



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

January 26, 2023

Marcus Trotta
Santa Rosa Plain Groundwater Sustainability Agency
404 Aviation Boulevard
Santa Rosa, CA 95403
mtrotta@scwa.ca.gov

RE: Santa Rosa Valley – Santa Rosa Plain Subbasin - 2022 Groundwater
Sustainability Plan

Dear Marcus Trotta,

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

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first five-year review of the Santa Rosa Plain Subbasin GSP no later than January 31, 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
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Approval of the Santa Rosa Plain Subbasin GSP

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
APPROVAL OF THE
SANTA ROSA PLAIN SUBBASIN GROUNDWATER SUSTAINABILITY PLAN**

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the Subbasin 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 Rosa Plain Groundwater Sustainability Agency (Agency) for the Santa Rosa Plain Subbasin (Basin No. 1-055.01).

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 Subbasin. (23 CCR § 355.4(a)(3).)
- B. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) "conformance" with the specified statutory requirements, (2)

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“substantial compliance” with the GSP Regulations, (3) whether the Plan is likely to achieve the sustainability goal for the Subbasin within 20 years of the implementation of the Plan, and (4) whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) Application of these standards requires exercise of the Department’s expertise, judgment, and discretion when making its determination of whether a Plan should be deemed “approved,” “incomplete,” or “inadequate.”

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA’s numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above, the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113), and the Legislature’s express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner (Water Code § 10720.1(h)). The Department’s final determination 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 Subbasin 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 Subbasin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)
- D. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with the GSP Regulations, and appears likely to achieve the sustainability goal for the Subbasin. It does not appear at this time that the Plan

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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 conditions at or near 2015 conditions are sufficiently justified and explained. The Plan relies on decades of credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Subbasin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)
2. The Plan demonstrates a thorough understanding of where data gaps exist and demonstrates a commitment to eliminate those data gaps. The GSP establishes a monitoring network and data collection methods to fill data gaps related to delineating the greater extent of geologic formations to better assess groundwater conditions and estimating the quantity and timing of interconnected surface water depletions. Filling these known data gaps, and others described in the Plan, should lead to the 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 reduce water demand, increase groundwater storage, and increase non-groundwater water supply. The projects and management actions are reasonable and commensurate with the level of understanding of the Subbasin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Subbasin's sustainability goal and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)
4. The Plan provides a detailed explanation of how the varied interests of groundwater uses and users in the Subbasin were considered in developing the sustainable management criteria and how those interests, including domestic wells, would be impacted by the chosen minimum thresholds. (23 CCR § 355.4(b)(4).)
5. The Plan's projects and management actions appear feasible at this time and appear likely to prevent undesirable results and ensure that the Subbasin is operated within its sustainable yield within 20 years. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are

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- 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 GSP implementation will be closely coordinated with the neighboring groundwater sustainability agencies in the Petaluma Valley Basin and Sonoma Valley Subbasin. The Plan includes an analysis of potential impacts to adjacent basins related to the established minimum thresholds for each sustainability indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan. (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 eight member agencies, City of Cotati, City of Rohnert Park, City of Santa Rosa, Town of Windsor, Gold Ridge Resource Conservation District, Sonoma Resource Conservation District, County of Sonoma, and Sonoma County Water Agency have historically implemented numerous projects and management actions to address problematic groundwater conditions in the Subbasin. 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 public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

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

1. The Plan considers potential impacts on existing well users in establishing minimum thresholds for chronic lowering of groundwater levels that take into consideration the depths of shallow water supply wells (i.e., domestic, irrigation, industrial, and public supply wells). (Santa Rosa Plain GSP pp. 289-291.) The Plan utilizes a two-pronged approach for setting minimum thresholds which involves both the evaluation of historical low groundwater levels and a statistical analysis of the 98th percentile shallowest supply well depth (98% of wells being deeper than this depth) for wells located in the vicinity of each representative monitoring point. The final established minimum threshold value for each representative monitoring point was based on the shallower elevation between the historical low, minus a calculated drought buffer, or the nearby well impact depth (98th percentile supply well depth plus a saturated thickness factor of 10 feet). 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 Subbasin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and measures to improve understanding and management of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water exist. The GSAs 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 methodology becomes 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.

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Accordingly, the GSP submitted by the Agency for the Santa Rosa Plain Subbasin is hereby **APPROVED**. The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA and the Department therefore recommends the Agency address them by the time of the Department's five-year review, which is set to begin on January 31, 2027, as required by Water Code § 10733.8.

Signed:



Karla Nemeth, Director

Date: January 26, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Santa Rosa Plain Subbasin

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

Groundwater Basin Name: Santa Rosa Valley – Santa Rosa Plain (Basin No. 1-055.01)
Submitting Agency: Santa Rosa Plain Groundwater Sustainability Agency
Submittal Type: Initial GSP Submission
Submission Date: January 29, 2022
Recommendation: Approved
Date: January 26, 2023

The Santa Rosa Plain Groundwater Sustainability Agency (GSA or Agency) submitted the Santa Rosa Plain Subbasin (Subbasin) Groundwater Sustainability Plan (GSP or Plan) to the Department of Water Resources (Department) for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)¹ and GSP Regulations.² The GSP covers the entire Subbasin for the implementation of SGMA.

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

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

This assessment includes five sections:

- **Section 1 – Summary**: Overview of Department staff's assessment and recommendations.
- **Section 2 – Evaluation Criteria**: Describes the legislative requirements and the Department's evaluation criteria.

¹ Water Code § 10720 *et seq.*

² 23 CCR § 350 *et seq.*

³ 23 CCR § 350 *et seq.*

- **[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 Rosa Plain GSP. The GSA has identified areas for improvement of its Plan (e.g., provide more detail related to the monitoring networks to fill data gaps, further delineating the extent of geologic formations within the Subbasin, and addressing data gaps related to interconnected surface water, including estimations of the quantity and timing of surface water depletions). 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) identification of certain surface water imports,
- (2) providing additional details and discussion related to specific components the GSA used to establish chronic lowering of groundwater levels sustainable management criteria,
- (3) continuing to fill data gaps, collecting additional monitoring data, coordinating with resources agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping, and potentially refine sustainable management criteria, and
- (4) providing additional details related to the monitoring networks.

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 requirements⁴ and is likely to achieve the sustainability goal for the Santa Rosa Plain Subbasin.⁵ To achieve the sustainability goal for the Subbasin, the GSP must demonstrate that implementation of the Plan will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.⁶ Undesirable results must be defined quantitatively by the GSAs.⁷ The Department is also required to evaluate whether the GSP will adversely affect the ability of an adjacent basin to implement its GSP or achieve its sustainability goal.⁸

For the GSP to be evaluated by the Department, it must first be determined that the Plan was submitted by the statutory deadline,⁹ and that it is complete and covers the entire basin.¹⁰ If these conditions are satisfied, the Department evaluates the Plan to determine whether it complies with specific SGMA requirements and substantially complies with the GSP Regulations.¹¹ “Substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal.”¹²

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

⁴ Water Code §§ 10727.2, 10727.4.

⁵ Water Code § 10733(a).

⁶ Water Code § 10721(v).

⁷ 23 CCR § 354.26 et seq.

⁸ Water Code § 10733(c).

⁹ 23 CCR § 355.4(a)(1).

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

¹¹ 23 CCR § 350 et seq.

¹² 23 CCR § 355.4(b).

¹³ 23 CCR § 351(h).

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

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

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

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

Even when review indicates that the GSP satisfies the requirements of SGMA and is in substantial compliance with the GSP Regulations, the Department may recommend corrective actions.²⁴ Recommended corrective actions are intended to facilitate progress in achieving the sustainability goal within the Subbasin 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 engineering analysis of that information. The staff recommendation to approve a Plan

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.*

does not signify that Department staff, were they to exercise the professional judgment required to develop a GSP for the Subbasin, would make the same assumptions and interpretations as those contained in the Plan, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSA are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review and approval of the Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.²⁷ Also, GSAs have an ongoing duty to provide reports to the Department, periodically reassess their plans, and, when necessary, update or amend their plans.²⁸ The passage of time or new information may make what is reasonable and feasible at the time of this review to not be so in the future. The emphasis of the Department's periodic reviews will be to assess the progress toward achieving the sustainability goal for the basin and whether Plan implementation adversely affects the ability of adjacent basins to achieve their sustainability goals.

3 REQUIRED CONDITIONS

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

3.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority and not subject to critical conditions of overdraft to submit a GSP no later than January 31, 2022.²⁹

The GSA submitted its Plan on January 29, 2022.

3.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a GSP if that GSP is complete and includes the information required by SGMA and the GSP Regulations.³⁰

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

²⁷ Water Code § 10733.8; 23 CCR § 355.6.

²⁸ Water Code §§ 10728 et seq., 10728.2.

²⁹ Water Code § 10720.7(a)(2).

³⁰ 23 CCR § 355.4(a)(2).

required information, sufficient to warrant a thorough evaluation by the Department.³¹ The Department posted the GSP to its website on February 7, 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 Rosa Plain Subbasin and the jurisdictional boundary of the submitting GSA fully contains the Subbasin.³⁴

4 PLAN EVALUATION

As stated in Section 355.4 of the GSP Regulations, a Subbasin “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 Subbasin. The Department staff’s evaluation of the likelihood of the Plan to attain the sustainability goal for the Subbasin is provided below.

4.1 ADMINISTRATIVE INFORMATION

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, a description of the Plan area, and a demonstration of the legal authority and ability of the submitting Agency to develop and implement a Plan for that area.³⁵

The GSP states that the Santa Rosa Plain GSA has exclusive GSA status for the Plan area, and “no other GSAs have jurisdiction within the Subbasin.”³⁶ 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

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/136>.

³³ Water Code § 10727(b); 23 CCR § 355.4(a)(3).

³⁴ Santa Rosa Plain GSP, Section 2.1, p. 80.

³⁵ 23 CCR § 354.2 *et seq.*

³⁶ Santa Rosa Plain GSP, Section 1.3.1, p. 70.

for the initial five years are \$1.2 million.³⁷ Funding for GSP implementation will come from state grants, financing, project beneficiaries and partners, and fees collected from all groundwater pumpers.³⁸

The Santa Rosa Plain Subbasin is located between the Mendocino Range to the west and the Mayacamas and Sonoma Mountains to the east, and encompasses 80,000 acres.³⁹ The agencies located within the Subbasin's boundaries and with jurisdiction include the following: Sonoma County; Sonoma County Water Agency; the cities of Cotati, Rohnert Park, Santa Rosa, and Sebastopol; the town of Windsor; and the Resource Conservation Districts of Gold Ridge and Sonoma.⁴⁰ Land use within the Subbasin includes urban, residential, commercial, and industrial (36%); native vegetation or water (35%); and irrigated and non-irrigated agriculture (26%).⁴¹ The GSP states that the primary water sources are groundwater, imported and local surface water, and recycled water.⁴² A map showing the Subbasin boundary along with adjacent basins is shown in Figure 1 below.

³⁷ Santa Rosa Plain GSP, Sections ES.7.1 and 7.1-7.2.8, pp. 29-30 and 396-412.

³⁸ Santa Rosa Plain GSP, Sections ES.7.2 and 7.3-7.3.1, p. 31 and pp. 412-413.

³⁹ Santa Rosa Plain GSP, Section ES.2, p. 9, Section 2.1, p. 80, Figure 2-1, p. 81.

⁴⁰ Santa Rosa Plain GSP, Section 2.1, p. 83.

⁴¹ Santa Rosa Plain GSP, Section 2.2, p. 85, Figures 2-a to 2-c, pp. 86-88.

⁴² Santa Rosa Plain GSP, Sections 2.3-2.3.4, pp. 85 and 89-91, Figure 2-5, p. 89.

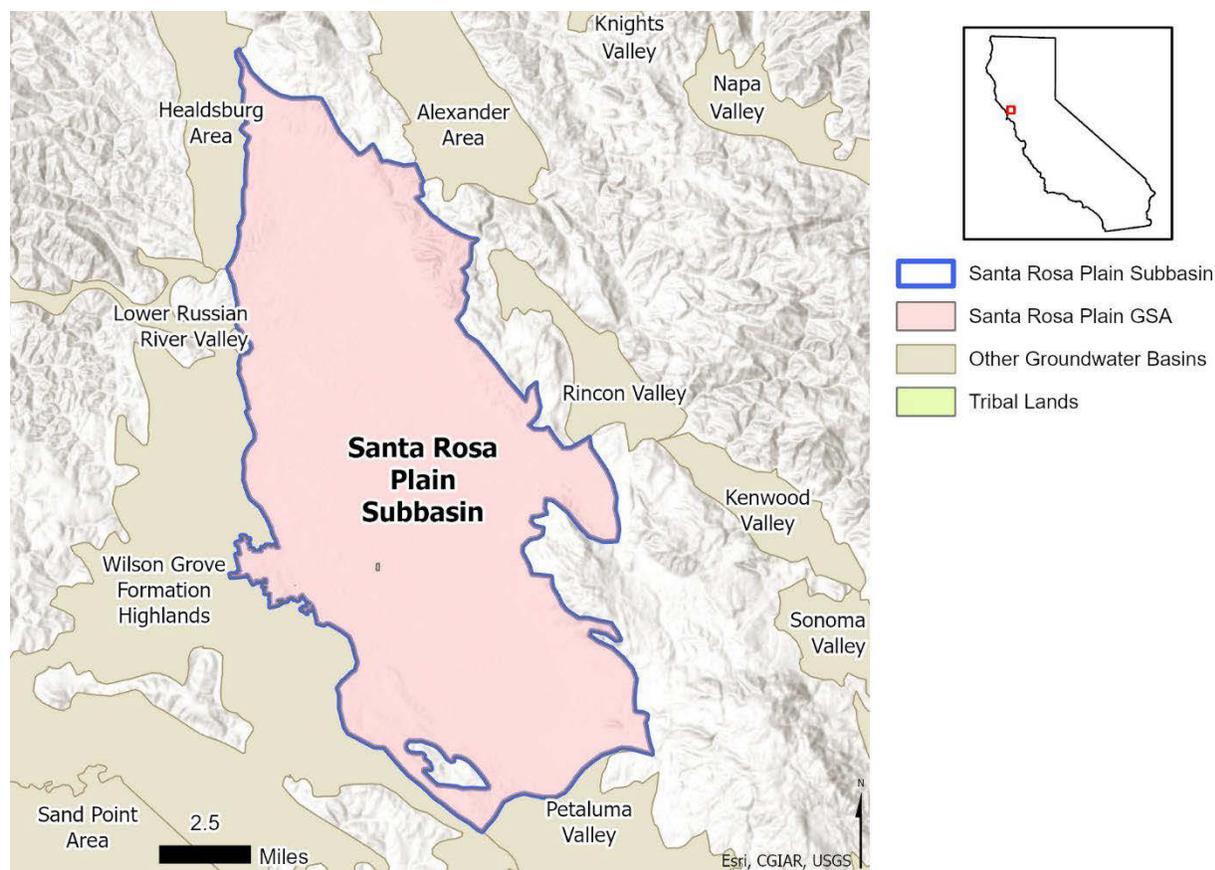


Figure 1: Santa Rosa Plain Subbasin Location Map.

The Plan describes in some detail the GSA’s authority to manage groundwater in the Subbasin, 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 Subbasin. The Agency provides a list of public meetings, materials, and notifications on its website, and lists of meetings 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 Subbasin and current conditions of the Subbasin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the Subbasin, including historical, current, and projected water budget conditions.⁴³

4.2.1 Hydrogeologic Conceptual Model

The GSP Regulations require a descriptive hydrogeologic conceptual model of the Subbasin that includes a written description supported by cross sections and maps.⁴⁴ 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.⁴⁵

The primary water sources within the Subbasin are groundwater, imported surface water, local surface water, and recycled water. According to the Plan, groundwater within the Subbasin supplies various beneficial uses and users, including stream baseflow, groundwater-dependent ecosystems (GDEs), domestic wells, irrigation wells, industrial wells, and public water-supply for various districts and municipalities.⁴⁶

The Plan describes two principal aquifers beneath the Subbasin, differentiating between a shallow and a deep aquifer system.⁴⁷ Extending up to 200 feet deep, the shallow aquifer system is generally comprised of Quaternary alluvial deposits and the Glen Ellen Formation, except along the Subbasin margins where the Wilson Grove and Petaluma Formations predominate.⁴⁸ The shallow aquifer is characterized as hydraulically connected to streams and surface waters on a local and seasonal basis. The deep aquifer system is comprised of confined and semiconfined conditions within the Wilson Grove Formation, Petaluma Formation, and Sonoma Volcanics. The Plan states that the deep aquifer, situated approximately 200 feet below land surface, does not have a distinct boundary between the deep aquifer system and the shallow aquifer system. However, the GSP states that the characteristics of the deep aquifer and the boundary between the two aquifer systems will continue to be evaluated as new information and data are developed.⁴⁹

⁴³ 23 CCR § 354.12 *et seq.*

⁴⁴ 23 CCR § 354.12 *et seq.*

⁴⁵ 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.

⁴⁶ Santa Rosa Plain GSP, Section 3.1.5.3, p. 144.

⁴⁷ Santa Rosa Plain GSP, Section 3.1.5, p. 139.

⁴⁸ Santa Rosa Plain GSP, Section 3.1.5, pp. 139-140.

⁴⁹ Santa Rosa Plain GSP, Section 3.1.5, p. 141.

Groundwater recharges the shallow aquifer system from rainfall and interconnected streams throughout the Subbasin. The deep aquifer system is recharged from vertical flow from the shallow aquifer as well as rainfall and surface water infiltration along the mountain-front margins of the Santa Rosa Valley.⁵⁰ The Plan provides a map showing the “natural recharge potential” of the Subbasin and contributing watershed. The recharge potential is indicative of the potential for groundwater recharge via rainfall based on weighted factors such as soil permeability, slope, and shallow geologic unit permeability. Natural recharge potential within the Subbasin is highest in the Glen Ellen Formation and areas of lower elevation that are underlain by the Wilson Grove Formation. Recharge is lower in the areas of greater elevation that are underlain by igneous formations, such as the Sonoma Volcanics.⁵¹

The information provided in the GSP that comprises the hydrogeologic conceptual model substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan’s descriptions of the regional geologic setting, the Subbasin’s physical characteristics, the principal aquifer, and hydrogeologic conceptual model appear to utilize the best available science. Department staff are aware of no significant inconsistencies or contrary technical information presented in the Plan.

4.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the applicable sustainability indicators and groundwater dependent ecosystems.⁵²

The GSP provided a total of 26 hydrographs that depict long-term groundwater elevations for the principal aquifers.⁵³ The period of records for hydrographs provided in the GSP vary, but generally begin in the 1990s, some begin as early as the mid-1970s, and extend through 2020. Hydrographs representing groundwater conditions in the shallow and deep aquifers indicate generally stable groundwater levels throughout the Subbasin. The Plan states that instances of groundwater level decline have occurred in the Subbasin, particularly between the late 1970s to the early 1990s in the Rohnert Park-Cotati area and west of the City of Santa Rosa.⁵⁴ The GSP associates these declines with increased municipal groundwater pumping attributed to population growth in the 1980s and 1990s and droughts in 1976-1977 and 1987-1992.⁵⁵ Groundwater levels recovered to pre-1970s levels in the early 2000s as Sonoma County Water Agency increased surface water deliveries to the Santa Rosa Plain.⁵⁶ In the deep aquifer historical low groundwater levels generally occurred around 1990, with historical highs around 2010. Historical highs in the shallow aquifer are difficult to identify due to the stable nature of the hydrographs;

⁵⁰ Santa Rosa Plain GSP, Section 3.1.7.1, p. 146.

⁵¹ Santa Rosa Plain GSP, Figure 3-6, p. 147.

⁵² 23 CCR § 354.16 (a-f).

⁵³ Santa Rosa Plain GSP, Figures 3-11a to 3-11d, pp. 166-169.

⁵⁴ Santa Rosa Plain GSP, Figure 3-11a, p. 166.

⁵⁵ Santa Rosa Plain GSP, Section 3.2.2.1, p. 154.

⁵⁶ Santa Rosa Plain GSP, Figure 3-9b, p. 156.

however, shallow aquifer hydrographs with the most variance display a historical high around 2010 and a historical low around 1990.

The GSP includes a description of the change in groundwater storage and graphs depicting the change in storage demonstrating the annual and cumulative change in volume of groundwater storage.⁵⁷ The GSP states that the historical total average estimated groundwater storage loss is approximately 600 acre-feet per year since water year 1976.⁵⁸ The GSP includes a description of current and historical groundwater quality issues including maps and has identified general minerals, major-ions, total dissolved solids (TDS), specific conductance, arsenic, nitrate, and chloride as the water quality constituents of interest from previous studies in the Subbasin.⁵⁹ The GSP states that groundwater quality is “highly variable throughout the Subbasin and contributing watershed area and is generally acceptable for beneficial uses”.⁶⁰ Poor groundwater quality within the Subbasin is associated with anthropogenic inputs associated with land use, deep connate waters in Tertiary sedimentary units, and hydrothermal fluids associated with the Sonoma Volcanics or fault zones.⁶¹ The GSP states that the Subbasin is located far from coastal areas and that seawater intrusion is not a relevant sustainability indicator for the Subbasin.⁶² The GSP includes a description of current and historical land subsidence conditions, along with maps, in the Subbasin.⁶³ The maps of current land subsidence covers the extent, cumulative total, and annual rate of subsidence in the Subbasin. The GSP states that current and historical subsidence monitoring data collected in the Subbasin suggest that groundwater extraction induced inelastic subsidence has not occurred.⁶⁴

The GSP identifies the Russian River and its major tributaries as surface water bodies that are interconnected to groundwater within the Subbasin. Interconnected surface water was evaluated utilizing direct measurements and modeling estimates to determine a scoring system that would classify how likely surface water bodies were connected to groundwater. The GSA acknowledges that limited data was available to conduct the analysis and that the model’s output dataset is limited in its conclusions. The GSP identifies the limited dataset as a data gap for the depletion of interconnected surface water sustainability indicator. The GSP states that the characterization of interconnection between surface water and groundwater will continue to be evaluated and refined as additional data and information are acquired during GSP implementation.⁶⁵

⁵⁷ Santa Rosa Plain GSP, Section 3.2.3, p. 181, pp. 232-235, Figure 3-32, p. 235 and Table 3-11, p. 235.

⁵⁸ Santa Rosa Plain GSP, Table 3-11, p. 235.

⁵⁹ Santa Rosa Plain GSP, Section 3.2.5, pp. 187-201 and Figures 3-15a to 3-15h, pp. 191, 193-198, 200.

⁶⁰ Santa Rosa Plain GSP, Section 3.2.5, p. 187.

⁶¹ Santa Rosa Plain GSP, Section 3.2.5, p. 187.

⁶² Santa Rosa Plain GSP, Section 4.7, p. 306.

⁶³ Santa Rosa Plain GSP, Section 3.2.4, pp. 181-186, Figures 3-14a to 3-14e, pp. 183-186.

⁶⁴ Santa Rosa Plain GSP, Section 3.2.4, pp. 184-185.

⁶⁵ Santa Rosa Plan GSP, Section 3.2.6.3, p. 211.

The Plan sufficiently describes the historical and current groundwater conditions throughout the Subbasin, and the information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

4.2.3 Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical; current; and projected water budget conditions, and the change in the volume of water stored, as applicable.⁶⁶

The Plan provides a water budget using the Santa Rosa Plan Hydrologic Model (SRPHM) and contains a model simulation for water years 1976 through 2018. The SRPHM was developed by the United States Geological Survey (USGS) using GSFLOW, a coupled groundwater -surface water flow model based on the integration of the Precipitation-Runoff Modeling System and the 2005 Modular Groundwater Flow Model (MODFLOW).

Department staff conclude the historical, current, and projected water budgets included in the Plan substantially comply with the requirements outlined in the GSP Regulations. The GSP provides the required historical, current, and future accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Subbasin including an estimate of the sustainable yield of the Subbasin and projected future water demands.

While the water budget described in the GSP substantially complies with the GSP Regulations, Department staff note a missing component related to the inclusion of surface water inputs to the SRPHM. The GSP states that imported surface water from the Russian River accounts for 45 percent of the water supply in the Subbasin. However, this import of surface water to the Santa Rosa Plain appears to be missing from the historical water budget and projected water budget presented in the GSP. Department staff believe this is important because, as mentioned, water imported from the Russian River is a major source of water for the Subbasin, primarily supplying water for urban areas. Surface water from the Russian River may contribute to other parts of the water budget including recycled water or discharge to streams. Since groundwater is a supplemental water source for the Subbasin, there is the potential for its use to increase when surface water is not available. As a result, quantifying surface water availability or reliability is important to the historical and projected water budgets. Department staff conclude the GSA should quantify the volume of water imported from the Russian River to the Subbasin in the historic and projected water budgets (See [Recommended Corrective Action 1](#)).

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

⁶⁶ 23 CCR § 354.18.

thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.⁶⁷

There are no management areas proposed within the Plan area.

4.3 SUSTAINABLE MANAGEMENT CRITERIA

GSP Regulations require each Plan to include a sustainability goal for the Subbasin 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 Subbasin including the process by which the GSA characterizes undesirable results and establishes minimum thresholds and measurable objectives for each applicable sustainability indicator.⁶⁸

4.3.1 Sustainability Goal

The GSP describes the sustainability goal as to “adaptively and sustainably manage, protect, and enhance groundwater resources, while allowing for reasonable and managed growth through: careful monitoring of groundwater conditions; close coordination and collaboration with other entities and regulatory agencies that have a stake or role in groundwater management in the Subbasin; and a diverse portfolio of projects and management actions that ensure clean and plentiful groundwater for future uses and users in an environmentally sound and equitable manner.”⁶⁹

The GSP states that available data and model projections documented in the Subbasin Setting section of the GSP indicate that current and future groundwater conditions are generally acceptable and indicates the early stages of GSP implementation will focus on conservation and efficiency, aquifer storage and recovery projects, and stormwater capture and managed aquifer recharge.⁷⁰ In describing the measures to achieve the Subbasin’s sustainability goal, the GSA intends to implement an “adaptive management strategy, which will allow the GSA to react to the progress and outcomes of projects and management actions implemented in the Subbasin and to make management decisions to redirect efforts in the Subbasin as necessary to more effectively achieve the sustainability goal.”⁷¹

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.⁷² Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable

⁶⁷ 23 CCR § 345.20.

⁶⁸ 23 CCR § 354.22 *et seq.*

⁶⁹ Santa Rosa Plain GSP, Section 4.2, p. 277.

⁷⁰ Santa Rosa Plain GSP, Section 4.2, pp. 277-278.

⁷¹ Santa Rosa Plain GSP, Section 4.2, p. 278.

⁷² 23 CCR § 351(ah).

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 water⁷³ – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

The following subsections thus consolidate three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives. Information, as presented in the Plan, pertaining to the processes and criteria relied upon to define undesirable results applicable to the Subbasin, as quantified through the establishment of minimum thresholds, are addressed for each sustainability indicator. However, 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 Subbasin.⁷⁴

4.3.2.1 Chronic Lowering of Groundwater Levels

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.⁷⁵

For the chronic lowering of groundwater levels, the GSP's goals are (1) maintaining groundwater levels within or near historical conditions (i.e., above historical low groundwater levels) while accounting for future droughts and climate variability in areas with stable conditions; and (2) maintaining groundwater levels at current conditions and above historic lows in areas with declining or recovering trends. The Plan describes the significant and unreasonable chronic lowering of groundwater levels as conditions that limit the ability of domestic, municipal, and agricultural well owners from accessing groundwater, declining groundwater levels near the Subbasin boundaries that impacts neighboring basins and lowering groundwater levels to the point of causing impacts to groundwater dependent ecosystems.⁷⁶

The GSP states that an undesirable result would occur when groundwater levels in 10 percent of the representative monitoring points in either the shallow aquifer system or deep aquifer system exceed their specific minimum threshold for three consecutive fall measurements. The GSP further explains that an undesirable result would not be

⁷³ Water Code § 10721(x).

⁷⁴ 23 CCR § 354.26(d).

⁷⁵ 23 CCR § 354.28(c)(1).

⁷⁶ Santa Rosa Plain GSP, Section 4.5, pp. 284-285.

occurring if minimum threshold exceedances are caused by emergency operational issues or droughts that extend for longer than the 4-year drought factor incorporated into establishing the minimum thresholds. However, an undesirable result would occur under these circumstances if groundwater levels do not recover above the minimum threshold during future normal and/or wet years following periods of drought.⁷⁷ The GSP, however, provides little discussion of the process, information, and data considered when presenting the discussion of what constitutes emergency operations. Department staff recognize the GSP includes a description of what Sonoma County considers drought conditions;⁷⁸ however, the lack of information related to how the 4-year drought period correlates with emergency operational issues makes it difficult for Department staff to understand how the GSA intends to manage the Subbasin during extended dry periods (i.e., drought conditions exceeding the 4-year drought buffer analysis). SGMA also identifies “overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.”⁷⁹ Department staff recommend providing further explanation and description related to emergency operations and the potential effects on beneficial uses and users if conditions extend beyond the 4-year drought factor (see [Recommended Corrective Action 2](#)).

The GSP outlines potential effects of undesirable results for chronic lowering of groundwater levels on beneficial users as the inability to supply groundwater to meet water demands for a significant amount of private, agricultural, municipal, and industrial production wells. These beneficial users include domestic well users, irrigation well users, and public water supply well users. The GSP further explains that the chronic lowering of groundwater levels reduces the saturated thickness of aquifers leading to increased pumping costs, reduction in pumping capacity, and/or the need to install deeper groundwater wells.⁸⁰

The GSP defines minimum thresholds for the chronic lowering of groundwater levels at 14 shallow aquifer and 12 deep aquifer representative monitoring points. The GSP explains the methodology to establish the minimum thresholds included evaluation of historical groundwater elevation data, depths and locations of existing wells, maps of current and historical groundwater elevation data, input from stakeholders, and results from modeling future conditions. The GSP further explains that the minimum thresholds set at each representative monitoring point are based on three criteria:

1. Identifying the lowest historical groundwater elevation
2. Calculation of well impact depths in the vicinity of each monitoring point

⁷⁷ Santa Rosa Plain GSP, Section 4.5.4.1, p. 301.

⁷⁸ Santa Rosa Plain GSP, Appendix 4-B, p. 1040.

⁷⁹ Water Code § 10721(x)(1).

⁸⁰ Santa Rosa Plain GSP, Section 4.5.4.3, p. 302.

3. Calculation of a drought factor used as an additional buffer⁸¹

Per the GSP, the methodology for incorporating the potential impacts on existing well users involved the statistical evaluation of known well construction information for all water supply wells (i.e., domestic wells, irrigation wells, public supply wells, and industrial wells) located within the vicinity of each potential representative monitoring point. The minimum threshold was set at the 98th percentile shallowest supply well depth, plus a saturated thickness factor of 10 feet, for wells located in the vicinity of the representative monitoring point.⁸² The GSP does not disclose the total number of wells that fall outside of the 98th percentile that could be potentially impacted. Additionally, the GSP does not describe how the 10-foot saturated thickness value was established. Department staff find that including this information in the GSP will provide additional technical details supporting the description of how the GSA established the sustainable management criteria for chronic lowering of groundwater levels (see [Recommended Corrective Action 3](#)).

The methodology for the drought buffer was based on either historical 4-year declines during historically dry periods or simulated declines for wells with less than 10 years of data. The drought buffer was then subtracted from the historical lows. The calculated drought buffers range from 2 to 17 feet.⁸³

The final established minimum threshold value for each representative monitoring point was based on the shallower of the historical groundwater low with the drought buffer, or the calculated well impact depth in the vicinity of the monitoring point. The historic low groundwater level minus the 4-year drought buffer was used as the minimum threshold for 21 of the representative monitoring points. For the remaining five representative monitoring points the well impact depth was used.⁸⁴

Additionally, the GSP established “warning-level thresholds” for four representative monitoring points that had historical declines exceeding 100 feet. The warning-level thresholds were established primarily around areas of historic municipal pumping – one in the vicinity of production wells operated by Sonoma Water Agency and three in the City of Rohnert Park. The GSP explains that the thresholds were developed due to uncertainties associated with well depth data collected at these locations, uncertainties as to whether historical lows could cause undesirable results, and, for wells near Rohnert Park, the presence of groundwater extractors that do not have existing groundwater production restrictions. The warning level-thresholds are groundwater elevations shallower than the established minimum threshold and were calculated using the mean historical seasonal lows from 1998 to 2004 for representative monitoring points in Rohnert Park representing periods after significant drought but prior to full recovery. The threshold for the representative monitoring point near Sonoma Water Agency’s production wells

⁸¹ Santa Rosa Plain GSP, Section 4.5.2.1, p. 289.

⁸² Santa Rosa Plain GSP, Section 4.5.2.1, p. 289.

⁸³ Santa Rosa Plain GSP, Section 4.5.2.1, p. 291.

⁸⁴ Santa Rosa Plain GSP, Section 4.5.2.1, p. 291.

was calculated using mean historical seasonal lows for 2014 and 2015, a period where Sonoma Water Agency’s wells were activated to address local drought conditions.⁸⁵

The measurable objective for representative monitoring sites with stable conditions is established at the historical median spring groundwater elevation. The GSP explains that for representative monitoring points that have stable long-term groundwater level trends the goal is to maintain groundwater levels within the historical range. For representative monitoring points that have recovering conditions as a result of historic groundwater level declines the measurable objectives are set at the median spring groundwater level during the most recent 5- or 10-year period based on whether the monitoring point has increasing trends or is beginning to recover from declining trends. The GSP states the interim milestones are equivalent to the measurable objectives being that the goal is to maintain recent or current conditions.⁸⁶

Department staff conclude that the sustainable management criteria for groundwater levels is commensurate with the understanding of current conditions, responsive to interested party feedback, and reasonably protective of the groundwater uses and users in the Subbasin. The approach to maintain stable groundwater level conditions in wells with no history of declines and maintain recovering trends in wells that have had historic declining water levels is a reasonable approach that will help avoid a significant and unreasonable depletion of supply in the Subbasin. The Plan provides a credible and sufficient assessment of the impacts the minimum thresholds would have on supply wells – including domestic wells – by evaluating the well impact depth and comparing that to the historic low with a drought factor to establish the minimum thresholds at individual representative monitoring points. However, as highlighted in the recommended corrective actions above, the GSP should include some additional supporting technical details that provides further description as to how the minimum thresholds will help the GSA achieve its sustainability goal and avoid undesirable results as identified in the recommended corrective actions.

4.3.2.2 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 Subbasin 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 Subbasin, calculated based on historical trends, water year type, and projected water use in the Subbasin.⁸⁷

The GSP describes a significant and unreasonable reduction of groundwater storage as conditions that would result in “impacts on long-term sustainable beneficial use of

⁸⁵ Santa Rosa Plain GSP, Section 4.5.2.1, p. 295.

⁸⁶ Santa Rosa Plain GSP, Section 4.5.3, p. 300.

⁸⁷ 23 CCR § 354.28(c)(2).

groundwater in the basin, as caused by: long-term reductions in groundwater storage; and pumping exceeding the sustainable yield.”⁸⁸

The GSP states that “based on well-established hydrogeologic principles, stable groundwater elevations maintained above the minimum threshold will indicate that groundwater storage is not being depleted.” The GSP further describes chronic lowering of groundwater levels criteria and representative monitoring points will be used as a proxy for groundwater storage sustainable management criteria.⁸⁹ The GSP states that an undesirable result for the reduction of groundwater storage will occur if groundwater levels in 10 percent of the representative monitoring points in either aquifer system exceeds their minimum thresholds for three consecutive fall measurements.⁹⁰

The GSP explains that the effects of the reduction of storage minimum thresholds on beneficial uses and users are equivalent to the potential effects caused by the chronic lowering of groundwater levels.

The measurable objective for the change in storage sustainability indicator was defined using groundwater levels as a proxy.⁹¹ Thus, the change in storage measurable objective is equivalent to the chronic lowering of groundwater levels measurable objective. While groundwater levels are used as a proxy instead of using the total volume of groundwater extracted, the measurable objective will require that groundwater levels either increase or are maintained at their current levels. The measurable objective will necessitate that extraction within the Subbasin will remain within the estimated sustainable yield.⁹²

Based on review of the materials referenced in the GSP, staff find that the GSP’s discussion and presentation of information related to significant and unreasonable reduction of groundwater storage, including the rationale that maintaining stable groundwater levels indicates groundwater storage is not being reduced, covers the specific items listed in the GSP Regulations in an understandable format using appropriate data.

4.3.2.3 *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.⁹³

The GSP states that the Subbasin does not border the Pacific Ocean, bays, deltas, or inlets and therefore seawater intrusion is not an applicable sustainability indicator; therefore, sustainable management criteria are not established.⁹⁴

⁸⁸ Santa Rosa Plain GSP, Section 4.6.1, p. 303

⁸⁹ Santa Rosa Plain GSP, Section 4.6, p. 302.

⁹⁰ Santa Rosa Plain GSP, Section 4.6.4, p. 305.

⁹¹ Santa Rosa Plain GSP, Section 4.6.3, p. 305.

⁹² Santa Rosa Plain GSP, Section 4.6.3.2, p. 305.

⁹³ 23 CCR § 354.28(c)(3).

⁹⁴ Santa Rosa Plain GSP, Section 4.7, p. 306.

Department staff concur with the rationale for not setting sustainable management criteria for seawater intrusion.

4.3.2.4 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 Subbasin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the Subbasin.⁹⁵

The GSP states that significant and unreasonable conditions for degraded water quality would occur if an increase in the concentrations of constituents of concern lead to adverse impacts on beneficial uses and users due to (1) direct actions by Santa Rosa Plain GSP projects or management actions and/or (2) undesirable results occurring for other sustainability indicators.⁹⁶ Three constituents of concern – arsenic, nitrate, and TDS – were identified in the GSP based on three criteria, including: whether the constituents have an established state and/or federal water quality standard; whether the constituents have occurred in the Subbasin above the standard; and whether the constituent is present throughout the Subbasin. The GSP explains that point source contaminants are not observed on a regional extent and are regulated and monitored through other regulatory programs, so the GSP does not consider localized point source contaminants constituents of concern in the GSP. The GSP states the GSA will coordinate with other regulatory agencies to evaluate water quality conditions.⁹⁷

The GSP explains an undesirable result for degraded water quality occurs when a single minimum threshold is exceeded, based on a calculated annual average, during two consecutive years.⁹⁸ The GSP outlines potential causes of undesirable results, including: changes in the locations and rates of groundwater extraction implemented under the GSP; active recharge or captured runoff dynamics; recharge of groundwater with elevated constituent of concern concentrations; and the exceedance of an undesirable result for other sustainability indicators may lead to an undesirable result for degraded water quality.⁹⁹

The GSP describes evaluation methods that the GSA will take following a minimum threshold exceedance but prior to the occurrence of an undesirable result. The evaluation includes investigating projects or actions by the GSA that may have caused the exceedance and determining if undesirable results occurred for any other sustainability

⁹⁵ 23 CCR § 354.28(c)(4).

⁹⁶ Santa Rosa Plain GSP, Section 4.8.1, p. 306.

⁹⁷ Santa Rosa Plain GSP, Section 4.8.1, p. 307.

⁹⁸ Santa Rosa Plain GSP, Section 4.8.4.1, p. 317.

⁹⁹ Santa Rosa Plain GSP, Section 4.8.4.2, p. 317.

indicator that may be linked to the exceedance.¹⁰⁰ The GSP discusses the effects of undesirable results related to degraded water quality on beneficial uses and users. Degraded water quality would diminish drinking water supply due to the exceedance of drinking water standards and impact domestic well users, irrigation well users, and public water supply users.¹⁰¹

The GSP establishes minimum thresholds based on a number of supply wells exceeding the water quality standard for the constituents of concern. The supply wells are described as public supply wells where the constituents of concern will be monitored against the maximum contaminant level or secondary maximum contaminant level, depending on the constituent of concern. The GSP explains that a review of available data between 2015 and 2019 provided the total number of wells that had maximum contaminant level exceedances. The GSP further states that the minimum threshold for each of the three constituents of concern – arsenic, nitrate, and TDS – is established at two additional supply wells exceeding the maximum contaminant level for arsenic and nitrate and the secondary contaminant level for TDS. For example, the GSPs analysis of water quality data between 2015 and 2019 indicated 21 wells had exceeded the regulatory standard for arsenic (i.e., the maximum contaminant level); therefore, the minimum threshold is established at 23 wells exceeding the regulatory standard.¹⁰²

The GSP states that minimum thresholds maintain water quality for irrigation as they are below thresholds known to be harmful to crops associated with the Subbasin. The GSP also explains the minimum thresholds relationship with the other sustainability indicators, the possible effects on neighboring basins, and the effects on each beneficial use and user in the Subbasin.

The GSP states that the minimum thresholds for degraded water quality will not negatively impact neighboring basins and subbasins due to the minimum thresholds' goal of preventing elevated concentrations from migrating.¹⁰³ The GSP discusses the effect of the minimum thresholds on beneficial uses and users, including agricultural land, urban land, domestic land, and ecological land uses and users.¹⁰⁴

The GSP states that the measurable objectives for the degraded water quality sustainability indicator are the number of existing supply wells that exceeded the maximum contaminant level or secondary maximum contaminant level from 2015 to 2019.¹⁰⁵ The goal of the measurable objective is to not have additional supply wells exceed their applicable state and federal regulatory criteria for the constituents of concern. The GSP states that interim milestones for degraded water quality are identical

¹⁰⁰ Santa Rosa Plain GSP, Section 4.8.4.2, p. 317.

¹⁰¹ Santa Rosa Plain GSP, Section 4.8.4.3, p. 318.

¹⁰² Santa Rosa Plain GSP, Table 4-7, p. 310.

¹⁰³ Santa Rosa Plain GSP, Section 4.8.2.6, p. 315.

¹⁰⁴ Santa Rosa Plain GSP, Section 4.8.2.7, p. 315.

¹⁰⁵ Santa Rosa Plain GSP, Section 4.8.3, p. 316.

to measurable objective being that the measurable objectives are set at current conditions.¹⁰⁶

Based on review of the GSP's discussion of the establish sustainable management criteria, Department staff find that the GSP's discussion and presentation of information on degradation of water quality covers the specific items listed in the regulations in an understandable format using appropriate data.

4.3.2.5 Land Subsidence

The GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.¹⁰⁷ 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 Subbasin, 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 Subbasin that defines the minimum threshold and measurable objectives.¹⁰⁸

The GSP states that available State-wide datasets do not indicate the occurrence of inelastic land surface subsidence due to groundwater extraction within the Subbasin. Additionally, no local stakeholders have reported damage to infrastructure or modified drainage patterns due to subsidence. The GSP defines significant and unreasonable subsidence as any rate of future inelastic subsidence caused by groundwater pumping.¹⁰⁹

The GSP states that "a land subsidence undesirable result will occur if:

- The land subsidence minimum threshold of 0.1 foot of total subsidence is exceeded over a geographic area of 25 acres in a single year.
- Cumulative total subsidence of 0.2 foot is exceeded over a geographic area of 25 acres within a five-year period.
- The minimum threshold exceedance is determined to be correlated with: (1) groundwater pumping and (2) a minimum threshold exceedance of the chronic lowering of groundwater levels sustainable management criteria."

The GSP's goal for land subsidence is zero inelastic subsidence, which would be measured by satellite via Interferometric Synthetic Aperture Radar (InSAR). However, the GSP describes that InSAR contains a 0.1-foot potential error in its data processing, therefore the GSP establishes the minimum threshold for land subsidence at 0.1 feet per year of inelastic subsidence for approximately 2.5-acre grids throughout the Subbasin.¹¹⁰

¹⁰⁶ Santa Rosa Plain GSP, Section 4.8.3.2, p. 316.

¹⁰⁷ 23 CCR § 354.28(c)(4).

¹⁰⁸ 23 CCR § 354.28(c)(4)(A-B).

¹⁰⁹ Santa Rosa Plain GSP, Section 4.9.1, p. 320.

¹¹⁰ Santa Rosa Plain GSP, Section 4.9.2, p. 320.

The GSP defines the measurable objective for land subsidence in the Subbasin as the minimum threshold, given that the zero-subsidence related to groundwater extraction is the minimum threshold. The interim milestones for the land subsidence sustainability indicator are identical to the measurable objectives and minimum threshold.¹¹¹

Department staff find that the GSP adequately describes the sustainable management criteria and approach to managing land subsidence. Department staff also believe the Agency used the best information and science available at the time of Plan development.

4.3.2.6 Depletions of Interconnected Surface Water

SGMA defines undesirable results for the depletions 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 Subbasin.¹¹² 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.¹¹³ 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.¹¹⁴

The Plan acknowledges the presence of interconnected surface waters in the Subbasin and identifies their location by incorporating measured groundwater level and streambed elevation differences and modeled estimates of the amount of a time a stream is gaining, median stream flow, and surface leakage.¹¹⁵ The GSA describes using a conservative approach to combine this information to predict where interconnected surface waters are likely to occur. Department staff are satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Subbasin.

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.¹¹⁶ At this time, the GSP describes a methodology to correlate shallow near stream- groundwater levels with simulated stream depletion. The GSP further proposes initial sustainable management criteria based on the evaluated shallow near -stream groundwater levels as a proxy for the rate and volume of depletions. In addition, the Plan describes an adaptive management approach for developing new information and data to refine the initial sustainable management criteria in the first few years of Plan implementation. The GSP explains the approach to managing depletions was informed by two practitioner groups organized by the GSA that helped to (1) map and understand

¹¹¹ Santa Rosa Plain GSP, Section 4.9.3, p. 323.

¹¹² Water Code § 10721(x)(6).

¹¹³ 23 CCR § 354.16 (f).

¹¹⁴ 23 CCR § 354.28 (c)(6).

¹¹⁵ Santa Rosa Plain GSP, Section 3.2.6.2, pp. 202-204.

¹¹⁶ 23 CCR § 354.28 (c)(6).

groundwater dependent- ecosystems in the Subbasin; and (2) establish the quantitative metrics for the initial sustainable management criteria and identify areas for developing new information and data that will improve the management criteria.¹¹⁷

The GSP describes significant and unreasonable depletions of interconnected surface water as occurring when “surface water depletion, caused by groundwater pumping within the Subbasin, exceeds historical depletion or adversely impacts the viability of GDEs or other beneficial users of surface water.”¹¹⁸ The GSP states that the goal of the sustainable management criteria is to maintain groundwater levels above the levels observed during the recent historical period (i.e., 2004 to 2018) in which the largest volume of depletions occurred (i.e., 2014 to 2016).¹¹⁹ The GSP further describes the process to develop the sustainable management criteria based on model simulations and statistical correlation which support the GSP’s goal of maintaining conditions so that estimated depletion rates and volumes do not reach the quantity estimated during the three years between 2014 and 2016.

The GSP defines an undesirable result for the depletion of interconnected surface water occurring when the minimum threshold is exceeded in 40 percent of wells during dry years or in 10 percent of wells during normal and wet years and is determined to be associated with groundwater pumping. The GSP describes the difference between dry years and normal and wet years as necessary to help avoid higher levels of depletions that have been observed in dry years from occurring in wet or normal years. The Plan also states that an exceedance of a minimum threshold in a single representative monitoring point will initiate an investigation to determine if the GSA should implement actions to avoid the potential occurrence of undesirable results.¹²⁰ The steps related to the investigation of a single minimum threshold exceedance includes a review of the entire groundwater level monitoring network to assess the extent of declining levels, review climatic data, assess changes in groundwater extraction, and engage with stakeholders to share information.¹²¹

The GSP describes the process to establish the sustainable management criteria in four steps: (1) demonstrating correlation between shallow groundwater levels and surface water depletion; (2) methodology for establishing groundwater levels as a proxy for minimum thresholds and measurable objectives; (3) description of quantitative undesirable results; and (4) evaluation of future improvements to refine the sustainable management criteria.

To demonstrate correlation between shallow groundwater levels and surface water depletions, the GSP describes model simulations to isolate stream flow depletion by subtracting pumping scenarios from non-pumping scenarios near each of the representative monitoring points. The estimated amount of depletion based on the

¹¹⁷ Santa Rosa Plain GSP, Section 4.10, pp. 325-326.

¹¹⁸ Santa Rosa Plain GSP, Section 4.10.1, p. 326.

¹¹⁹ Santa Rosa Plain GSP, Section 4.10.2.1, p. 328.

¹²⁰ Santa Rosa Plain GSP, Section 4.10.4.1, pp. 332-333.

¹²¹ Santa Rosa Plain GSP, Section 4.10.4.1, p. 333.

SRPHM simulations were then evaluated against the groundwater levels in the representative monitoring points to calculate a coefficient of correlation value (R-squared value). If the R-squared value was greater than 0.60, the water levels and surface water depletions at the representative monitoring point were determined to be “sufficiently correlated.” As indicated in the GSP and discussed in multiple public comments, there are two representative monitoring points that show a poor correlation between groundwater levels and stream depletion which the GSP attributes to insufficiencies in the model for those locations and states the GSA will focus on improving the representation of those areas in the model.¹²² The remaining five of the seven representative monitoring points showed adequate correlation based on the GSPs analysis (i.e., R-squared value >0.60).¹²³

The minimum thresholds were established in the GSP by evaluating simulated streamflow from 2004 to 2020 using a Subbasin wide pumping versus non-pumping scenario at a USGS stream gauge located at the discharge point of the Subbasin. The simulation results provided an aggregate of the total surface water depletion by year that had occurred in the Subbasin upstream of the discharge point. The aggregate depletion volumes were then used to evaluate the years with the largest amount of simulated depletion (i.e., 2014, 2015, and 2016).¹²⁴ As mentioned above, the minimum thresholds in the shallow near stream- groundwater monitoring wells were established to avoid the water level conditions observed in the 2014 to 2016 time period identified as having the greatest amount of estimated historical depletions. The GSP clarifies that the shallow representative monitoring points were installed in fall 2019 which limits the evaluation of dry season- groundwater levels in the dedicated monitoring points. The GSP further describe a process to use “match points” to interpolate historic dry season- groundwater levels from adjacent wells with longer periods of record to establish the minimum threshold groundwater level in the representative monitoring points. The minimum threshold value in the shallow representative monitoring points were then established using a “percentile-ranking of historical dry-season groundwater levels” which generally resulted in the minimum threshold value being set relative to the 2019 and 2020 groundwater levels. Department staff understand that the representative monitoring points do not have sufficient data; however, Department staff do not fully understand – from what is presented in the GSP – how the percentile ranking- is developed and applied to inform establishing minimum thresholds (see [Recommended Corrective Action 4a](#)).

The measurable objectives for the depletion of interconnected surface water were established to represent achievable target groundwater elevations near streams that allow for operational flexibility over a range of climate and hydrologic variability.¹²⁵ The measurable objectives were established as the observed average dry-season surface water depletion from pumping that occurred during years with available data from 2004

¹²² Santa Rosa Plain GSP, Appendix 4-D, pp. 1290-1291.

¹²³ Santa Rosa Plain GSP, Appendix 4-D, p. 1330.

¹²⁴ Santa Rosa Plain GSP, Appendix 4-D, p. 1291.

¹²⁵ Santa Rosa Plain GSP, Section 4.10.3, p. 332.

to 2020. The interim milestones for this sustainability indicator are identical to the measurable objectives being that the measurable objectives are set at the average groundwater elevations from 2004 to 2020.¹²⁶

The GSP describes an adaptive management approach to address data gaps that will inform the improvement and refinement of the initial sustainable management criteria. The adaptive management approach is broken out into two groups: characterization of cause and effect of depletions; and monitoring network improvements and special studies. The characterization of depletion activities includes the improvement of data and information from wells and stream diversions, focused numeric model calibration of surface water and groundwater interaction, and better understanding of groundwater dependent ecosystems. The monitoring networks and special studies include additional shallow monitoring wells and stream gauges, geophysical surveys, and geomorphic and habitat assessments. The Plan also provides a description of the future methodology the GSA intends to implement prior to the first periodic update, including developing a modeling framework to isolate impacts of groundwater pumping on stream flow, improving correlation between groundwater levels and depletions, and refining the process for setting groundwater levels as a proxy for minimum thresholds.

As mentioned, the GSP identifies several data gaps and future methodologies that will improve the GSA's understanding of the timing and location of interconnectivity including incorporating data collected in the dedicated representative monitoring points installed in 2019 into the process and limit the need to use adjacent wells to inform the minimum threshold value.¹²⁷ Department staff encourage addressing those data gaps to the extent that they can improve the GSAs overall understanding of the conditions leading to depletions in the Subbasin.

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. Department staff further advise that at this stage in SGMA implementation it is appropriate to approve Plans with recommended corrective actions to address deficiencies related to interconnected surface water depletion where GSAs are still working to fill data gaps related to interconnected surface water and where these data will be used to inform plan components that will be subject to future review. Accordingly, Department staff believe that affording GSAs adequate time to refine their

¹²⁶ Santa Rosa Plain GSP, Section 4.10.3, p. 332.

¹²⁷ Santa Rosa Plain GSP, Appendix 4-D, p. 1293.

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 basin 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 Subbasin and evaluate changing conditions that occur through implementation of the Plan.¹²⁸ Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,¹²⁹ monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds,¹³⁰ capture seasonal low and high conditions,¹³¹ include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location, and frequency.¹³² Department staff encourage GSAs to collect monitoring data as specified in the GSP, fill data gaps identified in the GSP prior to the first periodic update,¹³³ update monitoring network information as needed, follow monitoring best management practices,¹³⁴ and submit all monitoring data to the Department's Monitoring Network Module immediately after

¹²⁸ 23 CCR § 354.32.

¹²⁹ 23 CCR § 354.34(b)(2).

¹³⁰ 23 CCR § 354.34(b)(3).

¹³¹ 23 CCR § 354.34(c)(1)(B).

¹³² 23 CCR §§ 354.34(g)-(h).

¹³³ 23 CCR § 354.38(d).

¹³⁴ Department of Water Resources, 2016, [Best Management Practices and Guidance Documents](#).

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 identified 96 monitoring wells within the contributing watershed area to include in the groundwater level monitoring network.¹³⁵ Of the identified wells, 85 of the 96 wells are located within the Subbasin with 57 wells screened in the shallow aquifer system and 28 wells screened in the deep aquifer system. A total of 26 wells are used as representative monitoring points.

The GSP proposes to use the groundwater level monitoring network as a proxy for the groundwater storage monitoring network because changes in groundwater storage are directly dependent on changes in groundwater levels.¹³⁶

The GSP states that City of Santa Rosa's Salt and Nutrient Management Plan (SNMP) monitoring network and public supply wells regulated by the California State Water Resources Control Board's Division of Drinking Water will make up the groundwater quality monitoring network.¹³⁷ The GSP states that both monitoring programs have differing constituents that are sampled with Division of Drinking Water wells analyzed for arsenic, nitrate, and TDS and SNMP wells analyzed for nitrate and TDS.¹³⁸

The GSP states that in addition to utilizing InSAR data, three continuous global positioning system sites will be included in the land subsidence monitoring network.¹³⁹ One global positioning system site is located within the Subbasin, and two sites are located in contributing watershed areas outside of the Subbasin.

The GSP has identified nine shallow stream-adjacent monitoring wells to include in the monitoring network for depletions of interconnected surface water.¹⁴⁰ The monitoring network also includes nine USGS stream gages and nine Sonoma Water stream gages.¹⁴¹ Five of the stream gages have an adjacent shallow monitoring well.¹⁴² The five stream gages that have adjacent shallow monitoring wells include the USGS stream gage in Santa Rosa Creek near the City of Santa Rosa, the USGS stream gage in Santa Rosa Creek in the City of Santa Rosa, the USGS stream gage in Laguna de Santa Rosa at Stoney Point Road, the USGS stream gage in Colgan Creek near the City of Sebastopol, and the USGS stream gage in Laguna de Santa Rosa near the City of Sebastopol.

The description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the Plan describes in sufficient

¹³⁵ Santa Rosa Plain GSP, Section 5.2.1.2, p. 341.

¹³⁶ Santa Rosa Plain GSP, Section 4.6, pp. 302-303.

¹³⁷ Santa Rosa Plain GSP, Section 5.2.2, pp. 341 and 351.

¹³⁸ Santa Rosa Plain GSP, Section 5.2.2, pp. 341 and 351.

¹³⁹ Santa Rosa Plain GSP, Section 5.2.4, p. 354, Figure 3-14a, p. 183, Figure 3-14e, p. 186.

¹⁴⁰ Santa Rosa Plain GSP, Section 5.2.3, p. 354, Appendix 4-D, pp. 1288-1333.

¹⁴¹ Santa Rosa Plain GSP, Section 5.2.3, p. 351 and p. 354, Table 5-2, p. 352.

¹⁴² Santa Rosa Plain GSP, Table 5-2, p. 352.

detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Subbasin and evaluate changing conditions that occur through Plan implementation. The GSP provides a good explanation for the conclusion that the monitoring network is supported by the best available information and data and is designed to ensure adequate coverage of sustainability indicators. The Plan also describes existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network prior to the first periodic update. Department staff consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations regarding monitoring network.

While the information included in the GSP for the monitoring network does not preclude plan approval, Department staff have identified one or more recommended corrective action(s) for the Plan. The GSP provides a robust monitoring network that will monitor the sustainability indicators and assist in achieving the sustainability goal; however, there are some components of the GSP Regulations which the GSP does not address.

While the GSP does provide a map identifying the location of the representative monitoring sites for degradation of water quality and representative monitoring sites have been identified in the monitoring network module, Department staff have determined additional information should be provided in the GSP regarding the monitoring network for degraded water quality. The GSP did not report, in tabular format, the monitoring site type or measurement frequency for the degraded water quality monitoring network as required by the GSP Regulations.¹⁴³ Providing this information will provide the Department additional clarity on how other water quality programs are being leveraged by the Subbasin to comply with the requirements of the GSP Regulations and SGMA (see [Recommended Corrective Action 5](#)).

The GSP Regulations require GSPs to provide specific information about each monitoring site per the data and reporting standards.¹⁴⁴ As an example, well construction information is required for monitoring sites, but is not provided for wells in the degraded water quality monitoring network. It is imperative the GSA work to ensure the information defining the monitoring network is consistent within the GSP, consistent with the Department's Monitoring Network Module, and follow the data and reporting standards. Department staff recommend there be a reconciliation between the details of the monitoring network provided in the GSP with the requirements of the data and reporting standards in the GSP Regulations (see [Recommended Corrective Action 6](#)).

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,

¹⁴³ 23 CCR § 354.34 (h).

¹⁴⁴ 23 CCR §§ 352.4, 354.34(g)(2).

including projects and management actions to respond to changing conditions in the basin.¹⁴⁵

The GSP includes a variety of projects and management actions, split between three groups of planned projects and three management actions requiring additional assessment. Group 1 projects represent voluntary, incentive-based water-use efficiency and alternate water source projects focused on non-municipal groundwater users.¹⁴⁶ Expected benefits from the implementation of Group 1 projects include reduction in the number of potential minimum threshold exceedances for the chronic lowering of groundwater levels and a decrease in the decline of groundwater storage. Group 2 and 3 projects consist of new or significantly expanded projects and actions that would require additional assessment and planning for implementation. Benefits from the implementation of Group 2 and Group 3 projects include increases to both measured groundwater levels and overall aquifer storage. Each project or management action includes a description, timetable for implementation, expected quantitative benefits, associated public noticing, overview of any permitting or regulatory process, estimated costs with a funding plan, and legal authority required for implementation.

The Plan adequately describes proposed projects and management actions in a manner that is generally consistent and substantially complies with the GSP Regulations. The projects and management actions, which focus largely on conservation and efficiency; stormwater efforts; increasing groundwater in storage through recharge; and increasing non-groundwater water supply, are directly related to the sustainable management criteria and present a generally feasible approach to achieving the sustainability goal of the Subbasin.

4.6 CONSIDERATION OF ADJACENT BASINS/SUBBASINS

SGMA requires the Department to “...evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin.”¹⁴⁷ 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.¹⁴⁸

The Santa Rosa Plain Subbasin has five adjacent basins/subbasins: Healdsburg Area, Wilson Grove Formation Highlands, Petaluma Valley, Rincon Valley, and Alexander Area. The Healdsburg Area Subbasin, Wilson Grove Formation Highlands Basin, Rincon Valley Subbasin, and Alexander Area Subbasin are designated very-low priority basins and are not required to be managed under a GSP. The Plan includes an analysis of potential impacts to adjacent basins with the defined minimum thresholds for each sustainability

¹⁴⁵ 23 CCR § 354.44 et seq.

¹⁴⁶ Santa Rosa Plain GSP, Section 6.3, p. 385.

¹⁴⁷ Water Code § 10733(c).

¹⁴⁸ 23 CCR § 354.28(b)(3).

indicator. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan.

4.7 CONSIDERATION OF CLIMATE CHANGE AND FUTURE CONDITIONS

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.¹⁴⁹

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 explore how the proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the Subbasin based on current and future drought conditions. The Department encourages GSAs to also explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the Subbasin given increasing aridification and effects of climate change, such as prolonged drought. Lastly, the Department encourages GSAs to 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 forces¹⁵⁰ to evaluate how the Agency's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the Subbasin.

¹⁴⁹ 23 CCR § 354.18.

¹⁵⁰ Water Code § 10609.50.

5 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The Santa Rosa Plain Subbasin GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the GSP will likely achieve the sustainability goal for the Santa Rosa Plain Subbasin. The GSAs have 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 GSP should include all sources of water in the historical and projected water budgets and, specifically, identify surface water imports to the Subbasin from the Russian River.

RECOMMENDED CORRECTIVE ACTION 2

The GSP's undesirable results definition for chronic lowering of groundwater levels includes drought conditions stating that minimum threshold exceedances caused by "emergency operational issues or droughts that extend for longer than the 4-year drought factor incorporated into the minimum thresholds" will not contribute to an undesirable result unless the groundwater levels do not recover in proceeding hydrologically normal to wet years. The GSP, however, provides little discussion of the process, information, and data considered when presenting the discussion of what constitutes emergency operations. The GSP should provide further explanation and description related to what constitutes emergency operations. Additionally, the GSP should analyze the anticipated groundwater conditions that would lead to emergency operations and the potential effects on beneficial uses and users if conditions extend beyond the 4-year drought factor.

RECOMMENDED CORRECTIVE ACTION 3

The minimum threshold for chronic lowering of groundwater levels was set at the 98th percentile shallowest supply well depth, plus a saturated thickness value of 10 feet. The GSP does not disclose the total number of wells that could be potentially impacted at the proposed minimum threshold. The GSA should more explicitly disclose the total number of wells that may be impacted by the proposed minimum threshold. The GSA should also provide a description related to the spatial relationship of the potentially impacted wells

and the representative monitoring point associated with each of the vicinity area polygons used for the statistical well impact depth analysis.¹⁵¹

RECOMMENDED CORRECTIVE ACTION 4

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, subbasin-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. Elaborate on how the percentile -ranking in groundwater wells near the representative monitoring points was developed and applied to the minimum thresholds for depletions of interconnected surface water. The GSP should also provide an explanation, as part of the future methodology for refining the minimum thresholds, of how the measurements from the shallow near stream representative monitoring points and future data gap filling efforts will be interpreted to modify the initial sustainable management criteria.¹⁵² The explanation of how the newly acquired data will be applied to refining the minimum thresholds should include an assessment of how the observed conditions compare to the conditions in 2014, 2015, and 2016.
- 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.

¹⁵¹ Santa Rosa Plain GSP, Figure 5-B-24, p. 1367.

¹⁵² Santa Rosa Plain GSP, Appendix 4-D, p. 1293.

RECOMMENDED CORRECTIVE ACTION 5

Define the monitoring site type and data collection frequency in tabular format for the degraded water quality monitoring network in the GSP.

RECOMMENDED CORRECTIVE ACTION 6

Conduct a reconciliation between the details of the monitoring network provided in the GSP with the requirements of the data and reporting standards in the GSP Regulations. Where requirements of the data and reporting standards are not provided, the GSA should include this information in the periodic update of the GSP. As a reminder, updates to the monitoring network must be reflected in the SGMA Portal's Monitoring Network Module.