Section 7: Implementation Plan
Groundwater Sustainability Plan for Petaluma Valley Groundwater Basin

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7 IMPLEMENTATION PLAN

This implementation plan serves as an initial roadmap for addressing GSP implementation activities between 2022 and 2042 with a primary focus on implementation activities within the initial 5 years (2022 through 2026). This section describes the plans for implementing the activities and actions identified in **Sections 4** through **6** in this GSP, including:

- GSA's governance structure and planned administrative approach
- Main implementation components and estimated costs for the initial 5 years of implementation
- Initial approach to funding
- Schedule

This implementation plan is based on the current understanding of Basin conditions, identified data gaps, monitoring needs and projects and management actions. In order to successfully implement the GSP, the implementation plan will adapt over time based on new information and data, model development, and input from Basin stakeholders.

7.1 Governance Structure and Planned Administrative Approach

The GSA anticipates that the current governance and general administrative structure will remain in place through the implementation period. As described in **Section 1.3.2**, the six member agencies currently plan to continue operating under the Joint Powers Authority agreement that created the GSA. The Board will continue serving as the governing body, making decisions regarding the implementation of projects and management actions; closing data gaps; contracts; administration; funding; and other governance issues. A stakeholder-based Advisory Committee representing multiple stakeholder interests will continue providing guidance and recommendations to the Board and GSA staff. Both the GSA Board and Advisory Committee will continue to hold regular public meetings in compliance with California's laws governing public meetings (commonly known as the Brown Act).

Currently, the GSA contracts with Sonoma Water for technical, outreach, grant administration, and GSA management services and contracts with other consultants for legal, facilitation, and some monitoring services. As the GSA transitions from GSP development to implementation starting in 2022, staffing needs will be evaluated to determine how to move forward efficiently and effectively. To reduce costs and for consistency for groundwater users within Sonoma County, it is possible that the GSA will coordinate management and other services with the Santa Rosa Plain and Sonoma Valley GSAs.

7.2 Groundwater Sustainability Plan Implementation Components and Estimated Costs

This section describes details of each of the main implementation components, assumptions, and estimated costs for the initial 5 years.

7.2.1 Administration and Finance

Administration and finance costs include day-to-day management of the agency, as-needed legal costs, applying for and administering grants, tasks associated with implementation of a fee, auditing and accounting services, administration of the well registration program, facility fees, and office supplies. Annual administration costs to range from $220,000 to $245,000 annually.

7.2.2 Communication and Stakeholder Engagement

To meet the requirements of SGMA, the GSA will continue the activities described in **Section 1**, including:

- Holding regular meetings of a diverse, stakeholder-based Advisory Committee to receive feedback on implementation efforts and to solicit outreach ideas and assistance
- Informing, educating, and soliciting feedback from stakeholders on the progress of implementing projects and management actions and on Basin conditions through social media, the GSA website, periodic community meetings, focused stakeholder briefings, and paid and free media
- Approaching and engaging a diverse set of stakeholders and groundwater users by continuing to reach out to and meet with organizations that represent disadvantaged communities (with a focus on Spanish-language speakers), farmers, environmental interests, rural landowners, and business interests
- Conduct government-to-government communication with federally and non-federally recognized Tribal governments to reassess interest in participating in GSA activities

The GSA will maintain and improve two products currently under development: the Groundwater User Information Data Exchange program, which will allow well owners to review and correct well and groundwater use information, and the Groundwater Data Dashboard, which will provide groundwater data in a visual, user-friendly format.

The GSA will conduct, in cooperation with other agencies or organizations, outreach and education programs on specific topics relevant to groundwater users within the Basin, such as the importance of well maintenance, management, and best practices, with the goal of empowering well owners with an understanding of well construction, pump and storage practices, water quality considerations and treatment options, and well abandonment.

In addition, the GSA will continue to engage and coordinate with local, state, and regional agencies (including City of Petaluma, Permit Sonoma, other GSAs, Agricultural Commissioner, Sonoma County Agricultural Preservation and Open Space District, DWR, SWRCB's DDW and Water Rights Division, and SFBRWQCB) on filling data gaps and implementation of projects and actions. This coordination will include discussions of partnering opportunities for funding implementation components that are mutually beneficial.

An important component of this engagement will be ongoing coordination with the agencies responsible for regulating groundwater quality. The GSA will regularly coordinate with SFBRWQCB, SWRCB-DDW, and others to understand and develop a process for determining whether groundwater management is resulting in degraded water quality and to assess whether any additional COCs should be considered in the future.

A focused area of engagement in the early stages of GSP implementation is anticipated to be continued coordination and information sharing with agencies that have land use responsibilities and authorities, including Permit Sonoma, city planning departments, and county and city planning commissions. This coordination will build on ongoing coordination that has occurred through development of the GSP and activities that Permit Sonoma has initiated using Proposition 68 grant funding. Coordination will include the sharing of information, including the tracking of land use changes and number of new well permits, as well as new agricultural permits (including cannabis projects) within the Basin/contributing watershed and surrounding areas. In addition, as required by SGMA, the GSA will also engage in General Plan updates and any specific planning area processes in Petaluma Valley. In addition, the GSA will engage in and review General Plan amendments, other local policies, and issues related to groundwater resources in the Basin.

Annual outreach and communication are estimated to cost $80,000 in the first 4 years of implementation, and $100,000 in the fifth year, when additional outreach will be needed for the preparation of the 5-year GSP update.

7.2.3 Annual Monitoring, Data Evaluation, and Reporting

Monitoring of the six sustainability criteria is a key component for successful implementation of the GSP. Most monitoring relies on existing monitoring programs, some of which will be enhanced or expanded as described in **Section 5** and **Section 7.2.4.2**. Data from the monitoring programs will be routinely evaluated to ensure progress is being made toward sustainability, identify whether undesirable results are occurring, and assess and investigate conditions that may lead to undesirable results. Data will be maintained in the data management system and will be used by the GSA to guide decisions on projects and management actions and to prepare annual reports to Basin stakeholders and DWR.

7.2.3.1 Monitoring and Data Evaluation

Specific planned monitoring activities are summarized herein and in **Table 7-1** and are more fully described in **Section 5**.

- Groundwater-level monitoring activities will include the collection of groundwater-level data at the 11 existing RMPs and new planned RMPs identified in **Section 5.3.1** for comparison to MTs and MOs. The groundwater-level monitoring will also include the coordination and evaluation of measurements from nine additional wells within the Basin and contributing watershed areas described in **Section 5.2.1** to continue tracking trends in these wells with historical data and support the development of groundwater-level contour maps and storage change estimates. The groundwater-level data will be collected in

accordance with the monitoring protocols outlined in **Section 5.3.1**. Monitoring network data gaps identified in **Section 5.4.1** will be addressed through the activities described in **Section 7.2.4**. Groundwater elevation data will be uploaded to the DWR data portal semiannually; before January 1 and July 1 of each year.

- Water quality monitoring activities will include the compilation and evaluation of water quality data reported from existing public water supply wells and compared with the MTs and MOs for the seawater intrusion and water quality sustainability indicators.

    - For the water quality sustainability indicator, the data review will focus on exceedances of MTs, or MCLs and SMCLs for the three COCs (arsenic, nitrate, and TDS) identified for this GSP. However, if during review of the water quality data, additional constituents appear to frequently exceed MCLs and SMCLs, MTs and MOs will be considered for these additional constituents during GSP 5-year updates. The number of public water supply wells routinely monitored for each COC is shown in **Table 7-1**. If any other routine monitoring of supply wells is initiated in the Basin at a later date, these wells will also be considered for inclusion in the water quality monitoring network.

    - Monitoring for seawater intrusion just north and along the perimeter of the San Pablo Baylands area will be conducted using a combination of existing water supply wells and additional proposed new dedicated monitoring wells constructed during implementation of the GSP, depending upon well access, construction, and funding availability. Initially, this network will include existing public water supply wells within 1 mile of the Baylands area. The future monitoring network will be designed to more accurately map the location of the 250 mg/L chloride isocontour.

- Monitoring for land surface subsidence will be measured using satellite InSAR data provided by DWR. InSAR data will be downloaded from the DWR website annually, checked and verified for completeness and reasonableness, and used to develop annual change in elevation maps. The average value for each 100 square meter pixel and elevation change maps will be used to compare with MTs and MOs for the land surface subsidence sustainability indicator.

- Monitoring for surface water and groundwater interaction will include the following monitoring activities:

    - Compilation and evaluation of surface water data from five active stream gages within the Basin and contributing watershed area.

    - Measurement and evaluation of groundwater elevations from the three RMPs used to monitor surface water depletion as a proxy. For reporting seasonal highs and lows for future comparison with MTs, all measurements collected more frequently than monthly will be reported as monthly averages in order to better align with the measurement frequency within historical datasets used to calculate the minimum thresholds.

Plans for assessing and improving the monitoring network for surface water and groundwater interaction are described in **Section 7.2.4.1**.

Table 7-1. Monitoring Networks and Initial Representative Monitoring Point Networks

Sustainability Indicator	Monitoring Network	Initial Representative Monitoring Point Network
Chronic Lowering of Groundwater levels	20 wells within the contributing watershed area (including 15 wells in the Basin)	11 wells (3 dedicated monitoring wells; 5 private supply wells; 3 inactive municipal wells)
Reduction in Groundwater Storage	Same as monitoring network for Chronic Lowering of Groundwater Levels	Same as monitoring network for Chronic Lowering of Groundwater Levels
Seawater Intrusion	Within 1 to 2 miles of Baylands: 9 public water supply wells	Within 1 to 2 miles of Baylands: 9 public water supply wells
Degraded Water Quality	Existing supply well groundwater quality monitoring programs, as follows: Arsenic: 18 wells Nitrate: 30 wells Salts: 13 wells	Existing supply well groundwater quality monitoring programs, as follows: Arsenic: 18 wells Nitrate: 30 wells Salts: 13 wells
Land Surface Subsidence	1 GPS location; InSAR satellite in most of the Basin	InSAR dataset
Interconnected Surface Water	16 stream gages; 3 shallow monitoring wells adjacent to streams	3 shallow monitoring wells adjacent to streams

7.2.3.2 Annual Reports

Annual reports will be developed to present data, information, and the implementation status for each WY and meet SGMA requirements. As defined by DWR, annual reports must be submitted for DWR review by April 1 of each year following the GSP adoption, except in years when 5-year or periodic assessments are submitted. Annual reports are anticipated to include three key sections: General Information, Basin Conditions (including SMC status and progress towards achieving measurable objectives), and Implementation Actions and Activities.

General Information

The General Information section will include an executive summary that highlights the key content of the annual report. This section will include a map of the Basin, a description of the sustainability goal, a description of GSP projects and their progress, and an annual update to the GSP implementation schedule.

Basin Conditions

The Basin Conditions section will describe the current groundwater conditions and monitoring results. This section will also include an evaluation of how conditions have changed over the previous year and will compare groundwater data for the WY to historical groundwater data. Estimated pumping data, effects of project implementation (if applicable), surface water

deliveries, total water use, and groundwater storage data will be included. Key required components include:

- Groundwater-level data from the monitoring network, including contour maps of seasonal high and seasonal low water-level maps
- Hydrographs of groundwater elevation data at RMPs
- Groundwater extraction data and estimates by water-use sector
- Groundwater quality at RMPs
- Surface water supply availability and use data by water-use sector and source
- Streamflow data
- Total water-use data
- Change in groundwater in storage
- Subsidence rates and associated data

As part of the monitoring program reporting, the status of SMC will also be reported, including MT and MO status of RMPs. Additionally, information on land use changes and additional permitting of wells and projects that use groundwater will be tracked and reported in the annual reports.

GSP Implementation Progress

Progress toward GSP implementation will be included in the annual reports. This section of the annual report will describe the progress made toward achieving interim milestones as well as implementation of projects and management actions. Key required components include:

- GSP implementation progress, to be measured by whether the GSA is achieving the milestones provided in the Implementation Schedule (**Figure 7-1**)
- Progress toward achieving the Basin sustainability goals
- Any changes that may be considered necessary for successful GSP implementation

Development of an annual report will begin following the end of the WY, September 30, and will include an assessment of the previous WY. The annual report will be submitted to DWR before April 1 of the following year. The 2022 annual report covering WY 2021 will be submitted by the GSA by April 1, 2022. Four annual reports for the Basin will be submitted to DWR each April between 2022 and 2025, prior to the first 5-year update of this GSP, which will be prepared in 2026 and submitted to DWR in January 2027.

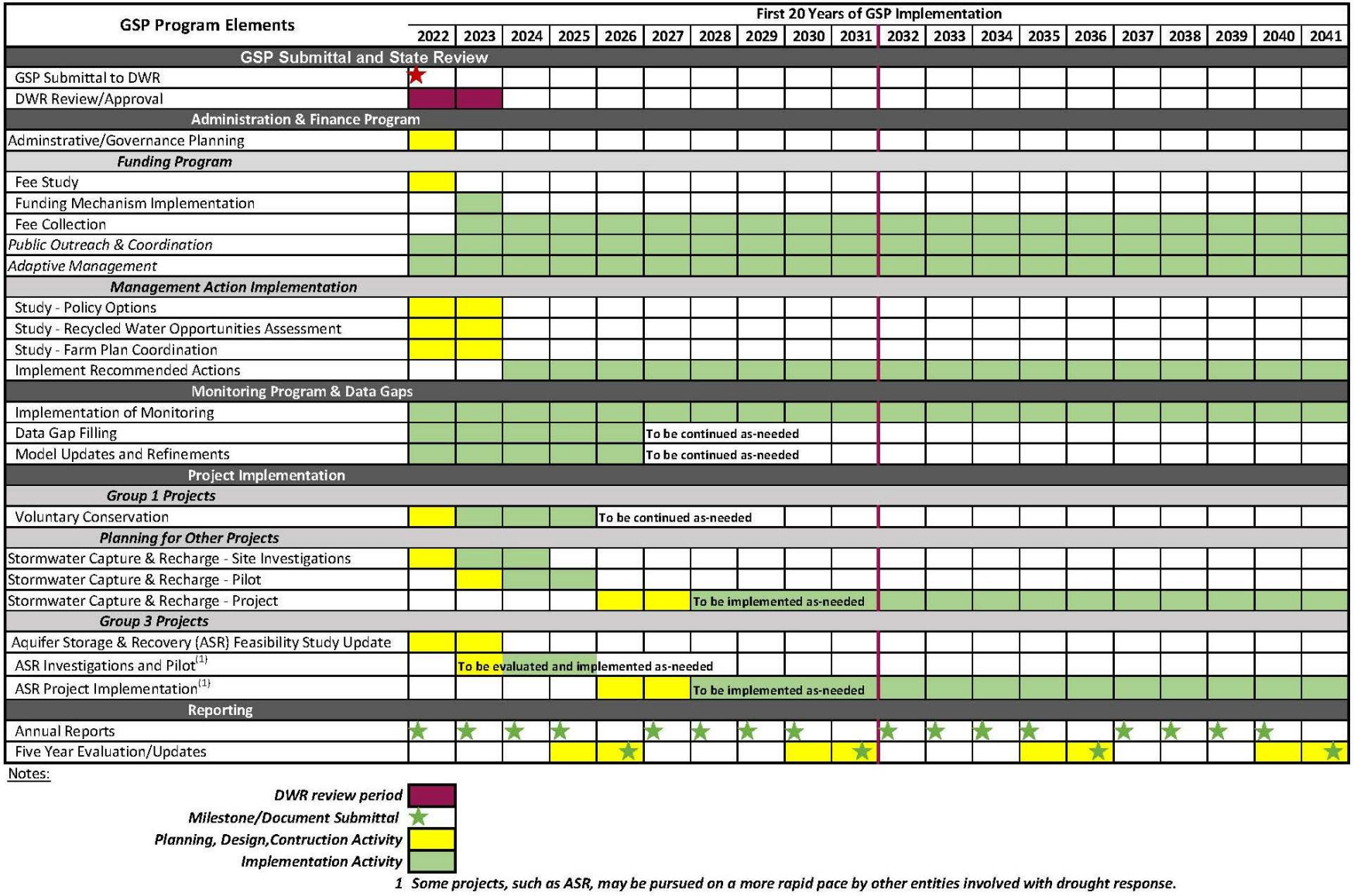

Figure 7-1. Implementation Schedule

The estimated annual cost of performing annual monitoring, data evaluation, and reporting ranges from $150,000 to $200,000, with a cumulative 5-year cost ranging from $750,000 to $1,000,000.

7.2.4 Addressing Data Gaps

Through development of this GSP, a number of key data gaps have been identified in **Sections 3** through **5**. These data gaps were shared and discussed with Basin stakeholders to prioritize activities and actions needed to address the data gaps.

- Amounts, locations, and depths of groundwater pumping (rural residential, agricultural, public water systems, commercial, and industrial)
- Role of faults within and along the boundaries of the Basin
- Distribution and extent of brackish groundwater along the margins of the Baylands area
- The interconnection of streams to the shallow aquifer system, including seasonal variability and how groundwater pumping and surface water diversions affect streamflow
- Basin boundary characteristics, such as the direction and magnitude of groundwater fluxes across Basin boundaries
- Aquifer hydraulic properties, recharge and discharge mechanisms, and volumes of both the shallow and deep aquifer systems
- Three-dimensional data gaps in the monitoring network for each primary aquifer

Studies and activities planned to address these identified data gaps within the initial 5 years of GSP implementation are identified in the following sections and categorized as either studies and information gathering or monitoring network improvements.

7.2.4.1 Studies and Information Gathering

Planned studies and information gathering include the following activities.

Improve information on existing water wells and groundwater extraction. The objective of this task is to better assess the locations, depths, volumes, and timing of groundwater pumping from water-use sectors that have not historically measured and reported water use, such as rural residential, agricultural, commercial, and industrial. This will improve the assessment of potential impacts from groundwater pumping to beneficial users and uses within the Basin, including existing residential and other water wells and GDEs. The task will include the following activities, which will be performed within the initial 2 years of GSP implementation:

- Integration of parcel-specific information obtained through the planned well registration program with existing well log databases

- Assessment of available remote sensing data on actual ET to help constrain the estimates of groundwater demands for irrigation supplies

Aquifer system properties assessment: The objective of this task is to improve the understanding of the aquifer system hydrogeologic framework, the distribution and potential effects of faults on groundwater flow, and Basin boundary characteristics. Completion of this task will also improve the GSA's ability to assess potential impacts from groundwater pumping on beneficial users and uses within the Basin, including existing residential and other water wells and GDEs. As part of this task, the GSA will:

- Evaluate the airborne electromagnetic (AEM) survey results (data collection and compilation funded by DWR) and incorporate them into the existing HCM. DWR is planning to collect geophysical data from the Basin through its AEM survey program in 2021 or 2022. Additional focused geophysical surveys to refine information in key areas (that is, areas identified for potential managed aquifer recharge projects) will also be considered.

- Based on these data collection and evaluation efforts, perform aquifer testing at up to three locations. It is anticipated that the aquifer testing will be completed within the initial 3 years of GSP implementation and is planned to be completed within the initial 2 years of GSP implementation. Wells for testing will be identified using the following criteria:

    - Wells are owned by willing well owners

    - Wells have known well completion information

    - Wellheads are completed such that water elevations in wells can be monitored with data loggers

    - Wells are equipped with accurate flow meters

    - Wells have an area or system for the discharge of test water

    - Preferred wells will have nearby wells that can be monitored during the test and will be located near key data gap areas, Basin boundaries, and interconnected surface water

Baylands area voluntary water quality sampling program: The objective of this task is to improve the understanding of the distribution and extent of brackish groundwater along the margins of Baylands area and provide data to assist in the selection of locations for future RMPs needed for the seawater intrusion monitoring network. The study will be designed to supplement data collected through previous studies and monitoring programs. The task will include the following activities:

- Outreach to well owners within and near the Baylands area through the outreach activities described in Section **7.2.2**.

- Assessment of potential candidate wells for sampling.

- Collection of water quality samples for the analysis of chloride and TDS from up to 25 existing water wells.

- Evaluation of water quality sampling results to inform the development of a seawater intrusion monitoring network.

Interconnected surface water and GDE studies: As indicated in **Section 4.10.2.1**, in recognition of the significant information and data limitations and the importance of interconnected surface water to beneficial users within the Basin, the following studies and activities are planned:

- Develop improved information on the locations and amounts of surface water diversions under the jurisdiction of the SWRCB, including both direct diversions from streams and diversions that may occur from water wells near streams under riparian water rights. This information will be developed through the coordination process established between the GSA and SWRCB related to depletions of interconnected surface water.

- Perform studies that determine the impact of groundwater pumping on surface water depletion through a combination of differential stream gaging, tracer experiments, temperature profiling, and other methods.

- Assess the influence of groundwater pumping and groundwater levels on GDE health using available remote sensing tools and datasets. The GDE Pulse web application developed by TNC provides data on long-term temporal trends of vegetation metrics. This information will be integrated with available groundwater-level data and information to assess the relationship between groundwater conditions and GDEs. Conduct field visits as-needed to verify the findings of the remote sensing assessment regarding GDE locations and health. The potential GDEs identified in this GSP will be field verified to ensure that groundwater-dependent communities exist, and that the shallow groundwater is connected to regional aquifers that will be managed as part of this GSP.

- Compile and evaluate existing and relevant habitat field surveys that aid in understanding potential impacts of groundwater pumping on habitat associated with interconnected surface water.

To help prioritize and schedule these activities, the GSA will regularly consult with interested members of the GDE and ISW practitioner workgroups to address these important data gaps within the Basin. It is anticipated that this consultation will be scheduled within the first 6 months of implementation.

7.2.4.2 Monitoring Network Improvements

Based on the assessment of data gaps in **Section 5**, the following activities for improving the monitoring networks are planned.

Development of seawater intrusion monitoring network: Following completion of the voluntary water quality sampling program, the GSA will develop an improved sea water intrusion monitoring network. It is anticipated that the network will include a combination of appropriately constructed and located existing wells through a long-term voluntary sampling program and new dedicated monitoring wells. The monitoring network will be designed to adequately map the chloride concentration isocontour in both the shallow and deep aquifer systems. For the purposes of estimating costs, it is assumed that four new dedicated multi-level monitoring wells would be constructed for the seawater intrusion monitoring network between years 2 and 4 of GSP implementation.

Refinement of groundwater-level monitoring network: As described in **Section 5**, many of the identified data gaps in the groundwater-level monitoring network are being addressed through new wells being constructed under the Proposition 68 grant. For remaining data gap areas, the GSA will evaluate both the use of existing voluntary wells and the construction of new dedicated monitoring wells. For the purposes of estimating costs, it is assumed that three new dedicated multi-level monitoring wells would be constructed for the groundwater-level monitoring network. The GSA intends to conduct outreach and expand the voluntary groundwater-level monitoring program in the Basin during GSP implementation.

Additionally, the GSA will work to improve data quality in groundwater-level monitoring networks by a combination of the following activities:

- Performing survey activities for wells that lack sufficient reference point vertical survey data, as funding becomes available
- Obtaining well construction information from well owners or by conducting investigations (for example, video logging) as funding or technical assistance becomes available
- Replacing wells in the monitoring network that have data quality issues with dedicated monitoring wells, as funding becomes available

Refinement of interconnected surface water monitoring network: Following completion of the interconnected surface water and GDE studies and information gathering, improvements to the interconnected surface water monitoring network will be developed. For the purposes of estimating costs, it is assumed that four new dedicated shallow aquifer system monitoring wells would be constructed for the interconnected surface water monitoring network between years 2 and 4 of GSP implementation. Additionally, it is assumed that remote sensing assessments of vegetation health will continue to be performed and reported at key intervals such as the 5-year GSP updates.

The 5-year cost of addressing data gaps is estimated to be from $1,500,000 to $2,000,000.

7.2.5 Maintaining, Updating, and Making Improvements to the Model

The Basin groundwater model (PVIHM) informs the project and management activities and ongoing performance assessment of the SMC. Periodic updates to the groundwater model will

be required to continue to refine and improve its capabilities and maintain ongoing functionality. This includes incorporating new model tools and features, updates to HCM, incorporating new monitoring data, and related work to support ongoing simulations of projects and management actions. Improvements will be focused on the initial 3 years of implementation to facilitate reassessing preliminary SMC, as appropriate, and planning for any projects and actions. Model updates and refinements will be informed by data and information collected during early stages of implementation, including the planned activities for assessing data gaps, described in **Section 7.2.4**. A detailed plan for model improvements and updates is provided in **Appendix 7-A**. The preliminary areas of focus identified for model updates and improvements include:

- Focused calibration of surface water and groundwater interaction
- Assessment of aquifer properties
    - Calibration contingent on the availability of groundwater-level observation data, aquifer pump tests, simulation results, and other data
- Assessment of model boundary conditions, including mountain front recharge, general head boundaries, and simulated faults
- Improved model estimates of groundwater pumping, including responses to climate change and the impact of surface water diversions and recycled water

The 5-year cost of performing updates and making improvements to the model is estimated to be from $200,000 to $300,000.

7.2.6 Study and Implementation of Projects and Actions

To prevent potential undesirable results and to achieve MOs, projects and management actions are planned as part of GSP implementation. As described in **Section 6**, a portfolio of projects and management actions has been developed with the goal of addressing relevant sustainability indicators, including the circumstances under which they may be implemented.

Only the voluntary water-use efficiency and alternate water source projects (Group 1 projects) are defined enough for evaluation using model scenarios and are deemed necessary in the near term based on the current sustainable conditions within the Basin. To account for the significant data gaps in the Basin and prepare for future droughts and other uncertain conditions, a portfolio of other projects and management actions requiring further assessment (consisting of expanded recycled water deliveries, stormwater capture and recharge and ASR) have been included in the GSP. For these projects and management actions included in **Section 6**, initial implementation steps include performing studies or analyses to refine the concepts into actionable projects. Studies and work efforts may include, but are not limited to, CEQA studies and documentation, and engineering feasibility studies and preliminary design reports.

After the necessary initial studies are completed, other projects and management actions will undergo, as necessary, final engineering design (in the case of infrastructure projects) and public noticing and outreach, after which construction projects can occur followed by ongoing operations and maintenance.

The following activities related to projects and actions are planned during the first 5 years of implementation.

Implementation of Group 1 Projects:

- Assessment and implementation of conservation and groundwater use efficiency opportunities. This project would include an assessment of groundwater use characteristics, existing levels of water-use efficiency, and recommendations on preferred tools and strategies and incentives for implementation.

Planning for Other Projects Included in **Section 6**:

- Update 2013 feasibility study for other ASR opportunities
    - Update source water (Russian River) availability and transmission system capacity assumptions
    - Assess locations/operations that benefit GSP implementation (that is, areas of depletion)
    - Design and implement pilot studies for favorable areas
- Coordinate with City of Petaluma to assess additional recycled water opportunities
    - Optimize existing and projected future available supplies
    - Perform a cost/benefit analysis for future alignment options
    - Identify optimal locations for future storage
- Site-specific investigations and pilot study of on-farm and other stormwater capture and recharge opportunities
    - Identify water available for recharge
    - Locate areas with permeable near-surface deposits
    - Determine optimal methods and techniques
    - Focus on locations that could help sustain baseflows/support GDEs for recharge
    - Coordinate with Petaluma Flood Zone 2a's Upper Petaluma River Watershed Feasibility Analysis and other ongoing studies

Management Actions:

- Study potential policy options for future GSA consideration or recommendation, including this initial list of potential policy options:

    - Water conservation plan requirements for new development
    - Discretionary review of well permits for any special areas identified in GSP
    - Expanded low-impact development or water-efficient landscape plan requirements
    - Well construction and permitting recommendations (for example, water quality sampling/reporting for COCs, requirement for water-level measurement access, prevent cross-screening of multiple aquifers)

- GSA review of discretionary projects that impact groundwater resources

    - Metering program
    - Drinking water well mitigation program
    - Permitting and accounting of water hauling

    This list represents initial ideas for policy options, which will be informed through continued stakeholder engagement and outreach. In particular, it is expected that as the GSA participates in future General Plan amendments and updates processes with the County, as required by SGMA, additional policy options may be developed and considered.

- Coordinate farm plans, developed at individual farm sites, with implementation of the Basin-wide GSP:

    - Identify areas of mutual interest (for example, improved water-use efficiency, increased groundwater recharge, increased monitoring and data collection, coordinated information sharing and reporting) in addition to challenges that need to be addressed (for example, data confidentiality, data quality requirements, verification of farm plan performance)

    - This project would: (1) identify requirements or standards that would demonstrate the benefits of GSP implementation, (2) develop metrics that would be measured and verified, and (3) consider options for incentivizing actions of mutual benefit.

The costs of refining and implementing these projects and actions are estimated to be from $150,000 to $350,000, as summarized in **Table 7-2**.

Table 7-2. Summary of Estimated 5-year Costs for Projects and Management Actions, Excluding Capital Project Costs

Project/Action	Project Group	Estimated 5-year PV GSA Costs	Other Potential Funding Sources	Assumptions
Conservation/Water-Use Efficiency/Alternate Water Sources	1	$40,000 to $80,000	Other GSAs	Split equally among three GSAs
Stormwater Capture and Recharge		$80,000 to $190,000	Grants	
Site Investigations				
Aquifer Storage and Recovery		$20,000 to $40,000	Other GSAs, Sonoma Water/water contractors	Other GSAs and Sonoma Water/water contractors will also contribute funding
Participate in Regional Feasibility Study				
Farm Plan Coordination		$20,000 to $60,000	Other GSAs	Other GSAs will also contribute funding
Recycled Water Expansion		$20,000 to $30,000	City of Petaluma	
Assess additional opportunities				
Policy Options		$20,000 to $40,000	County	County and other GSAs will also contribute funding
		$200,000 to $440,000 $320,00	Total range Midrange	

It is anticipated that capital project costs within the initial 5 years will be paid for by some combination of individual project proponents/beneficiaries and grant funding. Specific details regarding roles of project proponents and the cost share mechanisms are anticipated to be determined as the projects are further defined and scoped. Therefore, costs associated with implementation of capital project implementation are not included in the GSP implementation budget estimate shown in **Table 7-2**.

It is also anticipated that each implemented project and management action will have its own set of monitoring objectives and data collection requirements to allow for project and management action evaluation and confirmation assessments, and, if necessary, modifications to improve project and management action effectiveness. The costs of specific projects that are not covered by beneficiaries/project proponents will include assumptions about financing the projects over time.

7.2.7 Five-year Update to Groundwater Sustainability Plan

As required by SGMA regulations, an evaluation of the GSP and the progress toward meeting the approved SMC and the sustainability goal will occur at least every 5 years and with every

amendment to the GSP. A written 5-year evaluation report (or periodic evaluation report) will be prepared and submitted to DWR. The information that will be included in the evaluation reports includes:

- A sustainability evaluation that will contain a description of current groundwater conditions for each applicable sustainability indicator and will include a discussion of overall sustainability in the Basin. Progress toward achieving MOs and interim milestones that achieve sustainability by 2042 will be included, along with an evaluation of the status relative to MTs. If interim milestones are not being achieved, the evaluation will identify obstacles to achieving the interim milestones. The evaluation will include a plan for overcoming those obstacles and provide a new assessment of interim milestones.

- An implementation plan progress section that will describe the current status of project and management action implementation and whether any adaptive management actions have been implemented since the previous report. An updated project implementation schedule will be included, along with any new projects identified that support the sustainability goals of the GSP and a description of any projects that are no longer included in the GSP. The benefits of projects and management actions that have been implemented will be described and updates on projects and management actions that are underway at the time of the report will be documented.

- A discussion of GSP elements. GSP elements will be reconsidered as additional monitoring data are collected, land uses and community characteristics change, and GSP projects and management actions are implemented, and it may become necessary to reconsider elements of this GSP and revise the GSP as appropriate. GSP elements to be reassessed may include the Basin setting, management areas, undesirable results, MTs, and MOs. If appropriate, a revised GSP, completed at the end of the 5-year evaluation period, will include revisions informed by findings from the monitoring program and changes in the Basin, including changes to groundwater uses, demands, or supplies, and results of project and management action implementation.

- A description of the monitoring network, including an assessment of the monitoring network's function and an analysis of the data collected to date. If data gaps are identified, the GSP will be revised to include a method for addressing those data gaps, along with an implementation schedule for addressing the gaps and a description of how the GSA will incorporate updated data into the GSP.

- A description and evaluation of the new information available since the last 5-year evaluation or GSP amendment. If the new information should warrant a change to the GSP, this will also be included, as described previously for the discussion of GSP elements.

- A summary of the regulations or ordinances related to the GSP that have been implemented by DWR or others since the previous report. The summary will include a discussion of any required updates to the GSP.

- A summary of legal or enforcement actions taken by the GSA in relation to the GSP, including an explanation of how such actions support sustainability in the Basin.
- A description of amendments to the GSP, including adopted amendments, recommended amendments for future updates, and amendments that are underway.
- A description of ongoing coordination activities among the GSA; members of the Advisory Committee; other local, state, and federal partners; and the public. The 5-year evaluation report will describe activities such as meetings, joint projects, data collection and sharing, and groundwater modeling efforts.
- A record of outreach activities associated with the GSP implementation, assessment, and GSP updates.

The initial 5-year GSP evaluation is due to be submitted to DWR in 2027. The cost of preparing the initial 5-year GSP update is estimated to be from $200,000 to $300,000.

7.2.8 Estimated 5-year Implementation Costs

The cost of the items described in **Sections 7.1.1** through **7.1.7** will vary from year to year but the average cost of implementation is approximately $1.0 million annually for the first 5 years (fiscal year 2022-2023 through fiscal year 2027-2028), excluding the construction costs of specific capital projects, as summarized in **Table 7-3**.

To enhance efficiencies and provide similar benefits to nearby groundwater users in the Santa Rosa Plain and Petaluma Valley GSAs, it is assumed that the development costs of common projects and actions will be shared among the three GSAs. In addition, the budget assumes that costs will be shared for the development of projects and actions conducted in cooperation with local, regional, and state partners (such as sanitation districts, water suppliers, RCDs, and others).

Table 7-3. Total Estimated 5-year Implementation Costs

GSP Implementation Item	Year 1 2022 to 2023	Year 2 2023 to 2024	Year 3 2024 to 2025	Year 4 2025 to 2026	Year 5 2026 to 2027
GSA Administration and Operations	$245,000	$235,000	$230,000	$220,000	$235,000
Communication and Stakeholder Engagement	$80,000	$80,000	$80,000	$80,000	$100,000
Annual Monitoring, Evaluation, and Reporting	$190,000	$170,000	$170,000	$170,000	$170,000
Data Gap Filling	$55,000	$515,000	$885,000	$265,000	$25,000
Conceptual Projects	$20,000	$95,000	$185,000	$10,000	$10,000
Model Updates	$0	$30,000	$50,000	$100,000	$70,000
5-year GSP Updates	$0	$0	$0	$100,000	$200,000
Subtotal	$590,000	$1,125,000	$1,600,000	$945,000	$810,000

GSP Implementation Item	Year 1 2022 to 2023	Year 2 2023 to 2024	Year 3 2024 to 2025	Year 4 2025 to 2026	Year 5 2026 to 2027
10 Percent Contingency - rounded to nearest $5,000	$60,000	$115,000	$160,000	$95,000	$80,000
Total	$650,000	$1,240,000	1,760,000	$1,040,000	$890,000

Note:
Preliminary average annual costs are equal to approximately $1 million

Estimates of future implementation costs (years 6 through 10) will be provided in the 5-year GSP update.

7.3 Funding

Development of this GSP was partially funded through grants from DWR through the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) and the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 (Proposition 68). Additional support was provided through the DWR Technical Support Services program, which included the drilling of 12 shallow monitoring wells. GSA member agencies, as described in **Section 1.3.1**, funded the remainder of the GSP development and GSA administration. The grant funding ends after submittal of this GSP, and the member-agency funding agreement ends on June 30, 2022. Therefore, additional funding streams are needed for GSP implementation.

GSP implementation will partially be funded by an implementation fee that is the current subject of an ongoing fee study. Other potential funding sources include grants through DWR, SWRCB, and federal and local entities; DWR technical support; and partnerships with member agencies and other GSAs and entities interested in leveraging mutually beneficial programs, projects, and studies.

7.3.1 Fees, Grants, and Other Funding Sources

SGMA provides GSAs with the authority to impose certain fees, including groundwater pumping fees. In September 2021, the GSA engaged a consultant, SCI Consulting, to conduct a fee study to evaluate and provide recommendations for GSP implementation funding. The study will include outreach and education to inform and solicit feedback from groundwater users and other stakeholders. Any imposition of a fee, tax, or charge will comply with California law and all applicable constitutional requirements, based on the nature of the fee.

The fee will be designed to pay for the costs of implementing the GSP that will not be covered by grants, low-interest financing, project beneficiaries and project partners. An implementation budget provided in **Table 7-3** provides a high-level overview of costs, and indicates items that could be eligible for grant funding. Administrative and operational costs are generally not eligible for grants or loans, but the remainder of the items listed in the budget (with the exception of contingency funds) may be partially or fully eligible for grant funding, depending on the grant source and availability. The GSA has successfully applied for and received more

than $2.2 million in grant funding and technical support services, and will continue to pursue grants and low-interest financing to offset the costs of monitoring, filling data gaps, and for planning and implementing projects and actions.

In addition, funding could be provided by project partners (such as other agencies) or project beneficiaries (such as farmers, businesses and nearby groundwater users) who directly benefit from project implementation.

A more detailed budget will be developed as part of the fee study process and will be available in Winter 2022. The GSA Board will consider adoption of the implementation fee in Spring 2022, and fee collection is anticipated to begin in December 2022.

7.4 Schedule

The implementation schedule is shown on **Figure 7-1**. The final GSP will be submitted to DWR no later than January 31, 2022. While DWR has 2 years to review the GSP, **Figure 7-1** assumes that implementation begins immediately, and provides an overview of the preliminary schedule for agency administration and finance, monitoring, project implementation, and reporting. Many of these categories consist of ongoing tasks and efforts that will continue throughout GSP implementation.

Administration and finance activities shown on **Figure 7-1** include:

- Completion and implementation of the fee study
- Adaptive management tasks related to ongoing development and assessment of the SMC for seawater intrusion and interconnected surface water (as described in **Section 4**)
- Outreach and communication
- Studies and implementation of management actions, including farm plan coordination and development of the policy options (described in **Section 7.1.6**).

The monitoring task includes collecting and analyzing data from existing and future RMPs, and planning for new monitoring sites to fill the data gaps discussed in **Section 5**. Specifically, this category includes the installation of stream gages and the development of associated shallow wells to fill data gaps for the depletion of interconnected surface water and the development of additional monitoring sites to assess seawater intrusion.

The project implementation schedule includes the development and implementation of Group 1 projects, as described in **Section 6**. After a short planning period, it is assumed that Group 1 project implementation will begin in 2023. Timing for the implementation of other projects and management actions will be based on conditions within the Basin, an ongoing evaluation of the potential for undesirable results to occur in the future, and completion of the initial planning activities. The timing of projects is based on best estimates and may shift as GSP implementation proceeds based upon the needs at the time.

GSP reporting will occur on an annual and a 5-year basis as required under SGMA. Annual reports will be submitted to DWR by April 1 of each year. Periodic reports (every 5 years or following substantial GSP amendments) will be submitted to DWR by April 1 at least every 5 years (2027, 2032, 2037, and 2042). The contents of annual and periodic reports are described in **Section 7.3**.