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CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

January 28, 2022

Ronnie Samuelian
Kings Subbasin Point of Contact
1800 30th Street, Suite 280
Bakersfield, CA 93301
rsamuelian@ppeng.com

RE: Incomplete Determination of the 2020 Groundwater Sustainability Plans Submitted for the San Joaquin Valley – Kings Subbasin

Dear Ronnie Samuelian,

The Department of Water Resources (Department) has evaluated the seven groundwater sustainability plans (GSPs) submitted for the San Joaquin Valley – Kings Subbasin (Subbasin), as well as the materials considered to be part of the required coordination agreement. Collectively, the seven GSPs and the coordination agreement are referred to as the Plan for the Subbasin. The Department has determined that the Plan is incomplete pursuant to Section 355.2(e)(2) of the GSP Regulations.

The Department based its incomplete determination on recommendations from the Staff Report, included as an enclosure to the attached Statement of Findings, which describes that the Subbasin's Plan does not satisfy the objectives of the Sustainable Groundwater Management Act (SGMA) nor substantially comply with the GSP Regulations. The Staff Report also provides corrective actions which the Department recommends the Subbasin's seven groundwater sustainability agencies (GSAs) review while determining how and whether to address the deficiencies in a coordinated manner.

The Subbasin's GSAs have 180 days, the maximum allowed by the GSP Regulations, to address the identified deficiencies. Where addressing the deficiencies requires modification of the Plan, the GSAs must adopt those modifications into their respective GSPs and all applicable coordination agreement materials, or otherwise demonstrate that those modifications are part of the Plan before resubmitting it to the Department for evaluation no later than July 27, 2022. The Department understands that much work has occurred to advance sustainable groundwater management since the GSAs submitted their GSPs in January 2020. To the extent to which those efforts are related or responsive to the Department's identified deficiencies, we encourage you to document that as part of your Plan resubmittal. The Department prepared a Frequently Asked Questions document to provide general information and guidance on the process of addressing deficiencies in an incomplete determination.

Department staff will work expeditiously to review the revised components of your Plan resubmittal. If the revisions sufficiently address the identified deficiencies, the Department will determine that the Plan is approved. In that scenario, Department staff

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will identify additional recommended corrective actions that the GSAs should address early in implementing their GSPs (i.e., no later than the first required periodic evaluation). Among other items, those corrective actions will recommend the GSAs provide more detail on their plans and schedules to address data gaps. Those recommendations will call for significantly expanded documentation of the plans and schedules to implement specific projects and management actions. Regardless of those recommended corrective actions, the Department expects the first periodic evaluations, required no later than January 2025 – one-quarter of the way through the 20-year implementation period – to document significant progress toward achieving sustainable groundwater management.

If the Subbasin's GSAs cannot address the deficiencies identified in this letter by July 27, 2022, then the Department, after consultation with the State Water Resources Control Board, will determine the GSP to be inadequate. In that scenario, the State Water Resources Control Board may identify additional deficiencies that the GSAs would need to address in the state intervention processes outlined in SGMA.

Please contact Sustainable Groundwater Management Office staff by emailing sgmps@water.ca.gov if you have any questions about the Department's assessment, implementation of your Plan, or to arrange a meeting with the Department.

Thank you,

Paul Gosselin

Paul Gosselin
Deputy Director of Sustainable Groundwater Management

Attachment: Statement of Findings Regarding the Determination of Incomplete Status of the San Joaquin Valley – Kings Subbasin Groundwater Sustainability Plans

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# STATE OF CALIFORNIA
# DEPARTMENT OF WATER RESOURCES

## STATEMENT OF FINDINGS REGARDING THE DETERMINATION OF INCOMPLETE STATUS OF THE SAN JOAQUIN VALLEY – KINGS SUBBASIN GROUNDWATER SUSTAINABILITY PLANS

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA), is likely to achieve the sustainability goal for the basin covered by the GSP, and whether the GSP adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the GSP within two years of its submission. (Water Code § 10733.4.)

SGMA allows for multiple GSPs implemented by multiple groundwater sustainability agencies (GSAs) and coordinated pursuant to a single coordination agreement that covers the entire basin to be an acceptable planning scenario. (Water Code § 10727.) In the San Joaquin Valley – Kings Subbasin (Subbasin), seven separate GSPs were prepared by seven GSAs pursuant to the required coordination agreement. This Statement of Findings explains the Department's decision regarding the multiple GSPs covering the Subbasin. Collectively, the seven GSPs and the coordination agreement are referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- *Central Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (Central Kings GSP) – prepared the Central Kings GSA (CKGSA).
- *James Groundwater Sustainability Agency Groundwater Sustainability Plan* (James GSP) – prepared by the James GSA (JGSA).
- *Kings River East Groundwater Sustainability Agency Groundwater Sustainability Plan* (Kings River East GSP) – prepared by the Kings River East GSA (KREGSA).
- *McMullin Area Groundwater Sustainability Agency Groundwater Sustainability Plan* (McMullin GSP) – prepared by the McMullin Area GSA (MAGSA).
- *North Fork Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (North Fork Kings GSP) – prepared by the North Fork Kings GSA (NFKGSA).
- *North Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (North Kings GSP) – prepared by the North Kings GSA (NKGSA).

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- *South Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (South Kings GSP) – prepared by the South Kings GSA (SKGSA).

Department management has reviewed the enclosed Staff Report, which recommends that the deficiencies identified should preclude approval of the Plan. Based on its review of the Staff Report, Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with, and hereby adopts, staff's recommendation and all the corrective actions provided. The Department thus deems the Plan incomplete based on the Staff Report and the findings contained herein.

A. The GSPs do not set their sustainable management criteria for chronic lowering of groundwater levels in a manner consistent with the requirements of SGMA and the GSP Regulations.

    1. The GSPs lack justification for, and the effects associated with, the undesirable result definition for the chronic lowering of groundwater levels. The GSAs do not consider the effect the groundwater conditions, associated with the undesirable result definition, would have on the interests of the Subbasin's beneficial uses and users of groundwater. Additionally, the definition appears to be inconsistent with the intent of SGMA to manage groundwater basins sustainably and for the avoidance of undesirable results.

    2. The GSPs did not establish their minimum thresholds in a manner consistent with SGMA and the GSP Regulations. Specifically, the GSPs established minimum thresholds that were decoupled from the Subbasin's undesirable result definition and do not represent an actual threshold that, if exceeded, may cause an undesirable result.

B. The GSPs do not set minimum thresholds and measurable objectives for land subsidence in a manner consistent with their undesirable result definition and the requirements of SGMA and the GSP Regulations.

    1. The SKGSA did not provide adequate information and data to demonstrate that undesirable results related to land subsidence are not present and are not likely to occur.

    2. The GSPs did not include similar methods to identify the structures, infrastructure, and/or major roads within individual plan areas nor did they provide any metrics to determine the level of functionality loss that is deemed significant and unreasonable, per the Subbasin's undesirable result definition.

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3. Each GSP, except for JGSA and SKGSA, established minimum thresholds that were greater than or equal to an individual plan area's maximum historical land subsidence rate. Collectively, the GSAs established minimum thresholds which ranged from 4 to 12.5 inches per year. These GSPs do not provide adequate information and criteria to justify the established minimum thresholds.

4. The GSPs established measurable objectives which ranged from 3 to 10 inches per year. These measurable objectives do not appear to be consistent with the intent of SGMA to avoid or minimize land subsidence once basins achieve their sustainability goal.

C. The GSPs do not consistently identify interconnected surface water systems, or provide the location, quantity, and timing of depletions of those systems due to groundwater use. The GSPs do not define sustainable management criteria for the depletions of interconnected surface water in the manner required by the GSP Regulations.

    1. The GSPs do not include a subbasin-wide integrated surface water-groundwater numerical model or an equally effective method, tool, or analytical model.

    2. The GSAs do not currently have a sufficient technical understanding of interconnected surface waters in the Subbasin and do not identify this lack of understanding as a data gap.

    3. The GSPs do not establish sustainable management criteria for the depletions of interconnected surface water nor do the GSPs sufficiently demonstrate that undesirable results for the depletions of interconnected surface water are not applicable for the Subbasin.

D. The GSPs do not provide adequate information to support the selection of degraded water quality sustainable management criteria.

    1. The CKGSA did not provide sufficient rational for not establishing sustainable management criteria for degraded water quality until the first five-year update.

    2. The remaining GSPs do not provide numerical minimum threshold values at groundwater wells where the historical concentrations of a constituent of concern was greater than the constituent's maximum contaminant level (MCL).

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3. The GSPs do not provide information related to how the GSAs evaluated whether GSA actions, which occur during GSP implementation, are attributing to the degradation of groundwater quality and whether the monitoring network can sufficiently determine the cause(s) of future groundwater quality degradation.

Based on the above, the Plan submitted by the GSAs in the San Joaquin Valley – Kings Subbasin is determined to be incomplete because the Plan does not satisfy the requirements of SGMA, nor does it substantially comply with the GSP Regulations. The corrective actions provided in the enclosed Staff Report are intended to address the deficiencies that, at this time, preclude the Plan's approval. The GSAs have up to 180 days to address the deficiencies outlined above and detailed in the Staff Report. Once the GSAs resubmit their respective GSPs and the required coordination agreement, the Department will review the revised Plan to evaluate whether the deficiencies were sufficiently addressed. Should the GSAs fail to take sufficient actions to correct the deficiencies identified by the Department, the Department shall disapprove the Plan if, after consultation with the State Water Resources Control Board, the Department determines the Plan to be inadequate pursuant to 23 CCR § 355.2(e)(3)(C).

Signed:

Karla Nemeth, Director
Date: January 28, 2022

Enclosure: Groundwater Sustainability Plan Assessment Staff Report – San Joaquin Valley – Kings Subbasin

# State of California
# Department of Water Resources
# Sustainable Groundwater Management Program
# Groundwater Sustainability Plan Assessment Staff Report

| | |
|---|---|
| Groundwater Basin Name: | San Joaquin Valley – Kings Subbasin (No. 5-022.08) |
| Number of GSPs: | 7 (see list below) |
| Number of GSAs: | 7 (see list below) |
| Point of Contact: | Ronnie Samuelian |
| Recommendation: | Incomplete |
| Date: | January 28, 2022 |

The Sustainable Groundwater Management Act (SGMA)[1] allows for any of the three following planning scenarios: a single groundwater sustainability plan (GSP) developed and implemented by a single groundwater sustainability agency (GSA); a single GSP developed and implemented by multiple GSAs; and multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement.[2] GSAs developing GSPs are expected to comply with SGMA and substantially comply with the Department of Water Resources' (Department) GSP Regulations.[3] The Department is required to evaluate an adopted GSP within two years of its submittal date and issue a written assessment.[4]

In the Kings Subbasin (Subbasin), seven separate GSPs were prepared by seven GSAs pursuant to a required coordination agreement.[5] The coordination agreement includes a legal agreement signed by all GSAs in the Subbasin. Collectively, the seven GSPs and the coordination agreement will, for evaluation and assessment purposes, be treated and referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- *Central Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (Central Kings GSP) – prepared the Central Kings GSA (CKGSA).
- *James Groundwater Sustainability Agency Groundwater Sustainability Plan* (James GSP) – prepared by the James GSA (JGSA).
- *Kings River East Groundwater Sustainability Agency Groundwater Sustainability Plan* (Kings River East GSP) – prepared by the Kings River East GSA (KREGSA).

[1] Water Code § 10720 *et seq*.
[2] Water Code § 10727.
[3] 23 CCR § 350 *et seq*.
[4] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[5] Water Code § 10733.4(b).

- *McMullin Area Groundwater Sustainability Agency Groundwater Sustainability Plan* (McMullin GSP) – prepared by the McMullin Area GSA (MAGSA).
- *North Fork Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (North Fork Kings GSP) – prepared by the North Fork Kings GSA (NFKGSA).
- *North Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (North Kings GSP) – prepared by the North Kings GSA (NKGSA).
- *South Kings Groundwater Sustainability Agency Groundwater Sustainability Plan* (South Kings GSP) – prepared by the South Kings GSA (SKGSA).

Department staff have thoroughly evaluated the Plan, the Subbasin's coordination agreement, and other information provided or available and known to staff, and have identified deficiencies in the Plan that staff recommend should preclude its approval.[6] In addition, consistent with the GSP Regulations, Department staff have provided corrective actions that the GSAs should review while determining how and whether to address the deficiencies in a coordinated manner.[7] The deficiencies and corrective actions are explained in greater detail in Section 3 of this staff report and are generally related to the need to define sustainable management criteria in the manner required by SGMA and the GSP Regulations and the development of sustainable management criteria for depletions of interconnected surface water.

This assessment includes four sections:

- **Section 1 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 2 – Required Conditions:** Describes the submission requirements, Plan completeness, and basin coverage required for a Plan to be evaluated by the Department.
- **Section 3 – Plan Evaluation:** Provides a detailed assessment of identified deficiencies in the Plan. Consistent with the GSP Regulations, Department staff have provided corrective actions for the GSAs to address the deficiencies.
- **Section 4 – Staff Recommendation:** Provides staff's recommendation regarding the Department's determination.

[6] 23 CCR §355.2(e)(2).
[7] 23 CCR §355.2(e)(2)(B).

# 1 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA [8] and is likely to achieve the basin's sustainability goal. [9] To achieve the sustainability goal, the Plan must demonstrate that implementation will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results. [10] Undesirable results are required to be defined quantitatively by the GSAs overlying a basin and occur when significant and unreasonable effects for any of the applicable sustainability indicators are caused by groundwater conditions occurring throughout the basin. [11] The Department is also required to evaluate whether the Plan will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.[12]

For a Plan to be evaluated by the Department, it must first be determined that it was submitted by the statutory deadline[13] and that it is complete and covers the entire basin.[14] Additionally, for those GSAs choosing to develop multiple GSPs, the Plan submission must include a coordination agreement.[15] The coordination agreement must explain how the multiple GSPs in the basin have been developed and implemented utilizing the same data and methodologies and that the elements of the multiple GSPs are based upon consistent interpretations of the basin's setting. If these required conditions are satisfied, the Department evaluates the Plan to determine whether it complies with SGMA and substantially complies with the GSP Regulations.[16] As stated in the GSP Regulations, "[s]ubstantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal."[17]

When evaluating whether the Plan is likely to achieve the sustainability goal for the basin, Department staff review the information provided for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice. [18] The Department's review considers whether there is a reasonable relationship between the

[8] Water Code §§ 10727.2, 10727.4, 10727.6.
[9] Water Code § 10733(a).
[10] Water Code § 10721(v).
[11] 23 CCR § 354.26.
[12] Water Code § 10733(c).
[13] 23 CCR § 355.4(a)(1).
[14] 23 CCR §§ 355.4(a)(2), 355.4(a)(3).
[15] 23 CCR § 357.4.
[16] 23 CCR § 350 *et seq*.
[17] 23 CCR § 355.4(b).
[18] 23 CCR § 351(h).

information provided by the GSAs and the assumptions and conclusions presented in the Plan, including whether the interests of the beneficial uses and users of groundwater in the basin have been considered; whether sustainable management criteria and projects and management actions described in the Plan are commensurate with the level of understanding of the basin setting; and whether those projects and management actions are feasible and likely to prevent undesirable results.[19] The Department also considers whether the GSAs have the legal authority and financial resources necessary to implement the Plan.[20]

To the extent overdraft is present in a basin, the Department evaluates whether the Plan provides a reasonable assessment of the overdraft and includes reasonable means to mitigate it.[21] When applicable, the Department will assess whether coordination agreements have been adopted by all relevant parties and satisfy the requirements of SGMA and the GSP Regulations.[22] The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.[23] Lastly, the Department's review considers the comments submitted on the Plan and evaluates whether the GSAs have adequately responded to the comments that raise credible technical or policy issues with the Plan.[24]

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment.[25] The assessment is required to include a determination of the Plan's status.[26] The GSP Regulations provide three options for determining the status of a Plan: approved,[27] incomplete,[28] or inadequate.[29]

After review of the Plan, Department staff may conclude that the information provided is not sufficiently detailed, or the analyses not sufficiently thorough and reasonable, to evaluate whether it is likely to achieve the sustainability goal for the basin. If the Department determines the deficiencies precluding approval may be capable of being corrected by the GSAs in a timely manner,[30] the Department will determine the status of the Plan to be incomplete. A formerly deemed incomplete Plan may be resubmitted to the Department for reevaluation after all deficiencies have been addressed and incorporated into the Plan within 180 days after the Department makes its incomplete determination. The Department will review the revised Plan to evaluate whether the identified deficiencies were sufficiently addressed. Depending on the outcome of that evaluation,

[19] 23 CCR §§ 355.4(b)(1), (3), (4) and (5).
[20] 23 CCR § 355.4(b)(9).
[21] 23 CCR § 355.4(b)(6).
[22] 23 CCR § 355.4(b)(8).
[23] 23 CCR § 355.4(b)(2).
[24] 23 CCR § 355.4(b)(10).
[25] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[26] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[27] 23 CCR § 355.2(e)(1).
[28] 23 CCR § 355.2(e)(2).
[29] 23 CCR § 355.2(e)(3).
[30] 23 CCR § 355.2(e)(2)(B)(i).

the Department may determine the resubmitted Plan is approved. Alternatively, the Department may find a formerly deemed incomplete GSP is inadequate if, after consultation with the State Water Resources Control Board, it determines that the GSAs have not taken sufficient actions to correct any identified deficiencies.[31]

The staff assessment of the Plan involves the review of information presented by the GSAs, including models and assumptions, and an evaluation of that information based on scientific reasonableness. In conducting its assessment, the Department does not recalculate or reevaluate technical information provided in the Plan or perform its own geologic or engineering analysis of that information. The recommendation to approve a Plan does not signify that Department staff, were they to exercise the professional judgment required to develop a Plan for the basin, would make the same assumptions and interpretations as those contained in the Plan, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSAs are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review and assessment of an approved Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.[32] Also, GSAs have an ongoing duty to reassess their GSPs, provide annual reports to the Department, and, when necessary, update or amend their GSPs.[33] The passage of time or new information may make what is reasonable and feasible at the time of this review to not be so in the future. The emphasis of the Department's periodic reviews will be to assess the GSA's progress toward achieving the basin's sustainability goal and whether implementation of the Plan adversely affects the ability of GSAs in adjacent basins to achieve their sustainability goals.

[31] 23 CCR § 355.2(e)(3)(C).
[32] Water Code § 10733.8; 23 CCR § 355.6 *et seq*.
[33] Water Code §§ 10728 *et seq.*, 10728.2.

# 2 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline.[34] The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.[35] Additionally, when multiple GSPs are developed in a basin, the submission of all GSPs must include a coordination agreement.[36] The coordination agreement must explain how the multiple GSPs in the basin have been developed and implemented utilizing the same data and methodologies and that the elements of the multiple GSPs are based upon consistent interpretations of the basin's setting. If a Plan is determined to be incomplete, Department staff may require corrective actions that address minor or potentially significant deficiencies identified in the Plan. The GSAs in a basin, whether developing a single GSP covering the basin or multiple GSPs, must sufficiently address those required corrective actions within the time provided, not to exceed 180 days, for the Plan to be reevaluated by the Department and potentially approved.

## 2.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority as of January 1, 2017 and that were subject to critical conditions of overdraft to submit a GSP no later than January 31, 2020.[37]

The GSAs submitted their individual GSPs to the Department in January 2020, and the coordination agreement was submitted on January 28, 2020, in compliance with the statutory deadline.

## 2.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a Plan if that Plan is complete and includes the information required by SGMA and the GSP Regulations.[38] For those basins choosing to submit multiple GSPs, a coordination agreement is required.

The Subbasin's seven GSAs submitted seven adopted GSPs that cover the entire Subbasin, and all GSAs signed the required coordination agreement. Department staff found the GSPs and coordination agreement to be complete and include the required information, sufficient to warrant an evaluation by the Department. The Department posted the Subbasin's seven GSPs and coordination agreement to its website on January 31, 2020.

[34] Water Code § 10720.7.
[35] 23 CCR § 355.4(a)(3).
[36] Water Code § 10733.4(b); 23 CCR § 357.4.
[37] Water Code § 10720.7(a)(1).
[38] 23 CCR § 355.4(a)(2).

## 2.3 BASIN COVERAGE

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.[39] A Plan that intends to cover the entire basin may be presumed to do so if the basin is fully contained within the jurisdictional boundaries of the submitting GSAs.

The Plan intends to manage the entire Kings Subbasin and the jurisdictional boundaries of the submitting GSAs appear to cover the entire Subbasin.[40]

[39] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[40] Kings Subbasin Coordination Agreement, pp. 11-12.

# 3 PLAN EVALUATION

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors[41] including whether the elements of a GSP were developed in the manner required by the GSP Regulations, [42] whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable,[43] and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.[44]

Department staff have identified deficiencies in the GSPs, the most serious of which preclude staff from recommending approval of the Plan at this time. Department staff believe the GSAs may be able to correct the identified deficiencies within 180 days. Consistent with the GSP Regulations, Department staff are providing corrective actions related to the deficiencies, detailed below, including the general regulatory background, the specific deficiency identified in the Plan, and the specific actions to address the deficiency.

## GENERAL BACKGROUND

SGMA allows for multiple GSPs to be implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers an entire basin.[45] The GSP Regulations and SGMA detail the requirements for a coordination agreement and the elements of the GSPs necessary to be coordinated to achieve the basin's sustainability goal.[46] The coordination agreement must provide both administrative and technical coordination and consistency between all the GSPs. The collective submittals for the basin are to be based upon consistent interpretations of the basin setting and utilize the same data and methodologies.[47] In the context of utilizing the same data and methodologies, the coordination agreement must provide the following:[48]

- a coordinated water budget for the basin, including groundwater extraction data, surface water supply, total water use, and change in groundwater in storage;
- a sustainable yield for the basin, supported by a description of the undesirable results for the basin, and an explanation of how the minimum thresholds and

[41] 23 CCR § 355.4.
[42] 23 CCR § 355.4(a)(1).
[43] 23 CCR § 355.4(b)(1).
[44] 23 CCR §§ 355.4(b)(5), 355.4(b)(6).
[45] Water Code § 10727(b)(3).
[46] 23 CCR § 357.4; Water Code § 10727.6.
[47] 23 CCR § 357.4(a).
[48] Water Code § 10727.6 *et al;* 23 CCR §§ 357.4(b)(3)(B), 357.4(b)(3)(C), 357.4(c).

measurable objectives defined by each GSP relate to those undesirable results, based on information described in the basin setting; and

- an explanation of how the GSPs implemented together satisfy the requirements of SGMA and are in substantial compliance with the GSP Regulations.

The Department is tasked with evaluating whether the GSPs, in coordination with one another, conform with the required regulatory contents and are likely to achieve the sustainability goal for the basin.[49]

For basins with multiple GSPs, the GSAs must justify and explain how the GSPs implemented together would effectively achieve the sustainability goal for the entire Subbasin.[50]

## 3.1 Deficiency 1. The GSPs do not set their sustainable management criteria for chronic lowering of groundwater levels in a manner consistent with the requirements of SGMA and the GSP Regulations

### 3.1.1 Background

Tthe GSP regulations require GSAs to set their minimum thresholds for chronic lowering of groundwater levels at "the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results."[51] The GSP Regulations also require that GSAs set measurable objectives for chronic lowering of groundwater levels, which are based on the same metrics and monitoring sites used for minimum thresholds[52] and which "provide a reasonable margin of operational flexibility under adverse conditions."[53]

### 3.1.2 Deficiency Details

Undesirable Results. Each of the Subbasin's GSAs define undesirable results for the chronic lowering of groundwater levels in a similar manner, which generally consists of the depletion of the Subbasin's usable groundwater supply. For example, the NKGSP states that an undesirable result is "when either the water level has declined to a depth that a new productive well cannot be constructed, or when the water level has declined to a depth that water quality cannot be treated for beneficial use."[54] Each GSP in the Subbasin, except for the CKGSP, contains an identical or a similar definition for an undesirable result. The CKGSP states that "undesirable results for [CKGSA] would be a lowering of groundwater levels at a faster rate than historical such that a level was realized that resulted in a majority of domestic wells associated with the farmsteads or in the rural

[49] Water Code § 10733(b); 23 CCR § 355.4(b).
[50] Water Code § 10733.4(b)(2).
[51] 23 CCR § 354.28(c)(1).
[52] 23 CCR § 354.30(b).
[53] 23 CCR § 354.30(c).
[54] North Kings GSP, p. 216.

residential neighborhoods within the GSAs to become inoperable."[55] While the specific mention of domestic wells may appear to be a distinction, relative to the other GSAs' undesirable result definition, the CKGSA further states that, "to be clear, this is not meant to apply where pump lowering or well deepening is possible."[56] Because there is no theoretical limit to lowering pumps or deepening domestic wells, beyond the total depletion of the aquifer, Department staff conclude that there is not a meaningful distinction in the CKGSA's undesirable result definition relative to the definitions of the other GSPs in the Subbasin.

Department staff believe that the GSAs' definition of an undesirable result for the chronic lowering of groundwater levels is not consistent with the intent of SGMA to manage groundwater basins sustainably and for the avoidance of undesirable results.[57] Instead, the GSAs appear to have described a condition that is the end result of *unsustainable* management (i.e., extracting groundwater until it is impossible to extract more for beneficial use) and then conflated avoiding that *unsustainable* condition with achieving sustainable groundwater management. Department staff are unconvinced that a significant and unreasonable depletion of supply will not occur until all usable groundwater in the subbasin is extracted (see Corrective Action 1). This appears to be a fundamental misapplication of SGMA and the GSP Regulations.

Additionally, it does not appear that the approach used by the GSAs meaningfully considered the current beneficial uses and users of groundwater and the potential effects of the proposed management (either to total depletion, under the definition of the undesirable result, or the ramp down in storage decline proposed by the minimum thresholds and measurable objectives, as described below). Department staff do not believe it is sufficient to simply identify that it would theoretically be possible to install a deeper well as evidence that an undesirable result has not occurred. Instead, the GSAs should assess other factors that may affect where, in their Subbasin, uses and users can or cannot adapt to declining groundwater conditions and then set limits on that decline that prevent significant and unreasonable effects. For example, if the GSAs anticipate groundwater level declines to impact a community's drinking water supply and the community does not have the economic means to drill a deeper well, then the GSPs should, at a minimum, disclose that fact and, ideally, should adjust their management criteria to avoid that condition or describe projects or management actions the GSAs would take to address the lack of funding or other ways to avoid the impact to the community's drinking water supply.

Minimum Thresholds. Department staff also find that the GSAs did not establish their minimum thresholds in a manner consistent with SGMA and the GSP Regulations (see Corrective Action 1). Minimum thresholds are the site-specific, measurable groundwater elevations that, by definition in the GSP Regulations, should represent the point at which

[55] Central Kings GSP, p. 209.
[56] Central Kings GSP, p. 209.
[57] Water Code § 10721(x)(1); 23 CCR § 354.24.

undesirable results could occur.[58] In the Subbasin, however, the GSAs do not use their definition of an undesirable result when setting their minimum thresholds. Instead, it appears the GSAs based their minimum thresholds (and measurable objectives) on what they describe as "the requirement to stabilize water levels by 2040."[59] The GSAs justify this approach by stating that, due to the Subbasin having a very large unconfined aquifer, and recent water levels being several hundred feet above the base of the aquifer, the GSP Regulations requirement to stabilize water levels by 2040 becomes the controlling condition for setting target water levels (i.e., minimum thresholds and measurable objectives).[60] As a result, the GSAs established interim milestones and measurable objectives based on the progressive reduction of the historic rate of groundwater level decline equivalent to the GSPs' incremental mitigation of overdraft.[61] This resulted in measurable objectives for the individual plan areas that represent groundwater level declines ranging from approximately 32 to 75 feet relative to Fall 2019. Minimum thresholds were subsequently set by adding the groundwater level decline experienced during the 2011 to 2015 drought below the measurable objective.[62] This resulted in minimum thresholds for the individual plan areas that represent groundwater level declines ranging from approximately 36 to 83 feet below the measurable objective, or approximately 68 to 158 feet below the Fall 2019 level.[63]

Although the GSAs used a standardized approach to set minimum thresholds, they used varying minimum threshold exceedance criteria to determine when groundwater level declines become "significant", not an undesirable result.[64] The NFKGSA, KREGSA, NKGSA, and SKGSA state that "significant" conditions would become present if the minimum threshold at a single representative monitoring well was exceeded;[65] the JGSA and MAGSA state that "significant" conditions would be present if the minimum threshold at one-third of representative monitoring wells were exceeded for two consecutive years;[66] and for the CKGSA it is not clear when "significant" conditions would be present.[67] Overall, it is unclear as to when an undesirable result for the chronic lowering of groundwater levels would be present within the Subbasin.

The corrective actions described below direct the GSAs to define an undesirable result for the chronic lowering of groundwater levels in a manner that is consistent with SGMA and the GSP Regulations, taking into account the Subbasin's beneficial uses and users of groundwater. An adequate and reasonable definition of the undesirable result will also

[58] 23 CCR § 354.28(a).
[59] See e.g., South Kings GSP, p. 174; North Kings GSP, p. 216; McMullin Area GSP, p. 258.
[60] See e.g., North Kings GSP, p. 216; McMullin Area GSP, p. 258.
[61] Kings River East GSP, p. 248; James GSP, p. 217; Central Kings GSP, p. 248; North Fork Kings GSP, p. 266; North Kings GSP, p. 215; McMullin Area GSP, p. 258; South Kings GSP, p. 174.
[62] Central Kings GSP, p. 228.
[63] GSP Monitoring Data, California Natural Resources Agency, https://data.cnra.ca.gov/dataset/gspmd.
[64] James GSP, p. 212.
[65] North Fork Kings GSP, p. 267; Kings River East, p. 249; North Kings GSP, p. 216; South Kings GSP, p. 175.
[66] James GSP, p. 212; McMullin Area GSP, p. 260.
[67] Central Kings GSP, pp. 210-211.

allow the GSAs to set minimum thresholds that actually represent the point at which an undesirable result might occur.

### 3.1.3 Corrective Action 1

The GSAs must revise the Plan to define sustainable management criteria for the chronic lowering of groundwater levels by utilizing information specific to the Subbasin. The GSAs should first characterize undesirable results by describing the significant and unreasonable effects that could be, or are being caused by, lowering groundwater levels that the GSAs are seeking to avoid. The GSAs will need to define the criteria used to determine when and where the effects of the groundwater conditions will cause undesirable results and describe the potential effects on the beneficial uses and users of groundwater that may occur or are occurring from undesirable results, which analysis could include both physical and economic impacts.

Next, the GSAs should revise minimum thresholds to quantify groundwater conditions which represent a point in the Subbasin that, if exceeded, may cause undesirable results. The Plan's description of minimum thresholds should include (1) information and criteria relied upon to establish and justify the minimum thresholds supported by the basin setting and qualified by uncertainty in the understanding of the basin setting; (2) the relationship between these minimum thresholds and each sustainability indicator to show how these basin conditions would avoid undesirable results for each sustainability indicator; (3) a technical description explaining how operating the Subbasin to the proposed minimum thresholds would not be expected to cause undesirable results in adjacent basins or affect the ability of adjacent basins to achieve their sustainability goals; and (4) how the minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.

Addressing this deficiency may require the GSAs to not only reconsider their undesirable results, minimum thresholds, and measurable objectives, so that they are consistent with SGMA and the GSP Regulations as discussed above, but also may require changes to other aspects of the GSPs, such as the projects and management actions that the GSAs would implement to achieve sustainable groundwater management.

## 3.2 Deficiency 2. The GSPs do not set minimum thresholds and measurable objectives for land subsidence in a manner consistent with their undesirable result definition and the requirements of SGMA and the GSP Regulations

### 3.2.1 Background

SGMA defines an undesirable result for land subsidence as that which causes "significant and unreasonable land subsidence that substantially interferes with surface land uses."[68] The GSP Regulations require minimum thresholds to be the rate and extent of land

[68] Water Code § 10721(x)(5); 23 CCR § 354.26.

subsidence that substantially interferes with surface land uses and may lead to an undesirable result. The minimum threshold quantitative values should be supported by:

- The identification of land uses and property interests that have been affected or are likely to be affected by land subsidence;
- An explanation of how the GSAs have determined and considered the affects to those land uses and property interests, and the GSAs rational for establishing minimum thresholds in light of those effects;
- Maps or graphs showing the extent and rate of land subsidence that defines the minimum thresholds.[69]

The establishment of minimum thresholds should be based upon a basin-wide undesirable result definition and a basin-wide approach to identify the land uses and property interests that have been affected or are likely to be affected by land subsidence during the GSP planning and implementation horizon.

### 3.2.2 Deficiency Details

Most of the Subbasin's GSAs provide similar definitions for an undesirable result for land subsidence, defining it as the significant and unreasonable loss of functionality of structures or infrastructure and major damage to roads within the Kings Subbasin.[70] The NFKGSA definition varies slightly with the "loss of functionality of levees, canals, structures, and other critical infrastructure such as bridges, roads or highways, wells and pumps….".[71]

Of note, the SKGSA determined that land subsidence was not applicable to their plan area,[72] but did not provide adequate information and data to demonstrate that undesirable results related to land subsidence are not present and are not likely to occur (see Corrective Action 2a).[73] The GSA states that recent land subsidence, occurring between 2015-2017, have resulted in no visual impacts to structures or wells, and that as groundwater levels are stabilized over the GSP implementation period, the minimal subsidence is expected to do the same.[74] The GSA does not provide adequate historical information, does not define an undesirable result, and does not identify the land uses and property interests which may be affected by land subsidence.

Although the GSPs included similar undesirable result definitions, they did not include similar methods to identify the structures, infrastructure, or major roads within individual plan areas nor any metrics to determine the level of functionality loss that is deemed significant or unreasonable. Some GSPs, such as the NFKGSP, do state that functionality

[69] 23 CCR § 354.28(c)(5).
[70] North Kings GSP, p. 253; Central Kings GSP, p. 267; James GSP, p. 233; McMullin Area GSP, p. 286; Kings River East GSP, p. 288.
[71] North Fork Kings GSP, p. 300.
[72] South Kings GSP, p. 201.
[73] 23 CCR § 354.26(d).
[74] South Kings GSP, p. 201.

loss to the point that "the feature cannot be operated as designed, requiring either significant retrofitting or replacement" is significant and unreasonable."[75] However, the NFKGSP later states that "there have been reports of irrigation canals requiring fill material to raise the banks to maintain original design capacity and freeboard" which they do not believe reaches the level of functionality loss that would be significant and unreasonable. [76] As a result, Department staff are unable to determine when the Subbasin's GSAs consider land subsidence to be significant and unreasonable.

Six of the Subbasin's GSAs established minimum thresholds based on the extent and rate of land subsidence, which may lead to an undesirable result if exceeded. Based on the Subbasin's land subsidence undesirable result definitions, the established minimum thresholds should ensure that structures, infrastructure, and/or major roads within a plan area do not experience a significant and unreasonable loss of functionality. The GSAs state that there have not been any known issues or undesirable results based on discussions with stakeholders and landowners. Relying on these discussions, the GSAs appear to assume that continuing the historic rate of land subsidence throughout the GSP implementation period would not lead to an undesirable result.[77] The GSAs thus defined minimum thresholds and measurable objectives based on the maximum and minimum historical land subsidence rates from various datasets.[78] Table 1 includes the measurable objectives, minimum thresholds, and the maximum historic rate of land subsidence by plan area.

[75] North Fork Kings GSP, p. 300.
[76] North Fork Kings GSP, p. 300.
[77] Kings River East GSP, p. 289; North Fork Kings GSP, p. 300; James GSP, p. 234; McMullin Area GSP, p. 286; Central Kings GSP, p. 266; North Kings GSP, p. 254.
[78] USGS 1926-1970, DWR 1949-2005, USBR 2011-2016, KRCD 2013-2016, and NASA 2015-2017.

**Table 1. Kings Subbasin Subsidence Data**

| GSP | Maximum Historical Rate | Annual Rate (MO) | Annual Rate (MT) | Cumulative (MO) | Cumulative (MT) |
|---|---|---|---|---|---|
| CKGSA[79] | Unknown | 3 inches | 4 inches | 36 inches | 48 inches |
| JGSA[80] | 7.5 inches | 3 inches over 4 miles$^2$ | 6 inches over 4 miles$^2$ | 24 inches | 36 inches |
| KREGSA[81] | 3.97 inches | 4 inches over 36 miles$^2$ | 8 inches over 36 miles$^2$ | 24 inches | 48 inches |
| MAGSA[82] | 5.87 inches | 6 inches over 36 miles$^2$ | 12 inches over 36 miles$^2$ | 36 inches | 60 inches |
| NKGSA[83] | 2.50 inches | 2.5 inches over 36 miles$^2$ | 5 inches over 36 miles$^2$ | 6 inches | 24 inches |
| NFKGSA[84] | 10 inches | 10 inches | 12.5 inches | 80 inches | 100 inches |

The only supporting information for establishing minimum thresholds were the reported statements regarding the lack of issues associated with historical land subsidence, which the GSAs believe demonstrate that the continued historic land subsidence rates would not cause an undesirable result.[85] Several GSAs established land subsidence rate minimum thresholds at 125 to 200 percent of their plan area's maximum historical rate.[86] Most GSAs quantified their cumulative land subsidence minimum thresholds by multiplying the maximum annual land subsidence rate, taken from one of the available datasets, by 20 to represent the 20-year GSP implementation period.[87] Only the JGSA provided any support for their cumulative land subsidence minimum threshold.[88] The

[79] Central Kings GSP, pp. 269 and 271.
[80] NASA 2015-2017 (See James GSP, Table 4-11, p. 238); James GSP, pp. 236 and 244.
[81] KRCD 2013-2016 (See Kings River East GSP, Table 4-15, p. 296); Kings River East GSP, pp. 294 and 301.
[82] KRCD 2013-2016 (See McMullin Area GSP, Table 4-14, p. 292); McMullin Area GSP, pp. 291 and 298.
[83] NASA 2015-2017 (See North Kings GSP, Table 4-15, p. 260); North Kings GSP, pp. 259 and 265.
[84] KRCD 2013-2016 (See North Fork Kings GSP, Table 4-11, p. 305); North Fork Kings GSP, pp. 303 and 307.
[85] James GSP, p. 234; Kings River East GSP, p. 289; North Fork Kings GSP, p. 300; North Kings GSP, p. 300; North Kings GSP, p. 254; McMullin Area GSP, p. 286.
[86] Kings River East GSP, p. 295; North Fork Kings GSP, p. 304; North Kings GSP, p. 259; McMullin Area GSP, p. 291.
[87] Kings River East GSP, p. 295; North Fork Kings GSP, p. 304; North Kings GSP, p. 259; McMullin Area GSP, p. 291.
[88] James GSP, p. 237.

JGSA quantified an initial minimum threshold value of 64-inches, or 5.3-feet, using DWR's 1949 to 2005 land subsidence dataset and a process similar to the Subbasin's other GSAs.[89] However, the JGSA states that "[g]iven the criteria used to establish undesirable results, this cumulative amount of subsidence would likely be unacceptable as it would impact flood protection and water conveyance infrastructure."[90] As a result, the JGSA established a cumulative land subsidence minimum threshold of 3.0-feet based on input from stakeholder agencies and making certain assumptions which include the assumption that nearby areas outside of their plan area are experiencing subsidence at a similar rate and that subsidence is not localized within the plan area.[91]

Additionally, the GSPs provide inconsistent lists of land uses and property interests that could be affected by subsidence, and lack the necessary explanation concerning the basin-wide approach for the identification and consideration of those uses and interests. The minimum threshold numeric values are also poorly supported relative to the requirements of the GSP Regulations.[92] Relying only on discussions with stakeholders and landowners concerning the anecdotal effects of historical land subsidence is insufficient for the establishment of sustainable management criteria. Collectively, the GSPs do not provide the necessary information and criteria to adequately demonstrate that the established minimum thresholds are representative of the groundwater conditions associated with the Subbasin's undesirable result definition.

To properly address these concerns, the GSAs should develop a coordinated basin-wide approach to identify land uses and property interests that could be affected by land subsidence. With these land uses and property interests identified the GSAs should develop a basin-wide approach to determine the amount of subsidence which, if exceeded, could cause a feature to experience functionality loss to the point that it cannot be operated as designed. These processes should be developed in a coordinated manner and be based on technical studies to adequately understand the amount of subsidence that would be significant and unreasonable. Following the identification of land uses and property interests, and the determination of the amount of subsidence that would cause the significant and unreasonable functionality loss to those identified, the GSAs should reestablish minimum thresholds based on this new information (see Corrective Action 2b).

To establish measurable objectives, the Subbasin's GSAs referenced the same datasets used to establish minimum thresholds. However, measurable objectives are generally set equal to the historical rate of a dataset, rather than the additional 125 to 200 percent used to quantify minimum thresholds.[93] The KREGSA, MAGSA, NKGSA, and NFKGSA, set their measurable objective rate equal to the greatest average annual rate of their available

[89] James GSP, p. 237.
[90] James GSP, p. 237.
[91] James GSP, p. 237.
[92] 23 CCR § 354.28(c)(5).
[93] James GSP, p. 244; Kings River East GSP, p. 301; North Fork Kings GSP, p. 307; North Kings GSP, p. 265; McMullin Area GSP, p. 298.

datasets.[94] The CKGSA did not provide sufficient information to determine how their measurable objective was established. The JGSA set their measurable objective land subsidence rate as 3 inches per year, which is equal to DWR's 1949-2005 maximum land subsidence rate, and is the second highest rate of the available datasets.[95] The JGSA previously determined that the continuation of this rate was unacceptable as it would impact flood protection and water conveyance infrastructure.[96] Although the JGSA provided the only example of one of the Subbasin's GSAs establishing sustainable management criteria, based on the protection of a specific land use or property interest, their decision to set their land subsidence rate measurable objective equal to a value greater than zero, in the Department staff's opinion, creates real uncertainty with regard to whether the Subbasin will achieve sustainable groundwater management.

One of the stated intents for SGMA is that subsidence would be avoided or minimized[97] once basins achieve their sustainability goal.[98] To be consistent with that intent, and in the absence of compelling information as to why additional long-term subsidence is acceptable for the Subbasin, Department staff suggest that the measurable objective be zero subsidence (see Corrective Action 2c). Although zero subsidence may be exceeded during the implementation period (i.e., between 2020 and 2040), the long-term objective should be to avoid subsidence or minimize it to a rate that is beyond the GSAs control (see Corrective Action 2d). In addition, the rates at which projects and management actions are implemented should be consistent with the rate of, and cumulative, subsidence that the GSAs determined needs to be avoided to prevent the potential impacts or interference to beneficial uses and users of groundwater and surface land uses, during the reestablishment of the Subbasin's land subsidence minimum thresholds (see Corrective Action 2b).

### 3.2.3 Corrective Action 2

a) The SKGSA should define an undesirable result for land subsidence and either establish sustainable management criteria, with consideration give to Corrective Action 2b and 2c, or provide additional information and data to adequately demonstrate that an undesirable result related to land subsidence is not present and is not likely to occur.

b) The Subbasin's GSAs should develop a coordinated basin-wide approach to identify the land uses and property interests that have been affected or are likely to be affected by land subsidence, including an explanation of how the GSAs have determined and considered those uses and interests.[99] Additionally, the GSAs should identify the amount of subsidence the identified land uses and property

[94] Kings River East GSP, p. 301; McMullin Area GSP, p. 298; North Kings GSP, p. 265; North Fork Kings GSP, p. 307.
[95] James GSP, p. 244.
[96] James GSP, p. 237.
[97] Water Code § 10720.1(e).
[98] 23 CCR § 354.24.
[99] 23 CCR § 354.28(c)(5)(A).

interests (commonly referred to as structures, infrastructure, and major roads within the GSPs) can tolerate throughout GSP implementation. The GSAs should revise their minimum thresholds for land subsidence to reflect the intent of SGMA and incorporate the information gained following the identification of land uses and property interests and the amount of subsidence that may be tolerated.

c) The Subbasin's GSAs should revise their measurable objectives for land subsidence to reflect the intent of SGMA that land subsidence be avoided or minimized once sustainability is achieved.

d) The Subbasin's GSAs should provide an explanation for how the implementation of projects and management actions is: 1) consistent with the reestablished minimum thresholds and measurable objectives; 2) achieving the long-term avoidance or minimization of land subsidence; and 3) ensuring that the Subbasin will not exceed the cumulative amount of land subsidence the identified land uses, and property interests can tolerate.

## 3.3 Deficiency 3 – The GSPs do not consistently identify interconnected surface water systems, or provide the location, quantity, and timing of depletions of those systems due to groundwater use. The GSPs do not define sustainable management criteria for the depletions of interconnected surface water in the manner required by the GSP Regulations.

### 3.3.1 Background

SGMA identifies six effects of groundwater conditions occurring throughout a basin that GSAs must evaluate to achieve sustainable groundwater management. Generally, when any of these effects are significant and unreasonable, as defined in SGMA, they are referred to as an undesirable result.[100] The GSP Regulations refer to these effects as sustainability indicators, and they include depletions of interconnected surface water.[101] SGMA requires GSAs to sustainably manage groundwater, which is defined as avoiding undesirable results for any sustainability indicator during the planning and implementation horizon.[102] Specifically, for each applicable sustainability indicator a GSA must develop sustainable management criteria, describe the process used to develop those criteria, and establish a monitoring network to adequately monitor conditions.[103]

A GSA that is able to demonstrate one or more sustainability indicators are not present and are not likely to occur in the basin is not required to develop sustainable management

[100] Water Code § 10721(x).
[101] 23 CCR § 351(ah).
[102] Water Code §§ 10721(v), 10721(r).
[103] 23 CCR §§ 354.22, 354.32.

criteria for those indicators.[104] Absent an explanation of why a sustainability indicator is not applicable, the Department assumes all sustainability indicators apply.[105] Demonstration of applicability (or non-applicability) of sustainability indicators must be supported by best available information and science and should be provided in descriptions throughout the GSP (e.g. information describing basin setting, discussion of the interests of beneficial users and uses of groundwater).

The Department's assessment of a GSP's likelihood to achieve its sustainability goal for a basin or subbasin is based, in part, on whether a GSP provides sufficiently detailed and reasonable supporting information and analysis for all applicable indicators. The GSP Regulations require the Department to evaluate whether establishment of sustainable management criteria is commensurate with the level of understanding of the basin setting.[106]

The GSP Regulations require a GSP to identify interconnected surface water systems in the basin or subbasin and evaluate the location, quantity, and timing of depletions of those interconnected systems using the best available information and best available science.[107] As noted above, absent a demonstration of the inapplicability of the depletion of interconnected surface water sustainability indicator, GSAs in basins or subbasins with interconnected surface waters must develop sustainable management criteria for those interconnected systems as described in the GSP Regulations.[108]

### 3.3.2 Deficiency Details

The Subbasin's GSAs appear to have an inconsistent and incomplete approach to establishing sustainable management criteria for the depletion of interconnected surface water. As described below, several of the individual GSPs identify that interconnected surface water is present or is likely present in the Subbasin. However, none of the GSPs set sustainable management criteria for depletion of interconnected surface water. While the GSPs cite portions of the GSP Regulations that describe circumstances when development of sustainable management criteria are not required, none of the GSPs contain sufficient demonstrations to show that undesirable results for depletion of interconnected surface water is not applicable for the Subbasin.

Identification of interconnected surface water. The MAGSA provides evidence for the presence of interconnected surface water with the San Joaquin River within their plan area.[109] The NKGSA,[110] KREGSA,[111] and the CKGSA,[112] all provide evidence for, and

[104] 23 CCR §§ 354.22, 354.26(d), 354.28(e).
[105] DWR Best Management Practices for the Sustainable Management of Groundwater: Sustainable Management Criteria (DRAFT), November 2017.
[106] 23 CCR § 355.4(b)(3).
[107] 23 CCR §§ 354.28(c)(6)(A), 354.28(c)(6)(B).
[108] 23 CCR §§ 354.26, 354.28(c)(6), 354.30.
[109] McMullin Area GSP, p. 300.
[110] North Kings GSP, pp. 269-270.
[111] Kings River East GSP, pp. 305-307.
[112] Central Kings GSP, pp. 272-273.

state that there is the presence of, interconnected surface water with the Kings River in their individual plan areas. The JGSA provides evidence for, and states that there is the possibility of the presence of, interconnected surface water with portions of the James Bypass and the Fresno Slough that are inundated by the Mendota Pool.[113]

Evidence for non-applicability of undesirable results. The GSAs state that undesirable results are not applicable to their GSPs because the Subbasin currently contains existing river management programs but also because understanding seepage and other aspects of interconnected surface water in the Subbasin is complex. For example, several of the GSAs state that it can be challenging to distinguish depletions caused by groundwater pumping from other depletions, such as increased riparian pumping from rivers, change in river operations, or increased saturation.[114] The GSAs conclude that there is no evidence of active groundwater production wells causing increased seepage loss or impacts to downstream beneficial uses; however, the GSAs do not provide any information or data related to how they came to this conclusion nor do they identify the lack of evidence as a data gap warranting further evaluation and analysis.[115]

The NKGSA, KREGSA, CKGSA, and MAGSA point to the presence of existing river management programs as rationale for why undesirable results related to the depletion of interconnected surface water are not present and not likely to occur. The GSAs state that the San Joaquin River Restoration Program and the Kings River Fisheries Management Program both require certain flow rates, thus, the agencies responsible for maintaining those flows will be required to provide sufficient in-stream flows, thereby negating the possibility of undesirable results.[116] While the river management programs may help ensure certain flows remain in the rivers, their existence is not adequate evidence to demonstrate that groundwater use could not lead to undesirable results for streamflow depletions. For example, the GSAs do not assess whether increases in depletion due to groundwater use could impact the ability of the agencies responsible for surface water management to meet the flow requirements, as noted in public comments received by the Department.[117] Department staff encourage the GSAs to coordinate and work with the existing river management programs to better understand conditions that cause depletions and collaboratively develop sustainable management criteria, using the best available information and science, that avoids undesirable results and considers the interests of all beneficial uses and users.

Overall, neither the technical complexity of stream depletion nor the presence of surface water management programs is sufficient to demonstrate that groundwater use could not cause undesirable results for interconnected surface water. Department staff recogonize

[113] James GSP, pp. 158-159.
[114] Kings River East GSP, p. 305; North Kings GSP, p. 269; McMullin Area GSP, p. 310.
[115] Kings River East GSP, p. 305; North Kings GSP, p. 269; McMullin Area GSP, p. 310.
[116] North Kings GSP, p. 279; Kings River East GSP, p. 309; Central Kings GSP, p. 273; McMullin Area GSP, p. 310.
[117] See e.g., comment 2 of the letter from California Department of Fish and Wildlife: https://sgma.water.ca.gov/portal/service/gspdocument/download/3859.

that the GSAs may not currently have sufficient technical understanding of this issue. However, the GSAs do not specifically identify the understanding of depletion of interconnected surface water as a data gap. Therefore, Department staff recommend that resolving this deficiency should include proper identification of depletion of interconnected surface water as a data gap and reasonable measures and schedules to address the data gap (see Corrective Action 3a).[118] In other words, the GSAs must first understand where, when and how much groundwater pumping is impacting surface water, and then analyze those impacts within the context of the overall river management, before they can demonstrate with any real certainty that undesirable results are not present and not likely to occur.

Staff also believe that the absence of a subbasin-wide integrated surface water-groundwater numerical model or an equally effective method, tool, or analytical model leave the GSAs unable to either adequately demonstrate that undesirable results are not present and are not likely to occur in the Subbasin. The lack of sufficient data and methods limits the GSAs ability to establish sustainable management criteria for depletion of interconnected surface water. In the absence of adequate information and analysis, the GSPs must develop a subbasin-wide method to adequately determine the current and future depletions from the interconnected surface water bodies in the Subbasin. The GSAs must then either establish initial sustainable management criteria, establish representative minimum thresholds for groundwater elevations to serve as a proxy for the depletion of interconnected surface water, or provide the necessary evidence to demonstrate that depletions or undesirable results are not present and are not likely to occur in the Subbasin (see Corrective Action 3b).

### 3.3.3 Corrective Action 3

Having identified that interconnected surface water is present in the Subbasin, and absent a demonstration that undesirable results for depletion of interconnected surface water are not present and not likely to occur, Department staff recommend that the GSAs should properly identify depletion of interconnected surface water as a data gap and should provide a plan within 180 days that describes how the GSAs will address the data gap as soon as practical, with updated sustainable management criteria by the first required periodic evaluation. The plan to address the data gap should specifically outline how and when the GSAs will:

a) Acquire or develop data and tools to identify the location, quantity, and timing of the depletion of interconnected surface water due to groundwater use for interconnected surface water systems identified in the Subbasin's GSPs,[119] and

b) Develop sustainable management criteria based on the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses and users of the surface water in the Subbasin.

[118] 23 CCR § 355.4(b)(2).
[119] 23 CCR § 354.16(f).

## 3.4 Deficiency 4 – The GSPs do not provide adequate information to support the selection of degraded water quality sustainable management criteria

### 3.4.1 Background

SGMA and the GSP Regulations do not require a GSP to address undesirable results associated with degraded water quality that occurred before, and have not been corrected by, January 1, 2015. However, management of a basin under an adopted GSP should not result in further water quality degradation that is significant and unreasonable, either due to routine groundwater use or as a result of implementing projects or management actions called for in the GSP.[120] SGMA provides GSAs with legal authority to regulate and affect pumping and groundwater levels, which can potentially affect the concentration or migration of water quality constituents and result in the degradation of water quality. Additionally, the GSP Regulations state that GSAs should consider local, state, and federal water quality standards when establishing sustainable management criteria.[121] SGMA provides a GSA with the authority to manage and control polluted water and use authorities under existing laws to implement its GSP.[122] Thus, establishing sustainable management criteria and performing routine monitoring of water quality constituents known to affect beneficial uses and users is within the purview of a GSA.

### 3.4.2 Deficiency Details

All of the GSAs, except the CKGSA, established sustainable management criteria for the identified constituents of concern based on existing groundwater quality standards. The CKGSA did not establish sustainable management criteria for degraded water quality and states that minimum thresholds and measurable objectives are "to be determined in the 5-year update."[123]

The CKGSA attributes the lack of sustainable management criteria to insufficient data to establish baseline conditions, especially with regard to agricultural and rural residential beneficial uses. [124] Nowhere in the CKGSP does the CKGSA discuss the data or information that may be available to conduct a preliminary assessment of groundwater quality conditions. The CKGSP contains a map within the current and historic groundwater conditions section that the GSP claims to depict "location where water quality sampling identified as meeting MCL or above MCL [sic]…";[125] however, the map only depicts the various monitoring locations in the GSA – no concentration data are provided even though the GSP states, for example, "[d]ata from the area shows that

[120] Water Code § 10721(x)(4); 23 CCR § 354.28(c)(4).
[121] 23 CCR § 354.28(c)(4).
[122] Water Code §§ 10726.2(e), 10726.8(a).
[123] Central Kings GSP, p. 264.
[124] Central Kings GSP, p. 260.
[125] Central Kings GSP, p. 150.

nitrate concentrations are higher in the unconfined groundwater compared to being much lower in the confined groundwater…".[126]

Department staff are encouraged that the CKGSA identified constituents of concern, provided basic descriptions of those constituents, and discussed the three general groundwater uses in the basin as they relate to groundwater quality. Further, Department staff recognize the CKGSA identifies groundwater quality as a data gap; however, Department staff believe the CKGSA needs to disclose and discuss more comprehensively the groundwater quality data and information that is available in the GSA, similar to other GSAs in the Subbasin (e.g., MAGSA[127] and NFKGSA[128]). Additionally, Department staff do not believe the lack of an established baseline inhibits the GSA from initially establishing sustainable management criteria based on existing agricultural or drinking water standards (i.e., Agricultural Water Quality Goals and Maximum Contaminant Limits) (see Corrective Action 4a).

The other six GSAs established sustainable management criteria for constituents of concern discussed in the individual GSPs groundwater conditions section. The minimum thresholds for each constituent are defined as either: 1) the MCL for wells with concentrations historically below the MCL; or 2) a statistically significant increase of the historical concentration for those wells with concentrations historically above the MCL.[129] Each GSA provided the MCL for their constituents of concern and attributes the MCL to the minimum threshold for wells with concentrations historically below the MCL. For wells that have had concentrations greater than the MCL for a particular constituent, the GSAs do not define what constitutes a "statistically significant increase." Some of the GSPs include the statement that "statistical significance is defined as a result not likely to occur from random fluctuations (seasonal or otherwise) or by chance but instead can likely be attributed to a specific cause (i.e., groundwater pumping)";[130] however, the statement does not describe a quantitative statistical process nor establishes a value to define the minimum threshold. The GSAs also do not explain how the potential increase in water quality degradation could be evaluated and attributed to specific causes, such as groundwater pumping or recharge actions.

Department staff believe each GSA needs to quantitatively define "statistically significant increase" and describe and disclose which wells have historical concentrations greater than or less than the MCL of a particular constituent of concern. Further, each of the Subbasin's GSAs should provide the minimum threshold concentration value for each constituent of concern monitored at a given well within their monitoring network regardless of whether the minimum threshold is the MCL or the to be determined significant increase above the MCL (see Corrective Action 4b). Additionally, Department staff find the GSAs need to describe how they intend to evaluate whether actions taken

[126] Central Kings GSP, p. 148.
[127] McMullin Area GSP, pp. 182-198.
[128] North Fork Kings GSP, pp.174-193.
[129] North Fork Kings GSP, p. 294; James GSP, p. 227; Kings River East GSP, p. 278.
[130] See e.g., North Kings GSP, p. 243.

by the GSAs during GSP implementation (i.e., groundwater pumping, recharge efforts, etc.) are not exasperating the degradation of groundwater quality (see Corrective Action 4c).

### 3.4.3 Corrective Action 4

a) The CKGSA should further discuss and disclose the data and information that is available in their GSP's plan area and, understanding that data gaps exist, further describe how the GSA intends to obtain the data necessary to develop baseline groundwater quality conditions for each beneficial use. The CKGSA must also establish sustainable management criteria for the degraded water quality, which can be based on existing water quality standards, similar to the other GSAs in the Subbasin. Additionally, the CKGSA should consider Corrective Action 4b and Corrective Action 4c when developing the sustainable management criteria.

b) Each GSA should describe how the statistically significant increase is quantified and provide the numerical values established for the sustainable management criteria for degraded water quality at each well in their monitoring network. The GSAs should discuss the specific method used to establish the sustainable management criteria for each monitoring well.

c) The GSAs should provide additional information related to how they intend to evaluate whether or not GSA actions are attributing to the degradation of groundwater quality and how the monitoring network and monitoring frequency contribute to understanding the potential causes of groundwater quality degradation.

# 4 STAFF RECOMMENDATION

Department staff believe that the deficiencies identified in this assessment should preclude approval of the Plan for the Kings Subbasin. Department staff recommend that the Plan be determined incomplete.