CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
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October 26, 2023

Angelica Martin
Tejon-Castac Water District Groundwater Sustainability Agency
4436 Lebec Road
Lebec, CA 93243
amartin@tejonranch.com

RE: San Joaquin Valley – White Wolf Subbasin - 2022 Groundwater Sustainability Plan

Dear Angelica Martin,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP or Plan) submitted for the San Joaquin Valley – White Wolf Subbasin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the White Wolf Subbasin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the White Wolf Subbasin GSP no later than January 28, 2027.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

Thank You,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the San Joaquin Valley – White Wolf Subbasin Groundwater Sustainability Plan

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE SAN JOAQUIN VALLEY – WHITE WOLF 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 White Wolf Groundwater Sustainability Agency (GSA or Agency) for the San Joaquin Valley – White Wolf Subbasin (Subbasin) (Basin No. 5-022.18).

Department management has discussed the Plan with staff and has reviewed the Department Staff Report, entitled Sustainable Groundwater Management Program Groundwater Sustainability Plan Assessment Staff Report, attached as Exhibit A, recommending approval of the GSP. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with staff's recommendation and all the recommended corrective actions. The Department therefore **APPROVES** the Plan and makes the following findings:

A. The Plan satisfies the required conditions as outlined in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.):

    1. The Plan was submitted within the statutory deadline of January 31, 2022. (Water Code § 10720.7(a); 23 CCR § 355.4(a)(1).)

    2. The Plan was complete, meaning it generally appeared to include the information required by the Act and the GSP Regulations sufficient to warrant a thorough evaluation and issuance of an assessment by the Department. (23 CCR § 355.4(a)(2).)

    3. The Plan, either on its own or in coordination with other Plans, covers the entire White Wolf Subbasin. (23 CCR § 355.4(a)(3).)

B. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2) "substantial compliance" with the GSP Regulations, (3) whether the Plan is likely

to achieve the sustainability goal for the Subbasin within 20 years of the implementation of the Plan, and (4) 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.) Application of these standards requires exercise of the Department's expertise, judgment, and discretion when making its determination of whether a Plan should be deemed "approved," "incomplete," or "inadequate."

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA's numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above; the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113); and the Legislature's express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.1(h)) The Department's final determination is made based on the entirety of the Plan's contents on a case-by-case basis, considering and weighing factors relevant to the particular Plan and Subbasin under review.

C. In making these findings and Plan determination, the Department also recognized that: (1) the Department maintains continuing oversight and jurisdiction to ensure the Plan is adequately implemented; (2) the Legislature intended SGMA to be implemented over many years; (3) SGMA provides Plans 20 years of implementation to achieve the sustainability goal in a Subbasin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)

D. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with 23 CCR § 355.4, and appears likely to achieve the sustainability goal for the Subbasin. It does not appear at this time that the Plan will adversely affect the ability of adjacent basins to implement their GSPs or impede achievement of sustainability goals.

1. The sustainable management criteria for chronic lowing of groundwater is established using a multi-step process based on valuation of historical groundwater trends, a review of the proximity to critical infrastructure, a review of well construction information, and consideration sustainable management criterias developed in Kern County Subbasin. While Department staff have identified a recommended corrective action, the overall groundwater level and storage conditions in the Basin are generally stable based on the information included in the GSP, so this fault does not preclude plan approval. The Plan relies on credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Basin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)

2. The Plan demonstrates a reasonable understanding of where data gaps exist and demonstrates a commitment to eliminate those data gaps. For example, the GSAs plan to collect additional data to improve understanding of the hydrogeologic properties of the Subbasin; conduct an inventory of wells in the Subbasin and improve understanding of well construction details; and expand monitoring networks to improve characterization of interconnected surface water, address spatial variability and uncertainty in water table conditions in the eastern portion of the Subbasin, and to monitor effects of implemented projects and management actions. The GSAs intend to incorporate the additional data obtained from these data filling efforts into the Subbasin's groundwater model, to improve water budget calculations and better understand surface water and groundwater interactions. (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed are designed to achieve sustainability for the Subbasin though water supply augmentation and water demand reduction. The projects and management actions are reasonable and commensurate with the level of understanding of the Subbasin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Subbasin's sustainability goal and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

4. The Plan provides a detailed explanation of how the varied interests of groundwater uses and users in the Subbasin were considered in developing the sustainable management criteria and how those interests, including domestic wells, would be impacted by the chosen minimum thresholds. (23 CCR § 355.4(b)(4).)

5. The Plan's projects and management actions appear feasible at this time and capable of preventing undesirable results and ensuring that the Subbasin is operated within its sustainable yield within 20 years. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are not implemented or appear unlikely to prevent undesirable results or achieve sustainability within SGMA timeframes. (23 CCR § 355.4(b)(5).)

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft, if present. (23 CCR § 355.4(b)(6).)

7. At this time, it does not appear that the Plan will adversely affect the ability of an adjacent subbasin to implement its GSP or impede achievement of sustainability goals in an adjacent subbasin. The Plan includes an analysis of potential impacts to adjacent subbasins related to the established minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent subbasins resulting from the minimum thresholds defined in the Plan. (23 CCR § 355.4(b)(7).)

8. Because a single plan was submitted for the Subbasin, a coordination agreement was not required. (23 CCR § 355.4(b)(8).)

9. The GSA's member agencies provide a reasonable level of confidence, at this time, that the GSA has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9)).

10. Through review of the Plan and consideration of public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

E. In addition to the grounds listed above, DWR also finds that:

1. The Department developed its GSP Regulations consistent with and intending to further the State's human right to water policy through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring substantial compliance with the GSP Regulations, the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (Water Code § 106.3; 23 CCR § 350.4(g).)

2. The Plan acknowledges and discusses interconnected surface waters within portions of the Plan area. The GSA acknowledges, and the Department agrees, that data gaps related to depletions of interconnected surface water exist. The GSA should continue filling data gaps, collecting additional monitoring data, and coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future updates to the Plan should aim to improve or refine the initial sustainable management criteria as more information and improved methodologies become available.

3. Projections of future Subbasin extractions are likely to stay within current and historic ranges, at least until the next periodic evaluation by the GSA and the Department. Subbasin groundwater levels and other SGMA sustainability indicators appear unlikely to substantially deteriorate while the GSA implements the Department's recommended corrective actions. The California Environmental Quality Act (Public Resources Code § 21000 *et seq*.) does not apply to the Department's evaluation and assessment of the Plan.

Accordingly, the GSP submitted by the Agency for the San Joaquin Valley – White Wolf Subbasin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agency address them by the time of the Department's periodic review, which is set to begin on January 28, 2027, as required by Water Code § 10733.8. Failure to address the Department's recommended corrective actions before future, subsequent plan evaluations, may lead to a Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth

Karla Nemeth, Director
Date: October 26, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – San Joaquin Valley – White Wolf Subbasin

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

Groundwater Basin Name:	San Joaquin Valley – White Wolf Subbasin (5-022.18)
Submitting Agency:	White Wolf Groundwater Sustainability Agency
Submittal Type:	Initial GSP Submission
Submittal Date:	January 28, 2022
Recommendation:	Approved
Date:	October 26, 2023

The White Wolf Groundwater Sustainability Agency (GSA or Agency) submitted the White Wolf Groundwater Sustainability Plan (GSP or Plan) for the San Joaquin Valley – White Wolf Subbasin (Subbasin) to the Department of Water Resources (Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)[1] and GSP Regulations.[2] The GSP covers the entire Subbasin for the implementation of SGMA.

After evaluation and assessment, Department staff conclude that the Plan includes the required components of a GSP, demonstrates a thorough understanding of the Subbasin based on what appears to be the best available science and information, sets well explained, supported, and reasonable sustainable management criteria to prevent undesirable results as defined in the Plan, and proposes a set of projects and management actions that will likely achieve the sustainability goal defined for the Subbasin.[3] Department staff will continue to monitor and evaluate the Subbasin's progress toward achieving the sustainability goal through annual reporting and future periodic evaluations of the GSP and its implementation.

- ***Based on the current evaluation of the Plan, Department staff recommend the GSP be approved with the recommended corrective actions described herein.***

This assessment includes five sections:

- **Section 1 – Summary:** Provides an overview of Department staff's assessment and recommendations.

[1] Water Code § 10720 *et seq*.
[2] 23 CCR § 350 *et seq*.
[3] 23 CCR § 350 *et seq*.

- **Section 2 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 3 – Required Conditions:** Describes the submission requirements, Plan completeness, and basin coverage required for a GSP to be evaluated by the Department.
- **Section 4 – Plan Evaluation:** Provides an assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- **Section 5 – Staff Recommendation:** Includes the staff recommendation for the Plan and any recommended or required corrective actions, as applicable.

1 SUMMARY

Department staff recommend approval of the White Wolf Subbasin GSP. The GSA has identified areas for improvement of its Plan (e.g., addressing data gaps related to the hydrogeological conceptual model, well construction information, and interconnected surface water, expanding monitoring networks, and refining projects and management actions). Department staff concur that those items are important and recommend the GSA address them as soon as possible. Department staff have also identified additional recommended corrective actions within this assessment that the GSA should consider addressing by the first periodic evaluation of the Plan. The recommended corrective actions generally focus on the following:

(1) Conducting necessary investigations or studies to better understand the relationship between groundwater levels and degraded water quality and describing the potential impacts of the minimum thresholds established for chronic lowering of groundwater levels on degraded water quality;

(2) Establishing sustainable management criteria for land subsidence based on direct measurements of land elevation changes;

(3) Continuing to fill data gaps, collecting additional monitoring data, coordinating with resources agencies, and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping, and potentially refine sustainable management criteria; and

(4) Expanding the land subsidence monitoring network to provide sufficient coverage of the Subbasin.

Addressing the recommended corrective actions identified in Section 5 of this assessment will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal.

2 EVALUATION CRITERIA

The GSA submitted a single GSP to the Department to evaluate whether the Plan conforms to specified SGMA requirements[4] and is likely to achieve the sustainability goal for the White Wolf Subbasin.[5] To achieve the sustainability goal for the Subbasin, the GSP must demonstrate that implementation of the Plan 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.[6] Undesirable results must be defined quantitatively by the GSAs.[7] The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.[8]

For the GSP to be evaluated by the Department, it must first be determined that the Plan was submitted by the statutory deadline,[9] and that it is complete and covers the entire basin.[10] If these conditions are satisfied, the Department evaluates the Plan to determine whether it complies with specific SGMA requirements and substantially complies with the GSP Regulations.[11] Substantial 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.[12]

When evaluating whether the Plan is likely to achieve the sustainability goal for the Subbasin, Department staff reviewed the information provided and relied upon in the GSP for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.[13] The Department's review considers whether there is a reasonable relationship between the information provided and the assumptions and conclusions made by the GSA, including whether the interests of the beneficial uses and users of groundwater in the basin have been considered; whether sustainable management criteria and projects and management actions described in the Plan are commensurate with the level of understanding of the basin setting; and whether those projects and management actions are feasible and likely to prevent undesirable results.[14]

[4] Water Code §§ 10727.2, 10727.4.
[5] Water Code § 10733(a).
[6] Water Code § 10721(v).
[7] 23 CCR § 354.26 *et seq.*
[8] Water Code § 10733(c).
[9] 23 CCR § 355.4(a)(1).
[10] 23 CCR §§ 355.4(a)(2), 355.4(a)(3).
[11] 23 CCR § 350 *et seq.*
[12] 23 CCR § 355.4(b).
[13] 23 CCR § 351(h).
[14] 23 CCR §§ 355.4(b)(1), (3), (4), and (5).

The Department also considers whether the GSA has the legal authority and financial resources necessary to implement the Plan.[15]

To the extent overdraft is present in a basin, the Department evaluates whether the Plan provides a reasonable assessment of the overdraft and includes reasonable means to mitigate the overdraft.[16] The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.[17] Lastly, the Department's review considers the comments submitted on the Plan and evaluates whether the GSA adequately responded to the comments that raise credible technical or policy issues with the Plan.[18]

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment of the Plan.[19] The assessment is required to include a determination of the Plan's status.[20] The GSP Regulations define the three options for determining the status of a Plan: Approved,[21] Incomplete,[22] or Inadequate.[23]

Even when review indicates that the GSP satisfies the requirements of SGMA and is in substantial compliance with the GSP Regulations, the Department may recommend corrective actions.[24] 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 the Plan adversely affects adjacent basins. While the issues addressed by the recommended corrective actions do not, at this time, preclude approval of the Plan, the Department recommends that the issues be addressed to ensure the Plan's implementation continues to be consistent with SGMA and the Department is able to assess progress in achieving the sustainability goal within the basin.[25] Unless otherwise noted, the Department proposes that recommended corrective actions be addressed by the submission date for the first periodic assessment.[26]

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, including standard or accepted professional and scientific methods and practices. The assessment does not require Department staff to recalculate or reevaluate technical information provided in the Plan or to perform its own geologic or

[15] 23 CCR § 355.4(b)(9).
[16] 23 CCR § 355.4(b)(6).
[17] 23 CCR § 355.4(b)(2).
[18] 23 CCR § 355.4(b)(10).
[19] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[20] Water Code § 10733.4(d); 23 CCR § 355.2(e).
[21] 23 CCR § 355.2(e)(1).
[22] 23 CCR § 355.2(e)(2).
[23] 23 CCR § 355.2(e)(3).
[24] Water Code § 10733.4(d).
[25] Water Code § 10733.8.
[26] 23 CCR § 356.4 *et seq*.

engineering analysis of that information. The staff recommendation to approve a Plan 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 Plan, 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 and approval of the Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.[27] Also, GSAs have an ongoing duty to provide reports to the Department, periodically reassess their plans, and, when necessary, update or amend their plans.[28] 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 Plan implementation adversely affects the ability of adjacent basins to achieve their sustainability goals.

3 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline. The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.

3.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority and not subject to critical conditions of overdraft to submit a GSP no later than January 31, 2022.[29]

The GSA submitted their Plan on January 28, 2022.

3.2 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.[30]

The GSA submitted an adopted GSP for the entire Subbasin. After an initial, preliminary review, Department staff found the GSP to be complete and appearing to include the

[27] Water Code § 10733.8; 23 CCR § 355.6.
[28] Water Code §§ 10728 *et seq.*, 10728.2.
[29] Water Code § 10720.7(a)(2).
[30] 23 CCR § 355.4(a)(2).

required information, sufficient to warrant a thorough evaluation by the Department.[31] The Department posted the GSP to its website on February 14, 2022.[32]

3.3 Basin Coverage

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.[33] A GSP that is intended 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 White Wolf Subbasin and the jurisdictional boundary of the submitting GSA fully contains the Subbasin.[34]

4 Plan Evaluation

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors 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. The Department staff's evaluation of the likelihood of the Plan to attain the sustainability goal for the Subbasin is provided below.

4.1 Administrative Information

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, its decision-making process, and its legal authority;[35] a description of the Plan area and identification of beneficial uses and users in the Plan area;[36] and a description of the ability of the submitting Agency to develop and implement a Plan for that area.[37]

The White Wolf GSA was formed in 2017 through a Joint Powers Agreement and is governed by a board of directors which includes two representatives of each member district, which includes the Arvin-Edison Water Storage District (AEWSD), Tejon-Castac

[31] The Department undertakes a preliminary completeness review of a submitted Plan under section 355.4(a) of the GSP Regulations to determine whether the elements of a Plan required by SGMA and the Regulations have been provided, which is different from a determination, upon review, that a Plan is "incomplete" for purposes of section 355.2(e)(2) of the Regulations.
[32] https://sgma.water.ca.gov/portal/gsp/preview/123.
[33] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[34] White Wolf GSP, Section 5.1.1, p. 38.
[35] 23 CCR § 354.6 *et seq*.
[36] 23 CCR § 354.8 *et seq*.
[37] 23 CCR § 354.6(e).

Water District (TCWD), and Wheeler Ridge-Maricopa Water Storage District (WRMWSD). Kern County is the seventh, non-voting or additional entity, member of the board.[38] The GSP states "[k]ey GSP development and implementation decisions are made by the GSA Board of Directors," and the "ad-hoc Technical Committee helps to guide the GSP development technical consultant team and provides feedback on draft work products."[39]

The Subbasin is located at the southern end of the San Joaquin Valley within Kern County and encompasses 107,532 acres (168 square miles). The Subbasin is bordered on the north by the Kern County Subbasin, with no adjacent basins located to the south, east, or west. map showing the location of the Subbasin and adjacent subbasins is presented as Figure 1 below.

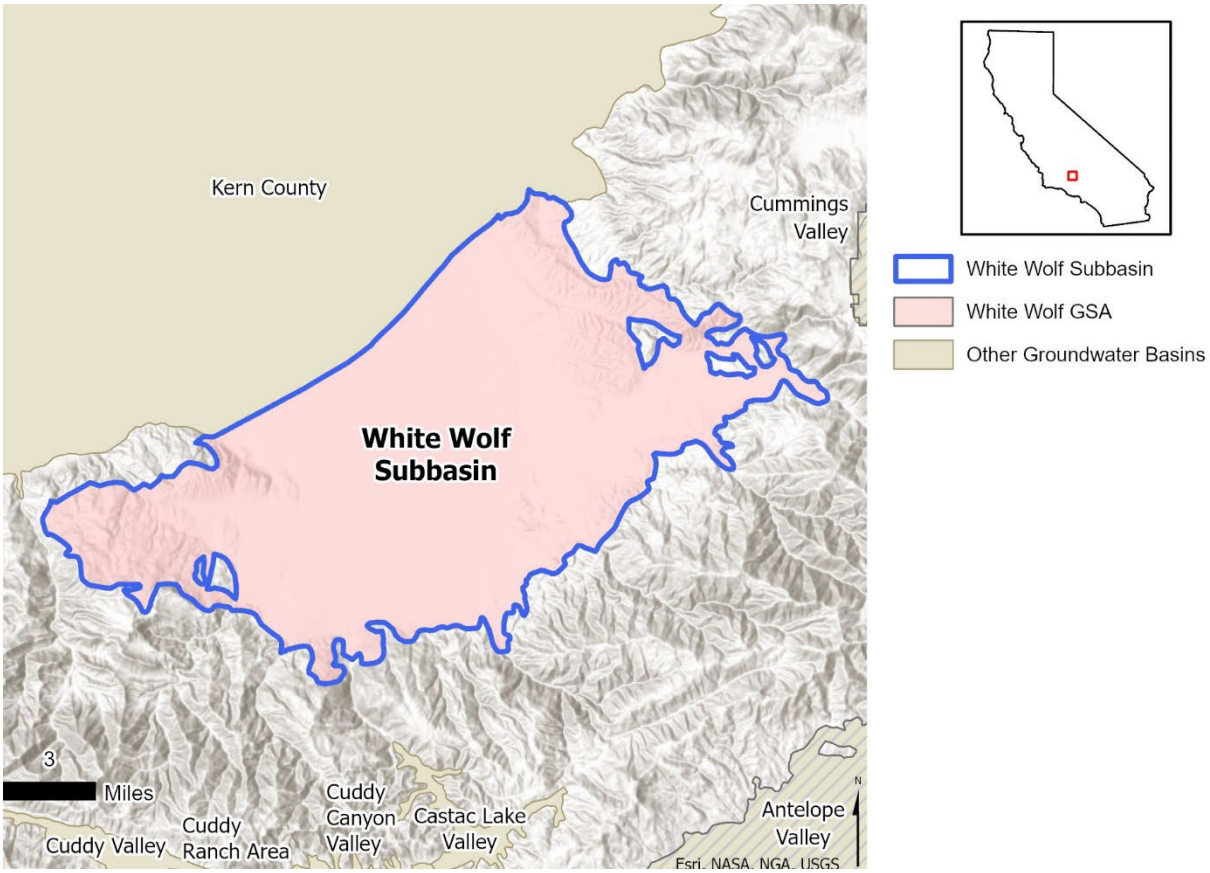

Figure 1: White Wolf Subbasin Location Map.

Based on information presented in the GSP, most of the land in the Subbasin is undeveloped (approximately 66%). Approximately 32% of the land is used for agriculture (with vineyards, fruit and nut, tree nursery, and berry being the most abundant agricultural land use) and approximately 2% is collectively used for quarry, mining, and oil fields. The

[38] White Wolf GSP, Executive Summary, pp. 20-21, Section 3.2, p. 35, and Appendix A, pp. 367-375.
[39] White Wolf GSP, Appendix B, Section 2.2, p. 382, and Appendix A, pp. 368-369.

Plan states that there are no incorporated cities within the Subbasin. [40] The Plan identifies "two small regions within the [Subbasin] that qualify as Disadvantaged Communities (DAC) or Severely Disadvantaged Communities (SDAC). Both areas are lightly populated (i.e., it is estimated that approximately 390 people currently live within the Basin [DWR, 2019])".[41] The Plan also states that "there are no tribal lands within or in the vicinity of the [Subbasin]."[42]

Entities with water management responsibilities in the Subbasin include AEWSD, TCWD, and WRMWSD, and Kern County Water Agency (KCWA).[43] The GSP identifies beneficial uses and users of groundwater in the Subbasin as including agricultural users, domestic well owners, and commercial and Industrial users.[44]

The GSP provides an inventory of wells and well-density maps using data from the Department's Online System for Well Completion Report (OSWCR) dataset. Based on the information provided, there are a total of 71 wells in the Subbasin, 93% of the wells are production wells and 6% of the wells are domestic. Additionally, the GSP provides a well inventory and well density maps using data from the White Wolf Data Management System (DMS) dataset. Based on this information, there are a total of 275 wells in the Subbasin, 93% of the wells are production wells, 6% of the wells are of mixed domestic use and 1% of the wells are public supply wells. [45]

The GSP includes information on existing groundwater and surface water monitoring conducted by various entities, including existing water management plans and regulatory programs currently operating in the Subbasin.[46] As detailed in the GSP, groundwater management actions have been ongoing in the Subbasin for several years. The GSA intends to coordinate with other entities in the Subbasin to support existing groundwater management efforts and build upon them to achieve sustainable groundwater management in the Subbasin.

The GSP describes in sufficient detail the organizational structure of the GSA and its legal authority to manage groundwater in the Subbasin, and finance projects and management actions. The GSA adopted a Framework Agreement in 2017, which formed the White Wolf Subbasin Sustainable Groundwater Management Agency. The GSP also provides the GSA's funding strategy to support their GSP implementation activities and includes high-level cost estimates for the first five years of GSP implementation. The costs range from approximately $290,000 to $345,000 per year. [47] The GSP describes funding mechanisms that the GSA will consider for meeting the GSP implementation costs, which

[40] White Wolf GSP, Section 5.1.3.1, p. 39.
[41] White Wolf GSP, Executive Summary, p. 21.
[42] White Wolf GSP, Section 5.1.3.3., p. 39.
[43] White Wolf GSP, Section 5.1.3.5, p. 40.
[44] White Wolf GSP, Appendix B, Section 3.1, p. 384.
[45] White Wolf GSP, Section 5.1.5, p. 43.
[46] White Wolf GSP, Section 5.2, pp. 43-45.
[47] White Wolf GSP, Section 19.2.1, p, 355, and Table PI-1, p. 357.

include a combination of contributions from landowners, grant funding, and rate payers (if available).[48]

The GSP includes a Communication and Engagement Plan which describes the GSA's communication and public engagement efforts during the development phase of the GSP, including its decision-making process. The Communication and Engagement Plan also describes the communication and public involvement approach that the GSA plans to use during the GSP implementation phase.[49] The GSA provides a list of public meetings where the GSP was discussed or considered,[50] including public comments and how they were addressed.[51]

Department staff conclude that the administrative information included in the GSP substantially complies with the requirements outlined in the GSP Regulations.

4.2 Basin Setting

GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[52]

4.2.1 Hydrogeologic Conceptual Model

The hydrogeologic conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, and represents a local agency's understanding of the geology and hydrology of the basin that support the geologic assumptions used in developing mathematical models, such as those that allow for quantification of the water budget.[53] The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,[54] and includes a description of basin boundaries and the bottom of the basin,[55] principal aquifers and aquitards,[56] and data gaps.[57]

[48] White Wolf GSP, Section 3.5, p. 36, Section 19.2.2, p. 356; and Table PI-2, p. 257.
[49] White Wolf GSP, Appendix B, pp. 276-399.
[50] White Wolf GSP, Section 5.5.2, pp. 58-59.
[51] White Wolf GSP, Appendix C, pp. 400-444.
[52] 23 CCR § 354.12.
[53] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[54] 23 CCR §§ 354.14 (a), 354.14 (c).
[55] 23 CCR §§ 354.14 (b)(2-3).
[56] 23 CCR § 354.14 (b)(4) *et seq.*
[57] 23 CCR § 354.14 (b)(5).

The Plan provides a comprehensive description of the hydrogeologic conceptual model (HCM) based on technical studies, maps, and cross sections that use the best available information to describe the groundwater system in the Subbasin.[58]

The Plan states that the Subbasin is located at the southern end of the San Joaquin Valley and is a sedimentary trough filled with Quaternary-age alluvial deposits, Tertiary age sandstone, siltstone, shale, conglomerates, minor volcanics, and Eocene-age marine facies resting unconformably on a basement complex.[59] The GSP describes that the Subbasin is located in a tectonically active area with the recently active White Wolf Fault (WWF) on the northern border of the Subbasin, multiple high-angle normal faults creating a graben in the center of the Subbasin, and surrounding thrust faults.[60] The GSP also states that the Springs Fault in the southeastern Subbasin is a southeastern-dipping high angle fault that creates a partial hydraulic barrier between the Principal Aquifer and the shallow water-bearing zone in the southeastern Subbasin.[61] The Plan describes that the Subbasin is bounded on the north by the White Wolf Fault, on the east and south by a crystalline basement complex of the Tehachapi Mountains, and on the west by Tertiary-age sedimentary rocks of the San Emigdio Mountains.[62]

The GSP states that the Subbasin contains one principal aquifer defined as consisting of Shallow Alluvium, the Kern River Formation, and the Chanac Formation.[63] The GSP states that the lenticular geometry, heterogeneity of deposits, and similarity of depositional environments make it difficult to identify separate aquifer units in most of the Subbasin; therefore, the GSP combines the Shallow Alluvium, Kern River, and Chanac Formations into the Principal Aquifer.[64] The degree of confinement within the Subbasin is not well known, however, groundwater in the Subbasin is generally expected to be unconfined to semi-confined.[65] The GSP states that confinement increases with depth and is likely related to sections of poorly sorted, fine-grained deposits rather than a thick layer of lacustrine clay.[66] The GSP describes the Shallow Alluvium as Quaternary/Recent fan, terrace and alluvial deposits, the Kern River Formation as fine to coarse-grained sands and sandy clays with interbeds of poorly-sorted sands, gravels and boulders, and the Chanac Formation as loosely consolidated fanglomerate with sand and clay lenses.[67] The GSP states that there is a clay rich transition zone that is approximately 50 to 100 feet thick between the Chanac and Santa Margarita Formation that may act as an aquitard to the Santa Margarita Formation aquifer.[68] The Santa Margarita Formation directly

[58] White Wolf GSP, Section 7, pp. 72-94, Figures HCM-1 to HCM-19, pp. 95-113.
[59] White Wolf GSP, Section 7.1.1, pp. 72-73, Figures HCM-11 to HCM-13, pp. 105-107.
[60] White Wolf GSP, Section 7.1.1, pp. 72-73, Figures HCM-11 to HCM-13, pp. 105-107.
[61] White Wolf GSP, Section 7.1.1, pp. 72-73, Figures HCM-11 to HCM-13, pp. 105-107.
[62] White Wolf GSP, Section 7.1.2, pp. 73-74, Figure HCM-1.
[63] White Wolf GSP, Section 7.1.3.4, p. 78.
[64] White Wolf GSP, Section 7.1.3.4, p. 78.
[65] White Wolf GSP, Section 7.1.3.4, p. 78.
[66] White Wolf GSP, Section 7.1.3.4, p. 78.
[67] White Wolf GSP, Section 7.1.4.1, pp. 79-80.
[68] White Wolf GSP, Section 7.1.4.1, pp. 79-80.

underlies the Chanac Formation and consists of well-sorted gray sandstone, gravel and shale, however, the Plan states that there is no documented groundwater extraction from the Santa Margarita Formation in the Subbasin.[69]

The GSP states that majority of available evidence (EKI, 2016) demonstrates that the White Wolf Fault acts as a significant impediment to groundwater flow. Based on multiple scientific studies concurring that the White Wolf Fault impedes groundwater flow, the Department approved a basin boundary modification separating the Subbasin from the Kern County Subbasin in 2016 with the new northern boundary of the Subbasin represented by the White Wolf Fault.[70] The GSP describes that the Springs Fault in the southeastern Subbasin is a southeastern-dipping high angle fault that creates a hydraulic barrier between the Principal Aquifer and the shallow water-bearing zone in the southeastern Subbasin.[71] Depth to groundwater levels measured in 2021 at shallow monitoring wells adjacent to and north of the Springs Fault suggests that as groundwater flows northward, the Springs Fault acts as a partial hydraulic barrier and water backs up immediately on the southern side of the fault.[72]

According to the GSP, groundwater in the Subbasin primarily supplies irrigated agriculture, but also supplies other beneficial uses such as public water systems and private domestic wells.[73] Figure HCM-10 in the GSP shows the location of wells and their respective type of use with most production wells located within the northcentral portion of the Subbasin.[74]

The GSP recognizes multiple data gaps in the HCM and states that the GSA will make efforts to address them, but does not identify reasonable measures or schedules to eliminate the data gaps.[75] Data gaps include uncertainty in the hydraulic gradient and groundwater flow across the White Wolf Fault and Springs Fault, uncertainty in distinguishing hydraulic properties between formations in the Principal Aquifer, uncertainties about well construction details, well use, well status, and the unknown locations of the Tut Brothers public water system wells.[76] Department staff encourage the GSA to provide a plan and schedule to address the data gaps, discuss whether the data gaps are critical to GSP implementation, and discuss how filling data gaps will impact achieving sustainability.

Department staff conclude that the information provided to characterize the hydrogeologic conceptual model substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan's descriptions of the regional geologic setting, the

[69] White Wolf GSP, Section 7.1.4.1, p. 80, Section 7.1.4.2, pp. 80-81.
[70] White Wolf GSP, Section 7.1.4.3, p. 84, Figure HCM-1, p. 95.
[71] White Wolf GSP, Section 7.1.4.3, p. 84, Figure HCM-13, p. 107.
[72] White Wolf GSP, Section 7.1.4.3, p. 85, Section 8.2.1.2, p. 118.
[73] White Wolf GSP, Section 7.1.4.5, pp. 85-86, Figure HCM-10, p.104.
[74] White Wolf GSP, Figure HCM-10, p. 104.
[75] White Wolf GSP, Section 7.1.5, p. 86, Section 19.1.2, p. 349.
[76] White Wolf GSP, Section 7.1.5, p. 86.

Subbasin's physical characteristics, the principal aquifer, and hydrogeologic conceptual model appear to utilize the best available information and science. Department staff are aware of no significant inconsistencies or contrary technical information to that presented in the Plan.

4.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the applicable sustainability indicators and groundwater dependent ecosystems that includes the following: groundwater elevation contour maps and hydrographs,[77] a graph depicting change in groundwater storage,[78] maps and cross-sections of the seawater intrusion front,[79] maps of groundwater contamination sites and plumes,[80] maps depicting total subsidence,[81] identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,[82] and identification of groundwater dependent ecosystems.[83]

The GSP defines "current conditions" as the period from calendar years 2015-2019. Two historical conditions periods are defined, water year (WY) 1995-2014 for calculating historical water budgets, and 1975-2019 based on the period that the Subbasin has been receiving surface water deliveries.[84] Groundwater elevation contour maps are provided for Spring and Fall 2015 and 2019.[85] Groundwater elevation contour maps were not provided in the GSP for any historical period years prior to 2015.

The GSP includes hydrographs from 6 wells with data from 1955 to 2019, and another 10 hydrographs from 1975 to 2019, which is defined as the historical period on Figure GWC-5. On Figure GWC-6, hydrographs for the same 16 wells are included for the 1995-2019 period and are described as "recent."[86] These hydrographs show a historical decline of up to 200 feet in groundwater elevation prior to the importation of surface water in the early 1970s, followed by a recovery of approximately 50 feet until approximately 2012.

To demonstrate the differences in vertical groundwater gradient data, the GSP included groundwater elevation data from two nested wells located in the southern portion of the Subbasin that are screened within the Chanac Formation and in the underlying Santa Margarita Formation, represented on Figure GWC-3. The GSP states that the Santa Margarita Formation is largely unpumped and is not considered as part of the Principal Aquifer system[87]. The GSP identifies a negative (upward) gradient from the Santa

[77] 23 CCR §§ 354.16 (a)(1-2).
[78] 23 CCR § 354.16 (b).
[79] 23 CCR § 354.16 (c).
[80] 23 CCR § 354.16 (d).
[81] 23 CCR § 354.16 (e).
[82] 23 CCR § 354.16 (f).
[83] 23 CCR § 354.16 (g).
[84] White Wolf GSP, Section 8, p. 114.
[85] White Wolf GSP, Figures GWC-1 and GWC-2, pp. 138-139.
[86] White Wolf GSP, Figures GWC-5 and GWC-6, pp. 142-143.
[87] White Wolf GSP, Figure GWC-3, p. 140.

Margarita Formation to the Chanac Formation, “a negative vertical gradient signifies upward flow between aquifer zones whereas a positive vertical gradient signifies downward flow between aquifer zones.”[88]

The GSP reports that the depth to groundwater across the Subbasin as measured between Fall 2014 and Fall 2019 ranged from a low to 69 feet below ground surface to 982 feet below ground surface as measured in a well in the higher land elevation portion of the Subbasin. The shallowest depths to water were measured in the southwest portion of the Subbasin where the GSP states that wells in this area are reportedly screened in both the Chanac and Santa Margarita Formations.[89]

The GSP describes the long-term trends to groundwater with hydrographs that have records back to 1955, which show up to a 200-foot decline in groundwater levels in the Subbasin that ceased and, in some cases, began to recover once surface water imports began between 1966 and 1975. Trends in changes to groundwater levels based on water year type are presented in the Plan on Table GWC-2. The Plan states that the climatic factor included in the analysis of long-term groundwater trends shows that groundwater levels were increasing in the Subbasin in the 1990’s, were relatively stable in the 2000’s, and then began decreasing around WY2010.[90]

The GSP describes the methodology used to calculate groundwater storage change per year[91] and provides net groundwater storage change in the GSA for the 1994-2015 historical period and each subsequent wet/dry period[92]. The GSP states that seasonal water level highs (Spring) were used for these calculations[93]. Groundwater storage change per year is summarized in Figure GWC-8;[94] water use type information is not provided, nor is the cumulative change in groundwater storage included. The Plan states that the annual change in storage ranged from an increase of 55,300 AF for the period from March 1998-February 1999 to a decrease of 45,600 AF for the period between March 2013 and February 2014, with changes in storage becoming more negative in dry years and improving during wet years.

The GSP states that the Subbasin is located far from coastal areas and seawater intrusion is not considered a threat to groundwater resources and therefore not a relevant sustainability indicator.[95] Given the geographic setting of the Subbasin, Department staff regard the reasoning of the GSP as sufficient to demonstrate that sea water intrusion is not present in the Subbasin and is not likely to occur in the future.

[88] White Wolf GSP, Section 8.2.1.1, pp. 116-118.
[89] White Wolf GSP, Section 8.2.1.2 Depth to Groundwater, p. 118
[90] White Wolf GSP, Section 8.2.2 p 119.
[91] White Wolf GSP, Section 8.3, p. 120.
[92] White Wolf GSP, Table GWC-3, p. 122.
[93] White Wolf GSP, Section 8.3, p. 121.
[94] White Wolf GSP, Figure GWC-8, p. 145.
[95]White Wolf GSP, Section 8.4, p. 122.

The Plan includes descriptions of current and historical groundwater quality conditions in the Subbasin,[96] along with maps of where groundwater quality issues are observed in the Subbasin[97] and trend graphs for constituents of concern.[98] Degradation of groundwater quality in the Subbasin is reported to be from both point and non-point sources. The Plan identifies groundwater constituents from non-point sources that have been detected above regulatory standards to include arsenic, nitrate, total dissolved solids (TDS), sulfate, iron, manganese, boron, sodium, and chromium.[99] The Plan also discusses point-source contamination sites present in the Subbasin, these sites are under the purview of the Water Quality Control Board. The GSP states "[given] the lack of open sites and the fact that the depth of groundwater is generally hundreds of feet below the land surface, the threat to groundwater from these sites is likely negligible."[100] Department staff encourage the GSA to coordinate with the water quality regulatory agencies/entities overseeing the various point-source contamination sites in assessing whether groundwater management is affecting plume migration during Plan implementation.

The Plan describes the current and historical land subsidence conditions for the Subbasin[101] and provides a map[102] to show the extent of subsidence. The GSP describes regional land subsidence historically from the 1952 Arvin-Tehachapi earthquake to current conditions.[103] The Plan reports that between 1959 to 1962 groundwater level declines contributed 0.15 feet of subsidence within the Subbasin where similar declines to groundwater level north of the White Wolf Fault in the Kern County Subbasin resulted in 1.5 feet of subsidence. The GSP discusses recent subsidence measured at the two continuous monitoring stations and 34 surveyed benchmarks along the California Aqueduct, which is located on the western margin of the Subbasin. The GSP calculates an average ground surface subsidence of 0.2 inches per year as measured by the surveyed benchmarks.[104] The Plan states that INSAR data for the period covering October 2020 shows less than 0.1 inch of subsidence for the subbasin.

The GSP does not identify interconnected surface water systems within the Subbasin. However, the GSP does state that there may be interconnected surface waters within the area near the Springs Fault, the area is upslope of the developed part of the Subbasin and the GSP states that there is little groundwater pumping on the upgradient side of the Springs Fault. Water level data installed in co-located shallow monitoring wells show no impact from groundwater production from the principal aquifer. As a result, the GSP

[96] White Wolf GSP, Section 8.5, pp. 123-130.
[97] White Wolf GSP, Figures GWC-9 through GCW-13, pp. 146-151.
[98] White Wolf GSP, Figure SMC-7, p. 273.
[99] White Wolf GSP, Table GWC-4, p. 124.
[100] White Wolf GSP, Section 8.5.4, p. 129.
[101] White Wolf GSP, Section 8.6, pp. 130-131.
[102] White Wolf GSP, Figure GWC-15, p. 152.
[103] White Wolf GSP, Section 8.6.1, p. 130.
[104] White Wolf GSP, Section 8.6.1, p. 131.

concludes that this area is hydraulically disconnected from the principal aquifer and that it should be managed separately.

The Plan describes the process for distinguishing whether surface ecosystems are connected or disconnected from the Principal Aquifer based on depth to groundwater. Approximately 880 acres of potential groundwater dependent ecosystems (GDEs) were identified from both the Natural Communities Commonly Associated with Groundwater (NCCAG) spatial dataset and field interpretation, with approximately 435 acres ultimately included in the GSP.[105] The GSP states that GDEs of interest in the Basin are categorized as supported by either the shallow water-bearing zone upgradient of the Springs Fault, or as supported by the Regional Aquifer; Figure GWC-18 displays the two categories in map form.[106]

Department staff conclude that, overall, the Plan sufficiently describes the historical and current groundwater conditions for the sustainability indicators relevant to the Subbasin, based on what seems to be the best available science and information. Additionally, the information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

4.2.3 Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical; current; and projected water budget conditions,[107] and the sustainable yield.[108]

The GSP provides historical water budget information derived from the White Wolf Groundwater Flow Model (WWGFM) for the Subbasin for a 25-year period spanning from WY 1995 through WY 2014.[109] Specifically, the GSP provides graphical and tabular historical water budgets for all inflows into and outflows from the Subbasin[110] and the three interconnected systems used to define the hydrologic balance within the Subbasin: the groundwater system,[111] land surface system,[112] and surface water system.[113] Additionally, the GSP quantifies the change in the annual volume of groundwater storage between seasonal high conditions, investigates for the occurrence of overdraft conditions, identifies WY types, and attempts to quantify a sustainable yield for the Subbasin for the historical period.

[105] White Wolf GSP, Section 8.8.2, p. 135.
[106] White Wolf GSP, Figure GWC-18, p. 155.
[107] 23 CCR §§ 354.18 (a), 354.18 (c) *et seq*.
[108] 23 CCR § 354.18 (b)(7).
[109] White Wolf GSP, Section 9, pp. 156-220.
[110] White Wolf GSP, Table WB-8, p. 181, WB-16 and WB-17, pp. 216-217.
[111] White Wolf GSP, Table WB-5, p. 176, Figure WB-9 and WB-10.
[112] White Wolf GSP, Table WB-4, p. 174, Figure WB-7 and WB-8, pp. 207-208.
[113] White Wolf GSP, Table WB-3, p. 169, Figure WB-3, p. 203.

The WWGFM is a numerical groundwater flow model which utilizes the United States Geological (USGS) Modular Three-Dimensional Groundwater Modeling platform (MODFLOW-NWT). The model spatial domain covers the entire extent of the Subbasin and is vertically split into four grid layers which represent the four primary foundations within the Subbasin. The WWGFM is calibrated for WY 1985 through 2015. The model's aquifer properties, general head boundary conductance, fault hydraulic characteristics, and streambed conductance were subjected to manual calibration to match simulated conditions to observed groundwater levels, estimated subsurface flows, local artesian conditions, stream stage measurements, and stream flow measurements. Model calibration relied on groundwater elevation observations collected from 36 wells between October 1985 and September 2014 and stream gauge data collected at three points along the El Paso Creek and one point on the Tunis Creek.[114]

The Plan provides three water budgets evaluated using their model, which include the following:

- A 20-year historical water budget evaluated for water years 1994 to 2015.
- A current water budget evaluated for a period covering water years 2015 to 2019.
- A 53-year future projection water budget evaluated for water years 2020 to 2072.

The water budgets generally describe an accounting of inflows and outflows for the surface water and groundwater systems, including groundwater storage changes and sustainable yield, presented in tabular and graphical format.[115] However, the Plan provides the projected water budget for the groundwater system, but not for the surface water system, which is required by the regulations. Staff recommend the GSA include the projected water budget for the surface water system by the next periodic evaluation of the Plan (see Recommended Corrective Action 1).

The historical water budget estimates the 20-year historic water budget representing hydrologic conditions from water years 1994 to 2014, estimates the average inflow to be 56,600 acre-feet per year and the average outflow to be 53,300 acre-feet per year, resulting in a surplus in groundwater storage of 3,200 acre-feet per year.[116]

The current water budget estimates inflow into the Subbasin's groundwater system to be 49,500 acre-feet per year and the outflow to be 69,800 acre-feet per year, resulting in a decline in groundwater storage of 20,300 acre-feet year.[117]

The projected water budget is evaluated for several scenarios, including baseline conditions (for current land use conditions and projected land use conditions), and varied climate-modified scenarios, with and without projects and management actions considerations. For baseline conditions evaluated without projects and management

[114] White Wolf GSP, Appendix L, pp. 1174-1234.
[115] White Wolf GSP, Section 9.1 through 9.5, pp. 158-200; Figure WB-34 through WB-16, pp. 203-216.
[116] White Wolf GSP, Table WB-1, p. 157, and Table WB-5, p 176.
[117] White Wolf GSP, Table WB-1, p. 157, and Table WB-5, p 176.

actions, the Plan estimates a decrease in groundwater storage of up to 4,600 acre-feet per year.[118]

For the various climate-modified scenarios evaluated without considering projects and management actions, the Plan estimates a change in storage that ranges from a decline of 8,400 acre-feet per year to of 15,500 acre-feet per year. When projects and management actions are factored in for all scenarios, the Plan estimates a decline in groundwater storage of 700 to 7,200 acre-feet per year.[119]

Results of the projected annual changes in groundwater storage[120] and graphs depicting changes in groundwater elevations for the various modeled scenarios,[121] show that the projects and management actions proposed in the Plan[122] will be necessary to attain measurable objectives and achieve sustainability for the Subbasin.

The Plan provides sustainable yield estimates derived by subtracting the average annual groundwater pumped from the average annual change in groundwater storage during different periods. For the 20-year historical period (1995 to 2014) and current period (2015 to 2019), the sustainable yield is estimated to be 44,200 acre-feet per year and 38,200 acre-feet per year, respectively. For the projected period (2020 to 2072), the sustainable yield values range from 46,800 to 47,100 acre-feet per year, depending on the modeled scenario (i.e., variable climate conditions, with and without projects and management actions being implemented).[123]

The GSP identifies data gaps that the GSA acknowledges need to be addressed to improve the reliability of the water budgets and reduce uncertainty.[124] Department staff encourage the GSA to address the relevant data gaps to reduce uncertainty in the model results at the earliest possible, including updating the sustainable yield to be the maximum quantity of water calculated over a base period representative of long-term conditions in the Subbasin, and including any temporary surplus, that can be withdrawn annually without causing undesirable results in the Subbasin.

Despite the identification of a recommended corrective action, Department staff conclude the Plan provides the majority of the required historical, current, and future accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Subbasin and projected future water demands, using the best available tools and information available at the time of preparation of the Plan. Department staff recommend the GSA work to understand the reliability of the surface water supply to the

[118] White Wolf GSP, Table WB-1, p. 157, and Table WB-5, p 176.
[119] White Wolf GSP, Table WB-1, p. 157, and Table WB-5, p 176.
[120] White Wolf GSP, Table WB-9, p. 184.
[121] White Wolf GSP, Figure PMA-2, p. 345.
[122] White Wolf GSP, Section 18, pp. 317-326.
[123] White Wolf GSP, Table WB-9, p. 184.
[124] White Wolf GSP, Section 9.5.3, pp 199-200.

Subbasin to develop a projected water surface water budget and revise the estimate of the sustainable yield of the Subbasin as more data becomes available.

4.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.[125]

The GSP has not defined management areas for the Subbasin.[126]

4.3 Sustainable Management Criteria

GSP Regulations require each Plan to include a sustainability goal for the basin and to characterize and establish undesirable results, minimum thresholds, and measurable objectives for each applicable sustainability indicator, as appropriate. The GSP Regulations require each Plan to define conditions that constitute sustainable groundwater management for the basin including the process by which the GSA characterizes undesirable results and establishes minimum thresholds and measurable objectives for each applicable sustainability indicator.[127]

4.3.1 Sustainability Goal

GSP Regulations require that GSAs establish a sustainability goal for the basin. The sustainability goal should be based on information provided in the GSP's basin setting and should include an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation.[128]

The GSP states that the sustainability goal for the Subbasin is to "[c]ooperatively continue to maintain an economically viable groundwater resource within the White Wolf Subbasin that supports the current and future beneficial uses of groundwater by utilizing the area's groundwater resources within the local sustainable yield and avoiding undesirable results."[129]

The GSP describes an approach to achieve sustainability within 20 years of GSP implementation and maintain long-term sustainability, that includes implementing projects and management actions (P/MAs) using an adaptive strategy and tracking hydrologic conditions to ensure the Subbasin is operated within its sustainable yield. The proposed projects and management actions largely focus on increasing supply (referred to in the GSP as "groundwater augmentation projects") and demand reduction. The Plan states

[125] 23 CCR § 354.20.
[126] White Wolf GSP, Section 10, p. 221.
[127] 23 CCR § 354.22 *et seq*.
[128] 23 CCR § 354.24.
[129] White Wolf GSP, Section 12, p. 224.

that the projects and management actions were developed "using a portfolio approach whereby individual P/MAs were identified and grouped into categories based on their expected benefits… [t]his approach allows for the flexible implementation of P/MAs as needed to address future conditions throughout the 50-year GSP planning and implementation horizon (i.e., out to 2072)."[130]

Based on the information provided in the Plan relating to the sustainability goal, Department staff conclude that the Plan substantially complies with the GSP Regulations.

4.3.2 Sustainability Indicators

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.[131] Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon, significant and unreasonable reduction of groundwater storage, significant and unreasonable seawater intrusion, significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies, land subsidence that substantially interferes with surface land uses, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water[132] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

GSP Regulations require that GSAs provide descriptions of undesirable results including defining what are significant and unreasonable potential effects to beneficial uses and users for each sustainability indicator.[133] GSP Regulations also require GSPs provide the criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.[134]

GSP Regulations require that the description of minimum thresholds include the information and criteria relied upon to establish and justify the minimum threshold for each sustainability indicator.[135] GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,[136] and the relationship between the

[130] White Wolf GSP, Section 18, p. 317.
[131] 23 CCR § 351(ah).
[132] Water Code § 10721(x).
[133] 23 CCR §§ 354.26 (a), 354.26 (b)(c).
[134] 23 CCR § 354.26 (b)(2).
[135] 23 CCR § 354.28 (b)(1).
[136] 23 CCR § 354.28 (b)(4).

minimum thresholds for each sustainability indicator, including an explanation for how the GSA has determined conditions at each minimum threshold will avoid causing undesirable results for other sustainability indicators.[137]

GSP Regulations require that GSPs include a description of the criteria used to select measurable objectives, including interim milestones, to achieve the sustainability goal within 20 years.[138] GSP Regulations also require that the measurable objectives be established based on the same metrics and monitoring sites as those used to define minimum thresholds.[139]

The following subsections thus consolidate three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives. Information, as presented in the Plan, pertaining to the processes and criteria relied upon to define undesirable results applicable to the Subbasin, as quantified through the establishment of minimum thresholds, are addressed for each applicable sustainability indicator. A submitting agency is not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[140]

4.3.2.1 Chronic Lowering of Groundwater Levels

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the chronic lowering of groundwater, the GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results that is supported by information about groundwater elevation conditions and potential effects on other sustainability indicators.[141]

The GSP states that undesirable results associated with chronic lowering of groundwater levels would be experienced "if and when a chronic decline in groundwater levels in the Principal Aquifer negatively affects the reasonable and beneficial use of, and access to, groundwater for beneficial uses and users within the Basin."[142] The Plan states "[s]ignificant and unreasonable effects associated with Undesirable Results would include the complete dewatering of more than 25% of existing wells."[143]

The GSP provides a basis for how significant and unreasonable effects of chronic lowering of groundwater levels are defined. The GSP explains that "[t]he primary beneficial users of groundwater from the Principal Aquifer are groundwater pumpers… As such, the definition of [undesirable results] is focused on potential well impacts."[144] The GSP further explains that 78% of existing wells in the Subbasin are at least 50 years

[137] 23 CCR § 354.28 (b)(2).
[138] 23 CCR § 354.30 (a).
[139] 23 CCR § 354.30 (b).
[140] 23 CCR § 354.26 (d).
[141] 23 CCR § 354.28(c)(1) *et seq*.
[142] White Wolf GSP, Section 13.1, p. 231.
[143] White Wolf GSP, Section 13.1, p. 231.
[144] White Wolf GSP, Section 13.1, p. 231.

old and "would reasonably have to be replaced in the next 20 years due to age alone, it cannot be considered 'significant and unreasonable' if fewer than 25% of wells in the Basin were to be impacted due to chronic lowering of groundwater levels." [145]

The GSP quantitatively defines an undesirable result for chronic lowering of groundwater levels as occurring "if and when groundwater levels in the Principal Aquifer decline below the established [minimum thresholds] in 40% or more of the RMW-WLs [representative monitoring wells for chronic lowering of groundwater levels] over four consecutive seasonal measurements (i.e., measurements spanning a total of two years, including two seasonal high groundwater level periods and two seasonal low groundwater level periods)." [146] According to the GSP, the criteria used to define undesirable results for chronic lowering of groundwater are based on what the GSA considers as significant and unreasonable conditions of chronic lowering of groundwater levels, and "with consideration of groundwater levels and trends, well depths (i.e., in relation to impacts to groundwater pumpers as the primary beneficial user), and proximity to critical infrastructure (i.e., the California Aqueduct and the 850 Canal)."[147]

Department staff conclude the decision to set sustainable management criteria based on evaluating both spring and fall measurements may not adequately consider the interests of beneficial uses and users. Based on a review of hydrographs from the Subbasin, groundwater levels typically decline during the peak irrigation season and hit seasonal lows in the late summer or fall period where potential impacts to beneficial uses and users will be most severe. The GSA's decision to set sustainable management criteria for the chronic decline of groundwater levels based spanning a total of two years, including two seasonal high groundwater level periods and two seasonal low groundwater level periods, instead of focusing on the time of most impacts in late summer or fall, is flawed as it likely disregards potential impacts to beneficial uses and users from seasonal variations. Under this management decision, even if the GSA successfully maintains spring groundwater levels within the historical range, impacts to beneficial uses and users that occur during any other times of the year (as groundwater levels typically decline) appear to not be considered. The GSA should revise the sustainable management criteria to be based on seasonal low groundwater levels to ensure potential impacts to beneficial uses and users are considered (see Recommended Corrective Action 2).

The GSP identifies potential causes of undesirable results related to chronic lowering of groundwater levels which include increased groundwater use (due to conditions such as increases in water use per acre or new irrigated land) and reduced recharge (due to conditions such as improved agricultural irrigation efficiency, climate change, decreased

[145] White Wolf Subbasin GSP, Section 13.1, p. 231.
[146] White Wolf GSP, Section 13.1.2, p. 232.
[147] White Wolf GSP, Section 13.1.1, pp. 231-232.

surface water inflows from contributing watersheds, and/or increased evapotranspiration).[148]

The GSP describes the methodology used to establish the minimum thresholds as being a multi-step process that was based on an evaluation of historical groundwater trends for the period from WY 1966 to WY 2019; a review of the proximity to critical infrastructure for consideration of potential land subsidence impacts; a review of well construction information to consider impacts to beneficial uses; and consideration of the effects of the sustainable management criteria developed in the adjacent Kern County Subbasin.[149] The GSA used the information "to develop [minimum threshold] estimates using a quantitative algorithm that accounted for trends, historical lows, and water level variability … [which] allowed for the most complete and representative historical water level information to inform the MTs [minimum thresholds]."[150]

The GSP describes the first step of establishing the minimum thresholds as a "Minimum Threshold Algorithm" that "included evaluation of historical groundwater elevation data, projected trends, and analysis of potential impacts to existing wells."[151] The Plan further describes how the three key components, described below, were utilized to calculate the minimum threshold initial estimates for the representative monitoring sites (RMSs):

1. Historical low water levels are used as a starting point for MTs "based on the fact that significant and unreasonable impacts to beneficial uses and users of groundwater due to low groundwater levels are not known to have occurred since the time when water levels were at their historical low."[152]
2. Variability in groundwater levels "is accounted for by calculating a Variability Correction Factor as the product of the observed water level range over a relevant time period and a "Range Fraction." This Variability Correction Factor is applied to the historical low (as discussed below) and acknowledges the fact that different locations within the Basin have experienced different amounts of water level variability."[153]
3. Recent trends in groundwater levels and projected water use "are accounted for by extending the trend for a certain amount of time (the "Trend Extension Period") to determine a Trend Continuation Factor. This factor is also applied to recent water levels in order to allow time for implementation of any Projects and/or Management Actions needed to eliminate declining trends, and thereby avoid potential rapid disruption to land uses."[154]

[148] White Wolf GSP, Section 13.1.2, p. 232.
[149] White Wolf GSP, Section 14.1.1.1 p. 247.
[150] White Wolf GSP, Section 14.1.1.1 pp. 247-248.
[151] White Wolf GSP, Section 14.1.1.1 p. 247.
[152] White Wolf GSP, Section 14.1.1.1 p. 247.
[153] White Wolf GSP, Section 14.1.1.1 p. 247.
[154] White Wolf GSP, Section 14.1.1.1 p. 247.

The second step included a review of areas proximal to critical infrastructure "that may be particularly sensitive to significant and unreasonable effects from land subsidence…"[155] In those cases "an adjustment to the initial MT estimates was applied in the algorithm to ensure that the calculated MT was no lower than the historical low groundwater levels."[156] The third step (or factor) include a consideration of the effects of the sustainable management criteria developed in the adjacent Kern County Subbasin. The GSP states that the "[Subbasin's] MTs are higher than those in the adjacent area in Kern County Subbasin, which ensures that if water levels were to reach MTs in both basins, the horizontal gradient of groundwater flow from the Basin to the Kern County Subbasin will remain within the range of current conditions. [157] The final step described in the GSP is a review of well construction information to consider impacts to beneficial uses.

Based on the multi-step process, the GSP established minimum thresholds for chronic lowering of groundwater levels 14 representative monitoring wells (see Table SMC-4 and Figure SMC-4). [158]

The impact analysis states, if groundwater levels are lowered to the proposed minimum thresholds, none of the wells evaluated would result in "complete dewatering" and are "expected to result in partial dewatering of four wells that were not already partially dewatered at the Fall 2015 groundwater elevation."[159] The GSA should coordinate with well users in the Subbasin to understand if impacts are occurring to any users whose wells lack construction data or are older than 50 years. Department staff encourage the GSA to review the Department's April 2023 guidance document titled *Considerations for Identifying and Addressing Drinking Water Well Impacts*[160] while working well users in the Subbasin.

Additionally, the GSP developed an action plan to proactively address exceedances of minimum threshold. The Plan states that "[i]t important to monitor compliance with MTs and Measurable Objectives (MOs) over time to understand the Basin's likelihood of achieving sustainability and avoiding URs."[161] The six-step action plan includes the following:

1. Identify exceedance and investigate the RMS area,
2. Evaluate outside contributing factors,
3. Consider the need for increased or expanded monitoring,
4. Consider initiating projects and/or management actions,

[155] White Wolf GSP, Section 14.1.1.2 p. 249.
[156] White Wolf GSP, Section 14.1.1.2 p. 249.
[157] White Wolf GSP, Section 14.1.1.3, p. 249.
[158] White Wolf GSP, Table SMC-4, p. 251, Figure SMC-4, p. 270.
[159] White Wolf GSP, Section 14.1.1.3, p. 249.
[160] https://water.ca.gov/Programs/Groundwater-Management/Drinking-Water-Well
[161] White Wolf GSP, Section 16, p. 264.

5. Evaluate whether GSP implementation is causing or exacerbating MT exceedance for water quality and/or interconnected surface water, and
6. Consider enforcement action.

The GSP sets the measurable objectives of chronic lowering of groundwater levels for the 14 representative monitoring wells based on the "current" period (i.e., Fall 2015 through 2019) ... [a]t each RMW-WL, the lower of either Fall 2015 or Fall 2019, measured when available or model-calculated when measured was unavailable, was set as the MO."[162]

The interim milestones for chronic lowering of groundwater levels are established such that:

- For wells where the "current" groundwater level trend is stable to increasing, the interim milestones are set "at values above the MO, the subsequent IMs are all equal to the MO. Furthermore, a "trigger threshold" has been established as the mid-point between the MO and MT. If groundwater levels in 40% or more of the RMW-WLs fall below the trigger threshold, the Groundwater Sustainability Agency (GSA) will consider whether additional groundwater management action is warranted."[163]
- For all other wells, the interim milestones are "defined based on a trajectory for groundwater levels informed by current groundwater levels, the MTs, and the MOs. This trajectory assumes a continuation of current groundwater level trends for the first 5-year period, a deviation (slowing) from that trend over the second 5-year period, a recovery to the 5-year IM in the third 5-year period, and recovery towards the MO over the fourth (last) 5-year period (Table SMC-7)."[164]

The measurable objectives and interim milestones for chronic lowering of groundwater levels are presented in Table SMC-4 and are displayed on Figure SMC-10.

Department staff conclude that the GSP's discussion of sustainable management criteria for groundwater levels, and "with consideration of groundwater levels and trends, well depths (i.e., in relation to impacts to groundwater pumpers as the primary beneficial user), and proximity to critical infrastructure (i.e., the California Aqueduct and the 850 Canal)"[165] to be a reasonable approach that will help avoid a significant and unreasonable depletion of supply in the Subbasin in the long-term. While staff have identified the proposed inclusion of spring measurements in the consideration of undesirable results to be flawed, this equates to a recommended corrective action and not a deficiency that precludes approval of the GSP. This approach should be amended and addressed by the next periodic evaluation of the GSP.

[162] White Wolf GSP, Section 15.1.2, p. 261.
[163] White Wolf GSP, Section 14.2.1, pp. 252-253.
[164] White Wolf GSP, Section 14.2.1, pp. 252-253.
[165] White Wolf GSP, Section 13.1.1, pp. 231-232.

4.3.2.2 Reduction of Groundwater Storage

In addition to components identified in 23 CCR §§ 354.28 (a-b), for the reduction of groundwater storage, the GSP Regulations require the minimum threshold for the reduction of groundwater storage to be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[166]

The GSP states that "[r]eduction of Groundwater Storage is directly correlated to Chronic Lowering of Groundwater Levels. Therefore, the potential causes of Undesirable Results due to Reduction of Groundwater Storage are generally the same as the potential causes listed above for Undesirable Results due to Chronic Lowering of Groundwater Levels (i.e., increased groundwater pumping and reduced recharge). Because of the direct correlation between groundwater elevation and groundwater storage volume, groundwater levels are used to measure conditions for this Sustainability Indicator."[167]

The GSP establishes sustainable management criteria for the reduction of groundwater storage indicator using groundwater levels as a proxy.[168] Therefore, undesirable results, minimum thresholds, and measurable objectives established for the chronic lowering of groundwater levels sustainability indicator apply to the reduction of groundwater sustainability indicator.[169]

The GSP provides a description of the potential causes of reduction of groundwater storage undesirable results and the possible effects on beneficial uses and users in the Basin. Based on review of the GSP, Department staff are aware of no significant inconsistencies or contrary information to what was presented in the GSP and therefore have no significant concerns regarding the decision to use sustainable management criteria for the chronic lowering of groundwater levels as a proxy for the groundwater storage sustainable management criteria.

Based on the information presented to support use of groundwater levels as a proxy for the reduction of groundwater storage sustainability indicator, Department staff conclude that the GSAs' rationale to use groundwater levels as a proxy for reduction of groundwater storage is reasonable.

4.3.2.3 Seawater Intrusion

In addition to components identified in 23 CCR §§ 354.28 (a-b), for seawater intrusion, the GSP Regulations require the minimum threshold for seawater intrusion to be defined

[166] 23 CCR § 354.28(c)(2).
[167] White Wolf GSP, Section 13.2.1, p. 234
[168] White Wolf GSP, Section 15.1.2, p. 252.
[169] White Wolf GSP, Section 14.2 p. 252; Section 13.2.3, p. 234; and Section 16.2, p. 262.

by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.[170]

The GSP states that the Subbasin "is not located near any saline water bodies, seawater intrusion is not present and not likely to occur. The Seawater Intrusion Sustainability Indicator is therefore not applicable to the Basin, and no URs for this Sustainability Indicator are defined [in the Plan]."[171]

As the Subbasin is located inland, away from the ocean, Department staff concur that sustainable management criteria for seawater intrusion is not applicable for the Subbasin.

4.3.2.4 Degraded Water Quality

In addition to components identified in 23 CCR §§ 354.28 (a-b), for degraded water quality, the GSP Regulations require the minimum threshold for degraded water quality to be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be 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. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.[172]

The GSP states that "[s]ignificant and unreasonable effects associated with Undesirable Results would include an increase, on a regional basis, in concentrations of identified constituents of concern above state and federal regulatory thresholds, as a result of SGMA-related groundwater level management activities."[173] Undesirable results for degraded water quality are quantitatively defined to occur "if and when MTs are exceeded for any of the identified constituents of concern in 25% or more of the RMW-WQs at least two (2) consecutive years as a result of SGMA-related groundwater management activities."[174] The GSP explains that the criteria selected to define undesirable results for degraded water quality are justified because 25% of representative monitoring wells exceeding minimum thresholds relates to a level of impact that corresponds to a regional water quality issue rather than a well-specific water quality issue. The GSP further explains that the requirement for minimum thresholds to be exceeded for two consecutive years before considering that undesirable results are occurring is to confirm that degraded water quality conditions persist.

The GSP describes groundwater conditions that would lead to undesirable results associated with degraded water quality, which include increases in concentrations of constituents of concern due to processes related to groundwater management activities

[170] 23 CCR § 354.28(c)(3).
[171] White Wolf GSP, Section 13.3, p. 235.
[172] 23 CCR § 354.28(c)(4).
[173] White Wolf GSP, Section 13.4, p. 235.
[174] White Wolf GSP, Section 13.4.2, p. 237.

and due to processes unrelated to groundwater management activities (such as deep percolation of precipitation; seepage from natural and man-made channel; irrigation system backflow into wells and flow through well gravel packs and screens from one formation to another; and deep percolation of irrigation water and other water applied for cultural practices like soil leaching, and recharge from septic system discharge).[175]

The GSP also describes potential effects of the undesirable results on beneficial uses and users of groundwater, which include "increased costs to treat groundwater to drinking water standards if it is to be used as a potable supply source; increased costs to blend relatively poor-quality groundwater with higher quality sources for drinking water users; and potential reduction in the usable volume of groundwater in the Basin if large areas are impaired to the point that they cannot be used to support beneficial uses and users."[176]

The GSP sets minimum thresholds for degraded water quality for three constituents of concern: arsenic, nitrate, and selenium at the representative monitoring wells designated for degraded water quality. The Plan states that the minimum thresholds are based on the maximum contaminant levels [MCLs], "as MCLs are appropriate to consider when establishing MTs for Degraded Water Quality, as this approach meets the requirement to consider the beneficial uses and users of groundwater."[177] The minimum thresholds for arsenic, nitrate, and selenium are set at their respective primary MCLs (i.e.,10 micrograms per liter [μg/L], 10 milligrams per liter [mg/L] and 0.05 mg/L, respectively).[178]

Measurable objectives for degraded water quality are set at 75% of the MCL for the three constituents of concern (7.5 μg/L for arsenic, 7.5 mg/L for nitrate, and 0.375 mg/L for selenium).[179,180]

In lieu of setting interim milestones for degraded water quality, the GSP sets trigger thresholds because concentrations of constituents of concern in the Subbasin are mostly below measurable objectives. According to the GSP, the trigger thresholds are set such that if the concentration of a constituent of concern reaches 50% of its MCL, the GSA will consider additional action if warranted. The GSP presents in Table SMC-6 of the GSP, the trigger thresholds for arsenic, nitrate, and selenium, as 5 ug/L, 5 mg/L, and 0.005 mg/L, respectively.[181] Department staff note that the GSP does not elaborate on the additional action that the GSA will consider if concentrations of constituents of concern reach their trigger thresholds. Staff recommend the GSA explain why the tabulated trigger threshold values are higher than 50% of their respective MCLs or provide the correct values if the current tabulated values are typographical errors. In addition, staff

[175] White Wolf GSP, Section 13.4.1, p. 236.
[176] White Wolf GSP, Section 13.4.3, p. 237.
[177] White Wolf GSP, Section 14.4.1.2, p. 255.
[178] White Wolf GSP, Section 14.4.1.2, p. 255.
[179] White Wolf GSP, Section 14.4, pp 253-256.
[180] White Wolf GSP, Table SMC-5, p. 256.
[181] White Wolf GSP, Section 15.4, pp. 262-263 and Table SMC-6, p. 256.

recommend the GSA elaborate on the additional action that will be considered if concentrations of constituents of concern reach their trigger thresholds.

Based on review of the Plan's discussion of the established sustainable management criteria for degradation of water quality, overall, Department staff conclude that the Plan substantially covers the specific items listed in the GSP regulations in an understandable format and uses the best available information and science.

4.3.2.5 Land Subsidence

In addition to components identified in 23 CCR §§ 354.28 (a-b), the GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.[182] Minimum thresholds for land subsidence shall be supported by identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for establishing minimum thresholds in light of those effects and maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum thresholds and measurable objectives.[183]

The GSP states that undesirable results for land subsidence due to groundwater level declines would be experienced in the Subbasin when it negatively affects the ability to use existing critical infrastructure with the Subbasin.[184] Significant and unreasonable land subsidence conditions as described in the GSP "include subsidence-related damage to critical water conveyance infrastructure (i.e., the California Aqueduct and the 850 Canal), resulting in a loss of functional capacity of the infrastructure that prevents conveyance of available volumes of water that could otherwise be conveyed if the subsidence had not occurred."[185]

The GSP identifies increased pumping and/or reduced groundwater recharge which result in depressurization of aquifers and aquitards and cause compaction of compressible strata and vertical displacement of the ground surface, as conditions that could lead to undesirable results associated with land subsistence. [186]

Potential effects of land subsidence as described in the GSP include damage to the Subbasin's critical infrastructure "including gravity-driven water conveyance infrastructure (i.e., the California Aqueduct and the 850 Canal), gas and petroleum pipelines, municipal

[182] 23 CCR § 354.28(c)(5).
[183] 23 CCR §§ 354.28(c)(5)(A-B).
[184] White Wolf GSP, Section 13.5, p. 238.
[185] White Wolf GSP, Section 13.5, p. 238.
[186] White Wolf GSP, Section 13.5.1, p. 238.

water lines, etc. Potential effects could also include damage to other non-critical infrastructure such as groundwater well heads, discharges, and casings."[187]

The GSA provides an "extrapolation of the average rate of subsidence at locations along the California Aqueduct between 2016 and 2019 (i.e., approximately 0.2 inches per year)."[188] The Plan then states that "if the rate were allowed to continue for ten (10) years (i.e., the maximum time allowable for continuation of declining groundwater level trends by the established Chronic Lowering of Groundwater Level MTs), additional subsidence would amount to only approximately two (2) inches, which is very unlikely to negatively affect the ability to use existing critical infrastructure within the [Subbasin]."[189] Therefore, the GSP does not define minimum thresholds and measurable objectives for land subsidence and states that the groundwater level minimum thresholds are expected to prevent significant and unreasonable effects from land subsidence in the Subbasin.[190]

While there is generally a correlation between chronic lowering of groundwater levels and land subsidence, the relationship between the two sustainability indicators may not exactly or necessarily be linear at every point in the Subbasin due to influences of other factors such as soil structure. Because of the limited number of global positioning system monitoring stations within the Subbasin, limited InSAR-based subsidence data, and minimum thresholds for chronic lowering of groundwater levels being established at or lower than historical lows for the Subbasin, Department staff conclude that the GSA has not demonstrated with sufficient evidence that chronic lowering of groundwater levels is a reasonable proxy for land subsidence in the Subbasin and that use of groundwater level as a proxy for land subsidence is inappropriate because of the GSA's plan to allow continued lowering of groundwater levels. Therefore, Department staff recommend the GSA establish sustainable management criteria for land subsidence based on direct measurements of land elevation changes to assess and confirm that no significant and unreasonable land subsidence is occurring (see Recommended Corrective Action 3).

Despite the identified recommended corrective action, the GSP's discussion of land subsidence is comprehensive and includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. While Department staff have recommended the GSA to remove the use of groundwater levels as a proxy for land subsidence, this does not preclude the Plan for approval at this time, given that the Subbasin does not appear to have significant current or historical land subsidence. Department staff are aware of no significant inconsistencies or contrary information to that presented in the GSP and, therefore, have no significant concerns regarding the discussion of this subject in the Plan.

[187] White Wolf GSP, Section 13.5.3, p. 239.
[188] White Wolf GSP, Section 13.5.2, p. 238.
[189] White Wolf GSP, Section 13.5.2, p. 238.
[190] White Wolf GSP, Section 13.5.2, pp. 238-239.

4.3.2.6 Depletions of Interconnected Surface Water

SGMA defines undesirable results for the depletion of interconnected surface water as those that have significant and unreasonable adverse impacts on beneficial uses of surface water and are caused by groundwater conditions occurring throughout the basin.[191] The GSP Regulations require that a Plan identify the presence of interconnected surface water systems in the basin and estimate the quantity and timing of depletions of those systems.[192] The GSP Regulations further require that minimum thresholds be set based on the rate or volume of surface water depletions caused by groundwater use, supported by information including the location, quantity, and timing of depletions, that adversely impact beneficial uses of the surface water and may lead to undesirable results.[193]

The Plan states that "there is no interconnected surface water throughout the main portion of the [Subbasin] due to the deep groundwater levels in the Principal Aquifer, typically dry streams, and no beneficial uses of surface water. However, around the periphery of the Subbasin there are beneficial uses of surface water in the form of diversions for irrigated agriculture, as well as some locations where the presence of GDEs has been confirmed."[194] The Plan then states that despite the uncertainty, the GSA established minimum thresholds for interconnected surface water at three newly installed shallow monitoring wells located upgradient of the Spring Fault; these three monitoring wells are identified as representative monitoring wells for depletion of interconnected surface water. The minimum thresholds are presented in Table SMC-6.[195]

The measurable objectives and interim milestones for interconnected surface water are presented in Table SMC-6. The Plan states that "[w]ithout historical water level data to rely on, establishing MOs for Depletions of Interconnected Surface Water is similarly challenging. The preliminary MOs have been calculated as the projected depth to groundwater at the end of October 2021 based on trends observed during June 2021."[196] The further explains that the "preliminary MO values will be reevaluated, updated, and revised as appropriate upon review and analysis of data from the three RMW-ISWs to be collected over the first five years of Groundwater Sustainability Plan (GSP) implementation."[197]

Department staff note the GSA identifies this as a data gap and Department staff recommend that more surface water and groundwater elevation data be collected where surface water might have interconnections with groundwater to identify segments of interconnectivity. In the next periodic update to the Plan, the GSA should provide an

[191] Water Code § 10721(x)(6).
[192] 23 CCR § 354.16 (f).
[193] 23 CCR § 354.28 (c)(6).
[194] White Wolf GSP, Section 14.6, p. 258.
[195] White Wolf GSP, Table SMC-6, p. 259.
[196] White Wolf GSP, Table SMC-6, p. 259.
[197] White Wolf GSP, Table SMC-6, p. 259.

update on whether interconnected surface water exists in the Plan area. If it is determined that interconnected surface water is present, the GSA should provide an estimate of the quantity and timing of depletions of those interconnected surface water systems and establish a monitoring network and sustainable management criteria for this sustainability indicator.

4.4 MONITORING NETWORK

The GSP Regulations describe the monitoring network that must be developed for each sustainability indicator including monitoring objectives, monitoring protocols, and data reporting requirements. Collecting monitoring data of a sufficient quality and quantity is necessary for the successful implementation of a groundwater sustainability plan. The GSP Regulations require a monitoring network of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.[198] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[199] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[200] capture seasonal low and high conditions,[201] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[202] Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,[203] fill data gaps identified in the GSP prior to the first periodic evaluation,[204] update monitoring network information as needed, follow monitoring best management practices,[205] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Department staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The GSP describes monitoring networks for the five sustainability indicators relevant to the Subbasin: chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, land subsidence, and depletions of interconnected surface water.

As stated in the GSP, the objective of the Subbasin's monitoring network is to monitor short-term, seasonal, and long-term trends in groundwater and related surface water conditions; monitor changes in groundwater conditions relative to measurable objectives

[198] 23 CCR § 354.32.
[199] 23 CCR § 354.34(b)(2).
[200] 23 CCR § 354.34(b)(3).
[201] 23 CCR § 354.34(c)(1)(B).
[202] 23 CCR §§ 354.34(g-h).
[203] 23 CCR § 352.4 *et seq*.
[204] 23 CCR § 354.38(d).
[205] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.

and minimum thresholds; monitor impacts to beneficial uses or users of groundwater; and quantify annual changes in water budget components.[206]

For the Principal Aquifer, the GSP proposes a groundwater level monitoring network of 14 Representative Monitoring wells and one supplemental monitoring well, all screened within the principal aquifer.[207] The GSP calculates the minimum number of wells needed for the Subbasin area as per the Department's Best Management Practice[208] (7 wells) and concludes that the number of wells selected for the groundwater level monitoring network (15 wells) is adequate.[209] The GSP does not describe any process for determining if the spatial distribution of the monitoring wells is sufficient for the Subbasin. Department staff note an area of agricultural land in the eastern portion of the Subbasin that does not have any wells currently monitored for groundwater levels.[210] The GSP proposes a semiannual (Spring and Fall) groundwater elevation monitoring schedule, with Spring measurements taken January-March and Fall measurements taken September-November, intended to capture seasonal high and low groundwater elevations, respectively.[211] The Plan makes no mention of RMS wells being screened across multiple aquifer zones.

The GSA plans to use the monitoring network established for the chronic lowering of groundwater levels sustainability indicator to monitor and evaluate reduction of groundwater storage.[212]

The GSP proposes to monitor four public water system (PWS) wells within the Subbasin for degraded water quality sustainability indicators, and designates these wells as the representative monitoring wells, designated RMW-WQ PWS.[213] These are supplemented with eight additional wells already sampled for water quality by the WRMWSD, TCWD, AEWSD, and the Irrigated Lands Regulatory Program (ILRP), designated MW-WQ[214].

The GSP proposes to obtain analytical results for Title 22 constituents for the RMW-WQ PWS wells from the Safe Drinking Water Informational System (SDWIS) Drinking Water Watch website annually, and to sample these wells directly for any other constituents deemed significant. The MW-WQ wells will be sampled annually for potential constituents of concern. For wells with ILRP data available, the data will also be obtained annually from the GeoTracker® website.[215]

[206] White Wolf GSP, Section 17.1, p. 281.
[207] White Wolf GSP, Table MN-2, pp. 286-287.
[208] California Department of Water Resources, Best Management Practice for the Sustainable Management of Groundwater Monitoring Networks and Identification of Data Gaps BMP, dated December 2016, p. 34.
[209] White Wolf GSP, Section 17.1.1.1, pp. 284-285.
[210] White Wolf GSP, Figure MN-1, p. 313.
[211] White Wolf GSP 17.1.1.2, p. 285.
[212] White Wolf GSP, Section 17.1.2., p. 285.
[213] White Wolf GSP, Section 17.1.4, p. 288.
[214] White Wolf GSP, Section 17.1.4, p. 289.
[215] White Wolf GSP, Section 17.1.4.2, pp. 290-291.

The GSP identifies the following constituents as potentially of concern:

- Arsenic
- Nitrate as nitrogen
- Selenium
- TDS
- Boron
- Sodium
- Sulfate
- 1,2,3-Trichloropropane (1,2,3-TCP)

In addition to the above constituents, annual MW-WQ samples will also be analyzed for major ions.[216] The GSP has designated two groundwater level monitoring wells as groundwater quality monitoring wells, which will be used to detect any correlated trend between groundwater levels and groundwater quality that may affect SMCs[217].

The GSP proposes to use measurements from five wells from the groundwater level monitoring network as a proxy for the land subsidence monitoring network stating that changes in land subsidence are directly dependent on changes in groundwater levels. In addition, the GSP proposes to incorporate data from 34 checkpoints along the California Aqueduct collected by the Department, two UNAVCO GPS subsidence monitoring stations, and two checkpoints at WRMWSD stations monitored by White Wolf GSA. These subsidence monitoring points are concentrated entirely in the central and southern portions of the GSA, with no subsidence sustainability criteria monitoring proposed in the northern and northeastern portions of the GSA.[218] The GSP states that the Department checkpoint data will be obtained annually, but does not specify what time of year the data will be used from.[219] Department staff recommend the GSA to expand the land subsidence monitoring network to include additional locations to provide sufficient coverage of the Subbasin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Subbasin (see Recommended Corrective Action 4).

The GSP proposes to establish a dedicated depletions of interconnected surface water monitoring network. The GSA installed three representative monitoring wells to monitor depletion of interconnected surface water sustainability indicators in 2021, designated as RMW-ISW. These wells are screened in shallow alluvium less than 50 feet bgs upgradient of the Springs Fault[220]. In addition to these wells, the GSP proposes to monitor four stream gauges, two artesian spring observation points, and two domestic wells,

[216] White Wolf GSP 17.1.4.2, pp. 290-291.
[217] White Wolf GSP 17.1.4, p. 290.
[218] White Wolf GSP 17.1.5, p. 294.
[219] White Wolf GSP 17.1.5.2, p. 295.
White Wolf GSP, Section 17.1.6, pp. 298-299.

designated MW-WL[221]. The GSP states that the RMW-ISW wells will be instrumented to record monthly groundwater elevation changes, while the MW-WL wells will be measured semiannually, with a Spring measurement from January-March and a Fall measurement from September-November. Observation points will be visited semiannually and recorded as flowing or not flowing; the GSP does not specify when the semiannual visits will take place[222].

While a recommended corrective action is identified, the description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the Plan describes in sufficient detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Subbasin and evaluate changing conditions that occur through Plan implementation. The monitoring network appears to be supported by the best available information and data and is designed to ensure adequate coverage of sustainability indicators. The Plan also describes existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network. Department staff will evaluate the GSA's progress of filling data gaps through review of Annual Reports and Periodic Evaluations of the GSP.

4.5 Projects and Management Actions

The GSP Regulations require a description of the projects and management actions the submitting Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[223] Each Plan's description of projects and management actions must include details such as: how projects and management actions in the GSP will achieve sustainability, the implementation process and expected benefits, and prioritization and criteria used to initiate projects and management actions. [224]

The GSP states that "the Basin shows a net storage surplus over the historical period (i.e., Water Year [WY] 1995-2014), however the Basin has a storage deficit under current conditions (WY 2015-2019). Future projections without P/MAs show groundwater levels and storage changes continue to steadily decrease over the 50-year implementation horizon." [225] Therefore the "GSA anticipates that implementation of P/MAs will be necessary to ensure sustainability of the Basin under the uncertainty of future climate and land use conditions."[226] According to the GSA, the P/MAs presented in the Plan "were designed to meet the projected deficits under the 2030 Climate Change Scenario, as there is much greater uncertainty when projecting 2070 conditions. The GSA plans to

[221] White Wolf GSP, Section 17.1.6, p. 300.
[222] White Wolf GSP, Section 17.1.6.2, p. 300.
[223] 23 CCR § 354.44 (a).
[224] 23 CCR § 354.44 (b) *et seq.*
[225] White Wolf GSP, Section 18.5, p. 336.
[226] White Wolf GSP, Section 18.3, p. 335.

implement the P/MAs, as needed, to achieve the Basin Sustainability Goal in even under projected climate change conditions."[227]

The GSP proposes 24 projects and management actions "to support achievement of the Sustainability Goal within the White Wolf Subbasin."[228] The Plans states that the P/MAs were developed "using a portfolio approach whereby individual P/MAs were identified and grouped into categories based on their expected benefits… [t]his approach allows for the flexible implementation of P/MAs as needed to address future conditions throughout the 50-year GSP planning and implementation horizon (i.e., out to 2072)."[229]

The Plan states that "[t]o the extent that information was available, the P/MAs presented herein were developed with consideration of costs, benefits, and feasibility; however, each P/MA will require significant further evaluation (i.e., engineering, economic, environmental, legal, etc.) as part of implementation."[230] The Plan presents a list of the P/MAs grouped by benefit category in Table PMA-1 (detailed P/MA Information Forms are included in Appendix N).[231]

The GSA identified Chronic Lowering of Groundwater Levels as the relevant sustainability indicator to address existing or potential future Undesirable Results in the Subbasin. "Accordingly, the P/MAs are currently directed towards avoiding projected Undesirable Results from the Chronic Lowering of Groundwater Levels" therefore the P/MAs proposed in the Plan "pertain to management of water inflows (supplies) and outflows on (demands)."[232]

The proposed P/MAs are expected to benefit the Subbasin primarily though water supply augmentation and water demand reduction. Additionally, the P/MAs have secondary benefits, such as flood control, water management flexibility/efficiency, environmental benefits, and data gap filling.

The Plan adequately describes proposed projects and management actions in a manner that is generally consistent and substantially complies with the GSP Regulations. The projects and management actions are directly related to the sustainable management criteria and present a generally feasible approach to achieving the sustainability goal of the Basin.

4.6 Consideration of Adjacent Basins/Subbasins

SGMA requires the Department to "…evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent

[227] White Wolf GSP, Section 18.5, p. 336
[228] White Wolf GSP, Section 18, p. 317.
[229] White Wolf GSP, Section 18, p. 317.
[230] White Wolf GSP, Section 18, p. 317.
[231] White Wolf GSP, Table PMA-1, pp. 327-334.
[232] White Wolf GSP, Section 18.1.1, p. 318.

basin."[233] Furthermore, the GSP Regulations state that minimum thresholds defined in each GSP be designed to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.[234]

The White Wolf Subbasin has one has adjacent subbasin: the Kern County Subbasin. The Plan includes an analysis of potential impacts to adjacent basins with the defined minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan.

Department staff will continue to review periodic updates to the Plan to assess whether implementation of the White Wolf Subbasin GSP is potentially impacting adjacent basins.

4.7 Consideration of Climate Change and Future Conditions

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.[235]

Since the GSP was adopted and submitted, climate change conditions have advanced faster and more dramatically. It is anticipated that the hotter, drier conditions will result in a loss of 10% of California's water supply. As California adapts to a hotter, drier climate, GSAs should be preparing for these changing conditions as they work to sustainably manage groundwater within their jurisdictional areas. Specifically, the Department encourages GSAs to:

1. Explore how their proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the basin based on current and future drought conditions.
2. Explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the basin given increasing aridification and effects of climate change, such as prolonged drought.
3. Take into consideration changes to surface water reliability and that impact on groundwater conditions.
4. Evaluate updated watershed studies that may modify assumed frequency and magnitude of recharge projects, if applicable, and
5. Continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces to evaluate how their Plan's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the basin.

[233] Water Code § 10733(c).
[234] 23 CCR § 354.28(b)(3).
[235] 23 CCR § 354.18.

5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. White Wolf Subbasin GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the GSP will likely achieve the sustainability goal for the White Wolf Subbasin. The GSA has identified several areas for improvement of its Plan and Department staff concur that those items are important and should be addressed as soon as possible. Department staff have also identified additional recommended corrective actions that should be considered by the GSA for the first periodic assessment of the GSP. Addressing these recommended corrective actions will be important to demonstrate that implementation of the Plan is likely to achieve the sustainability goal.

The recommended corrective actions include:

RECOMMENDED CORRECTIVE ACTION 1

Develop and incorporate a projected water budget for the surface water system as required by the GSP Regulations.[236]

RECOMMENDED CORRECTIVE ACTION 2

Revise the sustainable management criteria to be based on seasonal low groundwater levels to ensure potential impacts to beneficial uses and users are considered.

RECOMMENDED CORRECTIVE ACTION 3

Establish sustainable management criteria for land subsidence based on direct measurements of land elevation changes to assess and confirm that no significant and unreasonable land subsidence is occurring.

RECOMMENDED CORRECTIVE ACTION 4

Expand the land subsidence monitoring network to provide sufficient coverage of the Subbasin. The GSA may consider the use of additional GPS stations, extensometers, or publicly available remote sensing data (e.g., InSAR) to expand the land subsidence monitoring network in the Subbasin.

[236] 23 CCR § 354.18 (c)(3)(C).