CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

April 27, 2023

Piret Harmon
Santa Margarita Groundwater Agency GSA
2 Civic Center Drive
Scotts Valley, CA 95066
pharmon@svwd.org

RE: Approved Determination of the 2022 Groundwater Sustainability Plan Submitted for the Santa Margarita Basin

Dear Piret Harmon,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Santa Margarita Basin 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 Santa Margarita Basin 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 five-year review of the Santa Margarita Basin GSP no later than January 03, 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 Santa Margarita Basin Groundwater Sustainability Plan

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE SANTA MARGARITA BASIN 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 Santa Margarita Groundwater Agency (GSA or Agency) for the Santa Margarita Basin (No. 3-027).

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 Santa Margarita Basin. (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 Santa Margarita Basin 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 of a Plan's status 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 Santa Margarita Basin under review.

C. In making these findings and Plan determination, the Department also recognized that: (1) it 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 Basin (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 Santa Margarita Basin. 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 and goal to maintain groundwater levels at or above historical low conditions are sufficiently justified and explained. 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 Santa Margarita 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, expanding the monitoring network to improve basin characterization, updating the integrated hydrologic model with new collected data, and increasing understanding of surface water and groundwater interaction, with respect to interconnected surface water depletion, groundwater dependent ecosystems, and the water budget. Filling those known data gaps, and others described in the Plan, should lead to refinement of the GSA's monitoring networks and sustainable management criteria and help inform and guide future adaptive management strategies. (23 CCR § 355.4(b)(2).)

3. The projects and management actions proposed are designed to help achieve the sustainable management goals in the Basin and avoid undesirable results. Projects and management actions are largely focused on expanding the existing conjunctive use programs by adding surface water and recycled water, and monitoring network, addressing the overdraft of the Basin. The projects and management actions are reasonable and commensurate with the level of understanding of the Santa Margarita Basin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Santa Margarita Basin'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 Santa Margarita Basin were considered in developing the sustainable management criteria and how those interests, including urban, rural, industrial, agricultural, and ecological land uses and users, 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 appear likely to prevent undesirable results and ensure that the Santa Margarita Basin 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 basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. The Plan states that the nature of the geologic formations form barriers to maintain hydraulic disconnect with the adjacent basins and therefore, no impacts are expected to neighboring basins at the Plan's proposed minimum thresholds. (23 CCR § 355.4(b)(7).)

8. If required, a satisfactory coordination agreement has been adopted by all relevant parties. (23 CCR § 355.4(b)(8).)

9. The GSA's three member agencies, Scotts Valley Water District, San Lorenzo Valley Water District, and the County of Santa Cruz have historically implemented several projects and management actions including water use efficiency projects, and conjunctive use programs to address problematic groundwater conditions in the Basin. The GSA's member agencies and their history of groundwater management provide a reasonable level of confidence 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 may have been 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 Plan sets minimum thresholds for chronic lowering of groundwater levels at or near historical low conditions. The Plan states that municipal, industrial, and domestic water users of the Basin have adjusted to the lowered groundwater levels during past droughts; therefore, maintaining groundwater levels at or above historic low groundwater levels should not

have adverse impacts to human groundwater beneficial users (Santa Margarita GSP pp. 335-336). The Plan's compliance with the requirements of SGMA and substantial compliance with the GSP Regulations supports the state policy regarding the human right to water (Water Code § 106.3). The Department developed its GSP Regulations consistent with, and intending to further, the 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. (23 CCR § 350.4(g).)

2. The Plan acknowledges and identifies interconnected surface waters within the Basin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve understanding and management of depletions of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water and groundwater dependent ecosystems 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 the initial sustainable management criteria as more information and improved methodologies become available.

3. 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 Santa Margarita Basin 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 five-year review, which is set to begin on January 3, 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: April 27, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Santa Margarita Basin

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

Groundwater Basin Name:	Santa Margarita Basin (No. 3-027)
Submitting Agency:	Santa Margarita Groundwater Agency
Submittal Type:	Initial GSP Submission
Submittal Date:	January 03, 2022
Recommendation:	Approved
Date:	April 27, 2023

The Santa Margarita Groundwater Agency (GSA or Agency) submitted the Santa Margarita Groundwater Agency Groundwater Sustainability Plan (GSP or Plan) for the Santa Margarita Basin (Basin) 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 Basin 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 Basin 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 Basin.[3] Department staff will continue to monitor and evaluate the Basin'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:** 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 Santa Margarita Groundwater Agency GSP. The GSA has identified areas for improvement of its Plan such as inadequate data to evaluate the historical conditions of interconnected surface water with groundwater and impacts of historical chronic lowering of groundwater levels on environmental groundwater users. The Agency proposes to construct monitoring wells by 2022 to obtain the data necessary to evaluate the hydraulic interconnection of surface water and groundwater. The GSP acknowledges the lack of adequate data and addresses to fill the data gaps by identifying and monitoring sites representative of environmental groundwater users such as Groundwater Dependent Ecosystems (GDE). 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) Investigate beneficial uses and users and fill data gaps for the Monterey Formation.
(2) Revise the definition of undesirable results for chronic lowering of groundwater levels, degraded water quality, and depletions on interconnected surface water.
(3) Continue to fill data gaps, collect additional monitoring data, coordinate 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.

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 Santa Margarita Basin.[5] To achieve the sustainability goal for the Basin, 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 GSA.[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 basin, 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 five-year 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, GSA has 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 its Plan on January 03, 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 Basin. 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 January 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 Santa Margarita Basin and the jurisdictional boundary of the submitting GSA fully contains the Basin.[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 Basin 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 Scotts Valley Water District, the San Lorenzo Valley Water District, and the County of Santa Cruz entered into a joint exercise of powers agreement (JPA) to form the GSA.

[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/74.
[33] Water Code § 10727(b); 23 CCR § 355.4(a)(3).
[34] Santa Margarita GSP, Section 2.1.1.1, p.48.
[35] 23 CCR § 354.6 *et seq*.
[36] 23 CCR § 354.8 *et seq*.
[37] 23 CCR § 354.6(e).

The JPA[38], adopted on June 1, 2017, details the management structure of the GSA and the specific duties, powers, and responsibilities of the GSA. The GSA is the sole Groundwater Sustainability Agency for the Basin and submitted the GSP. The GSP includes a communication and engagement plan,[39] an explanation of the GSA's decision-making process,[40] opportunities for public engagement and a table of their outreach activities,[41] and a discussion of how public input and response will be used.[42] The Basin boundary, GSA boundary and adjacent basins are shown below in Figure 1.

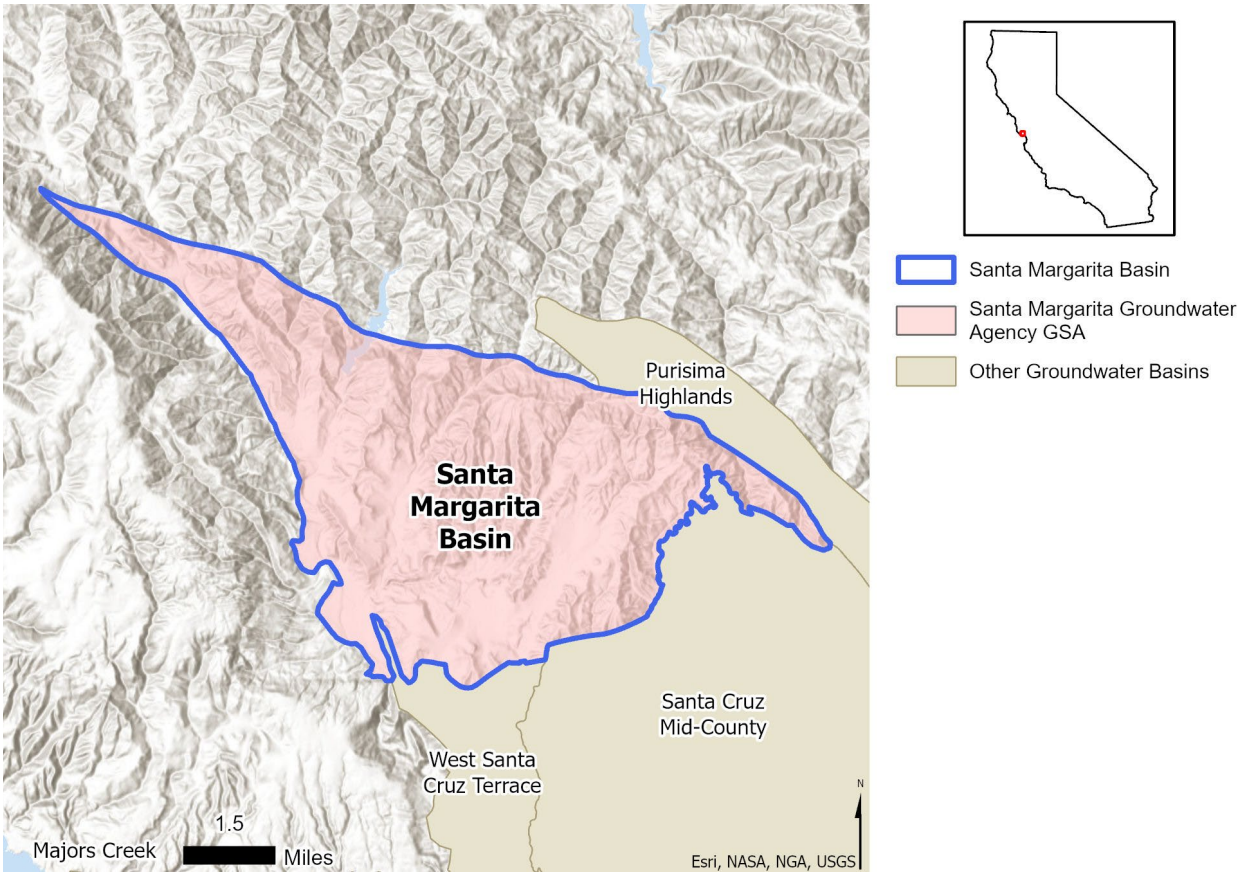

Figure 1: Santa Margarita Basin Location Map.

The Plan area of the Santa Margarita GSP includes the entire Basin, is located completely in Santa Cruz County, and is 34.8 square miles.[43] The GSP describes the Basin "extends from Scotts Valley in the east, to Boulder Creek in the northwest, to Felton in the southwest."[44] The basin is bordered by three adjacent groundwater basins the Purisima Highlands Subbasin of the Corralitos Basin, Santa Cruz Mid-County Basin, and West

[38] Santa Margarita GSP, Appendix 1B, pp. 452-469.
[39] Santa Margarita GSP, Appendix 2A, pp. 475-515.
[40] Santa Margarita GSP, Section 2.1.4.1.1, pp. 91-93.
[41] Santa Margarita GSP, Appendix 2A, pp. 475-515.
[42] Santa Margarita GSP, Section 2.1.4.1.2, p.93.
[43] Santa Margarita GSP, Section 2.1.1.1, p.48.
[44] Santa Margarita GSP, Executive Summary, p. 22.

Santa Cruz Terrace Basin.[45] Communities in the Basin include the City of Scotts Valley, and the communities of Ben Lomond, Boulder Creek, Brookdale, Felton, Lompico, Mount Hermon, and Zayante.[46] The GSP states there are no adjudicated areas within the basin.[47] The GSP describes jurisdictional areas of the basin to include the County of Santa Cruz, the San Lorenzo Valley Water District, the Scotts Valley Water District, the Soquel Creek Water District, the City of Scotts Valley, California State-managed Henry Cowell State Park, and the GSP reports that while portions of the Loch Lomond Recreation Area and Quail Hollow County Park are shown as state lands, they are managed by the City of Santa Cruz and County of Santa Cruz respectively.[48]

The GSP identifies beneficial uses and users of groundwater in the Basin. The GSP identifies municipal water agencies, the Mount Hermon Association, small water systems, private domestic pumpers disadvantaged communities, agricultural users, and industrial users as beneficial users in the Basin. The City of Santa Cruz and its customers are also listed by the GSP as indirect users of groundwater in the Basin "because the surface water it diverts from the San Lorenzo River for municipal use partially comprises baseflows supported by Basin groundwater discharge to creeks," and the city owns property partially located in the basin "associated with water supply use and construction of the Loch Lomond Reservoir."[49] The most common land uses in the Basin are open space (45.5%), rural residential (25.9 %), and suburban residential (13.2%). Agriculture is the least common land use accounting for only 18 total acres (0.1% of the basin area).[50]

The GSP provides descriptions and summaries of the costs and assumptions of the main GSP components for the initial five years of Plan implementation; the estimated average yearly expenses for the initial five years are $393,580.[51] The GSP explains that funding for GSP implementation is expected to come from state grants, financing, project beneficiaries and partners, and fees collected from all groundwater pumpers.[52]

The Plan describes in some detail the GSA's authority to manage groundwater in the Basin, which was generally presented in an understandable format using appropriate data. Department staff did not note any significant inconsistencies or contradicting information and consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations. The Plan contains sufficient detail regarding the beneficial uses and users of groundwater, water use types, existing water monitoring and resource programs, and types and distribution of land use and land use plans for the Basin. The Agency provides a list of public meetings, materials, and notifications on its

[45] Santa Margarita GSP, Figure 2-1, p. 49.
[46] Santa Margarita GSP, Section 2.1.1.1, p. 48.
[47] Santa Margarita GSP, Section 2.1.1.2, p. 48.
[48] Santa Margarita GSP, Section 2.1.1.4, pp. 50-54.
[49] Santa Margarita GSP, Section 2.1.4.2.1, p. 95.
[50] Santa Margarita GSP, Table 2-1, p.56.
[51] Santa Margarita GSP, Section 1.3.4, p.44.
[52] Santa Margarita GSP, Section 1.3.4, p.45.

website, and lists of meeting and public comments and how they were addressed by the GSA are included in the appendices of the GSP.

The GSP's discussion and presentation of administrative information covers the specific items listed in the GSP Regulations in an understandable format using appropriate data. Department staff are aware of no significant inconsistencies or contrary information presented in the GSP and therefore have no significant concerns regarding the quality, data, and discussion of this subject in the GSP. The administrative information included in the Plan 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 the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[53]

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.[54] The GSP Regulations require a descriptive hydrogeologic conceptual model that includes a written description of geologic conditions, supported by cross sections and maps,[55] and includes a description of basin boundaries and the bottom of the basin,[56] principal aquifers and aquitards,[57] and data gaps.[58]

The Plan provides a comprehensive description of the hydrogeologic conceptual model that provides details based on the available information to describe the groundwater systems in the Basin. The Plan describes the Basin as roughly triangular-shaped and bounded to the north by the active right-lateral Zayante-Vergeles Fault. The Ben Lomond Fault, a steep and inactive reverse fault, forms the western boundary of the Basin by juxtaposing aquicludes against aquifers.[59] The east side of the Basin is bounded by a granitic high which separates the Basin from the Santa Cruz Mid-County Basin,

[53] 23 CCR § 354.12.
[54] 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.
[55] 23 CCR §§ 354.14 (a), 354.14 (c).
[56] 23 CCR §§ 354.14 (b)(2-3).
[57] 23 CCR § 354.14 (b)(4) *et seq.*
[58] 23 CCR § 354.14 (b)(5).
[59] Santa Margarita GSP, Section 2.2.4.3.3, p. 123.

represented on cross sectionals.[60] The Plan describes the dominant geologic feature defining the Basin as the northwest trending Scotts Valley syncline which roughly bisects the Basin with the axis of the syncline indicated in the Plan's geologic map.[61]

The GSP contains four cross-sections that illustrate the Basin's stratigraphy and geologic structures.[62] The following stratigraphic units are found in the Basin as described in the Plan, from youngest to oldest: alluvium and terrace deposits, Purisima Formation, Santa Cruz Mudstone, Santa Margarita Sandstone, Monterey Formation, Lompico Sandstone, Butano Sandstone, Locatelli Formation, and crystalline basement. The Plan shows the stratigraphic column for the Basin.[63]

The Santa Margarita, Lompico, and Butano Sandstones, are identified in the Plan as the principal aquifers utilized by the municipal water suppliers in the Basin.[64] The Plan states the Monterey Formation is not a principal aquifer, but it is identified as being utilized by private wells.[65]

The Santa Margarita Aquifer is identified in the Plan as the shallowest aquifer in the Basin. The unconfined aquifer has widespread surface exposure in the southern and central portions of the Basin. The Plan provides an estimated hydraulic conductivity range from two to more than 100 feet/day, specific yield ranges from 0.02 to 0.25, and transmissivity ranges from 430 to 7,700 feet^2/day.[66]

The Butano Aquifer is identified in the Plan as the deepest aquifer in the Basin; its primary recharge is by direct infiltration of precipitation and streamflow in the northern and northeastern portion of the basin where the Butano Sandstone is exposed at the surface. The Plan indicates that groundwater elevations recover more quickly in the Butano Aquifer than in the Lompico Aquifer, due to less pumping occurring in the Butano Aquifer, and larger surface exposures for recharge.[67] The Butano Aquifer is comprised of three members: upper, middle, and lower. The middle member is more fine-grained and contains pyrite, making it unsuitable as an aquifer, but the upper and lower sandstone units are identified in the Plan as important aquifers for the Basin.[68] The Plan states that, for the Butano Aquifer, hydraulic conductivity is between 0.1 to 6 feet per day and storativity is between 0.000001 to 0.0007.[69]

The underlying Monterey Formation is identified in the Plan as an aquitard. It underlies the Santa Margarita Aquifer in all areas in the basin except in the Pasatiempo and Camp

[60] Santa Margarita GSP, Section 2.2.4.3.3, p. 123.
[61] Santa Margarita GSP, Figure 2-16, p. 114.
[62] Santa Margarita GSP, section 2.2.4.3.3, pp. 125-128.
[63] Santa Margarita GSP, Figure 2-17, p. 116.
[64] Santa Margarita GSP, Section 2.2.4.4, p. 129.
[65] Santa Margarita GSP, Section 2.2.4.2.5, p. 119.
[66] Santa Margarita GSP, Section 2.2.4.4.1, p. 130.
[67] Santa Margarita GSP, Section 2.2.4.4.3, p. 132.
[68] Santa Margarita GSP, Section 2.2.4.4.3, p. 131.
[69] Santa Margarita GSP, Table 2-14, p. 130.

Evers areas creating a direct hydrologic connection between the Santa Margarita Aquifer and Lompico Aquifer.

The GSP states that the Monterey Formation is not a principal aquifer because of its limited use. The Plan states that the Monterey Formation is mostly comprised of organic mudstone and shale; it is designated as an aquitard that separates the overlying Santa Margarita Aquifer from the underlying Lompico Aquifer across most of the basin. The Plan states that, for the Monterey Formation, hydraulic conductivity is between 0.5 to 7 feet per day and storativity is between 0.00001 to 0.001.[70] The Monterey Formation is largely present across the basin and many domestic wells utilize groundwater that is found in sandy intervals located near the base of the formation.[71] The GSP states the Monterey Formation is a "locally important aquifer for shallow domestic wells."[72] However, Department staff note the Plan does not state how many wells are screened in the Monterey Formation nor explain how many use it as a sole water supply. It is also noted that the Plan states there are three metered small water system (SWS) extraction wells that are screened in the Monterey Formation.[73] Department staff recommend that the GSA investigate groundwater use within the Monterey Formation and identify beneficial uses and users of this formation and consider them in the management of the Basin (see Recommended Corrective Action 1*).*

The Plan states that the Lompico Aquifer underlies the Monterey Formation in the Basin except for the Pasatiempo and Camp Evers areas where the Monterey Formation is absent, causing a hydrologic connection between the Santa Margarita Aquifer and the Lompico Aquifer. This area is identified in the Plan as the primary location for groundwater recharge for the Lompico Aquifer. The Plan indicates that the limited surface exposure of the Lompico Sandstone and the confined to semi-confined nature of the aquifer makes it relatively slow to respond to rainfall-driven recharge events.[74] The Lompico Aquifer is identified as providing a large portion of the Basin's municipal supply, which based on available aquifer testing results, reflects a moderately permeable, semi-confined to confined sandstone aquifer.[75] The Plan states that, for the Lompico Aquifer, the hydraulic conductivity is between 0.5 to 7 feet per day and storativity is between 0.000001 to 0.001.[76]

The GSP states that the hydrogeology of the Mount Hermon/South Scotts Valley subarea and portions of the Santa Margarita Aquifer in Olympia and Quail Hollow subareas are relatively well understood because of the water supply and monitoring wells that have been drilled, logged, and monitored by San Lorenzo Water District (SLVWD), Scotts Valley Water District (SVWD), Mount Hermon Association (MHA), along with

[70] Santa Margarita GSP, Table 2-14, p. 130.
[71] Santa Margarita GSP, Section 2.2.4.2.5, p.119.
[72] Santa Margarita GSP, Section 2.2.4.5.3, p. 132.
[73] Santa Margarita GSP, Table 3-4, p. 286.
[74] Santa Margarita GSP, Section 2.2.4.4.2, p. 131.
[75] Santa Margarita GSP, Section 2.2.4.4.2, p. 131.
[76] Santa Margarita GSP, Table 2-14, p. 130.

environmental remediation programs for locally impacted sites. Areas of the Basin that are lacking comprehensive data are described in the Plan as those that are outside of the jurisdiction of SLVWD, SVWD, and MHA, where private domestic groundwater extraction takes place. Additionally, the Plan states that the deep Butano Aquifer is poorly understood because it only has two dedicated monitoring wells used to monitor seasonal water levels.[77] The GSP further states that nine new monitoring wells will be installed to minimize the uncertainties of how the Basin responds to changes in recharge and groundwater extraction. Department staff concur with the decision to install additional groundwater monitoring wells to better understand the areas outside of local agencies' jurisdictions and the Butano Aquifer system.

Department staff appreciate the clarity of figures and text used to explain the Basin's geology, and the information provided that comprises the hydrogeologic conceptual model section, and conclude this section substantially complies with the requirements outlined in the GSP Regulations.

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,[78] a graph depicting change in groundwater storage,[79] maps and cross-sections of the seawater intrusion front,[80] maps of groundwater contamination sites and plumes,[81] maps depicting total subsidence,[82] identification of interconnected surface water systems and an estimate of the quantity and timing of depletions of those systems,[83] and identification of groundwater dependent ecosystems.[84]

Hydrographs were provided in the Plan for all three principal aquifers and the Monterey Formation. Hydrographs for wells in the Basin with water level data are included in the Appendix.[85]

The Plan divides the discussion of groundwater conditions for the Santa Margarita Aquifer into four subareas to evaluate the different conditions in each subarea. Sub-areas include:

[77] Santa Margarita GSP, Section 2.2.4.11, p. 153.
[78] 23 CCR § 354.16 (a)(1-2).
[79] 23 CCR § 354.16 (b).
[80] 23 CCR § 354.16 (c).
[81] 23 CCR § 354.16 (d).
[82] 23 CCR § 354.16 (e).
[83] 23 CCR § 354.16 (f).
[84] 23 CCR § 354.16 (g).
[85] Santa Margarita GSP, Appendix 2C, pp. 584-683.

- **Quail Hallow and Olympic/ Mission Springs** - Groundwater elevations in these areas are similar and have remained stable over time, [86] and have exhibited seasonal fluctuations from pumping, [87]
- **Mount Hermon South Scotts Valley,** - Groundwater elevations in this area have been stable since 2015, and the Santa Margarita Aquifer is connected to the deeper Lompico Aquifer. [88]
- **North Scotts Valley -** Groundwater elevations in this area have been stable since monitoring began in the 1990s. The Santa Margarita Aquifer is separated from the deeper Lompico Aquifer by an aquitard in this region. [89]

Department staff conclude the GSP's statement that the subareas of the Santa Margarita Aquifer demonstrate unique characteristics is reasonable. However, the Plan included selected hydrographs in the chapter and a bulk set of hydrographs without location data in the appendix,[90] which precludes a complete review of the data to confirm what is being reported in the text.

Hydrographs for wells screened within the Monterey Formation were included in the Plan.[91] Hydrographs provided for the Monterey Formation indicate that levels decreased with an extended dry period that started in the mid-1980s,[92] and elevations stabilized in 1994.[93]

The GSP included hydrographs of wells that are screened exclusively in the Lompico Aquifer. All wells that are included in the Plan that are screened in the Lompico Aquifer are located south of Bean Creek. The GSP states that groundwater elevations in the Lompico Aquifer were overdrafted as much as 200 feet during the drought period between 1985 and 1994 followed by a stabilization of levels in the early 2000s. [94] The GSA identifies that around 2012 as pumping volumes were reduced, the aquifer "ceased to be unsustainable." [95] The rationale provided in the Plan to support the Lompico Aquifer is no longer being "over-pumped" is the trend shown during the most recent drought of 2012-2015 where the seasonal lows in most wells were stable each year and have recovered since 2017. The Plan suggests that over-pumping is no longer occurring in the Lompico Aquifer [96] and Department staff note this is a reasonable assertion based on the information provided in the Plan.

[86] Santa Margarita GSP, Section 2.2.5.1.2.1, p. 163.
[87] Santa Margarita GSP, Section 2.2.5.1.2.1, p. 163.
[88] Santa Margarita GSP, Section 2.2.5.1.2.1, p. 163.
[89] Santa Margarita GSP, Section 2.2.5.1.2, p. 164.
[90] Santa Margarita GSP, Appendix 2C, pp. 631-636.
[91] Santa Margarita GSP, Appendix 2C, pp. 631-636.
[92] Santa Margarita GSP, Section 2.2.5.1.3, p. 169.
[93] Santa Margarita GSP, Section 2.2.5.1.3, p. 169.
[94] Santa Margarita GSP, Section 2.2.5.1.4, p. 171.
[95] Santa Margarita GSP, Section 2.2.5.1.4, p. 171.
[96] Santa Margarita GSP, Section 2.2.5.1.4, p. 171.

The GSP provided hydrographs of wells that were screened in the Butano and Lompico Aquifers. Department staff note that only one of the hydrographs provided was screened only in the Butano Aquifer, with one well that was labeled inconsistently.[97] The GSP states that the hydrographs show stable groundwater elevations in the Butano Aquifer since 1994. Department staff are unable to verify this statement since the Plan only provided one hydrograph screened solely in the Butano Aquifer.

The GSP states that studies have identified vertical gradients in the Pasatiempo, Camp Evers, and Scotts Valley areas due to overdraft of the Lompico Aquifer creating localized potentiometric surface depressions. The vertical gradient induces recharge to the Lompico Aquifer from the Santa Margarita Aquifer in the areas where the two aquifers are in contact with each other because groundwater level elevations are 50 to 150 higher in the Santa Margarita Aquifer than the Lompico Aquifer.[98] The GSP states vertical hydraulic gradient information is only available in the Pasatiempo/Camp Evers/southern Scotts Valley area because this is the only area where groundwater elevation data from nested or multi-level monitoring wells are available.[99]

The GSP discusses groundwater storage as part of the hydrogeologic conceptual model. The GSP indicates that since the 1970s, there has been a consistent loss of groundwater stored in the Basin primarily due to over-pumping of the Lompico Aquifer in the south Scotts Valley area.[100] The GSP provides a figure showing the change in storage, which shows that over the time from 1983-2018, the Basin experienced a decline of approximately 40,000 acre-feet in storage.[101] The GSP states that “after WY2014, [water year 2014] cumulative change in storage appears to be leveling out but it is anticipated that the overall below average rainfall from 2018 to present will continue the trend of declining groundwater in storage”.[102]

The GSP includes a description and maps of groundwater quality issues noted in the Basin and has identified salinity, total dissolved solids, chloride, iron and manganese, arsenic, nitrate, and organic compounds as constituents of concern. The GSP states that groundwater in the Basin is generally of good quality and does not regularly exceed primary drinking water standards. However, both naturally occurring and anthropogenic groundwater quality concerns are identified in the Plan as being present in some aquifers and areas.[103] An example of groundwater quality concerns in a specified aquifer is that the Plan states that arsenic concentrations above the MCL of 0.010 mg/L are found periodically in wells pumping from the Lompico Aquifer.[104]

[97] Santa Margarita GSP, Section 2.2.5.1.5, p. 176.
[98] Santa Margarita GSP, Section 2.2.5.2, p. 181.
[99] Santa Margarita GSP, Section 2.2.5.2, p. 181.
[100] Santa Margarita GSP, Section 2.2.5.3, p.184.
[101] Santa Margarita GSP, Figure 2-52. P. 185.
[102] Santa Margarita GSP, Section 2.2.5.3, p.184.
[103] Santa Margarita GSP, Section 2.2.5.4, p. 186.
[104] Santa Margarita GSP, Section 2.2.5.4.3.3, p. 203.

The GSP describes land subsidence conditions in the Basin and states there is no known evidence of land subsidence in the Basin.[105] The GSP states visible damage to roads, bridges and instances of protruding well casings would occur if subsidence was present.[106] The GSP uses Interferometric Synthetic Aperture Radar (InSAR) data collected between June 2015 to June 2019 to show that measurable subsidence was not observed anywhere in the Basin.[107] The GSP then concludes that since there was "no observed land subsidence related to historical declines in groundwater levels combined with the consolidated nature of Basin sediments" land subsidence is not an applicable sustainability indicator in the Basin.[108] Department staff conclude the GSA's assessment that land subsidence is not occurring or likely to occur in the Basin is reasonable at this time.

The GSP provides sufficient detail regarding the identification of interconnected surface waters which are present throughout the Basin, particularly along streams.[109] Several prior studies have used geochemistry and hydrology to determine where and when streams are either gaining or losing water throughout the year.[110] The Santa Margarita and Butano Aquifers are major contributors to groundwater discharge to streams due to extensive surface outcropping and high hydraulic conductivity. The GSP identifies data gaps in groundwater level monitoring in proximity to interconnected surface waters and intends to install five new monitoring wells near creeks.[111] The GSP estimates that approximately 1,000 acre-feet per year of depletion occurs due to groundwater extraction.[112] As for timing, the depletion is highly dependent on water year type and decreases rapidly in dry years but correspondingly recovers rapidly in wet years.[113]

The GSP includes a description of groundwater dependent ecosystems (GDEs) in the Basin along with a map showing the locations and classifications of GDEs within the Basin.[114] The GDE assessment was developed and cross-referenced primarily with the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Several known springs, seeps, or other groundwater-dependent wetlands were identified as likely GDEs by local experts and were added to the GDE dataset.[115] Four GDE classifications were identified in the Basin: springs, open water, riverine/ riparian, and other groundwater-supported wetlands.

Department staff appreciate the density of information and the clarity of figures considers the information provided that comprises the Groundwater Conditions section, and

[105] Santa Margarita GSP, Section 2.2.5.5, p.220.
[106] Santa Margarita GSP, Section 2.2.5.5, p.220.
[107] Santa Margarita GSP, Section 2.2.5.5, p. 221.
[108] Santa Margarita GSP, Section 2.2.5.5, p. 221.
[109] Santa Margarita GSP, Section 2.2.5.6, pp. 223-226.
[110] Santa Margarita GSP, Section 2.2.5.6.1, p. 223.
[111] Santa Margarita GSP, Section 2.2.5.6.2, p. 226.
[112] Santa Margarita GSP, Section 3.7.2.1, p. 358.
[113] Santa Margarita GSP, Figure 3-17, p. 360.
[114] Santa Margarita GSP, Figure 2-72, P. 225.
[115] Santa Margarita GSP, Section 2.2.4.9, p. 141.

conclude this section 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,[116] and the sustainable yield.[117]

The Santa Margarita Groundwater Basin model (SMGBM) was used by the GSA to support GSP development. The SMGBM was used to estimate historical, current, and projected water budgets.[118]

The GSP includes a historical water budget. The GSP identifies the historical period from 1985 to 2018[119]. The historical water budget identifies runoff to streams and stream contributions to groundwater.[120] Average surface water inflows and outflows average 120,300 acre-feet per year and are characterized by water year type.[121] The groundwater inflow components are primarily inflows from precipitation and streams. Inflows across Basin boundaries are negligible because the Basin is bounded by granitic basement rocks and faults that minimize subsurface flow.[122] Other inflows include precipitation recharge, streambed recharge, delivery system loss, and return flow from septic systems, quarry operations, and minor irrigation. Groundwater outflows consist of groundwater pumping and natural discharge to creeks. Subsurface outflow to surrounding basins is negligible due to the geologic boundaries of the Basin.

Groundwater inflows and outflows are characterized by aquifer, with the Santa Margarita and Butano Aquifers having the greatest flows.[123] Annual change in storage is greatly influenced by water year type, and greater recovery occurs during wet years while overdraft conditions occur after multiple dry years.[124] The GSP demonstrates a long-term average overdraft of 1,100 acre-feet per year in the historic water budget.[125] Staff note that the GSP indicates that a reduction in levels occurred in the 1990s and that basin conditions had slowed decline since.[126] Staff evaluation of hydrographs provided in the GSP agrees with this assessment.[127] Department staff conclude the individual aquifer

[116] 23 CCR §§ 354.18 (a), 354.18 (c) *et seq*.
[117] 23 CCR § 354.18 (b)(7).
[118] Santa Margarita GSP, Section 2.1, p. 1008.
[119] Santa Margarita GSP, Section 2.2.6.2, p. 237.
[120] Santa Margarita GSP, Table 2-22, p. 234.
[121] Santa Margarita GSP, Table 2-25, p. 240.
[122] Santa Margarita GSP, Section 2.2.6.1.3, pp. 235-236.
[123] Santa Margarita GSP, Table 2-27, p. 247.
[124] Santa Margarita GSP, Table 2-26, p. 243.
[125] Santa Margarita GSP, Section 2.2.6.2.3, p. 246.
[126] Santa Margarita GSP, Section 2.2.6.2.2, p. 246.
[127] Santa Margarita GSP, Figures 2-40, 2-44, 2-47, 2-50, 2-51, pp. 162, 172, 177,182, 183.

budgets are sufficiently detailed and commensurate with the level of understanding of the geology of the Basin.

The GSP includes a current water budget The GSP defines its current water budget as the years 2010 to 2018. The GSA selected this time period because it represents extreme climatic conditions expected to become more frequent in the future and includes recent efficiency improvements in municipal systems.[128] Surface water inflow and outflow components, groundwater inflow and outflow components for the current water budget are the same as in the historical period.[129] A decrease in municipal pumping resulted in groundwater outflows that are smaller in the current budget (3,000 acre-feet per year) compared to the historical budget (3,700 acre-feet per year).[130] Outflows to streams decreased by 1,200 acre-feet per year resulting from decreased precipitation during the current water budget time period.[131] Net annual change in groundwater storage decreased to 200 acre-feet per year and is lower than the historical water budget. Net groundwater recharge to these aquifers during normal or wet years.[132]

The projected model spans the years 2020 to 2072 and is calibrated from data cross the historical period 1985 to 2018.[133]

Surface water budget components exhibit average inflows and outflows of about 109,600 are-feet per year. Due to a decrease in precipitation and less total surface runoff, groundwater recharge is projected to be about 10% less compared to the historical period.[134] Total inflows are about 21,700 acre-feet per year while total outflows are about 22,300 acre-feet per year.[135] Groundwater pumping is projected to be 2,800 acre-feet per year and is assumed to be 900 acre-feet less than the historical pumping rate (3,700 acre-feet per year)[136] based on the scenario that the San Lorenzo Valley Water District will use more surface water in wet years.[137] Staff note that this assumption is reasonable if the storage capacity is available or will be constructed over the planning horizon.

The GSP indicates that the climate model ensemble projects a decrease in precipitation, less groundwater recharge, and therefore a decline in total storage by about -500 acre-feet per year from 2020 to 2072.[138] This value includes the assumed reduction in municipal pumping compared to historical rates and appears to be an improvement from the historical average overdraft of 1,100 acre-feet per year.

[128] Santa Margarita GSP, Section 2.2.6.3, p. 251.
[129] Santa Margarita GSP, Table 2-29, p. 252, Table 2-30, p. 253.
[130] Santa Margarita GSP, Table 2-30, p. 253.
[131] Santa Margarita GSP, Section 2.2.6.3.3, p. 253.
[132] Santa Margarita GSP, Section 2.2.6.3.3, p. 253.
[133] Santa Margarita GSP, Section 2.2.6.4, p. 255.
[134] Santa Margarita GSP, Section 2.2.6.4.1, p. 256.
[135] Santa Margarita GSP, Table 2-34, p. 260.
[136] Santa Margarita GSP, Table 2-34, p. 260.
[137] Santa Margarita GSP, Section 2.2.6.4.3, p. 262.
[138] Santa Margarita GSP, Section 2.2.6.4.3, p. 262.

The GSP provides a Basin-wide sustainable yield value of 2,820 acre-feet per year and further analyzes sustainable yield by aquifer.[139] Sustainable yield values were derived from the model using predictive simulations that do not produce undesirable results. Projected pumping includes a 5% buffer to maintain operational flexibility for extended critically dry periods.[140] The current water budget pumping volume remains slightly above the projected sustainable yield.

Based on a review of the water budget section and related appendices, staff conclude that the discussion and presentation of information on the projected water budget substantially covers the items listed in the regulations in an understandable format using appropriate data.

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.[141]

The GSP did not use management areas.

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.[142]

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.[143]

The GSP defines the sustainability goals for the basin as "to implement the Sustainable Groundwater Management Act, provide a safe and reliable groundwater supply that meets the current and future needs of beneficial users, support groundwater sustainability

[139] Santa Margarita GSP, Table 2-36, p. 271.
[140] Santa Margarita GSP, Section 2.2.6.5, p. 271.
[141] 23 CCR § 354.20.
[142] 23 CCR § 354.22 *et seq*.
[143] 23 CCR § 354.24.

measures and projects utilizing integrated water management principles, provide operational flexibility within the basin by supporting a drought supply reserve under future climate change projections, and plan and implement cost effective projects and activities that do not place undue financial hardship on the Agency, its cooperating agencies, or basin stakeholders."[144]

The GSP discusses the immediate and planned measures that the GSA would take to ensure that the basin is operated within its sustainable yield. The Agency plans to expand conjunctive use of surface water and groundwater using existing and new infrastructure that will be developed to access 313 acre-feet per year (AFY) of Loch Lomond water. The GSP explains that the combination of existing and new infrastructure will provide a long-term average of 540 AFY for conjunctive use. The GSP states that the anticipated increase in groundwater levels resulting from the 540 AFY increased conjunctive use will enable the Agency to meet its long-term measurable objectives established for chronic lowering of groundwater levels, depletion of interconnected surface water, and reduction of groundwater storage while having no impact on groundwater quality.[145]The GSP states that either treated surface water or purified wastewater imports from outside the basin will be evaluated during the first 5 years of the GSP implementation for additional water supply resiliency and protection from drought.[146]

Department staff conclude that the GSP's sustainability goal sufficiently meets 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.[147] 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[148] – 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

[144] Santa Margarita GSP, Section 3.1, pp. 277-278.
[145] Santa Margarita GSP, Section 3.1, p. 278.
[146] Santa Margarita GSP, Section 3.1, p. 278.
[147] 23 CCR § 351(ah).
[148] Water Code § 10721(x).

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.[149] 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.[150]

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.[151] GSAs are required to describe how conditions at minimum thresholds may affect beneficial uses and users,[152] and the relationship between the 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.[153]

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.[154] 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.[155]

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 Basin, 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.[156]

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

[149] 23 CCR §§ 354.26 (a), 354.26 (b)(c).
[150] 23 CCR § 354.26 (b)(2).
[151] 23 CCR § 354.28 (b)(1).
[152] 23 CCR § 354.28 (b)(4).
[153] 23 CCR § 354.28 (b)(2).
[154] 23 CCR § 354.30 (a).
[155] 23 CCR § 354.30 (b).
[156] 23 CCR § 354.26 (d).

about groundwater elevation conditions and potential effects on other sustainability indicators.[157]

The GSP describes that chronic lowering of groundwater levels becomes significant and unreasonable when lowered groundwater levels materially impair groundwater supply, negatively impact beneficial uses, or cause undue financial burden to a significant number of beneficial water users.[158]

The undesirable results for chronic lowering of groundwater levels are defined as "if the groundwater elevation in any RMP in any Representative Monitoring Point (RMP) falls below the minimum threshold in 2 or more consecutive non-drought years".[159] The following criteria[160] were considered when defining the undesirable results:

- Knowledge of impacts to groundwater beneficial users during periods when groundwater levels were lowest in the basin,
- Knowledge of the basin's aquifers response to climate changes, and
- Including some level of flexibility to implement management actions to address the short-term lowering of groundwater levels

The GSP states that minimum threshold exceedances caused by emergency operational issues or extended droughts are not considered to be undesirable results for the chronic lowering of groundwater levels.[161]

SGMA includes a provision which states "overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater *levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods*."[162] Therefore, Department staff conclude that including language in the definition of an undesirable result which precludes undesirable results due to drought conditions without discussing how extractions and recharge will be managed to offset these potential impacts in other periods is problematic. Furthermore, the GSP does not define what the term "drought year" means in the context of the definition of undesirable results, making it difficult to know when undesirable results would be excluded due to this condition. The GSA should revise the definition of undesirable results to remove the drought year condition or discuss how extractions and recharge will be managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods. Department staff recommend the GSA establish sustainable management criteria for all conditions within the Basin regardless of whether drought conditions are occurring or not (see Recommended Corrective Action 2).

[157] 23 CCR § 354.28(c)(1) *et seq*.
[158] Santa Margarita GSP, Section 3.4.1, p. 325.
[159] Santa Margarita GSP, Section 3.4.2.2, p. 327.
[160] Santa Margarita GSP, Section 3.4.2.1, p. 326.
[161] Santa Margarita GSP, Section 3.4.2.2, p. 327.
[162] Water Code § 10721(x)(1) emphasis added.

The GSP reviews historical conditions as part of its identification of minimum thresholds. The GSP notes that a 10-year extended drought and increased groundwater use resulted in Santa Margarita and Lompico Aquifer groundwater levels in the Lompico and Santa Margarita Aquifers declining from 1985 to 1994. During this time, municipal water supply wells in the Mount Hermon area and several shallow private wells outside of the Scotts Valley area were deepened or replaced in response to declining groundwater levels.[163] The GSP states that currently there are no undesirable results to human beneficial users; however, the impacts of historical chronic lowering of groundwater levels on environmental groundwater users, such as Groundwater Dependent Ecosystems (GDE) and aquatic species is less understood.[164] The GSP states that municipal, industrial, agricultural, and domestic groundwater users have adjusted to the lowered groundwater levels during past droughts.[165]

The GSP discussed the criteria it used to establish minimum thresholds. Minimum thresholds and measurable objectives were established based on historical groundwater elevation data collected at RMP wells and projected groundwater levels during the GSP planning and implementation horizon.[166] The GSP calculated minimum thresholds by using an average of the 5 lowest measured elevations to calculate an average minimum elevation at each RMP.[167]

The GSP discussed the potential effects of reaching minimum thresholds for groundwater levels could have on beneficial uses and users. The GSP states that historical groundwater levels have not appeared to cause significant and unreasonable conditions in the past, and therefore the minimum thresholds established based on historical lows would be able to continue to support similar beneficial use in the future.[168]

The GSP discussed the potential effects of reaching minimum thresholds for groundwater levels could have on other sustainability indicators. The GSP states minimum thresholds of chronic lowering of groundwater levels are not lower than the historical groundwater elevations, therefore, will not cause long-term declines of groundwater in storage, nor result in exceedances of groundwater quality minimum thresholds, nor result in a significant or unreasonable depletion of interconnected surface water.[169]

The GSP describes measurable objectives for groundwater levels. The GSP defines the measurable objectives for Santa Margarita Aquifer RMPs as the annual minimum groundwater levels in each RMP well in water year 2004. The GSP defines the RMPs located in the Monterey Formation, Lompico, and Butano Aquifers as the average annual minimum groundwater elevation measure from 2016 to 2020. The GSP selected water

[163] Santa Margarita GSP, Section 3.4.2.1, p. 326.
[164] Santa Margarita GSP, Section 3.4.2.4, p. 328.
[165] Santa Margarita GSP, Section 3.4.2.4, p. 328.
[166] Santa Margarita GSP, Section 3.4.3.1, p. 330.
[167] Santa Margarita GSP, Section 3.4.3.2, p. 330.
[168] Santa Margarita GSP, Section 3.4.3.5, pp. 335-336.
[169] Santa Margarita GSP, Section 3.4.3.3, p. 334.

year 2004 for Santa Margarita Aquifer because 2004 and the five prior years had an average annual precipitation similar to the annual average of precipitation measured from 1947-2020 at El Pueblo Yard in Scotts Valley and the rapid response nature of Santa Margarita Aquifer sets it apart from other principal aquifers in the basin.[170]

The interim milestones for the Santa Margarita Aquifer RMPs are set to the measurable objectives of the Santa Margarita Aquifer and the GSP states that projects and management actions are not predicted to increase groundwater elevations of Santa Margarita Aquifer significantly. Estimation of interim milestones for the confined aquifers (aquifers other than Santa Margarita Aquifer) in the basin reflects projected rise in groundwater elevations with the implementation of a 540 acre-feet per year conjunctive use project.[171]

Despite the identified recommended corrective action, the GSP's discussion of groundwater levels seems to be comprehensive and includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. Based on the review of the information related to the chronic lowering of groundwater levels and materials referenced in the GSP, Department staff conclude that the GSP's discussion and presentation of information generally covers the specific items listed in the GSP Regulations in an understandable format using appropriate data and assumptions.

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.[172]

The GSP describes that the reduction of groundwater in storage becomes significant and unreasonable when there is a long-term decline of groundwater in storage, or the volume of groundwater extracted causes undesirable results for any other sustainability indicator.[173] The undesirable results for the reduction of groundwater in storage are quantitatively defined as groundwater extraction volumes that exceed the reduction in groundwater storage minimum thresholds in one or more principal aquifers.[174]

The GSP establishes minimum thresholds for the reduction of groundwater in storage. The GSP establishes the minimum threshold as the estimated sustainable yield for each aquifer. The GSP estimates the sustainable yield from the groundwater pumping volumes

[170] Santa Margarita GSP, Section 3.4.4.1, p. 337.
[171] Santa Margarita GSP, Section 3.4.4.2, p. 338.
[172] 23 CCR § 354.28(c)(2).
[173] Santa Margarita GSP, Section 3.5.1, p. 338.
[174] Santa Margarita GSP, Section 3.5.2.2, p. 339.

from the baseline model simulation and uses the estimated sustainable yield values to represent the minimum thresholds for the reduction of groundwater in storage.[175] Minimum thresholds for the reduction of groundwater in storage by aquifer are presented in a table.[176] The GSA established minimum thresholds in acre-feet of groundwater extraction per year for the four aquifers.

- Santa Margarita Aquifer: 850 acre-feet per year
- Monterey Formation: 140 acre-feet per year
- Lompico Aquifer: 1290 acre-feet per year
- Butano Aquifer: 540 acre-feet per year

The GSP explains that the minimum threshold for the reduction of groundwater in storage for the Santa Margarita Aquifer was calculated differently from that of other aquifers in the Basin. Due to the more variable nature of Santa Margarita Aquifer, the minimum threshold was calculated based on the average baseline pumping between 2030-2049, because groundwater pumping and conditions estimated to occur during this time frame in this aquifer produced near zero cumulative groundwater in storage loss from WY2030-2049[177] whereas the minimum thresholds for the other aquifers (Lompico, Butano, Monterey) were calculated based on the average baseline pumping after 2022.[178]

The GSP states that the minimum thresholds of reduction of groundwater in storage will prevent groundwater extractions more than the sustainable yield and thus, avoid the chronic lowering of groundwater levels, degraded groundwater quality, or depletions of interconnected surface water undesirable results.[179] The GSP states that metered groundwater extractions from municipal and small water systems and estimated groundwater extractions from de minimis and non-de-minimis pumping will be used to quantify minimum thresholds for the reduction of groundwater in storage.[180]

The GSP establishes measurable objectives for the reduction of groundwater in storage. The GSP estimated measurable objectives by using a similar method to minimum thresholds. The GSA used the SBAMB to create a projected model run that incorporates a 540 AFY conjunctive use project in the South Scotts Valley area, resulting in less pumping.

Department staff appreciate the GSA's selection of the volume extracted from each principal aquifer as minimum thresholds and conclude the sustainable management

[175] Santa Margarita GSP, Section 3.5.3.2, p. 341.
[176] Santa Margarita GSP, Table 3-17, p. 341.
[177] Santa Margarita GSP, Section 3.5.3.2, p. 341.
[178] Santa Margarita GSP, Table 3-17, p. 341.
[179] Santa Margarita GSP, Section 3.5.3.2, p. 342.
[180] Santa Margarita GSP, Section 3.5.3.7, p. 344.

criteria defined for the reduction of groundwater in storage to be substantially compliant and presented in an understandable format using appropriate data.

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 by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results.[181]

The GSP states that seawater intrusion is not an applicable sustainability indicator for the Basin.[182] Based on the geographic information provided in the basin setting of the GSP and the information on the Department's basin prioritization website, the Department staff concurs with the Agency's statement that seawater intrusion is not applicable to the Basin.

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.[183]

The GSP describes the significant and unreasonable water quality conditions as they would "occur if projects or management actions in support of SGMA degrade groundwater quality such that it leads to diminished supply, adverse impacts on beneficial uses or undue financial burden for mitigating such negative impacts. In this context, undue financial burden means a cost or financial impact resulting from an action or inaction of the SMGWA or groundwater users in the Basin, that is unwarranted, inappropriate, or excessive and/or rising to a level that is more than is necessary, acceptable, or reasonable".[184]

The GSP's definition of undesirable results for degraded water quality, which solely focuses on water quality impacts caused directly by the GSA implementing an action, is incorrect. SGMA includes in its definition of undesirable results the "significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies."[185] SGMA specifies that the significant and unreasonable effects are those "caused by groundwater conditions occurring throughout the basin," but does not limit them to impacts caused by basin management under the GSP. As currently

[181] 23 CCR § 354.28(c)(3).
[182] Santa Margarita GSP, Executive summary, p. 32.
[183] 23 CCR § 354.28(c)(4).
[184] Santa Margarita GSP, Section 3.6.1, p. 345.
[185] Water Code § 10721(x).

defined, if, for instance, a minimum threshold exceedance occurs because of mobilization of naturally occurring constituents or migration of a contaminant plume to supply wells caused by groundwater pumping, but the GSA has not implemented any pumping regulations, the GSA would not identify this as an undesirable result. Staff consider this to be inconsistent with the intent of SGMA, which requires GSAs to ensure management of groundwater conditions in the Basin, including any action taken by the GSA, will not significantly and unreasonably degrade water quality. Therefore, degraded water quality caused by groundwater pumping, whether the GSA has implemented pumping regulations or not, should be considered in the assessment of undesirable results in the Basin. Department staff recommend the GSA revise the definition of undesirable results such that groundwater pumping, whether due to action or inaction of the GSA with respect to Basin management, is considered in the undesirable result definition, or the GSA should explain why it excludes minimum threshold exceedances that may result from unregulated groundwater pumping in the Basin, in the definition of undesirable results (see Recommended Corrective Action 3a).

The GSP describes that an undesirable result will be known to occur if any degraded groundwater quality minimum thresholds are exceeded at an RMP.[186] In addition to exempting undesirable results that were not caused by the GSA, the GSP also excludes undesirable results for iron, manganese, sulfate, arsenic, and nitrate.[187]

The GSA believes that degraded water quality caused by naturally occurring constituents—such as iron, manganese, sulfate, and arsenic—and constituents associated with urban, agricultural, and industrial land uses such as nitrate, are outside the purview of the GSA and are covered by other regulatory programs and are without a causal nexus to groundwater pumping.[188]

SGMA specifies that undesirable results for degraded water quality are to be defined by a GSA in terms of significant and unreasonable effects caused by groundwater conditions occurring throughout the basin, (Wat. Code § 10721(x)), which focuses attention on degradation caused by groundwater extraction, but does not limit the scope of contaminants that a GSA should consider. The GSA must effectively consider local, state, and federal water quality standards, when setting minimum thresholds and measurable objectives, including potentially coordinating with the agencies governing water quality standards and programs, which are set for constituents whether they are naturally occurring or not.[189] Department staff recommend that the GSA consider establishing sustainable management criteria for all applicable constituents of concern in the Basin (see Recommended Corrective Action 3b).

[186] Santa Margarita GSP, Section 3.6.2.2, p. 346.
[187] Santa Margarita GSP, Section 3.6.2.1, p. 346.
[188] Santa Margarita GSP, Section 3.6.2.1, p. 346.
[189] 23 CCR § 354.28(c)(4).

The GSP established minimum thresholds for degraded groundwater quality. The minimum thresholds for Constituents of Concern (COCs) are based on the State-defined primary maximum contaminant level (MCL) values. The minimum thresholds for the degradation of groundwater quality are presented in a Table.[190] The GSP sets the minimum thresholds for COCs at each RMP throughout the Basin as the State drinking water standards, except for nitrates. The GSP indicates that Nitrate levels in groundwater influence nitrate concentrations in the San Lorenzo River; therefore, the minimum threshold was set at 5 milligrams per liter (less than the MCL of 5 milligrams per liter) to help in meeting the nitrate daily loading rate established by Central Coast Regional Water Quality Control Board for San Lorenzo River inflows.[191] The GSP states that the Basin's groundwater quality is generally below the minimum thresholds set for the COCs.[192] Therefore, the Agency's objective is to maintain the groundwater quality at its current concentrations.

The GSP describes the effects of degraded groundwater quality on urban land uses and users, rural residential land uses and users, industrial land uses and users, agricultural land uses and users, and ecological land users and users. The GSP states that some private well owners do not routinely test groundwater pumped and there is a possibility that they could unknowingly drink groundwater exceeding drinking water standards and experience potential health effects.[193]

Measurable objectives for degraded groundwater quality are set at each RMP to the average concentration between January 2010 and December 2019 concentrations for each COC. The GSP states that groundwater in the basin is currently of better quality than minimum thresholds for all RMPs with no changes in quality expected from projects and management actions implemented to achieve sustainability. [194]Minimum thresholds and measurable objectives established values for degradation of groundwater quality for each aquifer are presented in a table[195] of the GSP. The GSP states that measurable objectives effectively represent current conditions and therefore, interim milestones are set at the same concentration as measurable objectives.[196]

Despite the identified recommended corrective action, Department staff conclude that the GSP's discussion and presentation of information generally covers the specific items listed in the GSP Regulations in an understandable format using appropriate data and assumptions.

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

[190] Santa Margarita GSP, Table 3-20, p. 351.
[191] Santa Margarita GSP, Section 3.6.3.2, p. 350.
[192] Santa Margarita GSP, Section 3.6.3.3, p. 352.
[193] Santa Margarita GSP, Section 3.6.2.4, p. 348.
[194] Santa Margarita GSP, Section 3.6.4, p. 355.
[195] Santa Margarita GSP, Table 3-21, p. 356.
[196] Santa Margarita GSP, Section 3.6.4.2, p. 355.

subsidence that substantially interferes with surface land uses and may lead to undesirable results.[197] 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.[198]

As previously stated in the groundwater conditions section, the GSP states "the land subsidence sustainability indicator is not applicable in the Basin as an indicator of groundwater sustainability." [199] Based on the statement, the GSA does not establish sustainable management criteria for this sustainability indicator. The GSP states that it will evaluate subsidence monitoring during implementation and if subsidence were to occur, the GSA would develop land subsidence sustainable management criteria in an update to the GSP.[200] Department staff conclude this is a reasonable approach to manage the Basin at this time and encourage the GSA to re-evaluate the applicability of this sustainability indicator during future updates to the Plan if monitoring data indicates conditions have changed.

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.[201] 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.[202] 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.[203]

The Plan acknowledges the presence of interconnected surface waters in the Basin and identifies their location by stream gauging, accretion studies, groundwater level monitoring, stream and GDE field reconnaissance, and groundwater modeling. Department staff are satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Basin.

[197] 23 CCR § 354.28(c)(5).
[198] 23 CCR §§ 354.28(c)(5)(A-B).
[199] Santa Margarita GSP, Section 3.7.4.2, p. 374.
[200] Santa Margarita GSP, Section 3.7.2.3, p. 374.
[201] Water Code § 10721(x)(6).
[202] 23 CCR § 354.16 (f).
[203] 23 CCR § 354.28 (c)(6).

The GSP does not quantify the rate or volume of surface water depletions due to groundwater pumping as the sustainable management criteria as required by the GSP Regulations.[204] Instead, the GSP proposes to use the groundwater levels as a proxy for the depletion of interconnected surface water sustainable management criteria development. The GSP utilizes a comparison of simulated streamflow depletion from pumping compared to measured groundwater elevation in two near-stream wells to justify the correlation. While the GSP states one well (SLVWD Quail MW-A) demonstrates a "good correlation," the GSP admits the other well (SVWD SV4-MW) does not.[205] Department staff note the GSP does not demonstrate, with adequate evidence, that the use of groundwater elevations as a proxy for depletions of interconnected surface water is sufficient to quantify the location, quantity, and timing of depletions of interconnected surface water.

The GSP states that the significant and unreasonable depletion of interconnected surface water occurs "if groundwater use, or projects or management actions proposed in the GSP adversely impact the sustainability of GDEs or selected priority species or cause undue financial burden to beneficial users of surface water. In this context, undue financial burden means a cost or financial impact resulting from an action or inaction of the SMGWA or groundwater users in the Basin, that is unwarranted, inappropriate, or excessive and/or rising to a level that is more than is necessary, acceptable, or reasonable."[206]

The GSP defines undesirable results of depletion of interconnected surface waters as the exceedance of the groundwater level minimum threshold at any RMP in two or more consecutive non-drought years. The GSP further states that RMP minimum threshold exceedance caused by emergency operational issues or extended drought is not considered an undesirable result.[207]

Department staff conclude including language in the definition of an undesirable result which precludes undesirable results due to drought conditions is incorrect. While SGMA includes a provision which states "overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods,[208] this provision does not apply to depletions of interconnected surface water. Furthermore, the GSP does not define what the term "drought year" means in the context of the definition of undesirable results, making it difficult to know when undesirable results would be excluded due to this condition. Therefore, the GSA should revise the definition of undesirable results to remove the drought year condition. Department staff recommend

[204] 23 CCR § 354.28 (c)(6).
[205] Santa Margarita GSP, Section 3.7.2.1.1 and Section 3.7.2.1.2, p. 363.
[206] Santa Margarita GSP, Section 3.7.1, p. 357.
[207] Santa Margarita GSP, Section 3.7.2.3, p. 365.
[208] Water Code § 10721(x)(1).

the GSA establish sustainable management criteria for all conditions within the Basin regardless of whether drought conditions are occurring or not (see Recommended Corrective Action 4a).

The GSP established minimum thresholds based on historical groundwater elevation data, by using the average of the 5 lowest groundwater measurements at the two RMPs.[209] The data from two existing shallow monitoring wells is utilized to conclude that if groundwater elevations connected to creeks are maintained at or above historical groundwater elevations at these RMPs, there will be no more depletion of surface water than experienced over the past 24 years.[210] The GSP further states that these historic groundwater levels are not thought to have caused undesirable results as defined. However, the GSP acknowledges that GSA has limited knowledge of the impacts of historically low groundwater levels on environmental groundwater users, such as GDEs and aquatic species.[211]

The GSP identified beneficial uses and users of interconnected surface water. The GSP notes that Central Coast Regional Water Quality Control Board policies as well as state and federal laws and regulations designed for the protection and restoration of conditions necessary for steelhead and coho salmon habitat in San Lorenzo River were considered in establishing the depletion of interconnected surface water minimum thresholds.[212] The GSP discusses the City of Santa Cruz, a user of the Basin's surface water and responsible party for habitat conservation in the San Lorenzo River, relies on river base flows would not be impacted because baseflows would remain within historical range to determine the agreed flows if groundwater levels adjacent to the creek are no lower than historical levels.[213]

The GSP acknowledges that GSA has limited knowledge of the impacts of historic low groundwater levels on environmental groundwater users, such as GDEs and aquatic species.[214] The GSP notes that specific sites are selected to be representative of the GDEs within the Basin and will be monitored to evaluate the impacts of groundwater use, projects, or management actions on GDEs.[215]

The GSP establishes measurable objectives for the depletion of interconnected surface water as the annual minimum groundwater levels in each RMP in the fall of water year 2004. The GSP explains that 2004 was selected because 1999-2004 precipitation was close to the long-term precipitation average in the basin of 41 inches/year. [216]

[209] Santa Margarita GSP, Section 3.7.3.1, p. 368.
[210] Santa Margarita GSP, Section 3.7.2.1, p. 361.
[211] Santa Margarita GSP, Section 3.4.2.4, p. 328.
[212] Santa Margarita GSP, Section 3.7.3.6, p. 373.
[213] Santa Margarita GSP, Section 3.7.3.5, p. 372.
[214] Santa Margarita GSP, Section 3.4.2.4, p. 328.
[215] Santa Margarita GSP, Section 3.3.1.5.1.5, p. 299.
[216] Santa Margarita GSP, Section 3.7.4.1, p. 374.

Department staff conclude there appears to be uncertainty regarding what scientific studies, reports, information, and biological, physical, or ecological factors are best suited to use when developing sustainable management criteria in the basin for depletions of interconnected surface water under SGMA. Additionally, there appear to be other state and federal agencies that are or may act under other laws and authorities to address biological or ecological concerns regarding low instream flows in portions of the San Lorenzo River, which appear to be caused by numerous factors of which depletions of interconnected surface waters from groundwater extractions in the basin is only one. Department staff conclude that at this time the GSA has considered this issue and explained and supported its choices adequately. It may be that alternative choices or methodology could also be supported by other studies or data, but it does not appear that there is a clear or convincing case that the GSA's choices or explanation are inappropriate.

Department staff understand that quantifying depletions of surface water from groundwater extractions is a complex task that likely requires developing new, specialized tools, models, and methods to understand local hydrogeologic conditions, interactions, and responses. During the initial review of GSPs, Department staff have observed that most GSAs have struggled with this new requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several years of Plan implementation that includes projects and management actions to address the data gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Accordingly, Department staff believes that affording GSAs adequate time to refine their Plans to address interconnected surface waters is appropriate and remains consistent with SGMA's timelines and local control preferences.

The Department will continue to support GSAs in this regard by providing, as appropriate, financial and technical assistance to GSAs, including the development of guidance describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, the GSA, where applicable, should consider incorporating appropriate guidance approaches into their future periodic updates to the GSP (See Recommended Corrective Action 4b). GSAs should consider availing themselves of the Department's financial or technical assistance, but in any event must continue to fill data gaps, collect additional monitoring data, and implement strategies to better understand and manage depletions of interconnected surface water caused by groundwater extractions and define segments of interconnectivity and timing within their jurisdictional area (See Recommended Corrective Action 4c). Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion (See Recommended Corrective Action 4d).

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.[217] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[218] monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,[219] capture seasonal low and high conditions,[220] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.[221] Department staff encourage GSAs to collect monitoring data as specified in the GSP, follow SGMA data and reporting standards,[222] fill data gaps identified in the GSP prior to the first periodic update,[223] update monitoring network information as needed, follow monitoring best management practices,[224] 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 has developed a monitoring network for the detection of chronic lowering of groundwater levels, reduction of groundwater in storage, depletions of interconnected surface water, degraded water quality, and groundwater dependent ecosystems. The GSP uses the groundwater level monitoring network as a proxy for the depletion of interconnected surface water sustainability indicators.

The GSP has identified 35 monitoring and extraction wells to include in the groundwater levels monitoring network.[225] The GSP also states that nine additional monitoring wells will be included in the existing monitoring network by 2022.[226] The GSP has identified 14 representative monitoring sites (RMS) out of the 35 total wells for the chronic lowering of groundwater levels monitoring network; six RMS for the Santa Margarita Aquifer, one

[217] 23 CCR § 354.32.
[218] 23 CCR § 354.34(b)(2).
[219] 23 CCR § 354.34(b)(3).
[220] 23 CCR § 354.34(c)(1)(B).
[221] 23 CCR §§ 354.34(g-h).
[222] 23 CCR § 352.4 *et seq*.
[223] 23 CCR § 354.38(d).
[224] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
[225] Santa Margarita GSP, Section 3.3.1.1, p 282.
[226] Santa Margarita GSP, Section 3.3.5.1, p 314.

RMS for the Monterey Formation, four RMS for the Lompico Aquifer, one RMS that is screened in both the Lompico and Butano Aquifers, and two RMS for the Butano Aquifer. The proposed monitoring frequency in the Plan is variable with seven wells monitored daily, 19 wells monitored monthly, and nine wells monitored semi-annually.[227] The proposed density of groundwater level monitoring wells meets or exceeds the range (0.2 – 10 wells per 100 square miles) recommended by the Department's Best Management Practices. Department staff note that the Department's Monitoring Network Module displays a total of 36 wells in the groundwater level monitoring network with 14 of those wells being listed as RMS for the chronic lowering of groundwater levels sustainability indicator.

The GSP identified groundwater storage monitoring. The GSP proposes to use metered and unmetered groundwater extractions to monitor the reduction of groundwater storage. The metered groundwater extraction network consists of 24 public small water systems (SWS). The unmetered groundwater extraction network estimates 777 residences in the Basin that are not metered and pumping groundwater. Collective pumping from de minimis wells for domestic supply is estimated to be around 233 AFY based on an annual water use factor of 0.3 acre-feet per year (AFY).[228]As part of GSP implementation, the Agency will implement a metering program that will require non-de-minimis users who pump more than two AFY to meter their wells and provide records to the SMGWA. The Plan did not explain the origin of the 0.3 AFY estimate for the unmetered domestic water use.

The GSP proposes to establish a dedicated degraded water quality monitoring network that consists of 21 wells that consist of public water agency wells and SWS wells with 15 or more connections which will be monitored by member agencies. Department staff observe that Table 3-6 lists 21 degraded water quality monitoring network wells which monitor the following COCs: inorganics, nitrate, arsenic, iron, manganese, and volatile and synthetic organics. Monitoring frequency varies by location and constituent with one year being the longest duration between monitoring events. The GSP has identified nine Representative Monitoring Sites (RMS) out of the 21 total sites for the degraded water quality network; two RMS for the Santa Margarita Aquifer, one RMS for the Monterey Formation, four RMS for the Lompico Aquifer, and two RMS for wells that are screened in both the Lompico and Butano Aquifers.[229]

The GSP has not established a dedicated land subsidence monitoring network because land subsidence is not an applicable indicator of sustainability in the Basin. The GSP states that DWR's InSAR dataset will be reviewed as part of each five-year update to confirm that subsidence is not occurring. The GSP further states that if inelastic or

[227] Santa Margarita GSP, Table 3-2, p. 282.
[228] Santa Margarita GSP, Section 3.3.1.2.2, p. 288.
[229] Santa Margarita GSP, Section 3.3.5.3, p. 322.

permanent land subsidence from groundwater extraction is found to be occurring, it will trigger the need for dedicated subsidence monitoring.[230]

The GSP proposes to establish a dedicated network to monitor depletions of interconnected surface water. The GSP states that there are seven active stream gages that will be a part of the monitoring network.[231] Department staff observed that the four County of Santa Cruz stream gages are measured monthly but only during seasonal baseflow; the remaining gages are measured on an approximately monthly basis. The Plan discusses the installation of one additional stream gage in 2022.

The GSP also uses the groundwater level monitoring network as a proxy for the depletions of interconnected surface water monitoring. The GSP states that two shallow monitoring wells on Bean Creek and Zayante Creek will be used to monitor the depletion of interconnected surface water and, up to five new shallow monitoring wells will be installed to complete the monitoring network.[232] The justification for using groundwater levels as a proxy is that both wells have had water levels that are above their adjacent streambed elevations for over 24 years and, if water levels are kept above historical elevations, there will be no more depletion of surface water then was experienced in the last 24 years. The Plan states that historic groundwater levels are not thought to have caused significant and unreasonable impacts to groundwater dependent ecosystems (GDEs).[233]

The GSP identified data gaps in the Plan for the groundwater level monitoring network which consist of areas of groundwater use but with no historical or current groundwater level data: 1) communities where there are domestic pumpers 2) deep Butano Aquifer, 3) shallow groundwater connected to surface water. The GSP states that nine new monitoring wells are scheduled to be installed by 2022 to assist in filling data gaps.[234] The GSP further states that five of the nine wells will also be used to monitor interconnected surface water impacts.

The GSP's discussion of the density, site selection, and frequency of the monitoring networks is comprehensive and includes adequate support, justification, and information to understand the GSA's process, analysis, and rationale. The GSP includes maps that contains the monitoring network sites and tables which lists the monitoring site type, frequency of measurements, and monitoring site purpose. Staff conclude only that the GSP adequately explains how and why the GSA performed the analyses and arrived at the conclusions it did, and that this effort is within the range of what staff considers professional and acceptable under the circumstances.

[230] Santa Margarita GSP, Section 3.3.1.6, p. 301.
[231] Santa Margarita GSP, Section 3.3.1.4, p. 292.
[232] Santa Margarita GSP, Section 3.3.1.1, p. 285.
[233] Santa Margarita GSP, Section 3.7.2.1, p. 361.
[234] Santa Margarita GSP, Section 3.3.4.1, p. 309.

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.[235] 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. [236]

The GSP describes nineteen projects and one management action. The projects and management actions are organized into three groups and tiers:[237]

- Group 1 projects - Existing projects that are currently being implemented and are expected to continue throughout the GSP implementation period.[238]
- Group 2 projects are currently in the planning phase and are expected to bring the basin into sustainability.[239] The GSP organizes Group 2 projects into three tiers:
    - Tier 1: Projects that rely on existing water sources within the basin
    - Tier 2: Projects that rely on water from existing surface water sources outside the basin
    - Tier 3: Projects that rely on purified wastewater
- Group 3 projects are expected to only be considered if Group 2 projects are unable to bring the basin into sustainability.[240] The GSP states more projects may be considered in the future and added to GSP updates.

The GSP describes Group 1 projects. Group 1 project types include continuing existing water use efficiency, stormwater capture, conjunctive use, and recycled water programs.

The GSP describes Group 2-Tier 1 Projects. Group 2-Tier 1 projects include projects that rely on existing water sources within the Basin.[241] Project types in this group and tier include implementing conjunctive use projects expected to reduce pumping by 510 acre-feet per year,[242] expanding water use efficiency, increasing efficiencies in distribution systems, and replacing old conveyance and storage infrastructure.[243]

The GSP explains the conjunctive use projects it plans to use to maintain sustainability. The GSP estimates that phase 1 will be completed by 2027, providing an average of 227

[235] 23 CCR § 354.44 (a).
[236] 23 CCR § 354.44 (b) *et seq.*
[237] Santa Margarita GSP, Section 4, p. 376.
[238] Santa Margarita GSP, Section 4.2, p. 379.
[239] Santa Margarita GSP, Section 4.3.1, p. 384.
[240] Santa Margarita GSP, Section 4.6, p. 419.
[241] Santa Margarita GSP, Section 4.3.1, p. 384.
[242] Santa Margarita GSP, Section 4.3.6, p. 392.
[243] Santa Margarita GSP, Section 4.3.6, p. 392.

acre-feet per year of pumping reductions.[244] The second phase of the expanded conjunctive use project with Loch Lomond will provide an additional 313 acre-feet per year of treated surface water from Loch Lomond to offset wet season demand and is expected to be completed by 2032.[245]

The GSP provides a summary of the detailed analysis performed by the GSA to evaluate the likelihood of the two conjunctive use projects allowing the Basin to maintain sustainability through 2040.[246] The summary includes estimated water budgets for each aquifer being managed, and projected conditions compared with minimum thresholds at four RMPs. The analysis indicates a change in storage of 300 acre-feet per year is estimated over the 2020-2072 period and that all four of the RMPs analyzed would not reach minimum thresholds prior to 2042. [247]

The GSP describes Group 2-Tier 2 Projects, which are projects that rely on surface water sources from outside the Basin. Group 2-Tier 2 Project types include: Treated surface water from the City of Santa Cruz, and an aquifer storage, and recovery project using the treated water from the San Lorenzo River and North Coast sources.[248]

The GSP describes Group 2-Tier 3 Projects, which are described as alternatives to Group 2-Tier 1 projects. Projects include purified wastewater recharge, which aims to achieve 710 acre-feet per year of recharge to the Lompico Aquifer,[249] and a separate purified wastewater recharge project with anticipated capacity of 710 acre-feet per year of recharge capacity for groundwater use as part of a larger regional project.[250]

Department staff note that the information included in the GSP related to projects and management actions is well described and comprehensive. The GSP identifies both projects that the GSA intends to implement to maintain sustainability and projects that the GSA may use if the planned measures are not sufficient. The GSP carefully evaluated the benefits of its key projects and showed how they improved sustainable management in the Basin. Staff note that while all of the details of the individual projects may not be developed due to varying stages of readiness, the suite of projects presented in the GSP provides a reasonable path for the GSA to implement as they work towards achieving sustainability in the Basin. Staff conclude the projects and management actions section of this GSP substantially complies with the GSP regulations.

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

[244] Santa Margarita GSP, Section 4.3.1.2, pp. 386-387.
[245] Santa Margarita GSP, Section 4.3.1.3, p. 388.
[246] Santa Margarita GSP, Section 4.3.6, pp. 391-398.
[247] Santa Margarita GSP, Table 4-2, p. 394.
[248] Santa Margarita GSP, Section 4.4.1.2, pp. 402-404.
[249] Santa Margarita GSP, Section 4.5.1.1, p. 408.
[250] Santa Margarita GSP, Section 4.5.1.2, p. 409.

sustainability plan or impedes achievement of sustainability goals in an adjacent basin."[251] 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.[252]

The GSP explains that three basins (Santa Cruz Mid-County Basin, Purisima Highlands Subbasin, and West Santa Cruz Terrace Basin) adjoining the Santa Margarita Basin are not likely to be affected by the minimum thresholds established for degradation of groundwater quality[253], changes in groundwater levels[254], and changes in groundwater storage[255] due to a relatively impermeable basement high that separates Santa Margarita basin and Santa Cruz Mid-County Basin, Zayante-Vergeles fault zone that separates Santa Margarita Basin and Purisima Highlands Subbasin, the lack of continuity in the Quarternary deposits of West Santa Cruz Terra Basin to the Santa Margarita Basin.

The GSP explains the lack of connection between the primary aquifer of the neighboring Santa Cruz Mid-County Basin and the Santa Margarita Aquifer as the reason for no impacts of minimum thresholds for the depletion of interconnected surface water will be on the Santa Cruz Mid-County Basin. The GSP also states that the other two neighboring Basins, the Purisima Highlands Subbasin and the West Santa Cruze Terrace Basin, are hydrologically disconnected from Santa Margarita Aquifer; therefore, there is no impact of minimum thresholds set for interconnected surface water in the Santa Margarita Basin on these two neighbor basins.[256]

4.1 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.[257]

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;

[251] Water Code § 10733(c).
[252] 23 CCR § 354.28(b)(3).
[253] Santa Margarita GSP, Section 3.6.3.4, p. 353.
[254] Santa Margarita GSP, Section 3.4.3.4, p. 335.
[255] Santa Margarita GSP, Section 3.5.3.4, p. 342.
[256] Santa Margarita GSP, Section 3.7.3.4, p. 372.
[257] 23 CCR § 354.18.

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[258] to evaluate how their Plan's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the basin.

[258] Water Code § 10609.50.

5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The Santa Margarita Basin 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 Santa Margarita Basin. 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 its 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

The GSA should evaluate beneficial uses and users of the Monterey Formation and consider how changes in groundwater levels in the Monterey Formation may affect domestic well users and GDEs. The GSA should evaluate monitoring in the Monterey Formation and fill any data gaps in areas where beneficial uses are present and monitoring is not present.

RECOMMENDED CORRECTIVE ACTION 2

The GSA should revise the definition of undesirable results to remove the drought year condition or discuss how extractions and recharge will be managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods within the sustainable management criteria for the chronic lowering of groundwater levels.

RECOMMENDED CORRECTIVE ACTION 3

The GSA should revise sustainable management criteria for degraded water quality.

a. Revise the definition of undesirable results for degraded groundwater quality so that exceedances of minimum thresholds caused by groundwater extraction, whether the GSA has implemented pumping regulations or not, are considered in the assessment of undesirable results in the Basin.

b. Revise the sustainable management criteria for degraded water quality to include undesirable results for constituents of concern in the basin identified in the GSP.

RECOMMENDED CORRECTIVE ACTION 4

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, basin-wide pumping is a complex task and that developing suitable tools may take additional time; however, it is critical for the Department's ongoing

and future evaluations of whether GSP implementation is on track to achieve sustainable groundwater management. The Department plans to provide guidance on methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water and support for establishing specific sustainable management criteria in the near future. This guidance is intended to assist GSAs to sustainably manage depletions of interconnected surface water.

In addition, the GSA should work to address the following items by the first periodic update:

a) Revise sustainable management criteria with the removal of the exemption for undesirable results in drought years.

b) Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions.

c) Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.

d) Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA’s jurisdictional area.