



# KAWEAH SUBBASIN PROBATIONARY HEARING DRAFT STAFF REPORT

## **Appendix A – Summary Table of Proposed Deficiencies and Potential Actions to Address Deficiencies**

May 2024

Deficiency	What SGMA Requires	Deficiency Summary	Potential Actions to Correct the Deficiency
<p><b>Deficiency Groundwater Levels (GL)-1</b> – The 2022 GSPs do not clearly define undesirable results for the chronic lowering of groundwater levels for the subbasin.</p>	<p>The GSP Regulations require a GSA to “describe...the processes and criteria relied upon to define undesirable results applicable to the basin.” This description must include the cause of past or potential undesirable results, “the criteria used to define when and where the effects of the groundwater conditions cause undesirable results,” and the potential effects of undesirable results on groundwater uses and users and land uses and property interests (Cal. Code Regs., tit. 23, § 354.26).</p>	<p><b>DWR Inadequate Determination summary:</b> The 2022 GSPs describes the causes leading to undesirable results but does not clearly define undesirable results consistent with the GSP Regulations. The 2022 GSP does not describe how significant and unreasonable effects will be avoided.</p> <p><b>Board additional issues:</b> None.</p>	<p><b>Potential Action GL-1</b> – Define the undesirable result for the chronic lowering of groundwater levels and explain how significant and unreasonable effects will be avoided.</p>
<p><b>Deficiency GL-2</b> – The GSAs did not select minimum thresholds based on avoiding undesirable results and significant and unreasonable impacts to beneficial uses and users.</p>	<p>The GSP Regulations requires GSAs to establish minimum thresholds that quantify groundwater conditions for chronic lowering of groundwater levels to avoid undesirable results (Cal. Code Regs., tit. 23, § 354.28(a)).</p>	<p><b>DWR Inadequate Determination summary:</b> Minimum thresholds have not been selected based on the avoidance of undesirable results and significant and unreasonable impacts to beneficial uses and users as required by the GSP Regulations and specified in the corrective action.</p> <p><b>Board additional issues:</b> Board staff questions how selected minimum thresholds would avoid undesirable results when minimum thresholds are set at declining groundwater levels projected to 2040.</p>	<p><b>Potential Action GL-2</b> – Select minimum thresholds to avoid undesirable results and significant and unreasonable impacts to beneficial uses and users.</p>
<p><b>Deficiency GL-3</b> – The GSAs do not thoroughly explain the effects groundwater level MTs have on other sustainability indicators, such as groundwater storage, subsidence, degradation of groundwater quality, and depletions of interconnected surface water.</p>	<p>The GSP Regulations require the GSA to determine how basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators. (Cal. Code Regs., tit. 23, § 354.28, subd. (b)(2)).</p>	<p><b>DWR Inadequate Determination summary:</b> The DWR Inadequate Determination noted the following, “none of the GSPs have thoroughly explained how water level minimum thresholds will not cause undesirable results for other sustainability indicators, in particular subsidence and water quality.”</p> <p><b>Board additional issues:</b> None.</p>	<p><b>Potential Action GL-3</b> – Describe the relationship between groundwater level minimum thresholds for each sustainability indicator. Revise groundwater level minimum thresholds as necessary to avoid undesirable results for other sustainability indicators.</p>
<p><b>Deficiency GL-4</b> – The 2022 Coordination Agreement’s discussion of the Mitigation Program Framework lacks specific details.</p>	<p>Although SGMA and the GSP Regulations do not require development of a well impact mitigation plan, many GSAs have proposed to couple such plans with MTs to allow for greater groundwater level declines while avoiding undesirable results.</p>	<p><b>DWR Inadequate Determination summary:</b> The Mitigation Program Framework proposed in the adapted 2022 Coordination Agreement is labeled as ‘draft’ and ‘for discussion purpose only’ and is unclear of the GSA’s commitment to this framework. The Mitigation Program Framework lacks details to assess the feasibility and likely effectiveness of the mitigation actions. DWR also noted that the scope of the mitigation plans must be revisited given the GSAs have focused on the narrowed subset of wells.</p> <p><b>Board additional issues:</b> Board staff notes that the Mitigation Program Framework and the GSA mitigation plans lacks specific details on appropriate funding sources, complexity and timeliness on mitigation processes, and an implementation schedule.</p>	<p><b>Potential Action GL-4</b> – Establish accessible and appropriately funded well impact mitigation programs that mitigate impacts to all wells affected by lowering of groundwater levels and degradation of water quality. Develop well mitigation programs with clear triggers, eligibility requirements, implementation schedule, and funding sources. (This action supports addressing both Deficiency GL-4 and Deficiency GWQ-4b.)</p>

Deficiency	What SGMA Requires	Deficiency Summary	Potential Actions to Correct the Deficiency
<p><b>Deficiency Land Subsidence (LS)-1</b> - The GSPs do not provide reasonable justification for subsidence SMC that involves the subbasin's water conveyance infrastructure.</p>	<p>The GSP Regulations require a GSA to “describe...the processes and criteria relied upon to define undesirable results applicable to the basin.” This description must include the cause of past or potential undesirable results, “the criteria used to define when and where the effects of the groundwater conditions cause undesirable results,” and the potential effects of undesirable results on groundwater uses and users, land uses, and property interests (Cal. Code Regs., tit. 23, § 354.26).</p>	<p><b>DWR Inadequate Determination summary:</b> The GSPs did not explain the methodology or how it was determined that approximately 10 inches or greater amount of subsidence would result in a 10% or more capacity loss in the subbasin’s conveyance infrastructure. The GSAs should explicitly describe the analysis that went into establishing the 10% capacity criteria.</p> <p><b>Board additional issues:</b> Board staff note that minimum threshold definitions include both an annual subsidence rate and maximum cumulative amount of 9.5 inches of subsidence. Board staff find it more reasonable to set a lower minimum threshold annual subsidence rate that is more protective and will allow for earlier detection of potential subsidence impacts along the Friant-Kern Canal.</p>	<p><b>Potential Action LS-1a</b> – Clearly define the subsidence conditions that would result in an undesirable result for the subbasin and provide enough detail so that associated MTs can be determined (Cal. Code Regs., tit. 23 § 354.28).</p> <p><b>Potential Action LS-1b</b> – Establish an annual subsidence rate MT that is less than the estimated cumulative subsidence amount expected to significantly impact the Friant-Kern Canal.</p>
<p><b>Deficiency LS-2</b> - The GSPs do not adequately define the relationship between groundwater level SMC and potential subsidence impacts.</p>	<p>The GSP Regulations require a GSA to describe “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.” (Cal. Code Regs., tit. 23, § 354.28 (b)(2)). More specific to DWR’s determination, the GSP Regulations also require that minimum thresholds for chronic lowering of groundwater levels shall be supported by potential effects on other sustainability indicators.” (Cal. Code Regs., tit. 23, § 354.28 (c)(1)(B)).</p>	<p><b>DWR Inadequate Determination summary:</b> DWR determined that the GSPs has not provided an explanation of how undesirable results for subsidence will be avoided with current groundwater level SMC. Considerable additional subsidence is expected to occur if groundwater levels are reduced to groundwater level SMC, and the GSPs do not adequately evaluate the potential impacts of groundwater level SMC on subsidence rates.</p> <p><b>Board additional issues:</b> Board staff note that undesirable results definition, which is currently established as exceedances at one-third of RMS sites, may still allow for considerable localized subsidence impacts to infrastructure.</p>	<p><b>Potential Action LS-2</b> – Update and establish more protective SMC definitions so water level declines do not cause subsidence undesirable results.</p>

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<p><b>Deficiency LS-3</b> – Significant impacts to conveyance infrastructure and undesirable results are expected under projected subsidence rates without mitigation.</p>	<p>Each GSP is required to include a description of the projects and management actions the GSA has determined will achieve groundwater sustainability in the basin. The description must include projects and management actions, summary of data used to support proposed actions, and a review of the uncertainty associated with the basin setting when developing projects or management actions (Cal. Code Regs., tit. 23, § 354.44).</p> <p>In reviewing GSPs, DWR must consider, among other questions, “whether sustainable management criteria and projects and management actions are commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the plan” and “whether the projects and management actions are feasible and likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield” (Cal. Code Regs., tit. 23, § 355.4, subd. (b)(3), (5)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board additional issues:</b></p> <ul style="list-style-type: none"> <li>• <b>Infrastructure Impacts</b> – Critical infrastructure mitigation is not required under the Mitigation Program Framework, despite expected significant impacts along water conveyance infrastructure due to differential subsidence.</li> </ul>	<p><b>Potential Action LS-3a</b> – Restrict pumping near critical infrastructure and other conveyance structures to avoid undesirable results.</p> <p><b>Potential Action LS-3b</b> - Revise the mitigation program to include conveyance infrastructure expected to experience significant impacts with clear mitigation triggers and funding sources.</p>
<p><b>Deficiency Groundwater Quality (GWQ)-1</b> – The 2022 GSPs do not clearly define the conditions that would be considered an undesirable result.</p>	<p>The GSP Regulations require a GSA to “describe...the processes and criteria relied upon to define undesirable results applicable to the basin.” This description must include the cause of past or potential undesirable results, “the criteria used to define when and where the effects of the groundwater conditions cause undesirable results,” and the potential effects of undesirable results on groundwater uses and users and land uses and property interests (Cal. Code Regs., tit. 23, § 354.26).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board issues:</b> The 2022 GSPs and coordination agreement define an undesirable result as when “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” (2022 Coordination Agreement, Appendix 6). The GSPs do not clearly describe how the subbasin would determine if SMC exceedances are impacted by groundwater pumping and recharge projects as opposed to other factors. The GSAs and the State Water Board therefore cannot evaluate whether the proposed SMC are adequate or if the broader quantitative definition of an undesirable result would guide day-to-day basin management as appropriate for avoiding plain-language undesirable results.</p>	<p><b>Potential Action GWQ-1</b> – Clearly define the conditions of an undesirable result. Explain how GSAs would determine the water quality impacts of:</p> <ul style="list-style-type: none"> <li>• Projects and management actions</li> <li>• Subsidence</li> <li>• Continued pumping</li> </ul>

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<p><b>Deficiency GWQ-2</b> – Sustainable Management Criteria in the 2022 GSPs are not consistent with GSP Regulations.</p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-2a</b> – The GSPs’ definition of an undesirable result would result in delayed identification of significant and unreasonable impacts and therefore delayed basin management.</li> <li>• <b>Deficiency GWQ-2b</b> – The GSPs do not consider all constituents with known exceedances nor justify not setting SMC for constituents with known exceedances.</li> <li>• <b>Deficiency GWQ-2c</b> – MTs based on agricultural standards are applied to domestic wells and SMC do not consider domestic well users.</li> </ul>	<p>The GSP Regulations require GSAs to base their MTs for degradation of water quality 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.” Also, GSAs must consider “local, state, and federal water quality standards applicable to the basin” in setting MTs (Cal. Code Regs., tit. 23, § 354.28, subd. (c)(4)). In describing MTs, GSPs must describe how MTs “may affect the interests of beneficial uses and users of groundwater or land uses and property interests.” (Cal. Code Regs., tit. 23, § 354.28, subd. (b)(4)). The Basin Setting shall include “groundwater quality issues that may affect the supply and beneficial uses of groundwater” (Cal. Code Regs § 354.16, subd. (d)) and MT shall be based on “concentrations of constituents determined by the Agency to be of concern for the basin...” (Cal. Code Regs § 354.28 subd. (c)(4)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board issues:</b></p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-2a</b> – The GSPs require that average constituent concentrations at one-third of RMS exceed MTs under a 10-year running average before being considered an undesirable result. Board staff note that this method may allow for drinking water to degrade substantially below drinking water standards before being considered an undesirable result. This may result in delayed management or mitigation of water quality undesirable results.</li> <li>• <b>Deficiency GWQ-2b</b> – The GSPs do not consider all the constituents with exceedances, specifically uranium (This is based on the SGMA Groundwater Quality Visualization Tool).</li> <li>• <b>Deficiency GWQ-2c</b> – MTs for RMS in agricultural areas are based on Water Quality Objectives rather than MCLs. This means that water quality in domestic wells could degrade below drinking water standards without being considered an undesirable result.</li> </ul>	<p><b>Potential Action GWQ-2</b> – Update Sustainable Management Criteria to be consistent with GSP Regulations.</p> <ul style="list-style-type: none"> <li>• <b>Potential Action GWQ-2a</b> – Revise the undesirable results and MT definitions to avoid any significant and unreasonable impacts.</li> <li>• <b>Potential Action GWQ-2b</b> – Use the best available data when defining constituents and set SMC for all constituents in the subbasin that may impact beneficial uses and users.</li> <li>• <b>Potential Action GWQ-2c</b> – Revise criteria to categorize RMS and describe potential impacts to all beneficial uses and users.</li> </ul>

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<p><b>Deficiency GWQ-3</b> – Water quality monitoring networks are not consistent with the GSP Regulations.</p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-3a</b> – Monitoring networks do not clearly monitor impacts to domestic drinking water wells.</li> <li>• <b>Deficiency GWQ-3b</b> – Discrepancies in monitoring networks and reported data.</li> </ul>	<p>The GSP Regulations require GSPs to include a description of the monitoring network objectives for the basin, including how the GSA will “monitor impacts to the beneficial uses or users of groundwater” (Cal. Code Regs., tit. 23, § 354.34, subd. (b)(2)). The monitoring network must be “capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate [GSP] implementation.” (Cal. Code Regs., tit. 23, § 354.34, subd. (a)). Data collected must be of “sufficient quality, frequency, and distribution” to characterize and evaluate groundwater conditions (Cal. Code Regs., tit. 23, § 354.32).</p> <p>GSA’s “may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin...”, known as RMSs (Cal. Code Regs., tit. 23, § 354.36). GSA’s identify MTs, MOs, and Interim Milestones at these sites. “The designation of [an RMS] shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area” (Cal. Code Regs., tit. 23, § 354.36, subds. (a) &amp; (c)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board issues:</b></p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-3a</b> – The GSPs do not demonstrate that the monitoring networks for water quality allow the GSA’s to monitor impacts to domestic drinking water wells. The GSA’s primarily use public supply wells to represent drinking water wells. Public supply wells are often deeper than domestic wells and are constructed in a way to avoid groundwater containing constituents of concern. As a result, the water quality readings in public supply wells are likely not representative of conditions in shallow domestic wells.</li> <li>• <b>Deficiency GWQ-3b</b> – State Water Board staff have identified discrepancies in the monitoring network descriptions among the GSPs, Coordination Agreement, and Water Year (WY) 2022 Annual Report. Staff are also uncertain about the reported percent of MT exceedances for the subbasin’s water quality RMS as described in the GSA’s WY 2022 Annual Report.</li> </ul>	<p><b>Potential Action GWQ-3</b> – Update the water quality monitoring networks to be consistent with GSP Regulations.</p> <ul style="list-style-type: none"> <li>• <b>Potential Action GWQ-3a</b> – Add description on how the existing monitoring networks effectively monitor impacts to shallow well users.</li> <li>• <b>Potential Action GWQ-3b</b> – Clearly define which wells are RMS monitored for GSP implementation and update tables and figures in the Coordination Agreement, individual GSPs, and annual reports.</li> </ul>

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<p><b>Deficiency GWQ-4</b> – Management actions are not responsive to water quality degradation.</p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-4a</b> – Additional sampling is not triggered when MTs are exceeded.</li> <li>• <b>Deficiency GWQ-4b</b> – Well mitigation plans don't address water quality degradation.</li> </ul>	<p>Each GSP is required to include a description of the projects and management actions the GSA has determined will achieve groundwater sustainability in the basin. The GSAs must 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" (Cal. Code Regs., tit. 23, § 354.44, subd. (b)(1)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board issues:</b></p> <ul style="list-style-type: none"> <li>• <b>Deficiency GWQ-4a</b> – Board staff note that elevated concentrations of arsenic, nitrate, uranium, gross alpha, and other constituents can severely impact human health. It is difficult to understand how GSAs can avoid significant and unreasonable impacts from degradation of groundwater quality if MT exceedances don't trigger additional monitoring to better characterize risks to beneficial uses and users.</li> <li>• <b>Deficiency GWQ-4b</b> – The GSAs are developing mitigation plans to address impacts due to declining groundwater levels and land subsidence. These plans should also mitigate degradation of water quality.</li> </ul>	<p><b>Potential Action GWQ-4</b> – Update management actions to be responsive to water quality degradation.</p> <ul style="list-style-type: none"> <li>• <b>Potential Action GWQ-4a</b> – Plan additional sampling when water quality is degraded.</li> <li>• <b>Potential Action GWQ-4b</b> – Include water quality in well mitigation programs with clear triggers, eligibility requirements, metrics, and funding sources. (This action supports addressing both Deficiency GL-4 and Deficiency GWQ-4b.)</li> </ul>
<p><b>Deficiency Interconnected Surface Water (ISW)-1</b> – The GSPs, in setting SMC for depletions of ISW, did not adequately describe the impacts of those criteria on beneficial uses and users.</p>	<p>GSP Regulations require GSPs to describe "the processes and criteria relied upon to define undesirable results applicable to the basin." This description must include the cause of past or potential undesirable results, "the criteria used to define when and where the effects of the groundwater conditions cause undesirable results," and the potential effects of undesirable results on groundwater uses and users, land uses, and property interests (Cal. Code Regs., tit. 23 § 354.26). Additionally, the GSPs must set their MTs for depletions of ISW at "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" (Cal. Code Regs., tit. 23 § 354.28, subd. (c)(6)). In describing MTs, GSPs must describe how MTs "may affect the interests of beneficial uses and users of groundwater or land uses and property interests" (Cal. Code Regs., tit. 23, § 354.28, subd. (b)(4)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board additional issues:</b> The GSPs did not adequately describe the potential effects on beneficial uses and users of groundwater and surface water that may result from depletions of ISW, particularly for environmental users within the subbasin. Without a clear understanding of the potential effects on beneficial uses and users and a clear definition of what is considered "significant and unreasonable," it is difficult for GSAs and Board staff to evaluate whether the MTs are appropriate for avoiding undesirable results.</p>	<p><b>Potential Action ISW-1</b> – Consider all beneficial uses and users when setting SMC for depletions of ISW and specifically describe the impacts of those criteria on beneficial uses and users.</p>

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<p><b>Deficiency ISW-2</b> – The GSPs did not establish MTs for depletions of ISW that are consistent with GSP Regulations.</p>	<p>The GSP Regulations require GSAs to describe “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” (Cal. Code Regs., tit. 23 § 354.28(b)(1)). Also, MTs established for depletions of ISW must be supported by "(A) The location, quantity, and timing of depletions of interconnected surface water" and "(B) A description of the groundwater and surface water model used to quantify surface water depletion" (Cal. Code Regs., tit. 23 § 354.28(c)(6)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board additional issues:</b> The MTs established by the GSPs are not supported with best available information, best available science, or a model that quantifies surface water depletion.</p>	<p><b>Potential Action ISW-2</b> – Establish MTs for depletions of ISW that are consistent with GSP regulations.</p>
<p><b>Deficiency ISW-3</b> – The GSPs did not establish a monitoring network designed to address depletions of ISW.</p>	<p>The GSP Regulations require GSAs to implement a monitoring network for depletions of ISW that is designed to monitor surface water and groundwater, characterize the spatial and temporal exchanges between surface water and groundwater, and calibrate and apply tools and methods necessary to calculate depletions of surface water caused by groundwater extractions (Cal. Code Regs., tit. 23 § 354.34(c)(6)).</p>	<p><b>DWR Inadequate Determination summary:</b> None.</p> <p><b>Board additional issues:</b> The GSPs do not have a monitoring network in place to monitor groundwater and surface water interactions, and current knowledge is based on groundwater level contours and limited local knowledge. Without a sufficient monitoring network, it is not possible to accurately identify ISW, establish SMC, and evaluate progress towards achieving sustainable groundwater management within the subbasin.</p>	<p><b>Potential Action ISW-3</b> – Create a monitoring network in the Kaweah Subbasin for depletions of ISW that is consistent with GSP Regulations.</p>