



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

David De Groot
Tule Subbasin Point of Contact
357 E. Olive Avenue
Tipton, CA 93272
davidd@4-creeks.com

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

Dear David De Groot,

The Department of Water Resources (Department) has evaluated the six groundwater sustainability plans (GSPs) submitted for the San Joaquin Valley – Tule Subbasin (Subbasin), as well as the materials considered to be part of the required coordination agreement. Collectively, the six 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 7 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

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 – Tule Subbasin Groundwater Sustainability Plans

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
DETERMINATION OF INCOMPLETE STATUS OF THE
SAN JOAQUIN VALLEY – TULE 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 – Tule Subbasin (Subbasin), six separate GSPs were prepared by 7 GSAs pursuant to the required coordination agreement. This Statement of Findings explains the Department's decision regarding the multiple GSPs covering the Subbasin submitted jointly by the multiple GSAs. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- *Groundwater Sustainability Plan, Alpaugh Groundwater Sustainability Agency (Alpaugh GSP) – The Alpaugh GSP is managed by a single GSA, the Alpaugh GSA.*
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Delano-Earlimart Irrigation District Groundwater Sustainability Agency (Delano-Earlimart Irrigation District GSP) – The Delano-Earlimart Irrigation District GSP is managed by a single GSA, the Delano-Earlimart Irrigation District GSA, and has four management areas.*
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Eastern Tule Groundwater Sustainability Agency, Tule Subbasin (Eastern Tule GSP) – The Eastern Tule GSP is managed by a single GSA, Eastern Tule Joint Powers Authority GSA, and has five management areas.*
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Lower Tule River Irrigation District Groundwater Sustainability*

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San Joaquin Valley – Tule Subbasin (Basin No. 5-022.13)

Agency, Tule Subbasin (Lower Tule River Irrigation District GSP) – The Lower Tule River Irrigation District GSP is managed by a single GSA, Lower Tule River Irrigation District GSA, and has three management areas.

- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Pixley Irrigation District Groundwater Sustainability Agency, Tule Subbasin (Pixley Irrigation District GSP) – The Pixley Irrigation District GSP is managed by a single GSA, Pixley Irrigation District GSA, and has three management areas.*
- *Tri-County Water Authority, Groundwater Sustainability Plan (Tri-County GSP) – The Tri-County GSP is managed by a single GSA, Tri-County Water Authority, and has two management areas.*

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 define undesirable results or set minimum thresholds and measurable objectives for groundwater levels in a manner consistent with the GSP Regulations.
1. The GSPs do not describe, with information specific to the Subbasin, the groundwater level conditions that are considered significant and unreasonable and would result in undesirable results. The GSPs do not explain or justify how the quantitative definition of undesirable results is consistent with avoiding effects the GSAs have identified as undesirable results.
 2. The GSPs do not explain how minimum thresholds at the representative monitoring sites are consistent with the requirement to be based on a groundwater elevation indicating a depletion of supply at a given location. The GSPs do not demonstrate that the established sustainable management criteria are based on a commensurate level of understanding of the basin setting or whether the interests of beneficial uses and users have been considered.

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B. The GSPs do not define undesirable results or set minimum thresholds and measurable objectives for land subsidence in a manner consistent with the GSP Regulations.

1. In areas adjacent to the Friant-Kern Canal, the GSPs do not identify, through analysis, the total amount of subsidence that can be tolerated by the Friant-Kern Canal during implementation of the GSPs in order to maintain the ability to reasonably operate to meet contracted for water supply deliveries. The GSPs do not explain how implementation of projects and management actions is consistent both with achieving the long-term avoidance or minimization of subsidence and with not exceeding the tolerable amount of cumulative subsidence adjacent to the Canal.
2. The GSPs do not explain how the criteria defining when undesirable results occur in the Subbasin was established, the rationale behind the approach, and why it is consistent with avoiding the significant and unreasonable effects identified by the GSAs.
3. The GSPs do not identify land uses and property interests, apart from the Friant-Kern Canal, susceptible to impacts from land subsidence, explain how they were considered, and describe the rationale for establishing minimum thresholds for land subsidence in consideration of uses and interests, or provide reasonable and convincing evidence that the other areas of the basin are not susceptible to impacts from land subsidence.
4. The GSPs' current minimum thresholds and measurable objectives for land subsidence are not consistent with the intent of SGMA that subsidence be avoided or minimized once sustainability is achieved in the Subbasin.

C. The GSPs do not provide sufficient information to justify the proposed sustainable management criteria for degraded water quality.

1. The GSPs do not specify what groundwater conditions are considered suitable for agricultural irrigation and domestic use. The GSPs do not explain the choice of constituents (pH, conductivity, and nitrate) as a means of evaluating impacts to beneficial uses and users, especially agricultural irrigation.
2. The GSPs do not explain how the use of a 10-year running average to establish the sustainable management criteria will avoid undesirable

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San Joaquin Valley – Tule Subbasin (Basin No. 5-022.13)

results due to degraded groundwater quality and related potential effects of the undesirable results to existing regulatory standards. The GSPs do not explain how the criteria defining when undesirable results occur in the Subbasin was established, the rationale behind the approach, and why it is consistent with avoiding significant and unreasonable effects associated with groundwater pumping and other aspects of the GSAs' implementation of their GSPs.

3. The GSPs do not explain how the sustainable management criteria for degraded water quality relate to existing groundwater regulatory requirements in the Subbasin and how the GSAs will coordinate with existing agencies and programs to assess whether or not implementation of the GSPs is contributing to the degradation of water quality throughout the Subbasin.

Based on the above, the Plan submitted by the GSAs in the San Joaquin Valley – Tule 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 – Tule Subbasin

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

Groundwater Basin Name: San Joaquin Valley Basin – Tule Subbasin (No. 5-022.13)
Number of GSPs: 6 (see list below)
Number of GSAs: 7 (see list below)
Point of Contact: David De Groot
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 Tule Subbasin (Subbasin), six separate GSPs were prepared by seven GSAs pursuant to a required coordination agreement.⁵ The Tule Subbasin Coordination Agreement (Coordination Agreement) includes a legal agreement signed by all GSAs in the Subbasin, as well as two key technical documents that are applicable to each of the GSPs – the Tule Subbasin Monitoring Plan and the Tule Subbasin Setting. Collectively, the six 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:

- *Groundwater Sustainability Plan, Alpaugh Groundwater Sustainability Agency (Alpaugh GSP) – The Alpaugh GSP is managed by a single GSA, the Alpaugh GSA.*⁶
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Delano-Earlimart Irrigation District Groundwater Sustainability*

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).

⁶ Alpaugh GSP, p. 23.

*Agency (Delano-Earlimart Irrigation District GSP) – The Delano-Earlimart Irrigation District GSP is managed by a single GSA, the Delano-Earlimart Irrigation District GSA, and has four management areas.*⁷

- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Eastern Tule Groundwater Sustainability Agency, Tule Subbasin (Eastern Tule GSP) – The Eastern Tule GSP is managed by a single GSA, Eastern Tule Joint Powers Authority GSA, and has six management areas.*⁸
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Lower Tule River Irrigation District Groundwater Sustainability Agency, Tule Subbasin (Lower Tule River Irrigation District GSP) – The Lower Tule River Irrigation District GSP is managed by a single GSA, Lower Tule River Irrigation District GSA, and has three management areas.*⁹
- *Sustainable Groundwater Management Act, Groundwater Sustainability Plan, January 2020, Pixley Irrigation District Groundwater Sustainability Agency, Tule Subbasin (Pixley Irrigation District GSP) – The Pixley Irrigation District GSP is managed by a single GSA, Pixley Irrigation District GSA, and has three management areas.*¹⁰
- *Tri-County Water Authority, Groundwater Sustainability Plan (Tri-County GSP) – The Tri-County GSP is managed by a single GSA, Tri-County Water Authority, and has two management areas.*¹¹

The Tulare County GSA entered into a memorandum of understanding (MOU) with the Lower Tule River Irrigation District GSA¹² and the Tri-County Water Authority GSA¹³ to ensure GSP coverage of Tulare County GSA's jurisdictional area.¹⁴

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 several deficiencies that staff recommends should preclude its approval.¹⁵ 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.¹⁶ The deficiencies and corrective actions are explained in greater detail in Section 3 of this staff report and are generally related to the

⁷ Delano-Earlimart Irrigation District GSP, p. 16-18.

⁸ Eastern Tule GSP, p. 99, 200.

⁹ Lower Tule River Irrigation District GSP, p. 18-20.

¹⁰ Pixley Irrigation District GSP, p. 18-19.

¹¹ Tri-County GSP, p. 15.

¹² Lower Tule River Irrigation District GSP, Figure 1-1, p. 15.

¹³ Tri-County GSP, Figure 1.4.2, p. 50.

¹⁴ Eastern Tule GSP, p. 781.

¹⁵ 23 CCR §355.2(e)(2).

¹⁶ 23 CCR §355.2(e)(2)(B).

need to define sustainable management criteria in the manner required by SGMA and the GSP Regulations for groundwater levels, land subsidence and degraded water quality.

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 the recommendation of staff regarding the Department’s determination and the recommended amount of time to allow the GSAs to address deficiencies.

1 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA¹⁷ and is likely to achieve the basin’s sustainability goal.¹⁸ 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.¹⁹ 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.²⁰ 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.²¹

For a Plan to be evaluated by the Department, it must first be determined that it was submitted by the statutory deadline²² and that it is complete and covers the entire basin.²³ Additionally, for those GSAs choosing to develop multiple GSPs, the Plan submission must include a coordination agreement.²⁴ 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.²⁵ 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.”²⁶

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.²⁷ The Department’s review considers whether there is a reasonable relationship between the

¹⁷ Water Code §§ 10727.2, 10727.4, 10727.6.

¹⁸ Water Code § 10733(a).

¹⁹ Water Code § 10721(v).

²⁰ 23 CCR § 354.26.

²¹ Water Code § 10733(c).

²² 23 CCR § 355.4(a)(1).

²³ 23 CCR §§ 355.4(a)(2), 355.4(a)(3).

²⁴ 23 CCR § 357.4.

²⁵ 23 CCR § 350 *et seq.*

²⁶ 23 CCR § 355.4(b).

²⁷ 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.²⁸ The Department also considers whether the GSAs have the legal authority and financial resources necessary to implement the Plan.²⁹

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.³⁰ 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.³¹ The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.³² 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.³³

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment.³⁴ The assessment is required to include a determination of the Plan's status.³⁵ The GSP Regulations provide three options for determining the status of a Plan: approved,³⁶ incomplete,³⁷ or inadequate.³⁸

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,³⁹ 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,

²⁸ 23 CCR §§ 355.4(b)(1), (3), (4) and (5).

²⁹ 23 CCR § 355.4(b)(9).

³⁰ 23 CCR § 355.4(b)(6).

³¹ 23 CCR § 355.4(b)(8).

³² 23 CCR § 355.4(b)(2).

³³ 23 CCR § 355.4(b)(10).

³⁴ Water Code § 10733.4(d); 23 CCR § 355.2(e).

³⁵ Water Code § 10733.4(d); 23 CCR § 355.2(e).

³⁶ 23 CCR § 355.2(e)(1).

³⁷ 23 CCR § 355.2(e)(2).

³⁸ 23 CCR § 355.2(e)(3).

³⁹ 23 CCR § 355.2(e)(2)(B)(i).

the Department may determine the resubmitted Plan is approved. Alternatively, the Department may conclude 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.⁴⁰

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.⁴¹ Also, GSAs have an ongoing duty to reassess their GSPs, provide annual reports to the Department, and, when necessary, update or amend their GSPs.⁴² 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.

2 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline.⁴³ The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.⁴⁴ Additionally, when multiple GSPs are developed in a basin, the submission of all GSPs must include a coordination agreement.⁴⁵ 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

⁴⁰ 23 CCR § 355.2(e)(3)(C).

⁴¹ Water Code § 10733.8; 23 CCR § 355.6 *et seq.*

⁴² Water Code §§ 10728 *et seq.*, 10728.2.

⁴³ Water Code § 10720.7.

⁴⁴ 23 CCR § 355.4(a)(3).

⁴⁵ Water Code § 10733.4(b); 23 CCR § 357.4.

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, 2020.⁴⁶

The Point of Contact representing seven GSAs submitted the Subbasin's Plan on January 30, 2020, in compliance with the statutory deadline. The Plan consists of six GSPs and the required coordination agreement.

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.⁴⁷ For those basins choosing to submit multiple GSPs, a coordination agreement is required.

The seven GSAs submitted six separate adopted GSPs that together cover the Subbasin. Department staff found the GSPs, and the collective Plan, to be complete and include the required information, sufficient to warrant an evaluation by the Department. The Department posted the Subbasin's six GSPs and coordination agreement to its website on February 19, 2020.

2.3 BASIN COVERAGE

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.⁴⁸ 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 GSA(s).

The Plan intends to manage the entire Tule Subbasin and collectively the jurisdictional boundaries of the submitting GSAs cover the entire Subbasin.

⁴⁶ Water Code § 10720.7(a)(1).

⁴⁷ 23 CCR § 355.4(a)(2).

⁴⁸ Water Code § 10727(b); 23 CCR § 355.4(a)(3).

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 factors⁴⁹ including whether the elements of a GSP were developed in the manner required by the GSP Regulations,⁵⁰ whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable,⁵¹ 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.⁵²

Department staff have identified deficiencies in the GSPs, the most significant 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.⁵³ 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.⁵⁴ 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.⁵⁵ In the context of utilizing the same data and methodologies, the coordination agreement must provide the following:⁵⁶

- 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

⁴⁹ 23 CCR § 355.4.

⁵⁰ 23 CCR § 355.4(a)(1).

⁵¹ 23 CCR § 355.4(b)(1).

⁵² 23 CCR §§ 355.4(b)(5), 355.4(b)(6).

⁵³ Water Code § 10727(b)(3).

⁵⁴ 23 CCR § 357.4; Water Code § 10727.6.

⁵⁵ 23 CCR § 357.4(a).

⁵⁶ 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.⁵⁷

3.1 DEFICIENCY 1. THE GSPs DO NOT DEFINE UNDESIRABLE RESULTS OR SET MINIMUM THRESHOLDS AND MEASURABLE OBJECTIVES FOR GROUNDWATER LEVELS IN A MANNER CONSISTENT WITH THE GSP REGULATIONS

3.1.1 Background

GSA must develop minimum thresholds for chronic lowering of groundwater levels that are based on a groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results. The description of minimum thresholds must include the following, among other items:

- A discussion of the potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring in the Subbasin.⁵⁸
- The information and criteria relied upon to establish minimum thresholds for chronic lowering of groundwater levels, supported by information from the basin setting, and other data or models as appropriate.⁵⁹

Additionally, the Department must consider “whether the assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are reasonable and supported by the best available information and best available science.”⁶⁰

3.1.2 Deficiency Details

Based on review of the Coordination Agreement and the six GSPs in the Tule Subbasin, Department staff conclude that sustainable management criteria for chronic lowering of groundwater levels were not defined in a manner required by SGMA and the GSP Regulations.

Undesirable Results. The Coordination Agreement identifies the potential effects associated with chronic lowering of groundwater levels as causing well failures, additional operational costs for groundwater extraction from deeper pumping levels, and additional

⁵⁷ Water Code § 10733(b); 23 CCR § 355.4(b).

⁵⁸ 23 CCR § 354.26(b)(3); 23 CCR § 354.28(b)(4).

⁵⁹ 23 CCR § 354.28(b)(1).

⁶⁰ 23 CCR § 355.4(b)(1).

costs to lower pumps, deepen wells, or drill new wells. The undesirable result for chronic lowering of groundwater levels is defined as a “basin-wide loss of well pumping capacity, which cannot be remedied.”⁶¹ Neither the Coordination Agreement nor the GSPs describe the groundwater conditions that would lead to impacts to well pumping capacities or under what conditions the ability to pump groundwater could no longer be remedied. The Coordination Agreement further states that localized lowering of groundwater levels that produce undesirable results may affect Subbasin-wide groundwater conditions resulting in minimum threshold exceedances or limiting the Subbasin from achieving the measurable objectives.⁶² Although the Coordination Agreement generally states the possible effects caused by localized groundwater level declines, neither the Coordination Agreement nor the GSPs disclose the impacts to beneficial uses and users that would occur throughout the Subbasin as a result of the localized groundwater level declines. From the descriptions provided, Department staff are unable to assess how localized groundwater level decline would affect the possible “basin-wide loss of well pumping capacity” or which beneficial users (i.e., agricultural well pumping capacity, drinking water well pumping capacity, etc.) would be impacted and to what degree because none of this information is quantified in the GSPs.

The GSPs define undesirable results for chronic lowering of groundwater levels in the Subbasin as the unreasonable lowering of the groundwater elevation below the minimum threshold for two consecutive years at greater than 50 percent of GSA Management Area representative monitoring sites, which results in significant impacts to groundwater supply.⁶³ The GSPs do not explain how the 50 percent criterion was selected or describe how it relates to specific effects (e.g., resulting in a basin-wide loss of well capacity) that the GSAs identified as undesirable results. Consequently, Department staff believe the GSPs do not adequately justify or describe how groundwater level declines below the minimum thresholds, which are predominately set below historic lows, for 50 percent of the GSA Management Area representative monitoring sites for two consecutive years does not result in a significant loss of groundwater supply. (see Corrective Action 1)

Minimum Thresholds. The Subbasin’s GSAs define minimum thresholds for chronic lowering of groundwater levels using a groundwater flow model projection of groundwater level conditions assuming successful implementation of all projects and management actions. Five of the GSPs⁶⁴ describe that the minimum threshold for groundwater levels for each representative monitoring site was determined utilizing the following stepwise process:

⁶¹ *Tule Subbasin Coordination Agreement* p. 48.

⁶² *Tule Subbasin Coordination Agreement* p. 49.

⁶³ *Tule Subbasin Coordination Agreement* p. 49; Tri-County GSP, page 238; Eastern Tule GSP, p. 212; Lower Tule River Irrigation District GSP, p. 187-188; Delano-Earlimart Irrigation District GSP, p. 154; Alpaugh GSP, p. 42-43; Pixley Irrigation District GSP, p. 147-148.

⁶⁴ The five GSPs include the Alpaugh GSP, Delano-Earlimart Irrigation District GSP, Eastern Tule GSP, Lower Tule River Irrigation District GSP, and Pixley Irrigation District GSP.

- Create a hydrograph of historical and future projected groundwater levels from the groundwater flow model.
- Establish interim milestones based on the projected water level conditions with the lowest interim milestone during the first 10-years of implementation generally corresponding to the projected value in 2030.
- Evaluate the change in groundwater levels experienced during the “recent drought” from 2007-2016 and subtract that value from the lowest interim milestone during the initial 10-years of implementation to establish the minimum threshold.

Four of the GSPs⁶⁵ state that the GSAs would adjust the projected groundwater elevations at representative monitoring sites from the groundwater flow model based on field measurements collected in the future (i.e., a date following adoption of the GSPs in February 2020) to establish a baseline condition. Similarly, the Alpaugh GSP states adjustments would be made to groundwater elevations at representative monitoring sites based on field measurements but uses measurements collected in 2019. The interim milestones and the measurable objective for the period between 2020 and 2040 would then be updated to reflect the adjusted groundwater elevations at the respective representative monitoring sites.

While Department staff expects GSAs to update models and other technical information based on experience and the acquisition of new or improved information, the GSAs must establish what groundwater level conditions occurring throughout the Subbasin would be considered significant and unreasonable that the GSAs intend to avoid and are based on their commensurate understanding of the basin setting.⁶⁶ Further, the minimum thresholds should be informed by that understanding and defined based on what conditions would lead to or are causing undesirable results in a basin.⁶⁷ Department staff do not read the GSPs to have established minimum thresholds on the basis of groundwater conditions that would cause undesirable results based on significant and unreasonable conditions, but that they are, instead, based on future projected groundwater elevations and that the GSPs do not establish a nexus between conditions at those predicted elevations and undesirable results the GSAs seek to avoid.

GSPs in the Subbasin state that the minimum thresholds were developed to minimize loss of existing wells via well failures, minimize increased pumping costs, and minimize additional capital cost to infrastructure, without defining the groundwater conditions under which those conditions would be experienced.

The Tri-County GSP indicates that the “TCWA Groundwater Model” – a groundwater flow model developed specifically for the Tri-County Water Authority GSA – was used to

⁶⁵ The four GSPs include the Delano-Earlimart Irrigation District GSP, Eastern Tule GSP, Lower Tule River Irrigation District GSP, and Pixley Irrigation District GSP.

⁶⁶ 23 CCR § 354.26(b)(1).

⁶⁷ Water Code § 10721(x); 23 CCR § 354.28(a).

develop sustainable management criteria for groundwater elevations by projecting groundwater elevations into the future based on observed historic trends. Tri-County GSP does not explain how its model was developed, and although the Tri-County GSP also refers to the Subbasin-wide groundwater flow model (i.e., the Tule Groundwater Flow Model), the Plan does not describe how the data and information from the Subbasin-wide groundwater flow model was considered with respect to establishing sustainable management criteria in the Tri-County GSP.⁶⁸ Regardless of how the models were developed or utilized, although the Tri-County GSA presents minimum thresholds for chronic lowering of groundwater levels, the Tri-County GSP does not explain how the values were established to avoid identified significant and unreasonable conditions.⁶⁹

In all cases the GSPs failed to explain how minimum thresholds at the representative monitoring sites were developed in a manner consistent with the requirement that thresholds be based on a groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.⁷⁰ Because minimum thresholds were defined with reference to targeted groundwater withdrawals and not as a means to avoid significant and unreasonable effects on the beneficial uses and users of groundwater, the Plans lack evidence demonstrating the GSAs considered the interests of beneficial users and uses of groundwater in defining undesirable results or establishing minimum thresholds. Among potential concerns that will have been overlooked as a result are effects on drinking water users including domestic wells, a concern raised by several public comments. Because the GSPs did not define undesirable results or establish minimum thresholds in a manner consistent with the requirements of the GSP Regulations, Department staff are not able to assess whether the GSAs have established sustainable management criteria based on a commensurate level of understanding of the basin setting or whether the interests of beneficial uses and users have been considered.⁷¹ (see Corrective Action 2.)

3.1.3 Corrective Actions

1. The GSAs should revise the GSP to describe, with information specific to the Subbasin, the groundwater level conditions that are considered significant and unreasonable and would result in undesirable results as these are described in the GSP Regulations and as discussed above. The GSAs should define the conditions, including specific water level depth and well construction information, anticipated to cause well failures, result in additional operational costs for groundwater extraction from deeper pumping levels, and result in additional costs to lower pumps, deepen wells, or drill new wells. The GSAs should then explain or justify how the quantitative definition of undesirable results (i.e., 50 percent minimum threshold exceedances for two consecutive years), which allows for

⁶⁸ Tri-County GSP, p. 239.

⁶⁹ Tri-County GSP, p. 240-251.

⁷⁰ 23 CCR § 354.28(c)(1).

⁷¹ 23 CCR § 355.4(b)(3-4)

potential continued groundwater decline at up to half of the monitoring sites, is consistent with avoiding the effects the GSAs have determined are undesirable results.

2. The GSAs must revise their GSPs to explain how minimum thresholds at the representative monitoring sites are consistent with the requirement to be based on a groundwater elevation indicating a depletion of supply at a given location. If the GSAs did not set minimum thresholds consistent with levels indicating a depletion of supply, they should revise the minimum thresholds accordingly. Groundwater sustainability agencies in other subbasins have used domestic wells as the shallowest beneficial user to constrain their groundwater thresholds. The Tule GSAs may consider incorporating an evaluation of domestic well impacts into the development of minimum thresholds for the chronic lowering of groundwater to ensure all beneficial uses and users of groundwater in the Subbasin are represented. The Tule Subbasin GSAs may need to look to other users, such as municipal or agricultural groundwater users, as applicable for each monitoring site, to determine the levels indicating supply depletion when setting minimum thresholds.

3.2 DEFICIENCY 2. THE GSPs DO NOT DEFINE UNDESIRABLE RESULTS OR SET MINIMUM THRESHOLDS AND MEASURABLE OBJECTIVES FOR LAND SUBSIDENCE IN A MANNER CONSISTENT WITH THE GSP REGULATIONS

3.2.1 Background

The GSP Regulations state that minimum thresholds for land subsidence should identify the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results. These quantitative values should be supported by:

- The identification of land uses or property interests potentially affected by land subsidence;
- An explanation of how impacts to those land uses or property interests were considered when establishing minimum thresholds; and
- Maps or graphs showing the rates and extents of land subsidence defined by the minimum thresholds.⁷²

3.2.2 Deficiency Details

The Coordination Agreement and six GSPs in the Tule Subbasin do not define sustainable management criteria for land subsidence in a manner required by SGMA and the GSP Regulations or provide sufficient explanations of how the undesirable results and minimum thresholds were selected.

⁷² 23 CCR § 354.28(c)(5).

Undesirable Results. The Coordination Agreement defines undesirable results for land subsidence in the Subbasin as “a loss of functionality of a structure or a facility to the point that, due to subsidence, the structure or facility, such as the Friant-Kern Canal (Canal), cannot reasonably operate to meet contracted for [sic] water supply deliveries without either significant repair or replacement.”⁷³ Neither the Coordination Agreement nor the individual GSPs support this general statement with a quantitative description of the groundwater conditions that would lead to functional impacts to structures and facilities, when and where the effects of land subsidence would cause undesirable results to the Canal, or what loss of functionality to structures or facilities other than the Canal would have that effect.⁷⁴ (see Corrective Actions 1 and 2.) Such an analysis would describe physical conditions in the basin that, were they to occur, would result in significant and unreasonable land subsidence that substantially interferes with land uses.^{75, 76} The Coordination Agreement’s undesirable result definition is further qualified by the condition that Canal operation require “significant repair or replacement” without defining what would constitute significant in this context or what types of impacts could occur that would require repair or replacement. Department staff consider the lack of clearly defined undesirable results to mean that it would be impossible to understand and monitor whether the GSPs are managing the Subbasin in a manner that would achieve the sustainability goal and avoid impacts to land uses and property interests.

Although the Coordination Agreement provides the previously discussed definition of undesirable results for land subsidence, the Coordination Agreement and five of the six GSPs define undesirable results due to land subsidence as occurring when 50 percent of the representative monitoring sites exceed their minimum threshold.⁷⁷ Neither the Coordination Agreement or any of the GSPs explain how the 50 percent figure was arrived at or how operating to that criterion would avoid the significant and unreasonable effects that would require repairs or replacement especially related to the Canal that is defined as constituting undesirable results. In addition, neither the Coordination Agreement or any of the GSPs explain how it was determined that subsidence was not a matter of concern to other structures or facilities in all other portions of the Subbasin not in immediate vicinity of the Canal. GSAs are required to define the physical conditions under which undesirable results would occur, based on an understanding of what conditions would produce significant and unreasonable effects to land uses and property interests susceptible to impacts from land subsidence and provide a clear explanation of the criteria

⁷³ Tule Subbasin Coordination Agreement, p. 51.

⁷⁴ 23 CCR § 354.26(b)(2).

⁷⁵ Water Code § 10721(x)(5).

⁷⁶ For the purposes of evaluating different alternatives for the Friant-Kern Canal Middle Reach Capacity Correction Project Feasibility Study, Draft Recommended Plan Report (October 2019), the U.S. Bureau of Reclamation and the Friant Water Authority evaluated the potential for future land subsidence in the Tule Subbasin to cause further restrictions on the Friant-Kern Canal capacity. The report is provided as an attachment to a comment letter submitted on the Draft Eastern Tule GSP (Eastern Tule GSP, p 483-484). However, the Eastern Tule GSP does not state that findings from the report was used to support selection of sustainable management criteria.

⁷⁷ Tule Subbasin Coordination Agreement, p. 51.

selected and basis for that selection in the GSP. Although Department staff do not expect a GSP to prove a negative, if predicted levels of subsidence are not expected to substantially interfere with surface land uses in certain areas of the basin, it is incumbent upon the GSA to describe existing conditions in sufficient detail and in a sufficiently convincing manner to persuade a reasonable person of that fact. (see Corrective Action 3.)

The sixth GSP, adopted by the Eastern Tule GSA, one of the GSA areas through which the Canal passes, defines more stringent criteria for undesirable results due to land subsidence as occurring if any one of their representative monitoring sites exceeds its minimum threshold for land subsidence.⁷⁸ This is consistent with the Coordination Agreement, which states individual GSAs may adopt more stringent criteria than established in Section 4.3.4.2 of the agreement.⁷⁹

Minimum Thresholds. All the Tule Subbasin GSPs, except for the Tri-County GSP, define minimum thresholds for land subsidence using projected land surface elevation during the implementation period (2020 – 2040) derived from the Groundwater Flow Model. The minimum thresholds defined in the GSPs, apart from Tri-County GSP, are generally determined utilizing the following stepwise process:⁸⁰

- Create a chart with interpolated historical land subsidence at each representative monitoring site and projected land subsidence at those RMS sites from the groundwater flow model.
- Adjust land subsidence at each representative monitoring site based on elevations collected in Fall 2019 to establish baseline conditions.
- Establish interim milestones based on the projected land subsidence with the lowest interim milestone during the first 10-years of implementation generally corresponding to the projected value in 2030.
- Evaluate the change in land subsidence, interpolated to the representative monitoring sites, experienced during the “recent drought” from 2007-2016 and subtract that value from the lowest interim milestone during the initial 10-years of implementation to establish the minimum threshold.

The Eastern Tule GSP follows the procedure outlined above for establishing minimum thresholds for land subsidence as four other Tule Subbasin GSPs but limits the cumulative subsidence along the canal during the period between 2020 and 2040 to a maximum of 3 feet. Department staff recognize acknowledge that the Eastern Tule GSP

⁷⁸ Eastern Tule GSP, p. 232-233.

⁷⁹ Tule Subbasin Coordination Agreement, p. 51.

⁸⁰ Delano-Earlimart Irrigation District GSP, p. 169-170; Lower Tule River Irrigation District GSP, p. 203; Pixley Irrigation District GSP, p. 163; Alpaugh GSP, p. 48.

states that it will develop a Land Subsidence Management and Monitoring Plan;^{81,82} however, the Eastern Tule GSA does not provide an explanation or justification as to how the 3-foot maximum of allowable cumulative subsidence threshold would avoid undesirable results and protect downstream beneficial uses and users of the Canal.

The Tri-County GSP states that existing data on land subsidence in Tri-County plan area is not considered adequate for developing interim milestones, measurable objectives, and minimum thresholds. The Tri-County GSP presents three figures illustrating sustainable management criteria for land subsidence in the plan area and states that they are considered to be tentative, pending collection of data over the next 5 years.⁸³ As acknowledged in the Coordination Agreement, the Department provides Interferometric Synthetic Aperture Radar (i.e., InSAR) data, which measures vertical ground surface displacement available through the California Natural Resources Agency data online platform. The Department encourages the Tri-County GSA and other GSAs in the subbasin to consult this dataset in addition to other monitoring sites established for land subsidence.⁸⁴

The Coordination Agreement and the individual GSPs generally identify land uses and property interests susceptible to impacts from land subsidence, but do not explain how they were considered or describe the rationale for establishing minimum thresholds for land subsidence in consideration of beneficial uses and property interests. (see Corrective Action 4.) Instead, as mentioned above, the GSPs define sustainable management criteria for land subsidence based on projected groundwater flow model output values for the years 2025, 2030, 2035, and 2040 at various representative monitoring sites in the basin.⁸⁵ Neither the Coordination Agreement nor the individual GSPs quantify the effects of subsidence on the identified land uses that they seek to avoid or define minimum thresholds in a manner designed to avoid the effects that would cause those undesirable results.

Considering the Subbasin has significant historical subsidence and contains infrastructure that the GSPs identify as both critical and susceptible to future subsidence, Department staff believe that the GSAs should identify the total cumulative amount of subsidence that can occur without causing significant and unreasonable impacts to beneficial uses and users, surface land uses, and property interests. The total cumulative amount of subsidence should consider the conditions necessary to minimize or halt

⁸¹ Eastern Tule GSP, p. 290.

⁸² Department staff acknowledge that Eastern Tule GSA is currently reviewing a draft of the Land Subsidence Management and Monitoring Plan, with an expected adoption of the final plan in WY 2021. (Eastern Tule GSA 2019/20 Annual Report (Revised October 2021), p. 38)

⁸³ Tri-County GSP, p. 255-256.

⁸⁴ The Department anticipates releasing the most recent dataset covering the period between June 2015 and October 2021 soon.

⁸⁵ As stated by the GSAs in Water Year 2019/2020 Annual Reports, these sites were selected arbitrarily (see Alpaugh GSA 2018/2019 Annual Report, p.22.; Delano-Earlimart Irrigation District GSA WY2020 Annual Report, p. 30; Eastern Tule GSA 2019/20 Annual Report, p. 29.; Lower Tule River Irrigation District GSA 2019/2020 Annual Report, p. 28; Pixley Irrigation District GSA 2019/2020 Annual Report, p. 25).

subsidence during GSP implementation and once sustainability has been achieved after 2040. (see Corrective Action 4.)

3.2.3 Corrective Actions

1. For areas defined as adjacent to the Canal in the Eastern Tule GSP, Delano-Earlimart Irrigation District GSP, and Lower Tule River Irrigation District GSP areas, the GSAs should identify, through analysis, the total amount of subsidence that can be tolerated by the Canal during implementation of the GSPs to maintain the ability to reasonably operate to meet contracted water supply deliveries. Eastern Tule GSA, Delano-Earlimart Irrigation District GSA, and Lower Tule River Irrigation District GSA should explain how implementation of the projects and management actions is consistent both with achieving the long-term avoidance or minimization of subsidence and with not exceeding the tolerable amount of cumulative subsidence adjacent to the Canal.
 - a. GSPs adjacent to the Canal should provide an updated description of the Land Subsidence Management and Monitoring Plan and the associated subsidence management in the vicinity of the Canal. The GSPs should include details of any projects, management actions, or mitigation programs associated with the management of land subsidence in the Subbasin.⁸⁶
2. For areas not adjacent to the Canal, the GSAs should identify facilities and/or structures, land uses and property interests that may be susceptible to impacts from land subsidence and should quantify the amount of land subsidence that would result in undesirable results. The GSAs should describe the rationale and any analysis performed to inform the quantification of undesirable results in these areas.
3. Tule Subbasin GSAs should define the criteria for when undesirable results occur in the Subbasin based on the results of analyses completed in response to Corrective Actions 1 and 2, the rationale behind the approach, and why it is consistent with avoiding the significant and unreasonable effects identified by the GSAs.
4. The GSAs should revise their minimum thresholds and measurable objectives for land subsidence to be consistent with the intent of SGMA that subsidence be avoided or minimized once sustainability is achieved. In doing that, the GSAs should identify a cumulative amount of tolerable subsidence that, if exceeded, would substantially interfere with groundwater and land surface beneficial uses and users in the Subbasin. The GSPs should explain how the extent of any future subsidence permitted by the GSPs would not substantially interfere with surface land uses. The GSAs should explain how implementation of the projects and

⁸⁶ The Coordination Agreement states that Parties to the Agreement have the intent to work on a mitigation program related to the projected cause of post 2020 land subsidence. (Tule Subbasin Coordination Agreement, p. 57).

management actions is consistent both with achieving the long-term avoidance or minimization of subsidence and with not exceeding the tolerable amount of cumulative subsidence.

3.3 DEFICIENCY 3. THE GSPs DO NOT PROVIDE SUFFICIENT INFORMATION TO JUSTIFY THE PROPOSED SUSTAINABLE MANAGEMENT CRITERIA FOR DEGRADED WATER QUALITY

3.3.1 Background

SGMA states that a GSP may, but is not required to, address undesirable results that occurred before, and have not been corrected by, January 1, 2015.⁸⁷ As a result, the Tule Subbasin GSPs would not be required to address preexisting undesirable results associated with degraded water quality. 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.⁸⁸ 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 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.⁸⁹ SGMA provides a GSA with authority to manage and control polluted water and use authorities under existing laws to implement its GSP.⁹⁰ 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.

3.3.2 Deficiency Details

Undesirable Results. The Coordination Agreement defines an undesirable result due to degraded water quality as “the significant and unreasonable reduction in groundwater quality due to groundwater pumping and recharge projects such that the groundwater is no longer generally suitable for agricultural irrigation and domestic use.”⁹¹ The Coordination Agreement adds that “degraded water quality causation will include those changes to groundwater quality caused by recharge or lowering of groundwater elevations.”⁹² The Coordination Agreement states that an undesirable result due to water quality degradation occurs if 50% of GSA Management Areas representative monitoring sites exceed their threshold as a result of either groundwater pumping or groundwater recharge. Four of the GSPs define constituents of concern for municipal and domestic

⁸⁷ Water Code § 10727.2(b)(4))

⁸⁸ Water Code § 10721(x)(4); 23 CCR § 354.28(c)(4).

⁸⁹ 23 CCR § 354.28(c)(4).

⁹⁰ Water Code §§ 10726.2(e), 10726.8(a).

⁹¹ Tule Subbasin Coordination Agreement, p. 50.

⁹² Tule Subbasin Coordination Agreement, p. 50.

wells as arsenic, chromium, nitrogen as N, and any constituent exceeding the Title 22 MCL at the baseline sampling event to be performed in Spring 2020.⁹³ The same four GSPs define constituents of concern for agricultural wells as pH, conductivity, and nitrate as N.⁹⁴ The Alpaugh GSP and Tri-County GSP do not identify specific constituents of concerns that would be evaluated for suitability of agricultural irrigation or domestic use.⁹⁵ The Alpaugh GSP states that shallow groundwater has been de-designated for agricultural and municipal uses to the west and northwest of the GSA, but that the lower-aquifer groundwater quality is suitable for agriculture. However, the Alpaugh GSP does not identify the specific water quality standards that make the water unsuitable or suitable for agricultural use.⁹⁶

The Tule Subbasin Setting states that nitrate concentrations in excess of the MCL of 45 mg/L have been detected historically in wells in the northwest portion of the subbasin. The Tule Subbasin Setting states that elevated nitrate is not an issue for agricultural irrigation or dairy supply but could limit the beneficial use of water from small domestic supply wells that are impacted.⁹⁷ This statement appears to be inconsistent with the selection of constituents of concern identified in four of the GSPs.

Neither the Coordination Agreement or the individual GSPs include additional discussion of water quality standards that would make water unsuitable for agricultural irrigation or domestic use. Nor do the GSPs justify why pH and conductivity are reasonable proxies to assess degraded water quality for agricultural use. (see Corrective Action 1.)

Measurable Objectives and Minimum Thresholds. Four of the six GSPs⁹⁸ set measurable objectives for degraded water quality at 10% above the 10-year running average for each constituent of concern. The Alpaugh GSP and the Tri-County GSP do not establish measurable objectives.⁹⁹ The Minimum thresholds for degraded water quality are generally set at 15% above the 10-year running average for each constituent of concern.¹⁰⁰ The GSPs intend the 10-year average to be based on groundwater quality survey measurements made annually, beginning in 2020.¹⁰¹ It is Department staff's understanding that the 10-year running average will be calculated annually using the

⁹³ Delano-Earlimart Irrigation District GSP, p. 161; Eastern Tule GSP, p. 226; Lower Tule River Irrigation District GSP, p. 194-195; Pixley Irrigation District GSP, p. 154-155.

⁹⁴ Delano-Earlimart Irrigation District GSP, p. 161; Eastern Tule GSP, p. 226; Lower Tule River Irrigation District GSP, p. 194-195; Pixley Irrigation District GSP, p. 154-155.

⁹⁵ Alpaugh GSP, p. 46; Tri-County GSP, p. 253.

⁹⁶ Alpaugh GSP, p.33.

⁹⁷ Tule Subbasin Coordination Agreement, Attachment 2, Tule Subbasin Setting, p. 394.

⁹⁸ The four GSPs include Delano Earlimart Irrigation District GSP, Eastern Tule GSP, Lower Tule Irrigation District GSP, and Pixley Irrigation District GSP

⁹⁹ Alpaugh GSP, p. 46; Tri-County GSP, p. 261-263.

¹⁰⁰ Delano-Earlimart Irrigation District GSP, p. 169; Eastern Tule GSP, p. 230; Lower Tule River Irrigation District GSP, p. 202; Pixley Irrigation District GSA GSP, p. 162; Tri-County GSP, p. 253; Alpaugh GSP, p. 46

¹⁰¹ Delano-Earlimart Irrigation District GSP, Footnote 11, p. 169; Eastern Tule GSP, Footnote 6, p. 230; Lower Tule River Irrigation District GSP, Footnote 7, p. 203; Pixley Irrigation District GSA GSP, Footnote 6, p. 162.

previous 10 annual measurements (or less, if 10 annual measurements are unavailable). The value derived from the 10-year running average will be multiplied by 1.1 and 1.15 to establish the next year's measurable objective and minimum threshold, respectively.

The GSPs do not explain how continued degradation of groundwater quality, which is a potential consequence of using a running 10-year average for minimum thresholds and measurable objectives, will avoid groundwater quality conditions that are not generally suitable for agricultural irrigation and drinking water use. This allowable continued degradation approach appears incapable of maintaining water quality above known water quality standards for agricultural irrigation and domestic use. Without a discussion of what is considered suitable for agricultural irrigation and domestic use, or a discussion of how the proposed sustainable management criteria relate to existing groundwater quality regulatory requirements in the Subbasin (e.g., Irrigated Lands Regulatory Program, Drinking Water Standards, Central Valley Salinity Alternatives for Long-Term Sustainability, etc.), Department staff cannot assess whether the proposed sustainable management criteria will avoid undesirable results. Further, the GSAs do not explain how minimum thresholds may affect the interest of beneficial uses and users of groundwater in the Subbasin.¹⁰² (see Corrective Action 2 and 3.)

3.3.3 Corrective Actions

The Tule Subbasin GSPs should be revised to include a discussion of:

1. What groundwater quality conditions are considered suitable for agricultural irrigation and domestic use using the best available information and science, including information from existing groundwater quality programs, agencies, and regulatory standards. The GSPs should also explain why pH and conductivity in addition to nitrate are suitable constituents to evaluate impacts to beneficial uses and users, especially agricultural irrigation.
2. How and why the 10-year running average is being applied to set sustainable management criteria, especially if baseline conditions had not been established at the time the GSPs were submitted. How the sustainable management criteria for degraded water quality will avoid undesirable results due to degraded groundwater quality and relate potential effects of the undesirable results to existing regulatory standards. Clarify how the criteria defining when undesirable results occur in the Subbasin were established, the rationale behind the approach, and why it is consistent with avoiding the significant and unreasonable effects associated with groundwater pumping and other aspects of the GSAs' implementation of their GSPs. Additionally, the GSPs should describe and disclose how the GSAs will assess whether any future degradation in groundwater quality is due to groundwater pumping and recharge projects occurring during GSP implementation.

¹⁰² 23 CCR § 354.28.

3. How the sustainable management criteria for degraded water quality relate to existing groundwater quality regulatory requirements in the Subbasin and how the GSAs will coordinate with existing agencies and programs to assess whether or not implementation of the GSPs are contributing to the degradation of water quality throughout the Subbasin.

4 STAFF RECOMMENDATION

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