



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

Kris Balaji, PMP, P.E.  
Eastern San Joaquin Subbasin Plan Administrator  
1810 E. Hazelton Avenue  
Stockton, CA 95201  
[kbalaji@sigov.org](mailto:kbalaji@sigov.org)

RE: Incomplete Determination of the 2020 Eastern San Joaquin Subbasin Groundwater Sustainability Plan

Dear Kris Balaji,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Eastern San Joaquin Subbasin (Subbasin) and has determined that the GSP is incomplete. The Department based its determination on recommendations from the Staff Report, included as an enclosure to the attached Statement of Findings, which describes that the Eastern San Joaquin Subbasin GSP 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 to address the identified deficiencies.

The Subbasin's Groundwater Sustainability Agencies (GSAs) have 180 days, the maximum allowed by GSP Regulations, to address the identified deficiencies. Where addressing the deficiencies requires modification of the GSP, the GSAs must adopt those modifications into the Subbasin's GSP or otherwise demonstrate that those modifications are part of the GSP 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 the GSP 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 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 GSP resubmittal. If the revisions address the identified deficiencies, the Department will determine that the GSP is approved. In that scenario, Department staff will identify additional recommended corrective actions that the GSAs should address early in implementing their GSP (i.e., no later than the first required periodic evaluation). Among other items, those recommendations will include for the GSAs to provide more detail on

their plans and schedules to address data gaps. Those recommendations will also 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 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 staff by emailing [sgmps@water.ca.gov](mailto:sgmps@water.ca.gov) if you have any questions about the Department's assessment, implementation of your GSP, or to arrange a meeting with the Department.

Thank You,

*Paul Gosselin*

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Paul Gosselin  
Deputy Director of Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Determination of Incomplete Status of the San Joaquin Valley - Eastern San Joaquin Subbasin Groundwater Sustainability Plan

**STATE OF CALIFORNIA  
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE  
DETERMINATION OF INCOMPLETE STATUS OF THE  
SAN JOAQUIN VALLEY – EASTERN SAN JOAQUIN SUBBASIN  
GROUNDWATER SUSTAINABILITY PLAN**

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the basin covered by the Plan, and whether the Plan 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 Plan within two years of its submission. (Water Code § 10733.4.) This Statement of Findings explains the Department's decision regarding the Plan submitted by the Eastern San Joaquin Groundwater Authority (Authority), which is a joint powers authority formed by the 16 groundwater sustainability agencies (GSAs) located within the San Joaquin Valley – Eastern San Joaquin Subbasin (No. 5-022.01).

Department management has reviewed the enclosed Staff Report, which recommends that the identified deficiencies should preclude approval of the GSP. 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 GSP has not defined sustainable management criteria (SMC) for the chronic lowering of groundwater levels in the manner required by SGMA and the GSP Regulations.

1. The GSP lacks sufficient justification for identifying that undesirable results for chronic lowering of groundwater levels (and by proxy land subsidence and depletion of interconnected surface waters) can only occur in consecutive non-dry water year types.

i. The GSP's proposed water-year type requirement in the definition of the undesirable result for chronic lowering of groundwater levels (i.e., two consecutive non-dry years) is not consistent with the intent of SGMA and could potentially allow for unmanaged and continued lowering of groundwater levels under certain hydrologic or climatic conditions that have occurred historically.

## Statement of Findings

## San Joaquin Valley – Eastern San Joaquin Subbasin (Basin No. 5-022.01)

- ii. While SGMA states that “overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods”, the GSP fails to identify specific extraction and groundwater recharge management actions the GSAs would implement or otherwise describe how the Subbasin would be managed to offset, by increases in groundwater levels or storage during other periods, dry year reductions of groundwater levels or storage.
  - iii. The GSP does not explain or disclose the potential impacts anticipated during extended drier climate conditions, as allowed by the water-year type requirement used to define undesirable results. In other words, the proposed management program may lead to potential effects on domestic wells or other beneficial uses and users during prolonged dry- or below-normal periods, and that information should, at a minimum, be disclosed and considered in the GSP.
  - iv. Although SGMA states that groundwater level declines during drought periods are not necessarily an undesirable result for chronic lowering of groundwater levels (if properly managed and offset), the statute does not include a similar exception for subsidence or stream depletion during periods of drought. The greatest impacts to infrastructure from land subsidence and beneficial uses of surface water from depletions of interconnected surface water are likely to occur when groundwater levels are lowest, which would likely be during dry and critically dry water years, and the GSP does not provide an evaluation of these potential impacts.
2. The GSP lacks sufficient explanation for its chronic lowering of groundwater levels minimum thresholds and undesirable results.
    - i. Apart from an analysis of potential impacts to domestic and municipal wells going dry, the GSP does not address how groundwater level SMCs are protective of other potential undesirable results identified by the GSAs, including reductions in pumping capacity or increased pumping costs for shallow

Statement of Findings

San Joaquin Valley – Eastern San Joaquin Subbasin (Basin No. 5-022.01)

groundwater users, or adverse impacts to environmental uses and users.

- ii. The GSP only considers an undesirable result to occur for groundwater levels in the Subbasin when at least 25 percent of representative monitoring wells (5 of 20 wells) fall below their minimum threshold value for two consecutive non-dry water years. The GSP does not justify or discuss how the GSAs developed this 25 percent threshold or show how the potential impacts allowed by this requirement would not be significant and unreasonable.
- iii. The GSP does not explain how the proposed minimum thresholds for the chronic lowering of groundwater levels, which allow groundwater levels to fall below historic lows, will be sufficient to avoid undesirable results related to groundwater quality.

B. The GSP does not provide enough information to support the use of the chronic lowering of groundwater level SMCs and representative monitoring network as a proxy for land subsidence.

1. The GSP does not identify specific infrastructure locations, such as flood control or water conveyance facilities, and the rate and extent of subsidence that would substantially interfere with those land surface uses and may lead to undesirable results.
  - i. Without the identification of specific infrastructure potentially at risk due to land subsidence, the GSP's proposed groundwater level monitoring network cannot be determined to be adequate.
2. The GSP does not provide adequate evidence to demonstrate a significant correlation between groundwater levels and land subsidence in the Subbasin, particularly relating to the potential for groundwater levels to decline below historic lows.
  - i. Without additional evaluation of potential groundwater level declines allowed by the chronic lowering of groundwater level SMCs, in addition to an analysis of dewatered subsurface materials related to those declines, the GSP does not provide enough information for the Department to conclude that the use of groundwater level SMCs as proxy for land subsidence would protect against undesirable results.

Statement of Findings

San Joaquin Valley – Eastern San Joaquin Subbasin (Basin No. 5-022.01)

Based on the above, the GSP submitted by the Authority for the San Joaquin Valley – Eastern San Joaquin Subbasin is determined to be incomplete because the GSP does not satisfy the requirements of SGMA, nor does it substantially comply with the GSP Regulations. The corrective actions provided in the Staff Report are intended to address the deficiencies that, at this time, preclude approval. The Authority has up to 180 days to address the deficiencies outlined above and detailed in the Staff Report. Once the Authority resubmits its Plan, the Department will review the revised GSP to evaluate whether the deficiencies were adequately addressed. Should the Authority fail to take sufficient actions to correct the deficiencies identified by the Department in this assessment, the Department shall disapprove the Plan if, after consultation with the State Water Resource Control Board, the Department determines the Plan inadequate pursuant to 23 CCR § 355.2(e)(3)(C).

Signed:



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Karla Nemeth, Director

Date: January 28, 2022

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

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

Groundwater Basin Name: San Joaquin Valley – Eastern San Joaquin Subbasin (No. 5-022.01)

Submitting Agencies: Central Delta Water Agency GSA; Central San Joaquin Water Conservation District GSA; City of Lodi GSA; City of Manteca GSA; City of Stockton GSA; County of San Joaquin GSA - Eastern San Joaquin 1; County of San Joaquin GSA - Eastern San Joaquin 2; Eastside San Joaquin GSA; Linden County Water District GSA; Lockeford Community Service District GSA; North San Joaquin Water Conservation District GSA; Oakdale Irrigation District GSA; South Delta Water Agency GSA; South San Joaquin GSA; Stockton East Water District GSA; Woodbridge Irrigation District GSA

Recommendation: Incomplete

Date: January 28, 2022

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The Sustainable Groundwater Management Act (SGMA)<sup>1</sup> 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.<sup>2</sup> Here, as presented in this staff report, a single GSP covering the entire basin was adopted and submitted to the Department of Water Resources (Department) for review.<sup>3</sup>

The Central Delta Water Agency GSA, Central San Joaquin Water Conservation District GSA, City of Lodi GSA, City of Manteca GSA, City of Stockton GSA, County of San Joaquin GSA - Eastern San Joaquin 1, County of San Joaquin GSA - Eastern San Joaquin 2, Eastside San Joaquin GSA, Linden County Water District GSA, Lockeford Community Service District GSA, North San Joaquin Water Conservation District GSA, Oakdale Irrigation District GSA, South Delta Water Agency GSA, South San Joaquin GSA, Stockton East Water District GSA, and Woodbridge Irrigation District GSA (collectively, the GSAs) jointly submitted the Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan (GSP or Plan) to the Department for evaluation and

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<sup>1</sup> Water Code § 10720 *et seq.*

<sup>2</sup> Water Code § 10727.

<sup>3</sup> Water Code §§ 10727(b)(1), 10733.4; 23 CCR § 355.2.

assessment as required by SGMA and the GSP Regulations.<sup>4</sup> The GSP covers the entire Eastern San Joaquin Subbasin (Subbasin) for the implementation of SGMA.

Evaluation and assessment by the Department is based on whether the adopted and submitted GSP, either individually or in coordination with other adopted and submitted GSPs, complies with SGMA and substantially complies with GSP Regulations. Department staff base their assessment on information submitted as part of an adopted GSP, public comments submitted to the Department, and other materials, data, and reports that are relevant to conducting a thorough assessment.<sup>5</sup> Department staff have evaluated the GSP and have identified deficiencies that staff recommend should preclude its approval.<sup>6</sup> In addition, consistent with the GSP Regulations, Department staff have provided corrective actions<sup>7</sup> that the GSAs should review while determining how and whether to address the deficiencies. 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.

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, GSP completeness, and basin coverage required for a GSP to be evaluated by the Department.
- **Section 3 – Plan Evaluation:** Provides a detailed assessment of deficiencies identified in the GSP which may be capable of being corrected by the GSAs. 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 Department staff regarding the Department’s determination.

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<sup>4</sup> 23 CCR § 350 *et seq.*

<sup>5</sup> SGMA requires that the Department assess a Plan within two years of its submission by a GSA. However, the Department notes that ongoing litigation raises challenges to the Plan. This assessment is limited to technical review of the submitted Plan, as required by SGMA, and is not intended and should not be read as a comment on the litigation or the legal or factual claims raised by the parties.

<sup>6</sup> 23 CCR § 355.2(e)(2).

<sup>7</sup> 23 CCR § 355.2(e)(2)(B).



# 1 EVALUATION CRITERIA

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The Department evaluates whether a GSP conforms to the statutory requirements of SGMA<sup>8</sup> and is likely to achieve the basin’s sustainability goal.<sup>9</sup> To achieve the sustainability goal, the GSP must demonstrate that implementation of its groundwater sustainability program 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.<sup>10</sup> 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.<sup>11</sup> The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.<sup>12</sup>

To evaluate a GSP, the Department must first determine a GSP was submitted by the statutory deadline,<sup>13</sup> is complete,<sup>14</sup> and covers the entire basin.<sup>15</sup> For those GSAs choosing to develop multiple GSPs, the GSPs must be coordinated pursuant to a single coordination agreement that covers the entire basin.<sup>16</sup> If these conditions are satisfied, the Department evaluates the GSP to determine whether it complies with SGMA and substantially complies with the GSP Regulations.<sup>17</sup> 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.”<sup>18</sup>

When evaluating whether implementation of the GSP is likely to achieve the sustainability goal for the basin, Department staff review the information provided and relied upon in the GSP for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.<sup>19</sup> The Department’s review considers whether there is a reasonable relationship between the information provided by the GSA and the

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<sup>8</sup> Water Code §§ 10727.2, 10727.4.

<sup>9</sup> Water Code §§ 10733(a).

<sup>10</sup> Water Code § 10721(v).

<sup>11</sup> 23 CCR § 354.26 *et seq.*

<sup>12</sup> Water Code § 10733(c).

<sup>13</sup> Water Code § 10720.7; 23 CCR § 355.4(a)(1).

<sup>14</sup> 23 CCR §§ 355.4(a)(2).

<sup>15</sup> 23 CCR § 355.4(a)(3).

<sup>16</sup> Water Code §§ 10727(b)(3), 10727.6; 23 CCR § 357.4.

<sup>17</sup> 23 CCR § 350 *et seq.*

<sup>18</sup> 23 CCR § 355.4(b).

<sup>19</sup> 23 CCR § 351(h).

assumptions and conclusions presented in the GSP, 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 GSP 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.<sup>20</sup> The Department also considers whether the GSA has the legal authority and financial resources necessary to implement the GSP.<sup>21</sup>

To the extent that overdraft is present in a basin, the Department evaluates whether the GSP provides a reasonable assessment of the overdraft and includes reasonable means to mitigate it.<sup>22</sup> 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.<sup>23</sup> The Department also considers whether the GSP provides reasonable measures and schedules to eliminate identified data gaps.<sup>24</sup> Lastly, the Department's review considers the comments submitted on the GSP and evaluates whether the GSA adequately responded to the comments that raise credible technical or policy issues with the GSP.<sup>25</sup>

The Department is required to evaluate the GSP within two years of its submittal date and issue a written assessment.<sup>26</sup> The assessment is required to include a determination of the GSP's status.<sup>27</sup> The GSP Regulations provide three options for determining the status of a GSP: approved,<sup>28</sup> incomplete,<sup>29</sup> or inadequate.<sup>30</sup>

After review of the GSP, Department staff may find that the information provided is not sufficiently detailed, or the analyses not sufficiently thorough and reasonable, to evaluate whether the GSP 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 GSA in a timely manner,<sup>31</sup> the Department will determine the status of the GSP to be incomplete. A formerly deemed incomplete GSP may be resubmitted to the Department for reevaluation after all deficiencies have been addressed by the GSA within 180 days after the Department makes its incomplete determination. The Department will review the revised GSP to evaluate whether the identified deficiencies were sufficiently addressed. Depending on the outcome of that evaluation, the Department may determine the resubmitted GSP is approved. Alternatively, the Department may find a formerly deemed

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<sup>20</sup> 23 CCR §§ 355.4(b)(1), (3), (4) and (5).

<sup>21</sup> 23 CCR § 355.4(b)(9).

<sup>22</sup> 23 CCR § 355.4(b)(6).

<sup>23</sup> 23 CCR § 355.4(b)(8).

<sup>24</sup> 23 CCR § 355.4(b)(2).

<sup>25</sup> 23 CCR § 355.4(b)(10).

<sup>26</sup> Water Code § 10733.4(d); 23 CCR § 355.2(e).

<sup>27</sup> *Ibid.*

<sup>28</sup> 23 CCR § 355.2(e)(1).

<sup>29</sup> 23 CCR § 355.2(e)(2).

<sup>30</sup> 23 CCR § 355.2(e)(3).

<sup>31</sup> 23 CCR § 355.2 (e)(2)(B)(i).

incomplete GSP is inadequate if, after consultation with the State Water Resources Control Board, it determines that the GSA has not taken sufficient actions to correct any identified deficiencies.<sup>32</sup>

Even when the Department determines a GSP is approved, indicating that it satisfies the requirements of SGMA and is in substantial compliance with the GSP Regulations, the Department may still recommend corrective actions.<sup>33</sup> Recommended corrective actions are intended to facilitate progress in achieving the sustainability goal within the basin and the Department's future evaluations, and to allow the Department to better evaluate whether implementation of the GSP adversely affects adjacent basins. While the issues addressed by the recommended corrective actions in an approved GSP do not, at the time the determination was made, preclude its approval, the Department recommends that the issues be addressed to ensure the GSP's implementation continues to be consistent with SGMA and the Department is able to assess progress in achieving the basin's sustainability goal.<sup>34</sup> Unless otherwise noted, the Department proposes that recommended corrective actions be addressed by the submission date for the first five-year assessment.<sup>35</sup>

The staff assessment of the GSP involves the review of information presented by the GSA, 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 GSP or perform its own geologic or engineering analysis of that information. The recommendation to approve a GSP does not signify that Department staff, were they to exercise the professional judgment required to develop a GSP for the basin, would make the same assumptions and interpretations as those contained in the GSP, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSA are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review of an approved GSP 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 GSP.<sup>36</sup> Also, GSAs have an ongoing duty to reassess their GSPs, provide annual reports to the Department and, when necessary, update or amend their GSPs.<sup>37</sup> 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 progress toward achieving the sustainability goal for the basin and whether GSP implementation adversely affects the ability of adjacent basins to achieve its sustainability goals.

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<sup>32</sup> 23 CCR § 355.2 (e)(3)(C).

<sup>33</sup> Water Code § 10733.4(d).

<sup>34</sup> Water Code § 10733.8.

<sup>35</sup> 23 CCR § 356.4.

<sup>36</sup> Water Code § 10733.8; 23 CCR § 355.6 *et seq.*

<sup>37</sup> Water Code §§ 10728 *et seq.*, 10728.2.

## 2 REQUIRED CONDITIONS

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A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline.<sup>38</sup> The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin. If a GSP is determined to be incomplete, Department staff may require corrective actions that address minor or potentially significant deficiencies identified in the GSP. 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 GSP 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.<sup>39</sup>

The GSAs submitted the GSP for the Eastern San Joaquin Subbasin on January 29, 2020, in compliance with the statutory deadline.

### 2.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a GSP if that GSP is complete and includes the information required by SGMA and the GSP Regulations.<sup>40</sup>

The GSAs submitted an adopted GSP for the entire Subbasin. Department staff found the GSP to be complete and include the required information, sufficient to warrant an evaluation by the Department. The Department posted the GSP to its website on January 31, 2020.

### 2.3 BASIN COVERAGE

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.<sup>41</sup> A GSP 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 GSP intends to manage the entire Eastern San Joaquin Subbasin and the jurisdictional boundaries of the submitting GSAs cover the entire Subbasin.

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<sup>38</sup> Water Code § 10720.7.

<sup>39</sup> Water Code § 10720.7(a)(1).

<sup>40</sup> 23 CCR § 355.4(a)(2).

<sup>41</sup> Water Code § 10727(b); 23 CCR § 355.4(a)(3).

### 3 PLAN EVALUATION

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

Department staff have identified deficiencies in the GSP, the most serious of which preclude staff from recommending approval of the GSP 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 GSP, and the specific actions to address the deficiency.

#### **3.1 DEFICIENCY 1. THE GSP LACKS SUFFICIENT JUSTIFICATION FOR DETERMINING THAT UNDESIRABLE RESULTS FOR CHRONIC LOWERING OF GROUNDWATER LEVELS, SUBSIDENCE, AND DEPLETION OF INTERCONNECTED SURFACE WATERS CAN ONLY OCCUR IN CONSECUTIVE NON-DRY WATER YEAR TYPES. THE GSP ALSO LACKS SUFFICIENT EXPLANATION FOR ITS MINIMUM THRESHOLDS AND UNDESIRABLE RESULTS FOR CHRONIC LOWERING OF GROUNDWATER LEVELS.**

##### **3.1.1 Background**

Related to this deficiency, SGMA defines the term “Undesirable Result,” in part, as one or more of the following effects caused by groundwater conditions occurring throughout the basin:<sup>42</sup>

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

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<sup>42</sup> Water Code § 10721(x).

- Significant and unreasonable land subsidence that substantially interferes with surface land uses.
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

### 3.1.2 Deficiency Details

Department staff identified two areas of concern, described below, which, if not addressed, should preclude approval of the GSP. Regarding the first area of concern, the GSP identifies that an undesirable result occurs “when at least 25 percent of representative monitoring wells used to monitor groundwater levels (5 of 20 wells in the Subbasin) fall below their minimum level thresholds for two consecutive years that are categorized as non-dry years (below-normal, above-normal, or wet), according to the San Joaquin Valley Water Year Hydrologic Classification.” The GSP further states that “the lowering of groundwater levels during consecutive dry or critically-dry years is not considered to be unreasonable, and would therefore not be considered an undesirable result, unless the levels do not rebound to above the thresholds following those consecutive non-dry years.”<sup>43</sup>

Department staff find that the water-year type requirement in the definition of the undesirable result for chronic lowering of groundwater levels (i.e., two consecutive non-dry years) is not consistent with SGMA. The water-year type requirement could potentially allow for unmanaged and continued lowering of groundwater levels under certain hydrologic or climatic conditions that have occurred historically. A review of historical San Joaquin Valley water-year type classifications<sup>44</sup> indicates the potential for dry periods without the occurrence of a second consecutive non-dry year to persist for greater than ten years (see, e.g., the 11 years from water years 1985 through 1995). Department staff also note that consecutive non-dry years (i.e., below normal, above normal, or wet years) occurred in only five of the last twenty water years from 2001 through 2020. Because of this definition, GSAs in the Subbasin could disregard potential impacts of groundwater level declines below the minimum thresholds during extended periods of dry years, even if interrupted by individual normal or wet years.

Department staff also find this methodology inconsistent with other portions of the GSP. For example, while describing measurable objectives for groundwater levels, the GSP states, “the margin of operational flexibility is intended to accommodate droughts, climate change, conjunctive use operations, or other groundwater management activities. The margin of operational flexibility is defined as the difference between the minimum threshold and the measurable objective.”<sup>45</sup> Based on these statements, it appears the minimum thresholds already accommodate drought conditions, so it is unclear why the

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<sup>43</sup> ESJ GSP, p. 253.

<sup>44</sup> Chronological Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices, Water Year 1901 through 2020. California Department of Water Resources, <https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST>.

<sup>45</sup> ESJ GSP, p. 259.

GSP's definition of undesirable results further excludes minimum threshold exceedances during dry water years. (See Corrective Action 1a.)

SGMA states that “overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.”<sup>46</sup> If the GSAs intended to incorporate this concept into their definition of the undesirable result for chronic lowering of groundwater levels, the GSP fails to identify specific extraction and groundwater recharge management actions the GSAs would implement<sup>47</sup> or otherwise describe how the Subbasin would be managed to offset, by increases in groundwater levels or storage during other periods, dry year reductions of groundwater storage. The GSP identifies many projects that, once implemented, may lead to the elimination of long-term overdraft conditions in the Subbasin. However, the GSP does not sufficiently detail how projects and management actions, in conjunction with the proposed chronic lowering of groundwater levels sustainable management criteria, will offset drought-related groundwater reductions and avoid significant and unreasonable impacts when groundwater level minimum thresholds are potentially exceeded for an extended period in the absence of two consecutive non-dry years. (See Corrective Action 1b.)

As noted above, the GSP states that minimum thresholds developed for chronic lowering of groundwater levels serve as proxies for subsidence<sup>48</sup> and depletion of interconnected surface waters.<sup>49</sup> Therefore, Department staff assume the GSAs intend to apply the same water-year type criteria to undesirable results for those sustainability indicators (i.e., land subsidence or depletion of interconnected surface water undesirable results do not occur until groundwater levels exceed the thresholds for two consecutive non-dry water years). However, where SGMA acknowledges that groundwater level declines during drought periods are not necessarily sufficient to cause an undesirable result for chronic lowering of groundwater levels (if basin management offsets those depletions in other periods), SGMA does not provide a similar exception for subsidence or stream depletion during periods of drought. (See Corrective Action 1c.)

Department staff's second area of concern is the GSP's evaluation of the effects of the proposed minimum thresholds and undesirable results on beneficial uses and users of groundwater. The GSP describes that the chronic lowering of groundwater levels could cause undesirable results such as wells going dry, reductions in pumping capacities, increased pumping costs, the need for deeper well installations or lowering of pumps, and adverse impacts to environmental uses and users.<sup>50</sup> The GSP builds an analysis of domestic wells going dry into its minimum thresholds, thereby considering the factors of

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<sup>46</sup> Water Code § 10721(x)(1).

<sup>47</sup> 23 CCR § 354.44(b)(9).

<sup>48</sup> ESJ GSP, p. 270.

<sup>49</sup> ESJ GSP, p. 271.

<sup>50</sup> ESJ GSP, p. 253.

wells going dry and the need for deeper well installations. However, it does not address how the management criteria address the other factors identified by the GSAs as potential undesirable results including reductions in pumping capacity or increased pumping costs for shallow groundwater users, or adverse impacts to environmental uses and users.

The GSAs set minimum thresholds in the Subbasin at the shallower of the 10<sup>th</sup> percentile domestic [or municipal] well depth or the historical low groundwater levels with a subtracted buffer value, which the GSP states allows for operational flexibility.<sup>51</sup> These minimum threshold values would generally allow groundwater levels to decline below historic lows; minimum thresholds defined using the buffer value approach allow twice the historical drawdown from the shallowest recorded groundwater levels.<sup>52</sup> Aside from the GSP's domestic well analysis, the only description of how minimum thresholds were developed and evaluated to avoid undesirable results appears to be the statements that “for the majority of the Subbasin, GSA representatives identified no undesirable results, even if groundwater were to reach historical low groundwater levels” and that no GSA indicated undesirable results would occur “if the minimum threshold was set deeper than the [historic low] based on their understanding.”<sup>53</sup> The GSP provides no further explanation or description of how the individual GSAs concluded that there would be no undesirable results based on the minimum thresholds.

The GSP only considers an undesirable result to occur for groundwater levels in the Subbasin when at least 25 percent of representative monitoring wells (5 of 20 wells) fall below their minimum threshold value for two consecutive non-dry water years.<sup>54</sup> The GSP does not justify or discuss how the GSAs developed the 25 percent threshold, nor does it explain or disclose the potential impacts anticipated during extended drier climate conditions using this threshold (e.g., what impacts may occur if a cluster comprising only 20 percent of monitoring wells fall below their minimum thresholds for an extended period?). In other words, the proposed management program may lead to potential effects on domestic wells or other beneficial uses and users during prolonged dry- or below-normal periods, and that information should, at a minimum, be disclosed and considered in the GSP. (See Corrective Action 1d.)

If, after considering this deficiency, the GSAs retain minimum thresholds that allow for continued lowering of groundwater levels, it is reasonable to assume that some groundwater well impacts (e.g., loss of production capacity, increased pumping costs, etc.) will occur during the implementation of the GSP. SGMA requires GSAs to consider the interests of all groundwater uses and users and to implement their GSPs to mitigate overdraft conditions.<sup>55</sup> Implementing specific projects and management actions to prevent undesirable results may achieve sustainable groundwater management of the basin. The GSAs should describe how projects and management actions would address

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<sup>51</sup> ESJ GSP, p. 254-255.

<sup>52</sup> ESJ GSP, p. 258.

<sup>53</sup> ESJ GSP, p. 255.

<sup>54</sup> ESJ GSP, p. 253.

<sup>55</sup> 23 CCR §§ 355.4(b)(4), 355.4(b)(6).



drinking water impacts due to continued overdraft between the start of GSP implementation and the achievement of the sustainability goal. If the GSP does not include projects or management actions to address drinking water impacts, the GSP should contain a thorough discussion, with supporting facts and rationale, explaining how and why GSAs determined not to include actions to address those impacts from continued groundwater lowering below pre-SGMA levels. (See Corrective Action 1e.)

Additionally, related to the groundwater level declines allowed for by the GSP's minimum thresholds, the GSP does not explain how those groundwater level declines relate to the degradation of groundwater quality sustainability indicator. In the GSP, GSAs must describe, among other items, the relationship between minimum thresholds for a given sustainability indicator (in this case, chronic lowering of groundwater levels) and the other sustainability indicators.<sup>56</sup> The GSAs generally commit to monitoring a wide range of water quality constituents, but they have only developed sustainable management criteria for total dissolved solids based on the claim that they have not observed a causal nexus between groundwater management and degradation associated with other constituents. While Department staff are not aware of evidence sufficient to conclude that the GSAs acted unreasonably by focusing only on total dissolved solids, it is clear that the GSAs did not consider, or at least did not document, the potential for any kind of water quality degradation to occur due to further lowering of groundwater levels beyond the historic lows. (See Corrective Action 1f.)

### **3.1.3 Corrective Action**

The GSAs must provide more detailed explanation and justification regarding the selection of the sustainable management criteria for groundwater levels, particularly the undesirable results and minimum thresholds, and the effects of those criteria on the interests of beneficial uses and users of groundwater. Department staff recommend the GSAs consider and address the following:

- 1a. Department staff believe the management approach described in the GSP, which couples minimum thresholds and measurable objectives that account for operational flexibility during dry periods with a definition of undesirable results that disregards minimum threshold exceedances in all years except consecutive below normal, above normal, or wet years, to be inconsistent with sustainable groundwater management under SGMA. Therefore, the GSAs should remove the water-year type requirement from the GSP's undesirable result definition.
- 1b. The GSP should be revised to include specific projects and management actions the GSAs would implement to offset drought-year groundwater level declines.
- 1c. The GSAs should thoroughly explain how their management approach and minimum thresholds avoid undesirable results for subsidence and depletion of interconnected surface waters, in light of the fact that SGMA does not include an

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<sup>56</sup> 23 CCR § 354.28(b)(2).

allowance or exemption for conditions that occur during periods of drought for those sustainability indicators.

- 1d. Removing the water-year type requirement from the definition of an undesirable result (item a, above) would result in a GSP with groundwater level minimum thresholds designed to be generally protective of 90 percent of domestic wells regardless of regional hydrologic conditions. In that scenario, the GSAs should explain the rationale for determining that groundwater levels can exceed those thresholds at 25 percent of monitoring sites for two consecutive years before the effects would be considered significant and unreasonable. The GSAs should also explain how other factors they identified as "potential undesirable results" (e.g., adverse impacts to environmental uses and users) were considered when developing and selecting minimum thresholds and describe anticipated effects of the thresholds on beneficial uses and users of groundwater. Furthermore, the GSAs should explain whether other drinking water users that may rely on shallow wells, such as public water systems and state small water systems, were considered in the GSAs' site-specific thresholds. If not, the GSAs should conduct outreach with those users and incorporate their shallow wells, as applicable, into the consideration of site-specific minimum thresholds and measurable objectives.
- 1e. The GSAs should revise the GSP to describe how they would address drinking water impacts caused by continued overdraft during the period between the start of GSP implementation and achieving the sustainability goal. If the GSP does not include projects or management actions to address those impacts, the GSP should contain a thorough discussion, with supporting facts and rationale, explaining how and why the GSAs determined not to include specific actions to address drinking water impacts from continued groundwater lowering below pre-SGMA levels.
- 1f. The GSP should be revised to explain how the GSAs will assess groundwater quality degradation in areas where further groundwater level decline, below historic lows, is allowed via the minimum thresholds. The GSAs should further describe how they will coordinate with the appropriate groundwater users, including drinking water, environmental, and irrigation users as identified in the GSP. The GSAs should also discuss efforts to coordinate with water quality regulatory agencies and programs in the Subbasin to understand and develop a process for determining if continued lowering of groundwater levels is resulting in degraded water quality (e.g., increased concentrations of constituents of concern) in the Subbasin during GSP implementation.

## **3.2 DEFICIENCY 2. THE GSP DOES NOT PROVIDE ENOUGH INFORMATION TO SUPPORT THE USE OF THE CHRONIC LOWERING OF GROUNDWATER LEVEL SUSTAINABLE MANAGEMENT CRITERIA AND REPRESENTATIVE MONITORING NETWORK AS A PROXY FOR LAND SUBSIDENCE.**

### **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:<sup>57</sup>

- 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;
- Maps or graphs showing the rates and extents of land subsidence defined by the minimum thresholds.

The GSP Regulations allow the use of groundwater elevations as a proxy for land subsidence. However, GSAs must demonstrate a significant correlation between groundwater levels and land subsidence and must demonstrate that groundwater level minimum thresholds represent a reasonable proxy for avoiding land subsidence undesirable results. Additionally, the GSAs must demonstrate how the monitoring network is adequate to identify undesirable results for both metrics.

### **3.2.2 Deficiency Details**

Department staff find that the GSP does not adequately identify or define minimum thresholds and undesirable results for land subsidence. The GSP also does not provide adequate justification and explanation for using the groundwater level minimum thresholds and representative monitoring network as a proxy for land subsidence.

Generally, the GSP identifies that irrecoverable loss of groundwater storage and damage to infrastructure, including water conveyance facilities and flood control facilities, are potential impacts of land subsidence.<sup>58</sup> However, the GSP does not identify specific infrastructure locations, particularly those associated with public safety, in the Subbasin and the rate and extent of subsidence that would substantially interfere with those land surface uses and may lead to undesirable results. Additionally, without identifying infrastructure considered at risk for interference from land subsidence, Department staff cannot evaluate whether the groundwater level representative monitoring network is adequate to detect potential subsidence-related impacts.

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<sup>57</sup> 23 CCR § 354.28(c)(5).

<sup>58</sup> ESJ GSP, p. 269.

Department staff find the GSP does not provide adequate evidence to demonstrate a significant correlation between groundwater levels and land subsidence in the Subbasin. Without explaining this correlation, the Department cannot evaluate whether the groundwater level minimum thresholds and associated conditions required for identifying an undesirable result would protect against significant and unreasonable impacts related to land subsidence. The GSP states a significant correlation exists between groundwater levels and land subsidence, with lowering groundwater levels driving further land subsidence.<sup>59</sup> Department staff agree with this general statement. However, the GSP fails to provide adequate evidence to evaluate further this correlation, specifically concerning potential subsidence that could be caused by groundwater levels falling below historic lows, as would be allowed by the groundwater level minimum thresholds set in the GSP.

The GSP's justification for using the proposed groundwater level minimum thresholds as a proxy for land subsidence appears to rely mainly on an incomplete analysis and a data set with significant data gaps. The GSP states there are no historical records of significant and unreasonable land subsidence in the Subbasin.<sup>60</sup> The GSP also states that there is a lack of direct land subsidence monitoring in the Subbasin.<sup>61</sup> The GSP uses this absence of historical records to assert that historically dewatered geologic units are not compressible and, therefore, not at risk for land subsidence. Although groundwater level minimum thresholds are set below historic lows, the GSP states that the GSAs do not expect further declines in groundwater levels to dewater materials deeper than 205 feet below ground surface (the deepest groundwater level minimum threshold value in the Subbasin).<sup>62</sup> The GSP states that subsurface materials encountered up to this depth are the same [non-compressible] geologic units that have been historically dewatered.

Department staff find multiple aspects of this justification speculative and not supported by the best available science. First, the GSP presents no analysis of historic groundwater levels or historically dewatered subsurface materials to support the conclusion that the geologic units are not compressible. Second, the GSP does not provide an analysis showing how additional declines in groundwater levels would only affect subsurface materials similar to those which have been historically dewatered. Third, the GSP is unclear on whether the conditions required to identify an undesirable result for chronic lowering of groundwater levels in the Subbasin are also required to identify an undesirable result for land subsidence. Management under the GSP could allow groundwater level minimum thresholds to be exceeded in periods where two consecutive non-dry years do not occur, which is inconsistent with the claim that only materials up to the deepest groundwater level minimum threshold (205 feet below ground surface) will be dewatered.

Department staff note that the Legislature intended that implementation of SGMA would avoid or minimize subsidence.<sup>63</sup> Without analysis examining how allowable groundwater

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<sup>59</sup> ESJ GSP, p. 270.

<sup>60</sup> ESJ GSP, p. 269.

<sup>61</sup> ESJ GSP, p. 270.

<sup>62</sup> ESJ GSP, p. 270.

<sup>63</sup> Water Code § 10720.1(e).

levels below those historically experienced in the Subbasin may affect land subsidence, Department staff cannot determine if the GSP adequately avoids or minimizes land subsidence, and the GSP does not provide sufficient evidence to conclude that the proposed chronic lowering of groundwater level minimum thresholds are adequate to detect and avoid land subsidence undesirable results.

### **3.2.3 Corrective Action**

The GSAs must provide detailed information to demonstrate how the use of the chronic lowering of groundwater level minimum thresholds are sufficient as a proxy to detect and avoid significant and unreasonable land subsidence that substantially interferes with surface land uses. Alternatively, the GSAs could commit to utilizing direct monitoring for subsidence, e.g., with remotely sensed subsidence data provided by the Department. In that case, the GSAs should develop sustainable management criteria based on rates and extents of subsidence. Department staff suggest the GSAs consider and address the following issues:

- 2a. The GSAs should revise the GSP to identify the total extent and rates of subsidence that critical infrastructure in the Subbasin can tolerate during GSP implementation. Support this identification with information on the effects of subsidence on land surface beneficial uses and users and the amount of subsidence that would substantially interfere with those uses and users.
- 2b. The GSAs should revise the GSP to document a significant correlation between groundwater levels and specific amounts or rates of land subsidence. The analysis should account for potential subsidence related to groundwater level declines below historical lows and further declines that would exceed minimum threshold levels (i.e., during non-consecutive non-dry years, if applicable based on the resolution to Deficiency 1, above). This analysis should demonstrate that groundwater level declines allowed during GSP implementation are preventative of the rates and extent of land subsidence considered significant and unreasonable based on the identified infrastructure of concern. If there is not sufficient data to establish a correlation, the GSAs should consider other options such as direct monitoring of land subsidence (e.g., remotely sensed data provided by the Department, extensometers, GPS stations, etc.) until such time that the GSAs can establish a correlation.
- 2c. The GSAs should explain how the groundwater level representative monitoring network is sufficient to detect significant and unreasonable rates or extents of subsidence that may substantially interfere with land uses, specifically any identified infrastructure of concern. If the groundwater level monitoring network alone is not adequate, based on specific infrastructure locations, Department staff suggest incorporating continued analysis of available InSAR data to cover areas with data gaps.

## **4 STAFF RECOMMENDATION**

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Department staff believe that the deficiencies identified in this assessment should preclude approval of the GSP for the Eastern San Joaquin Subbasin. Department staff recommend that the GSP be determined incomplete.