts such as reduced inflow from the mountain front.

Section 6 Water Supply Accounting

Section 6 provides an accounting of various types of water within the Kaweah Subbasin for the three GSAs. The total volume of water was 660 TAF and was comprised of three primary types, including native water at 364 TAF, foreign water at 73 TAF, and salvaged water at 223 TAF. The GKGSA was apportioned 46% of the total volume, including 50% of the native water, 21% of the foreign water and 49% of the salvaged water.

Section 7 Projects and Management Actions

Section 7 provides a description of 16 projects and 12 management actions to enable the GKGSA to succeed at the sustainable management of its groundwater resources. The options include improvements to existing recharge basins, new recharge and storage facilities, changes in operations to gain access to wet-year flows that would previously pass through the subbasin, agricultural and urban conservation, and fallowing as well as further study of wells and the subbasin plus assistance with impaired wells. In addition, the potential use of flow meters would facilitate the application of several management programs, including fees and incentives, a groundwater market, and groundwater allocations. The estimated total capital costs range from \$40 to \$50 million for the increased storage and recharge projects. The total cost of the management actions is \$7 million per year, excluding the currently unknown costs for assisting with impaired wells, the metering program and the well characterization study. Through the 2022 revision one additional management action is being incorporated into the GSP, the work plan for filling the interconnected surface water data gaps. An existing management action, the Impaired Well Assistance Program (now called the Overdraft Mitigation Program) has more details related to the framework for which a mitigation program will be coordinated and developed across the Kaweah Subbasin. The Kaweah Subbasin GSAs are committing to develop and implement a mitigation program to support all beneficial uses/users while providing for the ability to operate and adapt within the Subbasin.

Section 8 DWR Reporting

Section 8 describes the effort to produce annual report for submittal to DWR and for the periodic 5-year assessment of the GSP. Each annual report is due on April 1st for the preceding water year, which starts on October 1st and ends the following September 30th. For example, the 2020 annual report will be submitted by April 1, 2020 for the period between October 1, 2019 to September 30, 2020.

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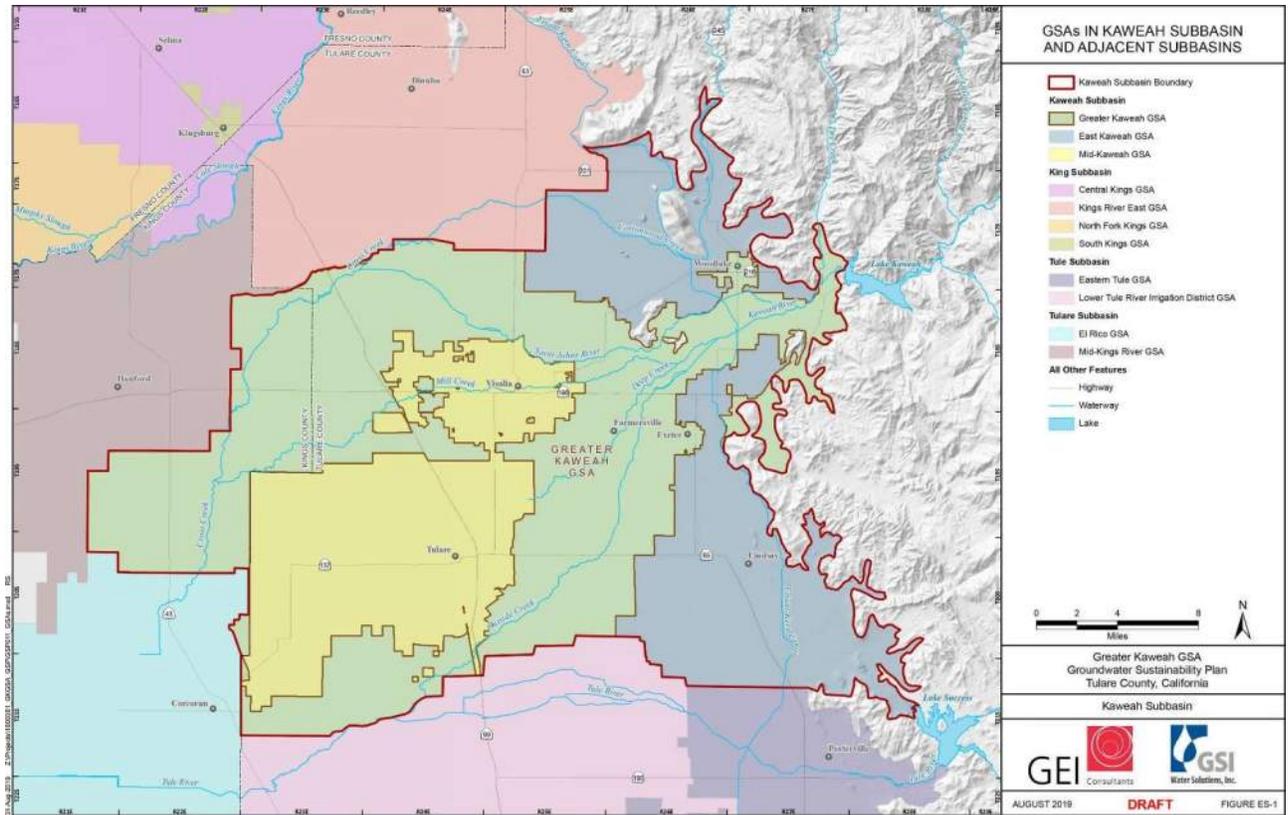


Figure ES-1: Greater Kaweah Jurisdictional Boundaries

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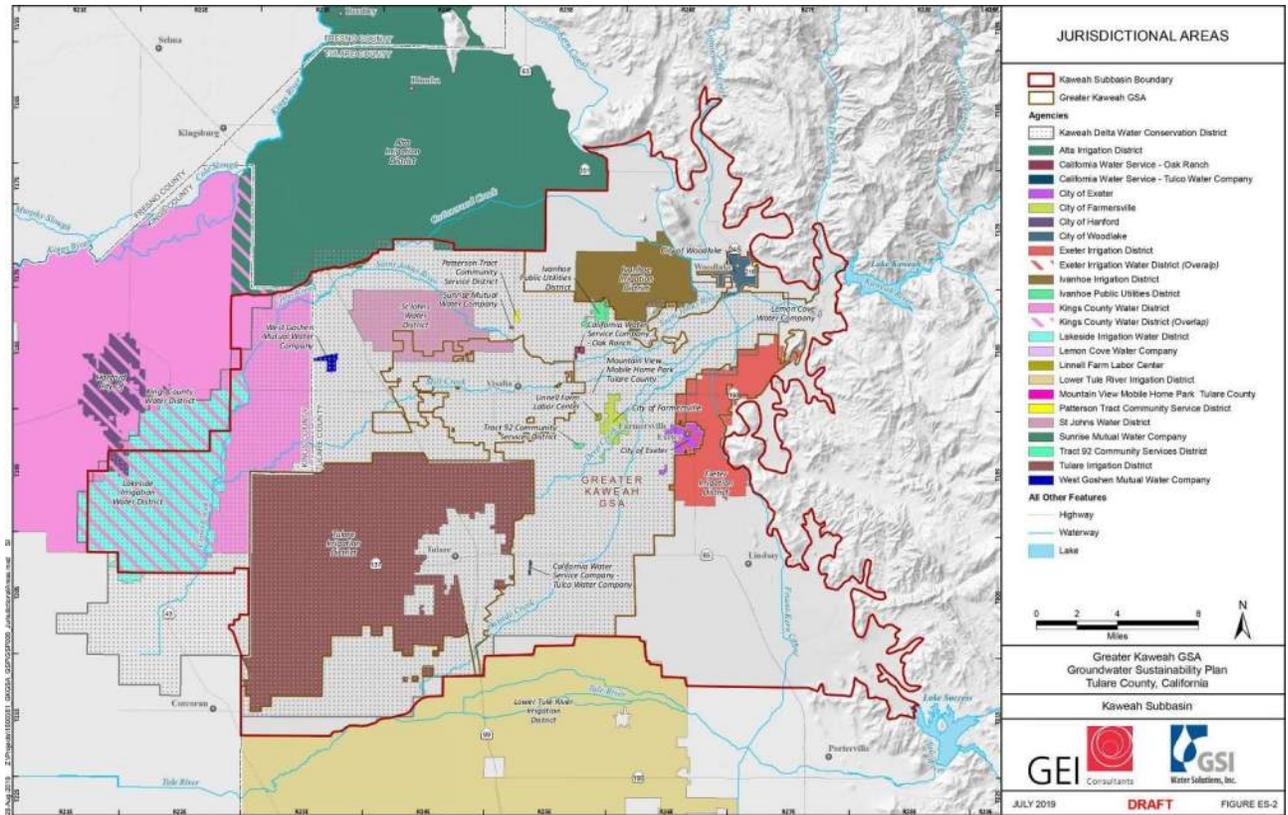


Figure ES-2: Jurisdictional Areas

1. Introduction

1.1 General Information

23 Cal. Code Regs. § 354.2 Introduction to Administrative Information
This Subarticle describes information in the Plan relating to administrative and other general information about the Agency that has adopted the Plan and the area covered by the Plan.

1.1.1 Purpose of GSP

To comply with the requirements of SGMA, the Greater Kaweah Groundwater Sustainability Agency (GKGSA) contracted with GEI Consultants, Inc. (GEI) for the preparation of the 2020 Groundwater Sustainability Plan (GSP). For the 2022 GSP revisions, the GKGSA has contracted with the consultant team of Provost & Pritchard Consulting Group and Montgomery & Associates. The GSP serves to do the following:

- Define and describe the geographic and geologic conditions.
- Identify and describe the Sustainability Goal for the Kaweah Subbasin and the GKGSA jurisdictional area.
- Identify and describe Undesirable Results for the Sustainability Indicators set forth in SGMA as they pertain to the Kaweah Subbasin and the GKGSA jurisdictional area.
- Identify and describe Minimum Thresholds and Measurable Objectives for each monitoring location for each applicable Sustainability Indicator, as required for the GKGSA to achieve the Sustainability Goal.
- Define and identify Projects and Management Actions proposed by GKGSA to achieve the Sustainability Goal.

1.1.2 References

23 Cal. Code Regs. § 354.4. *Each Plan shall include the following general information: (b) A list of references and technical studies relied upon by the Agency in developing the Plan. Each Agency shall provide to the Department electronic copies of reports and other documents and materials cited as references that are not generally available to the public.*

The reference list is provided in Section 9 and copies of documents are provided in the appendices.

1.2 Agency Information

23 Cal. Code Regs. § 354.6 Agency Information
When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information: (a) the name and mailing address of the Agency; (b) The organization and management structure of the Agency, identifying persons with management authority for implementation of the Plan; (c) The name and contact information, including the phone number mailing address and electronic mail address, of the plan manager.

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Agency Name: Greater Kaweah GSA
Agency Address: 2975 Farmersville Rd, Farmersville, CA
Agency Phone Number: (559) 747-5601
Agency Fax Number: (559) 747-1989
Agency Website: greaterkaweahgsa.org
Contact Person: Eric Osterling
Contact Person Title: General Manager

The GKGSA is a joint powers authority formed by five member agencies. The board of directors is comprised of one representative from each member agency, except the Kaweah Delta Water Conservation District (KDWCD), which is allotted two representatives. In addition, the board of directors includes one representative from the Rural Communities Committee, one representative from the Stakeholder Committee, and one representative from California Water Service Company. The total number of directors is nine.

Currently, the only staff of the GKGSA is a General Manager and one technical support staff, whose services are contracted through KDWCD, a member agency of the GKGSA. Staff from KDWCD is available to assist the General Manager as needed. The General Manager of the GKGSA, at the direction of the GKGSA board of directors, is the person with management authority for implementation of the Plan.

As agreed to in the Coordination Agreement, attached hereto and incorporated by reference as Appendix 1D, the Plan Manager for the Kaweah Subbasin is the General Manager for the GKGSA, currently Eric Osterling, whose contact information is located above.

1.2.1 Legal Authority of Agency

23 Cal. Code Regs. § 354.6. . . . *When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information: (d) The legal authority of the Agency, with specific reference to citations setting forth the duties, powers, and responsibilities of the Agency, demonstrating that the Agency has the legal authority to implement the Plan.*

On August 23, 2016, the Kaweah Delta Water Conservation District (KDWCD), the Kings County Water District, the Lakeside Irrigation Water District, St. John’s Water District, and the County of Tulare entered into a Joint Powers Authority (JPA) Agreement to form the Greater Kaweah Groundwater Sustainability Agency (GKGSA). Under this JPA Agreement, the GKGSA was granted the Authority to complete all acts necessary for the exercise of all powers authorized under SGMA and necessary to satisfy the requirements of SGMA. This JPA Agreement is included in **Attachment 1A**.

1.2.2 GSP Implementation Costs

The GKGSA, on behalf of its member agencies, will incur costs to implement its GSP and maintain the plan via annual reports and 5-year updates. These costs and sources of funding are described below.

23 Cal. Code Regs. § 354.6. . . . *When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information: (e) An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs.*

Table 1-1 presents an estimate of the costs associated with the implementation of the GKGSA GSP and measures associated with SGMA compliance.

Table 1-1: Estimated Costs for GSP Implementation

Item	Description	Estimated Cost
Annual Monitoring	Equipment, vehicles, SCADA, software	\$100,000
Projects	Projects with estimated capital or startup costs per Section 7	\$43,000,000
Management Actions	Management Actions with estimated annual costs per Section 7	\$7,000,000
Annual Report	Compilation per DWR Regulations	\$25,000
5-Year GSP Update and Report	Compilation per DWR Regulations, Assessment Report	\$250,000
GSA / GSP Administration	Administration, Legal, Data management, Enforcement, other	\$500,000

1.2.3 GSP Implementation Funding

Under its JPA Agreement and pursuant to SGMA, the GKGSA and its member agencies have the authority to assess fees from the constituent users of groundwater for a variety of activities, including but not limited to

- Preparation and amendment of the GSP
- Investigations, inspections, compliance assistance, and enforcement
- Acquisition of lands, other property, facilities, and services
- Supply, production, treatment, or distribution of water
- Program administration, including a prudent reserve

The fees may be imposed for permits, groundwater extraction, and other regulated activities as adopted by the GSA. GKGSA may seek interest and penalties for failure to pay for the groundwater fees. De

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minimis extractors (domestic wells < 2 AF/year) will not be subject to fees, except under very limited circumstances.

In addition to collecting fees, the GKGSA also has the authority to pursue local, State, and Federal grant funding on behalf of its member agencies for the development of projects within the GSA’s jurisdiction for the purposes of satisfying the requirements of SGMA.

1.3 Description of Plan Area

The GKGSA is located entirely within the Kaweah Subbasin, as defined in DWR Bulletin 118, in the Tulare Lake Hydrologic Region of the San Joaquin Valley Groundwater Basin. The Kaweah Subbasin is bounded by the Kings River Subbasin to the north, the Tulare Lake Subbasin to the west, the Tule Subbasin to the south, and the Sierra Nevada Mountains to the east. The Kaweah and St. Johns Rivers and Cottonwood and Mill Creeks flow through the northern portion of the GKGSA jurisdictional area, from the Sierra Nevada Mountains, turning southwest and draining toward the Tulare Lake Basin. The GKGSA is roughly bisected by California State Highway 99 and the Mid-Kaweah GSA is located within the west-central portion of the GKGSA. The following section describes the area covered by the GKGSA GSP.

1.3.1 Geographic Areas Covered

23 Cal. Code Regs. § 354.8 Description of Plan Area. *Each Plan shall include a description of the geographic areas covered, including the following information: (a) One or more maps of the basin that depict the following, as applicable: (1) The area covered by the Plan, delineating areas managed by the Agency as an exclusive Agency and any areas for which the Agency is not an exclusive Agency, and the name and location of any adjacent basins.*

As shown in **Figures 1-1 and 1-2**, the GKGSA’s jurisdictional area (343 square miles) represents nearly half (49%) of the area within the Kaweah Subbasin (696 square miles), with boundaries coincidental to the boundaries of the Mid-Kaweah GSA, the East Kaweah GSA, and the perimeter of the Kaweah Subbasin. The GKGSA is adjacent to the Kings River Subbasin to the north, Tule Subbasin to the south, the Tulare Lake Subbasin to the west, and the foothills to the Sierra Nevada Mountains to the east. The Mid-Kaweah GSA is located within the west-central portion of the GKGSA area in the vicinity of Visalia and Tulare and west of Tulare.

1.3.2 Adjudicated Areas

23 Cal. Code Regs. § 354.8 (a) *One or more maps of the basin that depict the following, as applicable: (2) Adjudicated areas, other Agencies within the basin, and areas covered by an Alternative.*

Adjudicated areas are not present within the Kaweah Subbasin. **Figure 1-2** depicts the other Agencies within the Kaweah Subbasin. An Alternative (to a GSP) was not prepared for the Subbasin.

1.3.3 Jurisdictional Boundaries and Plan Area Setting

23 Cal. Code Regs. § 354.8. *Each Plan shall include a description of the geographic areas covered, including the following information: (a) One or more maps of the basin that depict the following, as applicable: . . . (3) Jurisdictional boundaries of federal or state land (including the identity of the agency with jurisdiction over that land), tribal land, cities, counties, agencies with water management responsibilities, and areas covered by relevant general plans.*

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Within the GKGSA jurisdictional area, population centers include three incorporated cities and several unincorporated communities. The City of Exeter, the City of Farmersville, and the City of Woodlake are completely located within the GKGSA. A portion of the City of Hanford is also located in the western portion of the GKGSA. Unincorporated communities within the GKGSA area include Goshen, Ivanhoe, Tract 92, and Patterson Tract, as shown on **Figure 1-2**. In addition, **Figure 1-1** shows various water conveyance systems within the Kaweah Subbasin while **Figure 1-2** shows the jurisdictional areas of the KDWCD, Kings County Water District (KCWD), St. Johns Water District, and Lakeside Irrigation Water District within the GKGSA area. Other groundwater users include numerous *de minimus* domestic wells and multi-parcel water systems within the GKGSA, which will be covered by this GSP.

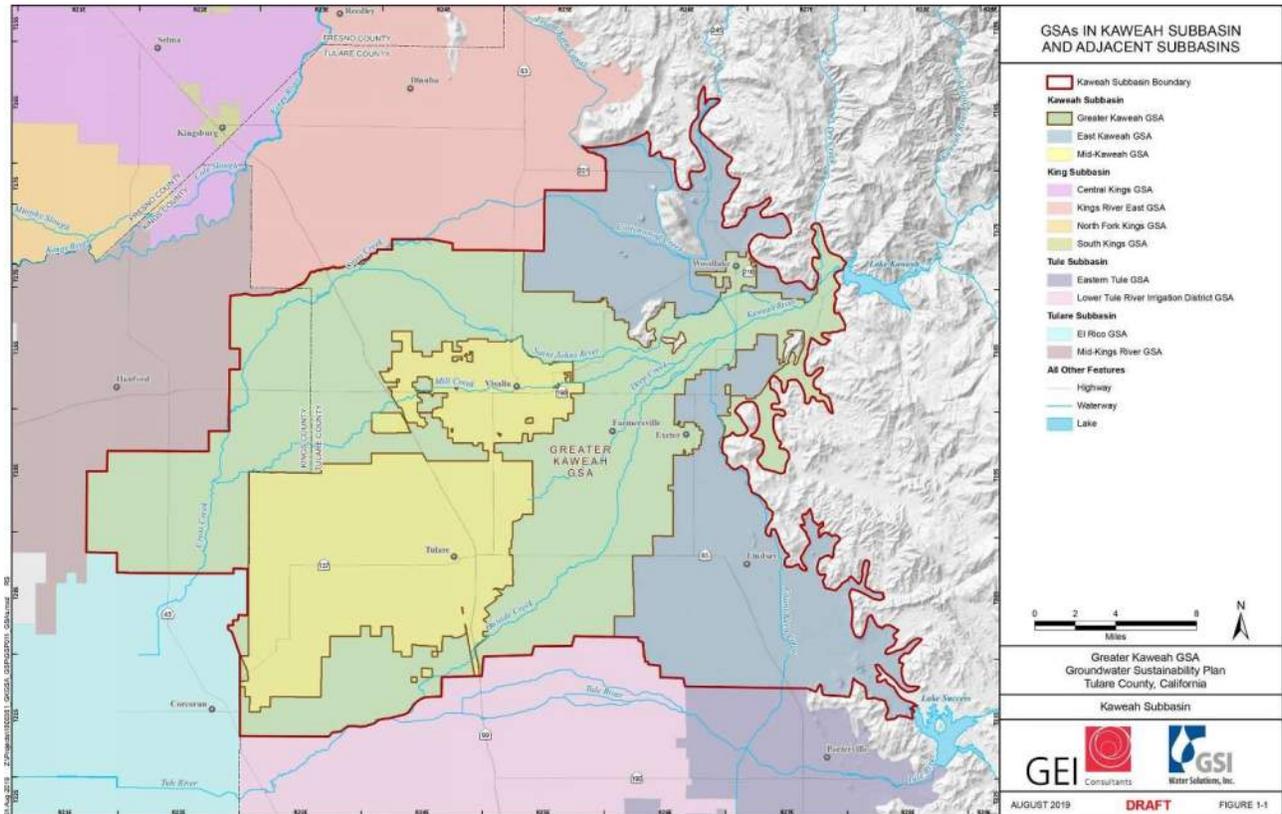


Figure 1-1: Greater Kaweah Jurisdictional Boundaries
Link: Full-size figure is available at the end of this section.

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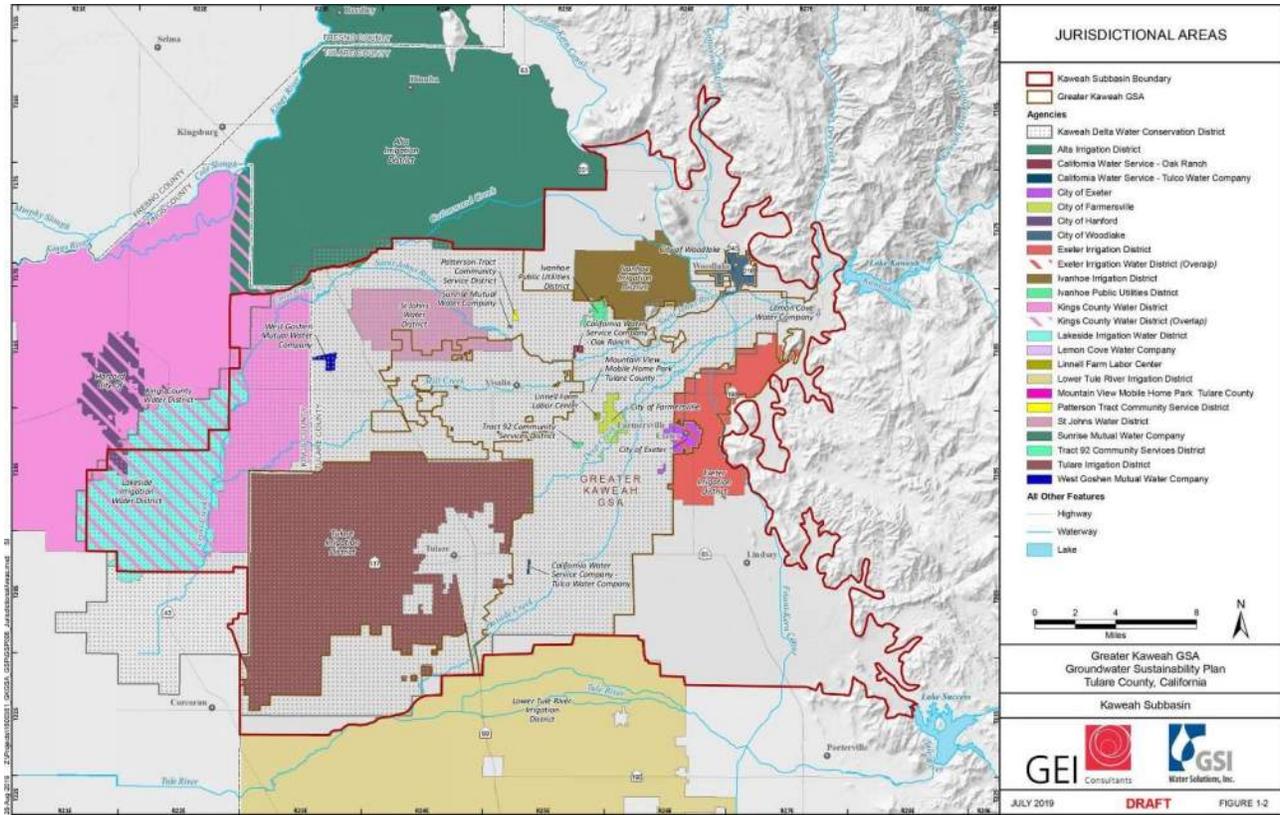


Figure 1-2: Jurisdictional Areas
Link: Full-size figure is available at the end of this section.

Land use within the GKGSA consists mainly of field crops, grain and hay crops, or pasture west of California State Highway 99, as shown in **Figure 1-3**. The eastern portion of GKGSA, outside of the City of Visalia, is mostly deciduous fruit and nut trees with grain and hay crops in the southeastern portion of the GKGSA area. The areas within the limits of the cities of Exeter, Farmersville, and Woodlake are classified as urban, as are the service areas for Ivanhoe Public Utility District, Patterson Tract Community Service District, and Tract 92 Community Service District.

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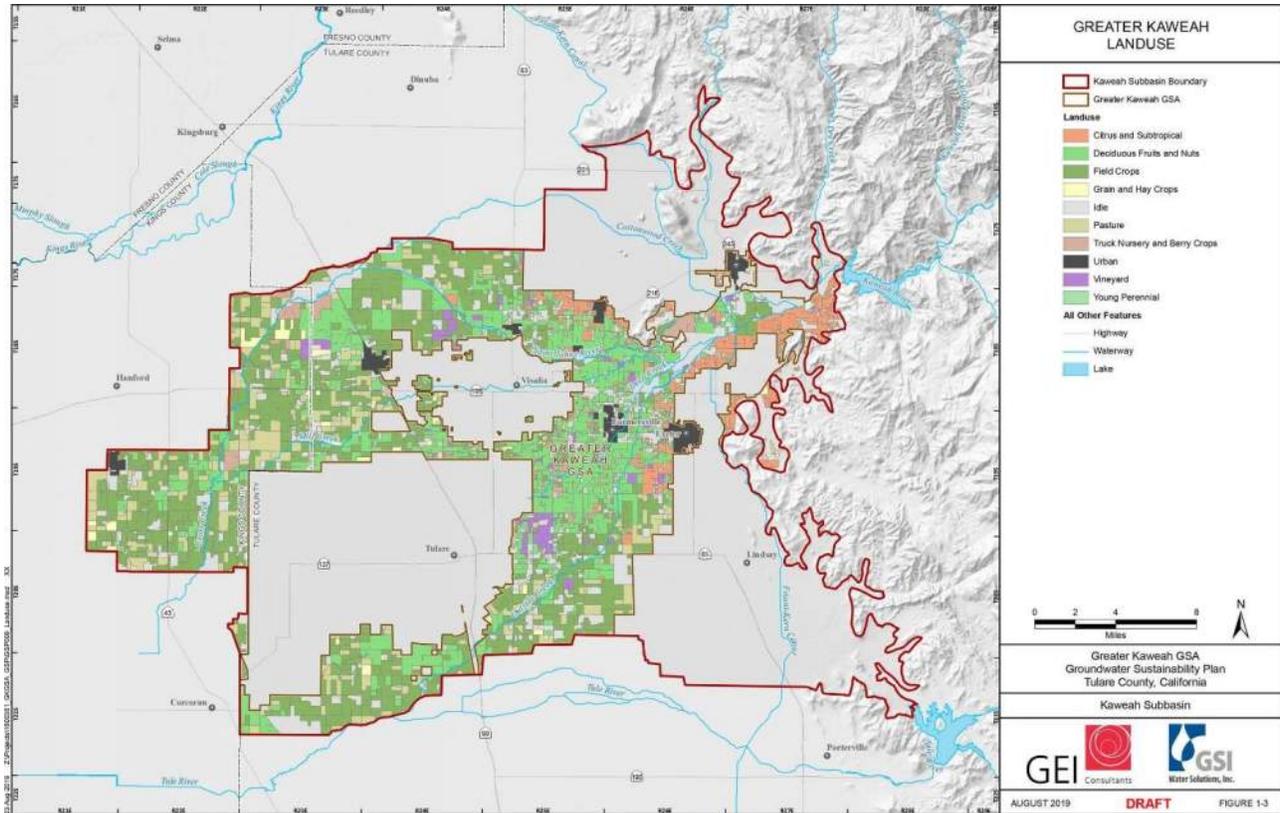


Figure 1-3: Greater Kaweah Land Use
[Link: Full-size figure is available at the end of this section.](#)

The lands located within the service areas of KCWD, KDWCD, Lakeside Irrigation District, and St. Johns Water District may have access to both surface water supply and groundwater supply. The incorporated communities, community service districts (CSDs), public utility districts (PUDs), and undistricted lands within the GKGSA area are supplied by groundwater only. Refer to **Figure 1-2** for the locations of these areas within the GKGSA.

Each of the three incorporated cities in GKGSA’s area have adopted General Plans. For the areas not within the limits of the incorporated cities, the Tulare County General Plan applies. The General Plans for the cities and the General Plan for the County each have land use elements which address water usage. These elements are to be considered in this GSP.

1.3.4 Existing Land Use Designations, Water Use Sectors, and Water Use Types

23 Cal. Code Regs. § 354.8. *Each Plan shall include a description of the geographic areas covered, including the following information: (a) One or more maps of the basin that depict the following, as applicable: . . . (4) Existing land use designations and the identification of water use sector and water source type.*

Figure 1-4 shows the various water sources and water use sectors in the GKGSA. The majority of the GKGSA uses a combination of surface water and groundwater for mostly agricultural uses, followed by commercial/industrial uses. The southwestern corner of the area relies on groundwater for mostly agricultural uses and the urban areas within GKGSA also rely on groundwater.

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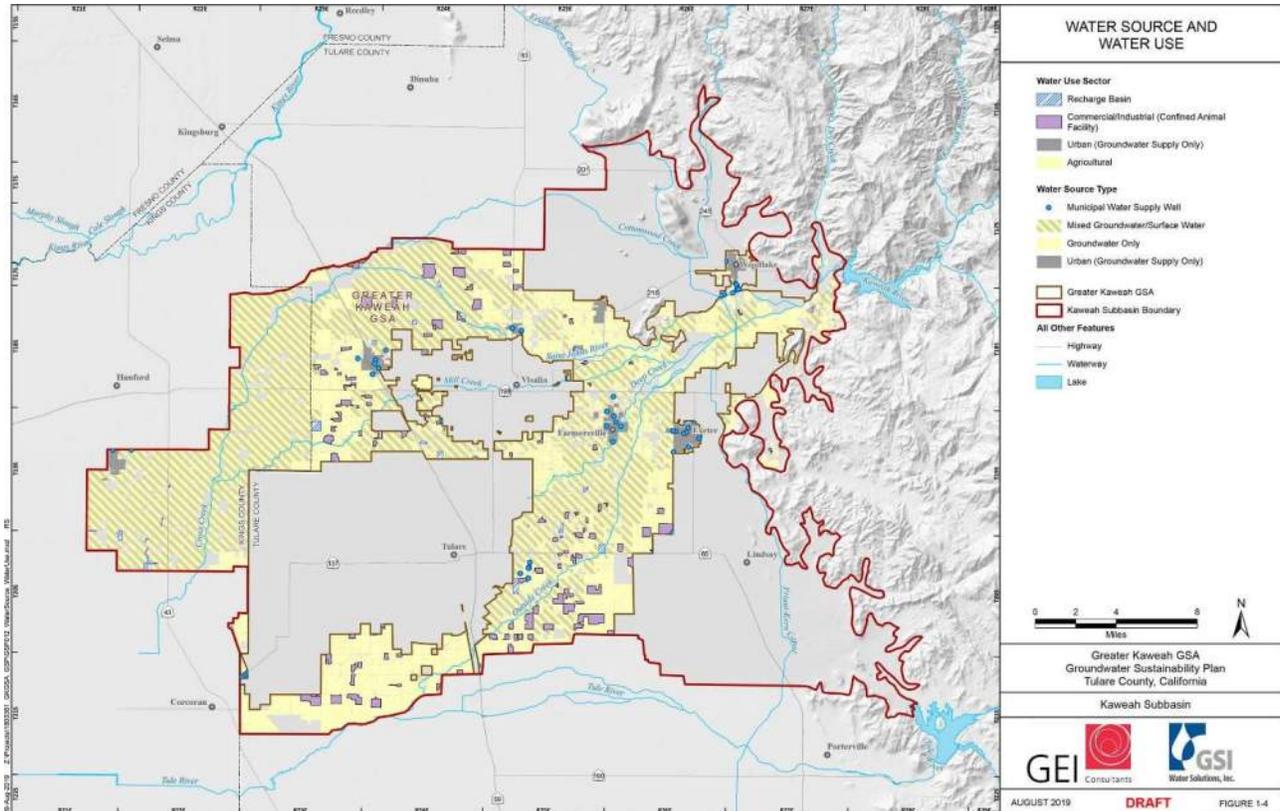


Figure 1-4: Water Source and Water Use
Link: Full-size figure is available at the end of this section.

1.3.5 Wells, Well Density, and Groundwater Dependent Communities

23 Cal. Code Regs. § 354.8. *Each Plan shall include a description of the geographic areas covered, including the following information: (a) One or more maps of the basin that depict the following, as applicable: . . . (5) The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the Department, as specified in Section 353.2, or the best available information.*

Figures 1-5, 1-6, and 1-7 are well density maps and show the overall distribution of domestic, production, and public supply wells within the GKGSA, respectively. These maps are based on information from the DWR’s Online System of Well Completion reports (OSWCR). The SGMA regulation [§ 354.8(a)(5)] requires the mapping of agricultural, industrial, and domestic wells based on DWR data; and these figures are provided for that requirement. The DWR data appears to have combined agricultural and industrial wells into the production well category although the majority of production wells in the GKGSA are likely agricultural wells. The status of these wells (active, inactive, abandoned, destroyed) is not yet known and confirming the status is beyond the scope of this version of the GSP.

GKGSA conducted a preliminary reconnaissance-level survey of all wells in the Agency area in the Summer of 2019 using remote sensing and GIS tools. This survey was intended to create a foundation for an immediate well registration process following implementation of the Plan. The survey identified potential well locations, classified wells according to use and probability of current activity (active,

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possibly active and inactive). In conjunction with parcel ownership data, this information will be used to develop a targeted outreach distribution list for the purposes of well registration to gain a more precise and current understanding of wells in the region.

The figures show the ‘square-mile’ sections that are covered in whole, or in part, of the GKGSA area. This GSP was not intended to produce any finer resolution than provided by the DWR map application.

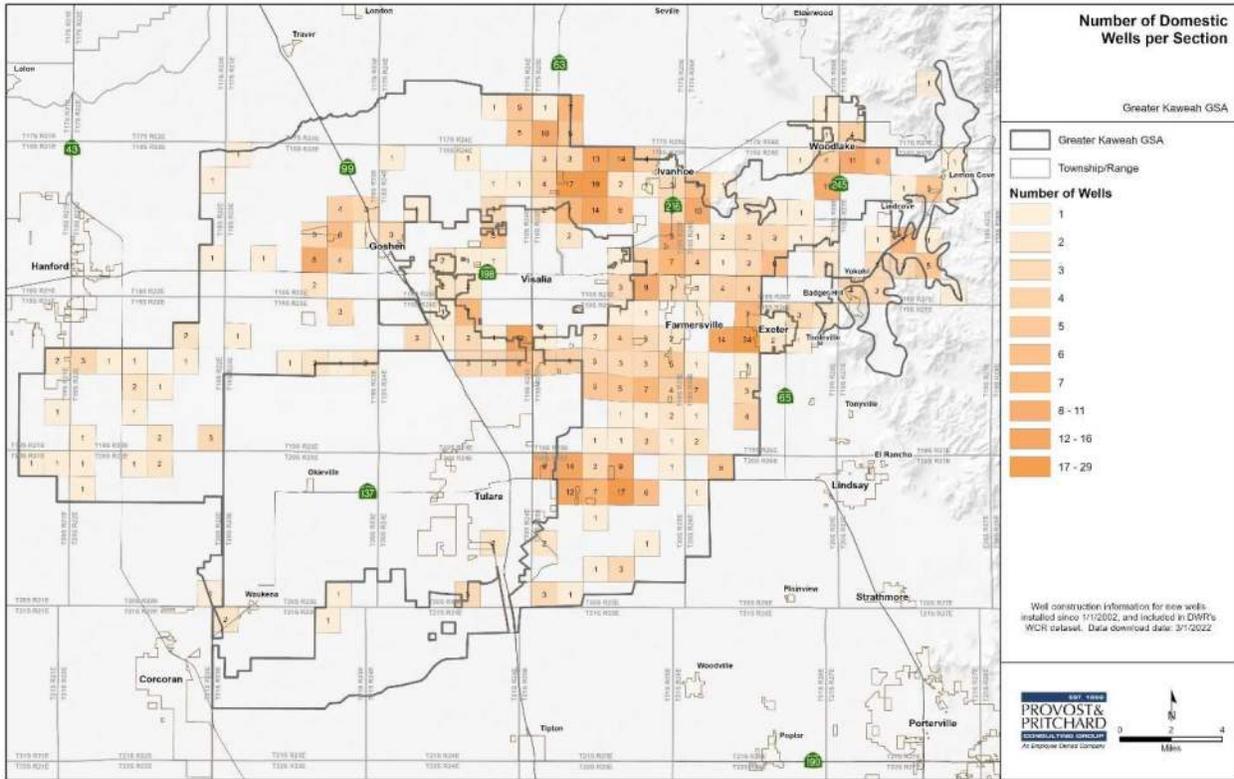


Figure 1-5: Well Density by Section (Domestic Wells)
Link: Full-size figure is available at the end of this section.

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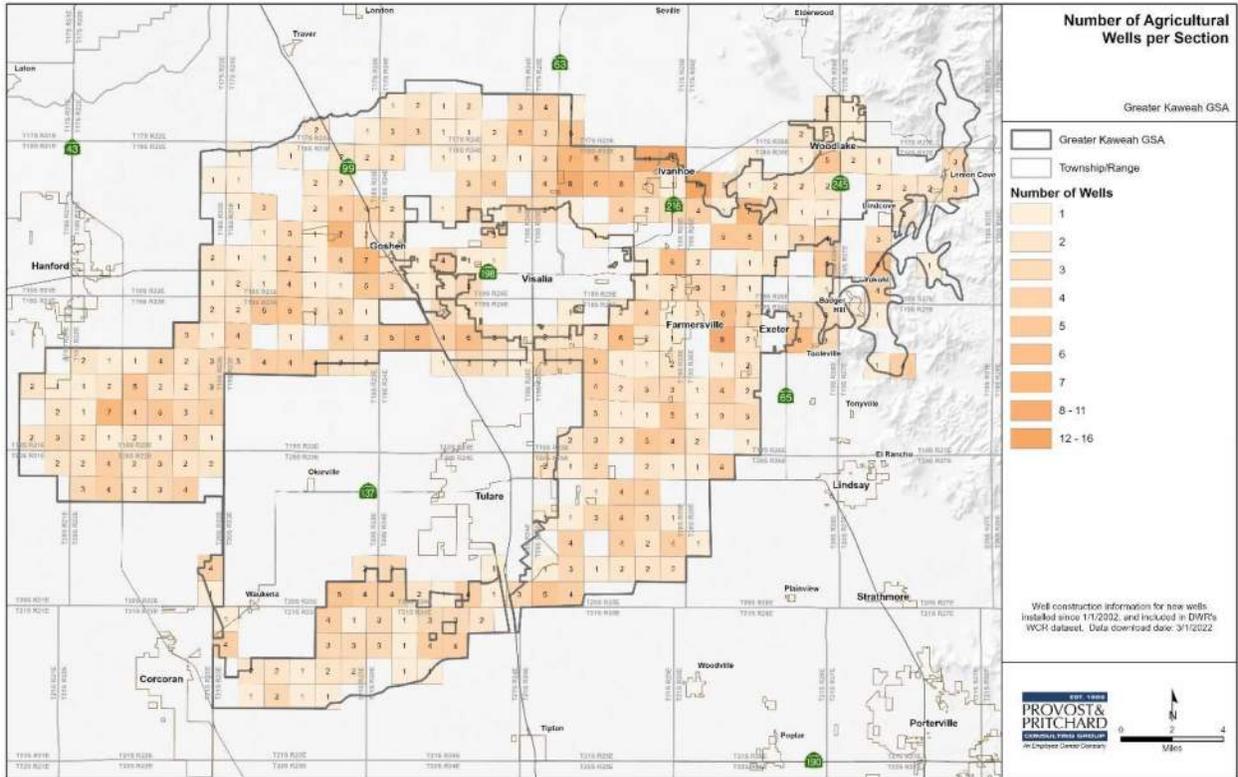


Figure 1-6: Well Density by Section (Production Wells)
 Link: Full-size figure is available at the end of the section.

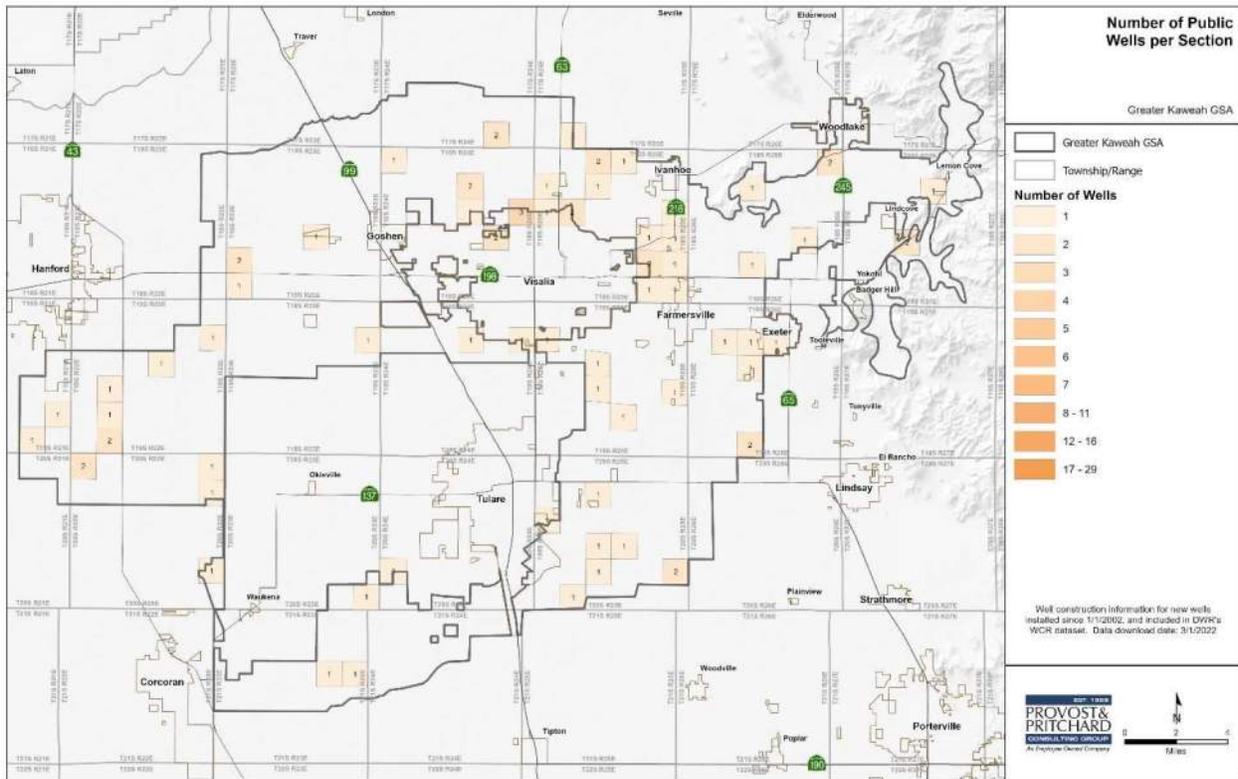


Figure 1-7: Well Density by Section (Public Wells)
 Link: Full-size figure is available at the end of this section.

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Table 1-2 summarizes the well completion report density information for wells that are classified as new construction from 01/01/2002 to 03\01\2022 as available from the DWR OSWCR. Only wells with intended use for domestic, agricultural, or public purposes are included. Well completion report data was summarized by section and assigned to GKGSA if the centroid of the section fell within the GSA boundary. Data from the remaining section centroids outside of GKGSA but within the subbasin are also included.

Table 1-2: Summary of Well Information

Location of Section Centroid		Total	Domestic	Agricultural	Public	
Number of Wells	Within GKGSA	1,468	618	784	66	
	Outside GKGSA	1,533	537	944	52	
	Total	3,001	1,155	1,728	118	
Well Density	Max	Within GKGSA	39	24	13	2
		Outside GKGSA	41	20	18	3
	Mean	Within GKGSA	8	4	3	1
		Outside GKGSA	7	3	3	1

Overall, a total of 3,001 well completion reports met the above criteria within the entire subbasin. Of those, 1,468 were assigned to GKGSA based on the section centroid method. Approximately 42% (618) were classified as domestic, 53% (784) as agricultural, and 5% (66) as public. Maximum density of wells per section was similar within and outside of GKGSA at 39 and 41 respectively. The mean densities for overall and each category were also almost identical within and outside of GKGSA.

The higher density domestic well sections within the GKGSA are generally located around population centers in the northeastern portions of the GKGSA area, east of Tulare, around Visalia, between Exeter and Farmersville, and in the vicinity of Woodlake. Production wells show lesser densities but are generally more evenly distributed across the GKGSA area. The distribution of public wells is quite low, with the highest density around Visalia and Farmersville.

All the communities in the GKGSA area are dependent on groundwater, including three incorporated cities (Exeter, Farmersville, Woodlake), several unincorporated communities, and the small community systems owned and operated by California Water Service Company (**Figure 1-2**), as well as the numerous domestic water users (*de minimus*) and multi-parcel water systems.

1.3.6 Land Use Elements

23 Cal. Code Regs. § 354.8 Description of Plan Area. *Each Plan shall include a description of the geographic areas covered, including the following information: (f) A plain language description of the land use elements or topic categories of applicable general plans that includes the following:*

- (1) A summary of general plans and other land use plans governing the basin.*
- (2) A general description of how implementation of existing land use plans may change water demands within the basin or affect the ability of the Agency to achieve sustainable groundwater management over the planning and implementation horizon, and how the Plan addresses those potential effects.*
- (3) A general description of how implementation of the Plan may affect the water supply assumptions of relevant land use plans over the planning and implementation horizon.*
- (4) A summary of the process for permitting new or replacement wells in the basin, including adopted standards in local well ordinances, zoning codes, and policies contained in adopted land use plans.*

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

Each of the three incorporated cities in GKGSA’s area have adopted General Plans. For the areas not within the limits of the incorporated cities, the General Plans of Tulare County and Kings County are applicable. These General Plans have land use elements and other elements which address water usage. These elements are to be considered in the development and implementation of this GSP.

1.3.6.1 County of Tulare General Plan

The 2030 General Plan Update for the County of Tulare, adopted on August 28, 2018, does not have a specific update to address water usage and supply. However, the 2012 County’s General Plan has a Water Resources Element that requires the County to adopt ordinances and measures to:

1. Regulate the permanent extraction and exportation of groundwater from Tulare County.
2. Assure that all watershed planning is done on a complete regional and watershed basis, and that such planning considers a balance between urban and agricultural demands.
3. Where feasible, the County shall participate in coordinated local, regional, and Statewide groundwater monitoring and planning programs.
4. Encourage active participation by local stakeholders and develop groundwater monitoring partnerships with local groundwater users and developers. Avoid the destruction of established recharge sites.
5. Work with federal, State, local, and regional agencies to improve local groundwater pollution detection and monitoring.
6. Encourage responsible agencies and organizations to install additional groundwater monitoring wells in areas where data gaps exist.
7. Research the development of an education program to inform homeowners regarding water quality concerns.
8. Incorporate provisions, including evaluating incentives, for the use of reclaimed wastewater, water conserving appliances, drought tolerant landscaping, and other water conservation techniques into the County’s building, zoning.
9. Identify and evaluate conditions within established watersheds which are causing deterioration of the water quality, water supply, or declining water yields.
10. Develop an education program to inform residents of water conservation techniques and the importance of water quality and adequate water supplies.
11. Protect groundwater recharge areas.

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12. Amend County ordinances to include development standards which protect groundwater basins and surface water drainage areas and provide incentives for use of conservation techniques.
13. Establish development or design standards for the protection of groundwater recharge areas.
14. Work with other local/regional agencies, water purveyors, and interest groups to seek funding sources to implement a variety of surface and groundwater restoration activities.

1.3.6.2 Kings County General Plan

The 2035 Kings County General Plan was adopted on January 26, 2010 addresses water in the objectives and policies of various elements, primarily in Resource Conservation (RC) and in Dairy, as listed below. The RC element recognizes that nearly one-third of its annual water use is derived from groundwater, which is replenished by precipitation, surface and subsurface flows, and imported water. The plan acknowledges that recharge to the aquifer beneath the Corcoran Clay occurs to the north and east of Kings County. The Air Quality element recognized improvements in agricultural practices that provide benefits to energy and air quality, including water well efficiency upgrades, conversion to electric motors to pump water versus the use of diesel engines, and the application of fertilizers and pesticides with irrigation water.

Element	Statement
Introduction	Protect water, natural lands, agriculture, prime soils, native plant and animal habitat, threatened and endangered species, fishing, energy, mineral, and archeological, cultural and historical resources throughout the County.
Land Use Objective A1.2	Protect natural waterways to ensure continued water delivery and recharge to surrounding agricultural uses and related homesites, while maintaining the natural aesthetic appeal of the Kings River and Cross Creek waterway channels.
RC Policy A1.1.1	Cooperate with water purveyors and water management agencies to manage groundwater resources within the County to assure an adequate, safe and reliable groundwater supply for existing and future water users.
RC Policy A1.1.2	Review new discretionary development proposals, including new or expanded uses within agricultural zone districts, to ensure that there are adequate water supplies to accommodate such uses. Projects should provide evidence of adequate and sustainable water availability prior to approval of a tentative map or other land use approval.
RC Policy A1.1.3	Discourage the net export of groundwater and surface water resources currently allocated to water users within Kings County.
RC Policy A1.1.5	Encourage and support regional groundwater management strategies such as an Integrated Regional Water Management Plan.

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RC Policy A1.1.6	Support expansion of joint management of surface water and groundwater supplies that contributes to the protection, reliability and sustainability of local and regional water supplies.
RC Policy A1.2.1	Encourage and support the development of educational programs by water purveyors and public agencies, in order to increase public awareness of water conservation opportunities and the potential benefits of implementing water-saving measures and programs.
RC Policy A1.2.3	Continue to support efforts and educational programs intended to reduce water consumption on agricultural lands and enhance groundwater recharge.
RC Objective A1.4	Protect the quality of surface water and groundwater resources in accordance with applicable federal, state and regional requirements and regulations.
RC Policy A1.4.1	Evaluate proposed land uses and development projects for their potential to create surface and groundwater contamination from point and non-point sources. Confer with other appropriate agencies, as necessary, to assure adequate water quality review to prevent soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products or waste; floating debris; and runoff from the site.
RC Policy A1.4.2	Monitor and enforce provisions to control water pollution contained in the U.S. EPA National Pollutant Discharge Elimination System (NPDES) program as implemented by the California Water Quality Control Board, Central Valley Region (RWQCB).
RC Policy A1.4.3	Require the use of feasible and cost-effective Best Management Practices (BMPs) and other measures designed to protect surface water and groundwater from the adverse effects of construction activities and urban and agricultural runoff in coordination with the RWQCB.
RC Policy A1.4.4	Encourage and support the identification of degraded surface water and groundwater resources and promote restoration where appropriate.
RC Objective A1.5	Avoid the placement of potential pollution sources in areas that have the potential to foster groundwater recharge.
RC Policy A1.5.1	Cooperate with local agencies in the preservation and purchase of natural sloughs for use as water recharge and drainage basins.
RC Objective A1.6	Protect groundwater quality by applying development standards which seek to prevent pollution of surface or groundwater and net loss of natural water features.
RC Policy A1.6.2	Support measures to ensure that water users do not unreasonably use groundwater resources.
RC Policy A1.6.3	Protect groundwater by enforcing the requirements for installation of wells in conformity with the California Water Code, the Kings County Well Ordinance, and other pertinent state and local requirements.
Health and Safety Objective A3.1	Prepare for long term countywide drought conditions by encouraging water conservation measures among urban, rural, and agricultural users, and

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	increase regional water storage capacity to enhance groundwater recharge and capture of floodwater.
Dairy Policy 1.2d	<u>High groundwater areas.</u> New dairies, or the expansion of existing dairies, are prohibited in shallow or perched groundwater areas of the County unless the applicant can demonstrate that the minimum vertical distance between proposed lagoon bottoms/corral surfaces and highest anticipated groundwater levels is at least five feet. Highest groundwater levels shall be established based on available records and site-specific geotechnical investigation by qualified registered professional engineer or hydrogeologist.
Dairy Policy 1.2h	<u>Separation of dairy facilities by ¼ mile.</u> The minimum distance between a Dairy Facility and other Dairy Facilities or confined animal feeding operations shall be one-quarter (¼) mile. This restriction includes only the actual dairy facilities, i.e., corrals, milk barns, feed storage areas, manure storage areas, etc., but not cropland used to spread dairy process water and manure. These separations are required to avoid potential nuisance problems, potential inter-herd disease transmission, soil and groundwater contamination, and cumulative air quality degradation.
Dairy Policy 3.1.a	With each application for a new or expanded dairy, a technical report shall be prepared and shall address the following siting issues: A. Ground and surface water quality and quantity,
Dairy Policy 3.2.a	The <i>Technical Report</i> shall address water issues in the Groundwater Evaluation (see Component 1b of Appendix J), A. Minimum separation from bottom of all lagoons, manure and feed storage areas, and corrals and the groundwater level shall be at least five (5) feet at all times. B. The source of potable water for the Dairy Facility, and the safeguards to protect that water source must be identified.
Dairy Policy 3.2.c	Minimum Dairy Facility setbacks from water wells and water bodies shall be required: A. Manured and feed storage areas on dairy facilities shall be set back 150 feet from wells and water bodies as required by the RWQCB. B. Dairy Facilities shall be designed to ensure that no runoff into surface waters, including rivers, creeks, intermittent streams, canals, reservoirs, lakes, ponds, sloughs, stormwater basins, groundwater recharge basins, floodplains, floodways, etc., will occur. This can be done by constructing barriers or grading the facility away from such water bodies.
Dairy Policy 3.2.d	Dairy process water shall not be discharged into any surface water, including rivers, creeks, intermittent streams, canals, reservoirs, lakes, ponds, sloughs, stormwater basins, or groundwater recharge basins.
Dairy Policy 3.2.h	<i>Hydrogeologic Sensitivity Assessment (HSA):</i> Whenever groundwater is being pumped from a hydrogeologic setting within one-half (½) mile of a proposed dairy site, or an expanding dairy, which is underlain by karst,

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	<p>fractured bedrock, or gravel, the applicants shall retain a qualified Certified Hydrogeologist or Professional Engineer to conduct a HSA.</p> <p>A. The HSA shall evaluate whether hydrogeologic setting would offer adequate barriers to pollutant migration to drinking water supplies. The evaluation shall be conducted in accordance with the principles contained in the EPA’s Ground Water Rule.</p>
Dairy Policy 3.2.i	<p>All existing active and inactive domestic and irrigation water supply wells (including those located at the dairy site) at a proposed new dairy or proposed expansion of an existing dairy shall be inspected by a qualified professional to ensure that each well is properly sealed at the surface to prevent infiltration of waterborne contaminants into the well casing or surrounding gravel pack. If any of the wells are found not to comply with the California Well Standards or RWQCB Standards, the applicant or dairy operator shall retain a licensed well driller to install the required seal or functional equivalent certified by a licensed engineer or other qualified registered professional. Documentation of the inspections and seal installations, if any, shall be maintained on the dairy site and made available to the Code Compliance personnel upon their request. This policy applies to all wells located on the Dairy Facility or on any farmland controlled by the dairy and used for the application of dairy process water.</p>
Dairy Policy 4.1a	<p><i>Manure Nutrient Management Plan (MNMP) Components:</i> The following components shall be addressed in the MNMP.</p> <p><i>B. Manure Handling and Storage</i> – Manure must be handled and stored properly to prevent water pollution from dairies. Manure and dairy process water handling and storage practices shall consider odor and other environmental and public health problems. Handling and storage considerations shall include:</p> <p>2. <i>Prevent leakage</i> – Construction and maintenance of buildings, collection systems, conveyance systems, and storage facilities shall prevent releases of organic matter, nutrients, and pathogens to ground or surface water by implementing the following measures:</p> <p>a. All manure separation pits and process water lagoons shall be constructed so that the bottoms of the pits and lagoons are at least five feet above the highest expected groundwater levels.</p>
Dairy Policy 4.1b	<p><i>Land Application of Manure</i></p> <p><i>B. Timing and methods of application</i> – Care must be taken when applying manure and process water to the land to prevent it from entering groundwater, streams, other water bodies, or environmentally sensitive areas. The timing and method of application shall prevent the loss of excess nutrients to groundwater or surface water.</p>
Dairy Policy 4.1c	<p><i>Land Management</i> – Tillage, crop residue management, grazing management, and other conservation practices shall be utilized to minimize movement to surface water and groundwater of soil, organic materials, nutrients, and pathogens from lands where manure is applied.</p>

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Dairy Policy 4.1d	<i>Dead Animals Management Plan</i> – A Dead Animal Management Plan (see Component 5 of Appendix J) shall be prepared and implemented for the disposal of all dead animals in a way that does not adversely affect groundwater or surface water, create public health concerns, or cause nuisances due to odor or vectors.
Dairy Policy 4.4a	The County hereby adopts compliance with the water quality objectives of the Basin Plan as the threshold of significance for impacts to water quality from implementation of the Dairy Element. Therefore, dairy projects that 1) comply with the Basin Plan and 2) comply with the provisions in the Element allowing approval of a site plan review (SPR), do not create cumulatively significant environmental impacts on water quality.
Dairy Policy 6.2f	<p><i>Minimum standards for water quality monitoring program:</i> Water quality monitoring shall comply with all requirements and orders of the RWQCB. Copies of all reports that are required by, and submitted to, the RWQCB by any new or expanded dairy regulated under this Dairy Element shall also be provided a copy of those reports to the Kings County Zoning Administrator.</p> <ul style="list-style-type: none"> A. Installation of groundwater monitoring wells at each dairy adequate to characterize the variations in depth to uppermost groundwater at the Dairy Facility and chemical quality of the uppermost groundwater zone. If noncontinuous perched groundwater zones underlie the facility, deeper aquifers may require monitoring. Vadose zone monitoring using lysimeters shall be required to monitor the quality of soil water, particularly in the vicinity of the lagoons. The design and installation of water quality monitoring system shall be performed under the direction of a Registered Geologist or a Professional Engineer in accordance with California Well Standards. B. Groundwater and soil water samples shall be analyzed, at minimum, for TDS, electrical conductivity, general mineral content, Nitrogen as nitrate and nitrite, phosphorus, and coliform or other appropriate indicator of biological contamination. This list of constituents to be analyzed may be modified at the request of the RWQCB. All samples should be analyzed by a State-certified analytical laboratory. C. Sampling of all wells and/or lysimeters shall be conducted prior to dairy operation to establish background levels and thereafter on an annual basis. In addition, the depth to water in each well shall be measured to within an accuracy of 0.01 feet twice each year, once in the spring and once in the fall.
Dairy Policy 6.4.d	Each dairy operator shall retain a qualified professional (i.e., Professional Engineer or Certified Hydrogeologist) to compile and evaluate the water quality data required by Policy DE 6.2f. The Code Compliance personnel shall review the data to determine whether violations have occurred, or if corrective action is required. When considering response action for identified violations, the County shall consult with the RWQCB.

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The GKGSA will address these issues with the adoption and implementation of its GSP in support of the Counties’ efforts to address these objectives in their respective General Plans.

1.3.6.3 City of Farmersville General Plan

The 2025 General Plan Update for the City of Farmersville, adopted on November 6, 2002, has numerous objectives to promote its future, including the fifth objective which states: “Protect and preserve natural resources, such as farmland, air and water quality and native vegetation, while facilitating growth of the community.” According to the General Plan, the City obtains its water supply from the underlying aquifer and the well system draws water from 240 to 400 feet below ground level. The water table is recharged by percolation from the Kaweah River and its distributary system and from irrigation waters.

In Chapter 4, which addresses the Conservation, Open Space, Parks, and Recreation Element of the General Plan, the City includes air and water quality as Issue Five and states that it “must provide for long-range community water needs and protect [ground]water quality and quantity.” Moreover, its goal is to “protect air and water quality from negative impacts” and the Water Quality sub-section provides the following objectives and action plans:

1. Promote a community awareness program that will educate the community in water-saving methodologies at the home and the work place.
 - a. The Public Works department will provide the community with information brochures containing water-saving techniques. Further the department should prepare a Water Conservation Ordinance for adoption by the City Council.
2. Promote the use of native and drought-tolerant new landscaping in existing and future parks.
 - a. The City is planning to prepare a Water Conservation Ordinance which shall stress the use of native and drought-tolerant species.
3. Allow for adequate groundwater recharge by developing storm ponding and retention basins where feasible. In some areas these ponds or basins can be incorporated into a recreational area or used as wildlife habitat area.
 - a. The Engineering Department shall implement the policies of this Element with regard to locations of future park/pond basins.

1.3.6.4 City of Exeter General Plan

The Exeter General Plan, 2000 - 2020 was adopted by the City Council on March 8, 2003 and addresses water supply and usage in the Resources section of the Land Use Element. Water is listed as a natural resource along with air, land, and native plants and animals. The Plan promotes the “wise use and management of these resources” and provides the following goals:

- Conserve natural resources, including native trees, agricultural land, and water.
- Promote groundwater recharge.

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- Promote energy and water conservation.

The Plan promotes the continued improvement to its water system, including funding for new water wells, but does not provide specific actions to address these goals. The GKGSA GSP will address these goals directly, particularly groundwater recharge and water conservation.

1.3.6.5 City of Woodlake General Plan

The Woodlake General Plan, 2008 to 2028, was adopted during 2009 and is similar to the Plans by the Cities of Exeter and Farmersville. The Land Use Element of the Plan lists water as a natural resource along with air, land, and native plants and animals; promotes the “wise use and management of these resources”; and provides the following goals:

- Conserve natural resources, including native trees, agricultural land, and water.
- Promote ground water recharge
- Promote energy and water conservation

The Conservation Element of the Plan identified the following components, goals, objectives, and actions:

1. Conservation, development and utilization of natural resources, including water, forests, soils, rivers and other waters, wildlife, and other natural resources.
2. Reduce the possibility of water quality contamination from surface contaminants by drawing water from 240 to 400 feet below the ground’s surface level. The City has abandoned wells due to high nitrate concentrations.
3. Aquifer recharge is derived from the St. Johns River and from irrigation water stored in Bravo Lake and conveyed by the Wutchumna Ditch.
4. Monitor activities of local canal and irrigation districts and promote the preservation of these established recharge sites and waterways.
5. Promote a community awareness program that will educate the community in water-saving methodologies at the home and the work place and prepare a water conservation ordinance for adoption by the City Council.
6. Allow for adequate groundwater recharge by developing storm ponding and retention basins where feasible and incorporate these features into recreation or wildlife habitat areas.
7. Promote the use of native and drought-tolerant species in private and public landscaping areas.

The GKGSA will address these issues with the adoption and implementation of its GSP in support of these cities’ efforts to address the objectives in their respective General Plans.

1.3.7 Plan Elements from CWC Section 10727.4

23 Cal. Code Regs. § 354.8 Description of Plan Area. *Each Plan shall include a description of the geographic areas covered, including the following information: (g) A description of any additional Plan elements included in Water Code Section 10727.4 that the Agency determines to be appropriate.*

1.3.7.1 Control of Saline Water Intrusion

Saline water intrusion is the induced migration of seawater into a freshwater aquifer system and is typically observed in coastal aquifers where over-pumping of the freshwater aquifer causes ocean water to encroach inland, degrading the freshwater aquifer. The GKGSA is located over 80 miles from the Pacific Ocean, which negates the possibility of saline water intrusion.

1.3.7.2 Wellhead Protection Areas and Recharge Areas

Tulare County does not have a specific program for wellhead protection and recharge areas but the region (Kings and Tulare Counties) was identified in a 2-page fact sheet (January 2018) on wellhead protection via the Southern San Joaquin Valley Management Practices Evaluation Program (SSJVMPEP). which produced a 2-page fact sheet on wellhead protection in January 2018 along with a similar fact sheet on abandoned and inactive wells.

Kings County has established a wellhead protection program for the handling and application of certain pesticides, including offset distances from wells, dwellings, schools, and other designated areas; well site requirements to minimize runoff to the wellhead area plus requirements for applicator certification, permitting, notifications, and other limitations related to unlined canals/ditches and to recharge basins. In 2004, Kings County designated a nominal 8-square mile area along Cross Creek, within the northwestern portion of the GKGSA area, as a runoff-type groundwater protection area (California Department of Pesticide Regulation, 2020).

1.3.7.3 Migration of Contaminated Groundwater

The GKGSA does not actively participate in enforcement programs to address the presence and migration of contaminated groundwater as state and local agencies have established programs to address this topic. The GKGSA will encourage prompt and timely actions from responsible parties and these regulatory agencies to address/resolve the presence of contaminated groundwater and will not implement projects or management actions that exacerbate the condition.

1.3.7.4 Well Abandonment and Well Destruction Programs

The Tulare County Environmental Health Services Division is responsible for the ordinance that regulates the disposition of wells according to Chapter 13, Part IV of the Ordinance Code of Tulare County. Article 1, Section 4-13-1005, defines “Abandoned Well” as a well which has been inactive for at least one year or is incapable of producing water, and “Destruction of Wells” as filling and sealing the well to prevent human and animal exposure to physical harm from an open well and to prevent surface water, waste, debris and contaminants from entering the well. Similarly, the Kings County Environmental Health Services Department addresses well abandonment and destruction via

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Ordinance 587 where abandoned wells are defined as wells “whose use has been permanently discontinued” and must be destroyed accordingly.

Both counties require a well permit and the destruction work must be completed by a licensed (C-57) contractor. The ordinances incorporates various requirements of the DWR bulletins related to well standards (74-81 and 74-90). Tulare County received grant monies to facilitate the identification and destruction of more than 80 abandoned wells.

1.3.7.5 Replenishment of Groundwater Extractions

Groundwater replenishment occurs naturally through deep percolation of rainfall, storm runoff via stream and river channels, and irrigation water via unlined channels and ditches and from irrigated fields. In addition, intentional replenishment occurs via deep percolation at recharge basins and wastewater effluent basins. KDWCD, as a water conservation district, engages in numerous groundwater replenishment activities. The primary sources of groundwater recharge are local supplies from the Kaweah River and imported water supplies from the CVP.

1.3.7.6 Conjunctive Use and Underground Storage

Kaweah Delta Water Conservation District has, for many decades, supported the conjunctive use of surface water and groundwater and the recharge of the groundwater system with surface water. The GKGSA will facilitate these ongoing efforts by KDWCD.

1.3.7.7 Well Construction Policies

Tulare and Kings Counties have each adopted an ordinance for the construction of wells, based on California Well Standards as presented in DWR Bulletins 74-81 and 74-90. These requirements are administered by their respective environmental health departments. Details are available at the respective links: <https://tularecountyeh.org/eh/index.cfm/our-services/water-wells/> <https://tchhsa.org/eng/index.cfm/public-health/well-drilling/> and <https://www.countyofkings.com/departments/health-welfare/environment-health-service/drinking-water/drinking-water-1>.

1.3.7.8 Measures Addressing Groundwater Contamination

The California Regional Water Quality Control Board, Central Valley Region (RWQCB) has implemented two long-term water quality programs to address wide-spread agricultural impacts throughout the Central Valley. These efforts include the Irrigated Land Regulatory Program (ILRP) and the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) program.

Tulare County recognizes the presences of groundwater contamination in some areas and has a voluntary well testing program for selected constituents, including bacteriological, nitrate, dibromochloropropane, and gross alpha. The County charges reasonable fees for the collection and analysis of samples from new private and public domestic wells.

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1.3.7.9 Efficient Water Management Practices

The GKGSA supports the efforts of Tulare County and the Cities of Exeter, Farmersville, and Woodlake to implement efficient water management practices as well as encouraging its constituents to pursue such practices.

1.3.7.10 State and Federal Regulatory Agencies

The member agencies of the GKGSA have existing relationships with state and federal regulatory agencies. Local supplies are impounded by the Terminus Dam, which is owned and operated by the US Army Corps of Engineers (ACOE). The Kaweah St. Johns River Association, managed by KDWCD staff, works closely with the ACOE on both water supply and flood control for local supplies. In addition, KDWCD is a CVP, Friant Division Contractor with the US Bureau of Reclamation and remains in close communication regarding importation of CVP water.

1.3.7.11 Review of Land Use Plans

The GKGSA will track updates to the land use plans of Tulare County, Kings County, and the Cities of Exeter, Farmersville, and Woodlake to ensure sustainable groundwater management can be accomplished in the Kaweah Subbasin. Tulare County is itself a member agency of the GKGSA. In addition, the communities both have presentation on the board as well as the Rural Communities Committee.

1.3.7.12 Impacts on Groundwater Dependent Ecosystems

The Nature Conservancy (TNC) has identified potential groundwater dependent ecosystems (GDEs) in the Kaweah Subbasin and the vegetation and wetland areas associated with the relatively large surface water channels. Interconnected Surface Water is a sustainability indicator and is defined as “surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.” Interconnection between the surface water and groundwater could lead to GDEs and must be considered by the Plan. However, surface water channels are without flow in the GKGSA area for much of the year. Figure 19 of the Basin Setting Report (Appendix 2A) identified potential GDEs within the forebay area (east corner of the GKGSA) of the Subbasin and a small GKGSA area along the northern boundary of the subbasin (total area is over 9,000 acres) because depths to groundwater were within 50 feet of the ground surface during spring 2015. A review of the potential GDE map did not identify any vegetation or wetlands at the small area along the northern boundary. In the highlighted forebay area, approximately 850 acres support potential GDEs, including about 500 acres of tree vegetation, 220 acres of wetlands, and nearly 140 acres of a mixture of both categories. The tree vegetation only areas are dominated by Goodding’s Willow (~40%) along with Valley Oak (~20%), and Fremont Cottonwood (~20%) while seven other species are present in the remainder. These trees are present in the mixed habitat area, and the Goodding’s Willow is dominant (~60%) compared to the Valley Oak and Fremont Cottonwood (~30% together). The wetland areas are comprised of riverine (~70%) and palustrine (~30%) conditions and this proportion is reversed in the mixed habitat area where palustrine is dominant (~70%) compared to riverine (~30%). Given that groundwater is produced from aquifers more than 50 feet deep beneath the GSA, the vegetation and wetlands listed by TNC are believed to be surface

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water dependent. Further study will be taking place going forward through the Interconnected Surface Water Data Gap Work Plan included in the Management Action Section 7.3 of this GSP.

1.4 Notice and Communication

SGMA and subsequent Emergency Regulations developed by the DWR in May 2016 identified a number of requirements for public notice and communication related to GSA formation and GSP development. California Code of Regulations §354.10 identifies the requirements for notice and communication information in a GSP:

1.4.1 Consultation with Beneficial Users (§354.10(a))

23 Cal. Code Regs. § 354.10 Notice and Communication. Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:
(a) a description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.

Beneficial uses of groundwater within GKGSA’s jurisdiction primarily include agricultural, industrial, and municipal and domestic water supply. GKGSA serves as GSA for the area comprising the collective jurisdictional area of its members. Beneficial users and uses of groundwater were identified and engaged by GKGSA based on the place and interest-based categories described in SGMA and codified in Water Code §10723.2. Beneficial uses and user of groundwater are codified in Water Code §10723.2 as:

- (a.) Holders of overlying groundwater rights, including:
 - (1) Agricultural users, including farmers, ranchers, and dairy professionals
 - (2) Domestic well owners
- (b.) Municipal Well Owners
- (c.) Public water systems
- (d.) Local land use planning agencies
- (e.) Environmental users of groundwater
- (f.) Surface water users, if there is a hydrologic connection between surface and groundwater bodies
- (g.) The federal government, including, but not limited to, the military and managers of federal lands
- (h.) California Native American
- (i.) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems

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- (j.) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency

Beneficial users and uses representing these categories and nature of consultation with these users are further described below.

1.4.1.1 Disadvantaged Communities (§10723.2(i))

Data published by the U.S. Census Bureau (Bureau) in 2016 show ten areas within the jurisdiction of the GKGSA that meet the annual Median Household Income (MHI) criteria¹ to be considered a Disadvantaged Community (DAC) or severely disadvantaged community (SDAC). DACs in the region that meet the 2016 Bureau criteria for Census Designated Places—as well as the broader criteria for Census Tracts and Block Groups—are the City of Exeter and the communities of Lemon Cove and Patterson Tract. The cities of Farmersville and Woodlake, and the communities of Linnell Camp, Ivanhoe, and West Goshen have been identified as SDACs. Unincorporated communities that meet the Census Tract and Block Group criteria for DACs and SDACs, respectively, are the Cameron Creek Colony and Hypericum. While a DAC per Bureau data, a door-to-door survey conducted in 2014 by Self-Help Enterprises and California State University, Fresno, indicate that Cameron Creek Colony qualifies as a SDAC

Consultation with these communities occurred primarily through the Rural Communities Committee, further described in Section 1.4.5. These committee meetings served as a collaborative forum for both community members and committee members to identify and resolve potential issues important for Plan development activities. In addition, the GKGSA followed best practices for engaging DAC and SDAC community members and eliminating potential access barriers these individuals may face. These practices included translating materials into Spanish and holding public workshops in coordination with the Community Water Center, Leadership Counsel for Justice and Accountability, and the Union of Concerned Scientists at locations convenient for the targeted community.

1.4.1.2 Agricultural Users (§10723.2(a)(1))

Agriculture and rangeland cover a broad area of the Kaweah Subbasin. Agricultural interests were represented in GSP during the Plan’s development by water, conservation, and irrigation districts. Representatives from the agricultural community serve on both the GKGSA Board of Directors (Board) and the Stakeholder Committee, further described in Section 1.4.5. During the Plan’s development, this included participation from the Consolidated Peoples Ditch Company, Farmers Ditch Company, Fleming Ditch Company, Foothill Ditch Company, Lemon Cove Ditch Company, Mathews Ditch Company, and the Wallace Ranch Water Company. As with the Rural Communities Committee, each Stakeholder Committee meeting is conducted as a collaborative forum where members and community members can discuss and resolve topics important for development of this Plan. Individual agricultural water users were also consulted and kept informed through existing

¹ A DAC is defined as a census geography community with an annual MHI that is less than 80 percent of the Statewide annual MHI (PRC Section 75005(g)). A SDAC is a census geography community with an annual MHI that is less than 60 percent of the Statewide annual MHI. The statewide MHI for the U.S. Census Bureau American Community Survey 5-Year Data: 2012 – 2016 is \$63,783. Therefore, the calculated DAC and SDAC thresholds are \$51,026 and \$38,270, respectively.

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communication channels of participating ditch companies, periodic electronic communication by the GKGSA and its sister GSAs in the Kaweah Subbasin.

1.4.1.3 Private Domestic Well Owners (§10723.2(a)(2))

Private domestic well operators within the GKGSA primarily include rural residents interspersed with active farmlands and rural schools. These domestic well water users are located in the unincorporated area of Tulare County and are represented on the Board by the County of Tulare. Domestic well owners had the opportunity to consult on the Plan during Board and Stakeholder Committee meetings, and review of this Plan.

1.4.1.4 Municipal Well Owners (§10723.2(b))

Municipal and industrial (M&I) water supplies within the GKGSA are drawn exclusively from groundwater resources. Replenishment of this shared resource has been historically lead by the KDWCD in coordination with its 27 irrigation districts and other regional partners. The M&I well operators include the cities of Exeter; Farmersville, Woodlake, and Hanford; Ivanhoe Public Utilities District; Patterson Tracy Community Services District; Tract 92 Community Services District, Lemon Cove Sanitary District; and Cal Water.

The M&I well operators are represented on both the Board- and Rural- Communities Committee. In addition, local M&I water providers conducted outreach to and consulted with their customers through distribution of informational materials and postings on their websites and social media accounts, as available.

1.4.1.5 Public Water Systems (§10723.2(c))

Public water systems within the GKGSA include the cities of Exeter, Farmersville, Woodlake; Lemon Cove Sanitary District; Patterson Tract Community Services District; Tract 92 Community Services District; Ivanhoe Public Utilities District; and the County of Tulare. Each of these agencies is consulted through representation on the Rural Communities Committee. In addition, the Rural Communities Committee appoints one representative to serve on the Board. The County of Tulare supports two County Service Areas, one of which serves the community of Wells Tract—a small community east of the City of Woodlake’s sphere. Residents of Wells Tract receive drinking water and wastewater from the City of Woodlake through an agreement with the County of Tulare.

1.4.1.6 Surface Water Users (§10723.2(f))

Given their connection to agricultural users, surface water users have been continually consulted regarding Plan development. Surface water supplies in the GKGSA region are diverted primarily from the Kaweah and St. John’s Rivers, with supplemental supplies from the Friant Division of the Central Valley Project. The Kaweah River St. Johns Association manages distribution of surface water supplies from local supplies on behalf of surface water right holders. The KDCWD conducts groundwater recharge operations with surface water from the Kaweah River and the Friant Division. Surface water users within GKGSA primarily include farm, ranch, and dairy operations. Surface water users within GKGSA primarily include farm, ranch, and dairy operations. These users were consulted through

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representation on the Stakeholder Committee, as well as regular communications through GKGSA member agencies' existing community platforms.

1.4.1.7 Federal Government (§10723.2(g))

Water Code section 10723.2(g) codifies the federal government as a beneficial user of groundwater. No federal lands were identified in the GKGSA that are using groundwater.

1.4.1.8 Governmental and Land Use Planning Agencies (§10723.2(d))

Governmental and land use planning agencies in the GKGSA include the planning commissions of the cities of Exeter, Farmersville, and Woodlake; and counties of Tulare and Kings. The County of Tulare is a member agency of the GKGSA and has one seat on the Board. The cities of Woodlake, Farmersville, and Exeter were consulted through representation on the Rural Communities Committee. In addition, GKGSA representatives provided a presentation to the City of Woodlake and City of Farmersville Planning Commissions on February 25, 2019 and April 17, 2019, respectively. The presentations' content included an overview of SGMA, the status of development of the Plan, and government and land use planning agencies' obligations under SGMA in association to general plan updates. Other local planning commissions were also invited to provide comment on this Plan.

1.4.1.9 California Native American Tribes (§10723.2(h))

As part of its 2016 formation notification to DWR, the GKGSA preliminarily identified five California Native American Tribes for potential engagement in the planning process. The GKGSA submitted a Sacred Lands File and Native American Contacts List Request to the Native American Heritage Commission (NAHC) on May 15, 2018. The GKGSA's request to the NAHC included a general description of the GKGSA and a map identifying US Geological Survey quadrangles wholly or partially in the GKGSA's boundaries. The NAHC replied to the request on May 22, 2018 and identified five potentially affected California Native American Tribes in the area of potential effect. These tribes, and their status, is identified in **Table 1-3**.

There are no tribes with designated tribal lands within the GKGSA's boundaries. Per the NAHC's letter response, the record search of the NAHC's Sacred Lands File identified that the Wukache Indian Tribe/Eshom Valley Band has a sacred land in the area known as Rocky Hill. The Rocky Hill area is in the foothills east of the City of Exeter and is presumed to be outside both the boundaries of the GKGSA and Kaweah Subbasin.

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**Table 1-3: Native American Tribes Identified in NAHCs Sacred Lands File and Native American Contacts List
Request Response**

Tribal Name	Contact	Title	Address	City/State/Zip	Sacred Lands File?
Kern Valley Indian Community	Robert Robinson	Chairperson	P.O. Box 1010	Lake Isabella, CA 93240	Yes
Santa Rosa Indian Community of the Santa Rosa Rancheria	Leo Sisco	Chairperson	P.O. Box 8	Lemoore, CA 93245	Yes
Tubatulabals of Kern Valley	Robert L. Gomez Jr.	Chairperson	12600 Mountain Mesa Road	Lake Isabella, CA 93240	Yes
Tule River Indian Tribe	Neil Peyron	Chairperson	P.O. Box 589	Porterville, CA 93258	Yes
Wuksache Indian Tribe/Eshom Valley Band	Kenneth Woodrow	Chairperson	1179 Rock Haven Court	Salinas, CA 93906	Yes

GKGSA staff began engaging tribes during GSA formation. In October 2016, GKGSA staff sent a letter to the Santa Rosa Indian Community of the Santa Rosa Rancheria informing them about potential formation of the GKGSA and inviting a representative of the tribe to serve on the Stakeholder Committee. No tribes in the region expressed interest in serving on the Stakeholder Committee. All tribes listed in **Table 1-3** above were notified of the availability of the draft Plan for public comment.

1.4.1.10 Environmental Users of Groundwater (§10723.2(e))

At this time, GKGSA has not identified environmental users of groundwater within the region. However, GKGSA did consult with organizations representing environmental interests, including the Tulare Basin Wildlife Partners and Sequoia Riverlands Trust, during development of this Plan. Representatives from these organizations served on the Stakeholder Committee and were consulted with extensively on the topics of interconnected streams, ecosystem multi-benefit projects, and potential mitigation of groundwater dependent ecosystems. Members of these groups were kept up to date on GKGSA activities and development of this Plan through existing communication channels led by their representatives that serve on the Stakeholder Committee.

1.4.1.11 Groundwater Elevation Monitoring and Reporting Entities (§10723.2(j))

Groundwater elevation monitoring and reporting in the GKGSA is primarily led by KDWCD, a member agency of GKGSA. The KDWCD leads the development of the Kaweah River Basin Integrated Regional Water Management Plan and manages a series of wells registered in the California Statewide Groundwater Elevation Monitoring Program.

1.4.1.12 Citizens Groups and General Public

Citizens groups and members of the general public, many of which are also beneficial users, were invited to engage in Board and Committee meetings, and other public meetings coordinated by GKGSA. In addition, outreach was conducted to civic organizations of the cities of Exeter, Woodlake, and Farmersville; and periodic presentations to the Tulare County Water Commission. These included presentations to the Woodlake Kiwanis Club, Rotary Club of Farmersville, Rotary Club of Woodlake,

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and the Exeter Kiwanis Club. **Table 1-4** lists all organizations that received presentations as parts of the GKGSA Speaker’s Bureau Program, further described below.

1.4.2 Public Meetings (§354.10(b))

23 Cal. Code Regs. § 354.10. *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: . . . (b) A list of public meetings at which the Plan was discussed or considered by the Agency.*

The GKGSA bylaws (**Appendix 1B**) require regular quarterly meetings of its Technical Advisory Committee, Rural Communities Committee, and Stakeholders Committee; and monthly meetings of its Board. These meetings are noticed and open to the public, in accordance with the Brown Act. In addition to these meetings, the GKGSA participates in a monthly Kaweah Subbasin Management Team meeting as signatory to the Kaweah Subbasin Coordinated MOU and Kaweah Subbasin Coordination Agreement (**Appendix 1D**), which includes representatives from the three GSAs in the Kaweah Subbasin.

The following agencies have participated in public outreach activities, as JPA members of the GKGSA:

- Kings County Water District
- Kaweah Delta Water Conservation District
- Lakeside Irrigation District
- St. John’s Water District
- The City of Farmersville
- The City of Exeter
- The City of Woodlake
- Ivanhoe PUD
- Tract 92 CSD
- Patterson Tract CSD
- Tulare County

In addition to activities within its own jurisdictional area, the GKGSA has also participated in subbasin-wide SGMA outreach activities with the Mid-Kaweah GSA and East Kaweah GSA, with participation from the Tulare County Farm Bureau. Additional public outreach workshops were held for the GKGSA and are documented in **Appendix 1G** of this Plan.

1.4.3 Comments Received (§354.10(c))

23 Cal. Code Regs. §354.10.... *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: (c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.*

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The public comment summary is provided in Appendix 1H, including a copy of the 14 written comment letters and six verbal comments.

1.4.4 Decision Making Process (§354.10(d)(1))

§354.10 (d) *A communication section of the Plan that includes the following:*
(1) An explanation of the Agency’s decision-making process.

The GKGSA Joints Powers Agreement and Bylaws (attached hereto and incorporated by reference as **Appendix 1B**) describe in detail the GKGSA JPA’s decision-making process.

The governing body of the GKGSA JPA consists of a nine-member Board of Directors (Board) that includes two seats held by the KDWCD; one seat for each founding agency; one seat held by California Water Service (Cal Water); and one seat each from a representative nominated by the Rural Communities Committee and Stakeholder Committee. The Cal Water representative on the Board is nominated by the utility and appointed by the Board. All decisions require a majority vote of the present and voting Board of Directors.

Cal Water is a privately held water utility regulated by the California Public Utilities Commission. Its participation on the Board was made possible through an amendment to Senate Bill 13 by Senator Fran Pavley and chaptered in California Water Code §10723.6(b)². Cal Water’s participates in the GKGSA’s decision-making process through an agreement with the GKGSA JPA (See **Appendix 1C**). The agreement applies to Cal Water operations in East Tulare Villa (known as “Tulco”), West Goshen, Goshen and Oak Ranch. Cal Water service operations in the City of Visalia are within the jurisdictional boundary of the Mid-Kaweah GSA, a sister agency of GKGSA in the Kaweah Subbasin.

The decision-making structure of the GKGSA Board, shown in **Figure 1-8** below, is supported through a hierarchical structure that includes the GSA’s Manager, Kaweah Subbasin Management Team, Rural Communities Committee, Stakeholder Committee, and Technical Advisory Committee. The Rural Communities Committee is comprised of local public agencies eligible to serve as a GSA pursuant to conditions described in California Water Code 10721(n)³. These communities include cities of Exeter, Farmersville and Woodlake, and the unincorporated communities of Ivanhoe, Lemon Cove, Patterson Track and Track 92. The Stakeholder Committee is comprised of private ditch companies, domestic well operators, growers, and non-profit organizations focused on ecosystem stewardship and enhancement. The Technical Advisory Committee is comprised of one technical person appointed by each Director. This group is led by a Director nominated by the full Board. To provide for a venue for consultation with community members, GKGSA and all of its committees, conduct and notice their respective meetings consistent to the Brown Act.

² (b) A water corporation regulated by the Public Utilities Commission or a mutual water company may participate in a groundwater sustainability agency through a memorandum of agreement or other legal agreement. The authority provided by this subdivision does not confer any additional powers to a nongovernmental entity.

³ 10721(n) “Local agency” means a local public agency that has water supply, water management, or land use responsibilities within a groundwater basin.

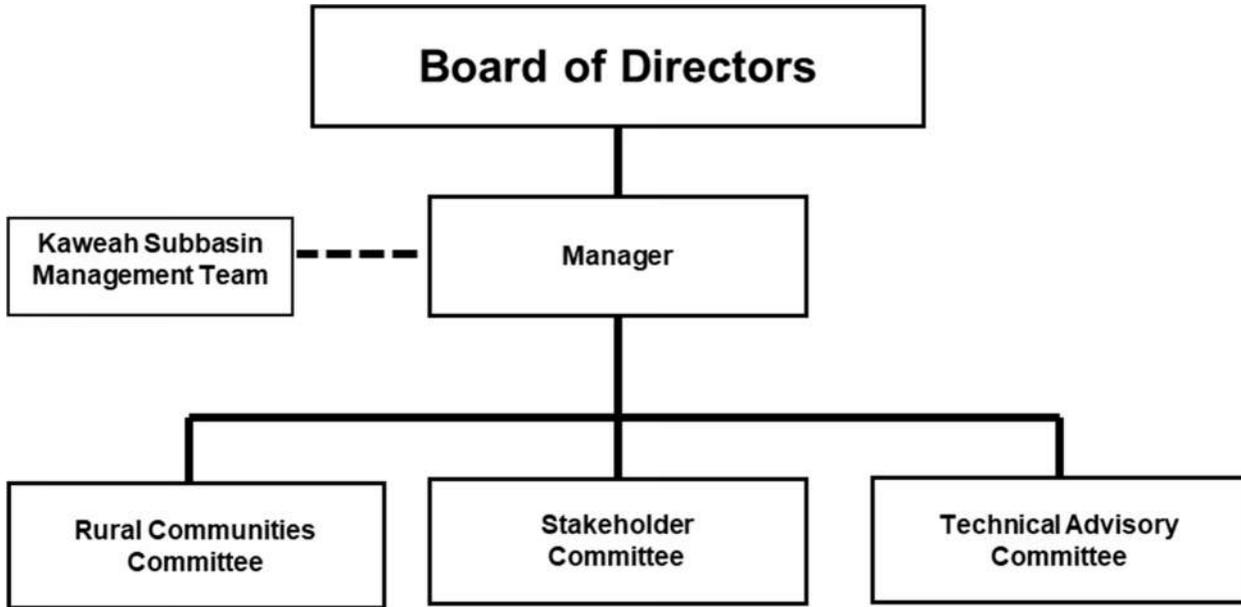


Figure 1-8: GKGSA Decision-Making Structure

1.4.5 Opportunities for Public Engagement (§354.10(d)(2))

23 Cal. Code Regs. § 354.10 *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: (d) A communication section of the Plan that includes the following: (2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.*

The primary opportunities for interested parties and members of the public to engage in development of this Plan included GKGSA Board and committee meetings, a public call for GSP projects and management actions, and the Plan public comment period. As described above, the GKGSA Board meets monthly and each of the three GKGSA committees meet, at a minimum, quarterly. All Board and committee meetings are open meetings pursuant to the Brown Act. Members of the public were notified of these meetings through notices sent to the interested parties database and postings on the GKGSA website. In addition, GKGSA representatives conducted a series of presentations to local organizations aimed at educating members of the general public about SGMA and encouraging participation at the Board and committee meetings. Each of these public engagement activities are further described below.

The GKGSA notified interested parties of the opportunity to provide input on the Public Review Draft Plan by posting on the GKGSA website, sending a notice to the interested parties database, and placing a notice in the local newspaper. Pursuant to SGMA, the GKGSA also sent a notice to cities and counties within the GKGSA’s area of jurisdiction. Comments received from the public on the Public Review Draft Plan will be considered by the Board prior to Plan adoption. All comments received on the Public Review Draft Plan will be summarized in the Final GSP with a response from the GKGSA to each credible comment

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1.4.5.1 Board of Directors Meetings

Board meetings served, in part, as a venue for planning staff to receive direction for major technical and policy issues. Comments on these topics from the public, committee members, and other interested parties were welcomed during scheduled public comment sessions. Comments received during these sessions were responded to by Board members or staff, as appropriate. These meetings also served as key opportunities for the public and stakeholders to engage and consult in development of the GSP and to track its progress. Information and notification of Board meetings was publicly provided in accordance with the Brown Act. Meeting agendas and summaries were additionally posted on the agency website and distributed to stakeholders that registered as interested parties on the Kaweah Groundwater Communication Portal (GCP), as described in Section 1.4.6.

The Board met monthly, unless otherwise publicly noticed in accordance with the Brown Act. Since August 23, 2016, the Board has held 27 meetings, with one meeting held at the City of Visalia Administration Building, 220 N. Santa Fe St. Visalia, CA. The balance of the Board sessions were held at the Tulare Public Library and Council Chambers, 491 North M. Street Tulare, CA. The list of meetings is available on the agency website. The meetings represented opportunities for the public and stakeholders to participate in Plan development and exchange ideas and concerns with Board members and agency staff. Standard agenda items at each Board meeting included a public comment session, an update on intra-basin coordination activities, and a report of committee activities.

1.4.5.2 Committee Meetings

Publicly noticed Stakeholder, Rural Communities, and Technical Advisory Committee meetings are important venues for development of recommendations to the Board to key technical, policy, and outreach issues. Interested members of the public were encouraged to engage and consult in these discussions and assist committee members in their consideration of a preferred approach. These recommendations were later provided to the Board for their consideration. Written notification for each meeting were posted on the GKGSA website and sent via email to all parties that subscribed to the Kaweah GCP. Notifications were additionally posted for public review at the meeting location, as required by the Brown Act.

Each of the committees holds monthly, public meetings, unless otherwise noticed. The Rural Communities Committee and Stakeholder Committee frequently hold joint meetings to discuss Plan development topics applicable to their respective beneficial water users. During Plan development, the majority of the committees' meetings were held at the KDWCD office in Farmersville. Common agenda topics for the Rural Communities Committee and Stakeholder Committee included updates on GKGSA activities and Plan development, subbasin coordination activities, inter-basin coordination activities, and public and stakeholder communication and engagement. Technical Advisory Committee agenda topics typically covered key Plan elements, such as the basin setting, sustainable management criteria, groundwater monitoring network, and projects and management actions. Agenda's, minutes, and materials from each committee meeting is posted on the GKGSA website.

1.4.5.3 Kaweah Subbasin Presentations

The GKGSA reached out to more than 10 community organizations, stakeholder groups and agencies as part of a Speaker's Bureau Program to raise awareness of the agency and encourage participation in

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development of this Plan at Board and Committee meetings. The Speaker’s Bureau Program sought to present information about the agency and status of Plan development during meetings hosted by the identified group. While the focus of the Speaker’s Bureau Program is to secure placement on the agenda of meetings where members of a community gather, it is also a method to raise awareness in a stakeholder community by sharing information to individuals active in the community. Overall, the Speaker’s Bureau resulted in 5 presentations and the distribution of GKGSA information to 11 organizations. **Table 1-4** includes the list of presentations provided during development of this Plan. **Table 1-5** provides the list of organizations that received information from GKGSA representatives through the Speaker’s Bureau Program.

Table 1-4: Speaker's Bureau Program Presentations

Presentation	Organization Name	Organization Type
February 6, 2019	Exeter Kiwanis Club	Citizens Groups
February 15, 2019	Rotary Club of Farmersville	Citizens Groups
March 12, 2019	Woodlake Rotary Club	Citizens Groups
February. 25, 2019	City of Woodlake, Planning Commission	Land Use Planning Agency
April 17, 2019	City of Farmersville, Planning Commission	Land Use Planning Agency

Table 1-5: Speakers Bureau Program Information Dissemination

Organization Name	Beneficial User Type (Per Water Code Section 10723.2)
Agricultural Well Owners	Agricultural Well Owners
Exeter Kiwanis Club	Citizens Groups
Rotary Club of Farmersville	Citizens Groups
Woodlake Rotary Club	Citizens Groups
Exeter Rotary Club	Citizens Groups
Woodlake Kiwanis Club	Citizens Groups
Farmersville Kiwanis Club	Citizens Groups
Homestead Well Owners	Domestic Well Owners
City of Woodlake, Planning Commission	Governmental and Land Use Agencies
City of Farmersville, Planning Commission	Governmental and Land Use Agencies
City of Exeter, Planning Commission	Governmental and Land Use Agencies

1.4.5.4 Stakeholder Surveys

To better understand and serve its community, the GKGSA gathered a large quantity of information on beneficial users within the boundaries of the Greater Kaweah subbasin by allowing stakeholders to

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participate in a voluntary water users survey. The survey was conducted online via a platform called Survey Monkey. The survey was five pages long and encompassed 85 questions that, among other questions, asked users which GSA they belonged to; what beliefs they had about groundwater and the environment; and what their knowledge of SGMA was; what they thought were the most pressing issues or challenges surrounding groundwater usage; and what ideas or suggestions they had regarding sustainability. The survey was made available to stakeholders in March of 2019. The survey has garnered a total of 138 responses as of July 2019. The GKGSA saw a positive completion rate of 86 percent by stakeholders with a general end time of four minutes and nine seconds.

1.4.5.5 Public Call for Projects and Management Actions

In 2018 the GKGSA began soliciting concept proposals for projects and management actions from stakeholders that are consistent with the region's groundwater sustainability objectives. In preparation for this Plan, the GKGSA created the proposal system by putting together a document that would allow not only stakeholders, but the public at large to submit their own ideas and suggestions for actionable sustainability projects that they believed should be brought to the GSA's attention. Thus far, the Delta View Recharge Project from Delta View Water Association co-sponsored by Kings County Water District has been the only proposal received.

1.4.6 Active Involvement of Diverse Social, Cultural, and Economic Elements (§354.10(d)(3))

§354.10 (d): *A communication section of the Plan that includes the following:*
(3) *A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of population within the basin.*

Notification and communication activities for the development of this Plan were guided by the GKGSA Communications and Engagement Plan of November 2018 (attached hereto and incorporated by reference as **Appendix 1F**). The C&E Plan serves to identify notification and communication activities that would meet or exceed the requirements and intent of the State legislature in passage of SGMA.

The nature of the consultation to beneficial users of groundwater and other interested parties was approached by segmenting stakeholders into one of three “groups,” based on a stakeholder’s level of interest in, or contribution to, GSP development. These groupings are as follows:

Group 1: *Collaborated (Inform + Consult + Collaborate)* – This group has been closely connected during the planning process through direct engagements aimed to exchange information through active two-way communication. As a proactive and reactive activity, these engagements gather information, and develop solutions to existing and emerging issues.

Group 2: *Consulted (Inform + Consult)* – This group has been connected during planning through written informational materials and scheduled presentations. This engagement is a proactive activity that seeks to gather stakeholder opinions to information presented by GKGSA.

Group 3: *Connected (Inform)* – This group has been connected during planning through distribution of written informational materials and prepared informational presentations. Presentations would be held in response to stakeholder requests.

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These groupings framed the approach GKGSA implemented to engage interested parties and stakeholder groups to participate in development of this Plan. Individuals and organizations were initially assigned one of the three groups by the GKGSA’s Stakeholder Committee, with the anticipation that each stakeholder’s involvement would change based on consultation with stakeholder and Plan content needs. All outreach efforts and engagement activities were tracked in a Community Engagement and Activities Database (CE & AD) that was continuously monitored and updated, consistent with DWR Emergency Regulations §354.10(b) and §354.10(d)

To encourage active participation during Plan development by the diverse social, cultural, and economic interests in the region, the GKGSA, in coordination with its Kaweah Subbasin sister agencies – East Kaweah GSA and Mid-Kaweah GSA – established the Kaweah GCP. Established pursuant to Water Code §10723.4, the Kaweah GCP is a shared database of interested parties in the Kaweah Subbasin and provides for distribution of notices and announcements by email. In addition to the Kaweah GCP, the platform supports self-enrollment to an email database of the GSA or GSAs of the stakeholder’s choice.

Additional tools to support public and stakeholder engagement included the GKGSA website (www.greaterkaweahgsa.org), the primary location for stakeholders within the GSA’s boundaries to review information related to SGMA and implementation of this Plan. Information provided on the website includes: an overview of SGMA, GKGSA member agencies, Board, Board meeting notices and summaries, public outreach and timeline information, frequently asked questions, news, links, and a contact list. Past and upcoming workshops and public meetings are also on the site. The website also serves as a repository for outreach collateral, workshop materials, and meeting packets and minutes for the GKGSA Board, Stakeholder Committee, Rural Communities Committee, Technical Advisory Committee, and Kaweah Subbasin Management Team. The site is cross-linked to the Mid-Kaweah GSA and the East Kaweah GSA websites, the DWR SGMA information portal, and other related sites.

1.4.1 Method to Inform the Public About Progress of Plan Implementation (§354.10(d)(3))

23 Cal. Code Regs. § 354.10 *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: (d) A communication section of the Plan that includes the following: (4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions*

The C&E Plan (incorporated by reference as **Appendix 1F**) describes the method the GKGSA will follow to inform the public about progress of implementing the Plan, including the status of projects and actions. In addition, the GKGSA will continue to comply with all Brown Act and SGMA requirements for public noticing, including notices to the interested party list.

1.4.2 Inter-Basin Coordination (§ 357.2)

§357.2: *Two or more Agencies may enter into an agreement to establish compatible sustainability goals and understanding regarding fundamental elements of the Plans of each Agency as they relate to sustainable groundwater management. Inter-basin agreements may be included in the Plan to support a finding that implementation of the Plan will not adversely affect an adjacent basin's ability to implement its Plan or impede the ability to achieve its sustainability goal. Inter-basin agreements should facilitate the exchange of technical*

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information between Agencies and include a process to resolve disputes concerning the interpretation of that information.

Development of this Plan was supported through a series of intra-basin and inter-basin coordination activities. The key intra-basin coordination activity was the Kaweah Subbasin Management Team (KSMT), a committee comprised of representatives from each of the three Kaweah Subbasin GSAs: East Kaweah, Greater Kaweah, and Mid-Kaweah. As members of the KSMT are appointed by their respective Board of Directors, all meetings of this group were publicly noticed consistent with the Brown Act. These meetings focused on development and evaluation of key policy and technical issues mutually shared by Kaweah Subbasin GSAs. Members of the public that attended these meetings were invited to provide comments on these topics. The schedule of KSMT and other intra-basin activities is provided in **Table 1-6**.

Inter-basin coordination activities included participation in events scheduled by other organizations, or events led by Kaweah Subbasin GSAs. These inter-basin activities focused on GSAs within the groundwater subbasins that comprise the Tulare Lake Basin, and provided opportunities for GSA managers, technical consultants, and the public to collaborate on topics of mutual concern. The schedule of these meetings is provided in **Table 1-6**.

Table 1-6: Inter-Basin, Intra-Basin Coordination Meetings

Date	Type	Event Name	Location	Participating GSAs or Subbasin	Key Agenda Topics
June 19, 2019	Intra-basin	Management Team Committee Meeting	City of Visalia Wastewater Treatment Plant, Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement, consultant presentation and recommendations
May 15, 2019	Intra-basin	Management Team Committee Meeting	Tulare County Board of Supervisors Chambers, Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	Public comment, GSA updates and progress, coordination agreement status, consultant and SkyTem presentations
April 23, 2019	Inter-basin	Farmer-Rancher Meeting	International Agri - Center, Tulare, CA	Tulare Lake Subbasin	SGMA and GSP development
April 17, 2019	Intra-basin	Management Team Committee Meeting	Tulare County Board of Supervisors Chambers, Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement status, consultant presentation
March 20, 2019	Intra-basin	Management Team Committee Meeting	Exeter Museum, Exeter, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement status, consultant presentation
January 16, 2019	Intra-basin	Management Team Committee Meeting	Tulare County Board of Supervisors Chambers, Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement elements, next steps and future activities

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Date	Type	Event Name	Location	Participating GSAs or Subbasin	Key Agenda Topics
December 18, 2018	Inter-basin	South Valley SGMA Practitioners Roundtable II	Tulare County Agricultural Commissioner's Office, Tulare, CA	Tulare Lake Subbasin	SGMA updates, inter-basin coordination, basin boundary flows and minimum thresholds, mapping aquifers and hydrogeologic frameworks near Tulare, SkyTEM, DACs and groundwater marketing
December 14, 2018	Inter-basin	South Valley Technical Group Meeting	Greater Kaweah GSA, Farmersville, CA	Tulare Lake Subbasin	Technical GSP development and coordination
September 19, 2018	Intra-basin	Management Team Committee Meeting	Kaweah Delta Water Conservation District, Farmersville, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement elements, next steps and future activities
May 16, 2018	Intra-basin	Management Team Committee Meeting	Tulare County Board of Supervisors Chambers Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, memorandum of understanding amendment, coordination agreement elements, next steps and future activities (Appendix 1D)
April 18, 2018	Intra-basin	Management Team Committee Meeting	Tulare County Board of Supervisors Chambers Visalia, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, coordination agreement elements, GSA coordination, management teamwork plan, next steps and future activities
April 10, 2018	Inter-basin	The Community Water Center: Drinking Water Vulnerability Assessment Web Tool Kick- Off Meeting	Resources Legacy Fund Sacramento, CA	Tulare Lake Subbasin	Development of an accessible, interactive and publicly available drinking water vulnerability assessment web tool, groundwater management needs of SDACs for GSPs
March 2, 2018	Inter-basin	Technical Group Meeting	Kaweah Delta WCD Office, Farmersville, CA	Tulare Lake Subbasin	SkyTEM proposal, technical memorandum discussing accounting framework, water budgets

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Date	Type	Event Name	Location	Participating GSAs or Subbasin	Key Agenda Topics
February 16, 2018	Inter-basin	South Valley Technical Group Meeting	Technical Three- hour Webinar	Tulare Lake Subbasin	SGMA overview, DWR inter- basin relationships regulations, subbasin perspectives, hydrogeologists/modelers subbasin concerns, hydrogeologic conceptual model development, subbasin numerical surface water and groundwater modeling efforts, adjacent subbasins, next steps
January 30, 2018	Intra-basin	Management Team Committee Meeting	Kaweah Delta Water Conservation District, Farmersville, CA	East Kaweah GSA, Greater Kaweah GSA, Mid-Kaweah GSA	GSA updates and progress, subbasin Memorandum of Understanding, management team administration, consultant presentation, subbasin water budget apportionment, management teamwork outlook
October 20, 2017	Inter-basin	South Valley SGMA Practitioners Roundtable III	International Agri-Center Heritage Complex, Tulare, CA	Tulare Lake Subbasin	Subbasin updates, DWRs SGMA technical assistance, SkyTEM in the South Valley, headwaters coordination
March 17, 2017	Inter-basin	South Valley SGMA Practitioners Roundtable II	International Agri-Center Heritage Complex, Tulare, CA	Tulare Lake Subbasin	Inter-basin coordination, objectives and best practices, groundwater flows between subbasins, next steps
July 22, 2016	Inter-basin	South Valley SGMA Practitioners Roundtable I	Southern California Edison, Ag Technology Application Center, Tulare, CA	Tulare Lake Subbasin	Perspective from a functioning GSA, coordinating the uncoordinated, SGMA fees, and SGMA implementation in the South Valley updates.

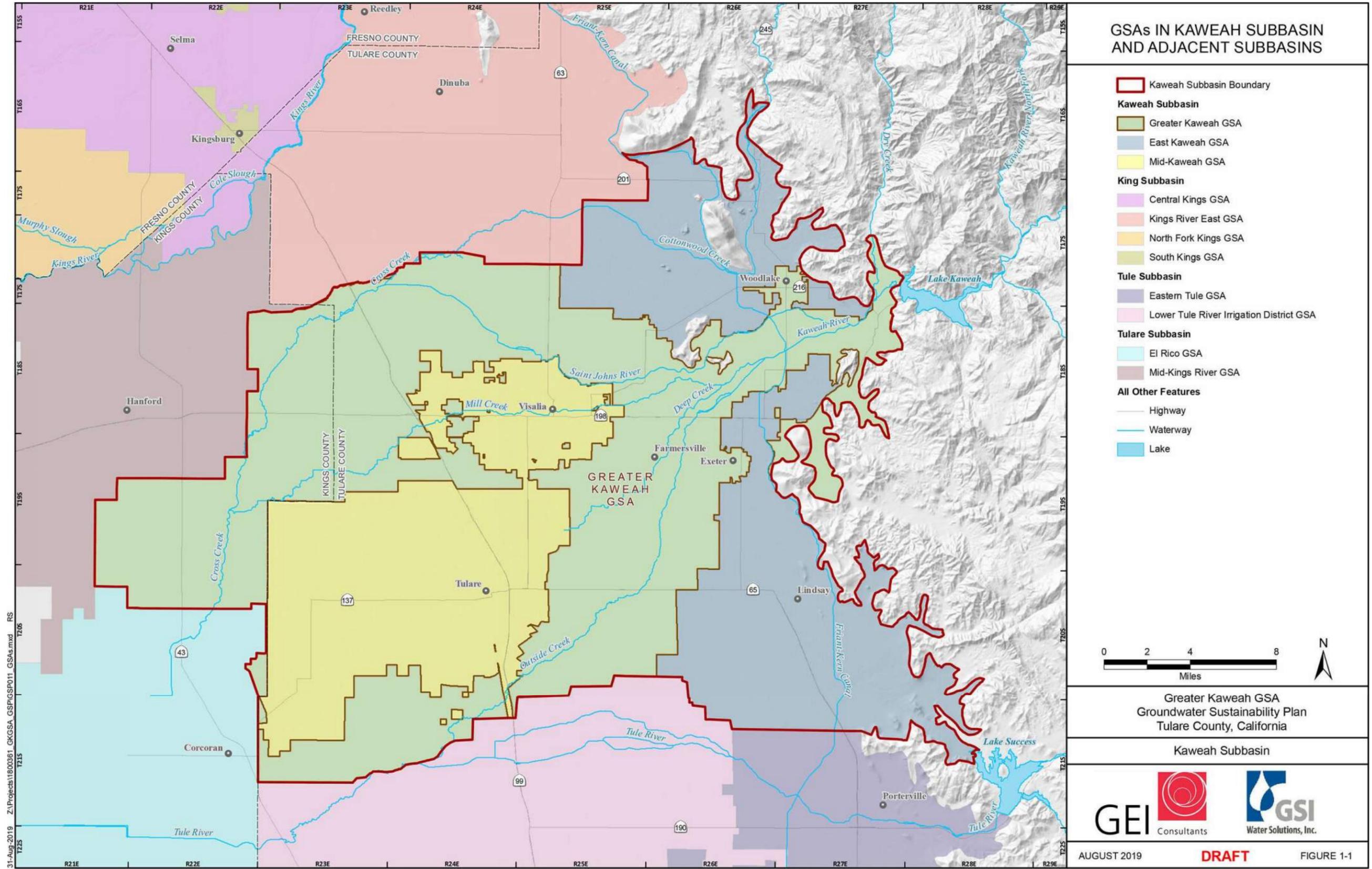


Figure 1-1: Greater Kaweah Jurisdictional Boundaries

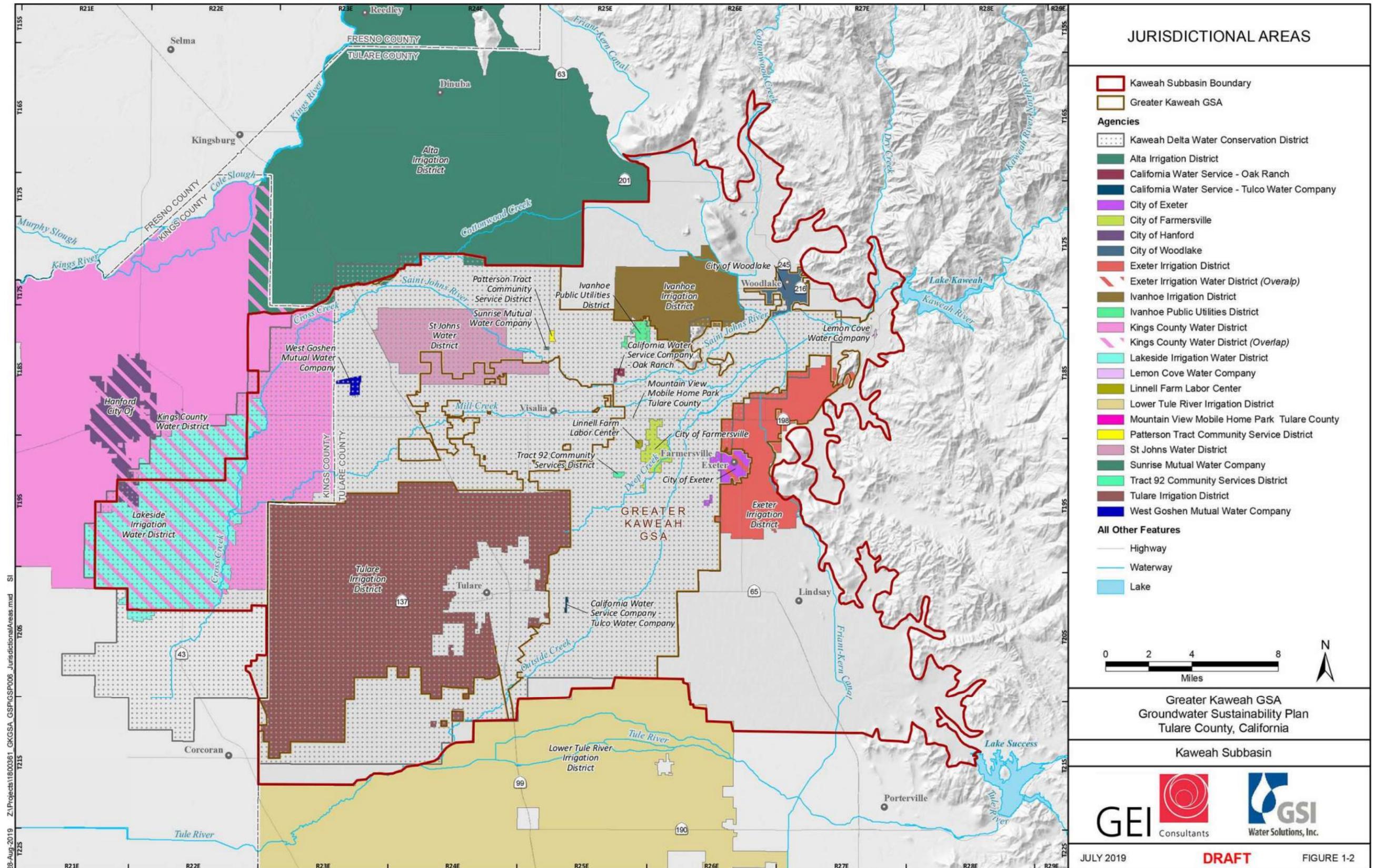


Figure 1-2: Jurisdictional Areas

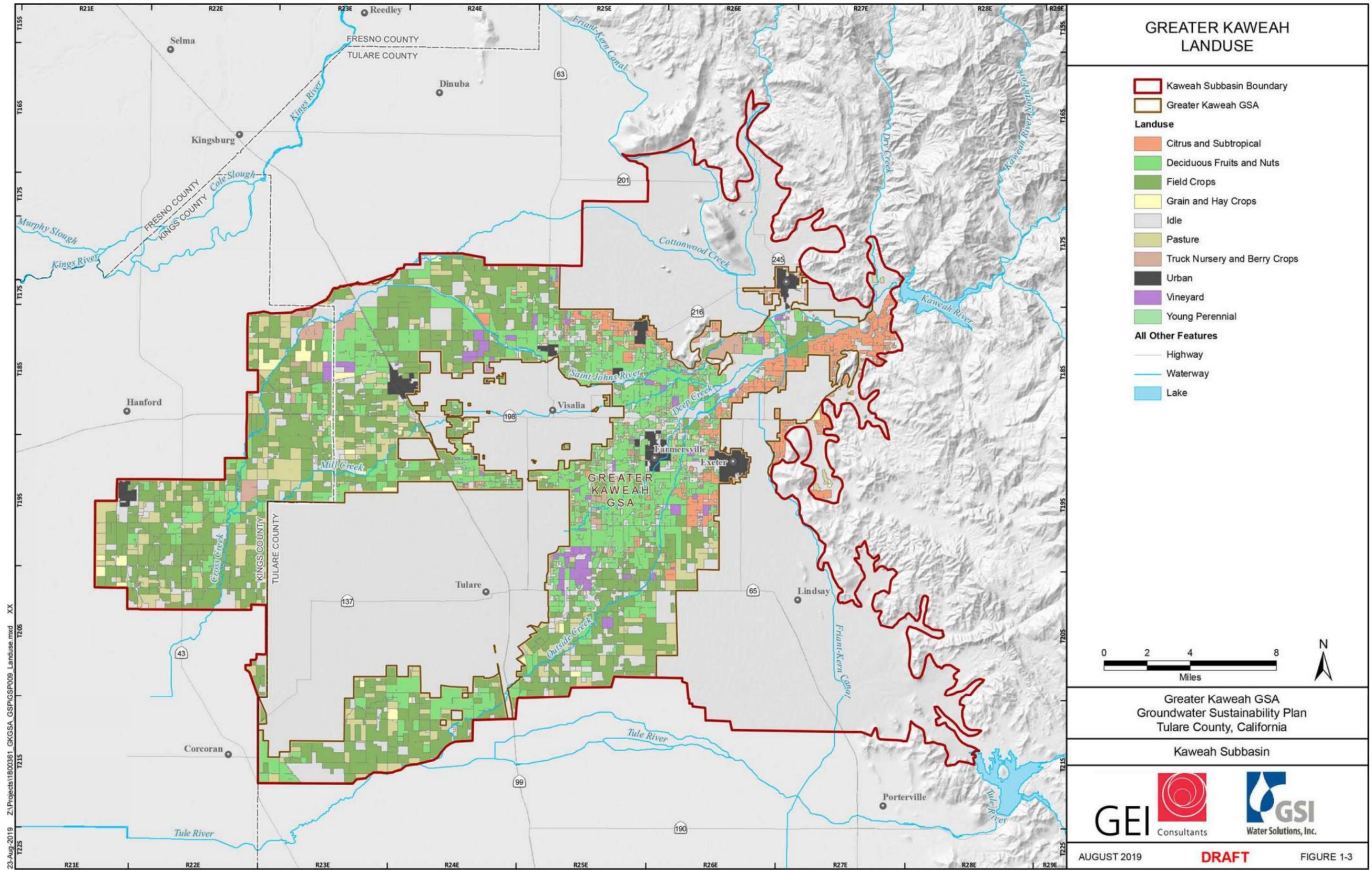


Figure 1-3: Greater Kaweah Land Use

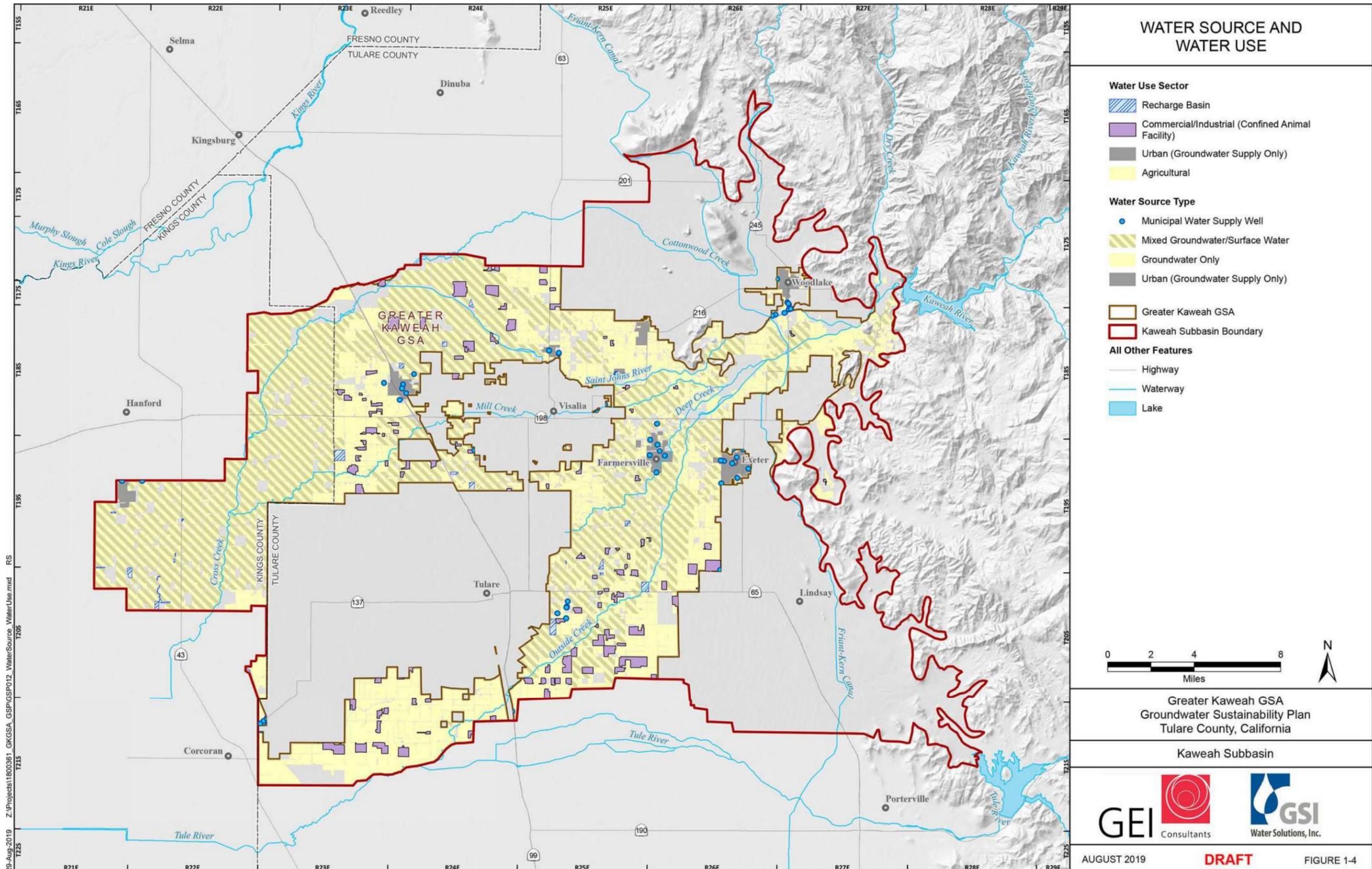


Figure 1-4: Water Source and Water Use

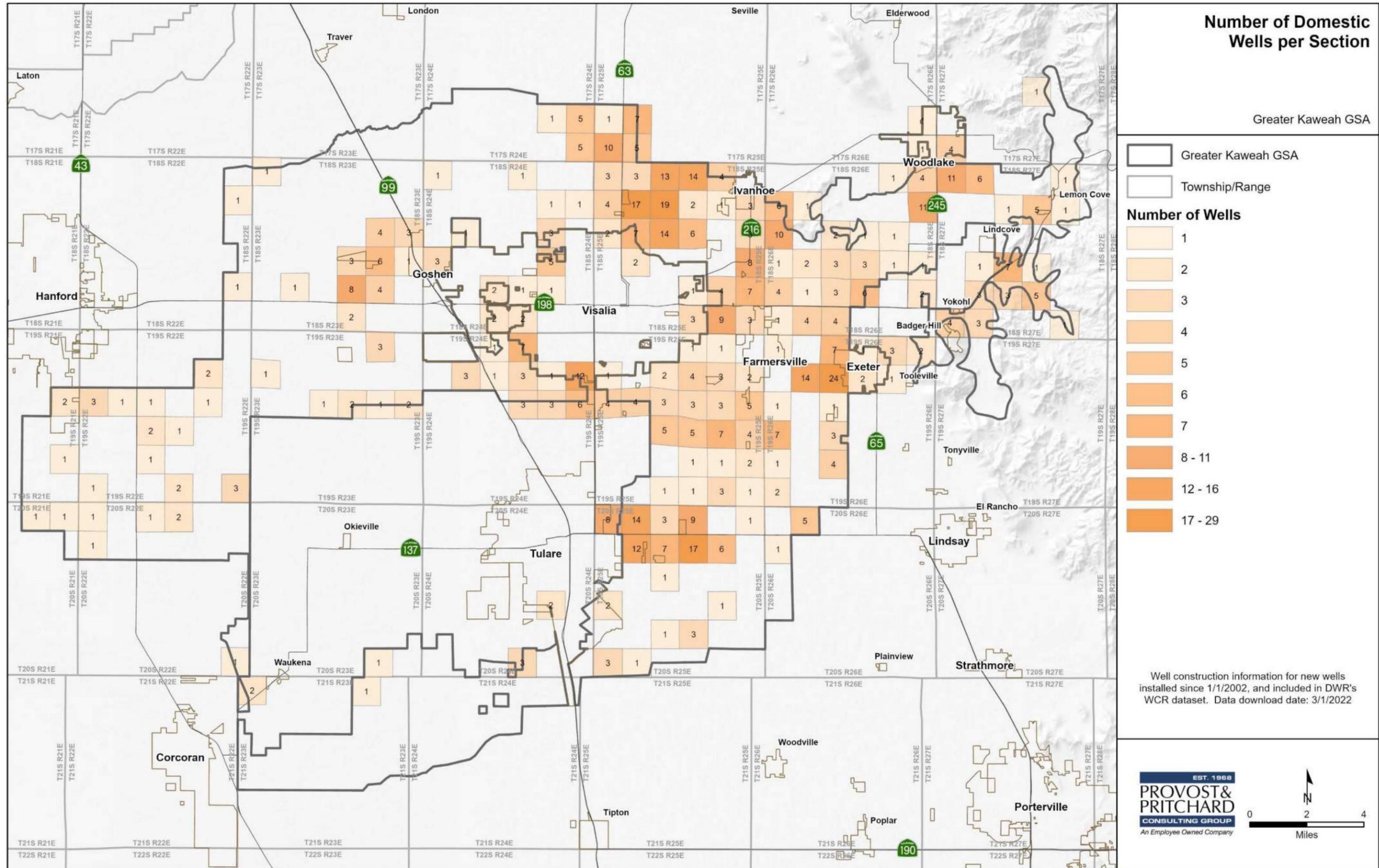


Figure 1-5: Well Density by Section (Domestic Wells)

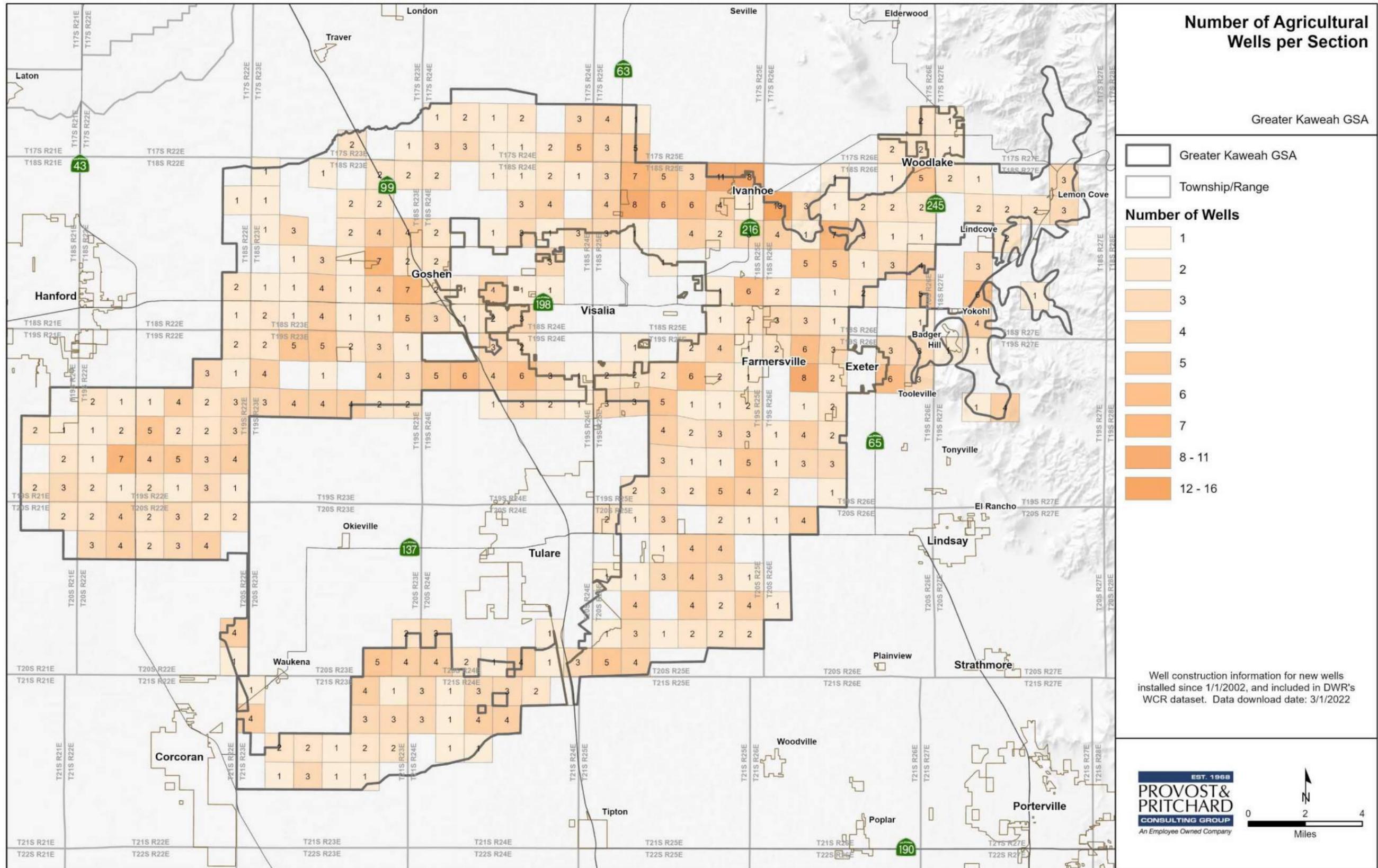


Figure 1-6: Well Density by Section (Production Wells)

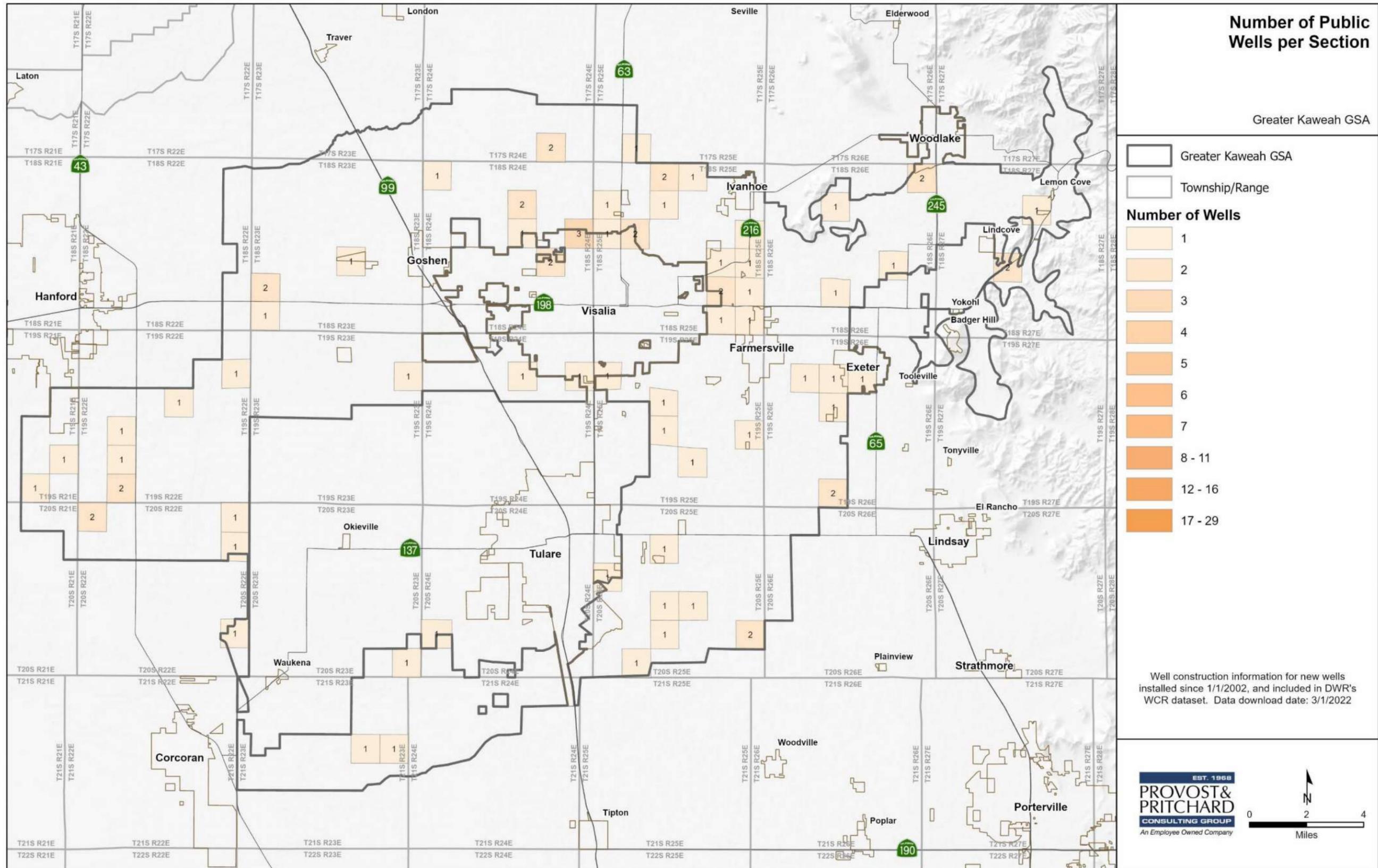


Figure 1-7. Well Density by Section (Public Wells)

2. Basin Setting

2.1 Overview

The three GSAs in the Kaweah Subbasin have coordinated and jointly prepared a comprehensive Basin Setting Report which is included as **Appendix 2A** of this Plan. The process and work effort to prepare this document are in accordance with the “MOU for Cooperation and Coordination of the Kaweah Subbasin” executed by the GSAs in 2017 for the purposes of (a) retaining consultants to conduct the necessary technical work sufficient to support a Coordination Agreement and (b) to establish a committee structure and associated public vetting process leading to an acceptable Hydrogeologic Conceptual Model (HCM), which describes and depicts the groundwater conditions and water budgets within the Subbasin. The appendix fully addresses §354.14, §354.16, and §354.18 of the GSP Regulations. The following sections serve as highlights of information for the GKGSA from **Appendix 2A**, but the reader is strongly encouraged to review the appendix to fully understand the hydrologic conditions in the GKGSA within the context of the entire subbasin and related statutory and regulatory requirements.

2.2 GSA Basin Setting Features

The GKGSA is located within Kaweah Subbasin, bordering the EKGSA and the mountain front to the east, the Kings River Subbasin to the north, the Tulare Lake Subbasin to the west, and Tule River Subbasin to the south. The MKGSA is located within the central-western portions of the Kaweah Subbasin and is surrounded by the GKGSA, except for portions of its western boundary. Roughly, the western half of the GSA is underlain by the Corcoran Clay, which creates an upper and a lower aquifer system, as shown by Sections A-A-, B-B', C-C', D-D', and E-E' (Figures 4 through 8 of the Basin Setting Report). A single aquifer system is present beneath the eastern portion of the GSA, all the way to the eastern boundary of the subbasin. The thickness of the fresh groundwater system varies from about 900 feet on the northeastern side of GKGSA where the St. Johns River enters the broad valley to about 1,600 feet along the western side of the subbasin. The thickness probably thins substantially eastward, up the river to the mountain front.

In general, groundwater flows across the GKGSA in a southwesterly direction and to local cones of depression during the irrigation season. The vertical flow gradient is from shallow to deep conditions. The majority of the groundwater quality data comes from the northern and central portions of the GKGSA and within the MKGSA. Several Constituents of Concern have been identified due to concentrations near Maximum Contaminant Levels (MCLs) or due to increasing trends in concentration: arsenic, nitrate, certain volatile organics, and 1,2,3-trichloropropane (1,2,3 TCP).

Land subsidence has occurred throughout much of the GKGSA area, and the Kaweah Subbasin in general, during the last 90 years, but data are limited in scale and frequency. The largest amounts of subsidence occurred along the western and southwestern portions of the GKGSA area. Greater amounts of subsidence are believed to have occurred beyond the Kaweah Subbasin to the west and

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south. According to the on-line DWR SGMA Data Viewer (2019), estimated subsidence between 1949 and 2005 has varied from about 1 foot or less to the north of Visalia to mostly 5 feet or less south of Farmersville and west of Visalia. Scattered areas of greater subsidence are present in these areas, between 5 and 10 feet. Along the southwestern corridor of GKGSA, the estimated subsidence mostly ranges between 10 and 15 feet with lesser areas ranging between 5 and 10 feet. In the westernmost GKGSA quadrangle, estimated subsidence ranges from 5 to 10 feet in the northwestern corner to between 15 and 20 feet in the southwestern corner. The pattern of these higher subsidence ranges is generally aligned in a northwest-southeast orientation. DWR did not provide subsidence estimates for the Farmersville, Ivanhoe, and areas further east. More recently, satellite radar technology (Interferometric Synthetic Aperture Radar or InSAR) has been used to identify subsidence for various time periods (January 2007 to December 2010, May 2015 to present), although this radar coverage is not complete across the basin. For the initial 4-year period, InSAR data are available for nine currently existing survey stations, including three stations with positive values (no subsidence) between 0.4 and 4.4 inches along the St. Johns River and six stations with negative values (subsidence) between -0.2 and -18.1 inches. The least amount of subsidence reported by DWR occurred on the east side of the GKGSA, south of Farmersville, while the greatest amounts of subsidence (-14.5 and -18.1 inches) occurred on the western side of the GKGSA. For the most recent approximately 7-year InSAR period, subsidence data are available for 14 survey stations monitored by Kaweah Delta Water Conservation District in partnership with CalTrans and values have ranged between -1.6 to -17.1 inches. The least amount of subsidence (<3 inches) occurred in the seven stations on the northeast side of GKGSA while the highest value occurred on the western side.

Groundwater levels throughout the majority of the Kaweah Subbasin do not appear to support Interconnected Surface Waters or Groundwater Dependent Ecosystems (GDEs). According to 23 Cal. Code Regs. § 351(o), “interconnected surface water” is defined as “surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted.” If the groundwater table is low enough, an unsaturated zone will sometimes develop beneath the streambed, and if the groundwater table drops further, the infiltration rate approaches a constant value. When further reductions in the groundwater table no longer significantly affect the infiltration rate, the stream is said to be disconnected (Brunner, Cook and Simmons, 2009).

Surface water tributaries in the Kaweah Subbasin include the Kaweah and St. Johns Rivers, originating at Terminus Dam. These rivers do not continuously flow, and groundwater elevations of the unconfined aquifer are typically, and significantly, lower than all surface water channels, indicating the presence of an unsaturated zone between the bottom of the river and the top of the unconfined groundwater. As of Fall 2014, depths to groundwater were greater than 30 feet of the land surface throughout the Kaweah Subbasin, according to the DWR Groundwater Information Center Interactive Map Application. Based on these groundwater depths, it is assumed that an unsaturated zone exists between surface water features and the aquifer system during average and dry periods, although it is noted that groundwater levels may temporarily rises in a relatively small area of the Kaweah Subbasin during infrequent wet periods. However, this condition, if it occurs, is temporary. As a result, the GKGSA is proposing to implement a Work Plan to fill data gaps and

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better understand the presence of interconnected surface water, if any, and further determine what impacts, if any, groundwater pumping may have in to be identified locations.

Data availability are limited at this time and additional work is necessary to determine if the plant communities and habitats are groundwater dependent.

The following data gaps were identified for the GKGSA:

- Accurate count of wells in GKGSA area, including well type (domestic, irrigation, etc.) and status (active, inactive, abandoned). A detailed reconnaissance survey is underway to verify location and operational status of wells within GKGSA’s jurisdiction but was not yet complete to inform this plan).
- Construction details of wells, especially production/screen interval(s). This data gap is significant and limits a comprehensive understanding of groundwater level and groundwater quality conditions above and below the Corcoran Clay.
- Lithologic composition of aquifer, including geophysical logs at strategic locations.
- Hydraulic parameters of principal aquifers based on pumping tests.
- Water quality data for domestic and irrigation wells.
- Measurements of subsidence within the GKGSA. The historical record of measured subsidence is incomplete and provides no information to inform an understanding of subsidence with depth.
- Groundwater elevation monitoring in areas with shallower groundwater levels to confirm whether or not the potential interconnected surface water and/or GDEs are present.

The data gaps will be addressed as GKGSA implements the Management Actions designed to close such gaps, as described in Section 7.3 to establish a subbasin-wide Monitoring Network as described in Section 4 of this GSP.

2.3 GSA Water Budget

Table 32 of **Appendix 2A** presents the annual tabulation of the current (1997-2017) water budget for the Subbasin. Based on the jurisdictional areas of each Subbasin GSA and the water budget components physically located within each area, a GKGSA water budget is presented in **Table 2-1**. This localized water budget represents the estimated physical net movement of water in and out of the GKGSA area on an annual basis and provides an average for the 21-year period. During that period, average groundwater storage was estimated to be a net loss of 34.6 TAF per year due to a combination of natural percolation, water management activities within the GKGSA, and influences from neighboring GSAs both in the Kaweah Subbasin and in neighboring subbasins. The range of storage change was -337 to 512 TAF per year during water year conditions that varied from the most dry to most wet with a median index that would be classified as moderately dry.

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**Table 2-1. Greater Kaweah Estimated Annual Deep Percolation, Extractions and Change in Storage –
 Historical and Current Periods**

Values in 1,000s af

Water Year	Rainfall		Components of Inflow							Components of Outflow							Total Inflow	Total Outflow	Change in Storage	Cumulative Change in Storage
	Inches	% of Average	Subsurface Inflow	Wastewater Inflow	Streambed Percolation and Conveyance Losses	Percolation of Recharge Basins	Percolation of Irrigation Water	Percolation of Precipitation (Crop and Non-Ag Land)	Groundwater Pumpage				Extraction by Phreatophytes	Evaporative Losses	Subsurface Outflow					
									M & I	Gross Applied Irrigation Water (Crop Water Demand)	Delivered Surface Water	GW Pumping for Irrigated Agriculture				Total Net Extraction				
1997	12.5	128%	79.4	3.0	194.6	67.8	119.7	89.6	21.6	512.5	188.1	328.7	350.3	0.4	1.0	101.2	534.1	452.9	81.2	81.2
1998	22.8	234%	44.0	2.9	223.6	70.4	91.0	161.6	21.0	390.3	253.7	141.7	162.6	0.7	1.0	104.2	593.5	268.6	325.0	406.1
1999	9.6	95%	292.7	3.0	110.9	38.8	138.7	43.3	21.5	518.9	124.7	407.4	429.0	0.3	1.0	158.9	627.4	589.2	38.2	444.4
2000	11.4	117%	279.6	3.1	118.3	34.6	139.7	51.3	21.9	542.9	141.3	415.0	436.9	0.4	1.0	180.2	626.6	618.4	8.2	452.6
2001	10.1	103%	275.0	3.2	72.0	6.7	127.8	42.5	22.5	543.8	97.0	446.8	469.3	0.3	1.0	194.1	527.3	664.7	-137.4	315.1
2002	10.4	107%	274.5	3.2	96.5	11.7	134.6	44.5	23.2	576.5	108.6	472.1	495.3	0.3	1.0	201.2	565.1	697.8	-132.7	182.5
2003	8.7	90%	273.3	3.4	128.5	31.3	136.5	38.1	24.2	575.6	128.7	446.9	471.1	0.3	1.0	214.3	611.2	686.7	-75.5	106.9
2004	8.0	82%	264.2	3.3	72.8	7.9	133.0	32.5	25.0	589.8	86.5	504.8	529.8	0.2	1.0	204.8	519.7	735.9	-222.2	-115.2
2005	12.2	125%	300.2	3.3	220.0	78.9	125.5	63.9	26.8	524.6	219.2	322.9	348.7	0.4	1.0	210.2	792.0	560.3	231.7	116.5
2006	15.4	159%	297.4	3.3	205.2	53.5	137.6	81.2	26.7	533.6	225.7	318.8	345.5	0.5	1.0	208.3	778.1	555.3	222.8	339.3
2007	3.8	39%	261.1	3.3	49.6	6.2	143.3	21.0	27.3	605.4	55.5	549.9	577.2	0.1	1.0	225.0	484.4	803.3	-319.0	20.3
2008	5.0	52%	288.8	3.3	99.3	7.7	139.3	33.0	28.1	602.6	127.2	476.7	504.8	0.2	1.0	283.5	571.4	789.4	-218.1	-197.8
2009	6.4	66%	301.4	3.3	101.6	10.1	133.8	24.4	28.7	632.9	117.0	517.0	545.7	0.2	1.0	271.5	574.6	818.4	-243.8	-441.6
2010	11.1	114%	325.3	3.2	177.1	45.2	129.3	45.4	29.2	561.3	182.2	382.5	411.7	0.3	1.0	253.7	725.6	666.7	58.9	-382.7
2011	13.7	140%	352.6	3.2	248.0	106.1	143.2	99.3	27.8	554.7	248.8	328.1	355.9	0.4	1.0	241.2	952.3	598.5	353.7	-29.0
2012	4.4	45%	305.0	3.1	80.4	11.3	142.5	32.1	24.9	604.8	99.8	505.0	529.9	0.1	1.0	228.5	574.3	757.5	-183.2	-212.2
2013	4.4	45%	295.8	3.0	54.3	2.7	143.8	21.8	26.1	615.6	44.7	570.9	597.0	0.1	1.0	238.4	521.4	836.6	-315.1	-527.3
2014	4.7	48%	293.3	3.0	36.2	0.3	147.4	17.0	25.1	622.4	27.9	594.5	619.6	0.1	1.0	213.9	497.3	834.6	-337.3	-864.6
2015	6.2	63%	281.9	3.0	31.8	0.4	137.6	32.1	24.1	582.1	22.3	559.8	583.8	0.2	1.0	195.1	486.7	780.1	-293.4	-1,158.0
2016	9.8	100%	281.8	2.8	108.6	10.3	125.2	52.6	24.8	535.5	108.4	429.0	453.9	0.3	1.0	208.6	581.4	651.8	-80.4	-1,238.4
2017	14.0	143%	364.4	2.9	319.7	140.8	135.0	78.9	24.5	525.1	290.2	279.3	303.8	0.4	1.0	222.6	1,039.6	527.8	511.7	-726.6
Maximum	22.8	234%	364.4	3.4	319.7	140.8	147.4	161.6	29.2	632.9	290.2	594.5	619.6	0.7	1.0	283.5	1,039.6	636.6	511.7	
Minimum	3.8	39%	44.0	2.8	31.8	0.3	91.0	17.0	21.0	390.3	22.3	141.7	162.6	0.1	1.0	101.2	484.4	268.6	-337.3	
Average	9.7	100%	272.9	3.1	130.9	35.4	133.5	51.6	24.9	559.6	138.0	428.5	453.4	0.3	1.0	207.4	627.5	662.1	-34.6	
% of Total			43%	0%	21%	100%	8%	21%	4%	65%	100%	0.05%	0.15%	31%						

/italic = Calculation
 = Component of Inflow
 = Component of Outflow

[Link: Full-size table is available at the end of this section.](#)

To apportion responsibilities for the development of recharge projects and management actions (extraction reductions), **Section 6: Water Supply Accounting** of this GSP segregates groundwater inflows based on a legal construct of native, foreign, and salvaged components. These components are proportionately assigned to each of the three Subbasin GSAs. This construct and apportionment have been considered and accepted by each GSA and represent a preliminary water accounting framework to be further discussed and refined during the first five years by the GKGS and the two other GSAs in the Kaweah Subbasin.

2.4 Management Areas

23 Cal. Code Regs. § 354.20. Management Areas.

(a) Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin. (b) A basin that includes one or more management areas shall describe the following in the Plan: (1) The reason for the creation of each management area. (2) The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large. (3) The level of monitoring and analysis appropriate for each management area. (4) An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable. (c) If a Plan includes one or more management areas, the Plan shall include descriptions, maps, and other information required by this Subarticle sufficient to describe conditions in those areas.

GKGS has considered establishing two Management Areas (MAs) within the GSA boundaries, including 1) the combined jurisdictional areas of GKGS members that import surface water to the

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Kaweah Subbasin and 2) the undistricted lands within the GKGSA, which are represented by the Tulare County membership in the GKGSA, as shown in **Figure 1-2**. MAs have not yet been established by this GSP but are expected to be included in its future revisions. This section addresses §354.20(b) and (c) of the GSP Regulations for MAs.

The reasons for the potential creation of the two MAs are:

- Each Member of the GKGSA is a separate public agency. With the exception of Tulare County, all the GKGSA Member agencies have the ability to import water to their jurisdictional areas to provide surface water supplies to their respective shareholders.
- As distinct public agencies, the GKGSA Members have differing means of raising funds to comply with SGMA and abilities to implement the Projects and Management Actions described in Section 7 of this GSP.
- The undistricted landowners in the GKGSA, having no overlying water agency other than the GKGSA, do not have the same means of developing and funding Projects as the landowners with access to surface water.
- Financial contributions by each member towards Projects may depend on an evaluation of existing water management agreements among them and on the water accounting framework (Section 6) which will define the water budget components of each member. These contributions may not be equal and would therefore vary depending on the Management Area.
- Management Actions by each member may differ due to varying water supply sources, participation in Projects, and other available resources.
- Each member has maintained an existing groundwater monitoring program for differing purposes and time periods. While these programs may be incorporated into a common platform for DWR annual reporting purposes, these programs will continue and will be somewhat distinct.

The Minimum Thresholds and Measurable Objectives are identified in Section 5 of this Plan; the monitoring and associated data evaluation are described in Section 4.

Minimum Thresholds were determined by first evaluating the groundwater levels that would be protective of the estimated 90th percentile of all beneficial uses and users within various analysis zones, as explained in Section 5. These protective levels were then compared to recent groundwater trending elevations and in context of the Kaweah Subbasin for a “smoothing” contour for Minimum Threshold elevations. This approach provides assurances that the Minimum Thresholds are protective of groundwater beneficial uses/users and are compatible across the Kaweah Subbasin and the selected well monitoring sites. Measurable Objectives for groundwater storage have been chosen on a monolithic basis and by application of the groundwater levels sustainable management criteria as a proxy.

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Wells serving the cities of Farmersville, Exeter, and Woodlake are generally tapping the single aquifer system east of the Corcoran Clay. These wellfields pump on a year-round basis and static water-level conditions are rarely if ever reached in these areas.

The chosen Measurable Objectives are not believed to create any adverse impacts leading to Undesirable Results. Action triggers, as described in Section 5, will avoid any significant deviation from these Measurable Objectives.

Table 2-1. Greater Kaweah Estimated Annual Deep Percolation, Extractions and Change in Storage – Historical and Current Periods

Values in 1,000s af

Water Year	Rainfall		Components of Inflow						Components of Outflow							Total Inflow	Total Outflow	Change in Storage	Cumulative Change in Storage	
	Inches	% of Average	Subsurface Inflow	Wastewater Inflow	Steambed Percolation and Conveyance Losses	Percolation of Recharge Basins	Percolation of Irrigation Water	Percolation of Precipitation (Crop and Non-Ag Land)	Groundwater Pumpage					Extraction by Phreatophytes	Evaporative Losses					Subsurface Outflow
									M & I	Gross Applied Irrigation Water (Crop Water Demand)	Delivered Surface Water	GW Pumping for Irrigated Agriculture	Total Net Extraction							
1997	12.5	128%	79.4	3.0	194.6	67.8	119.7	69.6	21.6	512.5	188.1	328.7	350.3	0.4	1.0	101.2	534.1	452.9	81.2	81.2
1998	22.8	234%	44.0	2.9	223.6	70.4	91.0	161.6	21.0	390.3	253.7	141.7	162.6	0.7	1.0	104.2	593.5	268.6	325.0	406.1
1999	9.6	99%	292.7	3.0	110.9	38.8	138.7	43.3	21.5	518.9	124.7	407.4	429.0	0.3	1.0	158.9	627.4	589.2	38.2	444.4
2000	11.4	117%	279.6	3.1	118.3	34.6	139.7	51.3	21.9	542.9	141.3	415.0	436.9	0.4	1.0	180.2	626.6	618.4	8.2	452.6
2001	10.1	103%	275.0	3.2	72.0	6.7	127.8	42.5	22.5	543.8	97.0	446.8	469.3	0.3	1.0	194.1	527.3	664.7	-137.4	315.1
2002	10.4	107%	274.5	3.2	96.5	11.7	134.6	44.5	23.2	576.5	108.6	472.1	495.3	0.3	1.0	201.2	565.1	697.8	-132.7	182.5
2003	8.7	90%	273.3	3.4	128.5	31.3	136.5	38.1	24.2	575.6	128.7	446.9	471.1	0.3	1.0	214.3	611.2	686.7	-75.5	106.9
2004	8.0	82%	264.2	3.3	72.8	7.9	133.0	32.5	25.0	589.8	86.5	504.8	529.8	0.2	1.0	204.8	513.7	735.9	-222.2	-115.2
2005	12.2	125%	300.2	3.3	220.0	78.9	125.5	63.9	25.8	524.6	219.2	322.9	348.7	0.4	1.0	210.2	792.0	560.3	231.7	116.5
2006	15.4	159%	297.4	3.3	205.2	53.5	137.6	81.2	26.7	533.6	225.7	318.8	345.5	0.5	1.0	208.3	778.1	555.3	222.8	339.3
2007	3.8	39%	261.1	3.3	49.6	6.2	143.3	21.0	27.3	605.4	55.5	549.9	577.2	0.1	1.0	225.0	484.4	803.3	-319.0	20.3
2008	5.0	52%	288.8	3.3	99.3	7.7	139.3	33.0	28.1	602.6	127.2	476.7	504.8	0.2	1.0	283.5	571.4	789.4	-218.1	-197.8
2009	6.4	66%	301.4	3.3	101.6	10.1	133.8	24.4	28.7	632.9	117.0	517.0	545.7	0.2	1.0	271.5	574.6	818.4	-243.8	-441.6
2010	11.1	114%	325.3	3.2	177.1	45.2	129.3	45.4	29.2	561.3	182.2	382.5	411.7	0.3	1.0	253.7	725.6	666.7	58.9	-382.7
2011	13.7	140%	352.6	3.2	248.0	106.1	143.2	99.3	27.8	554.7	248.8	328.1	355.9	0.4	1.0	241.2	952.3	598.5	353.7	-29.0
2012	4.4	45%	305.0	3.1	80.4	11.3	142.5	32.1	24.9	604.8	99.8	505.0	529.9	0.1	1.0	226.5	574.3	757.5	-183.2	-212.2
2013	4.4	45%	295.8	3.0	54.3	2.7	143.8	21.8	26.1	615.6	44.7	570.9	597.0	0.1	1.0	238.4	521.4	836.6	-315.1	-527.3
2014	4.7	48%	293.3	3.0	36.2	0.3	147.4	17.0	25.1	622.4	27.9	594.5	619.6	0.1	1.0	213.9	497.3	834.6	-337.3	-864.6
2015	6.2	63%	281.9	3.0	31.8	0.4	137.6	32.1	24.1	582.1	22.3	559.8	583.8	0.2	1.0	195.1	486.7	780.1	-293.4	-1,158.0
2016	9.8	100%	281.8	2.8	108.6	10.3	125.2	52.6	24.8	535.5	108.4	429.0	453.9	0.3	1.0	206.6	581.4	661.8	-80.4	-1,238.4
2017	14.0	143%	364.4	2.9	319.7	140.8	135.0	76.9	24.5	525.1	290.2	279.3	303.8	0.4	1.0	222.6	1,039.6	527.8	511.7	-726.6
Maximum	22.8	234%	364.4	3.4	319.7	140.8	147.4	161.6	29.2	632.9	290.2	594.5	619.6	0.7	1.0	283.5	1,039.6	836.6	511.7	
Minimum	3.8	39%	44.0	2.8	31.8	0.3	91.0	17.0	21.0	390.3	22.3	141.7	162.6	0.1	1.0	101.2	484.4	268.6	-337.3	
Average	9.7	100%	272.9	3.1	130.9	35.4	133.5	51.6	24.9	559.6	138.0	428.5	453.4	0.3	1.0	207.4	627.5	662.1	-34.6	
% of Total			43%	0%	21%	6%	21%	8%	4%			65%		0.05%	0.15%	31%				
			100%						100%											

Italic = Calculation
 = Component of Inflow
 = Component of Outflow

3. Sustainability Goal

3.1 Introduction

This Section presents the Subbasin-scale Sustainability Goal and basis for sustainable management criteria (SMC) as required by 23 Cal. Code Regs. §§354.22-.26. The Sustainability Goal and basis for SMC was coordinated across the Kaweah GSAs and included in the Coordination Agreement, particularly Appendix 6 of the Coordination Agreement which is attached in **Appendix 5A**). Pursuant to 23 Cal. Code Regs §354.26(d), no sustainable management criteria need to be set for the undesirable results of Seawater Intrusion. Thus, pursuant to 23 Cal. Code Regs §354.26I⁴, those undesirable results will not be discussed herein.

3.2 Sustainability Goal

23 Cal. Code Regs. § 354.24. *Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years of the applicable statutory deadline. The Plan shall include a description of the sustainability goal, including information from the basin setting used to establish and sustainability goal, a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation and is likely to be maintained through the planning and implementation horizon.*

The Sustainability Goal for the Kaweah Subbasin is stated in Section 6 of the Coordination Agreement. The Sustainability Goal and targets for how it will be achieved are laid out below. The metrics and approaches to be employed by GKGSAs for the six sustainability indicators are shown in **Table 3-1**.

Table 3-1: Sustainable Management Criteria by Sustainability Indicator

SMC Summary for GKGSAs		
Sustainability Indicators	Basis for Minimum Threshold	Basis for Measurable Objective
 Chronic Lowering of Groundwater Levels	Protection of greater than the 90 th percentile of all beneficial uses and users without allowing a greater rate of historical level decline ¹	Flexibility for at least 5 years of drought storage
 Reduction in Storage	Calculated based on groundwater levels ²	Calculated based on groundwater levels ²
 Land Surface Subsidence	Total subsidence of no more than 9 feet, and a subsidence rate of no more than 0.67 feet/year	Zero Subsidence

⁴ 23 Cal. Code Regs §354.26(e) provides “An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish minimum thresholds related to those sustainability indicators.

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SMC Summary for GKGSA			
Sustainability Indicators		Basis for Minimum Threshold	Basis for Measurable Objective
	Water Quality	Reference to other regulators ³	Reference to other regulators ³
	Seawater Intrusion	Not Applicable	Not Applicable
	Interconnected Surface Waters	50% of channel losses in selected waterways ⁴	30% of channel losses in selected waterways ⁴

¹ Determined by representative monitoring sites in Analysis Zones

² Storage volume changes and associated SMC determined as function of water level changes

³ e.g. SWRCB Division of Drinking Water requirements for public supply wells, RWQCB Irrigated Lands Regulatory Program

⁴ Work Plan in place to fill data gaps and better refine understanding of location and impacts caused by groundwater pumping

The broadly stated sustainability goal for the Kaweah Subbasin, as agreed to by the three GSAs therein, is for each GSA to manage groundwater resources to preserve the viability of existing agricultural enterprises of the region and the smaller communities that provide much of their job base in the Sub-basin, including the school districts serving the communities. The goal will also strive to fulfill the water needs of existing and amended County and City general plans that commit to continued economic and population growth within Tulare County and within portions of Kings County.

This sustainability goal as stated in this section is included by reference in the Kaweah Subbasin Coordination Agreement. This goal statement complies with §354.24 of the Regulations.

This Goal will be achieved by:

- The implementation of the EKGSA, GKGSA and MKGSA GSPs, each designed to identify phased implementation of measures (projects and management actions) targeted to ensure that the Kaweah Subbasin is managed to avoid undesirable results and achieve measurable objectives by 2040 or as may be otherwise extended by DWR.
- Collaboration with other agencies and entities to arrest chronic groundwater-level and groundwater storage declines, reduce or minimize land subsidence where significant and unreasonable, decelerate ongoing water quality degradation where feasible, and protect the local beneficial uses and users.
- Assessments at each interim milestone of implemented projects and management actions and their achievements towards avoiding undesirable results as defined herein.
- Continuance of projects and management actions implementation by the three GSAs, as appropriate, through the planning and implementation horizon to maintain this sustainability goal.

In furtherance of this Subbasin goal, GKGSA advances the following objectives:

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- Pursuit of projects to sustain and maximize the delivery of local and imported water supplies into the Subbasin for beneficial use, including groundwater recharge via sinking basins, incentivized on-farm programs, and natural and man-made water conveyance systems. GKGSA recognizes that maximizing deliveries of Sierra watershed surface supplies into the Subbasin will provide inherent water quality improvements for all beneficial uses.
- Where necessary, imposition of management actions to ensure that the rate of groundwater hydrostatic pressure/water-level decline in semiconfined zones and rate of groundwater-level decline in the unconfined zone reaches zero on a rolling 10-year average basis in GSAs and Management Areas as identified in Subbasin Plans by 2040 or as otherwise extended by DWR. Management actions may include land fallowing or other land-use conversion alternatives and will incorporate a demand reduction program.
- Implementation of water conservation measures consistent with state mandates and as reflected in urban water management plans.
- Where feasible, installations and modifications and upgrades of wastewater treatment facilities, both public and private, where effluent discharges reach the underlying aquifer, all as approved and authorized by the owner/operator of such facilities.
- Placement of recharge projects and management of pumping regimes in each GSA/Management Area such that acceleration of contaminant plume migration that impairs domestic and municipal supply well production as induced by GSP projects and management actions is avoided. Where technologically and economically feasible as determined by the GSA, consideration will be given to those projects and management actions (e.g., pumping regimes) that could result in key water quality constituent improvements leading to a deceleration of ongoing water quality degradation for potable uses. Any improvements would be consistent with MCLs or other constituents of concern as established by applicable regulatory agencies. Projects and management actions affording such improvements would be undertaken in partnership with other agencies charged with enforcing MCLs or otherwise engaged in water quality regulation.
- Placement of recharge projects and management of pumping regimes and adherence to minimum thresholds in each GSA/Management Area such that newly induced subsidence is not causing significant and unreasonable harm to surface and sub-surface infrastructure, including water conveyance systems, or contributing to significant and unreasonable sub-surface water quality degradation.

The sections discussing the causes and criteria for Undesirable Results previously in Section 3.4 through Section 3.8 for the 2020 GSP have been moved to Section 5 to be included with the discussion of Sustainable Management Criteria (SMC) for each sustainability indicator.

3.3 Seawater Intrusion

3.3.1 Undesirable Results

23 Cal. Code Regs § 354.26 (d) *An Agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators.*

Seawater intrusion will not occur in the Kaweah Subbasin as described more thoroughly in the basin setting. Thus, criteria were not established.

4. Monitoring Networks

The following section describes both the existing groundwater monitoring within the GKGSA area, and the representative monitoring required by SGMA. In areas where existing monitoring does not meet the SGMA requirements, this section identifies the data gaps and proposed measures to address these data gaps during the SGMA implementation period, so the monitoring improves with time. Any such improvement will be implemented as recognized and the results will be evaluated during the 5-year updates.

4.1 Existing Monitoring Networks and Programs

23 Cal. Code Regs. § 354.34 (e) *A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.*

Within the GKGSA boundaries, local, regional, state, and federal programs have been established to monitor groundwater levels, groundwater and surface water quality, surface water inflow, weather and precipitation, and land subsidence. A brief description of these programs and their applicability to groundwater management are provided below.

4.1.1 Existing Groundwater Level Monitoring

Groundwater elevations are monitored by local agencies (water conservation districts, irrigation districts, and others) and regional agencies. **Table 4-1** presents a summary of the groundwater monitoring in the GKGSA. The interpretation of these data is described in the Kaweah Subbasin Basin Setting Report (Appendix 2A).

Table 4-1: Existing Groundwater Level Monitoring Summary

Agency	Frequency of Monitoring	Period of Record for Monitoring	Types of Wells Monitored	Number of Wells (Approx.)	Known Completion of Wells Monitored	Number of Dual Completion Wells
Alta ID	Monthly to bi-annually	1921 – 2011	Agriculture / Domestic	5	None	None
Bureau of Reclamation	Monthly to bi-annually	1924 – 2008	Unknown	118	15	Unknown
Cal Water (City of Visalia)	Monthly	1971 – 2018	Municipal	104	None	Unknown
Dept of Water Resources	Bi-annually	1930 – 2016	Various	182	7	Unknown
Exeter ID	Bi-annually	1963 – 2016	Agricultural	40	None	Unknown
KDWCD	Monthly to Bi-Annually	1919 – 2018	Agricultural	425	30	4

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Agency	Frequency of Monitoring	Period of Record for Monitoring	Types of Wells Monitored	Number of Wells (Approx.)	Known Completion of Wells Monitored	Number of Dual Completion Wells
Kings County Water District	Bi-annually	2011 – 2018	Agricultural	6	3	Unknown
Lakeside IWD	Bi-annually	2012 – 2017	Agricultural	33	2	Unknown

In addition to the local agency monitoring, the KDWCD participates in the California Statewide Groundwater Elevation Monitoring (CASGEM) Program in a coordinated effort with overlapping jurisdictions (LIWD, KCWD, others). CASGEM was established by the DWR in 2009 and is used to track seasonal and long-term groundwater elevation trends in groundwater basins statewide, in collaboration with local monitoring entities. Tulare Irrigation District (TID) is the other CASGEM reporting entity for the Kaweah Subbasin. Within GKGSA, data are shared through coordinated efforts in overlapping jurisdictional boundaries (KDWCD, LIWD, KCWD, and others).

4.1.2 Existing Groundwater Quality Monitoring

Groundwater quality monitoring and reporting is currently conducted through numerous public agencies for the Kaweah Subbasin. The agencies and programs are summarized in **Table 4-2** for the GKGSA, and these programs are also described in the Kaweah Subbasin Basin Setting Report (Appendix 2A).

Table 4-2: Existing Groundwater Quality Monitoring Programs

Water Quality Monitoring Program	Participating Agencies	Constituents	Frequency
AB 3030 and SB 1938	Exeter ID, KDWCD, Lakeside ID	Agricultural suitability analysis (limited suite of general minerals)	Annually to Once Every 3 Years
State of California – Drinking Water Program	City of Exeter, City of Farmersville, Ivanhoe Public Utility District, City of Woodlake	All Title 22 regulated constituents	Title 22 General Minerals & Metals, every 3 years. Nitrates, annually (quarterly if ≥ 5 ppm). VOCs and SOCs, every 3 years Uranium, dependent on historical sampling and varies between every 3 years when ≥ 10 pCi/L, 6 years when < 10 pCi/L or 9 years when not detected

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Water Quality Monitoring Program	Participating Agencies	Constituents	Frequency
Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)		Most constituents sampled monthly, quarterly. General Minerals from source water and annual General Minerals from waste discharge. Kaweah is a Priority 1 Basin, meaning that management strategies will be initiated in 2019	
Department of Pesticide Regulation (DPR)	City of Exeter, City of Farmersville, Ivanhoe Public Utility District, City of Woodlake	Pesticides	Annual
Groundwater Ambient Monitoring and Assessment (GAMA)	United States Geological Survey (USGS), State Water Resources Control Board (SWRCB), Central Valley Regional Water Quality Control Board (RWQCB), Department of Water Resources (DWR), DPR, National Water Information System (NWIS), Lawrence Livermore National Laboratory (LLNL)	USGS established the original program with SWRCB. GAMA database is now derived from a variety of sources. Constituents vary by program objectives. The Priority Basin Project performed baseline and trend assessments, sampling 2,900 public and domestic wells statewide. The Domestic Well Project sampled over 180 wells in Tulare County (29 wells were in the Kaweah Subbasin).	Variable depending on project objectives.
Geotracker and Envirostor Databases	SWRCB, Central Valley RWQCB	Many contaminants of concern - organic and inorganic	Dependent on program or conditions of permits (monthly, quarterly, semiannually, annually, etc.)
Irrigated Lands Regulatory Program (IRLP)	Kaweah Basin Water Quality Association	Temperature, pH, electrical conductance, nitrate as nitrogen, dissolved oxygen, General Minerals suite	Annually for the five constituents, every 5 years for General Minerals (First sampling occurred during fall 2018)

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Water Quality Monitoring Program	Participating Agencies	Constituents	Frequency
USGS California Water Science Center	USGS	Multiple Groundwater Quality studies in Kaweah Subbasin	Studies used for Basin Setting: 2017 - Groundwater Quality in the Shallow Aquifer • 2012 - Status and Understanding • 2012 - Groundwater Quality in Southeast San Joaquin Valley (SESJ) • 2008 - Groundwater Quality Data in the SESJ • 1998 - Environmental Setting

4.1.3 Surface Water Inflow Monitoring

Section 2.3.4 of the Basin Setting document (Appendix 2A) describes all the surface water flow monitoring in the Kaweah Subbasin and Figure 21 of that document shows the locations of flow monitoring stations. The main sources of surface water come from the Friant Division of the Central Valley Project and Kaweah River. KDWCD holds a permanent contract with the US Bureau of Reclamation (USBR) which entitles it to certain quantities of surface water from Millerton Lake, which is delivered via the Friant-Kern Canal. KCWD and Lakeside IWD, while not long-term contractors, have historically purchased surplus CVP water, when available. The Kaweah River is fully appropriated, pre-1914 rights, and water is delivered via agreements with water rights holders of the Kaweah and St. Johns River Association. **Figure 4-1** shows the locations of surface water monitoring stations (headgates). Water rights are administered through the Watermaster in accordance with historic agreements and associated measurement locations. Additionally, KDWCD and KSJRA works with the Army Corps of Engineers in the operation of Terminus Dam to coordinate releases from the dam for flood releases as well as delivery to appropriators. As well as flood releases. Seasonal streams originating in the eastern portion of the Kaweah Subbasin, such as Yokohl, Lewis, Cottonwood, and Dry Creeks, also contribute to the surface water inflow to GKGSA.

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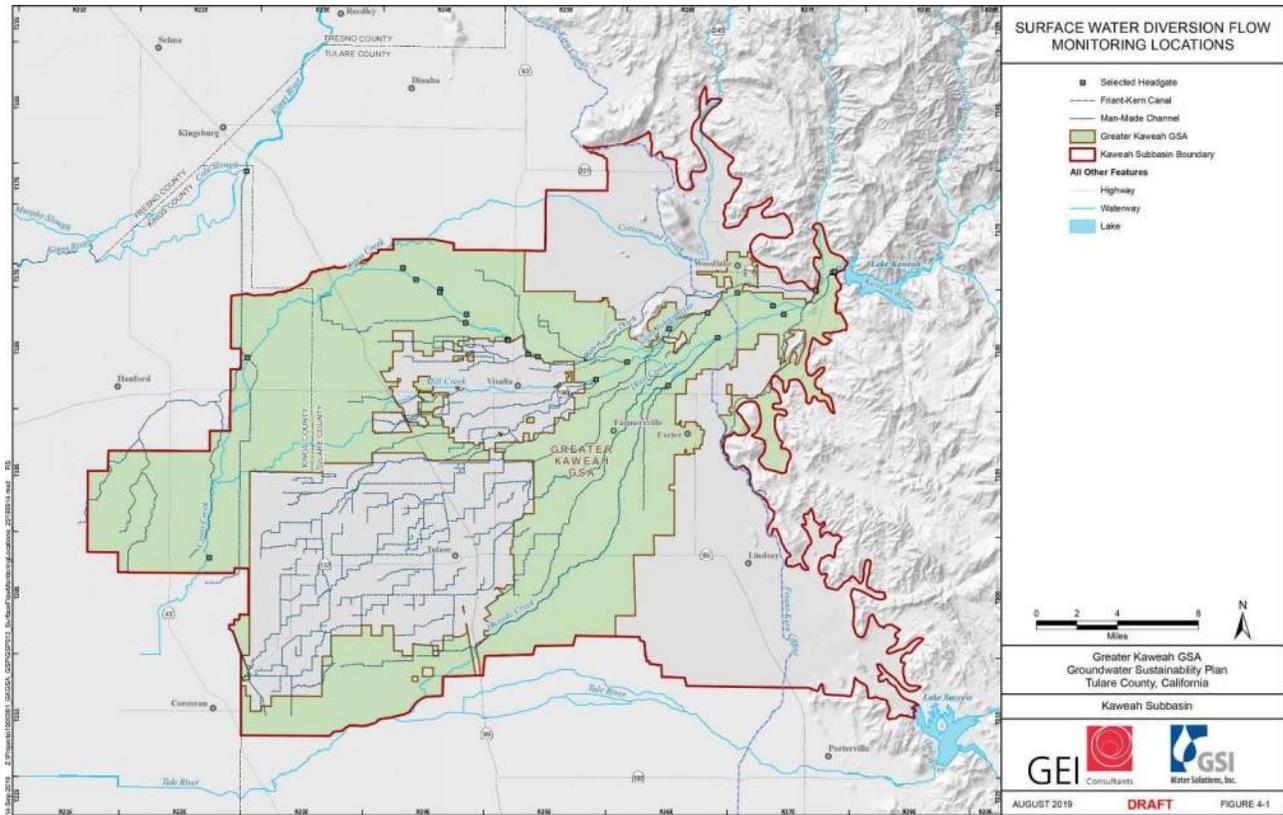


Figure 4-1: Surface Water Diversion Flow Monitoring Locations

Link: Full-size figure is available at the end of this section.

4.1.4 Weather and Precipitation Monitoring

For the Kaweah Subbasin, several weather stations are used for the measurement of precipitation. These stations, which are part of the CIMIS and NOAA networks, are listed in **Table 4-3** below.

Table 4-3: CIMIS Stations in and around Kaweah Subbasin

Source	Station Number	Station Name
CIMIS	43747	Hanford
CIMIS	42012	Corcoran
CIMIS	49367	Visalia
CIMIS	44957	Lindsay
CIMIS	44890	Lemon Cove
CIMIS	48917	Three Rivers Edison
NOAA	04-0204	Angiola
NOAA	04-2012	Corcoran Irrigation District
NOAA	04-2922	Exeter Fauver Ranch
NOAA	04-3747	Hanford 1 S

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Source	Station Number	Station Name
NOAA	72-0040	Lake Kaweah Weather
NOAA	04-4890	Lemon Cove
NOAA	04-4957	Lindsay
NOAA	04-7077	Porterville
NOAA	04-9367	Visalia

4.1.5 Existing Land Subsidence Monitoring

As described in Section 2.3.3 of the Basin Setting Report (Appendix 2A), land subsidence monitoring includes both the monitoring of land elevation changes and groundwater level changes. Land elevation survey monitoring includes NGS benchmark repeat level surveys, remote sensing by InSAR, and in-situ compaction monitoring by an extensometer south of the Kaweah Subbasin. The existing groundwater level monitoring network is described in Section 4.1.1 of this section and Section 2.3.1 of the Basin Setting Report (Appendix 2A). **Table 4-4** below is a summary of historic and recent land subsidence monitoring programs in the GKGS and the Kaweah Subbasin, at large.

Table 4-4: Historical and Recent Subsidence Monitoring

Category	Monitoring Entity (Entities)	Period of Record
Historical Monitoring	National Geodetic Survey of benchmarks (repeat level surveys)	1926 – 1970
Recent Monitoring	National Geodetic Survey of benchmarks (repeat level surveys). Installation and measurement of Deer Creek extensometer (8.5 miles south of Kaweah Subbasin in the Tule Subbasin)	1970 to present
	KDWCD Land Surface Elevation Monitoring (local benchmark monitoring network)	2016 to present
	UNAVCO and CVSRN CGPS stations: P056, P566, CRCN, LEMA, and RAPT	2006 to present (depending on station)
	NASA JPL, USGS, and others (InSAR and UAVSAR programs)	2007 – 2010 2015 to present

4.2 Monitoring Network Objectives

23 Cal. Code Regs. § 354.34 (b) *Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation.*

The Minimum Thresholds and Measurable Objectives for the Kaweah Subbasin account for the following sustainability indicators: Groundwater Levels, Groundwater Storage, Groundwater

Quality, Land Subsidence, and Interconnected Surface Water. While listed in SGMA, Seawater Intrusion is not considered in this Plan as described further in the Basin Setting Report (**Appendix 2A**)

4.2.1 Monitoring Objectives

23 Cal. Code Regs. § 354.34 (b) *The monitoring network objectives shall be implemented to accomplish the following: (1) Demonstrate progress toward achieving measurable objectives described in the Plan.*

23 Cal. Code Regs. § 354.34 (d) *The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.*

The monitoring networks will maintain data quality to meet the Measurable Objectives of this GSP. As described in the 2016 DWR best management practice (BMP) document for monitoring (*Groundwater Monitoring Protocols, Standards, and Sites BMP*), the processes for maintaining quality control and quality assurance are iterative and will be evaluated every five years for effectiveness. The monitoring networks implemented with this GSP will produce acceptable data to monitor the Sustainability Indicators against Minimum Thresholds and Interim Milestones. Where necessary, revisions will be made every five years.

4.2.2 Temporal Monitoring

23 Cal. Code Regs. § 354.34 (b) *The monitoring network objectives shall be implemented to accomplish the following: (2) Monitor impacts to the beneficial uses or users of groundwater.*

The monitoring network will be capable of collecting sufficient data to demonstrate seasonal, short-term (1 to 5 years), and long-term (5 to 10 years) trends in groundwater and related surface conditions, in addition to yielding representative information about groundwater conditions necessary to evaluate Plan implementation. The frequency at which data will be collected for each network is described in the following sections.

4.2.3 Representative Monitoring

23 Cal. Code Regs. § 354.36 (a). *Each Agency may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin, as follows:*

(a) Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.

(b) Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:

(1) Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.

(2) Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.

(c) The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area.

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As referenced in Regulation §354.36, representative monitoring sites may be designated where site results reflect the general conditions in the area, and where quantitative values are defined for Minimum Thresholds and Interim Milestones.

Representative monitoring will include the use of groundwater elevations as proxy measurements for groundwater storage. The USGS and DWR have utilized changes in groundwater elevations to estimate changes in groundwater storage and have demonstrated a correlation between declining groundwater elevations and increased subsidence, however a strong correlation was not identified for this plan area. A reasonable margin of operational flexibility with groundwater elevations will be taken to avoid undesirable results for the other sustainability indicators.

The Kaweah Subbasin Basin Setting (**Appendix 2A**) presents spatial distribution of Groundwater Quality, Groundwater Levels, and Land Subsidence data throughout the GKGSA and the Kaweah Subbasin. Representative monitoring sites are described in the following sections.

4.3 Monitoring Rationales

23 Cal. Code Regs. § 354.34 (g) *Each Plan shall describe the following information about the monitoring network:*

(1) Scientific rationale for the monitoring site selection process.

(2) Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results desired.

(3) For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones to be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.

As discussed in the Basin Setting Report (**Appendix 2A**), the overall trend for groundwater levels is declining in the Kaweah Subbasin for the Hydrologic Base Period and groundwater storage is commensurately less. Inelastic subsidence also tends to trend with declining groundwater levels in areas interbedded with clay layers or with a significant confining layer(s). Seawater Intrusion, due to the distance to the Pacific Ocean, is not considered to be a Sustainability Indicator (Section 3: Sustainability Goal). Due to limited data, a work plan has been developed to fill data gaps related to Interconnected Surface Waters in the GKGSA. More monitoring locations such as shallow monitoring wells and stream gauges are likely to be installed in gap areas as part of this work plan. More detail on the work plan is provided in Section 7.3.12.

Groundwater level monitoring is the key parameter that will inform progress made by the GKGSA in meeting the Interim Milestones and Measurable Objectives set in this Plan. The other Sustainability Indicators will be monitored using the existing monitoring systems and programs and will be evaluated concurrently groundwater levels. Data collected from the monitoring networks will be used to refine water budget components for future planning and subbasin modeling. Additional stream flow data will also enhance the water budget for an updated Subbasin model. The following sections (4.4 through 4.9) describe how GKGSA will monitor each Sustainability Indicator.

4.4 Groundwater Level Monitoring Network

23 Cal. Code Regs. § 354.34 (c) Each Monitoring Network shall be designed to accomplish the following for each sustainability indicator:

(1) Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods [identified below]:

4.4.1 Management Areas

23 Cal. Code Regs. § 354.34 (d) *The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.*

A Management Area (MA) refers to an area within the subbasin or GSA for which a GSP has identified different Minimum Thresholds, Measurable Objectives, monitoring, or Projects and Management Actions, based on unique local conditions for water use, water source, geology, aquifer characteristics, or other factors. MAs serve to preserve groundwater management practices and implement additional requirements set forth in this GSP. The GKGSA has not designated any MAs at this time but may elect to establish MAs in future updates to address different conditions (e.g. surface-water lands versus groundwater-only lands).

4.4.2 Monitoring Frequency

23 Cal. Code Regs. § 354.34 (c) *Each Monitoring Network shall be designed to accomplish the following for each sustainability indicator: (1) Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods: (B) Static groundwater elevation measurements shall be collected at least two times per year, to represent seasonal low and seasonal high groundwater conditions.*

23 Cal. Code Regs. § 354.34 (f) *The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:*

- (1) Amount of current and projected groundwater use.*
- (2) Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.*
- (3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.*
- (4) Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response.*

At a minimum, groundwater level monitoring will occur twice each year, typically in March and October. January has been a historic period of measurement because irrigation pumping is minimal during the winter rainy season when runoff is higher and groundwater recharge has begun. October is a typical period of measurement because the harvest is complete, and the irrigation season is generally over. March is a common period of measurement, but in drier years irrigation pumping has started by this time of the year, which reduces groundwater levels and dampens the recognition

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of groundwater level recovery. This frequency of monitoring is more than sufficient to demonstrate seasonal, short-term (1 to 5 years) and long-term (5 to 10 years) trends in groundwater and related surface conditions and yield representative information about groundwater conditions.

4.4.3 Spatial Density

23 Cal. Code Regs. § 354.34 (c) *Each Monitoring Network shall be designed to accomplish the following for each sustainability indicator: (1)(A) A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table potentiometric surface for each principal aquifer.*

23 Cal. Code Regs. § 354.34 (f) *The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:*

(1) Amount of current and projected groundwater use.

(2) Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.

(3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.

(4) Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response.

Figure 4-2 provides the current distribution of wells with available data throughout the GKGSA portion of the Kaweah Subbasin, including data from CASGEM, local and regional agencies, and MAs. **Figure 4-3** shows the groundwater wells in the GKGSA that will be used for monitoring of groundwater levels and water quality. Most of these wells are upper or single aquifer wells. Based on the BMP for monitoring networks, the well density goal is 4 to 10 wells per 100 square miles (DWR, 2017). The GKGSA area is approximately 340 square miles. Based on the BMP, the GKGSA monitoring network will require between 14 and 34 monitoring wells.

4.4.4 Maps of Grid for Each Aquifer/Management Area

23 Cal. Code Regs. § 354.34 (h) The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.

Figure 4-2 presents the representative wells for the groundwater level monitoring program for the GKGSA. Data from these 40 wells will be compared their respective sustainable management criteria. Selection of these wells was based on the following:

- Long record of historical data
- Current data
- Well accessibility
- Well construction information
- Total well depth
- Geographical distribution

Appendix B of the Basin Setting Report tabulates known well construction information while construction information was not available for many wells during the development of this initial GSP. Table 4 of the Basin Setting Report (**Appendix 2A**) lists the monitoring entity and the frequency of measurement for groundwater levels.

Access agreements are pending for the monitoring wells for the collection and reporting of groundwater level data at the time of publication of this public review draft. These agreements will be pursued during the GSP public review period and during the implementation period.

4.4.5 Monitoring Protocols

23 Cal. Code Regs. § 354.34(i) *The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data ad methodologies.*

As referenced in Regulation § 352.4, “monitoring protocols shall be developed according to best management practices. Monitoring protocols shall be reviewed at least every five years as part of the periodic evaluation of the Plan and modified as necessary.”

Per the DWR’s Monitoring Protocol BMP:

- All groundwater levels in a basin will be collected within as short a time as possible, preferably within a 1 to 2-week period.
- Depth to groundwater will be measured at an established Reference Point (RP) on the well casing. The RP will be identified with a permanent marker, paint spot, or a notch in the lip of the well casing. By convention in open casing monitoring wells, the RP is located on the north side of the well casing. If no mark is apparent, the person performing the

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measurement should measure the depth to groundwater from the north side of the top of the well casing.

- The sampler will remove the appropriate cap, lid, or plug that covers the monitoring access point listening for pressure release. If a release is evident, the measurement will be delayed for a short period of time to allow the water level to equilibrate.
- Measurements of depth to groundwater and land surface will be measured and reported in feet to an accuracy of at least 0.1 feet relative to NAVD88, or another national standard that is convertible to NAVD88, and the method of measurement will be noted on the record (i.e. electric sounder, steel tape, transducer, acoustic sounder or airline).
- The water level probe should be cleaned after measuring each well.
- To assure that the same well is being measured each time, the GSA will create a Well Identification Sheet for each well site, which will be used to track each well during monitoring. The following information will be recorded on each Well Identification Sheet: well number, date of survey, latitude and longitude, RP elevation, location description and map, well type and use, well completion type and, if available, total depth, screened intervals and well completion report number.
- The sampler will replace any well caps or plugs and lock any well buildings or covers.
- All data will be entered into the data management system (DMS) as soon as possible. Care will be taken to avoid data entry errors and the entries will be checked by a second person for accuracy.

4.4.5.1 Pressure Transducers

Per the DWR Monitoring Protocols BMP, groundwater levels may be measured using pressure transducers installed in monitoring wells and recorded by data loggers, along with calculated groundwater elevations. When relying on pressure transducers and data loggers, manual measurements of groundwater levels will be taken during installation to synchronize the transducer system and periodically (quarterly) to ensure monitoring equipment does not allow a ‘drift’ in the actual values.

The following protocols will be followed when installing a pressure transducer in a monitoring well:

- The sampler will use an electronic sounder or chalked steel tape to measure the depth to groundwater level from the RP. The groundwater elevation will be calculated by subtracting the depth to groundwater from the RP elevation. These values will be used as references to synchronize the transducer system in the monitoring well.
- The sampler will record the well identifier, the associated transducer serial number, transducer range, transducer accuracy, and other pertinent information in the log.
- Transducers will be able to record groundwater levels with an accuracy of at least 0.1 foot. Various factors will be considered in the selection of the transducer system, including battery life, data storage capacity, range of groundwater level fluctuations, and natural pressure drift of the transducers.

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- The sampler will record whether the pressure transducer uses a vented or non-vented cable for barometric compensation. Vented cables are preferred, but non-vented cables are acceptable if the transducer data are properly corrected for natural fluctuations in barometric pressure changes, which requires the commensurate logging of barometric pressures.
- Follow manufacturer specifications for installation, calibration, battery life preservation, correction procedure (for non-vented cables), and anticipated life expectancy to ensure optimal use of the equipment.
- Secure the cable to the well head with a well dock or another reliable method. Mark the cable at the elevation of the reference point with tape or an indelible marker to allow estimates of future cable slippage.
- The transducer data will be checked periodically against hand measured groundwater levels to monitor electronic drift or cable movement. This check will not occur during routine site visits, but at least annually.
- The data will be downloaded regularly to ensure data are not lost. Upon reviewing and accepting the data according to the QA/QC program, the data will be uploaded into the DMS. Data from non-vented cables will be corrected for barometric pressure fluctuations, as appropriate. After ensuring the transducer data have been downloaded and stored in the DMS, the data will be deleted from the data logger to ensure that adequate data logger memory remains for future measurements.

4.5 Groundwater Storage Monitoring Network

23 Cal. Code Regs. § 354.34(c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator: (2) Reduction of Groundwater Storage. Provide an estimate of the change in annual groundwater in storage.*

Change in groundwater storage is correlated with the change in groundwater levels, therefore the GKGSA will use groundwater levels as a proxy for the change in groundwater storage. Groundwater storage changes will be calculated by evaluating the volumetric difference between groundwater surfaces (contours of groundwater levels) at common seasons year over year (i.e. Fall to Fall or Spring to Spring). This volume will be multiplied by specific yield to determine the change in the volume of groundwater.

Because groundwater levels will be used as a proxy for groundwater storage changes, the sub-level discussions such as Management Areas, Monitoring Frequency, Spatial Density, etc. are not deemed necessary, since this information is provided for groundwater level data collection above.

4.6 Land Subsidence Monitoring Network

23 Cal. Code Regs. § 354.34(c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator: (5) Land Subsidence. Identify the rate and extent of land subsidence, which may be measured by extensometers, surveying, remote sensing technology, or other appropriate method*

4.6.1 Management Areas

For the purpose of this Plan, the GKGSA will not designate separate Management Areas to evaluate subsidence. The Sustainability Indicator for subsidence will be evaluated with SGMA implementation to determine the necessity to specify Management Areas for subsidence monitoring.

4.6.2 Monitoring Frequency

The monitoring network will be capable of yielding sufficient data to demonstrate short-term (1 to 5 years) and long-term (5 to 10 years) trends in subsidence and representative information about land surface elevation changes necessary to evaluate Plan efficacy. Land surface elevation data will be collected at least annually. It may also be collected intermediately for verification or to satisfy inquiry. These data will be used in conjunction with InSAR imagery available from NASA.

4.6.3 Monitoring Network

Figure 4-4 illustrates the current distribution of monitoring stations at which data are acquired by local and regional agencies. The KDWCD Land Surface Elevation Monitoring Network is comprised of passive and active terrestrial observation stations. The passive stations presently total 31. Six additional sites will be incorporated by the 2021 network calibration campaign. The active stations are four Continuously Operating Reference Stations (CORS) of the Caltrans Central Valley Spatial Reference Network (CVSRN) component of the California Spatial Reference Network (CSRN)/California Real-Time Network (CRTN). KDWCD and GKGSA, in collaboration with Caltrans and other public agencies, will construct densification CORS, which when combined with the four Caltrans CORS will be designated as a subnetwork of the CVSRN. The first collaborative CORS KDL1 began active service on 2 May 2019.

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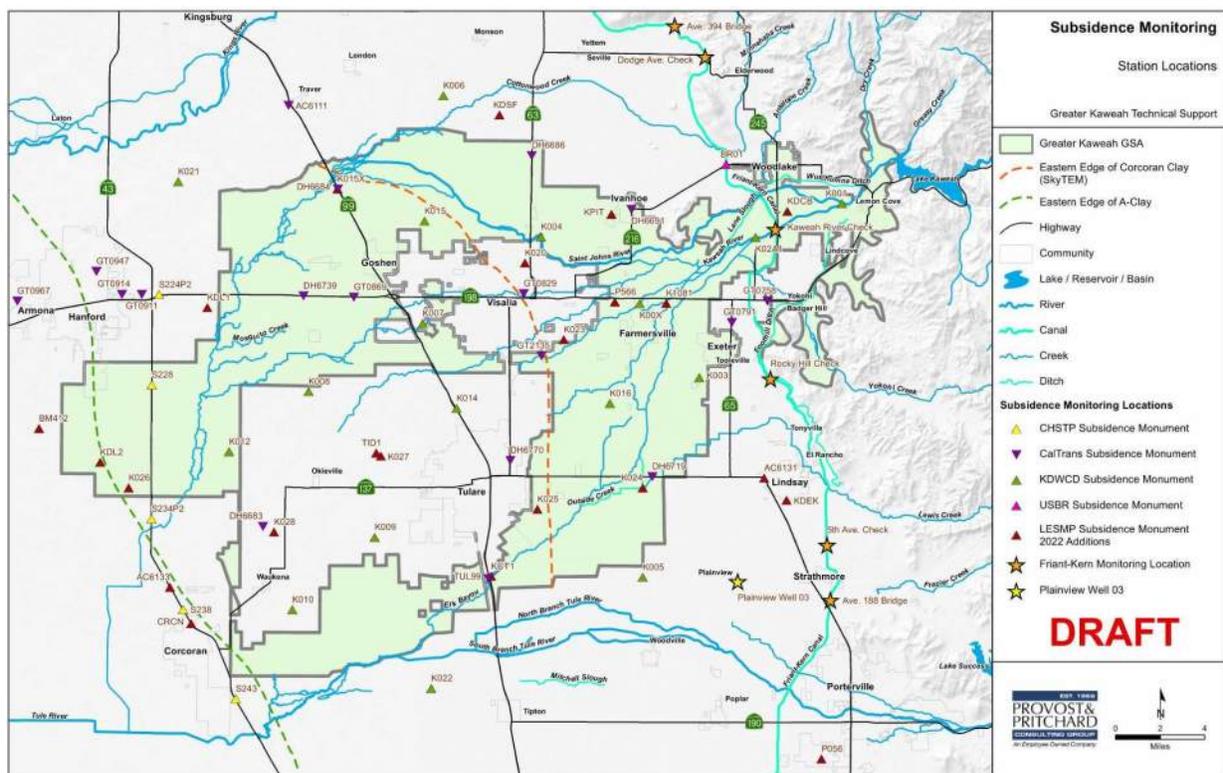


Figure 4-4: Subsidence Monitoring Network
Link: Full-size figure is available at the end of this section.

4.6.4 Maps of Grid for Each Aquifer/Management Area

Management areas were not established for the GKGSA at this time.

4.6.5 Monitoring Protocols

23 Cal. Code Regs. § 354.34(i) *The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data ad methodologies.*

The following data collection procedures are utilized by KDWCD to accomplish the objectives of its Land Surface Elevation Monitoring Program (LEMP) Plan. Caltrans initialized the passive station network component in February 2016. The KDWCD-Caltrans collaboration has significantly advanced the Program in terms of its ability to study local subsidence with greater accuracy, efficiency, and temporal relevance.

4.6.5.1 Passive Stations

Observers will occupy each station with a CVSRN compatible GNSS receiver. Data collection via the CRTN may be RTK or autonomous but shall be consistent across the network for each campaign. Observers will minimally collect one continuous 5-minute RTK or one continuous 15-minute autonomous dataset. Both types of datasets should be collected if time, communication, and network conditions permit. The data logging interval for each collection mode is one second.

4.6.5.2 CORS

CORS data are obtained from CalTrans.

4.6.5.3 Data Processing

The CSRN/CRTN are managed and operated by Scripps Orbital Permanent Array Center (SOPAC) and the California Spatial Reference Center (CSRC) at UC San Diego. Data collected by the CSRN/CRTN define the California Spatial Reference System (CSRS), California’s official geodetic datum.

The following types of position solutions are considered final: CRTN RTK with satisfactory quality indicators; CRTN autonomous adjusted by Caltrans to the appropriate realization of the CSRS Epoch; active, nominal CRTN CORS.

4.7 Seawater Intrusion Monitoring Network

<i>23 Cal. Code Regs. § 354.34(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator: (3) Seawater Intrusion. Monitor seawater intrusion using chloride concentrations, or other measurements convertible to chloride concentrations, so that the current and projected rate and extent of seawater intrusion for each applicable principal aquifer may be calculated.</i>
<i>23 Cal. Code Regs. § 354.34(j) An agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.</i>

As stated previously, the Kaweah Subbasin is not located near the Pacific Ocean which precludes the consideration of Seawater Intrusion as a Sustainability Indicator. Therefore, a monitoring network is not required for the Subbasin and GSAs therein.

4.8 Depletions of Interconnected Surface Water Monitoring Network

<i>23 Cal. Code Regs. § 354.34(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator: (6) Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following: (A) Flow conditions including surface water discharge, surface water head, and baseflow contribution. (B) Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable. (C) Temporal change in conditions due to variations in stream discharge and regional groundwater extraction. (D) Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.</i>
<i>23 Cal. Code Regs. § 354.34(j) An agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.</i>

The GKGSA has identified interconnected surface waters as a data gap and will be implementing a Work Plan to fill this data gap and work to better understand locations where interconnection potentially exists and to what extent groundwater pumping may be causing adverse impacts. The

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GKGSA will start from the existing groundwater monitoring and stream gauging locations and then evaluate locations for new sites to support the Work Plan.

4.9 Degraded Groundwater Quality

23 Cal. Code Regs. § 354.34(c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator: (4) Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.*

As described in Section 4.1, groundwater quality monitoring in the Subbasin is actively occurring under the direction of both 1) local agencies through existing networks established for groundwater management plans under AB-3030 and SB-1938 and 2) state and federal agencies: SWRCB, RWQCB, DWR, and DPR. Subbasin groundwater sustainability management is an opportunity for coordination of groundwater quality monitoring to share network infrastructure.

Local agencies collect groundwater water quality data and the data are typically reported biennially, and these groundwater quality programs comprise a significant portion of the effort. State groundwater quality management programs include the ILRP and CV-SALTS programs and are divided into large regions (management areas) to meet the objectives of their individual programs. The ILRP allows for compliance of their regulatory program through coalitions that cover a specific area within the Central Valley. These programs include permittees and local stakeholders working towards water quality management objectives set forth by the State. This GKGSA GSP will promote a collaborative effort to maximize the resources of each program to provide an integrated approach to address local groundwater management.

4.9.1 Monitoring Frequency

23 Cal. Code Regs. § 354.34 (f) *The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:*

- (1) Amount of current and projected groundwater use.*
- (2) Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.*
- (3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.*
- (4) Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response.*

The monitoring network will be capable of collecting sufficient data to demonstrate seasonal, short-term (1 to 5 years) and long-term (5 to 10 years) trends in groundwater and related surface conditions and yield representative information about groundwater conditions as necessary to evaluate Plan implementation. In general, water quality monitoring will be seasonal to evaluate water quality during spring groundwater levels (seasonal high prior to summer irrigation demands) and fall groundwater levels (seasonal low after the summer irrigation demands).

4.9.2 Spatial Density

The spatial distribution must be adequate to map or supplement mapping of known regional water quality trends as identified in the Basin Setting. The subbasin will coordinate with municipal water suppliers, ILRP, and CV-SALTS to share infrastructure. **Figure 4-5** shows the locations of existing groundwater quality sampling sites for public supply.

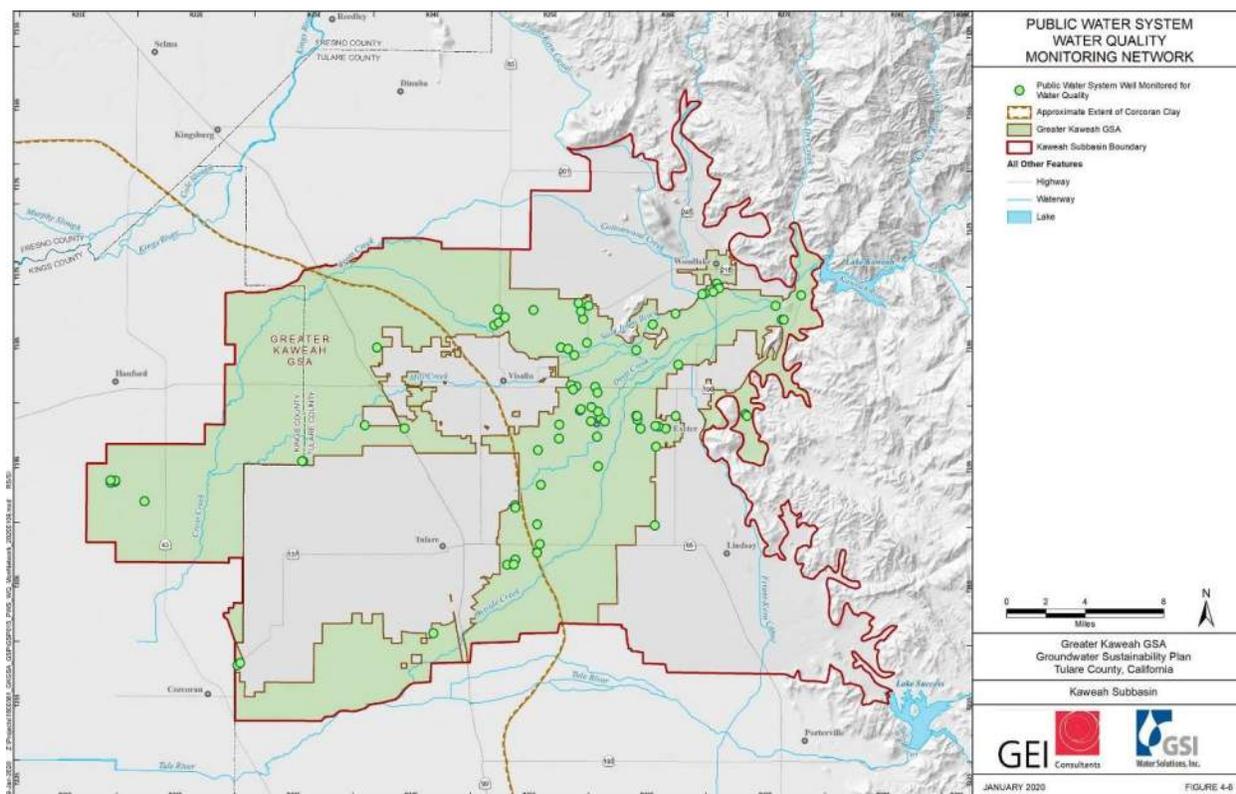


Figure 4-5: Public Water System Water Quality Monitoring Network
Link: Full-size figure is available at the end of this section.

4.9.3 Maps of Grid for Each Aquifer/Management Area

Management areas were not established for the GKGSA at this time.

4.9.4 Monitoring Protocols

23 Cal. Code Regs. § 354.34(i) *The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.*

The monitoring protocols will follow, at a minimum, the sampling guidelines as provided in DWR’s *Groundwater Monitoring Protocols, Standards, and Sites BMP* (2016). Groundwater quality sampling protocols should ensure that:

- Groundwater quality data are taken from the correct location,

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- Groundwater quality data are accurate and reproducible,
- Data are loaded into the DMS in a timely manner and handled in a way that ensures data integrity.

4.9.5 Management Areas

23 Cal. Code Regs. § 354.3(d) *The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.*

The GKGSA has not designated any MAs at this time but may elect to establish MAs in future updates to address different conditions (e.g. surface-water lands versus groundwater-only lands).

4.10 Assessment and Improvement of Monitoring Network

23 Cal. Code Regs. § 354.38. Assessment and Improvement of Monitoring Network.

(a) Each Agency shall review the monitoring network and include an elevation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.

(b) Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.

(c) If the monitoring network contains data gaps, the Plan shall include a description of the following:

- (1) The location and reason for the data gaps in the monitoring network.
- (2) Local issues and circumstances that limit or prevent monitoring.

(d) Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.

(e) Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:

- (1) Minimum threshold exceedances.
- (2) Highly variable spatial or temporal conditions.
- (3) Adverse impacts to beneficial uses and users of groundwater.
- (4) The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.

4.10.1 Data Gaps

The following section describes data gaps for groundwater elevations, groundwater quality, and land subsidence.

4.10.1.1 Groundwater Elevation and Storage

As referenced in Regulation §352.4, “If an Agency relies on wells that lack casing perforations, borehole depth, or total well depth information to monitor groundwater conditions as part of a Plan, the Agency shall describe a schedule for acquiring monitoring wells with the necessary information, or demonstrate to the Department that such information is not necessary to understand and manage groundwater in the basin.”

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Well types and construction details will need to be determined to improve the monitoring network. Downhole well surveys and desktop surveys will be utilized for existing wells to fill in the well construction details gap. New dedicated monitoring wells and converted production wells will be utilized to fill in the monitoring network spatial extent and density. Improvement will occur during the initial few years of the implementation period, prior to the first 5-year update.

4.10.1.2 Groundwater Quality

Groundwater quality data are mostly available from the reoccurring sampling requirements for public water systems, primarily the Cities of Exeter, Farmersville, and Woodlake, but also for smaller systems within the GKGSA. Additional groundwater quality data will be available from the IRLP program and the upcoming CV-SALTS program and will provide further coverage in agricultural and rural areas. DWR will construct two new nested monitoring wells for the GKGSA as part of the Technical Services Support program. In addition, inactive production wells will be converted to monitoring wells to improve the spatial extent and density of the monitoring network. Improvement will occur during the initial few years of the implementation period, prior to the first 5-year review.

4.10.1.3 Land Subsidence

Land subsidence has been limited by the availability of data, notwithstanding the continuous GPS data for station P566 near Farmersville since 2005 and station CRCN near Corcoran since 2010, limited and variable coverage of InSAR data for 2007 to 2010 and 2015 to 2018, and the recent 2-year period (2016-2018) of KDWCD GPS data for various locations within and around GKGSA. The continued implementation of the KDWCD Land Surface Elevation Monitoring Plan will provide additional data on future subsidence at 12 locations within GKGSA and seven locations with MKGSA plus eight locations outside the Kaweah Subbasin. The EKGSA established subsidence monitoring locations along the Friant-Kern Canal. The GKGSA and EKGSA will be coordinating to evaluate the subsidence monitoring along this critical infrastructure. The GKGSA will coordinate with adjacent subbasins, especially in the southwestern portion of the subbasin where subsidence is greatest and could be affect surface infrastructure.

4.10.1.4 Interconnected Surface Water

As part of addressing the data gap of spatial distribution for SGMA-compliant groundwater level monitoring, the GKGSA and other GSAs of the Kaweah Subbasin will coordinate for the installation of SGMA-compliant groundwater level monitoring to validate existing data and confirm whether or not Interconnected Surface Waters are present in the Kaweah Subbasin. Additional stream gauges may be installed in some locations pending further evaluation of the data gap filling work plan (Section 7.3.12).

4.10.2 Plan to Fill Data Gaps

4.10.2.1 Groundwater Elevation and Storage

Currently, the Kaweah Subbasin has a total of 14 SGMA compliant, dedicated monitoring wells that may be used for groundwater level monitoring. An additional six monitoring wells are proposed through the DWR’s Technical Support Services (TSS) program. Two of the proposed six wells are located within the GKGSA. While the remainder of the wells used in the interim have been identified as Key Wells in the Basin Setting, they are not dedicated SGMA compliant monitoring wells. To address this GKGSA, in coordination with EKGSA and MKGSA, plans to expand the spatial coverage of groundwater level monitoring wells by adding SGMA compliant wells at or near the locations of existing Key Wells as shown in **Figure 4-3**. The full development of the SGMA compliant monitoring network is scheduled to take place over the SGMA implementation period of 2020 to 2040.

4.10.2.2 Groundwater Quality

As described in Section 4.9, groundwater quality monitoring under existing regulatory programs for public water systems currently provide adequate coverage for the Constituents of Concern listed in the Basin Setting. For areas lacking a public water system, the IRLP and CV-SALTS programs can be used to provide groundwater quality data in the interim. Dedicated SGMA compliant monitoring wells are also eligible for use in groundwater quality sampling and can be brought into the monitoring network as they are completed.

4.10.2.3 Land Subsidence

The KDWCD Land Surface Elevation Monitoring Network and InSAR are adequate to address the requirements of SGMA, in terms of spatial distribution. Additional refinement to KDWCD may be considered as part of interbasin coordination efforts for areas which experience higher rates of subsidence.

4.10.2.4 Interconnected Surface Streams

The GKGSA and EKGSA are implementing a work plan focused on filling data gaps and better understanding the presence and potential impacts to interconnected surface waters with the Kaweah Subbasin related to groundwater pumping. This work plan will be striving to fill data gaps by installing new monitoring wells and/or stream gauges in gap areas to facilitate better understanding and guidance on setting of applicable SMC by the 2025 GSP update.

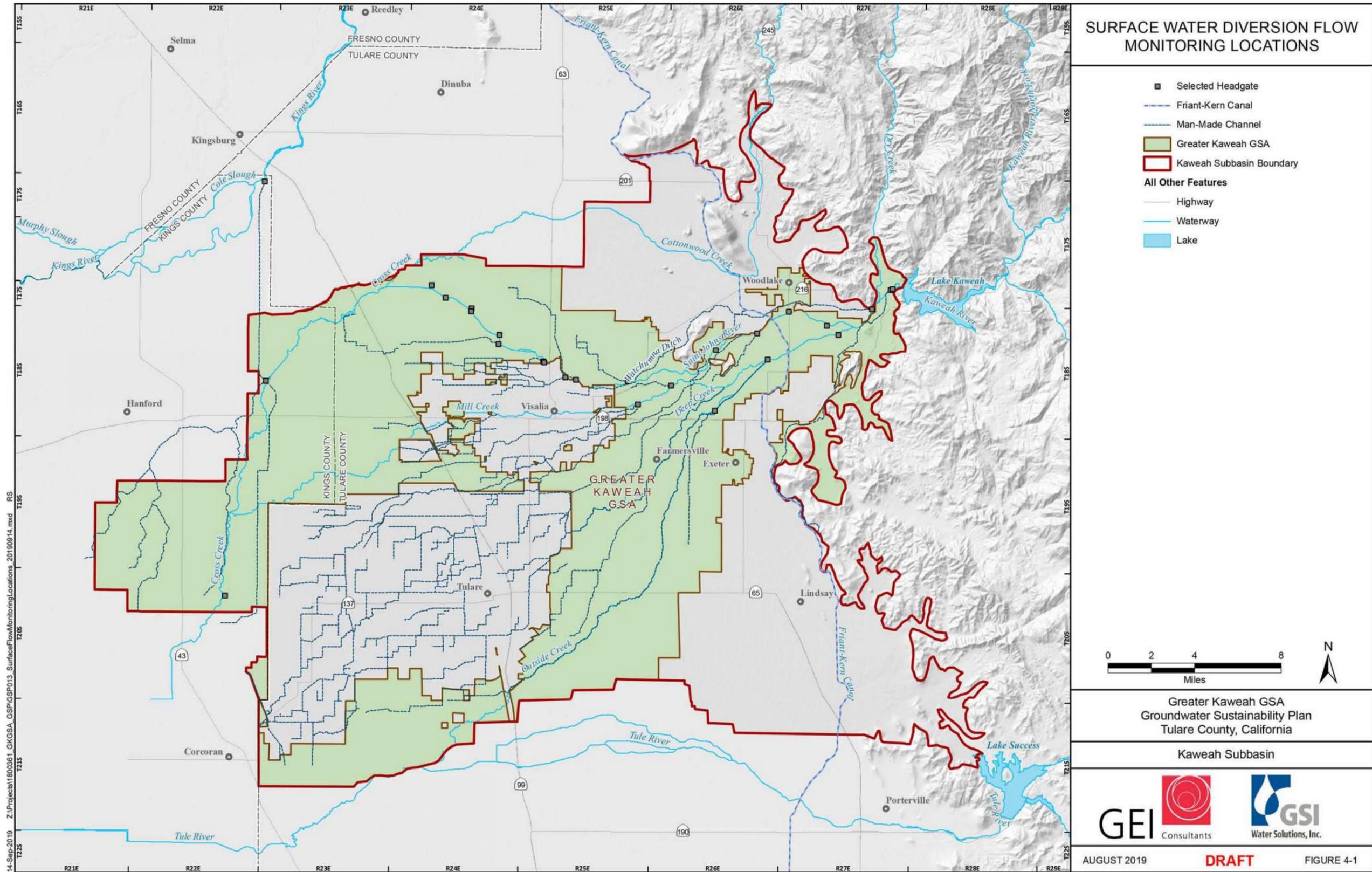


Figure 4-1: Surface Water Diversion Flow Monitoring Locations

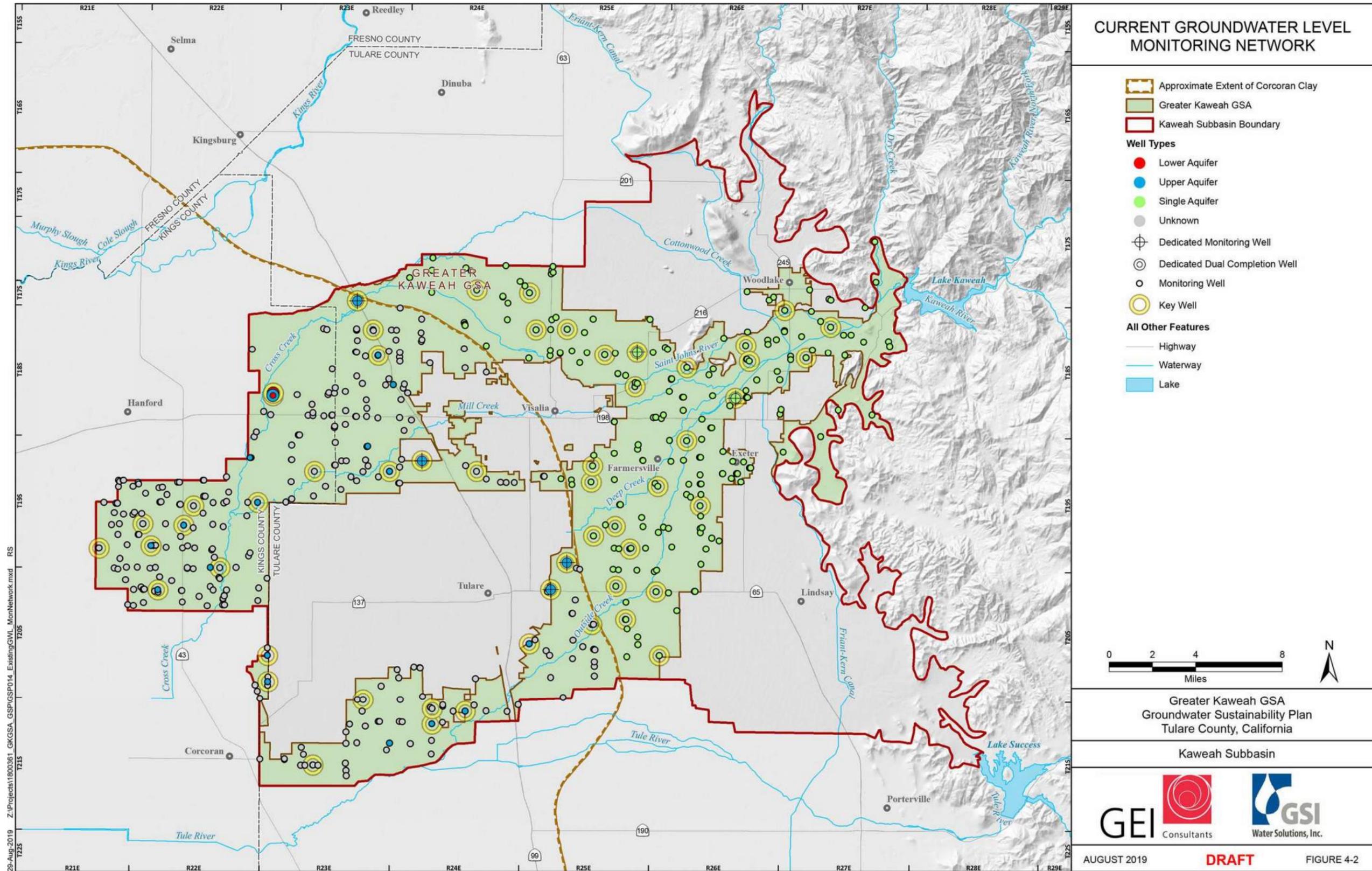


Figure 4-2: Current Groundwater Level Monitoring Network in the Kaweah Subbasin

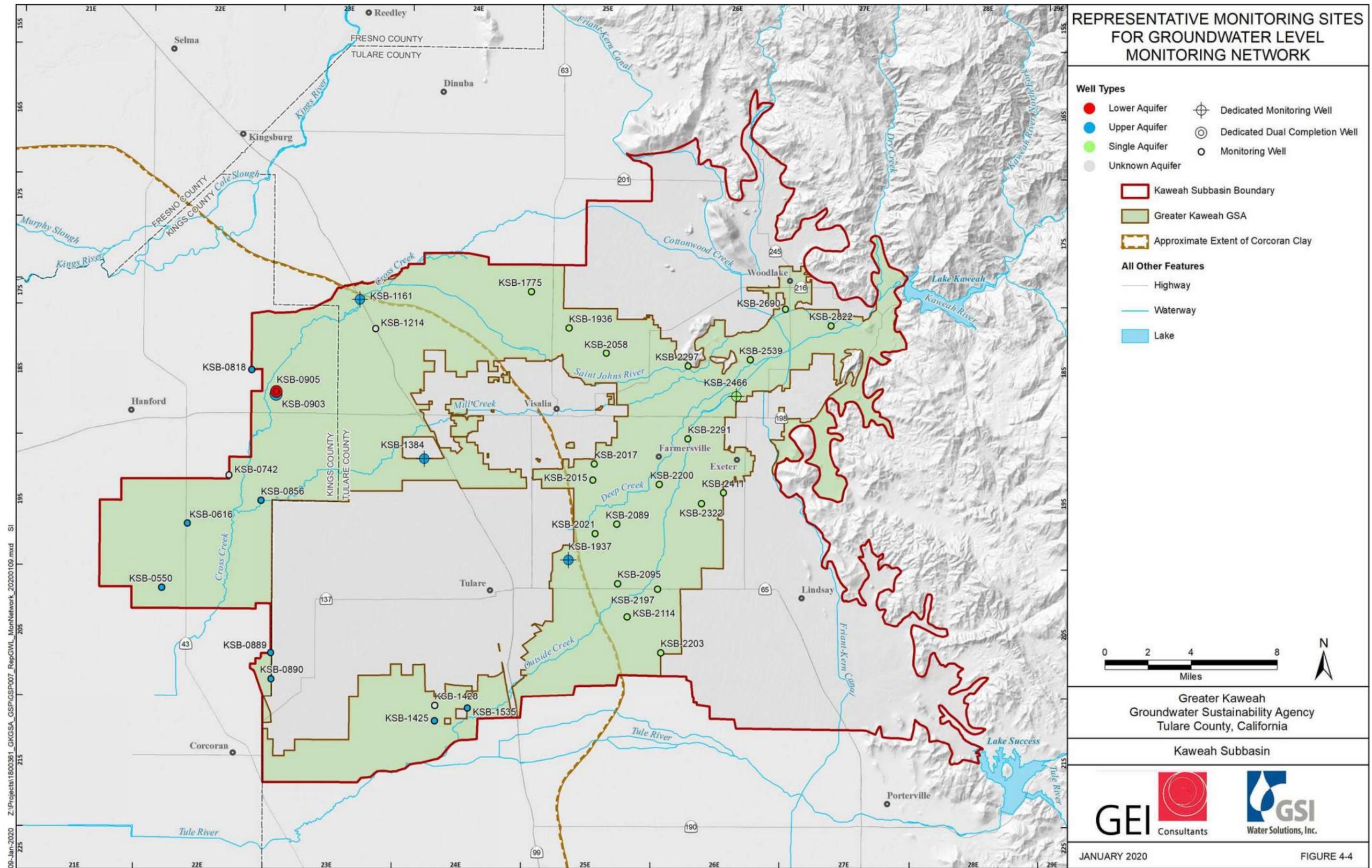


Figure 4-3: Representative Monitoring Site for Groundwater Level Monitoring Network

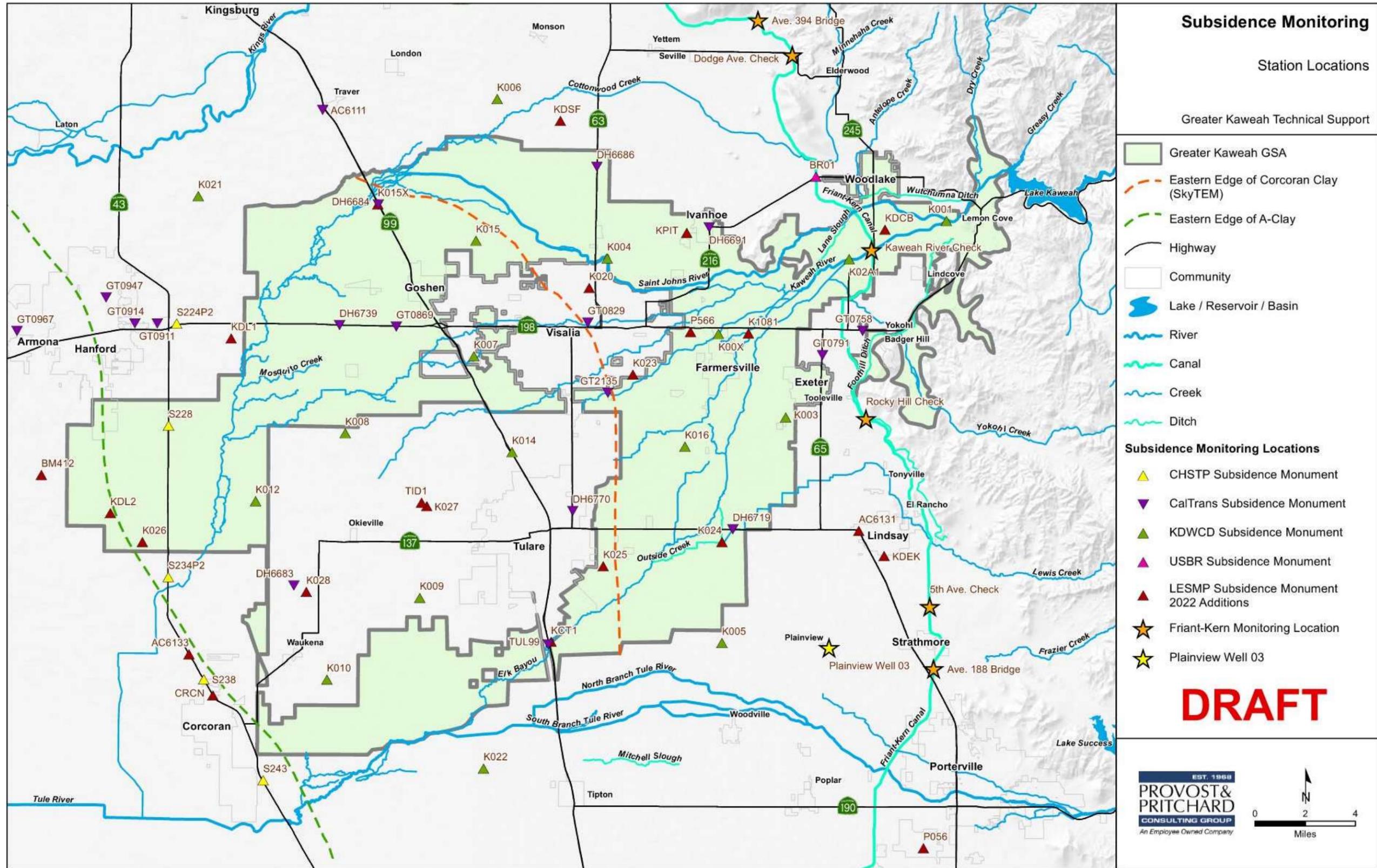


Figure 4-4: Subsidence Monitoring Network

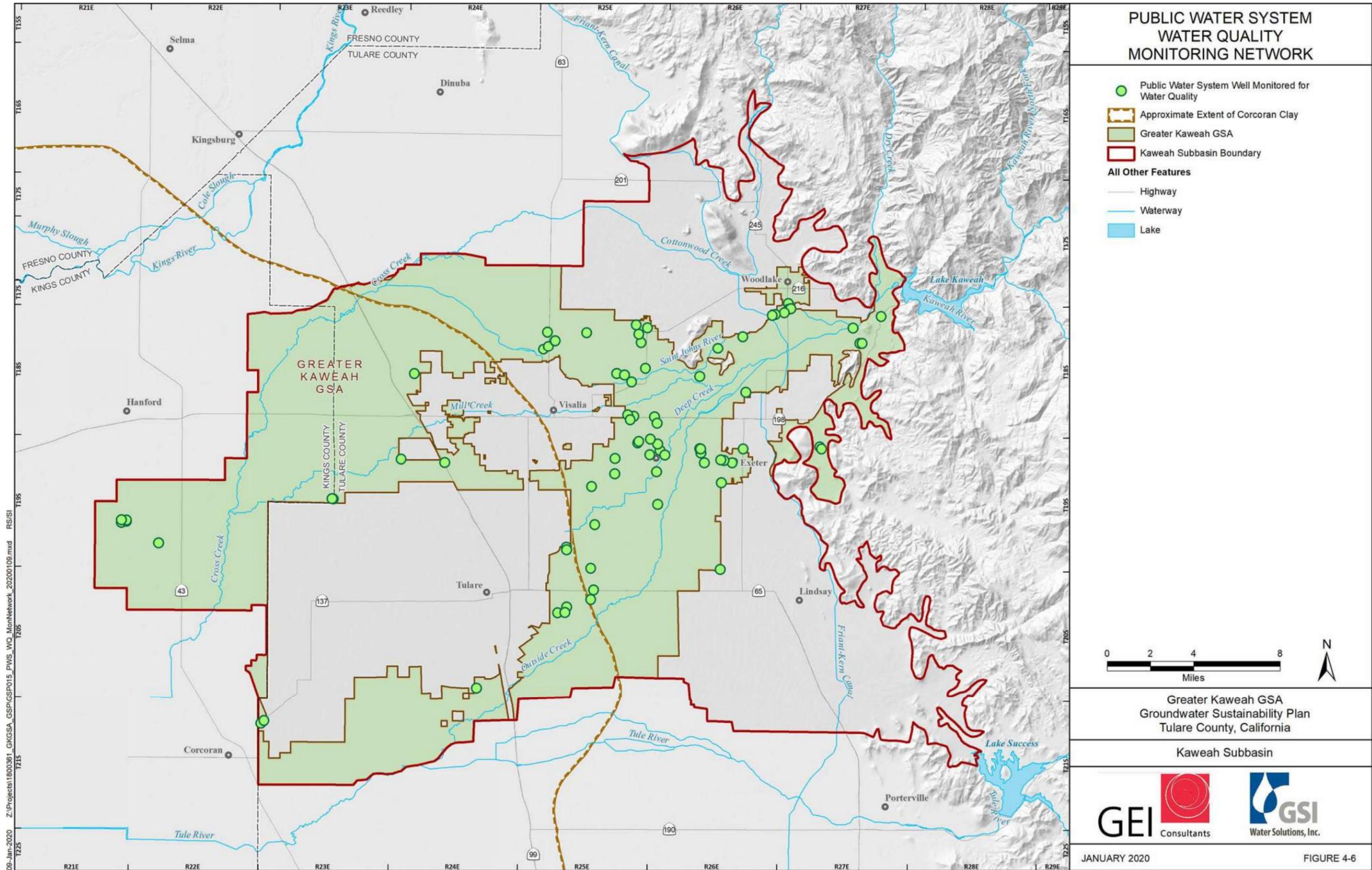


Figure 4-5: Public Water System Water Quality Monitoring Network

5. Sustainable Management Criteria

5.1 Introduction

This Section provides location-specific sustainable management criteria (SMC) for five of the six sustainability indicators, including establishing undesirable results, minimum thresholds, and measurable objectives with integrated interim milestones. This section builds from the Kaweah Subbasin’s sustainability goal described in Section 3 as well as the Coordination Agreement Appendix 6 (attached hereto and incorporated by reference as Appendix 5A). As discussed in Section 3, pursuant to 23 Cal. Code Regs §354.26(d) no sustainable management criteria need to be set at this time for the undesirable results of Seawater Intrusion.

5.2 General Approach

The SMC presented in this chapter were developed for the Subbasin as a whole using publicly available information, feedback gathered during public meetings, hydrogeologic analysis, GSA Advisory Committees, and meetings with the three GSA Managers, staff, consultants, technical advisors, and legal counsels. The general process included:

- Weekly technical meetings with GSA Managers, staff, consultants, technical advisors, and legal counsels.
- Presentations to and discussions with the three GSA Managers, their Boards, and Committees outlining the approach to developing SMC and discussing SMC approaches. The GSA Managers and Advisory Committees provided feedback and suggestions from these meetings were evaluated for the development of revised SMC.
- Modifying minimum thresholds and measurable objectives based on input from GSA staff and Board Members.
- All meetings with the GSA Board and Committees were conducted under public participation with full participation by the public.

This general process resulted in the SMC presented in this section.

The metrics and approaches to be employed by GKGSA for the six sustainability indicators are shown in **Table 5-1**:

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Table 5-1: Sustainable Management Criteria by Sustainability Indicator

SMC Summary for GKGSA		
Sustainability Indicators	Basis for Minimum Threshold	Basis for Measurable Objective
 Chronic Lowering of Groundwater Levels	Protection of greater than the 90 th percentile of all beneficial uses and users without allowing a greater rate of historical level decline ¹	Flexibility for at least 5 years of drought storage
 Reduction in Storage	Calculated based on groundwater levels ²	Calculated based on groundwater levels ²
 Land Surface Subsidence	Total subsidence of no more than 9 feet, and a subsidence rate of no more than 0.67 feet/year	Zero Subsidence
 Water Quality	Reference to other regulators ³	Reference to other regulators ³
 Seawater Intrusion	Not Applicable	Not Applicable
 Interconnected Surface Waters	50% of channel losses in selected waterways ⁴	30% of channel losses in selected waterways ⁴

¹ Determined by representative monitoring sites in Analysis Zones

² Storage volume changes and associated SMC determined as function of water level changes

³ e.g. SWRCB Division of Drinking Water requirements for public supply wells, RWQCB Irrigated Lands Regulatory Program

⁴ Work Plan in place to fill data gaps and better refine understanding of location and impacts caused by groundwater pumping

5.3 Groundwater Levels

23 Cal. Code Regs § 354.26 (a). *Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.*

The Sustainable Management Criteria (SMC) related to chronic lowering of groundwater levels are developed to protect relevant and applicable beneficial uses and users of groundwater in the Subbasin. Beneficial users of groundwater are domestic pumpers, disadvantaged communities, small water systems (2–14 connections), municipal water systems (>14 connections), agricultural pumpers, environmental users, and entities engaged in monitoring and reporting groundwater elevations. Understanding these different users, water uses, and their access to groundwater is the first step taken to inform what the GSAs and their stakeholders consider significant and unreasonable impacts.

Wells are how all users access groundwater, therefore, the approach used to develop SMC is based on water supply well depths. The depth of wells across the Subbasin varies by depth to groundwater and beneficial user type. Because of well depth variability, the Subbasin was subdivided into analysis

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zones based on clusters of beneficial user types, aquifers, and completed well depths. Well depth statistics from DWR's Online System of Completed Well Reports (OSCWR) reports were used to consider all uses and users to develop and inform significant and unreasonable groundwater levels, with the SMC being protective of a significant portion of the existing shallow wells. The three Subbasin GSAs have attempted to consider all uses and users, concurred on undesirable results, their causes, determination criteria and effects, all as defined in this section. The sustainability indicators used to determine undesirable results are referenced herein. This section complies with §354.26 of the Regulations.

5.3.1 Data Sources Used to Establish Minimum Thresholds and Measurable Objectives

The GKGSA understands that groundwater wells are very important infrastructure for all uses and users across the Kaweah Subbasin. The GKGSA views that an Undesirable Result would occur if a significant portion of the existing shallow wells in the Kaweah Subbasin went dry due to groundwater level declines. This is being described this way because the Subbasin has a significant data gap related to where all active wells are, how the active wells are constructed and how much the active wells are pumping. The Subbasin GSAs have plans to obtain this information from local landowners in the future. As this data gap is addressed, the description of an Undesirable Result (UR) for the Kaweah Subbasin will be further refined based on the more complete and accurate information.

Since well location, construction and pumping amounts for active wells is not available, DWR's OSCWR was evaluated to consider groundwater infrastructure for all uses and users. However, the OSCWR database is a historic compilation of records that does not necessarily reflect the currently active wells. In the Kaweah Subbasin, groundwater levels have steadily declined for decades, meaning that, over time, older wells have gone dry and newer wells have replaced them. Unfortunately, while having the historic information in the OSCWR database may be useful for geologic reasons, it is very limited for efforts considering all current uses and users. Also given other databases of well permits from Tulare County, it can be seen that the OSCWR database does not contain all wells that have been constructed, but only the wells which DWR received Well Completion Report (WCR) records. For this reason, the Kaweah Subbasin GSAs had to make decisions on how to adjust the OSCWR database information to more closely reflect their understanding of the area based on their experience. This was primarily done by excluding older well records based on the understanding that wells in this area generally have a limited period of use given persistent declining groundwater levels.

Due to the significant data gaps described above, the information used for establishing the chronic lowering of groundwater levels SMC included:

- Records from DWR's OSCWR dataset on completed depths, screen depths, and locations of wells installed since January 1, 2002 (see Figure 2 of Appendix 5B). Only well records drilled since 2002 are used for analysis to filter out wells that may have been abandoned or no

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longer represent typical modern depths for active wells and current groundwater elevations. Data download date was March 1, 2022.

- Historical groundwater elevation data from DWR’s California Statewide Groundwater Elevation Monitoring Program, SGMA Portal Monitoring Network Module, and individual water agencies.
- Maps of current and historical groundwater elevation contours.

The OSCWR dataset does not contain a complete accurate dataset; however, it is the best public source of data available. Approximately one-third of the wells drilled from 2002 on did not have well completion depths and could not be used in the analysis. For purposes of well depth analyses, it was assumed the available wells with depth information are typical and representative of depths in the Subbasin.

Well logs were reviewed for wells with completion depths less than 100 feet. This review generally found that either 1) the planned well use field was incorrectly classified as a water supply well when it was supposed to be a destroyed or remediation well, or 2) the completed well depth field was the depth of the conductor casing (often 50 feet) and not the bottom of the completed well. These inaccuracies were corrected. Furthermore, where coordinates of wells are unavailable, DWR locates the well in the middle of the Public Land Survey System section.

5.3.2 Significant and Unreasonable Chronic Lowering of Groundwater Levels

The terms “significant and unreasonable” are not defined by SGMA and are left to GSAs to define within their GSPs. The process to define “significant and unreasonable” began with stakeholder and landowner discussions. In the view of the Kaweah Subbasin GSAs and its stakeholders, the following impacts from lowering groundwater levels are viewed as “significant and unreasonable” as they would directly impact the viability of beneficial uses/users to meet their reasonable water demands through groundwater:

- Inability of the groundwater aquifer to recover in periods of average/above average precipitation following multi-year drought periods
- Dewatering of a subset of existing and active wells
- Substantial increase in costs for pumping groundwater, well development, well construction, etc. that impact the economic viability of the area
- Adverse effects on health and safety
- Interfere with other sustainability indicators

5.3.3 Undesirable Results

5.3.3.1 Causes leading to Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (1) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.*

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Section 6.4.1 of Appendix 6 of the Kaweah Subbasin Coordination Agreement (attached as Appendix 5A) discusses the causes leading to URs in the Kaweah Subbasin, primarily being groundwater pumping in excess of natural and artificial recharge, more firm water demand from more permanent cropping and dairies, and reductions in imported supplies due to climate and other factors.

5.3.3.2 Criteria to Define Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (2) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.*

Section 6.4.2 of Appendix 6 of the Kaweah Subbasin Coordination Agreement (Appendix 5A) discusses the criteria for defining URs in the Kaweah Subbasin. As defined an UR would be when a significant and unreasonable subset of existing and active wells are dewatered, which is believed to occur when one-third of the Representative Monitoring Sites (RMS) reach or exceed their respective Minimum Threshold (MT) groundwater elevation.

Groundwater elevations shall serve as the sustainability indicator and metric for chronic lowering of groundwater levels and, by proxy, for groundwater storage.

It is the preliminary determination that the values identified herein represent a sufficient number of monitoring sites in the Subbasin such that their exceedance would represent an UR for water-level declines and reduction in groundwater storage. Total completion depth data for all beneficial users (agricultural, municipal, and domestic wells), as identified in **Appendix 5B**, has been evaluated and URs are defined by the quantity of wells completely dewatered by 2040 if the MTs are met or exceeded. However, the Kaweah Subbasin GSAs are committing to implementing a Mitigation Program to mitigate certain impacts to active wells as groundwater levels transition to a more sustainable long-term condition (see Section 7.3.6 for details on the program). Based on observed groundwater conditions in the future and not less frequently than at each five-year assessment, the GSAs will evaluate whether these values need to be changed.

5.3.4 Potential Effects on Beneficial Uses and Users

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interest, and other potential effects that may occur or are occurring from undesirable results.*

Consistent with Section 6.4.4 of Appendix 6 of the Coordination Agreement (Appendix 5A), the potential effects of lowered groundwater levels, when approaching or exceeding minimum thresholds and thus becoming an UR, are reduced irrigation water supplies for agriculture and for municipal systems through loss of well capacity, loss or degradation of water supplies for smaller community water systems and domestic wells due to well failures, increased energy consumption due to lowered water levels, and the adverse economic consequences of the aforementioned effects such as increased energy usage to extract groundwater from deeper levels. The same effects occur with reductions in groundwater storage due to the proxy relationship with water levels.

5.3.5 Minimum Threshold

<p>23 Cal. Code Regs § 354.28(a). <i>Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.</i></p>
<p>23 Cal. Code Regs § 354.28(b). <i>The description of minimum thresholds shall include the following:</i></p> <ul style="list-style-type: none"><i>(1) The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.</i><i>(2) The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.</i><i>(3) How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affected the ability of adjacent basins to achieve sustainability goals.</i><i>(4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.</i><i>(5) How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.</i><i>(6) How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.</i>
<p>23 Cal. Code Regs § 354.28(c) <i>Minimum thresholds for each sustainability indicator shall be defined as follows:</i></p> <ul style="list-style-type: none"><i>(1) Chronic Lowering of Groundwater Levels. The minimum threshold for chronic lowering of groundwater levels shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results. Minimum thresholds for chronic lowering of groundwater levels shall be supported by the following:</i><ul style="list-style-type: none"><i>(A) The rate of groundwater elevation decline based on historical trends, water year type, and projected water use in the basin.</i><i>(B) Potential effects on other sustainability indicators.</i>
<p>23 Cal. Code Regs § 354.28(d). <i>An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.</i></p>

The minimum thresholds for groundwater levels were established to protect against the significant and unreasonable impacts to the beneficial groundwater uses and users that would lead to URs. If groundwater elevations in a significant number of representative monitoring wells fall below their minimum threshold, URs could occur, depending on the number of wells as discussed further herein.

SGMA requires a measured groundwater elevation for each representative monitoring site. Consistent with this requirement, the MT elevations are set in this GSP at specific levels to avoid a significant portion of the existing shallow wells in the Kaweah Subbasin going dry due to groundwater level declines.

5.3.5.1 Process Used to Establish Minimum Thresholds

The GKGSA views that an UR would occur if a significant portion of the existing shallow wells in the Kaweah Subbasin went dry due to groundwater level declines. MTs were developed with currently available information for groundwater uses and users and set at groundwater level elevations that are understood to avoid this UR. MTs are derived from groundwater elevations that protect the approximate 90th percentile of all beneficial user type water supply wells drilled since January 1, 2002, in each analysis zone, and that do not result in a greater rate of decline over water years 2020 to 2040 than experienced over a specific historical time period (2006-2016). The January 1, 2002 date for MT evaluating and groundwater level setting is based on trying to reduce the amount of data gaps in the data set as well as evaluate how wells in the Subbasin have responded over the past 20 years to set forth a plan (this GSP) for implementing sustainable groundwater management projects and actions over the next 20 years and beyond. The GKGSA and other Kaweah GSAs have also committed to developing a Mitigation Program that further evaluates and mitigates impacts to infrastructure for certain active and existing wells in the Subbasin (See Section 6.4.4 of Appendix 6 of the Coordination Agreement as well as Section 7.3.6 of this GSP).

The process for developing MTs is based on a comparison of three methodologies as data was evaluated with what is deemed significant and unreasonable. The process is laid out in more detail in **Appendix 5B** and spoken to in summary here:

1. Develop analysis zones based on GSP management areas or threshold regions, aquifer type, beneficial user types, and similar completed well depths (described in Section 2.1.1 of **Appendix 5B**).
2. Identify water supply wells drilled since January 1, 2002, with well screen depth information or a completed well depth.
3. Designate water supply wells to either the Upper, Lower, or Single Aquifer System based on a set of assumptions (described in Section 2.1.2 of **Appendix 5B**).
4. Designate RMS to either the Upper, Lower, or Single Aquifer System (described in Section 2.1.2 of **Appendix 5B**).
5. Estimate MT depths through Methodology 1 by calculating the 90th percentile well completion depth for water supply wells in each analysis zone and aquifer (described in Section 2.1.3 of **Appendix 5B**).
6. Apply the 90th percentile protective depth corresponding to the RMS' aquifer designation and analysis zone (described in Section 2.1.4 of **Appendix 5B**).
7. Estimate MT depths through Methodology 2 by projecting relevant base period groundwater level trends to 2040 for each RMS (described in Section 2.2 of **Appendix 5B**).
8. Compare elevations resultant from protective depths (Step 6) and projecting a groundwater levels trend out to 2040 (Step 7). The initial MT for the RMS is the higher elevation of the two methods (described in Section 2.4 of **Appendix 5B**).

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9. Contour the RMS MTs obtained in Step 8 for the unconfined aquifers (Single and Upper Aquifer Systems) to determine if the MT surface is relatively smooth. If there are anomalous MTs, remove the anomalous points and interpolate the final MT elevations at these points from MT contours generated by excluding the anomalous sites. This interpolation method is the third MT methodology used (described in Section 2.3 of **Appendix 5B**).

MT elevations have been established for each RMS well included in the representative groundwater level monitoring network, presented in Section 4 of the GSP. **Table 5-2** summarizes the MTs for each of the RMS wells. Hydrographs for the RMS wells with current SMC are included in **Appendix 5C**. **Figure 5-1** shows the contours of the MTs for the RMS wells classified as in the Single Aquifer (East) and Upper Aquifer (West) to show how the groundwater level MTs relate to each other across the Kaweah Subbasin. Lower (confined) aquifer contours are included in **Figure 5-2**. However, as there are fewer wells classified as dedicated lower aquifer wells, contouring is more challenging. This is a data gap to be filled by the Subbasin moving forward.

Importantly, the GKGSA will not be managing to these MT but, rather, to the Measurable Objectives (MO) established in Section 5.3.5.

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Table 5-2: Summary of Groundwater Level Sustainable Management Criteria for GKGS

Unique Well ID	Local Well ID	Aquifer System	Minimum Threshold	Measurable Objective	Interim Milestones 2025	Interim Milestones 2030	Interim Milestones 2035
17S23E34J001M	KSB-1161	Upper	67	107	140	118	111
17S24E34B001M	KSB-1580	Single	78	131	189	151	138
17S24E36H003M	KSB-1775	Single	73	127	157	137	131
17S26E36R001M	KSB-2690	Single	299	323	380	342	330
18S22E24D001M	KSB-0818	Upper	59	95	88	93	95
18S23E14A001M	KSB-1222	Upper	73	108	93	103	107
18S23E30D001M	KSB-0905	Lower	-207	-114	-20	-83	-104
18S23E30D901M	KSB-0903	Upper	71	103	161	123	110
18S25E05Q001M	KSB-1936	Single	93	135	199	157	143
18S25E15C001M	KSB-2058	Single	110	165	253	195	175
18S25E23J001M	KSB-2147	Single	169	213	273	233	220
18S26E17L001M	KSB-2297	Single	313	327	334	330	328
18S26E27B001M	KSB-2466	Single	349	358	351	356	358
18S27E05J001M	KSB-2822	Single	415	420	423	421	421
19S22E24B001M	KSB-0856	Upper	25	48	134	77	58
19S22E28D001M	KSB-0616	Upper	33	57	57	57	57
19S22E31B002M	KSB-0531	Upper	57	80	48	70	77
19S23E12L001M	KSB-1259	Lower	56	91	162	115	99
19S23E21C001M	KSB-1055	Upper	51	82	75	80	82
19S25E09H001M	KSB-2017	Single	142	163	187	171	166
19S25E13A002M	KSB-2200	Single	151	177	209	188	181
19S25E16A002M	KSB-2015	Single	91	143	180	156	148
19S25E27A001M	KSB-2089	Single	72	117	166	134	123
19S25E28H001M	KSB-2021	Single	56	111	149	124	116
19S25E35B002M	KSB-2139	Single	66	111	175	133	119
19S26E05C001M	KSB-2291	Single	229	264	258	262	264
19S26E16J002M	KSB-2411	Single	124	175	220	190	180
19S26E20A001M	KSB-2322	Single	106	161	208	177	167
20S22E07A003M	KSB-0550	Upper	20	43	-59	9	32
20S22E24R001M	KSB-0889	Upper	-17	11	-154	-60	-13
20S22E36A001M	KSB-0890	Upper	-10	17	23	19	18
20S24E24H001M	KSB-1783	Upper	56	85	52	74	82
20S25E03R001M	KSB-2095	Single	55	81	100	88	84
20S25E12A001M	KSB-2197	Single	65	88	159	112	96
20S25E14F004M	KSB-2114	Single	60	71	127	104	82
20S25E24R001M	KSB-2203	Single	65	85	137	103	91
21S24E03L001M	KSB-1535	Lower	10	30	-78	-6	18
21S24E08A001M	KSB-1425	Upper	80	100	120	107	102

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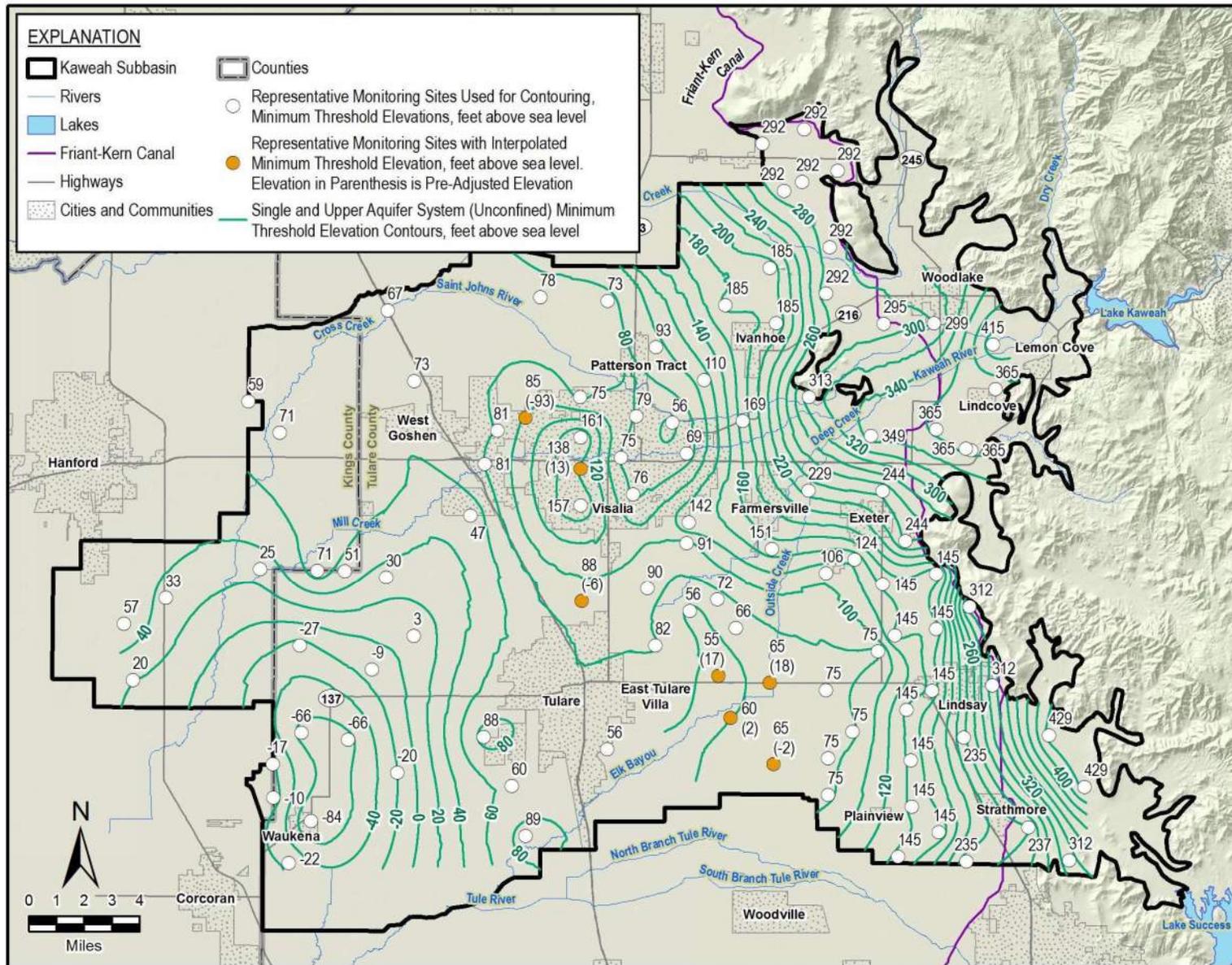


Figure 5-1: Kaweah Subbasin Groundwater Level MT Contouring – Single and Upper Aquifer

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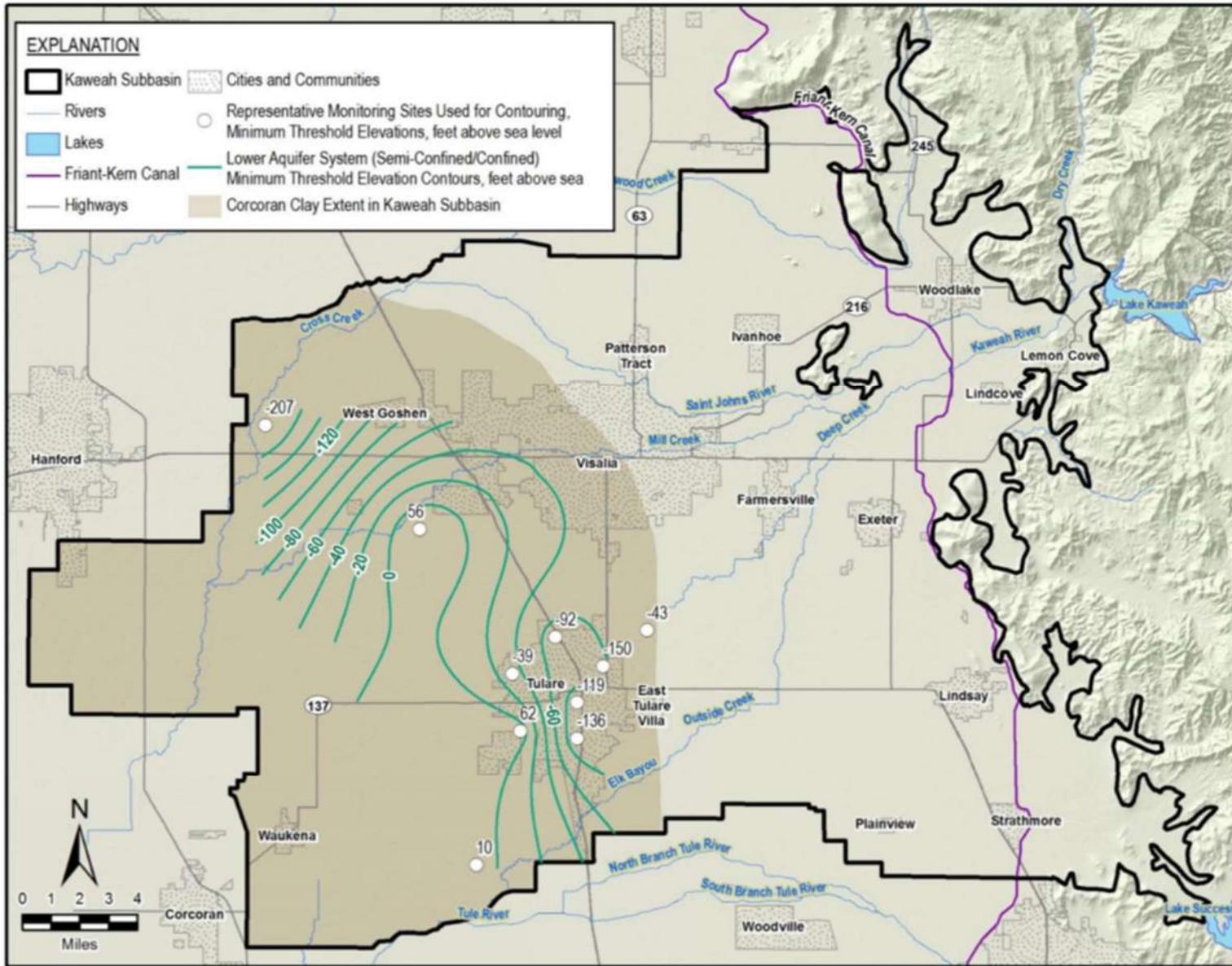


Figure 5-2: Kaweah Subbasin Groundwater Level MT Contouring - Lower Aquifer

5.3.5.2 Well Impacts Analysis at Proposed MTs

The Kaweah Subbasin's most significant data gap relates to not understanding where all active wells are located, how the active wells are constructed (what zones they pump from) and how much the active wells are pumping. The Kaweah Subbasin GSAs have plans to obtain this information from local landowners in the future. As this data gap is addressed, the description of an UR for the Kaweah Subbasin will be further refined based on the more complete and accurate information. Since well location, construction and pumping amounts for active wells is not available, DWR's OSCWR was evaluated to consider groundwater infrastructure for all uses and users. The Kaweah Subbasin GSAs had to make decisions on how to adjust for wells that were re-drilled in the OSCWR database information. This was primarily done by excluding older well records based on the understanding that wells in this area generally have a limited period of use given persistent declining groundwater levels.

The three GSAs used the OSCWR database records as the best available approximation for local wells within their jurisdictional boundaries, and evaluated the records focusing on wells with adequate information to determine completed depth. This data set included agricultural wells, public wells, and rural residential (domestic) wells. Specifics of this analysis are as presented in **Appendix 5D**.

The OSCWR database records were compared in their respective analysis zones to determine the relative depths of agricultural wells, public wells, and domestic wells to evaluate potential impacts of groundwater elevation declines.

The results of this well impact analysis are shown in the following **Table 5-3** summarizing the statistics for the 26 analysis zones in within the GKGSA. More detail on the zonal analysis by well type (agricultural, municipal, and domestic) is in **Appendix 5D**.

There were records in the OSCWR database that were excluded from the catalog of wells due to the understanding that they reflected wells that likely had been redrilled since 2002. When those records with construction information are compared to the developed MTs it shows that 297 well records could be experiencing impacts if groundwater conditions reach Subbasin MTs. Of this number of well records with adequate construction information for the analysis, 151 are located within the GKGSA and are made up of 96 domestic wells, 49 agricultural wells, and 6 are public supply wells. The approximate density of potentially impacted wells in the GKGSA is approximately 0.48 wells per square mile. This estimation is made with the understanding that there are gaps in the current data set. The GKGSA understands that the current data set has gaps and limitations and will be continually improving its knowledge through various actions during the implementation period. The GKGSA also understands that certain wells may be impacted prior to groundwater levels reaching MT groundwater elevations and should be mitigated in some fashion. The GKGSA is going to be implementing a mitigation program to address certain impacts (Section 7.3.6).

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Table 5-3: Estimate of Potentially Impacted Wells in the GKGSA

Well Use Type	Well Records with Known Depth			All Well Records in the Analysis Period		
	Number of Wells	Number of Potentially Impacted Wells	Percentage of Potentially Impacted Wells	Number of Wells	Number of Potentially Impacted Wells	Density of Impacted Wells (wells / square mile)
Domestic	732	96	13%	814	105	0.30
Agricultural	829	49	6%	914	55	0.16
Public Supply	64	6	10%	71	7	0.02
Industrial	8	0	0%	15	0	0.00
Total	1,633	151		1,814	167	0.48

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In the Management Action Section (Section 7.3) of this GSP, a small-system and domestic well owner assistance program was described, which will aid this group of stakeholders as the GSA implements measures over time to achieve sustainable yield by 2040. This assistance program has now been revised to be the framework for an Overdraft Mitigation Program to be further developed over the next year for implementing and protecting certain wells that may see impacts prior to the 90th percentile protection level. These stakeholders will be apprised of the mitigation program development process through the GSA’s outreach program as articulated in Section 1.4 of this GSP. Input to the design of the program will be obtained through regular meetings of the GKGSA advisory committees and the Kaweah Subbasin Management Team Committee.

In summary, the GKGSA views that an UR would occur if a significant portion of the existing shallow wells in the Kaweah Subbasin went dry due to groundwater level declines. MTs were developed with currently available information on groundwater uses and users as groundwater level elevations that are understood to avoid this UR. The GKGSA will not be managing to these MTs but, rather, to the MO established in Section 5.3.5. This impact analysis will be continually evaluated during the implementation period and will be considered when identifying both the mitigation and assistance programs outlined in Section 7.3.

The Tulare County region has not previously established regulatory limits or standards for groundwater level elevations. The GKGSA intends to rely on the monitoring network, as identified in Section 4 of this Plan, to monitor spring and fall season groundwater levels. Aquifer layers to be monitored are the unconfined zone above the E-clay layer and the semi-confined layer below the E-clay layer.

5.3.5.3 Evaluation of MT for Multiple Sustainability Indicators

23 Cal. Code Regs § 354.26 (c). *The Agency may need to evaluate multiple minimum thresholds to determine whether an undesirable result is occurring in the basin. The determination that undesirable results are occurring may depend upon measurements from multiple monitoring sites, rather than a single monitoring site.*

The GKGSA, in coordination with other GSAs in the subbasin, will utilize multiple wells to monitor and manage the GSA and basin. A detailed description of the GSA’s monitoring network is included in Section 4 of this GSP.

Section 354.26 of the GSP Regulations requires that the description of MTs include a discussion about the relationship between the MTs for each sustainability indicator. In the SMC BMP (DWR, 2017), DWR has clarified this requirement. First, the GSP must describe the relationship between each sustainability indicator’s MT (e.g., describe why or how a groundwater level MT set at a particular representative monitoring site is similar to or different from groundwater level MTs in nearby representative monitoring sites). Second, the GSP must describe the relationship between the selected MT and MTs for other sustainability indicators (e.g., describe how a groundwater level MT would not trigger an UR for land subsidence).

The groundwater elevation MT are plotted to check that they have a relatively smooth distribution across the Subbasin (**Figure 5-1**). Because the underlying groundwater elevation contours are a reasonably achievable condition, the individual MTs at representative monitoring sites do not conflict with each other.

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Groundwater elevation MTs may influence other sustainability indicators, as described below.

- **Reduction in groundwater storage.** Chronic lowering of groundwater levels MT are identical to the groundwater storage MT due to the direct relationship that groundwater levels have on groundwater storage. Thus, the groundwater level MT will not result in an undesirable loss of groundwater in storage. The GKGSA understands that projects and management strategies that are effective on groundwater level declines will also be effective on reduction in groundwater storage.
- **Degraded water quality.** The chronic lowering of groundwater levels MT may affect groundwater quality through two potential processes:
 - Changes in groundwater elevation could change groundwater gradients, which may cause poor quality groundwater to flow toward production and domestic wells that would not have otherwise been impacted. These groundwater gradients, however, are only dependent on differences between groundwater elevations, not on the groundwater elevations themselves. MT groundwater elevations do not directly lead to significant and unreasonable degradation of groundwater quality in supply wells because there are no large differences in MT between wells that would cause increased gradients.
 - Lowered groundwater levels can mobilize contaminants that may occur at depth, such as arsenic or draw down contaminants that are found closer to the ground surface such as nitrate. Since the chronic lowering of groundwater levels MTs are lower than historical levels, new depth dependent contaminants could potentially be mobilized and impact beneficial uses and users.

The GKGSA understands that the planned projects and GSP management strategies should not degrade groundwater quality.

- **Land subsidence.** The chronic lowering of groundwater levels MT allows for some additional groundwater level declines while the GKGSA implements the GSP. Additional land subsidence is expected to occur in parts of the GKGSA if groundwater levels decline to the MT. Impacts to beneficial groundwater users and land uses intend to be mitigated through the further development of the proposed mitigation program (Section 7.3.6), should they occur. In general, limiting groundwater level decline will help avoid getting close to the groundwater level and land subsidence MTs. The GKGSA understands that GSP management strategies that are effective on groundwater level declines in the confined aquifer will also be effective on reducing local subsidence.
- **Depletion of interconnected surface water.** Interconnected surface waters is listed as a data gap by the GKGSA. Further investigation is going to be implemented per the proposed Work Plan included in Section 7.3.12. Filling data gaps and then further analyzing the presence, potential impacts, and potential causes are intended to be better understood ahead of the 2025 GSP Update. The GKGSA understands that projects and management strategies

that are effective on groundwater level declines will also be effective on reducing depletion of interconnected surface water.

5.3.6 Measurable Objectives and Interim Milestones

<i>23 Cal. Code Regs § 354.30(a). Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue sustainably manage the groundwater basin over the planning and implementation horizon. (b) Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.</i>
<i>23 Cal. Code Regs § 354.30(c) Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which take into consideration components such as historical water budgets, season and long-term trends, and periods of drought, and be commensurate with levels of uncertainty</i>
<i>23 Cal. Code Regs § 354.30(d) An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.</i>
<i>23 Cal. Code Regs § 354.30(e) Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.</i>

5.3.6.1 Process for Setting Measurable Objectives

Measurable Objectives (MOs) are established at groundwater elevations higher than MTs to provide operational flexibility and reflect the GSAs’ desired groundwater conditions in 2040. The margin of operational flexibility accounts for droughts, climate change, conjunctive use operations, other groundwater management activities, and data uncertainty. The GSAs in the Kaweah Subbasin are managing their groundwater sustainability to meet the MO in 2040.

The MOs are based on one of two methods, depending on which methodology was used to set MTs. **Figure 5-2** graphically shows the relationship between the different MT and MO methodologies.

MO Method 1, Groundwater Level Trend Projection to 2030:

- For representative monitoring sites with MTs derived from the groundwater level trend projection being protective of groundwater uses and users based on currently available well construction information, which is understood to avoid URs, the MO is the 2006-2016 groundwater elevation projected to 2030.
- For representative monitoring sites where the MT is set using the protective elevation, and the difference between the MT and groundwater elevation trend projected to 2030 is 20 feet or more, the MO is the 2006-2016 groundwater elevation projected to 2030.

MO Method 2: 5-Year Drought Storage Based on 2006-2016 Trend

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- For representative monitoring sites where the MT is set using the protective elevation, and the difference between the MT and groundwater elevation trend projected to 2030 is less than 20 feet, the MO is set at an elevation that provides for 5 years of drought storage above the MT. Five years of drought storage is determined as the groundwater level change occurring over 5 years using the 2006-2016 groundwater level trend. The groundwater level change is added to the MT elevation to establish the MO elevation.
- For representative monitoring sites where anomalously low MTs are adjusted by interpolating from MT contours (i.e., evaluating towards a more consistent gradient), the MO is set at an elevation that provides for 5 years of drought storage above the adjusted MT

Details of the methods are described in **Appendix 5B**. The MO for groundwater level at each of the representative sites is shown in **Table 5-2**.

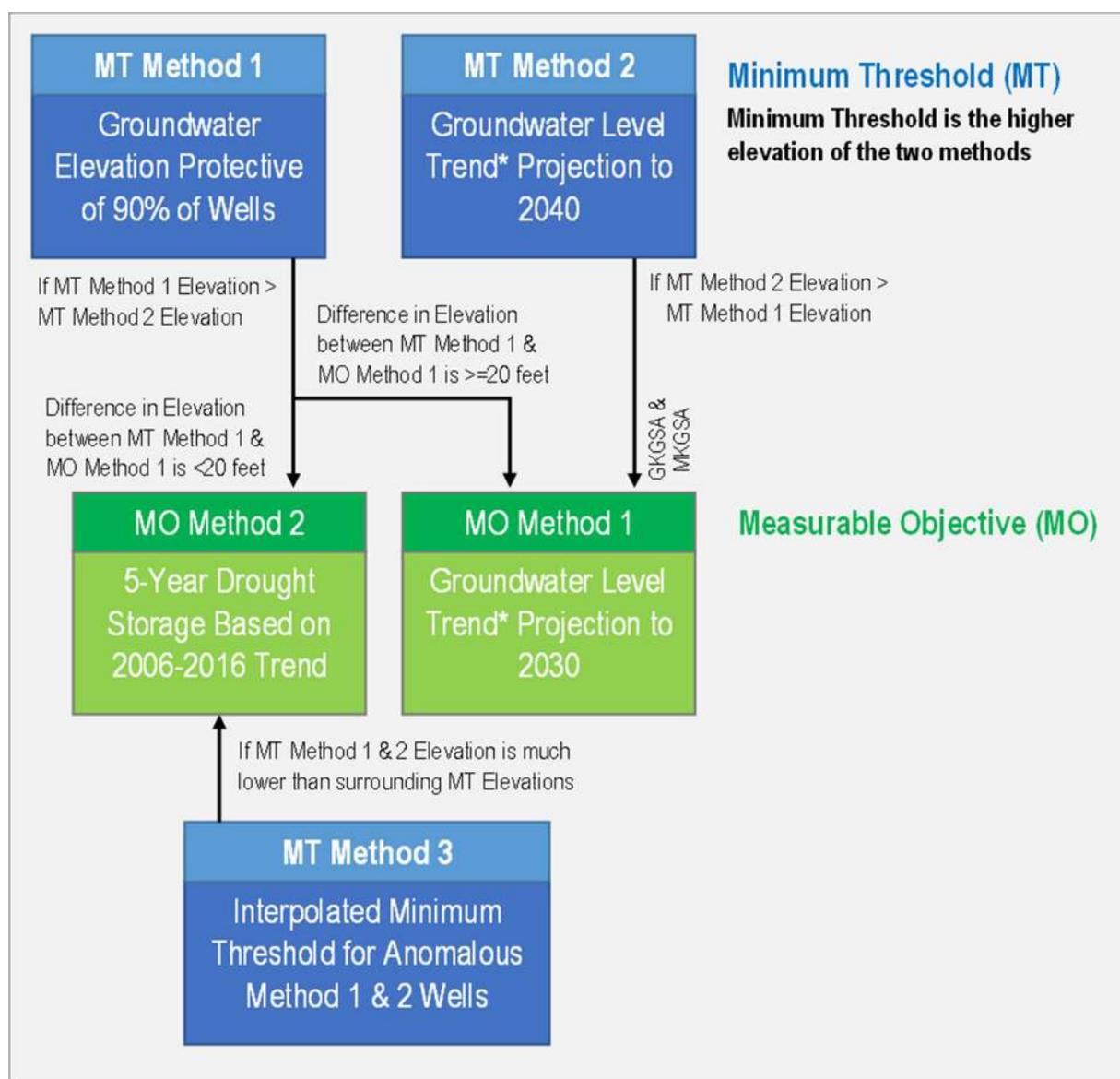


Figure 5-3: Relationship Between Minimum Threshold and Measurable Objective Methodologies

5.3.6.1 Methodology for Setting Interim Milestones

Interim milestones for all representative monitoring sites take the form of a curve that flattens out toward 2040 when the MO is reached. The curve shape is determined based on implementation of projects and management actions over the next 18 years.

Interim milestones for representative monitoring sites are based on incrementally decreasing groundwater level change over time based on the following:

- 2025 interim milestone – extend the 2006-2016 groundwater level trend to 2025
- 2030 interim milestone – elevation at two-thirds of the elevation difference between the 2025 interim milestone and the MO
- 2035 interim milestone – elevation at two-thirds of the elevation difference between the 2030 interim milestone and the MO

The method for setting interim milestones is illustrated on Figure 20 of **Appendix 5B**. The Interim Milestones for groundwater level at each of the representative sites is shown in **Table 5-2**.

5.4 Groundwater Storage

23 Cal. Code Regs § 354.26(a). *Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.*

The SMC related to changes in groundwater storage are the same as those for chronic lowering of groundwater levels as groundwater storage is directly tied to groundwater levels in the Kaweah Subbasin.

5.4.1 Data Sources Used to Establish Minimum Thresholds and Measurable Objectives

Many of the same data sources and information used for establishing the chronic lowering of groundwater levels SMC were also relied upon for changes in groundwater storage due to the direct linkage between the two sustainability indicators. Studies of the local hydrology performed historically by the USGS (1401D) and more recently by Furgro West on behalf of the Kaweah Delta Water Conservation District (Water Resources Investigation) were utilized for estimating the specific yield of the area to quantify groundwater in storage

5.4.2 Significant and Unreasonable Change in Groundwater Storage

The terms “significant and unreasonable” are not defined by SGMA and are left to GSAs to define within their GSPs. The process to define “significant and unreasonable” began with stakeholder and landowner discussions. In the view of the Kaweah Subbasin GSAs and its stakeholders, the impacts for chronic lowering of groundwater levels are applicable to the reduction in groundwater storage

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and are viewed as “significant and unreasonable” as they would directly impact the viability of beneficial uses/users to meet their reasonable water demands through groundwater:

- Inability of the groundwater aquifer to recover in periods of average/above average precipitation following multi-year drought periods
- Dewatering of a subset of existing and active wells below the bottom of the well
- Substantial increase in costs for pumping groundwater, well development, well construction, etc. that impact the economic viability of the area
- Adverse effects on health and safety
- Interfere with other sustainability indicators

5.4.3 Undesirable Results

5.4.3.1 Causes leading to Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (1) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.*

As described in Section 6.5.1 of Appendix 6 of the Kaweah Subbasin Coordination Agreement (included in Appendix 5A), URs associated with groundwater storage are caused by the same factors as those contributing to groundwater level declines. Given assumed hydrogeologic parameters of the Subbasin, direct correlations exist between changes in groundwater levels and estimated changes in groundwater storage.

5.4.3.2 Criteria to Define Undesirable results

In accordance with Section 6.5.2 of Appendix 6 of the Kaweah Subbasin Coordination Agreement (Appendix 5A), the water-level sustainability indicator is used as the driver for calculated changes in groundwater storage. Given assumed hydrogeologic parameters of the Subbasin, direct correlations exist between changes in groundwater levels and estimated changes in groundwater storage, and groundwater levels are to serve as a metric for groundwater storage reductions as well. As such, when one-third of the Subbasin representative monitoring sites for water levels exceed their respective minimum thresholds, an undesirable result for storage will be deemed to occur. The current estimated total volume of groundwater in storage in the Subbasin of 15 to 30 MAF is sufficient such that further depletion over the implementation period is not of a level of concern such that URs related to groundwater storage would emerge during the GSP implementation period.

5.4.4 Potential Effects on Beneficial Uses and Users

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interest, and other potential effects that may occur or are occurring from undesirable results.*

In accordance with Section 6.5.3 of Appendix 6 of the Kaweah Subbasin Coordination Agreement (included in Appendix 5A), the potential effects to beneficial uses and users related to the reduction in groundwater storage are essentially the same as for declines in groundwater levels. In most cases,

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the direct correlation is with declines in levels; however, some beneficial uses may be tied more specifically to loss of groundwater in storage than other uses.

5.4.5 Minimum Threshold

<p>23 Cal. Code Regs § 354.28(a). <i>Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.</i></p>
<p>23 Cal. Code Regs § 354.28(b). <i>The description of minimum thresholds shall include the following:</i></p> <ul style="list-style-type: none"><i>(1) The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.</i><i>(2) The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.</i><i>(3) How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affected the ability of adjacent basins to achieve sustainability goals.</i><i>(4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.</i><i>(5) How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.</i><i>(6) How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.</i>
<p>23 Cal. Code Regs § 354.28(c) <i>Minimum thresholds for each sustainability indicator shall be defined as follows:</i></p> <ul style="list-style-type: none"><i>(2) Reduction of Groundwater Storage. The minimum threshold for reduction of groundwater storage shall be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.</i>
<p>23 Cal. Code Regs § 354.28(d). <i>An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.</i></p>

5.4.5.1 Process Used to Establish Minimum Thresholds

A minimum threshold for reductions in groundwater storage is to be determined as a function of changes in water levels. Water levels are not serving as a proxy for this minimum threshold but, rather, as a means to calculate changes in storage using estimated hydrogeologic parameters.

GKGSA incorporates the use of groundwater levels as a means to estimate the reduction in groundwater storage over time. The specific metrics to be applied for storage changes (additions or reductions) will be acre-feet per year and estimated groundwater in storage above the minimum threshold groundwater levels, or floor. **Figure 5-3** shows the minimum threshold volume as “zero” on the vertical axis, which represents a loss of 2.70 MAF (9 to 18%) of groundwater storage over the 2017 condition, well below the total storage estimate for the Subbasin (15-30 MAF) as sited above.

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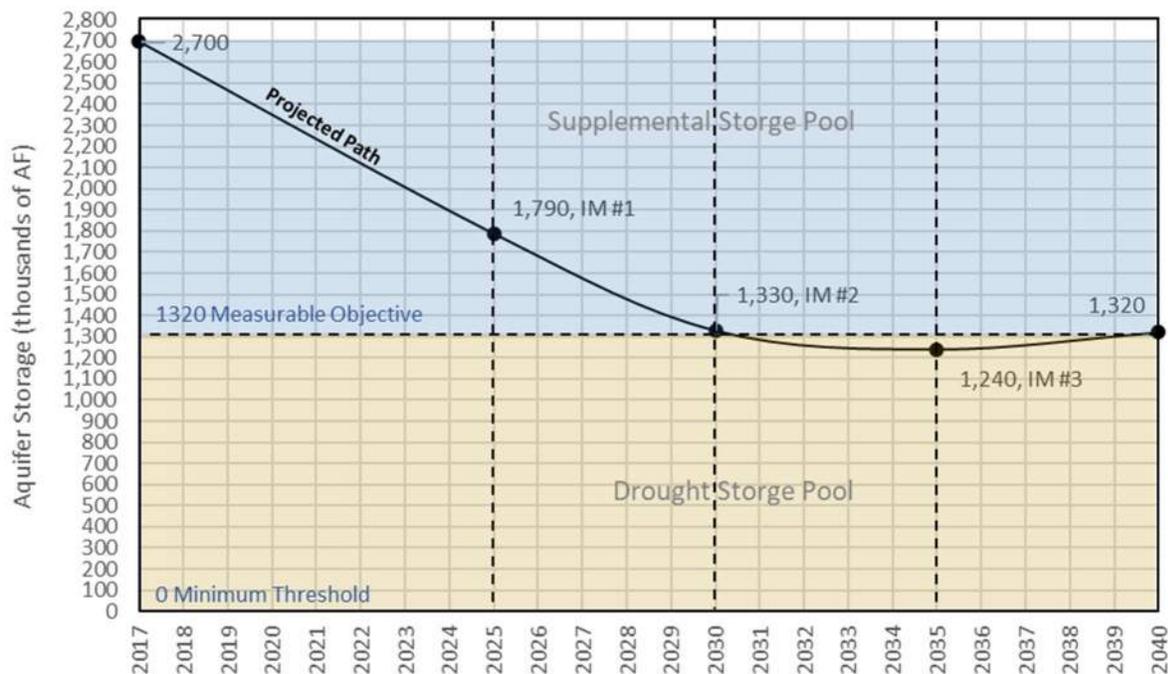


Figure 5-4: Groundwater Storage Sustainable Management Criteria

Each year, changes in groundwater storage will be calculated from changes in groundwater levels for the representative wells within the GKGSA by computing volumetric changes between potentiometric surfaces and adjusting for specific yield estimates for the aquifer between these surfaces. As an annual cross-check on this determination, the GKGSA will also track storage changes using the water budget inventory method as described in the Basin Setting Report (Appendix 2A) and adding another year of data onto the GKGSA-specific water budget summary (Section 2) during development of the annual report.

For the development of a minimum threshold for reduction in storage, the GKGSA did the following:

- Prepared a 2017 groundwater elevation map of the GKGSA representing “current conditions”
- Utilized the GKGSA groundwater elevation contour map protective of greater than the 90th percentile of all beneficial uses and users which do not allow for higher rates of groundwater declines than from historically experienced between 2006-2016 (MTs) from the well impact analysis.
- Estimated the total volume between the two surfaces described above.
- Multiplied total volume by specific yield.

The result of this analysis shows that, as of Spring 2017, the GKGSA had 2.7 MAF in groundwater storage above the minimum threshold groundwater levels. Using this approach, the total groundwater in storage within the GKGSA above the minimum threshold floor can be estimated

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each year. This threshold applies in monolithic fashion across the GSA and is not established at each representative monitoring site as with water level minimum thresholds.

The Tulare County region has not previously established regulatory limits or standards for groundwater storage. The base of fresh groundwater within the Subbasin is not well defined in the Subbasin south of Farmersville and Exeter or on the northeast, and most existing wells have been drilled to depths well above the presumed base.

5.4.6 Measurable Objectives and Interim Milestones

<i>23 Cal. Code Regs § 354.30(a). Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue sustainably manage the groundwater basin over the planning and implementation horizon. (b) Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.</i>
<i>23 Cal. Code Regs § 354.30(c) Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which take into consideration components such as historical water budgets, season and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.</i>
<i>23 Cal. Code Regs § 354.30(d) An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.</i>
<i>23 Cal. Code Regs § 354.30(e) Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.</i>

5.4.6.1 Process Used to Establish Measurable Objectives

Similar to the approach used in setting minimum thresholds for groundwater levels, GKGSA set a measurable objective for groundwater storage as following:

- Use the 2017 groundwater levels contours and the estimated groundwater elevations that provide flexibility for five (5) years of drought storage (MO) maps of GKGSA from the well impact analysis.
- Calculate the total volume between the measurable objective surface and the minimum threshold surface.
- Multiply total volume by specific yield to calculate aquifer storage between the measurable objective and minimum threshold.

These objectives apply in monolithic fashion across the GSA and are not established at each representative monitoring site as with water level objectives. **Figure 5-3** shows the results of this analysis indicating that the measurable objective has 1.3 MAF in storage at 2040. GKGSA’s goal is to manage groundwater basin storage to this measurable objective volume, and if possible, to a higher volume if the hydrology and the projects and management actions support this effort.

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GKGSA is also mindful of its imputed groundwater budget as discussed in Section 6 and its obligations in mitigating for reductions in groundwater storage during Plan implementation. With this in mind, the GKGSA will additionally evaluate changes in storage as a function of new projects (via water recharged) and management actions (via groundwater not extracted).

5.4.6.2 Methodology for Setting Interim Milestones

Interim milestones for reduction in groundwater storage are based on the contouring of all representative monitoring sites taken at the 5-year increments targeting a flattening of the groundwater level decline moving out toward 2040 when the MO is reached. The contour sets based on the different points along the curve shape described for the lowering of groundwater levels SMC, were applied to the specific yield to compute a volume. The corresponding interim milestones for reduction of groundwater storage are:

- 2025 interim milestone – 1.8 MAF
- 2030 interim milestone – 1.3 MAF
- 2035 interim milestone – 1.2 MAF

5.5 Land Subsidence

23 Cal. Code Regs § 354.26(a). *Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.*

The SMC related to subsidence are developed to protect various infrastructure throughout the Subbasin. The various land surface beneficial uses are summarized in the following table. Understanding these different beneficial land surface uses is the first step taken to inform what the GSAs and their stakeholders consider significant and unreasonable impacts. The Kaweah Subbasin GSAs have concurred with the URs, their causes, determination criteria and effects, all as defined in in Section 6.6 of Appendix 6 of the Coordination Agreement (Appendix 5A). The sustainability indicators used to determine undesirable results are referenced herein. This section complies with §354.26 of the Regulations.

Table 5-4: Summary of Beneficial Land Uses

Beneficial Use	Risks to Beneficial Uses	Initial Data Assessment
Beneficial Uses With Some Local Subsidence Impact Information		
Surface Water Delivery Canals	Loss of delivery capacity (i.e., 10%)	Historical data on what was significant
Flood Control Waterways	Reduced flood protection due to loss of capacity (10%)	
Wells	Well Collapse	Subsidence less than average well compression design

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Beneficial Uses Lacking Historical Information		
Roads and Bridges	Differential subsidence leads to cracks	No previous known impacts to develop significance levels
Gravity Sewers	Loss of capacity	No previous known impacts to develop significance levels
Utilities (i.e, gas pipelines)	Loss of capacity or pipe failure	No previous known impacts to develop significance levels
Electrical Lines	Stretch/harm	No previous known impacts to develop significance levels
Railroads	Differential subsidence leads to cracks	No previous known impacts to develop significance levels

5.5.1 Data Sources Used to Establish Minimum Thresholds and Measurable Objectives

Information used for evaluating the land subsidence SMC include:

- Geological studies by various entities that describe the type and characteristics of the Corcoran Clay and other clay layers/lenses.
- DWR’s OSCWR database records in the Kaweah Subbasin related to available well location and construction.
- Monitored groundwater levels and surveyed subsidence monitoring at RMS sites in the Kaweah Subbasin.
- Monitored survey information from Friant Water User Authority on the Friant-Kern Canal Alignment.
- Information from local groundwater users on subsidence impacts to their uses of groundwater, properties and businesses.
- Information from local well drillers on subsidence mitigation efforts they have incorporated into modern well designs.
- Information from Tulare County on local well permits on reasons for drilling new wells.
- Information from Kaweah Delta Water Conservation District’s, Water Resource Investigations.
- Information from the Kaweah Subbasin’s groundwater model developed in 2019.
- Information from regional groundwater models like CVHM and C2VSim on lithology in the Kaweah Subbasin.
- Stanford’s AEM evaluation of Kaweah Subbasin flights by AGF.
- Historical subsidence data from DWR’s InSAR, SGMA Portal Monitoring Network Module, NASA.
- Maps of current and historical groundwater elevation contours.

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- Available GIS information on Kaweah Subbasin flood channels, local rivers and creeks, regional and local ditch systems, municipal/community service areas and groundwater wells, railroads, major highways, and other local infrastructure.
- Consultant developed evaluations of recent studies of subsidence in the region and projections of various scenarios.

There are not data sets or complete data sets that provide enough detail to quantify SMC for many of the other listed infrastructure listed in Table 5-5. Through on-going monitoring and implementation of management actions, key data gaps are anticipated to be better understood, such as:

- Correlation - Subsidence has been compared to many different monitored conditions (groundwater levels, groundwater storage, pumping, well collapse, etc.) with varying levels of correlation based on current available data.
- Subsiding Zone - Although it is understood that the majority of subsidence is being developed below the Corcoran Clay in fine grained sediments that are depressurized, it is not understood whether it is a specific zone (of clay lenses) that is subsiding or a very broad zone (of clay lenses) in that aquifer.
- Maintenance - Impacts difficult to observe because regular maintenance can often address incremental issues.
- Well Collapse - No current tracking of well collapse in the well permitting process. Also, often times there are not just one issue identified when a well collapses.
- Flood Zones - No current understanding of how subsidence relates to flood zones because it seems that the low spot is moving away from communities, and planned projects will be reducing floodwater that make it to more susceptible areas.

5.5.2 Significant and Unreasonable Land Subsidence

The terms “significant and unreasonable” are not defined by SGMA and are left to GSAs to define within their GSPs. The process to define “significant and unreasonable” began with stakeholder and landowner discussions. In the view of the Kaweah Subbasin GSAs and its stakeholders, the following impacts from subsidence are viewed as “significant and unreasonable” as they would directly impact the viability of infrastructure for many beneficial uses/users:

- Capacity reduction to the Friant-Kern Canal – a facility of Statewide importance
- In-channel flood flow capacity reduction on flood control waterways
- Capacity reduction of local surface water delivery channels (or some capacity that cannot be re-regulated within the delivery system)
- Groundwater wells fail due to subsidence impacts
- Roadway/bridges fail resulting in increased economic impacts due to inability to facilitate local commerce
- Interfere with other sustainability indicators

5.5.3 Undesirable Results

5.5.3.1 Causes leading to Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (1) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.*

As described in Section 6.6.1 of Appendix 6 of the Coordination Agreement (Appendix 5A), URs associated with subsidence have many factors including the geological make-up of the Subbasin, deep aquifer pumping, and declining water levels resulting in deeper drilling.

Regional correlations of groundwater levels versus subsidence trends remain difficult to quantify because groundwater levels occur at a local scale and subsidence occurs at a broader/regional scale. While the basin setting and **Appendix 5E** relate subsidence to groundwater levels, a refined understanding of the relationship of pumping at individual wells to subsidence remains a data gap that will be filled over time through collection of data from the land surface subsidence monitoring network, the groundwater elevation monitoring network, and refined extraction data. Additionally, the Kaweah Subbasin is working with Stanford University in completing a Subbasin-wide subsidence model that will help manage groundwater pumping to minimize subsidence. With more data and additional analytical tool(s), the GKGSA and Kaweah Subbasin will continue evaluating the potential factors causing subsidence that may lead to an UR.

5.5.3.2 Criteria to Define Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (2) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.*

As described in Section 6.6.2 of Appendix 6 of the Coordination Agreement (Appendix 5A), the primary criteria and metrics for defining an UR will be the annual rate of reduction in land surface elevation, total amount of subsidence, and areal extent of such elevation changes. An UR will be identified in two ways:

- For the one-mile band on either side of the Friant-Kern Canal, if any of the subsidence RMS locations within the one-mile band reach an MT that will be viewed as an UR.
- For areas outside of the Friant-Kern Canal an UR will occur when one-third of all Subbasin subsidence RMS exceed their respective minimum thresholds.

In addition, GKGSA will evaluate cumulative subsidence at each of the interim milestones as described in this Section. Subsidence rates that represent minimum thresholds have been identified that reflect rates at which infrastructure is no longer protected and/or able to be mitigated.

5.5.4 Potential Effects on Beneficial Uses and Users

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interest, and other potential effects that may occur or are occurring from undesirable results.*

Section 6.6.3 of Appendix 6 of the Coordination Agreement (Appendix 5A) describes the understood impacts to the various land surface uses within the Subbasin such as flood channels, local channels, wells, transportation and utility corridors. The Kaweah Subbasin GSAs have attempted to consider all local infrastructure, land uses, and groundwater users relative to current and potential subsidence impacts.

5.5.5 Minimum Threshold

23 Cal. Code Regs § 354.28(a). *Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.*

23 Cal. Code Regs § 354.28(b). *The description of minimum thresholds shall include the following:*

- (1) The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.*
- (2) The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.*
- (3) How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affected the ability of adjacent basins to achieve sustainability goals.*
- (4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.*
- (5) How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.*
- (6) How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.*

23 Cal. Code Regs § 354.28(c) *Minimum thresholds for each sustainability indicator shall be defined as follows:*

- (5) Land Subsidence. The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results. Minimum thresholds for land subsidence shall be supported by the following: (A) Identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for establishing minimum thresholds in light of those effects. (B) Maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum threshold and measurable objectives.*

The MT for land subsidence is both a rate and extent of total subsidence. The horizontal extent of minimum thresholds covers the entirety of the GKGSA and will be measured through the dedicated subsidence RMS. Total subsidence is the sum of active subsidence caused by ongoing lowering of groundwater levels and any residual subsidence from previous years.

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MT are based on total subsidence measured at the 25 monitoring sites and are shown in **Figure 5-5** as well as summarized in **Table 5-5**. Actual subsidence rates will diminish over time as residual subsidence diminishes. Therefore, the GKGSA does not intend for this subsidence rate to exist indefinitely. These points will be used to evaluate impacts to land surface infrastructure described previously (**Table 5-4**) and in Section 6.6.3 of Appendix 6 of the Coordination Agreement.

5.5.5.1 Process Used to Establish Minimum Thresholds

Subsidence MT were evaluated through an iterative process examining total subsidence ranging from the subsidence currently understood to cause significant and unreasonable impacts, or the worst-case amount of subsidence that occur if groundwater levels equilibrated at minimum thresholds. The intent of the process was to come to a quantitative method that would provide protection of land surface infrastructure from the significant and unreasonable impacts.

The three-step process for developing the subsidence MT is detailed below.

1. Assess Maximum Worst Case Subsidence

A technical analysis was performed (details in **Appendix 5E**) that estimated worst-case total subsidence in the Subbasin if groundwater levels are held at MT. The total subsidence reflects all subsidence between 2020 and 2070. The results showed significant subsidence in the GKGSA in the western portions near the City of Hanford (see Figure 12 of **Appendix 5E**). This is not the expected condition, but rather the extreme condition should groundwater levels drop to MT and remain there indefinitely.

2. Compare Maximum Subsidence to Significant and Unreasonable Impacts

The GKGSA compared the total maximum subsidence shown in Figure 12 of **Appendix 5E** to the significant and unreasonable criteria. In many places, the maximum total subsidence is greater than significant and unreasonable total subsidence for land surface infrastructure and deep wells. Additionally, the maximum total subsidence would be expected to result in water conveyance infrastructure losing more than 10% of capacity.

3. Set Minimum Thresholds Based on Most Protective Subsidence.

From the conclusions in Step 2, the total maximum subsidence was modified to represent total subsidence that eliminates expected subsidence impacts. Wherever the total maximum subsidence exceeded significant and unreasonable levels, the amount of allowable subsidence was reduced to be less than significant and unreasonable. This results in MTs being set either at or less than the significant and unreasonable total subsidence; providing protection to all land uses and users with quantifiable subsidence impacts. A map of the modified MTs is shown in **Figure 5-5**.

Because a significant and unreasonable impact on deep wells occurs after 6-12 feet of subsidence, no MTs for subsidence is greater than 9 feet. This condition would be most anticipated in the western portion of the Subbasin overlaying the Corcoran Clay. The expected maximum total subsidence in the eastern portions of the Subbasin and GKGSA is

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far less than 9 feet. In the eastern region of the Subbasin, the Friant-Kern Canal traverses from north to south. The Friant-Kern Canal is a facility of Statewide importance and is critical infrastructure. The GKGSA and EKGSA have set the subsidence along the Friant-Kern Canal as approximately 10 (9.5) inches. This is the estimated amount that could reduce 10% of the capacity. Mitigation for impacts on the Friant-Kern Canal are anticipated to be more an expensive effort beyond what the GKGSA could handle. **Figure 5-5** shows the subsidence MTs across the GKGSA and is used to establish MT at each of the subsidence monitoring points. These MT are listed in **Table 5-5**.

While this is a reasonable preliminary approach to establishing quantitative levels of significance, the GSAs realize that well collapse could still occur with less than 9 feet of subsidence. This could be a significant and unreasonable outcome. To that end, the GKGSA is developing a Mitigation Program to mitigate the impacts of subsidence on wells during GSP implementation. Program details are in Section 7.3.6.

The subsidence MT rate was then designed to avoid subsidence rates greater than those seen in previous drought years. Subsidence from two recent drought years were analyzed: April 1, 2015 to April 1, 2016, and April 1, 2021 to April 1, 2022. For additional protection of surface uses and users, the Kaweah GSAs coordinated to establish that the annual subsidence rate should not exceed the 67th percentile subsidence rate from those years. Choosing the 67th percentile allows some subsidence during future droughts while avoiding any impacts from the maximum subsidence observed during recent droughts.

Figure 5-6 shows the ranked subsidence rates at each of the approximately 30 RMS in the Kaweah Subbasin. Subsidence rates during drought years ranged from -0.04 feet to 1.3 feet across the Subbasin. The 67th percentile of subsidence during these two previous drought years falls between 0.65 and 0.69 feet/year. Based on this analysis, the Kaweah Subbasin GSAs agreed on a maximum subsidence rate of 0.67 feet/year for the MT rate.

Both the rate and the extents portions of the MT must be satisfied to avoid UR. Therefore, subsidence will not continue unabated. If subsidence continues at the MT rate, it will eventually reach the MT extent for 9 feet, producing an UR.

Table 5-4 summarizes the minimum thresholds for the 13 representative stations in the GKGSA.

The Tulare County region has not previously established regulatory limits or standards for land subsidence.

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Table 5-5: Summary of Subsidence Sustainable Management Criteria for GKGSA

Subsidence Monitoring Point	Minimum Threshold		Measurable Objective		Interim Milestones (feet/year)		
	Annual Subsidence (feet/year)	Total Subsidence (feet)	Annual Subsidence (feet/year)	Total Subsidence (feet)	2025	2030	2035
DH6684	0.67	9.00	0	0	0.67	0.45	0.30
DH6686	0.67	3.48	0	0	0.67	0.45	0.30
DH6691	0.67	1.44	0	0	0.67	0.45	0.30
DH6719	0.67	9.00	0	0	0.67	0.45	0.30
DH6739	0.67	9.00	0	0	0.67	0.45	0.30
GT2135	0.67	9.00	0	0	0.67	0.45	0.30
K001	0.33	0.83	0	0	0.33	0.22	0.15
K003	0.67	2.65	0	0	0.67	0.45	0.30
K00X	0.67	1.52	0	0	0.67	0.45	0.30
K012	0.67	9.00	0	0	0.67	0.45	0.30
K015	0.67	6.75	0	0	0.67	0.45	0.30
K015X	0.67	9.00	0	0	0.67	0.45	0.30
K016	0.67	9.00	0	0	0.67	0.45	0.30
K024	0.67	9.00	0	0	0.67	0.45	0.30
K025	0.67	9.00	0	0	0.67	0.45	0.30
K026	0.67	9.00	0	0	0.67	0.45	0.30
K02A1	0.33	0.83	0	0	0.33	0.22	0.15
K1081	0.67	0.90	0	0	0.67	0.45	0.30
Kaweah River Check	0.33	0.83	0	0	0.33	0.22	0.15
KDCB	0.33	0.83	0	0	0.33	0.22	0.15
KDL2	0.67	9.00	0	0	0.67	0.45	0.30
KPIT	0.67	1.76	0	0	0.67	0.45	0.30
P566	0.67	3.11	0	0	0.67	0.45	0.30
Q 458	0.67	9.00	0	0	0.67	0.45	0.30
S228	0.67	9.00	0	0	0.67	0.45	0.30

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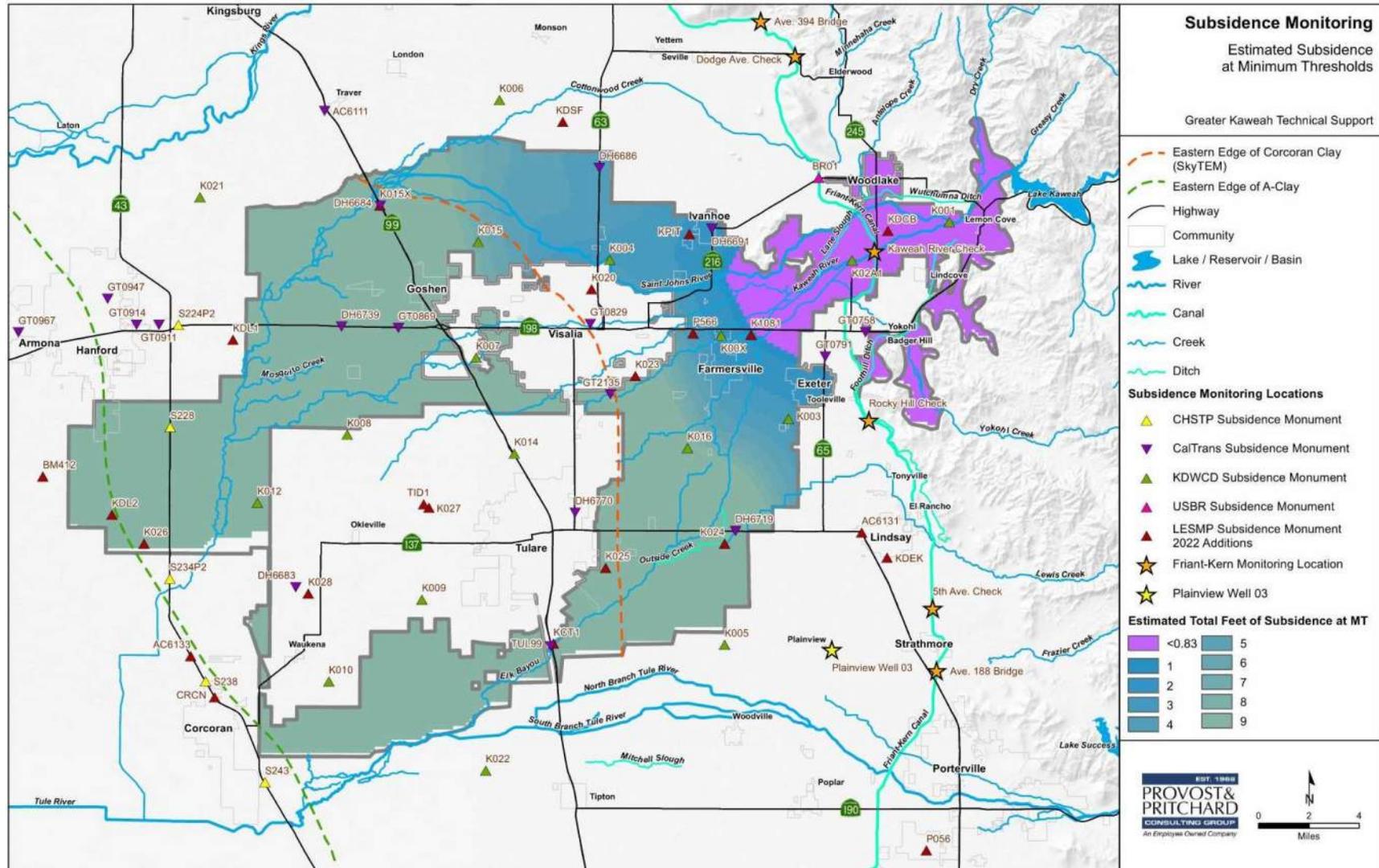


Figure 5-5: Subsidence Minimum Threshold Map for the GKGSA

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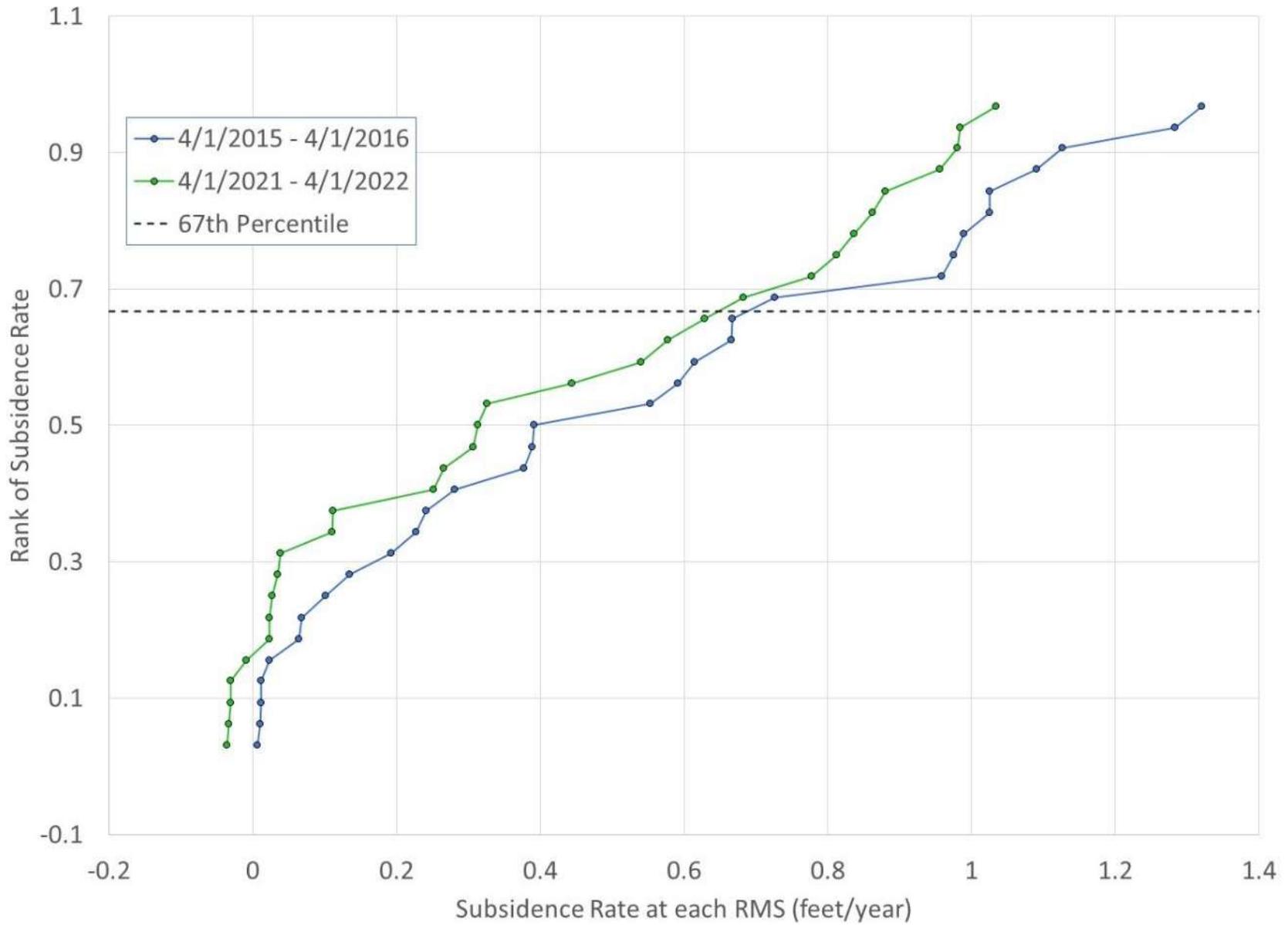


Figure 5-6: Subsidence Rate Evaluation for Kaweah Subbasin RMS

5.5.5.2 Evaluation of MT for multiple Sustainability Indicators

Section 354.28 of the GSP Regulations requires that the description of MT include a discussion about the relationship between the MT for each sustainability indicator. In the SMC BMP (DWR, 2017), DWR has clarified this requirement. First, the GSP must describe the relationship between each sustainability indicator's MT (e.g., describe why or how a subsidence MT set at a particular representative monitoring site is similar to or different from groundwater level MT in nearby representative monitoring sites). Second, the GSP must describe the relationship between the selected MT and MT for other sustainability indicators (e.g., describe how a groundwater level MT would not trigger an UR for land subsidence).

The potential subsidence MT impacts on other MT are currently understood to be as follows:

- **Chronic lowering of groundwater levels.** The subsidence MT may limit the amount of groundwater level declines if the subsidence MT are achieved prior to reaching the MT for chronic lowering of groundwater levels. In general, limiting groundwater level decline will help the GSAs avoid both the groundwater level and land subsidence MTs.
- **Reduction in groundwater storage.** The subsidence MT does not lower groundwater elevations below the levels used to calculate reduction in groundwater storage MT. Therefore, the subsidence and reduction in groundwater storage MTs do not conflict, and the subsidence MT does not result in a significant or unreasonable loss of groundwater storage. Although subsidence does result in a loss of storage space in aquitards, this is unusable storage space because it cannot be refilled once subsidence has occurred. Therefore, this loss of aquitard storage plays no part in active groundwater management.
- **Degraded water quality.** A relationship between the land subsidence MT and water quality MTs has not been established. However, it is not anticipated that land subsidence will result in significant or unreasonable degradation of water quality.
- **Depletion of interconnected surface water.** Interconnected surface water is listed as a data gap by the GKSA. Further investigation is going to be implemented per the proposed Work Plan included in Section 7.3.12. Filling data gaps and then further analyzing the presence and potential impacts and causes are intended to be better understood ahead of the 2025 GSP Update.

5.5.6 Measurable Objectives and Interim Milestones

23 Cal. Code Regs § 354.30(a). *Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue sustainably manage the groundwater basin over the planning and implementation horizon. (b) Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.*

23 Cal. Code Regs § 354.30(c) *Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which take into consideration components such as historical water budgets, season and long-term trends, and periods of drought, and be commensurate with levels of uncertainty*

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23 Cal. Code Regs § 354.30(d) *An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.*

23 Cal. Code Regs § 354.30(e) *Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.*

5.5.6.1 Process for Setting Measurable Objectives

The measurable objectives for land subsidence are set at zero subsidence. The goal of the GKGSA and Kaweah Subbasin is to work towards no additional subsidence as the groundwater aquifer(s) are managed to and maintain sustainability. This objective subsidence rates is shown in **Table 5-5**.

5.5.6.2 Process for Setting Interim Milestones

The interim milestones for land subsidence represent target annual subsidence rates that demonstrate progress towards the measurable objective. Because subsidence is driven by groundwater levels, an approach was developed for estimating interim milestones that retains consistency with the groundwater level interim milestones. The modified approach is:

- 2025 interim milestone– current subsidence rates
- 2030 interim milestone – a subsidence rate of two-thirds of the difference between the 2025 interim milestone and the MO
- 2035 interim milestone – a subsidence rate of two-thirds of the difference between the 2030 interim milestone and the MO

Interim milestones for each of the subsidence representative monitoring site are shown in **Table 5-5**.

5.6 Degraded Water Quality

23 Cal. Code Regs § 354.26(a). *Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.*

An UR may be significant and unreasonable if groundwater quality is adversely impacted by groundwater pumping and recharge projects and these impacts result in groundwater no longer being generally suitable for agricultural irrigation and/or domestic use.

5.6.1 Causes Leading to Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (1) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.*

As discussed in Section 6.7.1 of Appendix 6 of the Coordination Agreement, URs associated with water quality degradation can result from pumping localities and rates, as well as other induced effects by implementation of a GSP, such that known plumes and contaminant migration could threaten production well viability. Well production depths too may draw out contaminated groundwater, both from naturally occurring and man-made constituents which, if MCLs are exceeded, may engender undesirable results. Declining groundwater levels may or may not be a cause, depending on location. In areas where shallow groundwater can threaten the health of certain agricultural crops, rising water levels may be of concern as well.

5.6.2 Criteria to Define Undesirable Results

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (2) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.*

Consistent with Section 6.7.2 of Appendix 6 of the Coordination Agreement, should one-third of all Subbasin designated water quality monitoring sites exhibit a MT exceedance, and those exceedances are all associated with GSA actions, an undesirable result will be deemed to occur. Groundwater quality degradation will be evaluated relative to established MCLs or other agricultural constituents of concern by applicable regulatory agencies. The metrics for degraded water quality shall be measured for compliance with the respective MCL or the agricultural WQO depending on the dominant groundwater use. These metrics will address the following constituents where applicable:

- Arsenic
- Nitrate
- Chromium-6
- DBCP
- TCP
- PCE
- Sodium
- Chloride
- Perchlorate
- TDS

As explained in this Section, in regions where agriculture represents the dominant use of groundwater, Agricultural WQO will serve as the metric as opposed to MCLs within public water supply. An exceedance of any of the MCL or WQO metrics as defined herein at any representative monitoring sites will trigger a management action within the applicable Management Area or GSA, subject to determination that the exceedance was caused by actions of the GKGSA. MCLs and

WQOs are listed in **Appendix 3A** and these are subject to changes as new water quality objectives are promulgated by the State of California and the Federal EPA. GKGSA will provide updates in our annual reports and GSP Updates throughout the implementation periods of 2020 to 2040.

5.6.3 Potential Effects on Beneficial Uses and Users

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interest, and other potential effects that may occur or are occurring from undesirable results.*

Consistent with Section 6.7.3 of Appendix 6 of the Coordination Agreement, the potential effects of degraded water quality from migrating plumes or other induced effects of GSA actions include those effects upon municipal, small community and domestic well sites rendered unfit for potable supplies and associated uses, and/or the costs to treat groundwater supplies at the well head or point of use so that they are compliant with state and federal regulations. Potential effects also include those upon irrigated agricultural industries, as certain mineral constituents and salt build-up can impact field productivity and crop yields.

5.6.4 Evaluation of Multiple Minimum Thresholds

23 Cal. Code Regs § 354.26 (c). *The Agency may need to evaluate multiple minimum thresholds to determine whether an undesirable result is occurring in the basin. The determination that undesirable results are occurring may depend upon measurements from multiple monitoring sites, rather than a single monitoring site.*

The GKGSA, in coordination with other GSAs in the Subbasin, will utilize multiple wells to monitor and manage the GSA and basin. A detailed description of the GSA’s monitoring network is included in Section 4 of this GSP.

5.6.5 Minimum Threshold

23 Cal. Code Regs § 354.28(a). *Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.*

23 Cal. Code Regs § 354.28(b). *The description of minimum thresholds shall include the following:*

- (1) The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.*
- (2) The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.*
- (3) How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affected the ability of adjacent basins to achieve sustainability goals.*
- (4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.*
- (5) How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.*

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<i>(6) How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.</i>
23 Cal. Code Regs § 354.28(c) <i>Minimum thresholds for each sustainability indicator shall be defined as follows: (4) Degraded Water Quality. The minimum threshold for degraded water quality shall be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.</i>
23 Cal. Code Regs § 354.28(d). <i>An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.</i>

Groundwater quality is currently regulated by multiple state and local governmental agencies. Water quality objectives and the enforcement of these objectives are the responsibility of the Division of Drinking Water (DDW) of the State Water Resources Control Board (SWRCB) and the Central Valley Regional Water Quality Control Board (RWQCB). The SWRCB and these supporting agencies enforce State water quality and Federal Environmental Protection Agency (EPA) water quality standards for both surface and groundwater. In addition, agricultural water quality objectives (Ag WQO) have been established for irrigation water by crop type. SGMA does not provide the GKGSA with the regulatory authority to enforce water quality violations or otherwise take abatement actions. Rather, GKGSA is charged with avoiding the degradation of water quality and the migration of contaminant plumes via its groundwater management activities.

Table 5-6 lists the 80 public water supply wells that will comprise the initial monitoring network. Other supply wells may be added in the future, including wells for public supply, for domestic use, and/or for irrigation. In order to comply with the SGMA requirements, the GKGSA will support the protection of groundwater quality by coordinating with agencies, as listed above, that are already established to maintain and improve the groundwater quality in the Kaweah Subbasin. All future projects and management actions implemented by the GKGSA will be designed to avoid causing further groundwater quality degradation. The avoidance of groundwater quality degradation will be supported by existing and on-going groundwater sampling and reports which can be used to document pre-SGMA conditions for comparison to changes in groundwater quality that occur through the period 2020 to 2040.

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Table 5-6: Water Quality Monitoring Network

Well ID	System Name	Well Name	Latitude	Longitude	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Aquifer System
5403144-002	ALI MUTUAL WATER CO	WELL 02 (DOC'S CORNER)	36.21141	-119.25936			Single
5400710-001	BADGER HILL ESTATES	WELL 01 - NORTH	36.30742	-119.07207	69	184	Single
5400710-002	BADGER HILL ESTATES	WELL 02 - SOUTH	36.30615	-119.07061	69	121	Single
5401044-001	CAL TRANS-VISALIA MAINTENANCE STATION	WELL 01	36.32536	-119.22948	255	295	Single
5403076-002	CENTRAL CAL TRISTEZA ERAD	WELL 02	36.20511	-119.26166			Single
1610004-001	CORCORAN, CITY OF	WELL 01A	36.12122	-119.53431	194	465	Both
1610004-002	CORCORAN, CITY OF	WELL 02A	36.12286	-119.53180	217	467	Both
5403148-001	COURAGE TO CHANGE	WELL 01	36.30593	-119.17090			Single
5400583-003	CUTLER PARK	WELL 03	36.35067	-119.22829			Single
5410041-004	CWS - TULCO WATER COMPANY	WELL 201-02	36.19995	-119.28180	450	510	Lower
5410016-178	CWS - VISALIA	WELL 33-02 (OAKRCH)	36.35638	-119.24062			Single
5410016-179	CWS - VISALIA	WELL 42-01 (OAKRCH)	36.35531	-119.23432			Single
5410016-182	CWS - VISALIA	WELL 95-01	36.35589	-119.40841	300	320	Lower
1600249-001	DEL MONTE FOODS, INC. PLANT #24	WELL 01 - WEST WELL	36.25513	-119.65086			Unknown
1600249-003	DEL MONTE FOODS, INC. PLANT #24	WELL 03 - SOUTH	36.25593	-119.64644			Unknown
1600249-004	DEL MONTE FOODS, INC. PLANT #24	WELL 04 - NORTHEAST	36.25674	-119.64646			Unknown
1600249-005	DEL MONTE FOODS, INC. PLANT #24	WELL 05 - STBY2017	36.25690	-119.65094			Unknown
5400844-002	ELBOW CREEK SCHOOL	WELL 02	36.38397	-119.26555			Single
5400846-002	ELBOW SCHOOL	WELL 02	36.35983	-119.21668			Single
5403130-001	ELEANOR ROOSEVELT COMM LEARNING CTR	WELL 01	36.35450	-119.17182			Single
5403147-001	EXETER KINGDOM HALL	WELL 01	36.29661	-119.16776			Single
5410003-002	EXETER, CITY OF	WELL E06W	36.29675	-119.14465	181	400	Single
5410003-004	EXETER, CITY OF	WELL E09W	36.29827	-119.15143	164	243	Single
5410003-007	EXETER, CITY OF	WELL E11W	36.29871	-119.15415	150	405	Single
5410003-012	EXETER, CITY OF	WELL E12W	36.30606	-119.13576	320	600	Single
5410003-014	EXETER, CITY OF	WELL E13W	36.28330	-119.15387	230	480	Single
5410004-001	FARMERSVILLE, CITY OF	WELL 01A	36.30496	-119.20462			Single
5410004-003	FARMERSVILLE, CITY OF	WELL 03A	36.29064	-119.20757	230	318	Single
5410004-004	FARMERSVILLE, CITY OF	WELL 04A	36.30920	-119.20671	150	235	Single
5410004-005	FARMERSVILLE, CITY OF	WELL 05A	36.30192	-119.20069	156	300	Single
5410004-006	FARMERSVILLE, CITY OF	WELL 06A	36.30198	-119.21294	150	300	Single
5410004-007	FARMERSVILLE, CITY OF	WELL 07A	36.32322	-119.20716	150	390	Single
5410004-014	FARMERSVILLE, CITY OF	WELL 08A	36.31254	-119.21250	310	670	Single
5403141-001	HELLWIG PRODUCTS CO INC	WELL 01	36.32743	-119.20931			Single
5403090-001	IN & OUT FOODMART	WELL 01	36.29645	-119.38316	175	275	Upper
5403121-001	INTERNATIONAL PAPER - EXETER BULK	WELL 01	36.30620	-119.17174			Single
5410019-004	IVANHOE PUBLIC UTILITY DIST	WELL 04	36.37737	-119.22054	174	234	Single
5410019-006	IVANHOE PUBLIC UTILITY DIST	WELL 06	36.38928	-119.22462	230	410	Single
5410019-007	IVANHOE PUBLIC UTILITY DIST	WELL 07	36.38725	-119.21531	250	460	Single
5410019-008	IVANHOE PUBLIC UTILITY DIST	WELL 08	36.38311	-119.22233			Single
5403030-001	JACK GRIGGS INC.	WELL 01	36.39505	-119.02122			Single
1600013-001	LAKESIDE ELEMENTARY SCHOOL	WELL #1	36.24160	-119.61998			Unknown
5400616-001	LEMON COVE WATER CO	WELL 01 - MC KAY'S POINT	36.38738	-119.04461			Single
5410006-015	LINDSAY, CITY OF	WELL 15 (CITY WELL)	36.22540	-119.15448	210	420	Single
5400631-001	LINNELL FARM LABOR CENTER	WELL 01 - SOUTH	36.30997	-119.22309			Single
5400631-002	LINNELL FARM LABOR CENTER	WELL 02 - NORTH	36.31090	-119.22225	152	302	Single
5403032-001	MONROVIA NURSERY - NURSERY	WELL 8	36.37351	-119.15681	140	320	Single
5403055-001	MONROVIA NURSERY - OFFICE	WELL 01	36.38143	-119.13602			Single
5400819-002	MOUNTAIN VIEW MHP	WELL 01 (DRILLED 93/94)	36.32775	-119.22620			Single
1600602-001	NICHOLS FARMS	WELL #1	36.27165	-119.47541			Unknown
1600602-002	NICHOLS FARMS	WELL #2	36.27181	-119.47632			Unknown
5400972-001	OUTSIDE CREEK SCHOOL	WELL 01	36.26887	-119.20662	254	350	Single
5400850-002	PACKWOOD SCHOOL	WELL 02	36.29862	-119.41925	270	421	Both
5400519-001	PALO VERDE SCHOOL	WELL 01	36.14546	-119.35621	150	300	Both
5402038-001	PATTERSON TRACT CSD	WELL 01 WEST	36.37850	-119.29194			Single
5402038-002	PATTERSON TRACT CSD	WELL 02 EAST	36.37850	-119.29159			Single

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Well ID	System Name	Well Name	Latitude	Longitude	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Aquifer System
5403122-001	PC'S FOOD MART	WELL 01	36.38424	-119.29807	130	134	Single
5400969-002	PENINSULA PACKAGING CO	WELL 02	36.30333	-119.17084			Single
5400709-001	SEQUOIA UNION ELEMENTARY SCHOOL	WELL 01	36.37711	-119.03888			Single
5400709-002	SEQUOIA UNION ELEMENTARY SCHOOL	WELL 02	36.37711	-119.03694			Single
5403031-001	SUN PACIFIC - TULARE	WELL 01	36.23996	-119.28219	210	460	Both
5403031-002	SUN PACIFIC - TULARE	WELL 02 - STANDBY	36.23831	-119.28198			Unknown
5400714-001	SUNDALE UNION SCHOOL	WELL 01	36.22596	-119.26184	320	400	Single
5400881-001	SUNRISE MUTUAL WATER CO.	WELL 01	36.37266	-119.30142			Single
5400881-002	SUNRISE MUTUAL WATER CO.	WELL 02	36.37457	-119.29733			Single
5400903-001	TRACT 92 CSD	WELL 01 - EAST	36.28915	-119.24204	196	223	Single
5400903-002	TRACT 92 CSD	WELL 02 - WEST	36.28915	-119.24214			Single
5403050-002	TULARE COUNTY HAULING	WELL 02	36.28069	-119.26128			Single
5402027-001	TULARE COUNTY ROAD YARD 2/3	WELL 01	36.25517	-119.25852			Single
5410015-069	TULARE, CITY OF	WELL 44	36.19611	-119.28921	400	540	Lower
5400873-001	UNION SCHOOL	WELL 01	36.29943	-119.24203			Single
5400928-003	VISALIA SALES YARD	WELL 02	36.32863	-119.23162			Single
5403154-002	WILLITTS EQUIPMENT CO., INC.	WELL 02	36.34398	-119.13355			Single
5410020-004	WOODLAKE, CITY OF	WELL 08	36.40320	-119.09778	100	175	Single
5410020-005	WOODLAKE, CITY OF	WELL 09	36.40380	-119.09832	75	130	Single
5410020-006	WOODLAKE, CITY OF	WELL 10	36.39982	-119.09799	106	199	Single
5410020-007	WOODLAKE, CITY OF	WELL 11	36.40022	-119.09626	80	200	Single
5410020-008	WOODLAKE, CITY OF	WELL 12	36.39760	-119.10152	100	195	Single
5410020-009	WOODLAKE, CITY OF	WELL 13	36.39631	-119.10903			Single
5410020-010	WOODLAKE, CITY OF	WELL 14	36.39577	-119.11168			Single

The minimum thresholds shall be set at the MCLs or the Ag WQOs, whichever is applicable at the monitoring site. MCLs have been established for numerous constituents in water and these constituents will be tracked as the responsible agencies develop their data. However, the Basin Setting Report identified six constituents of primary concern and **Table 5-7** lists the MCLs for this list.

Table 5-7: Primary Water Quality Constituents of Concern and their Respective MCL/WQOs

Constituent	Units	Minimum Threshold		Measurable Objective 75% of MT
		Drinking Water Limit (MCL/SMCL)	Agricultural Water Quality Goal	
Arsenic	ppb	10	100	7.5 / 75
Nitrate as N	ppm	10	NA	7.5
Chromium-VI	ppb	10	NA	7.5
Dibromochloropropane (DBCP)	ppb	0.2	NA	0.15
1,2,3-Trichloropropane (TCP)	ppt	5	NA	3.8
Tetrachloroethene (PCE)	ppb	5	NA	3.8
Chloride	ppm	250	106	188 / 80
Sodium	ppm	NA	69	52
Total Dissolved Solids	ppm	1,000	450	750 / 338
Perchlorate	ppb	6	NA	4.5

The methodology to distinguish between the applicability of either MCLs or Ag WQO is:

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- At each representative monitoring well, determine the dominant beneficial use for that monitoring well. If the majority of the beneficial use (greater than 50% of the pumping within a determined area) is agricultural and there are no public water systems (including schools) the minimum threshold would be a host of agricultural water quality constituents.
- If a monitoring well is located within an urban area, or near a public water system (e.g., within a mile), which includes schools, then the minimum threshold would be set at the MCL for drinking water. If the MCL is exceeded, then the public water agency responsible for the water quality in those wells shall be contacted and the GKGSA shall coordinate its activities such that they do not result in an exceedance of any MCL.
 - The water will be monitored for drinking water standards and if a MCL exceedance occurs, the GKGSA shall inform other users in the area of the exceedance and provide technical assistance such as water quality testing and information on potential alternative water supply options (bottled water, reverse osmosis systems, connecting to a public water system, etc.).
 - Water quality testing of residential systems would increase the water quality data temporally and spatially over the GKGSA.
 - GKGSA will also notify other responsible agencies and stakeholder organizations of the MCL exceedance and coordinate GKGSA SGMA activities to prevent further exceedance of any MCL.
 - The above assistance programs are as summarized in Section 7.3 of this GSP.

The groundwater quality monitoring network is presented in Section 4 of this Plan and is currently focused on public supply wells and the available water quality data from the DDW. As other programs (ILRP, CV-SALTS) produce water quality data, this information will be assimilated into the GKGSA GSP program.

An exceedance of any MCL or AG WQO at any representative monitoring sites will trigger an evaluation within GKGSA to determine if the GKGSA projects or management actions caused the exceedance. Should one-third of all Subbasin monitoring sites exhibit an exceedance, an undesirable result will be deemed to occur. Where MCLs are already exceeded prior to GSP implementation, this condition will be considered a pre-existing, baseline condition that GKGSA is not responsible for remediating. However, GKGSA will work cooperatively with agencies charged with addressing these adverse water quality conditions.

As described in Section 4, GKGSA will evaluate groundwater quality degradation by reviewing groundwater quality data as it becomes available from other regulatory agencies responsible for the collection and reporting of groundwater quality. GKGSA will partner with these agencies to share data for inclusion in its GSP annual reports and five-year assessments. GKGSA may initiate a limited groundwater sampling and analysis program at specific locations that may arise during the implementation of a project or due to a management action. This GKGSA program will be developed further during the first five years of the implementation period.

5.6.6 Measurable Objectives

<i>23 Cal. Code Regs § 354.30(a). Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue sustainably manage the groundwater basin over the planning and implementation horizon. (b) Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.</i>
<i>23 Cal. Code Regs § 354.30(c) Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which take into consideration components such as historical water budgets, season and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.</i>
<i>23 Cal. Code Regs § 354.30(d) An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.</i>
<i>23 Cal. Code Regs § 354.30(e) Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.</i>

As explained in this Section, the GKGSA supports the protection of groundwater quality by coordinating with other regulatory agencies established to maintain and improve the groundwater quality in the Kaweah Subbasin. All future projects and management actions implemented by the GKGSA are designed to avoid causing further groundwater quality degradation.

To protect against further water quality degradation (exceedance of MCLs or Agricultural WQOs), the GKGSA will establish measurable objectives at 75% of the MCLs or WQOs. This objective will alert GKGSA to any constituent’s concentration that is approaching the MCL or WQO. Using water quality data provided by other agencies, GKGSA will include time-series plots of water quality constituents to demonstrate projects and management actions are operating to avoid degradation. Should the concentration of constituents of concern raise to 75% of the MCL or WQO as the result of a GSA project, GKGSA will implement corrective measures (i.e., halting recharge operations, reducing pumping, etc.) to avoid an exceedance in the event that such concentrations result from GSA actions.

As progress towards improving water quality rests largely with other regulatory agencies, interim milestones for water quality will not be explicitly applied.

GKGSA will also coordinate with the entities responsible for complying with existing groundwater quality regulatory programs. Many of these programs (i.e., ILRP, Dairy Program, CV-SALTS) are still in the early stages of implementation and groundwater quality objectives are still under consideration. Once established, GKGSA will include these levels in the GSP periodic assessments outlined in Section 8 of this Plan.

5.7 Interconnected Surface Water

<i>23 Cal. Code Regs § 354.26 (a). Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable</i>

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effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.

The GKGSA has identified interconnected surface water as a data gap and therefore does not have data or a full understanding to establish definitive sustainable management criteria for this sustainability indicator. The GKGSA has committed to performing a Work Plan and included it in the Management Actions Section 7.3.12. The Work Plan will be performing further investigation and filling of data gaps to better understand this sustainability indicator and, ahead of the 2025 GSP update, refine the preliminary SMC described below.

5.7.1 Undesirable Results

5.7.1.1 Causes leading to Undesirable Results

23 Cal. Code Regs § 354.26 (b). The description of undesirable results shall include the following: (1) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.

As described in Section 6.8.1 of Appendix 6 of the Coordination Agreement (included in Appendix 5A), URs associated with interconnect surface waters are understood to be caused by several factors. Some of these factors may include groundwater pumping, drier hydrology, and changes within the upper watershed, or some combination of all. Within the Kaweah Subbasin, there are currently significant data gaps related to understanding the potential locations and nexus to depletions caused by groundwater pumping. More information is intended to be developed and shared through a work plan being coordinated and implemented by the East Kaweah GSA and GKGSA and included in Section 7.3.12 of this GSP.

5.7.1.2 Criteria to Define Undesirable results

23 Cal. Code Regs § 354.26 (b). The description of undesirable results shall include the following: (2) The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

Consistent with Section 6.8.2 of Appendix 6 of the Coordination Agreement (Appendix 5A), the proposed work plan between the East Kaweah GSA and GKGSA will fill data gaps to further define criteria for determining URs for beneficial uses/users related to interconnected surface water. At the current time (July 2022), the primary criteria and metric for defining and quantifying adverse impacts and undesirable results will be the estimated percentage of channel losses within potentially interconnected channels, measured as a rate or volume of depletion of surface water, until the work plan provides more information. Currently, there is not sufficient data to definitively set rate of depletions on other data. Increased channel losses reduce the amount of surface water that can be delivered throughout the Kaweah Subbasin. Delivery of surface water is a critically important part of sustainably managing the Kaweah Subbasin, thus impacts that reduce the ability to deliver surface water can become significant and unreasonable and ultimately lead to an undesirable result. The initial percentages being used for SMC are 50% losses due to groundwater pumping for the MT and 30% losses due to groundwater pumping for the MO.

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The Work Plan may add or subtract to these uses/users in whole or part of the reaches of the selected waterways. The waterways to be evaluated as part of the Work Plan are shown in **Figure 5-7**. The reaches selected for study are based on evaluating the spatial extents of the 30' depth to water (DTW) contour for Spring 2015 (dry year) and Spring 2017 (wet year) or in areas where there is no groundwater level data. These two Spring seasons represent the driest and wettest water years since SGMA has been enacted and were used for understanding the potential extents and seasonal fluctuations along reaches to be studied through the Work Plan. These 30' DTW contours were not intended to imply conclusive locations of interconnected surface water at this time.

As with all sustainability indicators, continued observations of conditions in the future and not less frequently than at each five-year GSP assessments, the GKGSA in conjunction with the other Kaweah GSAs will evaluate whether criteria should be changed.

5.7.2 Potential Effects on Beneficial Uses and Users

23 Cal. Code Regs § 354.26 (b). *The description of undesirable results shall include the following: (3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interest, and other potential effects that may occur or are occurring from undesirable results.*

Consistent with Section 6.8.3 of Appendix 6 of the Coordination Agreement (Appendix 5A), currently identified potential beneficial uses/users related to interconnected surface water within the GKGSA are surface water users, riparian and/or groundwater dependent ecosystems, and water rights holders. As more data becomes available, the Work Plan may add or subtract to these uses/users in whole or part of the reaches of the selected waterways. The potential effects of depletions to interconnected surface water, when approaching or exceeding minimum thresholds and thus becoming an undesirable result include:

- Increased losses in interconnected surface waterways used for surface water conveyance, reducing water supply reliability and volumes.
- Negatively and significantly impacting the health of riparian and/or groundwater dependent ecosystems.
- Violating laws and doctrines governing California's surface water rights.

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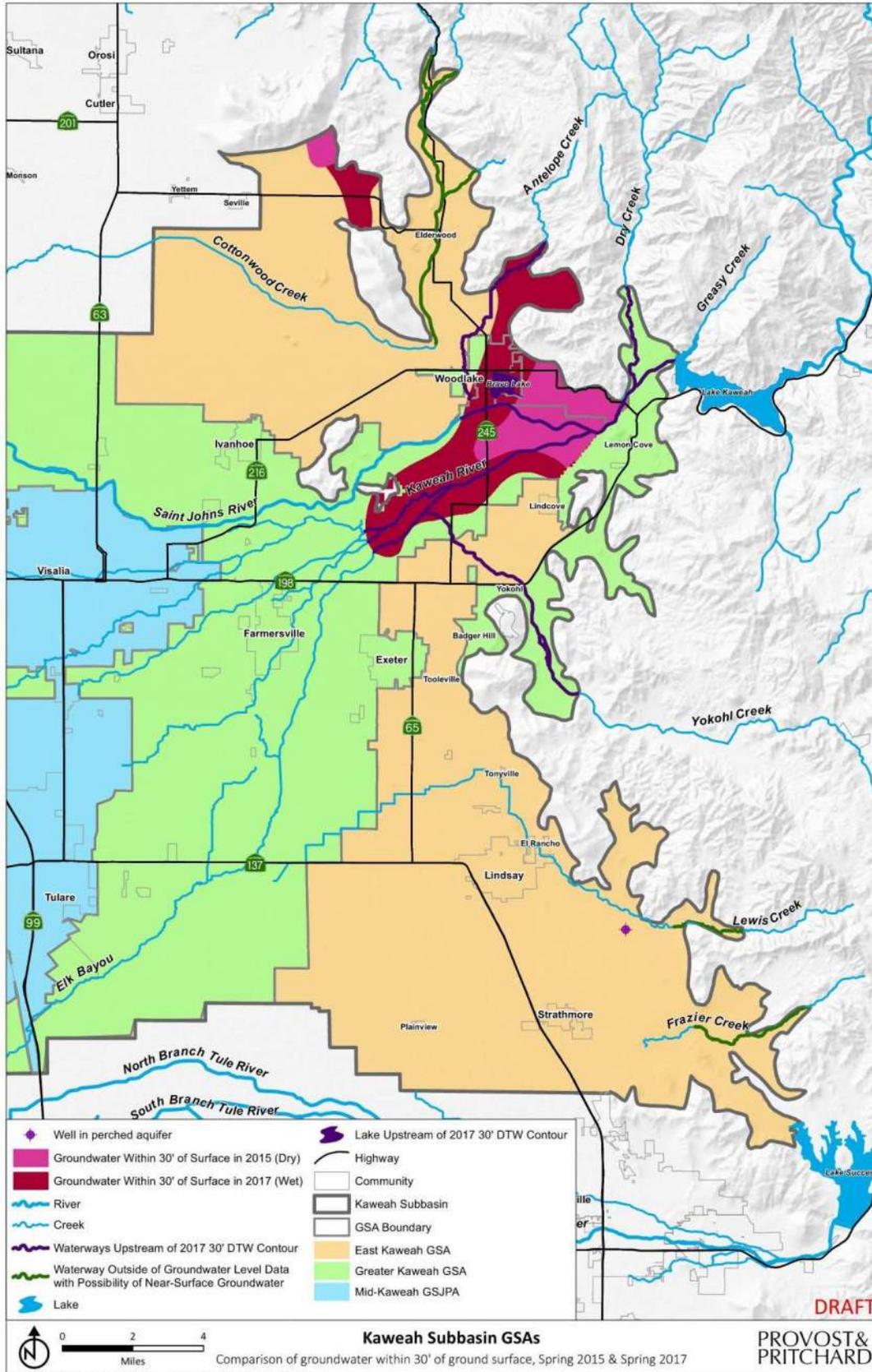


Figure 5-7 Selected Surface Waterways for Work Plan

5.7.3 Minimum Threshold

23 Cal. Code Regs § 354.28(a). *Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.*

23 Cal. Code Regs § 354.28(b). *The description of minimum thresholds shall include the following:*

- (1) The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.*
- (2) The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.*
- (3) How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affected the ability of adjacent basins to achieve sustainability goals.*
- (4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.*
- (5) How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.*
- (6) How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.*

23 Cal. Code Regs § 354.28(c) *Minimum thresholds for each sustainability indicator shall be defined as follows:*

(6) Depletions of Interconnected Surface Water. The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results. The minimum threshold established for depletions to interconnected surface water shall be supported by the following:

- (A) The location, quantity, and timing of depletions of interconnected surface water.*
- (B) A description of the groundwater and surface water model used to quantify surface water depletion. If a numerical groundwater and surface water model is not used to quantify surface water depletion, the Plan shall identify and describe an equally effective method, tool, or analytical model to accomplish the requirements of this paragraph.*

23 Cal. Code Regs § 354.28(d). *An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.*

The GKGSA is initially basing MTs on estimated channel losses as it is a metric with some local experience by surface water purveyors who have operated these waterways for decades, however to the extent channel losses have been caused or impacted by groundwater pumping is not understood. Based on the local experience, typical losses in these channels have varied annually and seasonally, but have been on the order of 30% of the flows in the channels. In dry periods these losses have increased. Losing half or more of the surface water supply may be considered significant and unreasonable given the importance of surface water supplies in the Kaweah Subbasin. Thus, the

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GKGSA has set starting MT for interconnected surface waters based on estimated 50% loss of the respective waterway’s flow, data permitting. In instances with little or no data, the 25-Year Storm capacity for respective waterways based on the 1970 Tulare County Flood Master Plan is used. Many of the waterways with little or no data are ephemeral in nature and take significant storms and/or wetter periods to generate surface water flow. Historic local hydrology suggests that approximately one out of four years are wetter hydrology, which guided the selection of the use of 25-Year Storm data. **Table 5-8** summarizes the estimated rates for the potentially interconnected portions of the surface water ways in the GKGSA. The rates are in cubic feet per second per linear foot of channel (CFS/LF)

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Table 5-8 Preliminary Minimum Thresholds for Interconnected Surface Waters

Water Body	Flow (CFS) ¹	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Channel Capacity ²
Kaweah River	Max	1,221	2,061	2,594	4,540	3,735	3,281	3,100	3,662	4,481	4,506	2,362	1,705	N/A
	Min	0	0	0	0	0	0	0	7	51	53	13	0	
	Avg	611	1,031	1,297	2,270	1,868	1,641	1,550	1,834	2,266	2,280	1,188	853	
	50% MT 30% MO	305 183	515 309	649 389	1,135 681	934 560	820 492	775 465	917 550	1,133 680	1,140 684	594 356	426 256	
Dry Creek	Max	58	885	1,710	1,698	1,260	1,532	1,920	317	140	50	24	36	N/A
	Min	0	0	0	0	0	0	0	0	0	0	0	0	
	Avg	29	443	855	849	630	766	960	159	70	25	12	18	
	50% MT 30% MO	15 9	221 133	428 257	425 255	315 189	383 230	480 288	79 48	35 21	13 8	6 4	9 5	
Lower Kaweah River	Max	693	650	1,009	1,825	1,690	1,436	1,383	1,393	1,677	1,672	1,265	918	N/A
	Min	0	0	0	0	0	0	0	0	1	8	0	0	
	Avg	347	325	505	913	845	718	692	697	839	840	633	459	
	50% MT 30% MO	173 104	163 98	252 151	456 274	423 254	359 215	346 207	348 209	420 252	420 252	316 190	230 138	
St. Johns River	Max	554	1,200	1,447	2,993	2,265	2,469	1,660	2,270	2,803	2,727	1,548	684	N/A
	Min	0	0	0	0	0	0	0	0	0	0	0	0	
	Avg	277	600	724	1,497	1,133	1,235	830	1,135	1,402	1,364	774	342	
	50% MT 30% MO	139 83	300 180	362 217	748 449	566 340	617 370	415 249	568 341	701 420	682 409	387 232	171 103	
Yokohl Creek	Max Min Avg	Not enough flow data records to quantify by month												3,960
	50% MT 30% MO													1,980 1,188

1 Monthly flow data based on flow measurement records from Water Years 1981-2021

2 In instances where no flow data is available, the flow based upon the 1970 Tulare County Flood Control Master Plan 25-Year Storm

5.7.4 Measurable Objectives and Interim Milestones

<p>23 Cal. Code Regs § 354.30(a). <i>Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue sustainably manage the groundwater basin over the planning and implementation horizon. (b) Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.</i></p>
<p>23 Cal. Code Regs § 354.30(c) <i>Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which take into consideration components such as historical water budgets, season and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.</i></p>
<p>23 Cal. Code Regs § 354.30(d) <i>An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.</i></p>
<p>23 Cal. Code Regs § 354.30(e) <i>Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.</i></p>

Similar to the approach used in setting MTs for interconnected surface waters, the GKGSA is leaning on limited local experience in the setting of MOs for interconnected surface waters. From experience, the understanding of the typical losses in these waterways is on the order of 30% of the flows in the channels. The GKGSA is unaware of significant impacts and/or URs at this loss rate or whether groundwater pumping is impacting this rate. Thus, the GKGSA has set preliminary MO for interconnected surface waters based on estimated 30% loss of the respective waterway’s flow, data permitting. In instances with little or no data, the 25-Year Storm capacity for respective waterways based on the 1970 Tulare County Flood Master Plan is used. **Table 5-8** summarizes the estimated MO rates for the potentially interconnected portions of the surface water ways in the GKGSA. The rates are in cubic feet per second per linear foot of channel (CFS/LF)

Interim Milestones for Interconnected Surface Water are set as a 5% reduction from the MT rate (50%) to the MO (30%) with each 5-year GSP update. Thus, the Interim Milestones would translate to 45% in 2025, 40% in 2030, 35% in 2035, and meeting the MO of 30% at the 2040 sustainability target. Interim Milestones, like other SMC related to interconnected surface water, will be updated and refined through the proposed Work Plan and better understanding of the potential locations and extent groundwater pumping is causing depletions.

5.7.5 Evaluation of Multiple Minimum Thresholds

<p>23 Cal. Code Regs § 354.26 (c). <i>The Agency may need to evaluate multiple minimum thresholds to determine whether an undesirable result is occurring in the basin. The determination that undesirable results are occurring may depend upon measurements from multiple monitoring sites, rather than a single monitoring site.</i></p>

The GKGSA, in coordination with other GSAs in the subbasin, have identified interconnected surface waters as a data gap. The proposed Work Plan added to the Management Actions Section 7.3.12 will

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be performing further investigation and filling of data gaps to better understand this sustainability indicator and refine the preliminary SMC going into the 2025 GSP Update.

Section 5 – Sustainable Management Criteria

The development of this MKWSA Minimum Thresholds and Measurable Objectives Section was informed by DWR’s Sustainable Management Criteria BMP. This document is provided in Appendix 3B.

6. Water Supply Accounting

6.1 Application of Basin Setting Water Budget

Table 32 of the Kaweah Basin Setting Report (Appendix 2A) contains the Subbasin hydrogeologic water budget for the period 1997-2017. Table 2.1 of Section 2 is based on this water budget and depicts the hydrogeologic water budget for GKGSA, showing all components of inflow to and outflow from the GKGSA region. The hydrogeologic water budgets are recognized in the Subbasin numerical model and its application to future scenarios incorporating groundwater pumping projections and planned projects and management actions of each GSA. These water budgets do not mandate the process by which the GSAs will achieve sustainability by 2040.

6.2 Water Accounting Framework Allocation

The Subbasin GSAs have discussed water budgets in the context of groundwater law and have developed a means to account for various components of the water budget consistent with commonly-accepted rules regarding surface and groundwater rights. These discussions also included recognition of water storage and conveyance infrastructure within the Subbasin as owned/operated by various water management entities within each GSA.

These discussions, (documented in the Subbasin Coordination Agreement) culminated in an agreed-to methodology to assign groundwater inflow components to each GSA consistent with categories that recognize a native, foreign and salvaged portion of all such components. In general, this methodology defines the native portion of groundwater inflows to consist of those inflows which all well owners have access to on a pro-rata basis; the foreign portion to consist of all imported water entering the Subbasin from non-local sources under contract by local agencies or by purchase/exchange arrangements; and the salvaged portion to consist of all local surface and groundwater supplies stored, treated and otherwise managed by an appropriator/owner of the supply and associated water infrastructure systems (e.g. storm water disposal systems and waste water treatment plants).

The methodology and apportionment of groundwater inflow components is shown in **Table 6-1**.

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Table 6-1: Components of Groundwater Inflow

Native*:	Inflows which all well owners have access to on a pro-rata basis
	<ul style="list-style-type: none"> • Percolation from rainfall
	<ul style="list-style-type: none"> • Streambed percolation (natural channels) from Kaweah River watershed sources
	<ul style="list-style-type: none"> • Agricultural land irrigation returns from pumped groundwater
	<ul style="list-style-type: none"> • Mountain front recharge
Foreign:	All imported water entering the Subbasin from non-local sources under contract by local agencies or by purchase/exchange agreements
	<ul style="list-style-type: none"> • Streambed percolation from imported sources
	<ul style="list-style-type: none"> • Basin recharge from imported sources
	<ul style="list-style-type: none"> • Ditch percolation from imported sources
	<ul style="list-style-type: none"> • Agricultural land irrigation from imported sources
Salvaged:	All local surface and groundwater supplies that are stored, treated, and otherwise managed by an appropriator/owner of the supply and associated water infrastructure systems
	<ul style="list-style-type: none"> • Ditch percolation from previously appropriated Kaweah River sources
	<ul style="list-style-type: none"> • Additional ditch/field recharge from over-irrigation
	<ul style="list-style-type: none"> • Captured storm water returns
	<ul style="list-style-type: none"> • Wastewater treatment plant returns
	<ul style="list-style-type: none"> • Basin percolation from previously appropriated Kaweah River sources
	<ul style="list-style-type: none"> • Agricultural land irrigation returns from Kaweah River watershed sources

* Except for mountain front recharge, subsurface inflows in and out of the Subbasin are excluded from this apportionment and no ownership claims are asserted or disavowed per this apportionment.

Applying the categorical apportionment in **Table 6-1** to each GSA and their member entities that hold appropriative and contract water rights and/or salvaged water infrastructure systems results in the following apportionment to each GSA, shown in **Table 6-2** below.

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Table 6-2: GSA Apportionment for Kaweah Subbasin

(values in acre-feet)

	Native Water			
	East	Greater	Mid	Total
Percolation of Precipitation (Ag and 'Native' non-Ag land	23,666	44,213	20,974	88,854
Streambed Percolation from Kaweah River Sources	16,767	31,324	14,860	62,952
Irrigation Return from Pumped Groundwater	41,484	77,501	36,766	155,752
Mountain Front Recharge	14,976	27,978	13,273	56,227
Total Native	96,894	181,017	85,874	363,784
GSA% of Total Native	27%	50%	24%	101%

	Foreign Water			
	East	Greater	Mid	Total
Streambed Percolation from Imported Sources	0	11,730	2,523	14,253
Ditch Percolation from Imported Sources	0	1,204	21,745	22,949
Basin Percolation from Imported Sources	0	1,050	14,305	15,355
Irrigation Return from Imported Sources	12,073	1,241	7,140	20,453
Total Foreign	12,073	15,225	45,713	73,010
GSA% of Total Foreign	17%	21%	63%	101%

	Salvaged Water			
	East	Greater	Mid	Total
Ditch Percolation from Kaweah River Sources	8,835	49,771	34,880	93,486
Additional Storage	226	6,892	5,697	12,815
Stormwater Return Flows	508	2,370	8,491	11,368
Wastewater Treatment Plant Return Flows	1,470	3,129	13,878	18,477
Basin Percolation from Kaweah River Sources	0	16,005	23,479	39,484
Irrigation Returns from Kaweah River Sources	4,555	31,039	11,981	47,574
Total Salvaged	15,593	109,205	98,406	223,205
GSA% of Total	7%	49%	44%	100%

	East	Greater	Mid	Total (*)
Grand Total	124,560	305,447	229,992	659,999
GSA% of Total	19%	46%	35%	100%

(*) Excludes net sub-surface inflow of 60 TAF/yr

Note: Data is based on water budget for the period Water Year 1997 to 2017 for the Kaweah Subbasin

As acknowledged in Section 2 of this Plan, GKGSA experienced a historical decline in groundwater levels and attendant depletion of groundwater in storage within its jurisdictional region, as does the rest of the Subbasin.

It is the intent of the Kaweah Subbasin GSAs, as stipulated in the Coordination Agreement, to continue to discuss water balances and groundwater conditions during the GSP implementation and,

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in so doing, manage the location, extent and financial contributions to projects and management actions of each GSA. The groundwater net inflow balances and hydrogeologic water budgets of each GSA region will be given due consideration in these future discussions. Therefore, the Subbasin GSA groundwater inflow water budgets are preliminary and a starting point from which to establish a future framework to assess GSA responsibilities in achieving the Subbasin Sustainability Goal and eliminating Undesirable Results by 2040.

As additional data becomes available and water budget component are refined, the Subbasin water budget will be periodically reevaluated, no less frequent than the five-year GSP assessments as submitted to DWR. Likewise, the individual GSA water balances will also be reviewed as this reevaluation occurs at the Subbasin level.

6.3 GSA Member Allocation Strategy

GKGSA Members recognize that the GSA water apportionments, as discussed in Section 6.2, may be further apportioned to different areas of the GKGSA area. This effort will take into consideration the existing water management and associated facility ownership agreements among the GKGSA Members as they relate to groundwater recharge activities. This apportionment will aid in determining Member participation in the various projects as well as shaping the extent of management actions (pumping restrictions), as outlined in Section 7. Any allocation strategy will give due consideration to the Sustainability Plan Cooperative Statement adopted by the GKGSA Board as stated in Section 7.3.11.

7. Projects, Management Actions and Adaptive Management

7.1 Sustainability Goal

23 Cal. Code Regs. § 354.42 Introduction to Projects and Management Actions. *This Subarticle describes the criteria for projects and management actions to be included in a Plan to meet the sustainability goal for the basin in a manner that can be maintained over the planning and implementation horizon.*

The Sustainability Goal for the Kaweah Subbasin was defined in **Section 3** and shall be reached with a combination of Projects and Management Actions. The Kaweah Subbasin has experienced an average overdraft of approximately 65,600 AFY during the Historic Base Period (WY 1981 – 2017). During the Current Base Period (WY 1997 – 2017), the Water Budget presented in the Basin Setting Report showed that the Kaweah Subbasin experienced an average overdraft of 77,600 AFY (**Section 2.3**). The GKGSA portion of the overdraft volume during the Current Base Period was an average of 34,600 AFY (45% of total). This overdraft volume, and the avoidance of Undesirable Results, will be addressed through a combination of Projects and Management Actions described in this section. The GKGSA recognizes that water availability, cost and other factors influence whether or not a proposed project is ever implemented. The specific projects detailed within this Plan were selected in part because they were determined to be either currently “under construction”, “shovel-ready”, and/or “highly feasible”. Should the implementation of any project be delayed, or ultimately fail, the GKGSA will work with JPA Members and other partners to replace that project or scale up management actions outlined in Section 7.3.

7.2 Projects

23 Cal. Code Regs § 354.44 Projects and Management Actions

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. . . .

The Projects proposed in this Plan by the GKGSA consist of a combination of ongoing projects, developed by the JPA Members of the GSA, and projects proposed by the GSA in partnership with either a JPA Member or another GSA in the Kaweah Subbasin. The following list includes a summary of the Project types proposed by the GSA Board and its committees, and the Sustainability Indicator(s) primarily impacted by the implementation of each Project.

Further planning is necessary to address the partnerships, funding, and benefactors for each project.

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Table 7-1: Summary of Projects and Managment Actions

Project	Agency	GW Levels 	Reduction in Storage 	Water Quality 	Land Subsidence 	Estimated Cost
Cross Creek Layoff Basin	KCWD LIWD	◆	◆		◆	\$6.6M
Recharge Basin Improvement	LIWD KCWD KDWCD	◆	◆	◆	◆	\$0.8M
New Recharge Basins	LIWD	◆	◆	◆	◆	\$21.3M
Delta View Canal	KCWD	◆	◆	◆	◆	\$2.5M
Lakeland Canal Deliveries	KCWD CID	◆	◆		◆	\$0.1M
Kings River Floodwater Arrangement	KCWD LIWD	◆	◆		◆	\$0.1M
Kings River Surplus Water	KCWD LIWD	◆	◆	◆	◆	\$85K / yr
Fallowing Program	KCWD LIWD	◆	◆		◆	\$0.8M / yr
On-Farm Recharge & Storage	KCWD LIWD	◆	◆	◆	◆	
Hannah Ranch Flood Control Project	KDWCD	◆	◆	◆	◆	\$6.3M
Paregien Flood Control & Recharge Project	KDWCD	◆	◆	◆	◆	\$1.9M
Ketchum Flood Control & Recharge Project	KDWCD	◆	◆	◆	◆	\$0.5M
St. Johns River Water Conservation Project	KDWCD	◆	◆	◆	◆	\$2.0M
Basin No. 4 Improvement Project	KDWCD	◆	◆	◆	◆	\$0.4M
Peoples Recharge Expansion Project	KDWCD	◆	◆	◆	◆	\$0.5M
Management Action	Agency	GW Levels 	Reduction in Storage 	Water Quality 	Land Subsidence 	Estimated Cost
Communication and Engagement	GKGSA	Not applicable				\$10K / yr
Terminus Reservoir Reoperation Program	KDWCD	Not applicable				\$0.3M
Groundwater Extraction Measurement Program	GKGSA	◆	◆		◆	Not well defined
Well Characterization Program	GKGSA	Not applicable				Not well defined
Geophysical Data Survey – Phase I	GKGSA MKGSA	Not applicable				\$0.5M
Geophysical Data Survey – Phase II	EKGSA	Not applicable				\$0.4M
Urban Water Conservation Program	Cities	◆	◆			
Overdraft Mitigation Program	GKGSA	◆	◆		◆	\$1.5 - \$2M
Agricultural Water Conservation & Management	GKGSA	Not applicable				
Fee & Incentive Program	GKGSA	Not applicable				
Groundwater Market	GKGSA	Not applicable				
Groundwater Allocation Program	GKGSA	Not applicable				
Interconnected Surface Water Data Gap Work Plan	GKGSA	Interconnected surface water				\$150K - \$750K

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Figure 7-1 shows the locations of the projects.

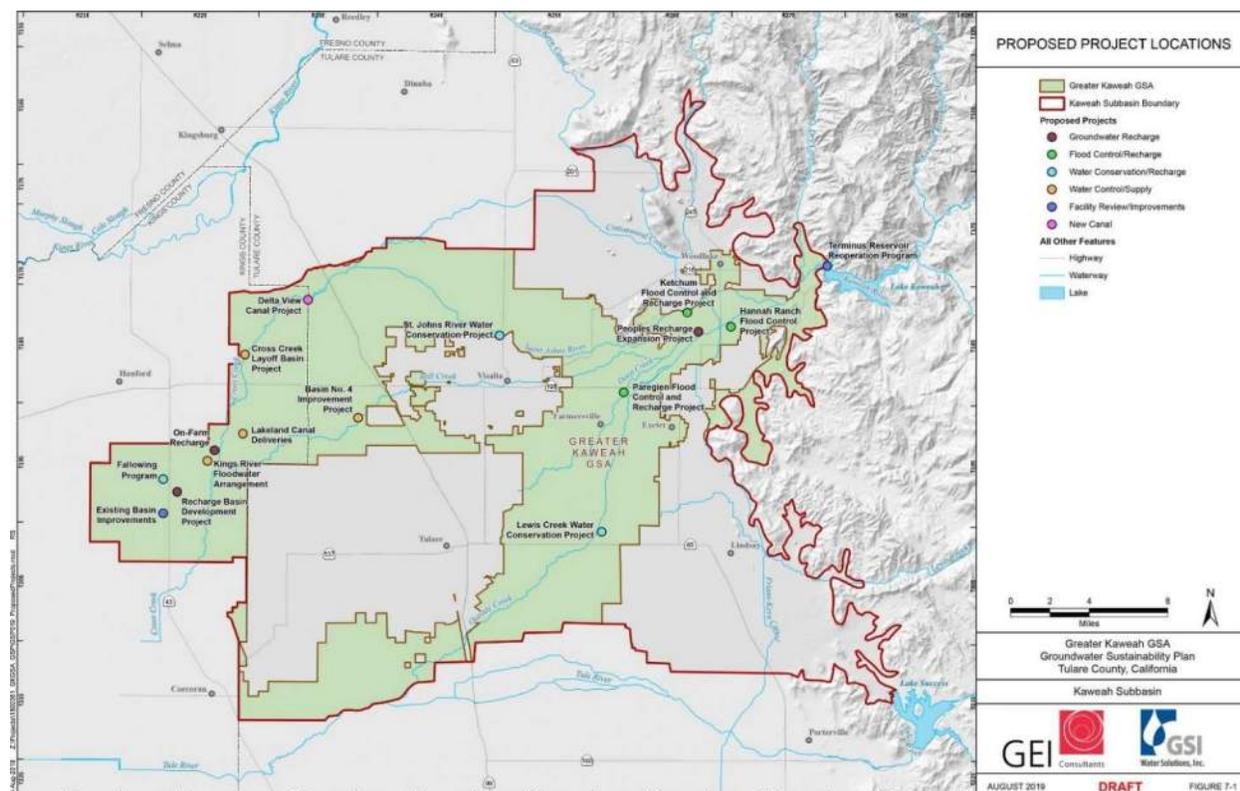


Figure 7-1: Proposed Project Locations

[Link: Full-size figure is available at the end of this section.](#)

7.2.1 Cross Creek Layoff Basin

Project Type: Local Surface Storage

Project Location: The preliminary site for this project has been identified, but it is believed that if it is disclosed acquisition will become more costly. For this reason, the area is described as north of Grangeville Avenue, near where the Lakeland Canal, the Lakeside Ditch and Cross Creek cross.

Implementing Agency: Kings County Water District, in partnership with Lakeside Irrigation Water District

7.2.1.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Cross Creek Layoff Basin will utilize roughly 115 acres to store floodwater for later use within a 125-acre site which will be located in the vicinity of the intersections of Lakeland Canal, the Lakeside Ditch and Cross Creek with Grangeville Avenue. The storable depth of the basin is anticipated to be 10 feet, which translates to a storable volume of roughly 1,100 acre-feet (AF). The

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basin might be utilized every fourth or fifth year during a wet winter season. Diversion and conveyance facilities will need to be developed for management of flows.

This project is located on agricultural acreage that relies on groundwater for irrigation and the elimination of this acreage will provide roughly 350 AF of in-lieu groundwater recharge per year (125 acres at 95% agriculture using 3 AF per year). Additional recharge may be realized through leakage from the basin during storage as well as deep percolation of the irrigated water.

7.2.1.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.1.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the KCWD is implementing this project to increase recharge to the subbasin.

7.2.1.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Environmental review for this project has not yet begun. Appropriate notice and outreach will be provided by the implementing agency (Kings County Water District [KCWD]) to various public agencies and other stakeholders, including Lakeside Irrigation Water District (LIWD), Kaweah Delta Water Conservation District (KDWCD), and GKGSA. In addition, a formal Public Notice is required by the California Environmental Quality Act (CEQA).

7.2.1.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 640 AF per year.

7.2.1.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The project will be subject to the Kings County Land Use Authority. Other regulatory process for large earth-moving projects include CEQA and the County ordinance (#558) for the Surface Mining and Reclamation Act (SMARA), as well as local permits.

7.2.1.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is anticipated to be completed during 2024 and ready to receive floodwater by 2025.

7.2.1.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 29,300 AF of in-lieu recharge during the 50-year planning and implementation horizon with an average annual benefit of 640 AF per year. This estimate includes a total of 16,100 AF of direct in-lieu recharge each year due to the non-agriculture presence of the basin and 13,200 AF for periodic in-lieu recharge during above-normal water years when the basin contains diverted floodwater. The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence. Deep percolation of the stored floodwater could improve groundwater quality since the floodwaters would be high-quality with a relatively low concentrations of total dissolved solids (TDS) and other constituents.

7.2.1.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Current water rights will be utilized for the diversion of the floodwaters that, according to past hydrology documented in watermaster reports, are anticipated to occur on a 4-year reoccurrence period.

7.2.1.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

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KCWD has the statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 31020 et seq.*

7.2.1.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project is \$6.6 million, including property acquisition, design, construction, and financing. The funding mechanism has not been selected but will likely be a land-based assessment and/or a groundwater pumping charge.

7.2.1.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.1.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.2 Recharge Basin Improvements for Lakeside Irrigation Water District

Project Type: Recharge Basin

Project Location: All existing basin locations within the jurisdictional boundary of Lakeside Irrigation Water District

Implementing Agency: Lakeside Irrigation Water District, in partnership with Kings County Water District and Kaweah Delta Water Conservation District

7.2.2.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

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The Lakeside Irrigation Water District (LIWD) operates numerous recharge basins and, during maintenance work on several basins, identified methods to improve recharge rates. This project will evaluate and rehabilitate other existing facilities to address sediment buildup, diversion capacities, and other issues.

7.2.2.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.2.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the LIWD is implementing this project to increase recharge to the subbasin.

7.2.2.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by Lakeside Irrigation Water District (LIWD). In addition, a formal Public Notice is required by the California Environmental Quality Act (CEQA).

7.2.2.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 1,600 AF per year.

7.2.2.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

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The project will be subject to the Kings County Land Use Authority.

7.2.2.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The evaluation phase of the project will likely begin during 2020 and be complete by 2021/2022.

7.2.2.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 78,000 AF of recharge during the 50-year planning and implementation horizon with an average annual benefit of 1,600 AF per year, based on a 4-year reoccurrence period.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence. Deep percolation of the recharge could improve groundwater quality since the surface waters would have relatively low TDS concentrations.

7.2.2.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Based on annual operational reports prepared by Friant Water Authority, the diversion of the CVP water is anticipated to occur on a 4-year reoccurrence period.

7.2.2.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

LIWD has the statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 31020 et seq.*

7.2.2.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project is \$0.8 million for 250 acres of recharge basin, including geotechnical borings, design, and sediment removal. The cost would be borne by LIWD as a normal maintenance cost for operating a recharge basin.

7.2.2.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.2.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.3 New Recharge Basins for Lakeside Irrigation District

Project Type: Recharge Basin

Project Location: The preliminary sites for this project have been identified, but it is believed that if they are disclosed, acquisition will become more costly. For this reason, the areas are described as sandy parcels within Lakeside Irrigation Water District's (LIWD) boundary.

Implementing Agency: Lakeside Irrigation Water District

7.2.3.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

LIWD currently utilizes recharge basins to store surplus CVP water. This project would establish new recharge basins – 275 acres total during the first 20-year of the planning and implementation period. These 10-foot deep basins would have a total storage capacity of 13,600 AF.

7.2.3.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.3.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the LIWD is implementing this project to increase recharge to the subbasin.

7.2.3.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by LIWD, and as necessary it partners KCWD and GKGSA. In addition, the CEQA review process would include a formal Public Notice.

7.2.3.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 3,600 AF per year.

7.2.3.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The project will be subject to the Kings County Land Use Authority. Other regulatory processes will likely include CEQA and the County ordinance (#558) for SMARA, as well as local permits.

7.2.3.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This project is in the early planning phase with an initial acquisition of land during 2023, followed by phased completions of approximately 25 percent of the project during subsequent 5-year intervals.

7.2.3.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 166,000 AF of recharge during the 50-year planning and implementation horizon with an average annual benefit of 3,600 AF per year. This estimate includes a total of 23,00 AF of in-lieu recharge each year due to the non-agriculture presence of the basin and 143,000 AF from periodic above-normal water years when excess CVP water is available.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence. Deep percolation of the surface could improve groundwater quality since the surface water would likely have a relatively low TDS concentration.

7.2.3.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Current water rights will be utilized for the diversion of the excess CVP water that, according to reports prepared by Friant Water Authority, are anticipated to occur on a 4-year reoccurrence period.

7.2.3.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD (*Cal. Water Code* §§ 31020 et seq.) and LIWD (*Cal. Water Code* §§ 22075 et seq.) have the statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area.

7.2.3.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project is \$21.3 million, including property acquisition, geotechnical and biological surveys, design, permits, construction, and financing. The funding mechanism has not been selected but will likely be a land-based assessment and/or a groundwater pumping charge.

7.2.3.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to*

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ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.3.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.4 Delta View Canal in Kings County Water District

Project Type: Local Conveyance Improvements/Recharge Basin

Project Location: The envisioned Project is located in the Kings County portion of the Kaweah Subbasin, outside of LIWD. The preliminary alignment for this project is along the western side of 1st Avenue in Kings County, from Cross Creek to Houston Avenue (Caldwell Ave in Tulare County).

Implementing Agency: Kings County Water District, in partnership with Kaweah Delta Water Conservation District

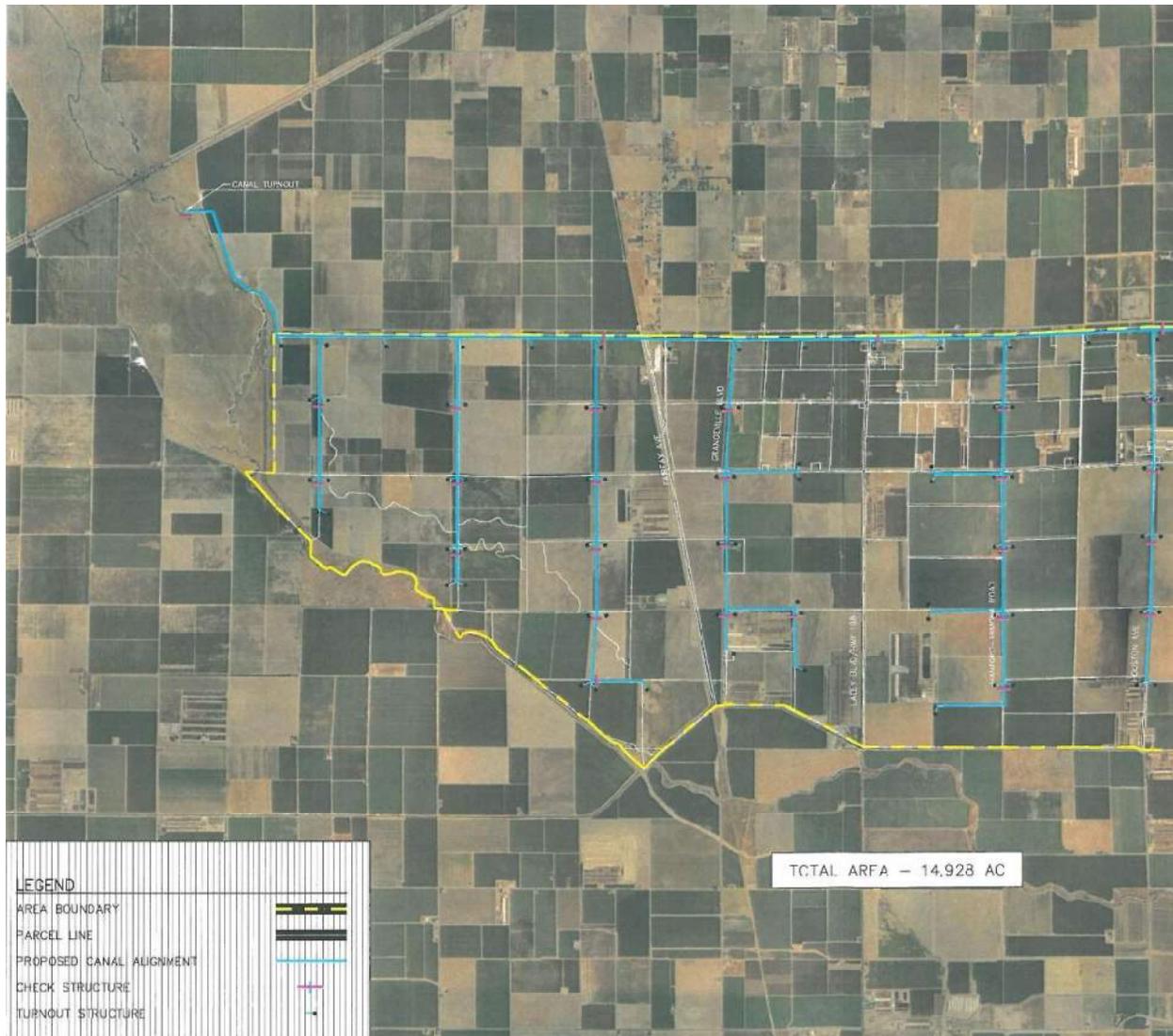
7.2.4.1 Project Description

23 Cal. Code Regs. §354.44 (a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...

The Delta View Canal will create a new 200-foot wide surface water conveyance alignment for roughly 6.5 miles (160 acres) and will terminate at either an existing 160-acre wastewater retention basin owned by the City of Visalia or a property of similar size nearby. The proposed canal alignment is located along 1st Avenue between Cross Creek and Houston Avenue. The canal would have a capacity of 100 cubic feet per second (cfs). The existing basin, if available, is not fully utilized by the City so about 120 acres may be improved to become a recharge basin. The project might be utilized every fourth or fifth year during a wet winter season with flows lasting up to 100 days. The total volume per use would be 20,000 AF, including 12,400 AF diverted to the groundwater recharge basin and 7,600 AF diverted for irrigation.

This canal will be located on agricultural acreage that relies on groundwater for irrigation and the elimination of this acreage will provide roughly 480 AF of in-lieu groundwater recharge per year (160 acres using 3 AF per year). Additional recharge may be realized through deep percolation of the irrigated water.

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7.2.4.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.4.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

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The Kaweah Subbasin has been designated as critically overdrafted and the KCWD is implementing this project to increase recharge to the subbasin.

7.2.4.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Environmental review of the proposed project has not yet begun. Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD and as necessary its partners KDWCD and/or GKGSA.

7.2.4.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 3,900 AF per year.

7.2.4.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Environmental review of the proposed project has not yet begun. The project will be subject to the typical regulatory process for large earth-moving projects, including CEQA as well as local permits.

7.2.4.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The canal is anticipated to be non-agriculture during 2023 and ready to receive floodwater by 2025.

7.2.4.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 180,000 AF during the 50-year planning and implementation horizon, including 22,100 AF of in-lieu recharge and 158,000 AF of recharge via the basin. The average annual benefit would be 3,900 AF per year.

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The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence. The recharge basin would likely improve groundwater quality since the floodwaters would be high-quality with a relatively low TDS.

7.2.4.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

According to past hydrology documented in watermaster reports, floodwaters from the Kings River and/or Kaweah River systems are anticipated to occur on a 4-year reoccurrence period.

7.2.4.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD has the statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal Water Code §§ 31020 et seq.*

7.2.4.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project is \$2.5 million, including property acquisition, design, construction, and financing. The funding mechanism has not been selected but will likely be a land-based assessment and/or a groundwater pumping charge.

7.2.4.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.4.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.5 Lakeland Canal Deliveries

Project Type: Local Surface Storage

Project Location: The area of this effort would be the Kaweah Subbasin area within Kings County. Generally, this efforts area would be a one to two-mile buffer around the Lakeland Canal within the Kaweah Subbasin.

Implementing Agency: Kings County Water District, in partnership with Corcoran Irrigation District

7.2.5.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Lakeland Canal deliveries water from the Kings River and Cross Creek to parties in the Tulare Lake area. The capacity of the upper canal, north of Idaho Avenue, is greater than the lower canal and, during the 2017 flood release flows, Corcoran Irrigation District (CID) allowed growers to use temporary floating pumps to divert water from the upper canal. The cost of these temporary diversions was the same as the cost for CID growers. The use of these floodwater for irrigation will reduce a comparable amount of groundwater pumping and provide in-lieu groundwater recharge. This project will formalize this type of diversion and define the condition under which diversions may occur.

7.2.5.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, and subsidence.

7.2.5.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the KCWD is implementing this project to increase recharge to the subbasin.

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7.2.5.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

The proposed project has not yet gone through environmental review. Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD, and as necessary by its partner GKGSA.

7.2.5.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

The project is estimated to provide an average annual benefit of 2,900 AF per year.

7.2.5.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

The project would not be subject to any permitting or regulatory process.

7.2.5.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

The project is anticipated to begin during 2021.

7.2.5.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

The expected benefits are estimated at nearly 140,400 AF of in-lieu groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit of 2,900 AF per year.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence.

7.2.5.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If

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the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

According to past hydrology documented in watermaster reports, floodwaters off of the Kings River system are anticipated to occur on a 4-year reoccurrence period.

7.2.5.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

KCWD (*Cal. Water Code* §§ 31020 et seq.) and CID (*Cal. Water Code* §§ 22075 et seq.) have statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of their respective service areas.

7.2.5.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

The cost of negotiating the project is estimated at \$0.1 million and would be borne by the benefactors of the project.

7.2.5.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.5.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.6 Kings River Floodwater Arrangement

Project Type: Local Surface Storage

Project Location: To be determined

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Implementing Agency: Kings County Water District, in partnership with Lakeside Irrigation Water District

7.2.6.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Kings River Service Areas excludes most of the Kings County portion of the Kaweah Subbasin. During significant flood releases, historically the Kings River Water Authority (KRWA) has allowed temporary use of the surplus supply under various flood water agreements.

As the lead agency, KCWD, as well as its partner, LIWD, are stockholders in the Peoples Ditch Company, which has a pre-1914 water right to the Kings River. This project will establish flood water agreements for KCWD and LIWD and reduce the demand for groundwater, which will provide in-lieu groundwater recharge. As new basins are developed in the area, the floodwaters could be used for groundwater recharge.

7.2.6.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, and subsidence.

7.2.6.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the KCWD is implementing this project to increase recharge to the subbasin.

7.2.6.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

The proposed project has not yet gone through environmental review. Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD and as necessary by its partners LIWD and/or GKGSA.

7.2.6.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 4,700 AF per year.

7.2.6.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The project would not be subject to any permitting or regulatory process.

7.2.6.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is anticipated to begin during 2021 and benefits of the project would be realized immediately following the first year of available flood water.

7.2.6.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at nearly 228,800 AF of in-lieu groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit of 4,700 AF per year.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence.

7.2.6.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

According to past hydrology documented in watermaster reports, floodwaters off of the Kings River system are anticipated to occur on a 4-year reoccurrence period. A floodwater agreement with KRWA has not been obtained and would be necessary to the success of the project.

7.2.6.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD (*Cal. Water Code* §§ 31020 et seq.) and LIWD (*Cal. Water Code* §§ 22075 et seq.) have statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of their service areas.

7.2.6.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The cost of negotiating a flood water agreement with KRWA is estimated at \$0.1 million and would be borne by the benefactors of the project.

7.2.6.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.6.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.7 Kings River Surplus Water

Project Type: Local Surface Storage

Project Location: To be determined

Implementing Agency: Kings County Water District, in partnership with Lakeside Irrigation Water District

7.2.7.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

During wet years, surplus Kings River water is often available late in the season from water-right holders that are at risk of potential flood releases later in the fall. This surplus water could be purchased for recharge and delivered via existing canals to existing and future recharge basins.

7.2.7.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.7.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the KCWD is implementing this project to increase recharge to the subbasin.

7.2.7.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD, and as appropriate by its partners LIWD and/or GKGSA.

7.2.7.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 1,800 AF per year.

7.2.7.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The project would be subject to any the surface water permitting process and would have to be coordinated with the water master(s).

7.2.7.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is anticipated to begin during 2021 and benefits of the project would be realized immediately following the first year of available surplus water.

7.2.7.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 88,400 AF of groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit would be 1,800 AF per year.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence. The recharge would likely improve groundwater quality since the surplus surface water would be high-quality with a relatively low TDS.

7.2.7.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

According to past hydrology documented in watermaster reports, surplus water off of the Kings River system is anticipated to be available on a 4-year reoccurrence period. A floodwater agreement with KRWA has not been obtained and would be necessary to the success of the project.

7.2.7.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD (*Cal. Water Code* §§ 31020 et seq.) and LIWD (*Cal. Water Code* §§ 22075 et seq.) have statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of their service areas.

7.2.7.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project would be \$85,000 per year for the purchase of surplus water. The funding mechanism has not been selected but will likely be a land-based assessment and/or a groundwater pumping charge.

7.2.7.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.7.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.8 Fallowing Program by KCWD and LIWD

Project Type: Groundwater Conservation

Project Location: The project area for this program would be fields planted to annual crops where the owner is willing to accept the terms of the arrangement and compensation from the Districts.

Implementing Agency: Kings County Water District, in partnership with Lakeside Irrigation Water District

7.2.8.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

KCWD and LIWD will develop a fallowing program in their combined areas to lease 1,500 acres of agricultural land from willing growers who are willing to accept compensation instead of irrigating a crop. This voluntary program would be similar to the former cotton fallowing program that sought to take cotton acreage out of production to synthetically limit the supply. For this program, the goal is to reduce cropped acreage and synthetically limit the amount of groundwater pumped each year while not permanently changing the agricultural land use status at the County Assessor's office.

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Conceptually, KCWD and LIWD would determine an acreage target for the year in October, after the previous season was generally over. A sign-up period would be opened during January and February, prior to the next growing season. The lease would provide a payment to the growers for the fallowing of their agricultural land. If the acreage target is not roughly achieved, KCWD and LIWD would consider increasing the lease payment in the following year(s) to improve grower participation. The lease period would be for only one growing season, as defined by each district.

7.2.8.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, and subsidence.

7.2.8.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the KCWD and LIWD are implementing this project to reduce demand on the groundwater resources within the subbasin.

7.2.8.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

The proposed project has not yet gone through environmental review. Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD, and as appropriate by its partners LIWD and/or GKGSA.

7.2.8.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 3,750 AF per year.

7.2.8.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The project would not be subject to any permitting or regulatory process.

7.2.8.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The following program is anticipated to begin during 2021.

7.2.8.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 183,800 AF of in-lieu groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit would be 3,750 AF per year.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, and land subsidence.

7.2.8.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

An alternate source of water is not required for a following program.

7.2.8.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD (*Cal. Water Code* §§ 31020 et seq.) and LIWD (*Cal. Water Code* §§ 22075 et seq.) have statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area.

7.2.8.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The initial cost of the program is estimated at \$500 per acre or \$0.75 million per year for the lease plus annual administration and legal costs \$65,000 per year. The funding mechanism has not been selected but will likely be a land-based assessment and/or a groundwater pumping charge.

7.2.8.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will reduce groundwater extraction which will allow groundwater levels to recovery and replenish storage.

7.2.8.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The level of participation in the fallowing program is the primary source of uncertainty. Fallowing can occur during the various types of hydrology (wet, normal, dry) within the subbasin.

7.2.9 On-Farm Recharge and Storage in KCWD and LIWD

Project Type: Recharge Basins

Project Location: The area of this effort would be the Kaweah Subbasin area within Kings County.

Implementing Agency: Lakeside Irrigation Water District, in partnership with Kings County Water District

7.2.9.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The On-Farm Recharge in KCWD and LIWD intends to expand an on-going trend during the last ten years for growers to develop small, often temporary basin facilities that centralizes pumped groundwater for improved distribution within the irrigation system. The existing private facilities have taken small areas of acreage out of production and this project will take out an additional 500 acres (total) for use during periods of high surface water flows (every four to five years). Operating

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assumptions include nearly 60 days of operation and 0.25 AF per day per acre of recharge. The existing basins could also be used to store excess surface water during flood flows.

7.2.9.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.9.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the LIWD and KCWD are implementing this project to increase recharge to the subbasin.

7.2.9.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

The project has not yet begun the environmental review. Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KCWD, and as necessary by its partners LIWD and/or GKGSA.

7.2.9.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The project is estimated to provide an average annual benefit of 1,900 AF per year.

7.2.9.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Consultation and coordination will be required with the Kings and Kaweah & St. Johns River Watermasters.

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7.2.9.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

New facilities are expected to be built during the first 5-year period of implementation.

7.2.9.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 93,600 AF of recharge during the 50-year planning and implementation horizon with an average annual benefit of 1,900 AF per year.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and water quality since the low TDS surface water will decrease the TDS of the groundwater.

7.2.9.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Pumped groundwater will be available as a property right where production wells exist and will be limited to groundwater availability and any restrictions administered by GKGSA. According to past hydrology documented in watermasters reports, floodwaters off of the Kings River and Kaweah River systems are anticipated to occur on a 4-year reoccurrence period.

7.2.9.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWD (*Cal. Water Code* §§ 31020 et seq.) and LIWD (*Cal. Water Code* §§ 22075 et seq.) have statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of their service areas.

7.2.9.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The cost of the basin development would be borne by the land owner and the cost of the surface water would be an extension of the typical process to receive a normal allotment of surface water.

7.2.9.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.9.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Wet conditions occur infrequently, perhaps every four or five years, so the project will be available during the wet years to capture additional recharge.

7.2.10 Hannah Ranch Flood Control Project

Project Type: Local Conveyance Improvements

Project Location: The proposed project is located adjacent and south of the Lower Kaweah River, northeast of the City of Visalia, in Tulare County.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.10.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Hannah Ranch Flood Control Project is located adjacent and south of the Lower Kaweah River, northeast of the City of Visalia. The Project would develop a 1,500 acre-foot reservoir with diversions occurring from the Lower Kaweah River and the Friant-Kern Canal onto a 380-acre parcel owned by KDWCD. The project will include the construction of five earthen basins built below grade, new diversion structures from the Lower Kaweah River and the Friant-Kern Canal, and a curtain wall with an interceptor/drain system around three sides of the property to protect adjacent landowners from potential impacts related to elevated groundwater levels. An existing rubble dam on the Lower Kaweah River will be replaced with a concrete structure equipped with overshot gates for both backwater head control and flow passage. A regulated discharge facility will be constructed to return water to the Lower Kaweah River.



7.2.10.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.10.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding and implementation. The project was able to obtain a matching State grant and it was determined to be a viable improvement for capturing and regulating available native and imported water supplies by the Board of Directors.

7.2.10.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will be an

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agenda item for Board discussion regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.10.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The primary purpose is the capture, regulation, and management of available native and imported surface water supplies to be distributed throughout multiple facilities within the subbasin for direct and/or in-lieu groundwater recharge. The project is estimated to generate a 2,250 AF annual average increase of water supply to mitigate overdraft within the subbasin.

7.2.10.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Numerous permits will be required for the project, including

- Section 404 permit from the US Army Corps of Engineers (USACE) for in-stream alternations,
- 401 Water Quality Certification from the California Regional Water Quality Control Board (RWQCB) for potential degradation to water quality,
- Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) to address existing natural resources,
- Caltrans encroachment permit for work within a highway right-of-way,
- Grading permit from Tulare County,
- Dust control plan from the San Joaquin Valley Air Quality Control District (SJVAQCD),
- Storm Water Pollution Prevention Plan from the RWQCB,

The CEQA process was completed early in the planning phase and resulted in a Mitigated Negative Declaration.

7.2.10.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

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Design work is ongoing and includes the completion of a preliminary design and the development of improvement designs for construction. Permit applications are being prepared for submittal to the appropriate regulatory agencies. Limited excavation has been performed in an effort to meet opportunities for off-site deliveries to adjacent lands. The project has received state and federal grant funding and could be operational by as early as 2021.

7.2.10.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 112,500 AF of in-lieu groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit of 2,250 AF per year. Other benefits would include storm and flood water capture, potential power generation enhancement, and improved local water management and water reliability.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.10.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

According to past hydrology documented in watermaster reports, surplus surface water is expected to be available approximately every four to five years, from the Kaweah River as well as from the Friant-Kern Canal via an existing contract with Central Valley Project (CVP).

7.2.10.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KDWCD has statutory authority to manage, regulate, and engage in water management activities, including groundwater recharge operations, for the benefit of its service area. *See, e.g., Cal. Water Code §§ 31020 et seq.*

7.2.10.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project is \$6.3 million, including property acquisition, design, and construction. Grant funding that has been awarded will support the majority of the project,

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including a federal WaterSMART grant of \$1.0 million from the US Bureau of Reclamation (USBR) and a state grant of \$3.1 million for Storm Water Management. The remainder of funds (\$2.2 million) will be provided from local sources.

7.2.10.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.10.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The project is currently under construction and in a location to optimize opportunities for maximizing its operational goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its favorable location near major sources of surface water supply.

7.2.11 Paregien Flood Control Project

Project Type: Recharge Basin

Project Location: The Project is located along Deep Creek, northeast of the City of Farmersville, in Tulare County.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.11.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Paregien Flood Control and Recharge Project is located along Deep Creek, northeast of the City of Farmersville. The project is a storm and flood water control and groundwater recharge facility. The facility consists of a 60-AF groundwater recharge basin within an earthen levee that is perpendicular to the direction of flow in Deep Creek across a local depression (~20 acres, ~3 feet deep) and includes concrete water management structures and monitor wells. The project was completed in 2018.

7.2.11.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.11.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding and implementation. The project was able to obtain a matching State grant and it was determined to be a viable improvement for capturing and regulating available native and imported water supplies by the Board of Directors.



7.2.11.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

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Appropriate notice and outreach were provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will continue to be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.11.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

The primary purpose is the capture, regulation, and management of available native and imported surface water supplies for direct groundwater recharge in the natural channels and developed basins associated with the project. The project is estimated to provide an annual average of 2,370 AF for groundwater recharge to mitigate for overdraft within the subbasin.

7.2.11.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

Numerous permits were acquired for the project, including

- USACE Section 404 permit for in-stream alternations,
- RWQCB 401 Water Quality Certification for potential degradation to water quality,
- CDFW Lake and Streambed Alteration Agreement to address existing natural resources,
- SJVAPCD Dust Control Plan,
- RWQCB Storm Water Pollution Prevention Plan,

The CEQA process resulted in a “Negative Declaration” and the NEPA determination by the USBR resulting in a “Finding of No Significance.”

7.2.11.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

The project was completed and started operations in 2018.

7.2.11.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 118,500 AF of groundwater recharge during the 50-year planning and implementation horizon with an average annual benefit of 2,370 AF per year. Other benefits would include storm and flood water capture, potential power generation enhancement, and improved local water management and water reliability.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.11.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Surface water is expected to be available from the Kaweah River as well as from the Friant-Kern Canal via an existing CVP contract. According to past hydrology documented in watermasters reports, this water and floodwaters are expected to be available approximately every four to five years.

7.2.11.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KDWCD has statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 74520 et seq.*

7.2.11.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The estimated cost of the project was \$1.85 million, including \$0.92 million from a USBR WaterSMART grant and \$0.93 million from KDWCD.

7.2.11.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

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The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.11.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The project has been completed recently and is operating in a location to optimize opportunities for maximizing its goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its favorable location near a significant source of surface water supply.

7.2.12 Ketchum Flood Control & Recharge Project

Project Type: Recharge Basin

Project Location: The Project is proposed to be located along the St. Johns River, adjacent to Ketchum Ditch, southwest of the City of Woodlake, in Tulare County.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.12.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Ketchum Flood Control and Recharge Project is proposed to be located along the St. Johns River, adjacent to Ketchum Ditch, southwest of the City of Woodlake. The project will consist of a 75-AF groundwater recharge basin built below grade, a new diversion structure from Ketchum Ditch, and a release outlet structure to the St. Johns River. The nominal 20-acre basin will hold nearly four feet of water and is envisioned to be filled and emptied three times during a nominal 2-month period of flood flow. The percolation rate is estimated at 0.3 feet per day. Water should be available during alternating years and would be derived from floodwater, stormwater, and unused entitlement waters (water rights).

7.2.12.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

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The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.12.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding, and implementation. The project was determined to be a viable improvement for capturing available native and imported water supplies by the Board of Directors. Study and design are currently on-going and additional partnerships are being pursued. A CEQA determination will have to be completed prior to the final dedication of funds for the implementation of construction.

7.2.12.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.12.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The primary purpose is the capture, regulation, and management of available native and imported surface water supplies to be distributed throughout multiple downstream facilities within the sub-basin for direct and/or in-lieu groundwater recharge. The project is estimated to generate a 300 AF annual average increase of water supply to the benefit of the subbasin to mitigate overdraft in the subbasin.

7.2.12.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

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Numerous permits will be required for the project, including

- USACE Section 404 permit for in-stream alternations,
- RWQCB 401 Water Quality Certification for potential degradation to water quality,
- CDFW Lake and Streambed Alteration Agreement to address existing natural resources,
- Grading permit from Tulare County,
- SJVAPCD Dust Control Plan,
- RWQCB Storm Water Pollution Prevention Plan,

The project will require a full CEQA evaluation and action by KDWCD to address impacts to natural resources.

Water rights and transfer agreements will need to be addressed prior to any operations because the project will receive, utilize, and regulate water from several different local and imported sources.

7.2.12.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is in the initial conceptual development phase for evaluation of benefits by KDWCD in coordination with Tulare Irrigation Company (property owner).

7.2.12.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 18,400 AF of recharge during the implementation period if the project is in operation by 2025. The average annual benefit is estimated to be 300 AF per year, including an average of 200 AF per year from direct groundwater recharge during a nominal 2-month period of flow and an average of 100 AF per year from in-lieu groundwater recharge due to conveyance of the stored water. The project would also improve operational management of water in the area.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.12.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If*

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the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

Surplus surface water is expected to be available from the Kaweah River and from the CVP contract. According to past hydrology documented in watermasters reports, this water and floodwaters are expected approximately every four to five years.

7.2.12.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

KDWCD has statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 74520 et seq.*

7.2.12.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

The preliminary estimated cost of the project is \$0.53 million, including property acquisition, administration, design, permits, and construction. The funds will be provided by KDWCD and possibly from other partners.

7.2.12.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.12.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

The project is in the initial planning and design phase with a proposed location to optimize opportunities for maximizing its goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its favorable location near a significant source of surface water supply.

7.2.13 St. Johns River Water Conservation Project

Project Type: Regional Conveyance Improvements

Project Location: The proposed Project would be located along the St. Johns River, north of the City of Visalia, in Tulare County.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.13.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The St. Johns River Water Conservation Project is located north of the City of Visalia and would make improvement to six existing in-stream check structures to better regulate and retain flows within the channel of the St. Johns River. This project would increase the average depth of the water by 1.5 feet (to 3 feet) and double the capacity of the existing structures to nearly 1,000 AF which can be used for irrigation instead of pumping groundwater. The existing structures are 300 feet wide by eight miles long total and will allow groundwater recharge at an estimated percolation rate of 0.3 feet per day during the nominal 3-week period of surplus water during alternating years.

7.2.13.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.13.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding, and implementation. The project was determined to be a viable improvement for capturing available native and imported water supplies by the Board of Directors. Study and design are currently on-going and additional partnerships are being pursued along with potential grant funding opportunities. A CEQA determination will have to be completed prior to the final dedication of funds for the implementation of construction.

7.2.13.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.13.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

The primary purpose is the capture and management of available native and imported surface water supplies for direct groundwater recharge in the natural channel of the St. Johns River. The project is estimated to provide an annual average of 1,400 AF recharge to mitigate for overdraft within the subbasin.

7.2.13.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

Numerous permits will be required for the project, including

- USACE Section 404 permit for in-stream alternations,
- RWQCB 401 Water Quality Certification for potential degradation to water quality,
- CDFW Lake and Streambed Alteration Agreement to address existing natural resources,
- SJVAPCD Dust Control Plan,
- RWQCB Storm Water Pollution Prevention Plan,

The project will require a full CEQA evaluation and action by KDWCD to address impacts to natural resources.

Water rights and transfer agreements will need to be addressed prior to any operations because the project will receive, utilize, and regulate water from several different local and imported sources.

7.2.13.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is in the initial conceptual development phase for evaluation of benefits by KCWCD in coordination with the City of Visalia and various other water agencies to address stakeholder interests.

7.2.13.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 64,400 AF of recharge during the implementation period if the project is in operation by 2025. The average annual benefit is estimated to be 1,400 AF per year, including an average of 900 AF per year from direct groundwater recharge during the 3-week period of flow and an average of 500 AF per year from in-lieu groundwater recharge due to conveyance of the stored water. The project would also improve operational management of water in the area.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.13.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Surplus surface water is expected to be available from the Kaweah River and from existing CVP contracts. This water and floodwaters are expected approximately half the time – five out of every ten years.

7.2.13.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KDWCD has statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 74520 et seq.*

7.2.13.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

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The preliminary estimated cost of the project is \$2.0 million, including property acquisition, administration, design, permits, and construction. The funds will be provided by KDWCD and possibly from other partners.

7.2.13.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.13.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The project is in the initial planning and design phase with a proposed location to optimize opportunities for maximizing its goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its favorable location near a significant source of surface water supply.

7.2.14 Basin No. 4 Improvement Project

Project Type: Recharge Basin

Project Location: The proposed Project would be located on South Mill Creek, southwest of the City of Visalia.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.14.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Basin No. 4 Improvement Project is located on South Mill Creek, southwest of the City of Visalia on the Tulare County and Kings County line. Subject to agreement being reached with the City of Visalia, it would upgrade water control operations within the creek and to the nominal 120-acre City of Visalia-owned basin. The improvements would include the existing in-stream check structure that regulates water into the basin and downstream and would provide the ability to increase flow rates into the basin. The basin would have a capacity to store 500 AF of surplus water which can be used for irrigation instead of pumping groundwater, and recharge would occur during

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the nominal 3-week period of surplus water during alternating years at an estimated percolation rate of 0.3 feet per day.



7.2.14.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.14.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding, and implementation. The project was determined to be a viable improvement for capturing available native and imported water supplies by the Board of Directors. Study and design are currently on-going and additional partnerships are being pursued along with potential grant funding opportunities. Agreement to proceed by City of Visalia and CEQA determination will have to be completed prior to the final dedication of funds for the implementation of construction.

7.2.14.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.14.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The primary purpose is the capture and management of available native and imported surface water supplies for direct groundwater recharge within the existing 160 acres of basins at the facility. The project is estimated to recharge a 500 AF annual average increase of water supply to mitigate for overdraft within the subbasin.

7.2.14.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Numerous permits will be required for the project, including

- USACE Section 404 permit for in-stream alternations,
- RWQCB 401 Water Quality Certification for potential degradation to water quality,
- CDFW Lake and Streambed Alteration Agreement to address existing natural resources,
- SJVAPCD Dust Control Plan,
- RWQCB Storm Water Pollution Prevention Plan,

The project will require a full CEQA evaluation and action by KDWCD to address impacts to natural resources.

7.2.14.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

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The project is in the initial conceptual development phase for evaluation of benefits by KCWCD in coordination with the City of Visalia to address the needs of both agencies.

7.2.14.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 9,000 AF of recharge during the implementation period if the project is in operation by 2023. The average annual benefit is estimated to be 500 AF per year from direct groundwater recharge during the 3-week period of increased flows into the facility of 12 cfs per day. The project would also improve local water management.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.14.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Surplus surface water is expected to be available from the Kaweah River and from the CVP contract. This water and floodwaters are expected approximately half the time – five out of every ten years.

7.2.14.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KCWCD has statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 74520 et seq.*

7.2.14.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The preliminary estimated cost of the project is \$0.4 million, including property acquisition, administration, design, permits, and construction. The funds will be provided by KDWCD and the City of Visalia.

7.2.14.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.14.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The project is in the initial planning and design phase with a proposed location to optimize opportunities for maximizing its goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its location.

7.2.15 Peoples Recharge Expansion Project

Project Type: Recharge Basin

Project Location: The proposed Project is proposed to be located along the Lower Kaweah River, adjacent to Peoples Basin, southwest of the City of Woodlake, in Tulare County.

Implementing Agency: Kaweah Delta Water Conservation District

7.2.15.1 Project Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The Peoples Recharge Expansion Project is being developed as a groundwater recharge facility on about 25 acres and will consist of a 100-AF basin built below grade with a new diversion structure from Peoples Basin. The project would allow recharge to occur using surplus during a nominal 2-month period during alternating years at an estimated percolation rate of 0.3 feet per day.

7.2.15.2 Measurable Objective Addressed

23 Cal. Code Regs. § 354.44. . . . (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

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The project will assist in achieving the measurable objectives for chronic lowering of groundwater levels, reduction in storage, subsidence, and possibly degradation of water quality.

7.2.15.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

KDWCD has developed a Long-Term Master Plan for Water Management/Groundwater Recharge Projects for the purposes of study, design, funding, and implementation. The project was determined to be a viable improvement for capturing available native and imported water supplies by the Board of Directors. Study and design are currently on-going and additional partnerships are being pursued along with future grant funding opportunities. A CEQA determination will have to be completed prior to the final dedication of funds for the implementation of construction.

7.2.15.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notice and outreach will be provided to various public agencies and other stakeholders by KDWCD. The district holds monthly Board of Director’s meetings and the project will be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.2.15.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The primary purpose is the capture and management of available native and imported surface water supplies for direct groundwater recharge within a proposed 40-acre basin at the facility. The project is estimated to provide an annual average of 300 AF of recharge to mitigate overdraft in the subbasin.

7.2.15.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Several permits will be required for the project, including

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- Grading permit from Tulare County,
- SJVAPCD Dust Control Plan,
- RWQCB Storm Water Pollution Prevention Plan,

The project will require a full CEQA evaluation and action by KDWCD.

7.2.15.7 Status and Schedule

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The project is in the initial conceptual development phase for evaluation of benefits by KDWCD, which has rights to develop the property under a long-term lease with Lindsay-Strathmore Irrigation District.

7.2.15.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The expected benefits are estimated at 13,600 AF of recharge during the implementation period if the project is in operation by 2023. The average annual benefit will be about 300 AF per year, including an average of 200 AF per year from direct groundwater recharge during the 2-month period of flow and an average of nearly 100 AF per year from in-lieu groundwater recharge.

The targeted sustainability indicators include stabilization of groundwater levels and, by proxy, groundwater storage, land subsidence, and improved water quality since the low TDS surface water will decrease the TDS of the native groundwater.

7.2.15.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Surface water is expected to be available from the Kaweah River and from the CVP contract.

7.2.15.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KDWCD has statutory authority to manage, regulate, and engage in groundwater recharge operations for the benefit of its service area. *See, e.g., Cal. Water Code §§ 74520 et seq.* According to

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past hydrology documented in watermasters reports, this water and floodwaters are expected to occur approximately every four to five years.

7.2.15.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The preliminary estimated cost of the project is \$0.53 million, including property acquisition, administration, design, permits, and construction. The funds will be provided by KDWCD and possibly from other partners.

7.2.15.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The project will provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.2.15.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The project is in the initial planning and design phase with a proposed location to optimize opportunities for maximizing its goals. Potential future circumstances that could reduce the effectiveness of the project include changes in climatic conditions, shifts in management schemes of regional native water rights users and imported supply contractors. Overall, the project should exhibit a relatively low level of uncertainty, primarily due to its location.

7.3 Management Actions

23 Cal. Code Regs § 354.44 Projects and Management Actions
(a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.*
(b) *Each Plan shall include a description of the projects and management actions that include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. . . .*

The Management Actions proposed in this Plan by the GKGSA are generally considered in two phases where the first phase includes pilot programs for the first five years and successful programs are implemented for a second phase during the remainder of SGMA implementation. This pilot

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phase would allow the GKGSA to monitor and evaluate the efficacy of each action prior to full implementation throughout the GSA.

7.3.1 Communication & Engagement

7.3.1.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The GKGSA will pursue in communication and engagement to all beneficial uses and users of groundwater within its jurisdiction in a manner consistent with the adopted GKGSA Communication and Engagement Plan. The goal is to provide ongoing correspondence to groundwater users and promote awareness of the aquifer condition and efforts and progress towards avoidance of Undesirable Results.

7.3.1.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The management action will not directly affect measurable objectives but, hopefully, will raise the awareness of groundwater users of the limited nature of this renewable resource and promote conservation, which will reduce demand and allow the recovery of groundwater levels and storage.

7.3.1.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to increase recharge to the subbasin.

7.3.1.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (1) The Plan shall include the following: (B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.*

Appropriate notification and outreach will be conducted consistent with GSA authorities and requirements and with the adopted GKGSA Communication and Engagement Plan.

7.3.1.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action will provide information to stakeholders and encourage them to conserve water, thus reducing demand on the groundwater resource. Quantification of this demand reduction is not practical and may not be possible given the other tangible efforts to manage the groundwater resource.

7.3.1.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Permitting and regulatory processes are not applicable to this management action.

7.3.1.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The Management Action requires an update to the GKGSA Communication and Engagement Plan which will occur beginning in 2020. Updating the plan and initial implementation activities are expected to occur within six to nine months.

7.3.1.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The GKGSA expects to benefit from this management action by encouraging involvement, open lines of communication and communicating future opportunities for input. Another expected benefit may include avoidance of Undesirable Results by educating the public on the use and condition of the groundwater resource.

7.3.1.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

A source of reliable water is not needed for this Management Action.

7.3.1.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA (*Cal Water Code* §§ 10725 et seq.) and related provisions and Article II of the agencies' Joint Powers Agreement provide GKGSA with the authority required to carry out activities related to this Management Action.

7.3.1.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The ongoing cost to perform communication and outreach to beneficial users of groundwater in the GKGSA is \$10,000 per year. Funding for related activities will be provide for by the GKGSA through either Member assessment, or land-based Proposition 218 assessment.

7.3.1.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This management action will promote the wise utilization of the groundwater resource and encourage conservation during wet periods to allow for the recovery of groundwater levels and storage after drought periods.

7.3.1.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The success of this communication program and the potential reduction in demand cannot be predicted at this time but will likely produce positive results during the course of the implementation period.

7.3.2 Terminus Reservoir Reoperation Program

7.3.2.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

Flow in the Kaweah River is regulated by the United States Army Corps of Engineers (USACE) for flood control purposes via Lake Kaweah and the control works. KDWCD has a contract with

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USACE for water storage rights at Lake Kaweah, which provides operational management of entitled irrigation supplies for the region.

The proposed program will be a review of the USACE Terminus (Lake Kaweah) Water Control Diagram with the intent to revise the Diagram to improve operational management. The Water Control Diagram provides the basis for determining allowable storage at Lake Kaweah while providing sufficient vacant space to receive inflows that could be a flood risk below the lake. The advent of the Airborne Snow Observatory program offers a new tool for evaluating water stored in the snow pack and predicting watershed run-off under various conditions. This tool could potentially be utilized to refine the USACE approach to regulating the balance between allowable storage for flood control and maximizing the storage for the benefit of irrigation demands.



7.3.2.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

This management action will maximize the available storage of surface water at Lake Kaweah, retain more of the native surface water within the subbasin, and reduce the overdraft of the groundwater resource. The action will allow the recovery of groundwater levels and an increase in groundwater storage.

7.3.2.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to increase recharge to the subbasin.

7.3.2.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Revision to the Water Control Diagram would be completed by the USACE in accordance with federal regulations. Public notices and outreach would occur in compliance with those federal regulations.

KDWCD holds monthly Board of Director's meetings and this management action will be an agenda item for Board consideration regarding the project status, schedule, budget, necessary approvals and/or required action by the Board. KDWCD also maintains and regularly updates a website with project descriptions, current activities, and progress.

7.3.2.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action does not address demand reduction so quantification cannot be done, but rather seeks to change the operation of a reservoir to optimize and modernize the distribution of water.

7.3.2.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Revision to the Water Control Diagram would be under USACE jurisdiction in accordance with their prescribed procedures. Other permitting or regulatory processes are not expected outside of the USACE actions.

7.3.2.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

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The proposed action is currently in the preliminary phase of planning. Consultants will be retained to perform an analysis of alternatives prior to seeking the USACE consideration of the revision.

7.3.2.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

An updated Water Control Diagram will maximize the available storage of surface water at Lake Kaweah, retain more of the native surface water within the subbasin, and reduce the overdraft of the groundwater resource. Increased knowledge of the watershed hydrologic conditions will promote the most efficient use of available storage at Lake Kaweah. In addition, this approach could improve the utilization of imported water to the subbasin via opportunities to capture available CVP water during timespans when there were previous operational conflicts.

7.3.2.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

This management action is targeting excess water in the Kaweah River that cannot be stored in Lake Kaweah due to the existing and dated operational procedures. All such excess surface water is covered under the KDWCD entitlement. Any improvement in imported supply would be the result of KDWCD optimizing its CVP contract to gain access to available supplies from other CVP contractors.

7.3.2.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

KDWCD has statutory authority to manage, regulate, and engage in water management activities, including groundwater recharge operations, for the benefit of its service area. *See, e.g., Cal. Water Code* §§ 31020 et seq. USACE has the authority to revise the Water Control Diagram for Lake Kaweah.

7.3.2.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The preliminary estimated cost of the project is \$0.33 million, including administration, consultant services, and USACE expense. The funds will be provided by KDWCD and Kaweah & St. Johns Rivers Association.

7.3.2.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The management action, if acceptable to the USACE, will optimize the flow of surface water and could provide additional recharge to the subbasin during wetter years to increase groundwater levels and replenish storage as an offset to decreasing levels and storage during drought conditions.

7.3.2.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The USACE is responsible for the operation of the facility and has well-established rules for this effort. Revisions to these rules could require a considerable amount of deliberation before revisions are made.

7.3.3 Groundwater Extraction Measurement Program

7.3.3.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

Within the GKGSA, all extractions by municipal systems are fully metered and such groundwater extractions and associated constituent levels are reported at least annually to the SWRCB. These municipal systems include the City of Farmersville, the City of Exeter, the City of Woodlake, Ivanhoe PUD, Tract 92 CSD, and Patterson Tract CSD. However, extraction measurements have not been required for private well owners within the irrigation districts and ditch company service areas, or in the undistricted lands within GKGSA. Extractions from these wells, primarily for irrigation, must be reported in the aggregate annually to the state according to §10728 and measured according to §10725.8 of SGMA.

GKGSA plans to initiate a pilot program in conjunction with the other two GSAs of the Kaweah Subbasin to determine the most feasible means to comply with the SGMA measurement provision. The measurement alternatives and data processing methods to be evaluated are depicted by **Figure 7-X**:

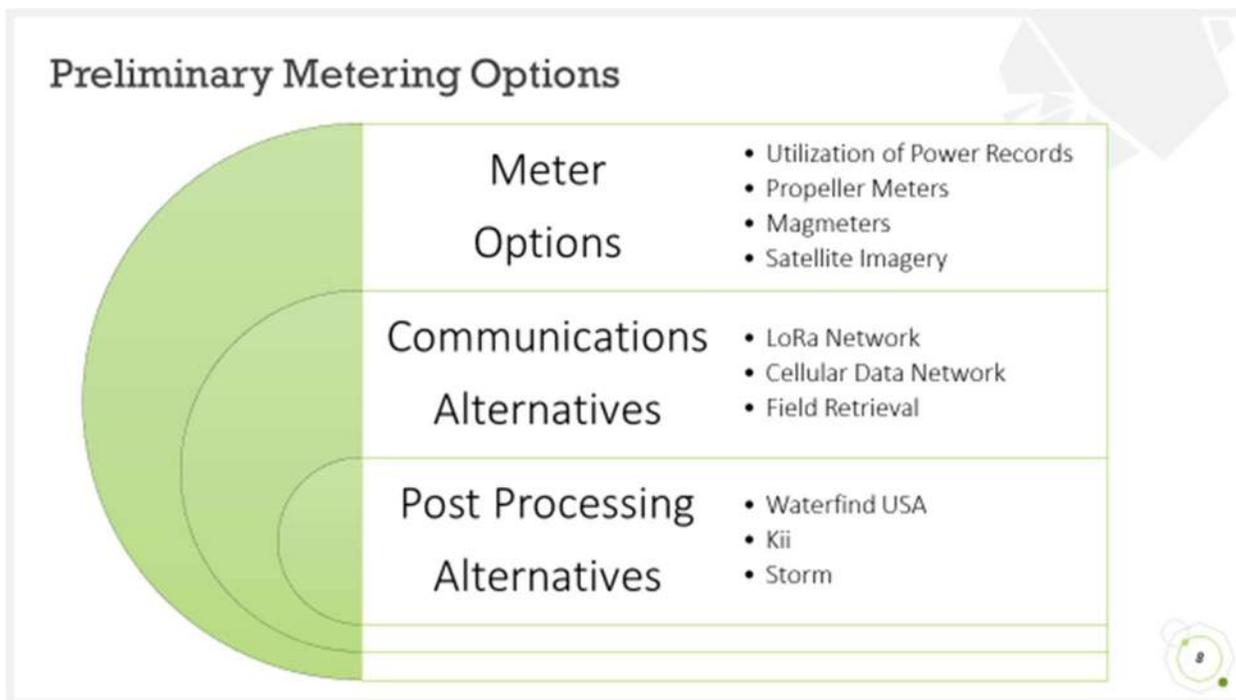


Figure 7-2: Data Measurement Alternatives

7.3.3.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

This management action will initiate the quantification process for the volume of groundwater extracted by various users versus the assumed volume of extracted groundwater. Ideally, this validation process will lead to better estimates of use and perhaps a reduction in use, which would reduce demand and allow groundwater levels and storage to rise.

7.3.3.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to increase recharge to the subbasin.

7.3.3.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

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Appropriate notification and outreach will be conducted consistent with GSA authorities and requirements. The management action will begin as a voluntary pilot program with a notice sent to landowners and a general call for volunteers at the GKGSA public meetings and on the GKGSA website.

7.3.3.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action will provide a better understanding of actual groundwater production versus assumed production and will enhance the management of the resource. An annual benefit cannot be defined at this time.

7.3.3.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Authority for groundwater measurement collection and processing resides within SGMA as previously cited. Additional permitting or regulatory compliance will not be necessary to implement a pilot program or to scale up to full coverage within the GSA.

7.3.3.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This proposed action is in the preliminary phase of planning. A proposal to initiate an evaluation of options was submitted to DWR for consideration of Technical Services funding and is currently under review.

7.3.3.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The management action will improve the knowledge on the timing and volume of groundwater extraction and, coupled with the aquifer response, should aid in the improvement of the Kaweah Subbasin predictive capability of the numerical model and in future groundwater management in general. Additionally, the development of a measurement standard for groundwater extraction will facilitate the development of a water market/allocation program, should the GKGSA decide to pursue such a program.

7.3.3.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

An additional water source is not required for this Management Action.

7.3.3.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Extractions from these wells, primarily for irrigation, must be reported in the aggregate annually to the state according to §10728 and measured according to §10725.8 of SGMA.

7.3.3.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

A proposal to initiate an evaluation of options was submitted to DWR for consideration of Technical Services funding and is currently under review. Costs to measure groundwater extractions within GKGSA could vary widely, from \$200,000 to upwards of \$4 million for capital and installation, and from under \$50,000 to as much as \$250,000 annually for O&M. According to SGMA §10725.8(b), costs for the measurement devices will be borne by the well owner/operator, so the cost exposure to the GKGSA in implementing a measurement program is not presently known. Since the municipal GSA Members already fund and operate meters at their facilities, the costs associated with an extraction measurement program lie primarily with the irrigation districts, ditch companies, and private landowners in undistricted lands of the GKGSA and with the GKGSA for the compilation and evaluation of the data.

7.3.3.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The management action could lead to better quantification of groundwater production which could optimize the use of the groundwater resource. As such, groundwater levels and storage could improve during wet years and offset decreasing groundwater levels and storage during drought years.

7.3.3.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The use of meters will reduce the level of uncertainty associated with the production of groundwater from the subbasin.

7.3.4 Well Characterization Program

7.3.4.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

Many agricultural wells have limited or no information as to depth, casing characteristics or screen intervals. This project would entail video logging and spinner logging to ascertain well construction and delineate groundwater production zones, respectively. Water quality profiling and depth-specific sampling might further delineate differences in aquifer zones, based on the vertical distribution of select constituents.

7.3.4.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

This management action will enhance the understanding of the wells that provide the characterization data of the aquifer system. The management of the groundwater resource will benefit from this improved understanding which could allow the recovery of groundwater levels and storage.

7.3.4.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to increase recharge to the subbasin.

7.3.4.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

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Appropriate notification and outreach will be conducted consistent with GSA authorities and requirements. The pilot phase of this program shall be voluntary, with noticing via mailers to landowners and a general call for volunteer participants at the GKGSA’s publicly held meetings and on the GKGSA’s website.

7.3.4.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action provides assistance to well owners that are impacted by the management of the groundwater resources and does not provide an annual benefit to the aquifer system.

7.3.4.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Permitting and regulatory process are not applicable to this Management Action.

7.3.4.7 Status of Implementation

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This Project will be defined and pursued during the first several years of GSP implementation and progress will be documented in the succeeding five-year assessment report to DWR.

7.3.4.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Expected benefits from this program include improved understanding of groundwater production from wells within the GKGSA and associated aquifer responses to groundwater extraction operations. Overall improvements in characterization of principal aquifers and aquitards is expected once we are able tie specific wells and their water level and water quality information with specific aquifers. Sustainability indicators anticipated to benefit via this improved knowledge and incorporation into the Subbasin numerical model would include groundwater level stabilization and, by proxy, groundwater storage stabilization, as well as potentially reduced water quality degradation. In addition, well characterization could be integrated with the AEM data to better improve the understanding of the subsurface hydrogeology.

7.3.4.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

An additional water source is not required for this Management Action.

7.3.4.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA, at §10725.2, allows GSAs to pursue various means to improve its understanding of the subbasin and production wells therein.

7.3.4.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Costs associated with this Management Action could be \$15,000 per well, possibly more, for contractor costs and will be refined during the early stages of GSP implementation. A budget of \$150,000 would allow ten wells to be characterized per year. An appropriate fee collection structure from GSA members will be determined during that time.

7.3.4.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This management action will not have a direct effect on groundwater extraction and recharge.

7.3.4.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The characterization of wells will reduce the level of uncertainty associated with depths of groundwater production zones within the aquifer system and facilitate the refinement of various components of the basin setting.

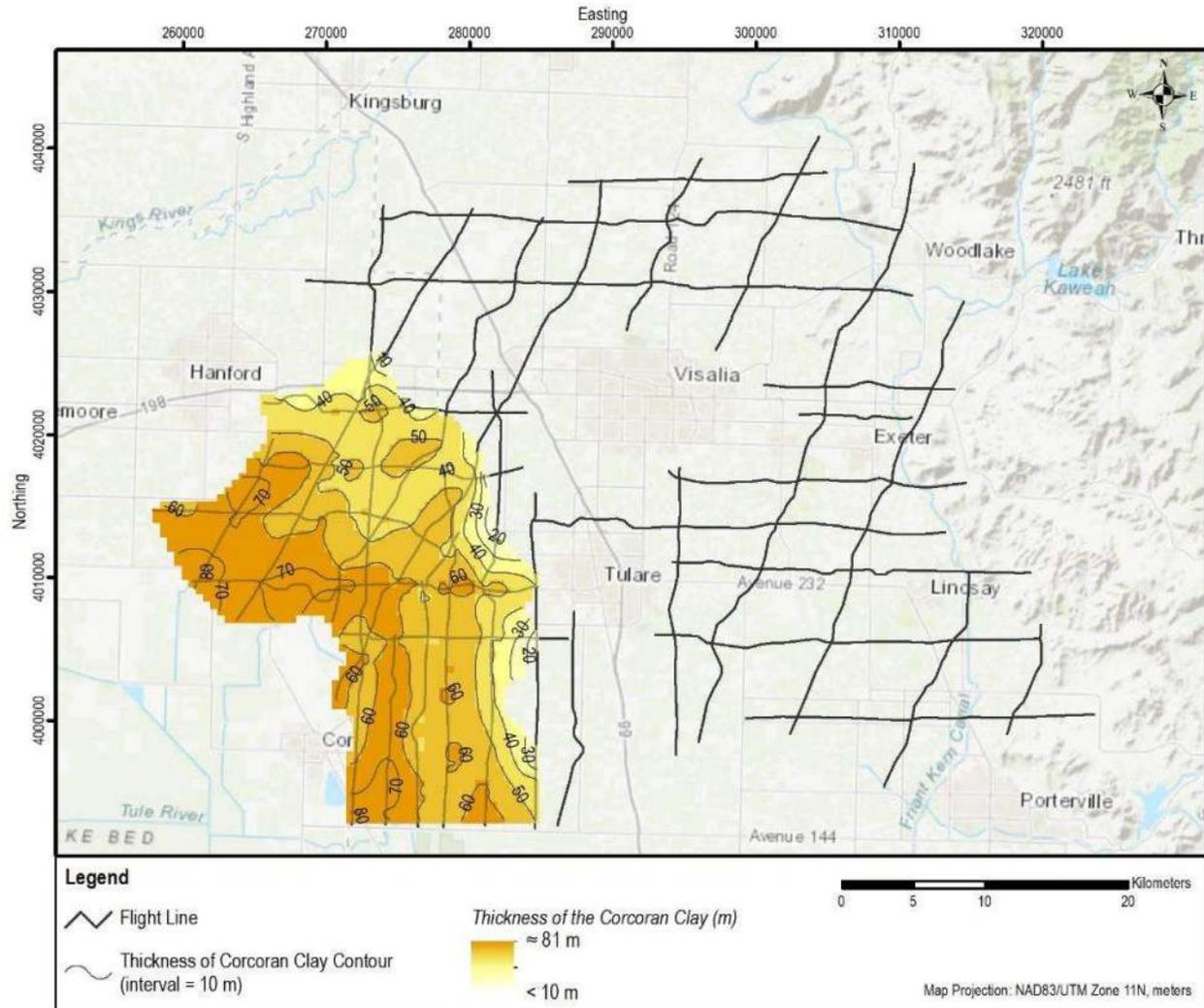
7.3.5 Geophysical Data Survey

7.3.5.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

GKGSA and the other two Kaweah GSAs in the Kaweah Subbasin served as a pilot geophysical program for hydrogeological subsurface data collection using an airborne electromagnetic method (AEM) via the company Aqua Geo Frameworks during the fall of 2018. This airborne survey method acquires deep aquifer resistivity data to better ascertain its characteristics and geology. The Phase I survey was jointly funded by Stanford University and the three Kaweah Subbasin GSAs, with data processing by Aqua Geo Frameworks using a SkyTEM system. The data was collected by way of helicopter fly-overs along pre-selected flight lines within the Kaweah Subbasin. Work products from this research and data analysis have been presented locally and statewide, and interest in furthering this means of sub-surface data collection are developing. The data were not available to the Kaweah GSAs in time for its inclusion in the Basin Setting Report (**Appendix 2A**); however, this information will be reviewed and incorporated into the 2025 Plan Update.

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GKGS may also utilize a towable electromagnetic imaging method that measures the resistivity of soils at depths of 100 ft or less. This resistivity information could be used to determine areas that are best suited (high infiltration rates) for groundwater recharge basins or for on-farm recharge programs. This ground-based technology is currently being evaluated and used within the Tulare Irrigation District areas of Mid-Kaweah GSA.

Stanford has also obtained a grant from National Academy of Sciences to integrate InSAR ground displacement data with AEM to improve groundwater modeling tools for the Kaweah Subbasin. These additional data will enhance the overall understanding of the Kaweah Subbasin and its underlying aquifer characteristics, assist with the Basin Setting and Hydrogeologic Conceptual Model, and provide new calibration parameters for the Subbasin numerical simulation model. The project will also provide direct benefits to the GSAs and landowners along the proposed new flight lines by providing detailed subsurface information not previously available.

7.3.5.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The study has improved the understanding of subsurface conditions and does not address measurable objectives and other management criteria.

7.3.5.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implemented this study to further the understanding of subsurface conditions.

7.3.5.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The study was discussed in GKGSA public meetings. Future work, if any, will be appropriately noticed and outreach will be conducted consistent with GSA authorities and requirements.

7.3.5.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The study has improved the understanding of subsurface conditions and will not produce an annual benefit to the groundwater resources.

7.3.5.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The regulatory process includes a FCC license due to electromagnetic wave signals and appropriate FAA plans due to the relatively low altitude flights.

7.3.5.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Phase I of the fly-over data collection effort was completed during 2018 and a report was issued during late April 2019. Consideration of this information will be included in the 2025 GSP Update. The report includes several recommendations for a Phase II survey, including:

8. Additional AEM mapping with high density block flights would allow for improved hydrogeologic framework for identifying potential recharge areas and potential managed aquifer recharge sites and for estimating groundwater in storage and hydrogeologic boundary identification.
9. Siting new boreholes used for water quality and water quantity should use the results from this survey and future surveys to optimize locations.
10. Aquifer characteristic studies such as aquifer tests and other methods should be planned, based on the data from this study, to optimize location for studies and observation-production well installation.
11. Improved geophysical borehole logs will benefit current and future studies. This logging should use calibrated equipment for best results.

7.3.5.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The anticipated benefits of this study include enhanced knowledge of the subsurface geology and a more robust HCM description as a result. Interpretation of the data resulted in three-dimensional mapping which could allow refinement of the structure of the Kaweah Subbasin numerical model and improved predictive accuracy. The mapping could benefit the siting of groundwater recharge projects and dedicated monitoring wells. These benefits are expected to be realized and documented in the first five-year GSP assessment to be conducted by each Subbasin GSA and submitted to DWR. Sustainability indicators anticipated to benefit via this improved knowledge would include groundwater level stabilization and, by proxy, groundwater storage stabilization, and possibly the identification of degraded water quality.

7.3.5.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

An additional water source is not required for this Management Action.

7.3.5.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA, at §10725.2, allows GSAs to pursue various means to improve its understanding of the subbasin.

7.3.5.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The cost of the Phase I Survey was paid as follows:

- \$300,000 from Stanford University for data collection costs
- \$160,000 from Subbasin GSAs for data collection costs
- \$25,000 from Subbasin GSAs for data management by GEI

A Phase II survey is estimated to cost \$400,000. The funding mechanism has not yet been selected but will likely be a mix of grant funding (if available), land-based assessment, and/or a groundwater pumping charge.

7.3.5.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This management action will not have a direct effect on groundwater extraction and recharge.

7.3.5.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

Geophysical methods are an indirect measurement of subsurface conditions that must be correlated with actual data from the subsurface. The Phase 1 results appeared reasonably consistent with known subsurface conditions.

7.3.6 Overdraft Mitigation Program

The Kaweah Subbasin GSAs have agreed to each implement a Mitigation Program to mitigate for impacts caused to beneficial uses and users due to groundwater level declines and land subsidence. The framework for this coordinated Mitigation Program is in the Kaweah Subbasin Coordination

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Agreement Appendix 6 included in **Appendix 1D** and **Appendix 5A**. The following describes the GKGSA’s Mitigation Program in conformance with the Coordination Agreement.

7.3.6.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) <i>Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...</i>

The purpose of the Mitigation Program is to mitigate for continued overdraft pumping for groundwater levels and land subsidence. Each Kaweah Subbasin GSA will adopt and implement a Mitigation Program to identify impacts caused by pumping within the GSA’s boundaries that may require mitigation. Each Mitigation Program will separately identify the impacts to beneficial uses that the Mitigation Program is intended to address. Each Mitigation Program will include a claim process to address impacts to: (i) domestic and municipal wells; (ii) agricultural wells; and (iii) critical infrastructure. Because the Mitigation Program will resolve impacts from groundwater management, significant and unreasonable results to wells and land uses that may occur prior to reaching Minimum Thresholds will be avoided.

Process

Identification of Need for Mitigation

The Mitigation Program will begin with a plan to establish the process for identification of wells or land uses in need for mitigation. The process may include: 1) an application process by the landowner or well user; or 2) data collection by the GSA and outreach to the affected user. The GSPs in the Subbasin set Measurable Objectives and Minimum Thresholds based on 2015 groundwater levels and land elevation. Impacts from that point further will be evaluated as potentially affected due to the allowance of some level of continued overdraft.

Evaluation

Once a potential well or land use has been identified as possibly impacted, an evaluation will occur by the GSA to determine whether the well has been adversely impacted by declining groundwater levels or by land subsidence which have been identified as occurring because of allowable continued overdraft conditions.

Qualifications

GSA’s may qualify mitigation based on a user’s compliance with the GSA’s GSP, Rules & Regulations, and other laws or regulations. For example, a user who has caused or contributed to overdraft may not qualify for the Mitigation Program.

Mitigation

Once a well has been identified as adversely impacted due to declining groundwater levels or land subsidence, the proper mitigation to alleviate impacts must be determined. This could be any of the following:

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For groundwater level impacts, this could include any of the following:

- 1) Repairing the well;
- 2) Deepening the well;
- 3) Constructing a new well;
- 4) Modifying pump equipment;
- 5) Provide temporary or permanent replacement water;
- 6) Coordinate consolidation with existing water systems; or
- 7) With the consent of the affected user, providing other acceptable means of mitigation.

For land use impacts, this could include any of the following:

- 1) Increased restrictions in groundwater extractions for certain regional areas;
- 2) Repair to canals, turnouts, stream channels, water delivery pipelines, and basins;
- 3) Repair to damaged wells;
- 4) Addressing flood control;
- 5) Repair to other damaged infrastructure including highways, roads, bridges, utilities, and buildings; or
- 6) With the consent of the affected user, providing other acceptable means of mitigation.

Various factors may reflect the proper mitigation methods for the specific well or land use at issue. For example, age, location, the financial impact to the beneficial user as a result of mitigation, and the beneficial user of the well may reflect which mitigation measures are optimal.

7.3.6.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The program will directly address the impacts of the chronic lowering of groundwater levels and land subsidence by providing funding for replacement wells, well modifications, or other mitigation to eligible landowners.

7.3.6.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

This is a high priority program that is necessary to mitigate the impacts of declining water levels and land subsidence and provide water supply to meet basic health and safety needs. The GSAs are committed to implementing this Program. Funding is available for the Program through GSAs

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implementation of assessments, fees, charges, and penalties. In addition, the GSAs will explore grant funding.

7.3.6.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Public outreach and education will be provided during development of the Mitigation Program and prior to implementation by each GSA. Prior to implementation, extensive outreach will be geared toward notifying landowners of the Mitigation Program requirements, facilitate how to qualify for the Mitigation Program, and how to apply for assistance. Outreach will be offered in multiple languages as appropriate for the GSA. Outreach methods could include workshops, mailings, flyers, website postings, Board meeting announcements, etc.

Common elements developed at the Kaweah Subbasin level shall be shared with the public through coordinated workshops and public meetings. As material and data become available, the Kaweah Subbasin GSAs will coordinate workshops for the public to attend. While special workshops can be utilized, the Kaweah Subbasin GSAs will utilize the quarterly Kaweah Subbasin Management Committee (Management Committee) meetings as a resource to share Workplan updates. The Management Committee is a coordinated meeting between representatives from each GSA, and the public is invited to attend and participate in the meetings. Meetings shall be noticed on GSA websites and shall be sent to interested parties. Interested parties are collected on an ongoing basis in the Kaweah Subbasin. Individual outreach plans specific to each GSA Mitigation Program shall be developed and shared with the public via individual outreach efforts at each.

7.3.6.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The proposed Program will directly mitigate impacts due to the chronic lowering of groundwater levels and land subsidence.

The Program will provide a direct benefit to beneficial users in the GSA who have had their well impacted because of continued overdraft conditions while the GSA implements other project and management actions to achieve sustainability. The metric for measuring program benefits will be the number of wells that are impacted and mitigated under this Program.

7.3.6.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

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The GSAs will be required to comply with any CEQA requirements prior to approval and implementation of the Program. No other permits or other regulatory requirements are expected to be necessary for the Program at this time.

Well repairs and replacement wells will require a permit from either Tulare County or Kings County.

7.3.6.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

Each GSA will formulate and implement a mitigation claims process for domestic and municipal use impacts within the first quarter of 2023, and complete all other aspects of the Mitigation Program by June 30, 2023. The initial claims process shall include reference to local programs and resources from the County, State, non-profit organizations, and the Kaweah Water Foundation.

As the Kaweah Subbasin GSAs anticipate that the individual Mitigation Programs will require time to be developed and established in a public and transparent fashion, in the interim, the Kaweah Subbasin GSAs will coordinate the development of an Interim Domestic Well Mitigation Program at a yet to be determined funding level and emergency criteria to make the limited funding available for drinking water well mitigation.

7.3.6.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

The Kaweah Subbasin GSAs intend to utilize the Annual Report submitted to DWR to report on and update progress on the Mitigation Program(s).

With the information presented, the Kaweah Subbasin GSAs anticipate pursuing locating and refining the potential number of wells impacted by lowering of groundwater levels to the MTs in the Kaweah Subbasin. The Kaweah Subbasin GSAs intend to leverage new tools developed by the California Department of Water Resources such as the Dry Domestic Well Susceptibility Tool and well surveys to establish a refined estimate of drinking water well impacts. The Kaweah Subbasin GSAs will continue to evaluate impacts to beneficial uses and users of Land Subsidence.

7.3.6.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

The project will be implemented by the GSA once fully developed and a funding source identified. This program relies on available groundwater. The GSAs may evaluate alternative sources of supply.

7.3.6.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

California Water Code Section 10725.2 provides the GSA has the powers and authorities “perform any act necessary or proper” to implement SGMA regulations and allows the GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation. Because the Department is required to evaluate whether the Plan provides a reasonable means to mitigate for continued overdraft, a mitigation program is an act necessary or proper to implement SGMA. (23 CCR §355.4(b)(6).)

7.3.6.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Following are preliminary estimated costs for implementing the program. These will be refined during project development and finalized prior to efforts to secure funding.

Development of Policies and Procedures. Each GSA will have consulting and legal costs to develop the Program policies and procedures, which costs will vary by GSA.

Develop Funding. The Subbasin will collaborate with programs and funding sources that already exist. Each GSA will need to develop long-term funding. This could include preparation of grant applications, a loan, or other options. These costs will vary by GSA.

Public Outreach. Public outreach will be performed in each GSA. These costs will vary by GSA and will be further estimated during development of the Program.

Project Administration. General administration costs for the program will vary by GSA and will be determined during the development of the Program.

Well Mitigation. Well mitigation costs will vary by GSA and location within each GSA in accordance with groundwater levels and the specific minimum thresholds that have been determined. An estimate of well mitigation costs will be developed by each GSA as part of their Program development and funding plan development. As a preliminary estimate to understand approximate magnitude, the number of wells that may be impacted within the GKGSA based on known data at this time (as described in Section 5.3.4.2) is approximately 167 wells. Recent estimates for drilling a new PVC domestic well is in the range of \$88 - \$125 per linear foot (LF). For estimating the potential magnitude of cost for this program, it was assumed that 100 LF could be needed for assisting potentially impacted wells beyond their current construction. Applying the cost per LF to 167 wells results in a range from \$1.5 - \$2.1 million.

Each GSA will develop a funding mechanism for the Mitigation Program, which is dependent on the specific GSA needs for specific expected impacted wells, critical infrastructure, and land uses within each GSA. Funding is anticipated to be available for each GSA’s Mitigation Program

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through implementation of assessments, fees, charges, and penalties. In addition, the GSAs will explore grant funding. The State has many existing grant programs for community water systems and well construction funding. County, state, and federal assistance will be needed to successfully implement the respective Mitigation Programs. Each GSA may, separately or in coordination with each other, also work with local NGOs that may be able to provide assistance or seek grant monies to help fund the Mitigation Program. GSAs may act individually or collectively to address and fund mitigation measures.

Below is a list of funding being sought within the Kaweah Subbasin:

- The Safe and Affordable Funding for Equity and Resilience (SAFER) Program through the California State Water Resources Control Board
- Household Water Well Program through the United State Department of Food and Agriculture
- Household Water Well System Grant Program through the United State Department of Food and Agriculture

7.3.6.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The Program will may impact groundwater extractions, if impacts show accelerated rates of groundwater extraction needs to occur. The Program will not directly impact recharge activities, but actively encourages that course of action. The Program is meant to mitigate for impacts caused by continued overdraft pumping until sustainability has been reached.

7.3.6.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

The GSAs are committed to the Program and required through the Coordination Agreement to implement the Program by the scheduled defined herein.

7.3.7 Agricultural Water Conservation and Management

7.3.7.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...

The agricultural water service providers that are members of the GKGSA comply with all provisions of SB 7 (amending Division 6, Part 2.55 of the Water Code) passed into law in 2009 regarding agricultural water conservation and management. Efficient management practices in the law, related

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to SGMA objectives, include volumetric water pricing, incentives for conjunctive use and increased groundwater recharge, and development of an overall water budget. AB 1668 and SB 606 passed in 2018 did not materially add to these objectives, save for those districts serving between 10,000 and 25,000 acres who must now prepare water management plans under the newer laws.

While these new laws do not require water use objectives or savings thresholds, they do encourage more efficient use of water by the agricultural sector and its suppliers.

7.3.7.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The management action encourages the conservation of water and, if successful will reduce groundwater production which could allow the recovery of groundwater levels and increase groundwater storage.

7.3.7.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to reduce the demand on the groundwater resources of the subbasin.

7.3.7.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Noticing for this program would be conducted through the processes established by the GKGSA’s agricultural water service providers and their respective policies and requirements under law.

7.3.7.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action encourages the conservation of water but does not require a specific benefit.

7.3.7.6 Permitting and Regulatory Compliance

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Regulatory compliance resides with those provisions now codified into state law.

7.3.7.7 Status of Implementation

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Most provisions of the conservation laws are being complied with by the agricultural water purveyors of the GKGSA. Water management plans, as originally required by USBR with the passage of the Central Valley Project Improvement Act (CVPIA) in 1992, are being regularly prepared by these districts for submittal to DWR.

7.3.7.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Benefits cannot be quantified from compliance with the agricultural conservation laws at the present time. The JPA Members of GKGSA that provide agricultural water supply will continue to divert for beneficial use all local and imported water supplies to which they are entitled. Should agricultural demands for irrigation water diminish as a result of some of the conservation provisions, a larger portion of diverted supplies will be devoted to groundwater recharge in the future.

7.3.7.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Additional water source is not required for this Management Action.

7.3.7.10 Legal Authority

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

As irrigation districts per Division 11 of the California Water Code, the agricultural water suppliers within the GKGSA are empowered with ensuring the beneficial use of all water furnished thereby.

7.3.7.11 Program Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Costs for water management plan report preparation and submittals are ongoing for agricultural water suppliers in the GKGSA, and any future costs related to surface water measurement compliance and associated funding would be borne by each respective district.

7.3.7.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This management action encourages the conservation of water and this message will be just as applicable during wet conditions as during drought conditions.

7.3.7.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

This management action encourages the conservation of water and the success of this action is not certain at this time.

7.3.8 Urban Water Conservation Program

7.3.8.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

As referenced in Section 2.5.1.4 of the Basin Setting Report (Appendix 2A), urban water usage in the future is expected to comply with the conservation mandates contained in SB 606 and AB 1668, both bills signed into law in May 2018. Based on that legislation, indoor residential use will be capped at 55 gallons per capita per day (gpcd) in 2019 and reduced to 50 gpcd by 2030. Outdoor residential use will be capped in the future based on local climate and size of landscaped areas. Standards for outdoor usage will be defined in a SWRCB rule-making process by June 2022.

7.3.8.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

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The management action encourages the conservation of water and, if successful will reduce groundwater production which could allow the recovery of groundwater levels and increase groundwater storage.

7.3.8.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Kaweah Subbasin has been designated as critically overdrafted and the GKGSA is implementing this project to reduce the demand on the groundwater resources of the subbasin.

7.3.8.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Noticing for this program would be conducted through the processes established by the GKGSA’s municipal water service providers and their respective policies and requirements under law.

7.3.8.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This management action encourages the conservation of water but does not require a specific benefit.

7.3.8.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

The Water Conservation Act of 2009 mandated a 20% reduction in urban per capita water usage by 2020 (SB7X7). Future achievements in urban conservation will be as derived from the passage of AB 1668 and SB 606 in 2018. Future amendments to UWMPs and modified city ordinances will eventually embody these recent laws.

7.3.8.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

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The cities of Farmersville, Exeter, and Woodlake are currently evaluating their respective compliance measures for indoor use and are awaiting additional information and guidelines concerning regional outdoor and landscape compliance measures. The cities presently are complying with the 20X2020 mandates contained in SB7X7 and as embodied in their respective UWMPs. As the SWRCB establishes its compliance deadlines for both indoor and outdoor usage, anticipated to occur by 2025, the municipal JPA Members will have a clearer picture of an implementation schedule.

7.3.8.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

The Pacific Institute estimated in its 2014 report (“Urban Water Conservation and Efficiency Potential in California”) that indoor usage could be reduced by 33 to 40 gpcd, and that outdoor/landscape usage could be reduced by 20 to 50 gpcd. These state-wide values are likely to be unrealistic in some regions; however, the report postulates that total urban water usage could be reduced by as much as 30 to 60%. Savings of this magnitude would represent a significant reduction in groundwater pumping. The Sustainability Indicators to benefit from additional urban conservation include stabilization of groundwater levels and, by proxy, groundwater storage stabilization as well as land subsidence.

7.3.8.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

Additional water source is not required for this Management Action.

7.3.8.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

Legal authorities for any additional urban water conservation will be as derived from the passage of AB 1668 and SB 606.

7.3.8.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

Costs to implement recent urban water conservation objectives are not known at this time. Funding would be as provided by each urban Member for their respective programs.

7.3.8.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This management action will lead to less demand on the groundwater resource and should allow groundwater levels and storage to recover further during wet years and offset decreasing groundwater levels and storage during drought years.

7.3.8.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

This management action encourages the conservation of water and the success of this action is not certain at this time.

7.3.9 Fee and Incentive Program

7.3.9.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The GKGSA has implemented a land-based assessment. In addition, the GKGSA anticipates both a groundwater extraction fee and penalties program to fund programs described herein and also discourage overdraft pumping. The Rules and Regulations anticipated to be adopted in August 2022 will clarify the authority for the GKGSA to do so and set forth the accounting and procedure for how such fees and penalties will be implemented. The board of directors plans to set the rate for each annually after legal compliance.

7.3.9.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

This Action will benefit all of the following sustainability indicators: groundwater elevations, groundwater change in storage, land subsidence, and groundwater quality.

7.3.9.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger*

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implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

The GKGSA will implement the fee and penalty structure after compliance with all procedural and substantive requirements of SGMA, and any applicable Proposition 218 Constitutional requirements.

7.3.9.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

The board will annually set groundwater extraction fees and penalty rates both held and noticed at public meetings in accordance with the Brown Act and in addition to any Proposition 218 requirements, if any.

7.3.9.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

The imposition of groundwater extraction fees and penalties is in part to disincentivize overdraft pumping and encourage sustainable levels of extraction.

7.3.9.6 Permitting and Regulatory Compliance

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

It is not anticipated any permits and other regulatory requirements are required for fees or penalty imposition. The GKGSA will comply with all procedural and substantive requirements of SGMA and any applicable Proposition 218 Constitutional requirements.

7.3.9.7 Status of Implementation

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

Groundwater extraction fees and penalties are anticipated to be imposed during Water Year 2023.

7.3.9.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

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The primary benefit resulting from fees and penalties is the reduction in groundwater overuse over time. The fee and penalty structure will help protect and enhance groundwater resources.

7.3.9.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The GKGSA will comply with all procedural and substantive requirements of SGMA and any applicable Proposition 218 Constitutional requirements. Additional water source is not required for this Management Action.

7.3.9.10 Legal Authority

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA authorizes the imposition of fees and penalties pursuant to Water Code §10730, *et seq.* In addition, the GKGSA has authority to collect land-based assessment, other fees and penalties pursuant to the Joint Exercise of Powers Act and the common powers rule pursuant to Government Code §6500, *et seq.* In addition, a GSA is authorized to perform any act necessary or proper to carry out the purposes of this part (Water Code § 10725.2(a)) and adopt rules, regulations, ordinances and resolutions for the purposes of carrying out SGMA (Water Code §10725.2(b)).

7.3.9.11 Program Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Staff and consultant costs are necessary to impose the fees and penalties. The same will be required for collection and enforcement of the same.

7.3.9.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Imposition of fees and penalties will encourage use within sustainable limits and disincentivize overdraft pumping. The fees and penalties program will assist the GKGSA in reaching sustainability targets by enhancing groundwater resources and eliminating overdraft conditions.

7.3.9.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

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This management action is anticipated to go into effect in Water Year 2023, thus there is low level uncertainty.

7.3.10 Groundwater Market

7.3.10.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The GKGSA will consider the feasibility and acceptance of a voluntary marketing program. With the existence of a groundwater allocation program and a suitable measurement program, the GKGSA will be in a position to administer a marketing program within the confines of the GKGSA and possibly with other GSAs in the Kaweah Subbasin. The program would consist of temporary or permanent transfers of groundwater extraction allotments for immediate use or for banking arrangements, as well as carry-over of unused allotments, all consistent with the provisions of SGMA §10726.4. A share-based methodology may be utilized, which would incorporate a fixed number of shares being issued to all groundwater rights holders, accompanied by an annual allotment dictating the volume of extractable water per share.

Stakeholder involvement will be important to this program, especially for agricultural pumpers, which will likely be the primary sellers/buyers, although the three cities within the GKGSA may be interested in participating in the program.

Prior to implementation, an accurate and reliable extraction measurement data collection protocol will be needed to support the accounting system and annual allotment per well owner. The GKGSA will seek guidance from agencies with experience in water markets to identify options for communications and outreach with stakeholders, program design, and mechanisms to ensure that non-participating stakeholders are not adversely impacted by the program.

7.3.10.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

Measurable Objectives to be addressed by this action include chronic lowering of groundwater levels and reduction in storage (Section 5) and avoidance of associated Undesirable Results (Section 3).

7.3.10.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

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A groundwater market is being considered at a conceptual level at this time and criteria have not been established for implementation.

7.3.10.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Noticing for this program would be conducted through the processes established by the GKGSA, its adopted policies and requirements under law.

7.3.10.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

A market/transfer program will not provide any new source of groundwater to the GKGSA area but may improve the distribution and/or application of the available groundwater among stakeholders.

7.3.10.6 Permitting and Regulatory Compliance

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Permitting and other regulatory compliance issues will be identified and addressed during the latter portion of the first 5-year period of the GSP implementation, consistent with city and county ordinances and SGMA §10726.4 (a) (3 & 4).

7.3.10.7 Status of Implementation

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The program is under conceptual consideration at this time but will likely be evaluated during the latter portion of the first 5-year period and implementation could occur during the second 5-year period.

7.3.10.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

A market/transfer program will not provide any new source of groundwater to the GKGSA area but could address the lowering of groundwater levels.

7.3.10.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The GKGSA area will be the source of the groundwater and will be limited by the hydrology of the region.

7.3.10.10 Legal Authority

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA §10726.4 (a) (3 & 4) provides legal authority for a groundwater transfer and accounting programs.

7.3.10.11 Program Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Costs to implement a marketing/transfer program are not known at this time and will require increased GSA staffing to administer such a program. A grant application was submitted by TID to the USBR and seeks funding for the entire subbasin to establish a pilot program, based on an outreach task, a scoping and planning task and a strategy task. Funding for the complete program will likely be included in the administrative process and will be borne by the participants.

7.3.10.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The implementation of a groundwater transfer program will include provisions for the recovery of groundwater levels and groundwater storage during non-drought periods.

7.3.10.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The interactions with experienced agencies and the detailed evaluation of the components will reduce the level of uncertainty.

7.3.11 Groundwater Allocation and Accounting Program

7.3.11.1 Management Action Description

23 Cal. Code Regs. §354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

The GKGSA is in the process of developing a groundwater accounting system, referred to as the Water Dashboard, to track groundwater use and implement a groundwater allocation program as also described herein. The rules upon which the Water Dashboard will operate will be based on the GKGSA's Rules and Regulations, scheduled to be adopted in August of 2022. The Water Dashboard and the Rules and Regulations specifically restrict groundwater pumping within the GKGSA.

The Water Dashboard was designed to enable to the GKGSA to efficiently manage activity relevant to its SGMA compliance efforts. These activities include management of individual and/or entity groundwater accounts pursuant to various policies, and enable the GKGSA staff to undertake core administrative tasks such as member management, tracking, billing and reporting.

7.3.11.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

The program will directly benefit lowering groundwater levels, groundwater storage, land subsidence, and water quality. The purpose of the program is to reduce groundwater extractions and reach sustainability.

7.3.11.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

This is a high priority program that is necessary to limit groundwater extractions to ensure the avoidance of undesirable results. Use of groundwater will be pursuant to the Rules and Regulations through either meters or Land IQ. GKGSA contracted with Land IQ in 2021 to monitor and measure total consumptive use. Through the Rules and Regulations, the GKGSA is using Land IQ to measure consumptive use for each individual parcel within the GKGSA. A landowner has the option to use Land IQ or a meter for his/her individual account within the Water Dashboard.

7.3.11.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

An extensive public review process has been conducted for both the Rules and Regulations and the Water Dashboard. Numerous workshops have been conducted. The Stakeholder and Rural Communities Committee have also directly engaged in the drafting and development of the Rules and Regulations and the Water Dashboard.

7.3.11.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

The Rules and Regulations set forth an annual allocation of groundwater based on a ramp down schedule, which overtime reduces pumping to reach sustainability. This action identifies the need to maintain average annual groundwater use within a sustainable limit and proposes to reach this sustainable limit through the gradual reduction in allowable groundwater use over time.

7.3.11.6 Permitting and Regulatory Compliance

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.

Pursuant to SGMA, groundwater management implemented by GKGSA is consistent with Section 2 of Article X of the California Constitution and does not determine or alter water rights (Water Code § 10720.5). The GSAs will be required to comply with any CEQA requirements prior to approval and implementation of the Program. No other permits or other regulatory requirements are expected to be necessary for the Program at this time.

7.3.11.7 Status of Implementation

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

The draft Rules and Regulations were circulated for public review during the first quarter of 2022. The board of directors will consider adoption in August 2022, at which time the Water Dashboard will have been released and accessible to all landowners. Early access to the Water Dashboard began in June 2022.

7.3.11.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

It is anticipated that overtime the Dashboard and the Rules and Regulations will protect and enhance groundwater resources by reducing groundwater overdraft gradually until groundwater use reaches sustainable limits. Other benefits include mitigating decline of groundwater levels, and limiting or eliminating land subsidence and/or the migration of contaminated plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated pursuant to annual reports to DWR.

7.3.11.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Rules and Regulations will be implemented through board action, which is anticipated to take place in August 2022. The water source is groundwater and the limitation of extractions from the same.

7.3.11.10 Legal Authority

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

A GSA is authorized to:

- Require the registration of groundwater extraction facilities (Water Code § 10725.6);
- Control groundwater extractions by regulating, limiting, or suspending groundwater extractions (Water Code § 10726.4(a)(2).);
- Authorize temporary and permanent transfers of groundwater extraction allocations within the agency (Water Code § 19726.4(a)(3));
- Establish accounting rules to allow unused groundwater allocations issued by the agency to be carried over from one year to another (Water Code § 10726.4(a)(4)).
- Perform any act necessary or proper to carry out the purposes of this part (Water Code § 10725.2(a)); and
- Adopt rules, regulations, ordinances and resolutions for the purposes of carrying out SGMA (Water Code §10725.2(b)).

7.3.11.11 Program Costs and Funding

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The Program cost is staff, legal and consulting time to develop the documents and online program to implement the accounting. The GKGSA previously based a land-based assessment to cover staff, legal and consulting time for purposes such as this Program.

7.3.11.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The purpose of the Program is to limit groundwater extractions in order to reach sustainability. Various components of the Rules and Regulations, including allocations, carryover, recharge credits, and enforcement, will ensure that groundwater users are able to plan for and manage against periods of drought while operating within limits determined to be sustainable.

7.3.11.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

The process of public review has already been conducted. The board will consider the Rules and Regulations in August 2022. There is very limited level of uncertainty the process will move forward.

7.3.12 Interconnected Surface Water Data Gap Work Plan

Within the GKGSA, the presence and understanding of potential interconnected surface water is not well understood. This Management Action sets forth a Work Plan to perform additional efforts specific to filling data gaps and performing additional research and analysis specific to the interconnection surface water indicator in the Kaweah Subbasin, particularly in the GKGSA. Note that absent a full data set and other potential unknowns, some components of the Work Plan are spoken to in generalities as the specific future steps (i.e., type of analytical tool) will be better understood as the Work Plan is undertaken.

7.3.12.1 Management Action Description

23 Cal. Code Regs. § 354.44 (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions...*

GKGSA plans to perform a Work Plan, described below, to fill data gaps and better understand the presence of interconnected surface waters, if any, and potential adverse impacts caused by

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groundwater pumping. Through the Work Plan and its pending results, the GKGSA can evaluate to the extent interconnected surface waters exist and to what extent whether impacts are significant and unreasonable. This information can then be used to develop sustainable management criteria. This Work Plan is anticipated to be performed in partnership, in part or in whole, with the East Kaweah GSA which is also going to be performing a Work Plan on this topic. The GKGSA will be focusing on the reaches of the Kaweah River, Lower Kaweah River, St. Johns River, Dry Creek, and Yokohl Creek that are highlighted in **Figure 5-6** of **Section 5.7.2**, which explains the rationale for focusing Work Plan in these areas.

The Work Plan will be performed within the following four (4) major components and are described in further detail below.

Phase 1: Filling Data Gaps and Further Research

Phase 2: Analytical Tool Development

Phase 3: Interconnection Analysis and Determination

Phase 4: SMC Refinement and Incorporation to 2025 GSP Update

Phase 1: Filling Data Gaps and Further Research

With interconnected surface water being an identified data gap, the GKGSA will work towards filling data gaps through research and further data collection. There are many different types of data to be gathered and/or better understood to improve the GKGSA's knowledge of interconnected surface waters. The data and research intended to be collected are listed below:

- Groundwater levels – There are gaps in the groundwater level monitoring points near the selected waterways. Without groundwater level data the GKGSA is unable to understand the proximity of groundwater to the surface water channel and how seasonal or annual groundwater elevations interact with the surface water channels. Early in the Work Plan, the GKGSA will look to identify new monitoring locations through existing wells or new wells to be installed.
- Pumping well locations, its beneficial use, and estimated quantity – Active pumping along or regional proximity to the selected waterways is not understood in the detail needed for making a determination of whether there are adverse impacts to surface water.
- Stream flow and/or estimated hydrology – Some of the selected water ways have little or no ability monitor surface water flows. Or there is not enough known about studies or analyses that may have been developed to estimate flows based on hydrological conditions. Pending further research new or additional stream measurement may be installed in locations of the selected waterways.
- Presence of Riparian habitat and/or Groundwater Dependent Ecosystems (GDE) – Further investigation will be performed utilizing available data sets for the presence of riparian and/or GDEs along the selected water ways. Field investigations may be performed to confirm physical presence and current status of these habitats. These efforts will be used to better understand if adverse impacts are being experienced in the reaches where present.
- Soils/geological considerations – Further investigation and review of the soils and geological conditions will be evaluated to guide the physical parameters for how surface and groundwater move through the strata present in the selected water ways. The flux through

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the channel bottoms as well as drawdown characteristics of the regional aquifer around the selected waterways will be reviewed to incorporate into the analytical tool and further analysis to understand mechanics for water movement naturally as well as impacted through groundwater extraction.

- Influence of the mountain front recharge – Determining the volume coming off the mountain front watersheds and how it impacts upper reaches of the waterways. The Kaweah Subbasin has estimated mountain front recharge in its Water Budgets, however the location and magnitude in different portions of the mountain front is not well understood.

Phase 2: Analytical Tool Development

As the additional research and data gaps are being filled, the GKGSA will begin to evaluate an analytical tool that will be appropriate and practical to support decision making and management. At this time, it is unknown the type of tool that will be appropriate but may range from a model, series of equation calculations, or other analytical method that provides for quantifying surface water depletions with respect to groundwater extraction. The USGS Circular 1376 provides guidance on potential approaches and will be closely reviewed during this phase.

It is envisioned this tool will be developed in a manner that can support analysis of a zone of influence around the selected surface waterways to evaluate the impacts groundwater extraction may have on surface flows in all or portions of the studied reaches.

Phase 3: Interconnection Analysis and Determination

Following the previous phases to perform additional research, fill data gaps, and development of an analytical tool based on the larger data set; the effort of this phase will include the analysis and estimation of the impacts on surface water depletions caused by groundwater extraction, if any. The established study zones from Phase 2 will be analyzed for the estimated groundwater extractions, and surface water depletion or losses over varying water year types (hydrology) and varying seasons within a water year (i.e., Spring, Fall, etc.). This analytical step will be aimed at driving toward establishing more refined sustainable management criteria in applicable areas for the 2025 GSP update. The refinements may increase or reduce the current reaches with preliminary SMC, pending the results of prior phases.

Phase 4: SMC Refinement and Incorporation to 2025 GSP Update

The final phase of the Work Plan is the refinement of SMC and incorporation into the 2025 GSP Updates. The level of refinement is unknown at this time. However, the GKGSA understands that providing the results of the Work Plan and modifying SMC, where applicable, is targeted for the 2025 GSP updates due in January 2025.

7.3.12.2 Measurable Objectives Addressed

23 Cal. Code Regs. § 354.44 (b) *The Plan shall include the following: (1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent...*

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This management action initiates a Work Plan aimed at understanding the presence of interconnected surface waters, if any, and the quantification of potential depletions caused by groundwater pumping. Ideally, this effort aims at supporting groundwater management that avoids adverse impacts to interconnected surface waters due to groundwater pumping.

7.3.12.3 Circumstances and Criteria for Implementation

23 Cal. Code Regs. § 354.4 (b) (1) *The Plan shall include the following: (A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The circumstances for implementing are critical as there is little data and information to inform and support groundwater management related to the interconnected surface water sustainability indicator. The GKGSA is committed to implementing the Work Plan to better understand the presence of interconnected surface waters, if any, and protect against adverse impacts caused by groundwater pumping.

7.3.12.4 Public Notice and Outreach Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Appropriate notification and outreach will be conducted consistent with GSA authorities and requirements. As results from the Work Plan become available, they will be reported and GKGSA Board and committee meetings, which are open to the public. Management changes stemming from the results of the Work Plan will follow a review and public comment period.

7.3.12.5 Estimated Annual Project Benefits

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This Work Plan will provide a better data and understanding of the location of interconnected surface waters within the GKGSA, if any. The results of the Work Plan may reduce groundwater pumping in the vicinity of interconnected surface waters and protect surface water users and riparian or GDEs from adverse impacts related to groundwater extraction. An annual benefit cannot be defined at this time.

7.3.12.6 Permitting and Regulatory Process

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (3) A summary of the permitting and regulatory process required for each project and management action.*

Permits for installation of monitoring wells would be needed from Tulare County. However, since these monitoring wells will not have extraction capability, obtaining permits should be procedural.

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Work within a surface water way, for example to install a stream gauge, could require permits from agencies such as the Army Corps of Engineers, State Water Resources Control Board, and/or California Department of Fish & Wildlife if the action does not fall into an exemption. Right of entry or access agreements with local landowners may be needed pending location.

7.3.12.7 Status of Management Action

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The Work Plan has yet to begin. The proposed schedule for the Work Plan is summarized in the following table. This is a preliminary schedule. Pending data gathered and/or timing of such data, there may be shifts or re-ordering of phases/tasks to better adapt and facilitate completion.

Table 7-1 Anticipated Work Plan Schedule

Phase	Description	Estimated Timeline
1	Additional research; data gap filling (monitoring well installation, stream gauge installation, etc.); data collection	October 2022 – June 2024
2	Analytical Tool Development – the type of tool will be determined with additional data and research	March 2023 – December 2023
3	Interconnection Determination and Analysis	January 2024 – July 2024
4	SMC Development and Incorporation into 2025 GSP	July 2024 – January 2025

7.3.12.8 Expected Benefits and Targeted Sustainability Indicators

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The management action will improve the knowledge on the timing and volume of depletion to interconnected surface water caused by groundwater pumping, if any. Pending the results of the Work Plan, the GKGSA could develop more specific SMC and/or management actions set to protect surface water users and riparian or groundwater dependent habitats from adverse impacts caused by groundwater pumping.

7.3.12.9 Source and Reliability of Water

23 Cal. Code Regs. § 354.44 (b) *Each Plan shall include a description of the projects and management actions that include the following: (6) An explanation of how the project or management action will be accomplished. If*

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the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

An additional water source is not required for this Work Plan effort. However, hydrology is an important part in understanding the natural variability within the surface water bodies. The ephemeral nature of the water ways and the ranges of flows that occur out of the Mountain Front is highly dependent on hydrology. Continuing drought conditions may impact the timeline and results of the Work Plan.

7.3.12.10 Legal Authority Required

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

The GKGSA has the authority to implement and perform the Work Plan as the SGMA legislation grants authority to GSAs to perform any act necessary or proper to implement and follow the regulations (§10725.2). This authority allows the GKGSA to implement the Work Plan and move toward better understanding this sustainability indicator with respect to conditions within the Kaweah Subbasin and develop further SMC or rules, pending results of this Work Plan.

7.3.12.11 Costs and Funding

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

As described in the Work Plan, there is some uncertainty in the direction next steps will take as more data and information is gathered and better understood. Costs to collect more data, develop a methodology to analyze surface water interconnection and nexus to groundwater extractions, and understand the location of interconnected surface waters within the GKGSA, if any could vary widely. Estimates for performing the Work Plan through 2024 (to be incorporated into the 2025 Update) range from \$150,000 to upwards of \$750,000 for the data gap filling and potential installation of wells and gauges, technical tool development, and analysis. The cost to the GKGSA in implementing will be whole or in part of this estimate. The GKGSA and EKGSA will be looking to find partnership on this effort as it most directly impacts their GSA boundaries. The GKGSA may also look to funding opportunities at State and/or Federal levels that support such efforts.

7.3.12.12 Management of Groundwater Extractions

23 Cal. Code Regs. § 354.44 (b) Each Plan shall include a description of the projects and management actions that include the following: (9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

The management action could lead to better quantification of groundwater production which could deplete interconnected surface waters and the timing and quantity for which it may occur. Pending results of the Work Plan, groundwater pumping in certain proximities of surface water channels could be reduced to minimize or eliminate depletions caused by groundwater pumping.

7.3.12.13 Level of Uncertainty

23 Cal. Code Regs. § 354.44(d) *An agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

There is high certainty the Work Plan will be implemented, the GKGSA is committed to following the Work Plan as set forth. The level of uncertainty associated with the direction of the Work Plan and the corresponding results are high as, absent data, the certainty related to presence of interconnected surface waters and the nexus to groundwater pumping not well understood. Specifically, the potential inability to monitor streamflow data during a range of hydrologic conditions due to persistent, multi-year drought conditions may impede the gathering of foundational data needed to significantly understand any potential interconnectivity between surface water ways and groundwater.

7.4 Conceptual Projects and Management Actions

The following conceptual projects and management actions are being explored by GKGSA but have not yet been evaluated for their impact on reaching the Sustainability Goal. When the concepts are adequately developed and determined to be reasonably feasible to move forward, they will be included in future updates to the Greater Kaweah GSP.

7.4.1 Lewis Creek Conservation Project

The Lewis Creek Water Conservation Project will be located along Lewis Creek immediately upstream of its confluence with Outside Creek, between the cities of Tulare and Porterville. As envisioned currently, the Project would consist of five in-stream check structures that would regulate and retain flows within the channel (water conservation) and enhance groundwater recharge. The overall dimensions are envisioned to be four miles long, 20 feet wide, and four feet deep, which would provide 40 AF of in-stream storage. The project would provide in-lieu groundwater recharge during a 3-week period of surplus in-stream storage and direct recharge during a nominal 2-month period of stream flow. The expected recharge benefits are estimated at an average annual benefit of 400 AF per year, including 200 AF per year from direct groundwater recharge during a 2-month stream flow period and an average of 200 AF per year from in-lieu groundwater recharge during the temporary storage of surplus water. The project would also improve operational management of water in the area. The source of water would be surplus supply from the Kaweah River and from existing CVP contracts. The preliminary estimated cost of the project is \$1.0 million, including property acquisition, administration, design, and construction. Funding has not yet been identified but would likely be provided by KDWCD and Consolidated Peoples Ditch Company (CPDC), and possibly from other partners.

7.4.2 Kasbergen Basin Project

The proposed Kasbergen Basin is an example of a project that involves the construction of an on-farm retention and recharge basin. It is one of many projects being negotiated between Consolidated Peoples Ditch Company (CPDC) and its shareholders to construct cost effective, small on-farm basins for the purposes of capturing surface waters when available from the Kaweah River and from

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existing CVP contracts. Accounting of water conveyed to the project would be the responsibility of CPDC and would be reported to GKGS in conformance with the Water Accounting Framework and water budgeting informational needs. The Kasbergen Basin could be built within the first year of GSP implementation, has an estimated cost of \$5,000 and would be entirely funded by the land owner.

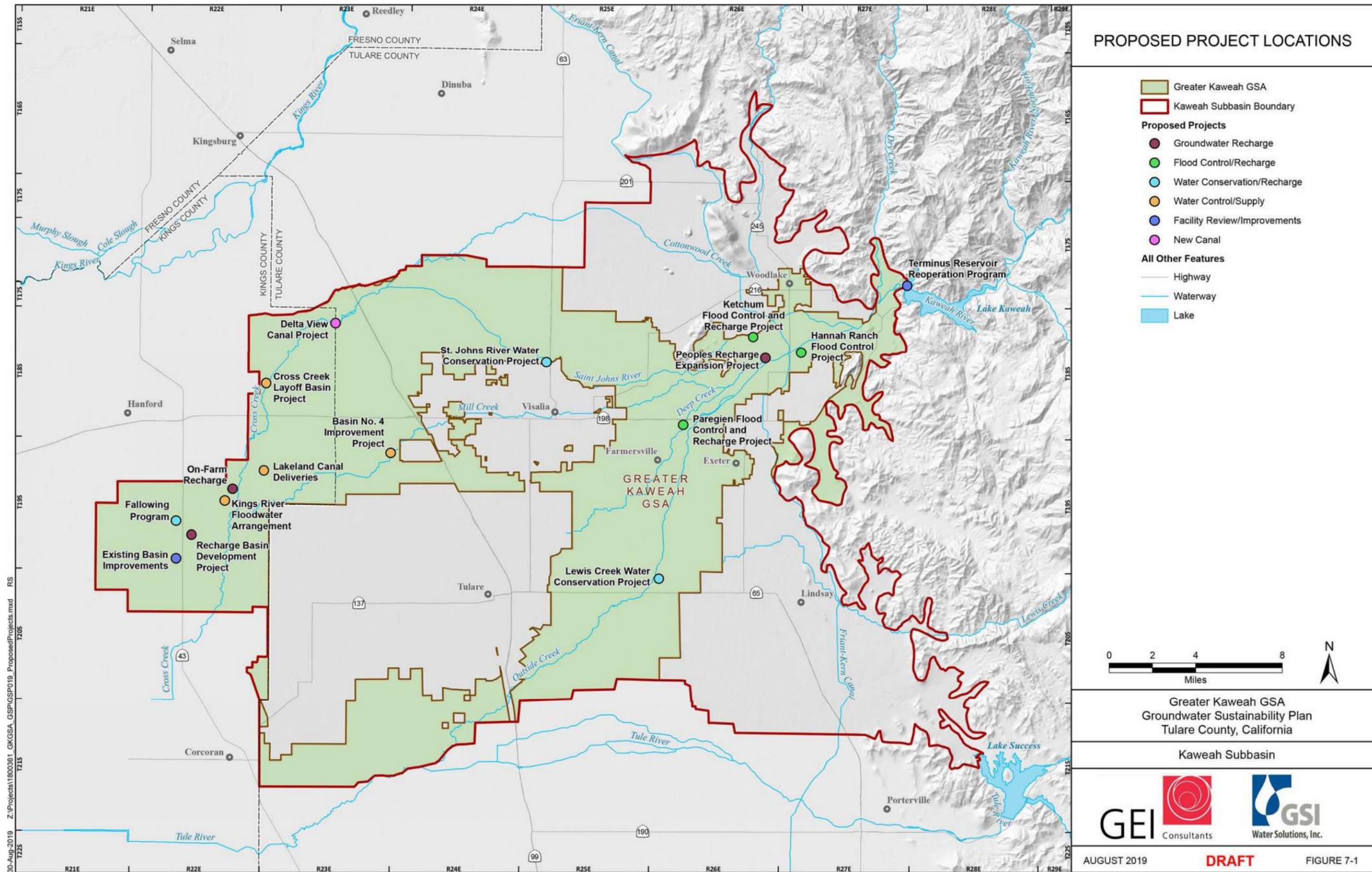


Figure 7-1. Location of GKGS)A Projects

8. DWR Reporting

8.1 Annual Reporting Summary

23 Cal. Code Regs. § 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.

According to § 356.2 of the Regulations, the GKGSA is required to provide an annual report to DWR by April 1 of each year following the adoption of the first GSP. The first annual report will be provided to DWR on April 1, 2020 and will include data for the prior Water Year (WY), which will be WY 2019 (October 1, 2018 to September 30, 2019). The Annual Report will establish the current conditions of groundwater within the GKGSA, the status of the GSP implementation, and the trend towards achieving the interim milestones. GKGSA has not yet determined whether to prepare an Annual Report for the GKGSA GSP, or an Annual Report in coordination with other Kaweah Subbasin GSAs.

8.1.1 General Information

23 Cal. Code Regs. § 356.2. *The annual report shall include the following components for the preceding year:*

(a) General information, including an executive summary and a location map depicting the basin covered by the report.

In accordance with § 356.2(a), each Annual Report will include, at the front of the report, an executive summary that will summarize the activities and the condition of groundwater levels within the GKGSA for the prior WY. The executive summary shall also include a map of the GKGSA, including the monitoring network.

8.1.1.1 Introduction

The annual report will include an introduction that will describe the following:

- A description of the GKGSA and the three agencies that are members of the GKGSA
- The general conditions of the GKGSA for the prior WY (precipitation, surface water allocations, crop demands, municipal demands, etc.)
- Any significant activities or events that would impact the water supply and/or groundwater conditions for the GKGSA

8.1.2 Basin Conditions

23 Cal. Code Regs. § 356.2 *The annual report shall include the following components for the preceding year: (b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan [identified below]:*

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Included in the annual report will be a discussion of specific local water supply conditions per § 356.2(b). This section will provide a description of the water supply conditions for the preceding WY along with a graphical representation of the conditions. A water year shall be defined as the 12-month period starting October 1 through September 30 of the following year. For example, WY 2019 shall include water supply conditions from October 1, 2018 to September 30, 2019. The discussion of water supply conditions will include:

- Groundwater Elevations – elevation data from the monitoring network
- Groundwater Extractions – groundwater pumping estimates and measurements for agricultural, municipal and domestic pumping
- Surface Water Supply – data from surface water supplies to irrigation demand, conveyance losses, and groundwater recharge
- Total Water Use – total water uses by agricultural, municipal and domestic sectors
- Change in Groundwater Storage – a determination of the volumetric change in groundwater storage

Below is a discussion of the individual GKGSA conditions that will be included in the Annual Report.

8.1.2.1 Groundwater Elevations in GKGSA

23 Cal. Code Regs. § 356.2(b)(1) *Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:*
(A) *Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.*
(B) *Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.*

Groundwater elevation data for the GKGSA will be collected per Section 4.4 groundwater level monitoring network of this GSP. The Annual Report will include a description of the monitoring network, including any modifications to the monitoring network that may have been made during the previous WY. A graphical representation of the monitoring network will be provided in the map provided in the Executive Summary.

As outlined in Section 4.4.2 Monitoring Frequency, the GKGSA will monitor groundwater elevations seasonally, with a goal to take measurements in the early spring (seasonal high before summer irrigation demands) and the fall (seasonal low after the summer irrigation demands). The Annual Report shall discuss the period in which measurements were taken and any observations about groundwater usage that would impact the groundwater elevation readings.

The annual report shall include figures that incorporate the groundwater elevations collected in the prior WY. The first set of figures shall be the development of groundwater contour maps that show the lines of equal elevation for groundwater for spring and fall readings of the previous WY. The second set of figures shall be the individual hydrographs for each monitoring well showing the prior

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WY elevation reading and the historical readings for that monitoring well. The hydrographs shall include historical data for each monitoring well.

Groundwater contour maps submitted during the first five years may reflect a composite of the principal aquifers within the subbasin due to data gaps as discussed in the Basin Setting Report (Appendix 2A) of this Plan. As additional dedicated monitoring wells are installed, and as more knowledge is gained regarding subbasin hydrogeology, groundwater conditions within each separate aquifer will be better understood. The geophysical data collection project described in Section 7 will also aid in this regard.

8.1.2.2

23 Cal. Code Regs. § 356.2(b)(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 extractions for the GKGSA will be estimated and reported for the prior WY in the annual report. A summary discussion of the estimated amount of groundwater pumped, the usage of the groundwater, and the percentage of the water supply for the GKGSA shall be included in the annual report. The Annual Report will provide a summary table that indicates the amount of groundwater per water use sector and the method of measurement (metered or estimate). A sample of the table that may be used is provided in **Table 8-1**.

Table 8-1: Sample Groundwater Extraction Summary

Water Use Sector	Measurement Method	Extraction Amount (AF)
M&I	Metered	
	Estimate	
Domestic	Metered	
	Estimate	
Agriculture	Metered	
	Estimate	
Total		

8.1.2.3 Surface Water Supplies

23 Cal. Code Regs. § 356.2(b)(3) *Surface water supply used or available for use, for groundwater storage or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.*

The GKGSA shall include a discussion of the surface water supplies diverted to the area for use by GKGSA members. The majority of surface water diversion and usage is by irrigated agriculture served by irrigation water districts and ditch companies. The discussion shall include a general description of the surface water made available to the GKGSA and how the surface water was used along with a comparison of the prior WY supplies versus historic supplies.

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The annual report shall include a discussion of how surface water supplies were used to meet agricultural demand. This description shall include a graphical representation of the cropping patterns shown for the agricultural areas of the GKGSA.

The annual report shall also discuss how surface water was applied to groundwater recharge activities. The GKGSA partners conduct various groundwater recharge activities, and a description of what activities took place in the prior WY shall be provided.

8.1.2.4 Total Water Use

23 Cal. Code Regs. § 356.2(b)(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 shall be reported in the annual report in a tabular format. A sample of the table that may be used is provided in **Table 8-2**.

Table 8-2: Sample Total Water Use Summary

Water Use Sector	Measurement Method	Total Water Use (AF)
M&I	Groundwater	
	Surface Water	
Domestic	Groundwater	
	Surface Water	
Agriculture	Groundwater	
	Surface Water	
Total		

8.1.2.5 Change in Groundwater Storage

23 Cal. Code Regs. § 356.2(b)(5) *Change in groundwater storage shall include the following:
(A) Change in groundwater in storage maps for each principal aquifer in the basin.
(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.*

The Annual Report shall include a discussion and analysis of the change in groundwater storage for the prior WY compared to historical trends. The annual report will also describe the events and conditions that would have contributed to the increase or decrease in groundwater storage. The change in groundwater storage for the prior WY will be added to the graph of historical change in groundwater storage.

8.1.3 GSP Implementation Progress

23 Cal. Code Regs. § 356.2 (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.*

The annual report shall include a description of the GSP implementation progress in accordance with § 356.2(c). This section will provide an update on progress for the prior WY in achieving the interim milestones as defined in Section 5 and the implementation of projects and management actions as described in Section 7.

8.1.3.1 Interim Milestones

Based on the interim milestones established in Section 5, the Annual Report shall determine if the prior WY had met, exceeded, or failed to reach the interim milestones. The Annual Report shall also discuss the conditions and actions that contributed to the interim milestones.

8.1.3.2 Implementation of Projects

The annual report shall include a list of projects from Section 7 that were anticipated to be implemented as of the prior WY. This section shall also include the status of those projects and note any completed projects or projects that were delayed. Lastly, a discussion shall be provided of projects that were implemented or developed in the prior WY that were not originally discussed or outlined in the GSP.

8.1.3.3 Implementation of Management Actions

The Annual Report shall include a list of management actions from Section 7 that were anticipated to be implemented as of the prior WY. This section shall also include the status of those management actions and note any completed management actions or those that were delayed. Lastly, a discussion shall be provided of management actions that were implemented or developed in the prior WY that were not originally discussed or outlined in the GSP.

8.1.3.4 Implementation of Adaptive Management Actions

Based on the ability of the GKGSA to achieve the interim milestones established in Section 5 of the GSP, GKGSA shall implement adaptive management actions to adjust projects and management actions to achieve future interim milestones. The adaptive management actions can come in the form of providing projects to increase groundwater recharge, reduce water consumption, or reduce pumping. The Annual Report shall include a preliminary evaluation and estimation of the ability of the adaptive management actions to achieve the future Interim Milestone.

8.2 Five-Year Assessments

23 Cal. Code Regs. § 356.4 *Each Agency shall evaluate its Plan at least every five years and whenever the Plan is amended, and provide a written assessment to the Department. The assessment shall describe whether the Plan implementation, including implementation of projects and management actions, are meeting the sustainability goal in the basin, and shall include the following:*

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- (a) A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives, interim milestones and minimum thresholds.*
- (b) A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.*
- (c) Elements of the Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, shall be reconsidered and revisions proposed, if necessary.*
- (d) An evaluation of the basin setting in light of significant new information or changes in water use, and an explanation of any significant changes. If the Agency's evaluation shows that the basin is experiencing overdraft conditions, the Agency shall include an assessment of measures to mitigate that overdraft.*
- (e) A description of the monitoring network within the basin, including whether data gaps exist, or any areas within the basin are represented by data that does not satisfy the requirements of Sections 352.4 and 354.34(c). The description shall include the following:*
- (1) An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of Section 354.8.*
- (2) If the Agency identifies data gaps, the Plan shall describe a program for the acquisition of additional data sources, including an estimate of the timing of that acquisition, and for incorporation of newly obtained information into the Plan.*
- (3) The Plan shall prioritize the installation of new data collection facilities and analysis of new data based on the needs of the basin.*
- (f) A description of significant new information that has been made available since Plan adoption or amendment, or the last five-year assessment. The description shall include whether new information warrants changes to any aspect of the Plan, including the evaluation of the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results.*
- (g) A description of relevant actions taken by the Agency, including a summary of regulations or ordinances related to the Plan.*
- (h) Information describing any enforcement or legal actions taken by the Agency in furtherance of the sustainability goal for the basin.*
- (i) A description of completed or proposed Plan amendments.*
- (j) Where appropriate, a summary of coordination that occurred between multiple Agencies in a single basin, Agencies in hydrologically connected basins, and land use agencies.*
- (k) other information the Agency deems appropriate, along with any information required by the Department to conduct a periodic review as required by Water Code Section 10733.*

In accordance with § 356.4 of the Regulations, the GKGSA will conduct a periodic evaluation of its Plan no less frequently than at five-year intervals and provide a written assessment to DWR of such evaluations. The assessments will include, but not be limited to, the following:

- Overall summary of then-current groundwater conditions and descriptions of each Sustainability Indicator for applicable minimum thresholds, measurable objectives, and interim milestones
- Summary of projects and management actions implemented and their localized and collective effect on groundwater conditions
- Review of Plan elements subject to reconsideration and potential revision, including minimum thresholds and measurable objectives, based on significant new information acquired since the prior Plan assessment

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- Evaluation of the Basin Setting and any needed changes thereto based on new data and water budget assessments, including estimated overdraft conditions
- Description of alterations to the monitoring network and its improvements to address data gaps
- Description of any new information made available or developed since Plan adoption or prior five-year assessment, and whether such information warrants changes to the current Plan
- Description of any completed or proposed Plan amendments
- Summary of GKGSA actions regarding Plan implementation, including any relevant ordinances or regulations issued thereby, and any legal or enforcement actions against groundwater users or others
- Summary of further collaboration and coordination between GSAs in the Kaweah Subbasin, GSAs in inter-connected subbasins, and land use agencies within Tulare County including Members of this GSA

8.2.1 *Monitoring Network Assessment and Improvement*

The GKGSA recognizes that its initial monitoring network as described in Section 4 of this Plan includes existing monitoring sites lacking sufficient information such as well depth, screen intervals, and reliable well-log records, thereby reflecting significant data gaps. Assessing these data gaps is a priority and will be conducted in accordance with § 352.2 and § 354.38 of the Regulations. Specific elements of such an assessment are to include:

- Targeting areas where an insufficient number of monitoring sites exist or where sites are considered unreliable or do not meet monitoring network standards
- Identifying data gap locations and reasons for their occurrence and surrounding issues that restrict monitoring and data collection
- Actions to be undertaken to close identified data gaps, including the addition and/or installation of new monitoring wells or surface-water measuring facilities, closure of inadequate well density areas, and needed adjustments to monitoring and measurement frequencies
- Improvement to the monitoring program and network to provide sufficient information to gauge the effectiveness of projects and management actions, including an assessment of the network's ability to determine exceedance of minimum thresholds, capture spatial or temporal variation in groundwater conditions, and adverse impacts upon beneficial uses and users of the groundwater resource
- The periodic assessment will also include a general determination of whether the monitoring network has been or is capable of evaluating groundwater conditions and impacts of projects

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and management actions on the ability of adjacent subbasins to meet their sustainability goals or to implement their respective GSPs

8.2.2 Review of Subbasin Coordination Agreement

23 Cal. Code Regs. § 357.4(i) *Coordination agreements shall be reviewed as part of the five-year assessment, revised as necessary, dated, and signed by all parties.*

In accordance with § 357.4(i) of the Regulations, the three GSAs encompassing the Kaweah Subbasin will review and, as necessary, revise their Coordination Agreement as part of their respective five-year assessments. Any revisions to the Agreement will be incorporated therein as amendments or restatement and executed by each GSA.

8.3 Reporting Provisions

23 Cal. Code Regs. § 353.4 Reporting Provisions
Information required by the Act or this Subchapter, including Plans, Plan amendments, annual reports, and five-year assessments, shall be submitted by each Agency to the Department as follows:
(a) Materials shall be submitted electronically to the Department through an online reporting system, in a format provided by the Department as described in Section 353.2.
(b) Submitted materials shall be accompanied by a transmittal letter signed by the plan manager or other duly authorized person.

The GKGSA shall comply with the provisions of §353.4 of the Regulations, in submitting any and all annual reports and five-year Plan assessments. Materials will be submitted in the manner required by DWR and be accompanied by a transmittal letter signed by the designated Subbasin Plan Manager or another authorized person.

8.4 Reporting Standards

The GKGSA shall comply with the reporting standards provided in §353.4 of the Regulations in submitting annual reports and five-year Plan assessments.

9. References

- Ayers, R.S., and Westcot, D.W. 1985. Water Quality for Agriculture – FAO Irrigation and Drainage Paper 29 rev. 1. Food and Agriculture Organization of The United Nations (FAO). <http://www.fao.org/docrep/003/t0234e/t0234e00.htm>
- Bertoldi, Gilbert L., Johnston, Richard H., and Evenson, K.D. 1991. *Ground Water in the Central Valley, California - A Summary Report*, USGS Professional Paper 1401-A.
- Bookman-Edmonston Engineering (B-E). 1972. *Report on Investigation of the Water Resources of Kaweah Delta Water Conservation District*, consultant’s unpublished report prepared for the Kaweah Delta Water Conservation District, February.
- Belitz, K. and Burton, C, 2012, *Groundwater quality in the Southeast San Joaquin Valley, California*: U.S. Geological Survey Fact Sheet 2011-3151, 4 p. <https://pubs.usgs.gov/fs/2011/3151/pdf/fs20113151.pdf>
- Braatne, Jeffrey H.; Rood, Stewart B.; Heilman, Paul E. 1996. *Life history, ecology, and conservation of riparian cottonwoods in North America*. In: Steller, R. F., ed. *Biology of Populus and its implications for management and conservation*. Ottawa, ON: National Research Council of Canada, NRC Research Press: 57-85.
- Bureau of Reclamation (USBR). Technical Studies in Support of Factual Report, Ivanhoe Irrigation District. Fresno; Apr 1949. 199 p.
- Bureau of Reclamation (USBR). Exeter Irrigation District and Stone Corral Irrigation District Irrigation Suitability Land Classification Report, Volume 2 of 2, Technical Studies in Support of Factual Report, Exeter Irrigation District. Fresno; Nov 1949. 174 p.
- _____, 1948. Geologic Study of the Lindmore Irrigation District. Fresno; 29 p, June.
- _____, 1949. Exeter Irrigation District and Stone Corral Irrigation District Irrigation Suitability Land Classification Report, Volume 2 of 2, Technical Studies in Support of Factual Report, Exeter Irrigation District. Fresno, 174 p, November.
- _____, 1949. *Factual Report Ivanhoe Irrigation District, Central Valley Project, California*. U.S. Bureau of Reclamation, Region II, Tulare Basin District, 80 pages.
- Burton, C.A., Shelton, J.L., and Belitz, Kenneth, 2012, Status and understanding of groundwater quality in the two southern San Joaquin Valley study units, 2005–2006—California GAMA Priority Basin Project: U.S. Geological Survey Scientific Investigations Report 2011–5218, 150 p. <https://pubs.usgs.gov/sir/2011/5218/>
- Burton, C.A., and Belitz, Kenneth, 2008, *Ground-water quality data in the Southeast San Joaquin Valley, 2005-2006 – Results from the California GAMA Program*: U.S. Geological Survey Data Series Report 351, 103 p. <https://pubs.usgs.gov/ds/351/>

**Greater Kaweah Groundwater Sustainability Agency (GKGSA)
Groundwater Sustainability Plan – 2022 First Amended Revision**

California Department of Finance. 2017. *County Population and Housing Estimates, 2010-2017 with 2010 Benchmarks*.

California Department of Water Resources (CDWR), 2003. *California's Groundwater Bulletin 118, Update 2003*.

_____, 2014. Historical, and Estimated Potential for Future Land Subsidence in California.

_____, 2016. *California's Groundwater Bulletin 118, Update 2016*.

_____, 2018. Guidance Document for the Sustainable Management of Groundwater, Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development.

California Regional Water Quality Control Board. 2003. *Initial Site Investigation Report, Country Club Cleaners, 2000 West Whitendale Avenue, Visalia, Tulare County*, July
http://geotracker.waterboards.ca.gov/regulators/deliverable_documents/8753980338/July%2016%202003%20Country%20Club.pdf

California State Water Resources Control Board. 2016. Groundwater Ambient Monitoring and Assessment (GAMA) Domestic Well Project Groundwater Quality Data Report – Tulare County Focus Area, July 2016.
https://www.waterboards.ca.gov/water_issues/programs/gama/docs/tularesummaryreport.pdf

California Water Service (Cal Water). 2016. *2015 Urban Water Management Plan, Visalia District*. June 2016

Croft, M.G. 1968. Geology and Radiocarbon Ages of Late Pleistocene Lacustrine Clay Deposits, Southern Part of San Joaquin Valley, California, USGS Professional Paper 600-B, p. B151-B156.

Croft, M.G. and Gordon, G.V., 1968. Geology, hydrology, and quality of water in the Hanford-Visalia area, San Joaquin Valley, California (No. 68-67).

Davids Engineering. 2013. *Time Series Evapotranspiration and Applied Water Estimates from Remote Sensing*, consultant's unpublished report prepared for the Kaweah Delta Water Conservation District, March.

Davids Engineering, 2018. *Kaweah Subbasin Development of Evapotranspiration and Applied Water Estimates Using Remote Sensing*, consultant's unpublished report prepared for the Kaweah Delta Water Conservation District, November.

Davis G.H., Green, J.H., Olmsted, F.H., and Brown, D.W. 1959. *Ground-Water Conditions and Storage Capacity in the San Joaquin Valley, California*, USGS Open-file Report 1469.

Duffield, Glenn M., 2016. *Representative Values of Hydraulic Properties*. AQTESOLV.
http://www.aqtesolv.com/aquifer-tests/aquifer_properties.htm

Greater Kaweah Groundwater Sustainability Agency (GKGS)
Groundwater Sustainability Plan – 2022 First Amended Revision

- Dziegielewski, B. and Kiefer, J.C. 2010. *Water Conservation Measurement Metrics Guidance Report*. The American Water Works Association Water Conservation Division Subcommittee Report. January 22, 2010.
- Farr, T.G., C. Jones, Z. Liu, 2015, Progress report: Subsidence in the Central Valley, California. Submitted to California Department of Water Resources. Available at: <http://www.nasa.gov/jpl/nasa-californiadrought-causing-valley-land-to-sink>
- _____, 2016, Progress report: Subsidence in the Central Valley, California. Submitted to California Department of Water Resources
- Faunt, C., R.T. Hanson, K. Belitz, W. Schmid, S. Predmore, D. L. Rewis, and K. McPherson, 2009, Groundwater availability of the Central Valley Aquifer, California. USGS Professional Paper 1766. Reston, Va.: United States Department of the Interior, Geological Survey. <http://pubs.usgs.gov/pp/1766>, 225.
- Faunt, C.C., R.T. Hanson, and K. Belitz, 2009, Development of a three-dimensional model of sedimentary texture in valley-fill deposits of Central Valley, California, USA, *Hydrogeology Journal* (2010) 18: 625– 649.
- Freeze, R.A., and Cherry, J.A., 1979. *Groundwater*. Prentice-Hall, Inc., Englewood Cliffs.
- Frink, J.W. and Kues, H.A. 1954. *Corcoran Clay, a Pleistocene Lacustrine Deposit in San Joaquin Valley, California*, *American Association of Petroleum Geologists Bulletin*, v. 38, no. 11, p. 2357-2371.
- Fugro West, Inc. 2003 (revised 2007). *Water Resources Investigation of the Kaweah Delta Water Conservation District*, consultant's unpublished revised report prepared for the Kaweah Delta Water Conservation District, July.
- Fugro Consultants, Inc. 2016. *Water Resources Investigation Update, Kaweah Delta Water Conservation District*, consultant's unpublished report prepared for the Kaweah Delta Water Conservation District, January.
- GEI Consultants, Inc. 2016. *Review of Kaweah Delta Water Resources Investigation Reports*, consultant's unpublished technical memorandum prepared for the Mid-Kaweah Groundwater Sustainability Agency Technical Advisory Committee, July 28.
- Grismer, M.E. 1990. *Leaching Fraction, Soil Salinity, and Drainage Efficiency*. *Journal of California Agriculture*, Vol. 44, No. 6.
- Hilton, G.S., McClelland, E.J., Klausning, R.L, and Kunkel, F. 1963. *Geology, Hydrology, and Quality of Water in the Terra Bella-Lost Hills Area, San Joaquin Valley, California*, USGS Open-file Report, 158 p.
- Jennings, C.W., 2010. *Geologic Map of California*, California Geological Survey.

**Greater Kaweah Groundwater Sustainability Agency (GKGSA)
Groundwater Sustainability Plan – 2022 First Amended Revision**

- KDWCD, 2012. *Groundwater Management Plan 2010 Annual Report*, consultant’s unpublished report prepared for the Kaweah Delta Water Conservation District, August.
<http://www.tulare.ca.gov/home/showdocument?id=2301>
- Klausing, R.L. and Lohman, K.E. 1964. *Upper Pliocene Marine Strata on the East Side of the San Joaquin Valley, California, Art. 124* in Short papers in geology and hydrology, USGS Professional Paper 189-C, p. 81-102.
- Lewis, D. C.; Burgy, R. H. 1964. *The relationship between oak tree roots and groundwater in fractured rock as determined by tritium tracing*. Journal of Geophysical Research. 69(12): 2579-2587.
- Luhdorff & Scalmanini Consulting Engineers (LSCE), J.W. Borchers, M. Carpenter. 2014. *Land Subsidence from Groundwater Use in California. Full Report of Findings* prepared for California Water Foundation. April 2014. 151 p http://ca.water.usgs.gov/land_subsidence/california-subsidence-cause-effect.html.
- Page, R.W. 1986. *Geology of the Tulare Formation and Other Continental Deposits, Kettleman City Area, San Joaquin Valley, California*, with a Section on Ground-Water Management Considerations and Use of Texture Maps, USGS Water Resources Investigations Report 83-4000.
- Park, W.H. and Weddle, J.R. 1959. Correlation Study of Southern San Joaquin Valley, Summary of Operations, in California Oil Fields, V. 45, No. 1, p. 33-34.
- State Water Resources Control Board, 1995. *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*. 1995.
- Tulare County, 2012. *2030 Update Tulare County General Plan*. August 2012.
- Tulare County Flood Control District, 1971. *Flood Control Master Plan for the County of Tulare California*. June 1971.
- University of California at Berkeley, 2017. “Trading Sustainably: Critical Considerations for Local Groundwater Markets Under the Sustainable Groundwater Management Act”. June 2017
- USDA National Agricultural Statistics Service Cropland Data Layer. 2018. *Published crop-specific data layer [Online]*. Available at <https://nassgeodata.gmu.edu/CropScape/> (accessed 3/29/2019). USDA-NASS, Washington, DC.
- USGS, 2015. *California Water Service Well 32-01 Final Results*. USGS Report. November 15, 2015.
https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/6835767984/usgs%20well%2032-01%20%20%20%2011%2010%202015.pdf.
- _____, 2012. *Status and Understanding of Groundwater Quality in the Two Southern San Joaquin Valley Study Units, 2005-2006: California GAMA Priority*. Scientific Investigations Report 2011-5218.
- _____, 2012. *Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow*. USGS Circular 1376, 2012.

**Greater Kaweah Groundwater Sustainability Agency (GKGSA)
Groundwater Sustainability Plan – 2022 First Amended Revision**

- ____, 1998. *Environmental Setting of the San Joaquin-Tulare Basins, California*. Water Resources Investigations Report 97-4205.
- USGS and State Water Resources Control Board (SWRCB) 2017. *Groundwater Quality in the Shallow Aquifers of the Tulare, Kaweah, and Tule Groundwater Basins and Adjacent Highlands areas, Southern San Joaquin Valley, California*, Fact Sheet, January.
- ____, 2008. *Groundwater Quality Data in the Southeast San Joaquin Valley, 2005-2006: Results from the California GAMA Program*, Data Series 351.
- Williamson, A.K., Prudic, D. E., and Swain, L. A., 1989. *Ground-Water Flow in the Central Valley, California*. USGS Professional Paper 1401-D.
- Woodring, W.P., Stewart, Ralph, and Richards, R.W. 1940. *Geology of the Kettleman Hills Oil Field, California*, USGS Professional paper 195, 170 p., 15 fig.

Appendix 1A
Letter of Intent to Form GSAs

LETTER OF INTENT

KAWEAH SUBBASIN COORDINATED GROUNDWATER SUSTAINABILITY AGENCY ACTIVITIES

This Letter of Intent (“LOI”) by and between the Mid-Kaweah Groundwater Sustainability Agency (“MKGSA”), the Greater Kaweah Groundwater Sustainability Agency (“GKGSA”), and the East Kaweah Groundwater Sustainability Agency (“EKGSA”) (individually referred to also as “Party” and collectively referred to as “Parties”), is entered into by the Parties based upon the following commonly understood facts:

1. The California Legislature enacted the Sustainable Groundwater Management Act of 2014 (“SGMA”), which, as amended, establishes a statewide framework for the sustainable management of groundwater resources. SGMA authorizes the formation of a Groundwater Sustainability Agencies (“GSAs”), one or more of which are authorized to be responsible for implementing provisions of SGMA.
2. SGMA allows local agencies or a combination of local agencies overlying a groundwater basin to serve as GSAs to develop and implement one or more Groundwater Sustainability Plans (“GSPs”) over an entire basin, subbasin, or a portion of a basin.
3. Pursuant to Water Code Section 10727, SGMA allows for the preparation of a GSP by three methods: (1) A single GSP covering the entire basin/subbasin developed and implemented by one GSA; (2) A single GSP covering the entire basin/subbasin developed and implemented by multiple GSAs; (3) Multiple GSPs implemented by multiple GSAs that are subject to a single Coordination Agreement that covers the entire basin/subbasin.
4. SGMA requires that if multiple GSPs will be implemented within a basin or subbasin then a Coordination Agreement must be prepared to ensure that the GSPs within a basin or subbasin utilize certain common data and methodologies as specified in Water Code Section 10727.6.
5. The Parties acknowledge that multiple GSAs have been formed within the Kaweah Subbasin and that each Party intends to develop and implement its own GSP. The Parties further acknowledge that careful coordination amongst GSAs within a subbasin is necessary and critical to achieve and maintain SGMA compliance.

The purpose of this LOI is to memorialize the mutual understandings and agreements of the Parties regarding the coordinated activities the Parties intend to undertake to comply with the aforementioned SGMA mandates, with principal emphasis focusing on the Parties’ collective pursuit of Category 2, Tier 1 grant funds from the Sustainable Groundwater Planning (“SGWP”) Grant Program being implemented by the

California Department of Water Resources (“DWR”) and authorized by the Water Quality, Supply and Infrastructure Improvement Act of 2014 (“Prop 1”). The current Category 2, Tier 1 funding opportunity shall be referred to hereinafter as the “Prop 1 Funding for GSPs and other Projects.”

The Parties hereby agree to the following principles and parameters regarding their pursuit of Prop 1 Funding for GSPs and other Projects:

1. Each Party shall be responsible for third-party consultant costs associated with application preparation costs for the Prop 1 Funding for GSPs and other Projects pursuant to the following proportions:

MKGSA	33.3%
GKGSA	33.3%
EKGSA	33.3%

Each Party shall be responsible for its own costs associated all efforts or activities undertaken by said Party’s personnel, the personnel of said Party’s members, and each Party’s legal counsel for the Prop 1 Funding for GSPs and other Projects.

2. The Parties agree to utilize the services of third-party consultant GEI Consultants, Inc. for the purpose of preparing all necessary application materials for the Prop 1 Funding for GSPs and other Projects.
3. The Parties agree that the MKGSA will serve as the administrative point of contact and fiscal agent for the Parties for the purposes of entering into the third-party consultant contract with GEI Consultants, Inc. specifically pertaining to the preparation of application materials for the Prop 1 Funding for GSPs and other Projects, and if such funding is awarded, for purposes of serving as the administrative point of contact and contracting party with DWR.
4. The Parties agree to communicate and coordinate with each other in the preparation of the application for the Prop 1 Funding for GSPs and other Projects, and continue to communicate and coordinate should such funds be awarded, including but not limited to attending regularly scheduled meetings. To the extent that the MKGSA is serving as the administrative point of contact and fiscal agent for the preparation of the application for the Prop 1 Funding for GSPs and other Projects, the MKGSA ensures that the representatives for the EKGSA and GKGSA are adequately consulted with and integrated into said process and activities. In no event shall an application for the Prop 1 Funding for GSPs and other Projects be submitted to DWR without the prior approval of the Parties.

5. Any application materials for the Prop 1 Funding for GSPs and other Projects shall propose a grant award such that, if awarded, each Party would be entitled to the grant award to the following proportions:

MKGSA	33.3%
GKGSA	33.3%
EKGSA	33.3%

6. In the event the Parties are awarded Prop 1 Funding for GSPs and other Projects, each Party shall be entitled to said funding pursuant to the following proportions:

MKGSA	33.3%
GKGSA	33.3%
EKGSA	33.3%

7. Notwithstanding the agreement of the Parties to share equally in the Prop 1 Funding for GSPs and other Projects if awarded, the Parties intend to dedicate their proportionate share of the funding first towards third-party consultant costs associated with the development of certain common data and methodologies as specified in Water Code Section 10727.6 (“Coordination Agreement Preparatory Work”). The Parties acknowledge that they are currently negotiating the terms and conditions of a “Memorandum of Understanding” that they will utilize for purposes of determining the scope and nature of the Coordination Agreement Preparatory Work, as well as the selection of third party consultants necessary for same. Any remaining Prop 1 Funding for GSPs and other Projects will be distributed equally to each Party for that party to utilize in the preparation of its GSP.

8. It is anticipated that work plans and budgets for the following projects will be included in the grant application: (1) Coordination Agreement Preparatory Work, (2) GSP for MKGSA, (3) GSP for GKGSA, and (4) GSP for EKGSA (“Projects”). The Parties shall ensure that the application Prop 1 Funding for GSPs and other Projects shall contain a sufficient number of eligible Projects and sufficient detail such that the total proposal costs are at least equal to the maximum potential grant award (\$1.5 million, as of the execution of this LOI).

9. At this time, the draft proposal solicitation package for the Prop 1 Funding for GSPs and other Projects indicates that a minimum cost share of 50% of the total proposal costs will be required. In this instance, the total of proposal costs for the Projects must be at least \$3 million to secure the maximum grant award. However, the possibility exists that DWR costs sharing for funded project proposals may be waived or reduced in certain circumstances. In the event that a cost share is required, each Party be responsible for identifying its cost share match pursuant to the following proportions:

MKGSA 33.3%
GKGSA 33.3%
EKGSA 33.3%

Pursuant to the draft proposal solicitation package, each Party may cover this cost share match with either GSP-related expenditures incurred after May 18, 2016, or by identifying additional projects that said Party desires to undertake as may be necessary.

For purposes of communications pursuant to this LOI, the point of contact for each Party shall be as follows:

Mid-Kaweah Groundwater Sustainability Agency

J. Paul Hendrix
Mid-Kaweah Groundwater Sustainability Agency
411 E. Kern Ave.
Tulare, CA 93274
jph@tulareid.org

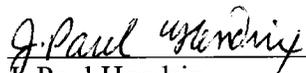
Mark Larsen
Greater Kaweah Groundwater Sustainability Agency
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mlarsen@kdwcd.com

Michael D. Hagman
East Kaweah Groundwater Sustainability Agency
315 E. Lindmore St.
Lindsay, CA 93247
mhagman@lindmoreid.com

The Parties have entered into this LOI as of the last date executed below.

MKGSA:

By:  10/2/17
Chairman Steve Nelsen Date

By:  9/29/17
J. Paul Hendrix Date

GKGSA:

By: Don Mills 10-17-17
Chairman Don Mills Date

By: Mark Larsen 10/17/17
Secretary Mark Larsen Date

EKGSA:

By: Edward Milanesio 10/24/17
Chairman Edward Milanesio Date

By: Michael D. Hagman 10/24/17
Secretary Michael D. Hagman Date

Appendix 1B

Greater Kaweah GSA Joint Powers Agreement and Bylaws