



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

901 P Street, Room 313-B | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

November 18, 2021

Katarina Campbell
Westside Subbasin GSP Manager
3130 N Fresno Street, P.O. Box 6056, Fresno, CA 93703
kcampbell@wwd.ca.gov

RE: Westside Subbasin - 2020 Groundwater Sustainability Plan

Dear Katarina Campbell,

The Westlands Water District Groundwater Sustainability Agency (GSA) and County of Fresno GSA (collectively, the GSAs) submitted the Westside Groundwater Subbasin (Subbasin) Groundwater Sustainability Plan (GSP) to the Department of Water Resources (Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA).¹

Department staff have substantially completed an initial review of the GSP and have identified potential deficiencies (see the enclosed document) that may preclude the Department's approval.² Department staff have also developed potential corrective actions³ for each potential deficiency. The potential deficiencies do not necessarily represent all deficiencies or discrepancies that the Department may identify in the GSP but focus on those deficiencies that staff believe, if not addressed, could lead to a determination that the GSP is incomplete or inadequate. This letter initiates consultation between the Department and the GSAs regarding the time needed to address the potential deficiencies and corrective actions. The Department will issue a final determination as described under the GSP Regulations⁴ no later than January 23, 2022.

If the Department determines the GSP to be incomplete, the deficiencies precluding approval would need to be addressed within a period not to exceed 180 days from the time the Department issues its determination. A determination of incomplete would allow the GSAs to formally address identified deficiencies and submit a revised GSP to the Department for further review and evaluation. Before making that determination, Department staff will contact you to discuss the potential deficiencies and the amount of time needed by the GSAs to address the potential corrective actions detailed in the enclosed document.

¹ Water Code § 10720 *et seq.*

² 23 CCR § 355.2(e)(2).

³ 23 CCR § 355.2(e)(2)(B).

⁴ 23 CCR Division 2, Chapter 1.5, Subchapter 2.

Materials submitted to the Department to address deficiencies must be part of the GSP. The GSAs must justify that any materials submitted are part of the revised GSP; this justification is also part of the submittal. To facilitate the Department's review of the revised GSP, the GSAs should also provide a companion document with tracked changes of modifications made to address deficiencies. The GSAs must submit the revised GSP through the DWR SGMA Portal where, as is currently available, interested parties may provide comments on submitted materials to the Department.

Department staff will work expeditiously to review materials submitted to address deficiencies and to evaluate compliance of the revised GSP. The Department will keep a GSP status designated as incomplete during its review of the submitted materials. The Department could subsequently approve an incomplete GSP if the GSAs have taken corrective actions to address deficiencies identified by the Department within a period not to exceed 180 days from the determination. The Department could also issue a determination of inadequate for an incomplete GSP if the Department, after consultation with the State Water Resources Control Board, determines the GSAs have not taken sufficient actions to correct the deficiencies identified by the Department.

If you have any questions, please do not hesitate to contact the Sustainable Groundwater Management Office staff by emailing sgmps@water.ca.gov.

Thank you,

Paul Gosselin

Paul Gosselin
Deputy Director for Sustainable Groundwater Management

Enclosure:

1. Potential Deficiencies and Corrective Actions

2020 Groundwater Sustainability Plan
Westside Subbasin (Basin No. 5-022.09)

Potential Deficiencies and Corrective Actions

Department of Water Resources (Department) staff have identified deficiencies regarding the Westside Subbasin (Subbasin) Groundwater Sustainability Plan (GSP) that may preclude the Department's approval. Therefore, consistent with the GSP Regulations, Department staff are considering corrective actions that the Westlands Water District Groundwater Sustainability Agency (GSA) and County of Fresno GSA (collectively, the GSAs) should review to determine whether and how they can address the deficiencies. The deficiencies and potential corrective actions are explained below, including the general regulatory background, the specific deficiencies identified in the GSP, and specific actions to address the deficiencies. The specific actions identified are potential corrective actions until the Department makes a final determination.

General Background

Potential deficiencies identified in the Westside GSP relate to the development and documentation of sustainable management criteria, including undesirable results and minimum thresholds that define when undesirable results may occur.

The Department's GSP Regulations describe several required elements of a GSP under the heading of "Sustainable Management Criteria"⁵, including undesirable results, minimum thresholds, and measurable objectives. These components of sustainable management criteria must be quantified so that GSAs, the Department, and other interested parties can monitor progress towards sustainability in a basin consistently and objectively.

A GSA relies on local experience, public outreach and involvement, and information about the basin it has described in the GSP basin setting (i.e., the hydrogeologic conceptual model, the description of current and historical groundwater conditions, and the water budget), among other factors, to develop criteria for defining undesirable results and setting minimum thresholds and measurable objectives.⁶

The Sustainable Groundwater Management Act (SGMA) defines sustainable groundwater management as the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.⁷ The avoidance of undesirable results is thus explicitly part of sustainable groundwater management as established by SGMA and critical to the success of a GSP.

The definition of undesirable results is critical to establishing an objective method to define and measure sustainability for a basin. As an initial matter, SGMA provides a

⁵ 23 CCR § Article 5, Subarticle 3.

⁶ 23 CCR §§ 354.8, 354.10, 354.12 *et seq.*

⁷ Water Code § 10721(v).

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qualitative definition of undesirable results as “one or more” of six specific “effects caused by groundwater conditions occurring throughout the basin.”⁸

GSAs define, in their GSPs, the specific significant and unreasonable effects that would constitute undesirable results and the groundwater conditions that would produce those results in their basins.⁹ The GSAs’ definition must include a description of the processes and criteria relied upon to define undesirable results and describe the effect of undesirable results on the beneficial uses and users of groundwater, surface land uses (for subsidence), and surface water (for interconnected surface water).¹⁰

SGMA leaves the task of establishing undesirable results and setting thresholds largely to the discretion of the GSAs, subject to review by the Department. In its review, the Department requires a thorough and reasonable analysis of the groundwater conditions and the associated effects the GSAs must manage the groundwater basin to avoid, and the GSAs’ stated rationale for setting objective and quantitative sustainable management criteria to prevent those undesirable conditions from occurring. In evaluating sustainable management criteria, the Department must consider whether assumptions, criteria, and findings, including undesirable results, minimum thresholds, and measurable objectives, are reasonable and supported by the best available information and science.¹¹

If the GSP does not meet these requirements, the Department cannot evaluate the GSAs’ likelihood of achieving their sustainability goal. That does not necessarily mean that the GSP or its objectives are inherently unreasonable, but the Department cannot evaluate whether the GSP’s implementation would successfully achieve sustainable management if it is unclear what undesirable conditions the GSAs seek to avoid.

Potential Deficiency 1: The GSP does not provide sufficient information to support the selection of land subsidence sustainable management criteria.

Background

In addition to the general background above, the GSP Regulations state that a GSP must “quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site” and that “the numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results.”¹² For land subsidence, minimum thresholds 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 and property interests potentially affected by land subsidence;

⁸ Water Code § 10721(x).

⁹ California Department of Water Resources, Best Management Practices for the Sustainable Management of Groundwater: Sustainable Management Criteria (Draft), November 2017.

¹⁰ 23 CCR §§ 354.26(b), 354.28(c)(5), 354.28(c)(6).

¹¹ 23 CCR § 355.4(b)(1).

¹² 23 CCR § 354.28(a).

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- An explanation of how impacts to those land uses and property interests were determined and considered when establishing minimum thresholds; and
- Maps or graphs showing the rates and extents of land subsidence defined by the minimum thresholds.¹³

The GSP Regulations allow the use of groundwater elevations as a proxy for land subsidence, but a GSA must demonstrate a significant correlation between groundwater levels and land subsidence and show that groundwater level minimum thresholds represent a reasonable proxy for land subsidence undesirable results.¹⁴

Potential Deficiency Details

The GSAs identify that the focus for subsidence sustainable management criteria is the area in the vicinity of the San Luis Canal (SLC).¹⁵ While acknowledging that subsidence has occurred in other portions of the Subbasin, the GSP supports its decision to focus on the SLC by stating that “during the last drought the District did not experience any significant impacts to the District’s infrastructure, other than impacts to [the Department’s] SLC.”¹⁶ However, whether subsidence during the last drought caused significant impacts is not material to the prospective evaluation of sustainability tasked to the GSAs.

While subsequent discussion in this section addresses the Department’s review of sustainable management criteria within the vicinity of the SLC, staff also believe the GSAs need to address the potential effects of subsidence that could result from allowable groundwater level decline in areas outside the SLC. Minimum thresholds for chronic lowering of groundwater levels in those areas are typically 40 feet lower than 2015 conditions, but in some cases are more than 100 feet lower than 2015, as noted in Potential Deficiency 2 below. The GSAs should evaluate and document whether there are land surface users outside the vicinity of the SLC susceptible to subsidence, the rates and amounts of subsidence that would substantially interfere with those uses and could lead to undesirable results, and the amount of subsidence the GSAs expect would occur if groundwater levels reach their minimum thresholds. If the amount of subsidence expected to result from groundwater level declines of up to 40 feet in most areas, and more than 100 feet in others, is less than the amount of subsidence that the land surface users could tolerate before undesirable results occur then the GSAs should document that fact and supporting analysis in the GSP. On the other hand, if the expected subsidence amounts exceed those amounts that land surface users can tolerate then the GSAs should set separate subsidence sustainable management criteria to avoid that condition (see Potential Corrective Action 1a).

For areas within the vicinity of the SLC, the GSP identifies measurable objectives and minimum thresholds for subsidence using two approaches, depending on data availability

¹³ 23 CCR § 354.28(c)(5).

¹⁴ 23 CCR § 354.28(d).

¹⁵ Westside GSP, Chapter 3.2.3.1, p. 215.

¹⁶ Westside GSP, Chapter 3.2.3.1, p. 215.

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and location.¹⁷ The first approach, used for two defined “areas of concern” along the SLC, defines groundwater levels as a proxy for subsidence.¹⁸ The GSAs set groundwater level minimum thresholds in these areas at 2015 conditions and measurable objectives at conditions higher than those observed in 2015.¹⁹ Department staff have no major concern with this approach, as limiting groundwater level decline to no worse than conditions observed in 2015 is likely to limit, though not eliminate, the future occurrence of subsidence. However, staff note that figures in the GSP appear to indicate some level of subsidence occurred in 2015, even in wells where groundwater levels had historically been below those observed in 2015.²⁰ Therefore, as the GSAs implement the GSP, they should monitor other sources of subsidence data (e.g., GPS stations or InSAR data), in addition to groundwater level measurements, to verify that significant subsidence is not triggered if groundwater levels approach those observed in 2015.

Department staff are concerned with the second approach, which the GSAs applied to areas outside the “areas of concern” but which the Plan identifies as within the vicinity of the SLC. The GSP identifies three extensometers in those areas and sets, at each location, measurable objectives and minimum thresholds as a rate of subsidence.²¹ However, the GSAs do not identify the maximum extent of subsidence that could occur without causing undesirable results, suggesting that subsidence under the GSP might continue indefinitely. The GSAs set the measurable objective to 0.1 feet of subsidence per year for each extensometer site, a rate the GSP describes as accounting “for a small amount of subsidence that will continue to occur as a result of residual subsidence”²² and as “the best achievable outcome.”²³ However, the GSP provides no technical information to support its assertion that 0.1 feet per year is a reasonable expectation of long-term residual subsidence. The GSAs attempt to use a prior study discussing projected residual subsidence on the SLC to support its definitions of management criteria.²⁴ However, Department staff believe the assumptions made regarding residual subsidence, specifically that residual subsidence would continue at 10 percent of the rate of active subsidence indefinitely,²⁵ are not supported by the study cited in the GSP. Rather, the cited 2017 report prepared by the Department references a 1963 U.S. Bureau of Reclamation study that estimated residual subsidence along the SLC would result in an additional 10 percent of subsidence in addition to the active subsidence that was estimated to occur before groundwater levels recover enough to halt active subsidence.²⁶

¹⁷ Westside GSP, Chapter 3.3.3.1, p. 229.

¹⁸ The “areas of concern” are shown on Figure 3-4, p. 279, of the Westside GSP.

¹⁹ Westside GSP, Tables 3-7 and 3-8, pp. 224-226.

²⁰ See e.g., the plot of groundwater level and subsidence at the Panoche extensometer on Figure 2-53, p. 173, of the GSP.

²¹ Westside GSP, Table 3-4, p. 217.

²² Westside GSP, Chapter 3.2.3.1, p. 215.

²³ Westside GSP, Chapter 3.2.3.1, p. 216.

²⁴ Westside GSP, Chapter 3.2.3.1, p. 216.

²⁵ Westside GSP, Chapter 3.2.3.1, p. 216.

²⁶ U.S. Bureau of Reclamation, Prokopovich, Nikola P., Ultimate Amounts of Deep Subsidence — San Luis Canal, Reaches 3 to 4 – San Luis Unit – Central Valley Project, California, November 1963.

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The cited report does not address at what rate or period this residual subsidence would occur.²⁷

The GSP indicates that it is “expected that residual subsidence will reduce overtime[sic],”²⁸ and information presented in the GSP supports the interpretation that residual subsidence rates may diminish fairly rapidly once water levels recover. Additionally, hydrographs and ground displacement overlays presented in the GSP show that when water levels recover above a certain elevation, subsidence rates in most monitoring sites appear to decline to close to zero after about 5-10 years.²⁹

The GSP acknowledges that “once the Subbasin is no longer experiencing current rates of residual subsidence, the GSA will evaluate whether it is feasible to lower the measurable objectives for subsidence during subsequent updates to the GSP.”³⁰ However, given that inelastic subsidence can cause permanent, unrecoverable losses, and that the assumptions regarding residual subsidence that underly the determinations of sustainable management criteria are not supported by the information provided, Department staff believe that waiting until future revisions of the GSP to reassess measurable objectives and minimum thresholds for subsidence may not be sufficient to avoid undesirable results. (See Potential Corrective Action 1b.)

The GSAs set minimum thresholds for the three extensometer sites at 0.3 feet per year.³¹ The GSP does not explicitly state how that value was determined, but the GSP identifies that “substantial rates of subsidence, if maintained over a long period of time, could lead to significant and unreasonable conditions.”³² Department staff, therefore, infer that the GSAs do not consider 0.3 feet per year of subsidence to be substantial. However, without supporting evidence from the GSAs describing how continued subsidence does not substantially interfere with groundwater and land surface beneficial uses and users, Department staff cannot determine the reasonableness of this approach, which could allow for up to 6 feet of cumulative subsidence over the 20-year implementation period of SGMA. (See Potential Corrective Action 1c.)

Department staff note that the legislature intended that implementation of SGMA would avoid or minimize subsidence³³ once GSAs achieve the sustainability goal for a basin. To be consistent with that intent, and in the absence of compelling information as to why additional long-term subsidence is acceptable for a basin, Department staff suggest that the GSAs set the measurable objective for inelastic subsidence to zero and that the minimum thresholds be set commensurate with the amount of residual subsidence expected in the Subbasin. It may be that those rates are exceeded during the

²⁷ California Department of Water Resources, California Aqueduct Subsidence Study, June 2017, p. 2-5.

²⁸ Westside GSP, Chapter 3.2.3.1, p. 215.

²⁹ Westside GSP, Figures 2-52 and 2-53, p. 172 and 173.

³⁰ Westside GSP, Chapter 3.2.3.1, p. 215-216.

³¹ Westside GSP, Table 3-9, p. 229-230.

³² Westside GSP, Chapter 3.3.3.1, p. 229.

³³ Water Code § 10720.1(e).

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implementation period (i.e., between 2020 and 2040), as the GSAs work to implement projects and management actions, but that can be acceptable if the GSAs are making adequate progress in implementing the GSP to achieve the sustainability goal. The rates at which GSAs implement projects and management actions should be consistent with the cumulative subsidence they determine needs to be avoided, as informed by the understanding of potential impacts or interference to beneficial uses and users of groundwater and surface land uses. (See also Potential Corrective Action 1d.)

Department staff also note that the discussion of subsidence sustainable management criteria contains several discrepancies that the GSAs should correct or clarify given the importance of subsidence for the Subbasin. For example, the GSP states, “since recent subsidence has not reportedly resulted in significant damage to infrastructure in other parts of the Subbasin, the extensometer-measured measurable objective in those areas was assigned a value of 0.25 feet per year.”³⁴ However, it is not clear which extensometers the GSP refers to in that statement; the GSP’s table of measurable objectives lists three extensometer sites, and all sites have a measurable objective of 0.1 feet per year. Furthermore, the GSP states, “the measurable objectives for subsidence that utilize groundwater levels were set at elevations that are not expected to cause active subsidence to occur in the subsidence prone areas and allow an equivalent amount of subsidence as the 0.25 feet per year described above.”³⁵ It is not clear to Department staff what this sentence is conveying; it appears to reference the measurable objectives that are based on groundwater levels, which are those within the “areas of concern” where groundwater level decline is limited to no worse than 2015 conditions. In that case, it is unclear how those groundwater conditions relate to the referenced 0.25 feet per year of subsidence.

Another discrepancy is that the GSP’s discussion of undesirable results references that “individual continuous GPS sites may not exceed minimum thresholds for more than two consecutive years.”³⁶ However, the GSP does not define minimum thresholds at any continuous GPS sites.³⁷ Overall, the entire discussion of subsidence sustainable management criteria should be critically reviewed for clarity and revised as necessary to correct any misleading or incorrect statements. (See Potential Corrective Action 1e.)

Potential Corrective Action 1

- a) For areas outside the SLC, where allowable groundwater level declines are typically 40 feet, and in some cases more than 100 feet, relative to 2015, the GSAs must revise the GSP to explain the relationship of those declines to subsidence. The GSAs should evaluate or describe how it plans to evaluate, in a timely manner, whether allowable groundwater level declines in areas outside the vicinity of the SLC could cause

³⁴ Westside GSP, Chapter 3.2.3.1, p. 216.

³⁵ Westside GSP, Chapter 3.2.3.1, p. 216.

³⁶ Westside GSP, Chapter 3.4.1.3, p. 241.

³⁷ See Tables 3-4 and 3-9 (Westside GSP, p. 217 and 229-230, respectively), which establish the representative monitoring sites as three extensometers and eleven groundwater monitoring wells.

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subsidence that substantially interferes with surface land uses. The GSAs should base that evaluation on their understanding of surface land uses and infrastructure in those areas and the amount of subsidence that could substantially interfere with those uses. If this evaluation leads the GSAs to conclude that surface land uses in these areas are susceptible to subsidence, then sustainable management criteria for areas outside the vicinity of the SLC should be developed and clearly described.

- b) Where rates of expected residual subsidence inform either the measurable objectives or minimum thresholds, the GSAs should justify those residual subsidence rates with adequate technical information, supported by best available information and best available science. If additional information is required, the GSAs should explain how they would evaluate residual subsidence rates as a data gap.
- c) The GSAs must revise the GSP to include an explanation supporting the rates, and cumulative amounts, as applicable, of subsidence allowed for under implementation of the GSP. Support the explanation with information from the basin setting and specific information regarding the GSA's understanding of how subsidence can interfere with land surface uses in the Subbasin.
- d) The GSAs should revise their minimum thresholds and measurable objectives for land subsidence to be consistent with the intent of SGMA that subsidence would be avoided or minimized once basins achieve their sustainability goals. If the GSP allows continued subsidence, then explain how that is compatible with sustainable management and how the continued subsidence would not substantially interfere with surface land uses. In areas where the GSAs use subsidence rates for sustainable management criteria, the GSA should also identify a cumulative amount of tolerable subsidence that, if exceeded, would substantially interfere with groundwater and land surface beneficial uses and users. Finally, the GSP should explain how implementing projects and management actions proposed in the GSP is consistent with avoiding that cumulative amount of subsidence, sufficient to avoid substantial interference.
- e) The GSAs should review and revise any inconsistencies in the text, figures, and tables of the GSP related to subsidence and sustainable management criteria.

Potential Deficiency 2: The GSP does not provide adequate information to support the selection of chronic lowering of groundwater level sustainable management criteria

Background

GSAs 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.³⁸ The description of minimum thresholds must include the following, among other items:

³⁸ 23 CCR § 354.28(c)(1).

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- 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.³⁹
- 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.⁴⁰

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.”⁴¹

Potential Deficiency Detail

Generally, the GSP provides little to no Subbasin-specific discussion or information to support the selection of sustainable management criteria for chronic lowering of groundwater levels, particularly the minimum thresholds and undesirable results. Information provided in the GSP appears to be based on an incorrect application or interpretation of requirements in the GSP Regulations.

The GSP qualitatively describes that significant and unreasonable lowering of groundwater levels (i.e., an undesirable result) would occur if the lowering was “sufficient in magnitude to lower the rate of production of pre-existing groundwater wells below that necessary to meet the minimum required to support beneficial use(s) where alternate means of obtaining sufficient water resources are not technically or financially feasible.”⁴² This description is contingent upon various undefined conditions, such as the minimum rate of production required to support beneficial uses or the technical or financial feasibility of obtaining sufficient water through alternative means. The GSP describes, generally, the effect of exceeding minimum thresholds on beneficial users as a loss of significant well capacity, increased costs due to higher pumping, lack of groundwater extraction capabilities, and subsidence.⁴³ However, the GSP does not specify groundwater level conditions in the Subbasin at which the GSAs expect the above effects to occur, as informed by their understanding of the beneficial uses and users of groundwater in the Subbasin. That understanding, which should be documented in the GSP, would inform the selection of minimum thresholds at the various representative monitoring sites that indicate a site-specific depletion of supply that may lead to undesirable results.

The GSP states that the GSAs set minimum thresholds after reviewing historical groundwater levels during extended drought periods and model-generated groundwater

³⁹ 23 CCR §§ 354.26(b)(3), 354.28(b)(4).

⁴⁰ 23 CCR § 354.28(b)(1).

⁴¹ 23 CCR § 355.4(b)(1).

⁴² Westside GSP, Chapter 3.3.1.1., p. 223.

⁴³ Westside GSP, Section 3.3.1.5, p. 226.

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elevation data.⁴⁴ The GSP defines minimum thresholds as “the lowest of a) projected lowest future groundwater level at the end of estimated 10-year drought or b) lowest modeled groundwater level from projected with projects model simulation.”⁴⁵ Except for Lower Aquifer wells inside the subsidence “areas of concern”, where minimum thresholds are at 2015 groundwater levels, the GSP sets groundwater level minimum thresholds at 40 feet below 2015 levels, with a few exceptions noted below.

Department staff believe that the groundwater level minimum thresholds, defined in the GSP based on the amount of groundwater decline that occurred during the last drought, or anticipated declines caused by future droughts, have not been established in a manner required by the GSP Regulations. Instead, the GSP Regulations require those thresholds to be based on “groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.”⁴⁶ Staff recognize that the GSP Regulations require groundwater level minimum thresholds to be *supported by* information including the rate of groundwater level decline based on historical trends, water year type, and projected water use in the basin.⁴⁷ This supporting information does not define thresholds, but should provide evidence that justifies thresholds set by the GSAs as a means to avoid the associated undesirable results. Establishing minimum thresholds requires that a GSA first determine what groundwater conditions would lead to (or are causing) undesirable results in the basin, based on an understanding of what conditions would produce the significant and unreasonable effects that define undesirable results.⁴⁸ Here, the GSAs appear to have inverted the process by establishing minimum thresholds based on projected future conditions, but not related to conditions the GSAs wish to avoid because they cause a depletion of supply that would lead to undesirable results. (See Potential Corrective Action 2a.)

Quantitatively, the GSP concludes that an undesirable result related to chronic lowering of groundwater levels occurs when 25 percent of minimum thresholds are exceeded for two consecutive spring measurements.⁴⁹ However, the GSP does not explain how the 25 percent condition was selected or describe how it relates to the specific effects (e.g., lowering the production rate of pre-existing groundwater wells) that the GSAs identified as undesirable results. Furthermore, because the minimum thresholds defined in the GSP allow for continued lowering of groundwater levels, it is reasonable to assume that some groundwater well impacts (e.g., loss of production capacity) would 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.⁵⁰ Implementing specific projects and management actions prevents undesirable results and achieves the sustainable yield of the basin. The GSAs should

⁴⁴ Westside GSP, Table 3-12, p. 240.

⁴⁵ Westside GSP, Table 3-12, p. 240.

⁴⁶ 23 CCR § 354.28(c)(1).

⁴⁷ 23 CCR § 354.28(c)(1)(A).

⁴⁸ Water Code § 10721(x).

⁴⁹ Westside GSP, Table 3-12, p. 240.

⁵⁰ 23 CCR § 355.4(b).

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describe how projects and management actions would address drinking water impacts due to continued overdraft between the start of GSP implementation and achieving 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 Potential Corrective Action 2b.)

Additionally, while most groundwater level minimum threshold values for monitoring sites outside the subsidence areas of concern are set to 40 feet below 2015 conditions, as previously described, several monitoring sites do not follow that approach. The GSP provides no explanation or rationale for the management criteria established for the following monitoring sites:⁵¹

- Five monitoring wells in an area in the south-central portion of the basin near Huron (Well numbers 19S/17E-20B01, 18S/18E-28N04, 19S/18E-34N04, 21S/18E-05C01, and 21S/19E-20D02) have minimum thresholds 100 feet or more below the 2015 baseline groundwater elevations. Four of those wells also have measurable objectives from 10 to 130 feet below the 2015 baseline elevations; the GSP describes that measurable objectives are typically set above 2015 conditions.
- Monitoring wells 14S/13E-23E02 and 13S/14E-32K01 have minimum thresholds set at 95.6 and 50.5 feet, respectively, below their listed 2015 baseline groundwater elevations. Department staff also note that appendix charts show a different value for the minimum threshold at 14S/13E-23E02; those charts indicate the threshold is at -24 feet relative to mean sea level, which is roughly 158 feet below the listed 2015 elevation of 134.6 feet relative to mean sea level.⁵²

The GSP does not explain why the specific representative monitoring sites listed above have sustainable management criteria that appear to differ from most other sites, or how the GSAs determined minimum thresholds and measurable objectives for those sites. (See Potential Corrective Action 2c.)

Potential Corrective Action 2

- a) The GSAs must revise the GSP 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. Department staff understand that the Subbasin contains relatively fewer domestic wells than most San Joaquin Valley subbasins. Groundwater sustainability agencies in some of those other subbasins have used domestic wells as the shallowest beneficial user to constrain

⁵¹ Westside GSP, Tables 3-7 and 3-8, p. 224 and 225-226.

⁵² Westside GSP, p. 1903.

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their groundwater thresholds. The Westside 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. Alternatively, the GSAs may determine, as they have done for groundwater levels within the subsidence areas of concern, that other sustainability indicators necessitate setting minimum thresholds at levels higher than those representing a depletion of supply; the GSAs should document those instances in the revised GSP.

- b) The GSAs should revise the GSP to describe, with information specific to the Subbasin, how they determined that undesirable results would not occur until more than 25 percent of monitoring wells are below the minimum threshold for two consecutive spring measurements. Describe how that criterion, which allows for potential continued groundwater decline at up to a quarter of the monitoring sites, is consistent with avoiding the effects the GSA has determined are undesirable results. In addition, the GSAs should describe how they would address drinking water impacts, e.g., to domestic wells, public water systems, or state small water systems, that may occur due to continued overdraft and groundwater level decline 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 that occur due to continued groundwater lowering below pre-SGMA levels.
- c) The GSAs must explain why a small number of monitoring sites mentioned in the GSP have minimum thresholds and measurable objectives that appear significantly different than values at most other sites. As applicable, resolve discrepancies between threshold values reported in the text, tables, figures, and appendices.

Potential Deficiency 3: The GSP does not provide adequate information to support the selection of degraded water quality sustainable management criteria.

Background

SGMA and the GSP Regulations do not require a GSP to address undesirable results associated with degraded water quality that occurred before, and have not been corrected by, January 1, 2015. However, management of a basin under an adopted GSP should not result in further water quality degradation that is significant and unreasonable, either due to routine groundwater use or as a result of implementing projects or management actions called for in the GSP.⁵³ 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

⁵³ Water Code § 10721(x)(4); 23 CCR § 354.28(c)(4).

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federal water quality standards when establishing sustainable management criteria.⁵⁴ SGMA provides a GSA with authority to manage and control polluted water and use authorities under existing laws to implement its GSP.⁵⁵ 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.

Potential Deficiency Detail

The GSP describes historical groundwater quality conditions, noting that recent (i.e., since the year 2000) data is limited, and that several constituents found in the Subbasin are naturally occurring.⁵⁶ The GSP states that “for agricultural beneficial uses, available groundwater quality data indicates that TDS [total dissolved solids] is a proxy for other naturally occurring constituents and is, therefore, considered the primary constituent of concern.”⁵⁷ However, the GSP does not provide evidence to support this claim. The GSP further states that, “based on the review of groundwater quality in [the basin setting section of the GSP], the constituents evaluated for *all beneficial users* are TDS” (emphasis added).⁵⁸ Similarly, the GSP does not provide evidence to support this claim. (See Potential Corrective Action 3a.)

The GSP Regulations require minimum thresholds and measurable objectives for groundwater quality degradation based on “the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin.”⁵⁹ The approach adopted by the GSP involves assigning measurable objectives using an equation to “represent the expected trends in background TDS concentrations along with acceptable annual increases in TDS concentrations from human activities that are generally representative of the [Regional Water Quality Control Board’s] Basin Plan Amendment allowances.”⁶⁰ However, the GSP does not explain how these increases are related to, or supported by, the Basin Plan Amendment or why the GSP relies on them to define measurable objectives. If the intention was to account for TDS increases due to “human activities” outside the control or responsibility of the GSAs, then that rationale should be clearly stated and supported with technical analysis. However, if the intention was that groundwater management activities would cause that level of degradation, then the GSAs should clearly state that fact and explain the anticipated effects of that degradation on beneficial uses and users of groundwater. (See Potential Corrective Action 3b.)

The GSP does not discuss how its sustainable management criteria relate to existing water quality monitoring regulatory programs, such as the Salinity Alternatives for Long-

⁵⁴ 23 CCR § 354.28(c)(4).

⁵⁵ Water Code §§ 10726.2(e), 10726.8(a).

⁵⁶ Westside GSP, Chapter 2.2.2.2, p. 98.

⁵⁷ Westside GSP, Chapter 2.2.2.2, p. 99.

⁵⁸ Westside GSP, Chapter 3.2.4.1, p. 218.

⁵⁹ 23 CCR § 354.28(c)(4).

⁶⁰ Westside GSP, Chapter 3.2.4.1, p. 218.

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Term Sustainability Program (CV-SALTS) or the Irrigated Lands Regulatory Program (ILRP). The GSP notes that groundwater quality monitoring would be augmented by “monitoring from the groundwater quality trend monitoring program under the Irrigated Lands program.”⁶¹ However, the GSP provides no additional information on monitoring frequency, regulatory limits, or any analysis from these programs completed to date that would support defining undesirable results and sustainable management criteria. The GSAs should describe how the sustainable management criteria relate to standards and management under the applicable regulatory programs and how management under the GSP would differ from the standards of those regulatory programs. Department staff note that continually increasing trends in TDS or other groundwater quality constituents in any basin is not a long-term sustainable condition. Therefore, in addition to the regulatory programs noted above, the GSAs should explain how they are working with any other applicable agencies or programs to address increasing salinity in the Subbasin’s groundwater. The GSAs should also explain how increasing salinity in the Subbasin would affect the beneficial uses and users of groundwater.

The GSP also states that “SGMA’s water quality objective focuses on a constituent’s contribution due to activities at the land surface rather than on the presence of naturally occurring constituents.”⁶² It is the opinion of Department staff that the GSP mischaracterizes the intent of SGMA in that the focus of the law is not on “activities at the land surface” but on groundwater management. Certain “activities at the land surface” (e.g., fertilizer application) may not be within the scope of a GSA’s management responsibility (though GSAs can engage with land use agencies and other regulatory agencies, as applicable). Conversely, naturally occurring constituents could contribute to groundwater degradation more rapidly under specific groundwater management regimes. It is the responsibility of a GSA to analyze and document the degradation of groundwater quality due to groundwater management in its GSP.

The GSP presents values of the measurable objectives as annual rates of increase in TDS concentration, ranging from 6 milligrams per liter to 31 milligrams per liter.⁶³ However, the GSP provides an insufficient explanation regarding how these annual rates of TDS increase were determined; visual inspection of time-concentration plots of TDS in the GSP show that trends appear mixed, not increasing uniformly.⁶⁴ Presumably, the value of the measurable objective would change each year, and the GSAs would compare that value against measured concentrations on an annual (or other periodic) basis. However, the GSP is not clear regarding the value of the baseline concentration, which is an input in the equation to determine the annual measurable objective value.⁶⁵ Therefore, with the information currently in the GSP, Department staff cannot calculate

⁶¹ Westside GSP, Chapter 2.2.2.2, p. 99.

⁶² Westside GSP, Chapter 3.3.4.1, p. 231.

⁶³ Westside GSP, Tables 3-10 and 3-11, p. 233 and 234.

⁶⁴ Westside GSP, Figures 2-41 and 2-42, p. 161 and 162.

⁶⁵ Department staff note that the GSP states (p. 235) that the baseline values are provided in Tables 3-10 and 3-11, but those tables do not contain any baseline values.

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the measurable objective each year to compare with measured data. Lack of information regarding all inputs required to calculate the measurable objective is problematic when, for example, the water year 2020 annual report contains a table with only the measured values for TDS.⁶⁶ (See Potential Corrective Action 3c.)

The GSP defines the minimum threshold is as a deviation from the expected degradation of water quality. The GSAs state that they would compare the measurable objective, calculated each year as described above, with measured concentrations. If the measured concentrations were greater than the annual measurable objective, the GSAs would check further to see if the increase was higher than the assigned annual deviation amount, indicating an exceedance of the minimum threshold. The GSP tabulates the annual deviation amounts,⁶⁷ but it does not explain how the GSAs calculated those amounts, nor can Department staff infer how they were calculated based on the measurable objective rates of increase. (See Potential Corrective Action 3d.)

The GSP also contains discrepancies that create confusion about the groundwater quality sustainable management criteria. Specifically, a portion of the GSP states “measurable objectives for groundwater quality are *concentrations* of TDS that are generally representative of secondary drinking water standards and tolerable for most crops grown in the Subbasin without blending with surface water supplies” (emphasis added) and that “generally, minimum thresholds were set at 2,000 milligrams per liter (mg/L) TDS in the Upper and Lower Aquifers.”⁶⁸ The GSAs should reconcile those statements with the predominant discussion in the GSP that presents the values of the measurable objectives and minimum thresholds as rates of TDS increase, not concentrations. (See Potential Corrective Action 3e.)

Potential Corrective Action 3

- a) The GSAs must revise the GSP to provide the rationale to support their conclusion that TDS is an appropriate proxy for other water quality constituents identified in the GSP.
- b) The GSP must be revised to explain the rationale for selecting measurable objectives as rates of water quality degradation. The GSAs should explain their understanding of the effects of those criteria, which allow for the continued degradation of groundwater quality, on beneficial uses and users in the Subbasin. As applicable, explain how the selected degradation rates are supported by or are consistent with other regulatory plans or programs, including the Basin Plan. The GSAs should explain how they are coordinating with other entities, as applicable, to address increasing salinity in the Subbasin.

⁶⁶ Westside GSP Annual Report 2020, p. 107.

⁶⁷ Westside GSP, Tables 3-10 and 3-11, final column, p. 233 and 234.

⁶⁸ Westside GSP, Chapter 3.3.4.2, p. 235.

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- c) The GSAs must provide sufficient detail for all components of the sustainable management criteria, including inputs for any formulas required to determine the annual value of any measurable objectives or minimum thresholds.
- d) The GSAs must revise the GSP to explain how the minimum threshold annual deviation amounts were determined, with references to supporting technical information or other studies or documents, as applicable.
- e) The GSAs must revise the GSP to reconcile conflicting information regarding the values of minimum thresholds and measurable objectives, including whether they are based on concentrations or rates of concentration increases.