180/400-Foot Aquifer Subbasin Groundwater Sustainability Plan

2025 Periodic Evaluation

Salinas Valley Basin
Groundwater Sustainability Agency

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ABBREVIATIONS AND ACRONYMS

AF ....acre-feet
AF/yr ....acre-feet per year
CCRWQCB.......Central Coast Regional Water Quality Control Board
COC(s) ....Constituent(s) of concern
CSIP ....Castroville Seawater Intrusion Project
DAC ....Disadvantaged Communities
DDW ....Division of Drinking Water
D-TAC ....Drought Operations Technical Advisory Committee
DWR ....California Department of Water Resources
eWRIMS ....Electronic Water Rights Information Management System
GDE(s) ....Groundwater dependent ecosystem(s)
GEMS ....Groundwater Extraction Management System
GSA..................Groundwater Sustainability Agency
GSP or Plan.......Groundwater Sustainability Plan
GSP Amendment 1 .....Amendment to the 180/400-Foot Aquifer Subbasin GSP
GTAC................Groundwater Technical Advisory Committee
HCP..................Habitat Conservation Plan
ILRP ....Irrigated Lands Regulatory Program
InSAR ....Interferometric Synthetic-Aperture Radar
ISW ....interconnected surface water
MCL ....Maximum Contaminant Level
MCWRA ....Monterey County Water Resources Agency
mgd ....million gallons per day
mg/L ....milligrams per liter
MLRP................Multi-benefit Land Repurposing Program
PMA(s).............Projects and Management Action(s)
RCA(s) ....Recommended Corrective Action(s)
RMS ....Representative Monitoring Site
SGMA ....Sustainable Groundwater Management Act
SMC ....Sustainable Management Criteria/Criterion
SMCL................Secondary Maximum Contaminant Level
SRDF.................Salinas River Diversion Facility
Subbasin............180/400-Foot Aquifer Subbasin
SVBGSA...........Salinas Valley Basin Groundwater Sustainability Agency
SVIHM..............Salinas Valley Integrated Hydrologic Model
SVOM ....Salinas Valley Operational Model
SVRP.................Salinas Valley Reclamation Project
SWIG ....Seawater Intrusion Working Group
SWO..................Surface Water Operations
SWRCB............State Water Resources Control Board

UMHOS/CM.....micromhos/centimeter
USGS ................U.S. Geological Survey
WY....................Water Year

EXECUTIVE SUMMARY

ES-1 Introduction

This report documents the Salinas Valley Basin Groundwater Sustainability Agency's (SVBGSA) evaluation of the first 5 years of implementation of the Groundwater Sustainability Plan (GSP) for the 180/400-Foot Aquifer Subbasin (180/400 Subbasin, or Subbasin). The 180/400 Subbasin is designated as a high priority and critically overdrafted basin, due in part to the presence of seawater intrusion. In recent decades, groundwater conditions in the 180/400 Subbasin have deteriorated for the following reasons: seawater intrusion, a decline in groundwater elevations in specific areas, and an overall decline in groundwater storage.

The 180/400 Subbasin is co-managed by the SVBGSA, Marina Coast Water District Groundwater Sustainability Agency (MCWD GSA), and the Monterey County Groundwater Sustainability Agency (MCGSA). The jurisdictional areas of each groundwater sustainability agency (GSA) are shown on Figure ES-1. The GSAs developed a single GSP for the entire 180/400 Subbasin.

In 2020, GSAs submitted the GSP for the 180/400 Subbasin that outlined how it would manage groundwater in accordance with the Sustainable Groundwater Management Act (SGMA). The California Department of Water Resources (DWR) approved the GSP in June 2021. This 2025 GSP Periodic Evaluation (GSP 2025 Evaluation) covers from Water Year (WY) 2019 to WY 2023. It is accompanied by GSP Amendment 1, which is the first amendment to the 180/400 Subbasin GSP. It fulfills the requirements of SGMA.

The 180/400 Subbasin is 1 of 6 subbasins within the Salinas Valley Groundwater Basin that fall partially or entirely within the jurisdiction of the SVBGSA. These 6 subbasins are referred to here as the Salinas Valley.

Following GSP submittal in 2020 and with funding from a DWR Proposition 68 Grant, SVBGSA created a 2-year work plan to prepare the 5 remaining GSPs in the Salinas Valley (Figure ES-1) along with a 2-year update to the 2020 GSP, GSP Amendment 1. SVBGSA formed 6 subbasin planning committees to provide input on the respective 6 subbasin GSPs. In January 2022, SVBGSA submitted the GSPs for the Eastside Aquifer (Eastside), Langley Area (Langley), Monterey (co-managed with Marina Coast Water District GSA), Forebay Aquifer (Forebay, co-managed with Arroyo Seco GSA), and Upper Valley Aquifer (Upper Valley) Subbasins to DWR. DWR reviewed and approved these plans in the spring of 2023.

The overarching groundwater sustainability goal of the 180/400 Subbasin is to manage groundwater resources for long-term community, financial, and environmental benefits of the Salinas Valley's residents and businesses. The goal of the Salinas Valley GSPs is to balance the needs of all water users and ensure long-term viable water supplies while maintaining the unique cultural, community, and business aspects of each subbasin. This report provides an evaluation of the progress made in implementing the GSP, including projects and management actions (PMAs), and demonstrates that the GSAs are on track to meet the GSP sustainability goal.

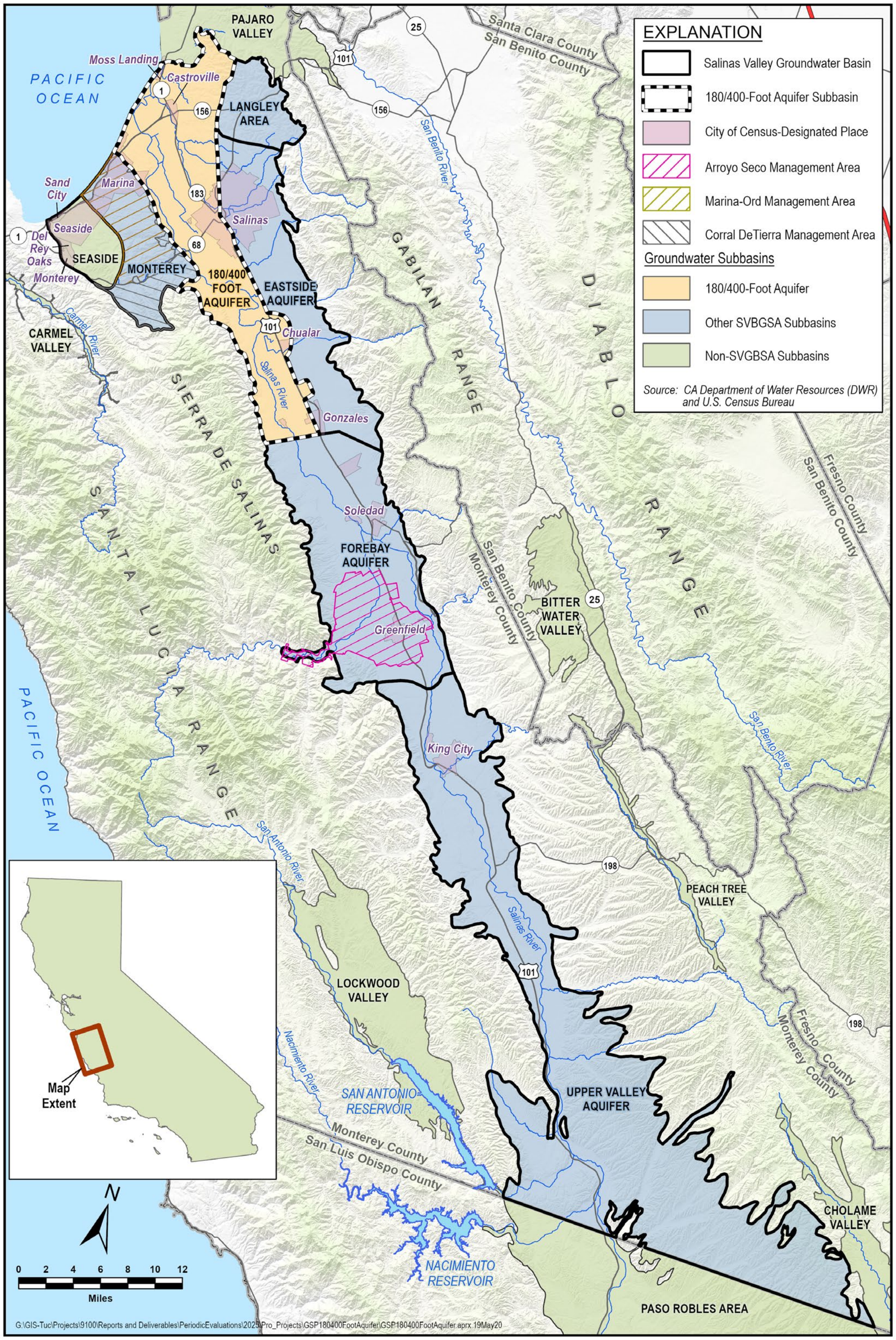


Figure ES-1. 180/400 Subbasin Location

ES-2 2022 GSP Amendment 1

This GSP 2025 Evaluation accompanies GSP Amendment 1 for the 180/400 Subbasin, which was adopted by the SVBGSA Board on September 8, 2022. While at that time it was referred to as the GSP Update, in this evaluation it is referred to as GSP Amendment 1. It describes changes from the 2020 GSP that are included in GSP Amendment 1 and provides additional updates on GSP implementation activities since 2022. Preparation of GSP Amendment 1 was funded by a Proposition 68 Planning Grant from DWR.

GSP Amendment 1 incorporates additional data about current conditions, adds clarifications identified during development of the 2022 Salinas Valley GSPs, addresses recommended actions from DWR's review of the original GSP, and incorporates additional regulatory requirements. SVBGSA submits GSP Amendment 1 to DWR as an amendment according to GSP Regulation § 355.10, and it replaces the original 2020 GSP. It continues to meet all of the GSP regulatory requirements. Appendix ES-A describes how GSP Amendment 1 and this GSP 2025 Evaluation meet GSP Regulations § 356.4.

In April 2022, the 180/400 Subbasin Planning Committee recommended the Board release GSP Amendment 1 for a public comment period. The Board approved this and issued a 90-day notice of a public hearing to adopt the GSP Amendment 1 (referred to at that time as a GSP Update). Comment letters and responses are included in GSP Amendment 1, Appendix 2A. On April 22, 2022, SVBGSA's Advisory Committee reviewed and commented on a draft of Amendment 1, and on June 2, 2022, the 180/400 Subbasin Committee received a final draft Amendment 1 and voted unanimously to forward it to the Board for a public hearing, which was held on September 8, 2022. As documented Resolution No 2022-16 (Appendix ES-B), the Board approved GSP Amendment 1 and authorized and directed its submittal to DWR.

On October 19, 2023, DWR sent a letter that acknowledged SVBGSA's desire to align the schedule for the 6 subbasins managed by SVBGSA and stated that DWR intended to conduct its review by September 30, 2024. This letter also stated that the SVBGSA would need to submit the first periodic evaluation for the 180/400 Subbasin no later than January 23, 2025.

On June 20, 2024, DWR sent subsequent correspondence informing SVBSGA that it could not complete its review of GSP Amendment 1 without a periodic evaluation. The letter stated that DWR believed the most efficient path forward was for the amendment to be withdrawn and resubmitted along with this GSP 2025 Evaluation. On August 8, 2024, the Board authorized the General Manager to withdraw GSP Amendment 1 with an intent to resubmit the amendment with the GSP 2025 evaluation by January 23, 2025.

ES-3 Significant New Information

Since GSP development, SVBGSA and partner agencies have collected new data and information that refine the understanding of the groundwater basin and contribute to efforts regarding how to reach sustainability. Section 1 includes new information that is in GSP Amendment 1, including new information on County policies, description of the shallow sediments, analysis of interconnected surface water (ISW), and a more detailed description of groundwater dependent ecosystems (GDEs).

Since GSP Amendment 1, the GSAs have acquired additional other significant new information including geophysical data, additional water use data, and the Salinas Valley Deep Aquifers Study. SVBGSA undertook further hydrostratigraphic analysis that informed groundwater flow model refinements, and it worked with Central Coast Wetlands Group (CCWG) to map potential GDEs and develop a field verification and monitoring approach, with field verification conducted in northern part of the 180/400 Subbasin. Monterey County Water Resources Agency's (MCWRA) adopted a Groundwater Monitoring Program ordinance that includes well registration. In addition, 6 new monitoring wells were installed: 1 ISW, 3 Deep Aquifers, and 2 seawater intrusion.

Lastly, during the evaluation period, SVBGSA and partner agencies worked to update surface water and groundwater models. SVBGSA developed and refined the Salinas Valley Seawater Intrusion Model (SWI Model), a variable density model to assist with addressing seawater intrusion. The U.S. Geological Survey (USGS) continued to develop the Salinas Valley Integrated Hydrologic Model (SVIHM) and Salinas Valley Operational Model (SVOM)[1] for MCWRA and SVBGSA. SVBGSA also funded updates to a Hydrologic Engineering Center River Analysis System (HEC-RAS) Model for the Salinas River. These models will be used together with the SWI Model to evaluate the effects of GSP PMAs, as well as for refinement of water budgets and other information to be considered for future GSP amendments.

ES-4 Recommended Corrective Actions

DWR approved the 2020 GSP in 2021 with 5 required Recommended Corrective Actions (RCAs). During the first 5 years of GSP implementation, SVBGSA focused on addressing DWR RCAs on the 2020 180/400 Subbasin GSP and collecting new information to fill data gaps. SVBGSA addressed the 5 RCAs in GSP Amendment 1. Section 1 summarizes the status of actions to address each RCA and how they are included in GSP Amendment 1. SVBGSA has

[1] These data (SVIHM and SVOM model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the USGS. No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

also begun addressing the DWR RCAs received on the other 5 SVBGSA GSPs. Those applicable to the 180/400 Subbasin will be included in the next periodic evaluation.

ES-5 Groundwater Conditions and Changes in Water Use

SGMA requires groundwater to be managed according to 6 sustainability indicators. These indicators are used to show progress toward sustainability while adhering to the overarching sustainability goal of the Subbasin. GSP Amendment 1 updates the Sustainable Management Criteria (SMC) set for each sustainability indicator for the 180/400 Subbasin. SVBGSA monitors groundwater conditions for these sustainability indicators and routinely evaluates progress toward meeting SMC metrics.

To operationalize the overarching sustainability goal and comply with SGMA, the Salinas Valley GSPs set SMC for each of the 6 sustainability indicators for the 180/400 Subbasin. SVBGSA and partner agencies will manage the Subbasin to its measurable objectives and will avoid undesirable results by 2040, demonstrating progress along the way. Since quantitative evaluation of undesirable results are based on minimum thresholds, managing to measurable objectives helps provide operational flexibility and prevent groundwater conditions from reaching undesirable results. Subbasin-specific SMC were developed based on public input, historically observed hydrologic conditions, and reasonably anticipated climate change. These SMC may be updated in future amendments to reflect changes in anticipated climate conditions or refined data and groundwater modeling results.

Section 2 includes updated water use and reports on groundwater conditions over the evaluation period. More specifically, Section 2 summarizes progress for each of the sustainability indicators reported in the first 5 annual reports from WY 2019 to WY 2023. It reviews groundwater conditions relative to minimum thresholds, the 2025 interim milestones, and measurable objectives. The evaluation period included 3 consecutive dry years from WY 2020 to WY 2022, and it ended with a very wet year, WY 2023. Given that groundwater levels fluctuate annually, Section 2 also analyzes the 5-year groundwater level trends. As expected, since the initial years of GSP implementation focused on filling data gaps and undertaking feasibility studies, the 180/400 Subbasin had undesirable results for the Groundwater Level, Groundwater in Storage, Seawater Intrusion, and Interconnected Surface Water SMC during the evaluation period. While the wet year improved groundwater levels on average, most wells still had declining groundwater level trends over the evaluation period, and in WY 2023 there were still undesirable results for the Groundwater Levels SMC, based on the Deep Aquifers, and the Seawater Intrusion SMC.

ES-6 Status of Projects and Management Actions

In the last 5 years, SVBGSA has made steady progress on PMAs in the GSP. Section 3 provides a summary of the activities from January 2020 to December 2024. If implemented, a suite of combined 2020 GSP and GSP Amendment 1 PMAs have the potential for reaching sustainability in the 180/400 Subbasin within 20 years and maintaining sustainability for an additional 30 years.

With help from the Round 1 SGM Implementation Grant, SVBGSA explored the 3 types of PMAs that can potentially mitigate seawater intrusion: an extraction barrier, injection, and extraction reduction. Those will culminate in a project update report in early 2025 and be complemented with considering various combinations of PMAs in the 180/400 Subbasin and other subbasins. These feasibility studies show that at least one project can meet the seawater intrusion minimum threshold: the Brackish Groundwater Restoration Project, which pairs an extraction barrier with desalination for a drought-proof alternative in lieu supply.

In 2025, SVBGSA will explore if other combinations of PMAs could also meet the minimum threshold. Groundwater modeling shows the measurable objective may have been unreasonably ambitious. SVBGSA will consider whether there are other ways to address the needs of beneficial users in the coastal area, such as expansion of the Castroville Seawater Intrusion Project (CSIP), alternative water supplies, and/or management of the Deep Aquifers.

SVBGSA intends to submit the next periodic evaluation for the 180/400 Subbasin in 2027 in line with the other 5 Salinas Valley subbasin periodic evaluations. In the next 2 years leading to those periodic evaluations, SVBGSA will work toward a comprehensive PMA selection process that will meet the sustainability needs of all subbasins individually and in an integrated manner.

ES-7 Changes in Basin Setting Based on New Information

A more refined understanding of the basin setting improves the ability to manage the Subbasin. The GSP 2025 Evaluation summarizes updates to the basin setting included in GSP Amendment 1 and further analyses completed afterward in light of significant new information.

Section 4 summarizes the update to the hydrogeologic conceptual model that integrates new data, such as new geophysical data, the Salinas Valley Deep Aquifers Study, and data on GDEs. Results included updating the bedrock surface and offshore hydrostratigraphy, the lateral and vertical extent of the 400/Deep Aquitard and extent of the Deep Aquifers, and the extents and depths of the coastal aquitards. This incorporated thin spots and gaps in some of the coastal aquitards, and showed that the 400-Foot Aquifer extends deeper than previously thought in the southern part of the Subbasin.

The revised understanding of hydrostratigraphy was used to update the SWI Model and is now being used to update the SVIHM and SVOM. More recent versions of the provisional SVIHM and SVOM were used to develop updated historical, current, and predictive water budgets included in this GSP 2025 Evaluation.

ES-8 Monitoring Networks

Since GSP submittal, SVBGSA has focused on filling data gaps and expanding the monitoring networks. Section 5 of the GSP 2025 Evaluation includes an assessment of the monitoring network for each sustainability indicator. It includes the changes in the monitoring network included in GSP Amendment 1, as well as those recommended for a future GSP revision. Table ES-1 summarizes the number of wells in each monitoring network, which Section 5 further breaks down by aquifer and provides explanations for the revisions. The wells added to the monitoring network in GSP Amendment 1 filled most monitoring network data gaps. This GSP 2025 Evaluation includes further revisions to the monitoring networks completed since 2022, including newly installed wells; these are recommended for inclusion in a future amendment. The Deep Aquifers Study identified additional groundwater level monitoring network data gaps, which SVBGSA and partner agencies plan to fill.

Table ES-1. Changes in SMC Monitoring Networks

Monitoring Network	Original GSP	GSP Amendment 1	Recommended for Future GSP Amendment	Wells Removed from the Representative Monitoring Site (RMS) Network
Groundwater Level	23	91	99	13
Seawater Intrusion	48	138	120	20
ISW	1	2	2	1

ES-9 SVBGSA Administration, Funding, and Authorities

Section 6 provides an overview of SVBGSA's administration and funding for GSP implementation, including the annual work plan, budget, and fee process. It describes 2 coordination agreements with other GSAs in the 180/400 Subbasin, MCWDGSA, and County of Monterey GSA. It describes other agencies with groundwater management authority and formal actions taken by them, and how SVBGSA has coordinated with these agencies and activities. It includes the only legal case related to the 180/400 Subbasin that occurred during the evaluation period.

ES-10 Outreach and Engagement

Groundwater supports economic activities from small domestic scale to large industrial scale. Groundwater is an important supply for over 400,000 people living within the Salinas Valley. Beneficial users in the Valley are the key interested parties targeted for robust public engagement for GSP development and implementation and are highly diverse. Community engagement and public transparency on SVBGSA decisions is paramount to building a sustainable and productive solution to groundwater sustainability in the Salinas Valley.

The process for development of the 2020 GSP included a combination of gathering feedback during public meetings with the Advisory Committee and Board of Directors. Subsequently, the Board established subbasin planning committees in May 2020 to inform and guide planning for the remaining 5 GSPs submitted in January 2022. Adopted in July 2021, SVBGSA Resolution No. 2021-06 established Subbasin Implementation Committees to be convened upon the submittal of the GSP for the Subbasin, including a new 180/400 Subbasin Implementation Committee (180/400 Committee).

As described in Section 7, the Board, Advisory Committee, and Subbasin Implementation Committees are working together to implement the 6 GSPs required within the SVBGSA jurisdiction. Subbasin Implementation Committee meetings follow the requirements of the Brown Act. Meeting agendas and materials are noticed publicly on the SVBGSA website, and public comments are taken on all posted agenda items. In addition to these formal public participation processes, SVBGSA maintains robust outreach and engagement with interested parties through multiple channels.

ES-11 Next Period Evaluation and Future Plan Amendments

SVBGSA prepared GSP Amendment 1 in 2022 with the intent to bring all 6 SVBGSA GSPs into the same 5-year cycle for periodic evaluations and plan amendments. More specifically, the other GSPs will require evaluations in 2027, 2032, and 2037.

SVBGSA intends to prepare its next periodic evaluation of the 180/400 Subbasin GSP, and potentially Amendment 2, to submit to DWR in 2027. After that, SVBGSA will prepare subsequent periodic evaluations on the same 5-year cycle for all 6 subbasins. This will provide an opportunity to ensure an integrated approach to the implementation of multi-subbasin and subbasin-specific PMAs, and, if needed, to develop future plan amendments for all 6 GSPs concurrently for a cohesive strategy to achieve and maintain sustainability in the Valley.

The GSP 2027 Evaluations will incorporate new data and information across all 6 subbasins, building on this GSP 2025 Evaluation. Modeling for each subbasin will use the same updated groundwater flow models. The SVIHM, SVOM, and the SWI Model will be used to evaluate and compare which PMAs will best achieve sustainability criteria and provide the greatest benefits to address overdraft and other groundwater conditions. A range of PMAs that will improve groundwater conditions in multiple subbasins will continue to be analyzed. Over the next 2 years leading to those GSP 2027 Evaluations, SVBGSA will work toward a comprehensive PMA selection process that will meet the sustainability needs of all subbasins individually and in an integrated manner, as well as review and consider next steps on PMAs across all subbasins concurrently.

1 STATUS OF DATA GAPS AND NEW INFORMATION COLLECTED

During the first 5 years of GSP implementation, the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) has focused on addressing the DWR Recommended Corrective Actions (RCAs) on the 2020 180/400 Subbasin GSP and collecting new information to fill data gaps. This GSP 2025 Evaluation summarizes the status of actions to address each RCA, and the extent to which these actions are included in the GSP Amendment 1.

1.1 Status of Recommended Corrective Actions

DWR approved the GSP in 2021 with 5 required RCAs. SVBGSA partially or entirely addressed the RCAs in GSP Amendment 1, as outlined in the following sections.

1.1.1 RCA 1 – Communications

RCA Number	RCA
1	SVBGSA should provide additional information on the required, [sic] ongoing communications elements required in the GSP Regulations, and describe how those required elements fit into phase 4 of the GSA's Engagement and Outreach Strategy, including engagement of irrigation, drinking water supply, and environmental beneficial users as identified in the Plan.

Chapter 11 of the originally submitted GSP included a Stakeholder Engagement and Outreach Strategy comprising 4 phases. The last phase, Implementation and Reporting, was described as continuing through the duration of the 50-year planning window to ensure that sustainability is achieved and maintained. GSP Regulations require the GSP to include elements regarding prospective communication (e.g., a discussion of how public input will be used, how the GSA encourages involvement of diverse elements of the population, and methods to inform the public about progress toward implementing the Plan). In this RCA, DWR staff recommended the GSA include details about how communications will be conducted during Plan implementation.

In GSP Amendment 1, SVBGSA updated the previous 2020 GSP Chapter 11 in a new Chapter 2: Communications and Public Engagement. It provides additional information to address DWR Recommended Corrective Action 1 on SVBGSA's implementation of the required, ongoing communications elements. Among other components, it included sections on the following:

- Identification of interested parties for the purposes of public engagement
- SVBGSA 180/400 Subbasin Planning and Implementation Committees
- Communication and public engagement actions (goals, objectives, target audiences, stakeholder database, key messages and talking points, engagement strategies, timeline and tactics, and an annual evaluation and assessment)

- Strategic engagement and communications with underrepresented communities and disadvantaged communities

1.1.2 RCA 2 – Connectivity of Salinas River, Non-principal Shallow Aquifer, and Principal Aquifers

RCA Number	RCA
2	Investigate the hydraulic connectivity of the Salinas River, the non-principal shallow aquifer, and the principal aquifers. Identify specific locations where the Salinas River gains or loses water to the groundwater system. Based on results of the investigation, provide updated discussion of the potential for management of the principal aquifers to impact beneficial uses and users of groundwater in the shallow aquifer, including that the GSA should document known impacts to drinking water users, should they occur, or surface water.

Department staff noted the concern for groundwater dependent ecosystems (GDEs) by several commenters, and while recognizing the potential importance shallow aquifers have on supporting and sustaining GDEs concluded that "Department staff do not believe the SVBGSA erred in its identification of principal aquifers" and "the SVBGSA did not act unreasonably when defining principal aquifers." This is largely because there is no extraction from the shallow sediments that is "significant and economic." However, Department staff noted that the shallow sediments above the Salinas Valley Aquitard in the Subbasin are relevant to the understanding of groundwater and surface water interactions and agreed with the assessment in the GSP that more information is needed to better understand the hydraulic connection between the shallow aquifer, the principal aquifers, and groundwater uses and users, including GDEs.

In Chapter 4: Hydrogeologic Conceptual Model of the GSP Amendment 1, SVBGSA included greater descriptions of interconnected surface water (ISW) and GDEs in discharge areas, as well as the hydraulic connectivity between the Salinas River, the non-principal shallow sediments, and principal aquifers. The chapter provides a new analysis and greater description of the shallow sediments and their connection to underlying aquifers (Section 4.4.1.1). The amended GSP presents new analyses on the locations of interconnected surface water (Section 4.4.5.1) using the provisional Salinas Valley Integrated Hydrologic Model (SVIHM) to map potential locations of ISW, and GSP Amendment 1 Appendix 4A presents an analysis of seasonal surface water interconnectivity. Finally, GSP Amendment 1 adds a new section on GDEs (Section 4.4.5.2) that includes information about where they are found within the Subbasin in relation to the shallow alluvium and principal aquifers.

While the Salinas Valley Aquitard is generally a thick layer of clay, AEM data indicates there may be a potential gap near Somavia Road. SVBGSA is investigating connectivity along this stretch in 2024 and 2025. In addition, the GDE efforts described below will help strengthen the understanding of the connectivity between the Salinas River, shallow sediments, and principal aquifers, and the relationship with GDEs.

DWR is developing guidance for ISW. When available, SVBGSA will review the forthcoming ISW Guidance and apply as appropriate to the 180/400 Subbasin.

1.1.3 RCA 3 – Groundwater Dependent Ecosystems

RCA Number	RCA
3	SVBGSA should clarify its plan to conduct necessary field reconnaissance for GDE identification. Update future iterations of the GSP with the results of the field studies to identify GDEs in the Subbasin.

The GSP and GSP Amendment 1 were based on existing information; and field data on GDEs were not available at the time. While SVBGSA included a more robust GDE section in the GSP Amendment 1 (Section 4.4.5.2), the added content summarizes known information about GDEs within the Salinas Valley and notes that field reconnaissance is needed.

SVBGSA acknowledges that GDEs are an important beneficial user of groundwater. SVBGSA has partnered with CCWG and completed a data-driven analysis to refine identification of potential GDEs and to conduct GDE field reconnaissance. With guidance from subject matter experts and an SVBGSA-convened interested parties working group, CCWG developed a methodology to identify GDEs and an approach to monitor and assess impacts to GDE health. This GDE identification and monitoring work includes the following:

- Analyzing datasets to identify potential GDEs (completed)
- Filtering the data to reflect local habitat and groundwater conditions (completed)
- Categorizing GDEs into units for monitoring and assessment (completed)
- Visiting field sites to ground truth GDEs and assess baseline conditions using tools such as the California Rapid Assessment Methodology (CRAM) (completed in northern portion of the Subbasin, remaining to be completed fall 2024).
- Identifying monitoring wells or additional shallow monitoring wells needed to measure groundwater elevations near GDEs (underway).
- Establishing remotely sensed data and CRAM thresholds to define what an adverse effect on a GDE means (completed and update underway).

In addition to the Sustainable Groundwater Management (SGM) Implementation Round 1 Grant funding for this work in the 180/400 Subbasin, SVBGSA has obtained grant funding through SGM Implementation Round 2 Grants to continue coordinating with CCWG to complete field reconnaissance in all subbasins and plans to include the results in GSP 2025 Evaluation. This work includes relating the vegetation types and distribution to groundwater elevation data. When the recommended shallow monitoring wells are installed, the groundwater conditions of the shallow water table near GDEs will help inform the monitoring of future GDE condition. The shallow water table data will also be used to investigate the connectivity of the upper saturated zone to the principal aquifer, which will further inform RCA 2.

Greater detail was added to GSP Amendment 1 to address DWR Recommended Corrective Action 3 on how SVBGSA plans to conduct field reconnaissance for GDE identification. Section 4.2.2 of this GSP 2025 Evaluation includes a discussion of progress to date on the GDE field reconnaissance.

1.1.4 RCA 4 – Average Hydrogeologic Conditions

RCA Number	RCA
4	Define what constitutes "average hydrogeologic conditions" and how the "long-term average over all hydrogeologic conditions" will be calculated for the consideration of undesirable results for reduction of groundwater storage and depletions of interconnected surface water.

The 2020 GSP defined the Reduction in Groundwater Storage undesirable result as when—during average hydrogeologic conditions and as a long-term average—the total groundwater pumping volume exceeds the minimum threshold of 112,000 acre-feet per year (AF/yr). The GSP, however, did not include information about what is defined as "average hydrogeologic conditions" or about how the long-term average will be calculated to determine when or if an undesirable result has occurred.

In GSP Amendment 1, SVBGSA added a new section to Chapter 8: Sustainable Management Criteria titled Achieving Long-Term Sustainability (Section 8.3) to explain the terminology and how long-term sustainability is calculated. It explains that the GSP addresses long-term groundwater sustainability and intends to develop SMC to avoid undesirable results under future hydrologic conditions. The understanding of future conditions is based on historical precipitation, evapotranspiration, streamflow, and reasonable anticipated climate change, which has been estimated on the basis of the best available climate science (DWR, 2018). The estimated future water budget over the planning horizon is based on these parameters (see Section 4.4). The average hydrologic conditions include reasonably anticipated wet and dry periods. Groundwater conditions that are the result of extreme climatic conditions and are worse than those anticipated do not constitute an undesirable result. If future conditions become more extreme and worse than anticipated to the extent it becomes the average, the SMC may be modified to reflect observed future climate conditions.

SVBGSA will track hydrologic conditions during GSP implementation. These observed hydrologic conditions will be used to develop a value for average hydrologic conditions, which will be compared to predicted future hydrologic conditions. This information will be used to interpret the Subbasin's performance against SMC. The GSP intent is to avoid undesirable results with long-term, deliberate groundwater management, not management to annual fluctuations. For example, groundwater extractions may experience variations caused by reasonably anticipated hydrologic fluctuations. However, under average hydrologic conditions, there will be no chronic depletion of groundwater storage.

The GSAs realize that the statements about average hydrogeologic conditions are unnecessary in the GSP. The Sustainable Groundwater Management Act (SGMA) is designed to address long-term groundwater sustainability, and exceedance of some SMC during an individual year does not constitute an undesirable result. Pursuant to SGMA regulations (California Water Code § 10721(w)(1)), "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." Therefore, groundwater levels may temporarily exceed minimum thresholds during prolonged droughts, which could be more extreme than those that have been anticipated based on historical data and anticipated climate change conditions. Such temporary exceedances do not constitute an undesirable result. Therefore, the addition of "During average hydrogeologic conditions, and as a long-term average over all hydrogeologic conditions" in the Storage Undesirable Result statement is unnecessary and was omitted from GSP Amendment 1.

1.1.5 RCA 5 – Water Quality Coordination

RCA Number	RCA
5	Coordinate with the appropriate groundwater users, including drinking water, environmental, and irrigation users as identified in the Plan, and water quality regulatory agencies and programs in the Subbasin to understand and develop a process for determining if groundwater management and extraction is resulting in degraded water quality in the Subbasin.

Department staff noted the 2020 GSP Water Quality SMC focused only on water quality impacts associated with GSP implementation, i.e., GSP-related projects, and is inappropriately narrow. While Department staff recognized that GSAs are not responsible for improving existing degraded water quality conditions, they noted GSAs are required to manage future groundwater extraction to ensure that groundwater use subject to its jurisdiction does not significantly and unreasonably exacerbate existing degraded water quality conditions. Where natural and other human factors are contributing to water quality degradation, the GSAs may have to confront complex technical and scientific issues regarding the role of groundwater extraction and other groundwater management activities, as opposed to other factors impacting water quality, in any continued degradation. The analysis should address whether groundwater extraction is causing the degradation and analyze any impacts from specific projects or management activities. Department staff recommended that the SVBGSA coordinate with the appropriate water quality regulatory programs and agencies in the Subbasin to understand and develop a process for determining when groundwater management and extraction is resulting in degraded water quality in the Subbasin.

To address DWR's clarification that GSAs are required to manage groundwater extraction and note that the Water Quality SMC was too narrow in the GSP Amendment 1, SVBGSA revised the undesirable result to be:

> *Future or new minimum thresholds exceedances are caused by a direct result of GSA groundwater management action(s), including projects or management actions and regulation of groundwater extraction.*

Additional text is added to recognize the existing regulatory framework, collaboration that SVBGSA will engage in with other water quality regulatory agencies, and a general approach to assess if a minimum threshold exceedance is due to a GSA's management.

In the GSP Amendment 1 Chapter 9: Projects and Management Actions, SVBGSA also developed a new implementation action titled Water Quality Coordination Group, which outlines how SVBGSA will address this RCA and coordinate with water quality regulatory agencies and programs in all subbasins. The Water Quality Coordination Group (Coordination Group) includes the Central Coast Regional Water Quality Control Board (CCRWQCB), local agencies and organizations, water providers, domestic well owners, technical experts, and other interested parties. The purpose of the Coordination Group is to coordinate amongst and between agencies that regulate water quality directly and the SVBGSA, which has an indirect role to monitor water quality and ensure its management does not cause undesirable water quality results. Part of this effort will focus on understanding and developing a process for determining when groundwater management and extraction result in degraded water quality in the Subbasin. The Coordination Group will also review water quality data, identify data gaps, and coordinate agency communication.

SVBGSA has engaged staff from water quality regulatory agencies to plan for the development of the Coordination Group. Planning meetings occurred in 2023, and the first Coordination Group meeting occurred in April of 2024. The first phase of the Coordination Group involves an emphasis on data sharing and staff level collaboration. The Coordination Group will meet at least annually in April to review the GSPs. Section 8 of this GSP 2025 Evaluation includes a discussion of progress to date of the Coordination Group.

1.2 New Information Collected

Since GSP development, SVBGSA and partner agencies have collected new data and information that refine the understanding of the groundwater basin and contribute to efforts regarding how to reach sustainability. Table 1-1 provides brief descriptions of the significant new information collected, aspects of the GSP affected, and whether they warrant changes to any aspects of the plan. It is separated into the new information incorporated into GSP Amendment 1 and new information collected after that point.

Additional description for new information collected is included in the sections below only if not covered elsewhere in the GSP 2025 Evaluation.

Table 1-1. Summary of New Information Collected

Significant New Information	Brief Description and GSP 2025 Evaluation Section with Further Description	Aspects of Plan Affected	Warrant Change to Any Aspects of the Plan (Yes/No) If yes, include section of the Plan *(including evaluation of basin setting, MT, MO, criteria for determining URs)*
New Information Collected and Included in GSP Amendment 1			
County Policies	County Public Policy of Safe and Clean Water and updates on County ordinances included (1.2.1)	Basin setting / Description of plan area (Section 1.2.1 and 3.6.5)	Included in GSP Amendment 1
Analysis of shallow sediments	Analysis and greater description of the shallow sediments and their connection to underlying aquifers, which addresses Corrective Action #2 of DWR's review of the 2020 GSP	Basin setting / HCM (Section 4.4.1.1)	Included in GSP Amendment 1
Analysis of ISW	Analyses on the locations of ISW	Basin setting / HCM (Section 4.4.5.1)	Included in GSP Amendment 1
Description of Groundwater-dependent Ecosystems (GDEs)	Greater description of GDEs within Salinas Valley (5.2.2)	Basin setting / HCM (Section 4.4.5.2)	Included in GSP Amendment 1
Water use	Water use data through Water Year (WY) 2020 (3.1.2)	Basin setting / Groundwater conditions	Included in GSP Amendment 1
New Information Collected After Development of GSP Amendment 1 to be Considered in Future Amendments			
Water use	Water use data through WY 2023 (3.1.2)	Basin setting / Groundwater conditions	No, annual water use data do not warrant changes to GSP.
Geophysical Data	Airborne Electromagnetic (AEM) Data, including flightlines from DWR Survey Area 1, DWR Survey Area 8, and the Salinas Valley Deep Aquifers Study, and U.S. Geological Survey (USGS) 2016 Seismic Data in Monterey Bay (5.1.2)	Basin setting / HCM	No, new information contributes to improved understanding of HCM and to model updates but does not warrant change to GSP. Updates recommended for inclusion in future amendment.
Salinas Valley Deep Aquifers Study	Scientific study of the Deep Aquifers that defines their geographic extent, hydrostratigraphy, water chemistry, isotopes, and aquifer properties. Study provides guidance based on the science for management and monitoring (5.1.1)	Basin setting / HCM, monitoring network	No, new information contributes to improved understanding of HCM, model updates, and revision of monitoring wells, but do not warrant change to GSP. Updates recommended for inclusion in future amendment.
Hydrostratigraphic analysis for model updates	Targeted analysis of the hydrostratigraphic in specific parts of the Subbasin to incorporate new	Basin setting / HCM	No, new information contributes to improved understanding of HCM and model updates, but do

Significant New Information	Brief Description and GSP 2025 Evaluation Section with Further Description	Aspects of Plan Affected	Warrant Change to Any Aspects of the Plan (Yes/No) If yes, include section of the Plan *(including evaluation of basin setting, MT, MO, criteria for determining URs)*
	data. Includes analysis of lithologic logs, AEM, and aquitard mapping (5.1.2)		not warrant change to GSP. Updates recommended for inclusion in future amendment.
New monitoring wells: 1 ISW, 3 Deep Aquifers, 2 seawater intrusion	Filled GSP-identified ISW monitoring network data gap with installation of 1 shallow monitoring well to monitor ISW. Filled 3 Deep Aquifers data gaps with installation of 3 new monitoring wells. Added 2 seawater intrusion monitoring well (2.2.2)	Basin setting / HCM, monitoring network	No, monitoring network changes do not warrant change to GSP. Updates recommended for inclusion in future amendment.
Well registration	The newly adopted Monterey County Water Resources Agency (MCWRA) Groundwater Monitoring Program includes well registration. MCWRA has finished the first part of developing a comprehensive registry of wells, their locations, and screen intervals through comparing and reconciling their records with County Environmental Health Bureau and DWR. First part focused on existing well records (2.2.3)	Basin setting / Description of plan area, SMC domestic well analysis	No, new information refines understanding of existing wells, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
GDE mapping and field verification	Central Coast Wetlands Group (CCWG) mapped potential GDEs and developed a field verification and monitoring approach. Field verification conducted in northern part of Subbasin (5.2.2)	Basin setting / HCM, SMC impacts on beneficial uses and users	No, new information refines data on potential GDEs present, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
Seawater Intrusion Model	Developed Seawater Intrusion Model to estimate advancement of seawater intrusion and evaluate actions to address intrusion (2.2.4)	Projects and management actions	No, new information is useful for comparison of project scenarios, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.
Hydrologic Engineering Center River Analysis System (HEC-RAS) Model	FlowWest updated a Salinas River HEC-RAS model to analyze groundwater recharge from storm events to help inform future decisions regarding the channel maintenance of the Salinas River (2.2.5)	Projects and management actions	No, new information is useful for understanding impacts of the Stream Maintenance Program, but do not warrant changes to GSP. Updates recommended for inclusion in future amendment.

1.2.1 County Policies

To recognize the Human Right to Water, SVBGSA included a section on the County Public Policy of Safe and Clean Water in the Basin Setting (Section 3.8) of GSP Amendment 1. In December 2018 the County of Monterey established a public policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes and that the human right to water extends to all residents of Monterey County, including disadvantaged individuals, groups, and communities in rural and urban areas.

The GSP Amendment 1 also includes updates on County ordinances in Section 3.6.5 that are relevant to SVBGSA. These focus on County Ordinance No. 5302 and 5303 that, prior to their expiration, prohibited the acceptance or processing of any new wells in the Deep Aquifers beneath areas impacted by seawater intrusion, with stated exceptions including municipal and replacement wells. The section also describes County Ordinance No. 5339 that placed a temporary moratorium on new well construction permit applications so the County could study the impact of the California Supreme Court's decision on 27 August 2020 in the case Protecting Our Water and Environmental Resources *et al.*, v. County of Stanislaus, *et al.*, (10 Cal.5th 479 (2020); "Protecting Our Water").

1.2.2 New Monitoring Wells

The 2020 GSP identified a number of groundwater level monitoring network data gaps. The GSAs initiated a program to fill these data gaps. The data gaps were first filled with existing wells monitored by Monterey County Water Resources Agency (MCWRA) for groundwater elevations. In GSP Amendment 1, the SVBGSA reevaluated the data gap locations based on the expanded monitoring network and data gaps only remained in the Deep Aquifers monitoring network. GSP Amendment 1 also identified a data gap in the ISW monitoring network. Sections 6.1 and 6.6 include more details about data gaps in the groundwater elevation and ISW monitoring networks, respectively.

In 2023 and 2024, the SVBGSA installed 4 monitoring wells, 3 of which fill Deep Aquifers groundwater level monitoring network data gaps and 1 that fills an ISW monitoring network data gap. All wells fill hydrogeologic conceptual model (HCM) data gaps identified in the GSP. The following monitoring well locations were targeted to best fill data gaps in the monitoring networks with available resources:

- Deep Aquifers wells, screened in the transmissive sediments of the Deep Aquifers to obtain representative groundwater levels:
    - 180/400-DA-1 – located near the Salinas River off South Davis Road, southwest of the City of Salinas

- 180/400-DA-2 – located near Gonzales off Corda Road
- 180/400-DA-3 – located northeast of Castroville near Highway 156, alongside Blackie Road

- ISW shallow well, completed across the water table near a streamflow monitoring site along the Salinas River to assess the depletion of ISW:
  - 180/400-ISW-1 – located near Laguna Road, south of the City of Salinas, where the Salinas Valley Aquitard is not present

SVBGSA funded the work through the DWR Sustainable Groundwater Management (SGM) Round 1 Implementation Grant for the 180/400 Subbasin. SVBGSA developed a Request for Bids (RFB) and selected Gregg Drilling to install the wells, with Montgomery & Associates (M&A) completing the hydrogeological services. Drilling, construction, development, testing, sampling, and equipping of the 4 monitoring wells occurred from September 2023 to June 2024.

M&A logged the borehole cuttings to review the lithology during drilling. The lithology in the locations of all 3 Deep Aquifers wells align with the understanding from the Deep Aquifers Study (M&A, 2024a) that they are confined by the 400/Deep Aquitard. As noted in Table 1-1, they were screened below the 400/Deep Aquitard and within the transmissive intervals of the Deep Aquifers. Well 180/400-ISW-1 was intended to screen across the water table, and borehole cutting confirmed the well is located outside the Salinas Valley Aquitard.

Table 1-2. Monitoring Well Depths and Screen Intervals

	180/400-DA-1	180/400-DA-2	180/400-DA-3	180/400-ISW-1
Total Drilled Depth (feet)	1,400	1,300	1,300	202
Completed Depth (feet)	1,010	1,090	1,210	95
Casing Diameter (inches)	4 (nominal)	4 (nominal)	4 (nominal)	4 (nominal)
Casing Material	Schedule 80 PVC	Schedule 80 PVC	Schedule 80 PVC	Schedule 80 PVC
Screened Interval (feet)	950-1,000	1,020-1,080	1,150-1,200	35-85

Notes: The completed depth is defined as the bottom of the casing.

M&A conducted slug testing at the 3 deep monitoring wells to estimate aquifer parameters. The estimated K value at well 180/400-DA-3 was lower than the other 2 monitoring wells. This is expected because the geophysical and lithologic logs collected during drilling indicated the presence of more fine-grained sediments at well 180/400-DA-3. The values are within the range of expected measurements, as summarized in Section 1.2.2 of this report and the 180/400-Foot Aquifer Subbasin Monitoring Well Construction, Development, Testing, Sampling, & Equipping Report (M&A, 2024b).

Groundwater elevations were measured during slug testing in June. Groundwater elevations in the 2 northernmost wells (180/400-DA-1 and 180/400-DA- 2) are consistent with groundwater elevations in other Deep Aquifers monitoring wells presented in the Deep Aquifer Study (M&A, 2024a). Moving from north to south, well 180/400-DA-3 had the lowest groundwater elevation at -47.4 feet NAVD88, well 180/400-DA-1 had a groundwater elevation of -36.6 feet, and well 180/400-DA-2 had a groundwater elevation of 14.3 feet. No groundwater elevation data solely in the Deep Aquifers southeast of the City of Salinas was available prior to the completion of well 180/400-DA-2. This new data point in the southern portion of the Deep Aquifers confirms that groundwater generally flows from southeast to northwest similar to the overlying aquifers in the Subbasin. Groundwater elevations in all 3 wells are below those in the 400-Foot Aquifer.

In June 2024, groundwater samples were collected from the new Deep Aquifers monitoring wells for water quality analysis. The groundwater chemistry in the new Deep Aquifers monitoring wells also aligns with the results of the Deep Aquifers Study. The northernmost well, 180/400-DA-3, had high concentrations of sodium and chloride compared to the other 2 new Deep Aquifers monitoring wells. The chemistry of the water in well 180/400-DA-3 is similar to other wells in the northern coastal portions of the Deep Aquifers. The water chemistry in well 180/400-DA-1 is more consistent with the chemistry for wells southwest of Salinas where this well is located. Water chemistry data for the southern portions of the Deep Aquifers did not exist prior to well 180/400-DA-2. However, water chemistry data is available for deep wells in the adjacent Eastside alluvial fans. The chemistry of the water in well 180/400-DA-2 is like that of well 16S/04E-03K01 and other nearby wells in the Eastside alluvial fans. This suggests a potential connection between the Deep Aquifers and the deeper portions of the Eastside alluvial fans. Figure 1-1 shows the stiff diagrams for the 3 new Deep Aquifers monitoring wells from northernmost to southernmost.

Of the 3 new Deep Aquifers monitoring wells, only well 180/400-DA-3 had exceedances of Title 22 maximum contaminant levels (MCL) or secondary MCLs (SMCL). Like the nearby Castroville Deep Aquifers well, well 180/400-DA-3 had an exceedance of the arsenic MCL. This well also exceeded the secondary MCLs of chloride, conductivity, iron, manganese, and total dissolved solids.

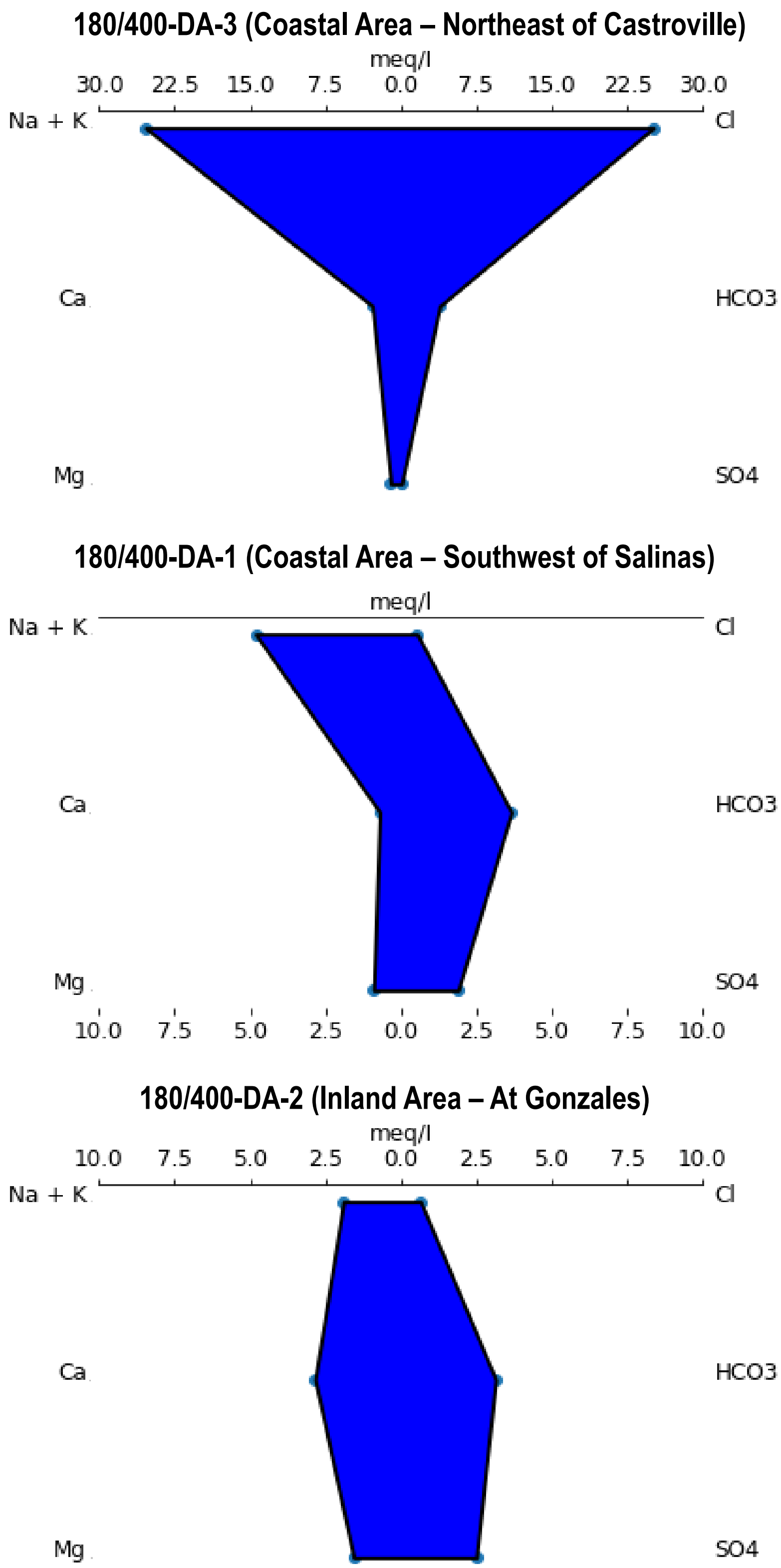


Figure 1-1. Stiff Diagrams for the New Deep Aquifers Monitoring Wells

In addition to the wells installed by the SVBGSA, MCWRA installed 2 new seawater intrusion monitoring wells near Castroville in January 2024. One well was completed in the 180-Foot Aquifer and the other was completed in the 400-Foot Aquifer.

1.2.3 Well Registration

MCWRA and SVBGSA partnered to improve collection and storage of regional groundwater data through the creation of the Groundwater Monitoring Program (GMP). The GMP includes well registration, the Groundwater Extraction Monitoring System (GEMS), and groundwater elevation and quality monitoring. MCWRA's well registration will create a single, updated database of all groundwater wells. Existing databases from agencies differ in their well numbers and associated well information and often do not track abandoned or destroyed wells. MCWRA began with a desktop analysis to compare the wells in the Monterey County Environmental Health Bureau permit tracking system and MCWRA Water Resources Agency Information Management System (WRAIMS) databases, and when needed DWR's Online System for Well Completion Reports (OSWCR) database, to match wells and identify the well locations, depths, and screen intervals. As of the drafting of this GSP 2025 Evaluation, MCWRA had completed the desktop analysis for existing well records. Well owner registration will be part of a second phase for the Subbasin where well owners will submit or verify well information through a registration portal. The data submission requirements include general information about well ownership, well construction specifications, and status of the well. This effort is complementary to the expansion and enhancement of GEMS, as described in Section 5.7.1.

1.2.4 Seawater Intrusion Model

To assist in evaluating and designing PMAs that address seawater intrusion, SVBGSA had M&A develop the Salinas Valley Seawater Intrusion Model. Existing groundwater flow models of the Salinas Valley do not have the ability to account for the differing densities of freshwater, seawater, and brackish water. During the evaluation period, SVBGSA and Monterey County funded development of a coupled flow and transport groundwater model to simulate seawater intrusion in the Salinas Valley Groundwater Basin. The Seawater Intrusion Model provides a tool to assist in designing and assessing PMAs that address seawater intrusion in the Salinas Valley. The Seawater Intrusion Model was initially developed for the Monterey Subbasin and was funded through the DWR Round 3 SGMA Planning Grants. SVBGSA and Monterey County then contributed funding to expand the model to the Salinas Valley's boundaries to cover the full extent of potential seawater intrusion, and completed updates in 2023 and 2024, as summarized in Section 4.3.

The predictive version of the updated Salinas Valley Seawater Intrusion Model (SWI Model) enables estimation of future groundwater conditions with and without projects and management actions. It simulates potential seawater intrusion starting from WY 2021—the end of the historical model—through 2070. Projected impacts are typically reviewed by comparing predictive simulation results of various PMAs to a No Project Scenario (see 3.5).

1.2.5 HEC-RAS Model

To better understand the interactions between the Salinas River and groundwater system, SVBGSA supported FlowWest in updating the Salinas River HEC-RAS model to 2023 topography, conducting 2024 statistical hydrology, and performing validation exercises for the March 2023 event and against gage records. This included analyzing gage records at Soledad (Forebay), Chualar, and Spreckels for their variability and accuracy of prediction of flows, which is relevant when discussing channel capacity. In addition, channel capacity and the stage of water in secondary channels were surface water datasets that informed potential for groundwater recharge. A sample of hydraulic model outputs from HEC-RAS was used to assess the potential for coupling or otherwise integrating the HEC-RAS model with groundwater models and analysis.

1.3 Status of Data Gaps

The 180/400 Subbasin GSP identified data gaps to be filled during GSP implementation. SVBGSA and partner agencies have filled most data gaps during the first 5 years of implementation, including HCM data gaps, groundwater elevation and ISW monitoring network data gaps, and data gaps associated with groundwater uses and users.

HCM Data Gaps

The 2020 GSP identified 4 main HCM data gaps: aquifer properties, hydrostratigraphy, Deep Aquifers, and Salinas River recharge and discharge. Additional data may be helpful for planning specific actions to reach sustainability; however, these 4 constituted the main areas of uncertainty related to the subbasin-wide understanding of the aquifer system. As such, SVBGSA focused on filling them early within GSP implementation.

SVBGSA collected aquifer property estimates from aquifer tests during the development of the Seawater Intrusion Model and Deep Aquifers Study, such as aquifer tests and slug tests. While some types of tests produce better estimates and have lower uncertainty than other types, they are useful when viewed together. SVBGSA conducted 2 aquifer tests just outside the 180/400 Subbasin as part of the Deep Aquifers Study to assess hydraulic parameters in the deep sediments in the basin. Aquifer properties estimates were used in the calibration of the Seawater Intrusion Model and those within the Deep Aquifers or adjacent deep sediments were included in the Deep Aquifers Study.

The 2020 GSP noted hydrostratigraphy data gaps of the vertical and horizontal extents of the aquifers and aquitards. While adequate hydrostratigraphic data exists for the 180-Foot and

400-Foot Aquifers, there were limited data on the Deep Aquifers' hydrostratigraphy. SVBGSA, MCWD GSA, and collaborative funding partners jointly funded the Deep Aquifers Study, which was an implementation action under the 2020 GSP. As described further in Section 4.1.1, the Study collected additional AEM data and mapped the lateral extent of the Deep Aquifers, as defined by the area underlying the 400/Deep Aquitard. SVBGSA incorporated the results from the Study and other data to refine the conceptual hydrostratigraphy and adjust the model layering for the groundwater flow models. Key findings from this work are described in Section 4.1.2.

The 2020 GSP also noted uncertainty regarding whether, where, and how much water recharges the Deep Aquifers. The Deep Aquifers Study did not find any evidence of surficial recharge of modern (post-1953) water reaching the Deep Aquifers. It included tritium isotope samples, and also noted the 2002 Study (Hanson *et al.*, 2002) with carbon-14 isotope analysis that age-dated the water to approximately 25,000 years old. The Study defined the Deep Aquifers as the water-bearing sediments below the 400/Deep Aquitard; however, the geologic formations that constitute the Deep Aquifers extend beyond the aquifer's defined extent. Groundwater can flow into and out of the Deep Aquifers from those adjacent or overlying aquifers dependent on the hydraulic gradients; however, no data provided evidence of surficial water reaching the Deep Aquifers. Shallower pumping within this area likely intercepts potential recharge to the deeper sediments.

Finally, the 2020 GSP highlighted the need for additional study of areas of Salinas River recharge and discharge. MCWRA conducts the Salinas River Discharge Measurement Series (River Series) annually to collect 10 streamflow (discharge) measurements that provide information to understand the relationship between the River and groundwater basin. Data are collected associated with reservoir releases to provide a quantification of streamflow loss. Similar to prior years, 2023 River Series data documented an entirely losing stream across the 91 sampled river miles, even where the Salinas Valley Aquitard is present below the river and above the 180-Foot Aquifer (MCWRA, 2023). SVBGSA used a provisional version of SVIHM under development by the USGS to assess Salinas River recharge and discharge. Modeling results corroborate MCWRA findings that the Salinas River is a losing stream on average. There may be small areas of discharge or areas where some discharge of groundwater occurs in the absence of flow down the River; however, model results align with River Series measurements that show overall it is recharging the Salinas Valley aquifers. This is summarized in GSP Amendment 1.

Monitoring Network

The 2020 GSP identified data gaps in the groundwater elevation monitoring network. Many of these were filled in the GSP Amendment 1. GSP Amendment 1 also identified new data gaps for groundwater elevation and ISW monitoring networks. Further refinements and additions are recommended for inclusion in a future amendment. The monitoring network data gaps are largely filled. Section 5 includes details about monitoring network data gaps.

Beneficial Uses and Users of Groundwater

SVBGSA is working to better understand the beneficial uses and users of groundwater in the Subbasin. The 3 main workstreams that have contributed to this effort are well registration, expansion and enhancement of GEMS, and GDE assessment and mapping.

Well registration will help understand the location and depth of all the wells in the Salinas Valley, as described in Section 1.2.3. SVBGSA is also working with MCWRA to expand and enhance the existing GEMS program, which currently monitors extractions from all wells with discharge pipes greater than 3 inches. The GEMS expansion will increase reliability and efficiency of extraction data collection and to include all areas of SVBGSA jurisdiction, as described in Section 5.7.1. For GDEs, GSP Amendment 1 includes a more robust GDE section (Section 4.4.5.2) that added information summarizing known information about GDEs within the Salinas Valley, and CCWG has progressed in their identification and assessment of potential GDEs, as described further in Section 4.2.2.

Northern 180/400 Subbasin

The northern and northeastern portion of the Subbasin has distinct characteristics from other areas of the subbasin, with varied topography and sandy hills that are predominantly in rural residential land uses. It is more similar in character to the Langley Subbasin than the rest of the 180/400 Subbasin. While this area of the subbasin is outside of MCWRA Zones 2, 2A, and 2B, and therefore not been part of the GEMS Program, concerns about groundwater conditions in this area were documented in Monterey County's North County Coast Land Use Plan in the 1980s. Further study of current groundwater conditions within this portion the Subbasin is needed through expansion of groundwater extraction monitoring and other studies. For example, while seawater intrusion to the north of the Elkhorn Slough has been well documented by the Pajaro Valley Water Management Agency in the adjacent Pajaro Valley Groundwater Basin, in the 180/400 Subbasin, further study of the potential for seawater intrusion into shallower domestic wells from this tidal estuary should be considered.

2 WATER USE AND GROUNDWATER CONDITIONS RELATIVE TO SUSTAINABLE MANAGEMENT CRITERIA

The overarching groundwater sustainability goal of the 180/400 Subbasin is to manage groundwater resources for long-term community, financial, and environmental benefits of the Salinas Valley's residents and businesses. The goal of the Salinas Valley GSPs is to balance the needs of all water users and ensure long-term viable water supplies while maintaining the unique cultural, community, and business aspects of each subbasin.

SGMA requires groundwater to be managed according to 6 sustainability indicators. These indicators are used to show progress toward sustainability while adhering to the overarching sustainability goal of the Subbasin. GSP Amendment 1 updates the sustainable management criteria (SMC) set for each sustainability indicator for the 180/400 Subbasin. SVBGSA monitors groundwater conditions for these sustainability indicators and routinely evaluates progress toward meeting SMC metrics.

2.1 Introduction and Overview of SMC

The SMC outline the desired groundwater conditions and the conditions that are to be avoided. In SGMA terminology, ***significant and unreasonable conditions*** occur due to inadequate groundwater management and qualitatively describe groundwater conditions deemed insufficient by subbasin planning committees. The ***minimum thresholds*** are quantitative indicators of the Subbasin's locally defined significant and unreasonable conditions. The ***undesirable result*** is a combination of minimum threshold exceedances that show a significant and unreasonable condition across the Subbasin as a whole. ***Measurable objectives*** are the goals that reflect the Subbasin's desired groundwater conditions for each sustainability indicator and provide operational flexibility above the minimum thresholds. GSPs are designed to not only avoid undesirable results, but to achieve or maintain the sustainability goals within 20 years, along with ***interim milestones*** every 5 years that show progress from current conditions to the measurable objectives. Table 2-1 summarizes the SMC for the 6 sustainability indicators, as updated in GSP Amendment 1.

Table 2-1. Summary of SMC

Sustainability Indicator	Significant and Unreasonable Conditions	Minimum Thresholds (groundwater conditions to be avoided)	Measurable Objective (groundwater condition goals)	Undesirable Result (assessment of subbasin-wide unreasonable conditions)
Chronic Lowering of Groundwater Elevations	Groundwater levels at or below the observed groundwater elevations in 2015, or that cause significant financial burden to local agricultural interests	Set to 1 foot above 2015 groundwater elevations	Set to 2003 groundwater elevations	More than 15% of Representative Monitoring Site (RMS) wells exceed groundwater elevation minimum thresholds in any aquifer
Seawater Intrusion	Any further seawater intrusion	2017 extent of 500 milligrams per liter (mg/L) chloride isocontour for the 180- and 400-Foot Aquifers, and the line defined by Highway 1 for the Deep Aquifers	Highway 1 for the 180-Foot, 400-Foot, and Deep Aquifers	Exceedance of the minimum threshold
Reduction of Groundwater Storage	Chronic, long-term reduction in groundwater storage	626,000 acre-feet (AF) below the measurable objective (based on Groundwater Level and Seawater Intrusion minimum thresholds)	0 AF change from Groundwater Level and Seawater Intrusion measurable objectives	Exceedance of the minimum threshold(s)
Degradation of Groundwater Quality	Increases in a COC caused by a direct result of a GSA groundwater management action that either results in groundwater concentrations in a potable water supply well above an established MCL or SMCL, or lead to significantly reduced crop production	No new exceedances past the existing number of wells that are above the regulatory standard for each constituent of concern (COC)		Future or new minimum thresholds exceedances are caused by a direct result of GSA groundwater management action(s), including projects or management actions and regulation of groundwater extraction
Land Subsidence	Any inelastic land subsidence that is caused by lowering of groundwater elevations in the Subbasin, or that causes an increase of flood risk	Zero net long-term subsidence		An exceedance of the minimum threshold due to lowered groundwater elevations
Depletion of ISW	Depletion from groundwater extraction that would result in a significant and unreasonable impact on surface water beneficial uses and users, or that is more than observed in 2015	Established by proxy using shallow groundwater elevations 1 foot about those observed in 2015 near locations of ISW	Established by proxy using shallow groundwater elevations observed in 2003 near locations of ISW	An exceedance of the minimum threshold

To operationalize the overarching sustainability goal and comply with SGMA, the Salinas Valley GSPs set SMC for each of the 6 sustainability indicators for the 180/400 Subbasin. SVBGSA and partner agencies will manage the 180/400 Subbasin to its measurable objectives and will avoid undesirable results by 2040, demonstrating progress along the way. Since undesirable results are based on minimum thresholds, managing to measurable objectives helps provide operational flexibility and prevent groundwater conditions from reaching undesirable results. Subbasin-specific SMC were developed based on public input, historically observed hydrologic conditions, and reasonably anticipated climate change. These SMC may be updated in future drafts to reflect changes in anticipated climate conditions or refined data and groundwater modeling results.

The GSP is designed to avoid undesirable results under average hydrologic conditions, as explained in Section 1.1.4. Average hydrologic conditions for the 180/400 Subbasin are represented by the average precipitation during the evaluation period. Table 2-2 shows that the precipitation during the evaluation period was less than the historical average, as well as less than the projected average annual precipitation, accounting for reasonable future climatic change (DWR, 2018). These projections are based on climate datasets developed for modeled future projections for the GSP.

Table 2-2. Historical, Evaluation Period, and Projected Average Annual Precipitation

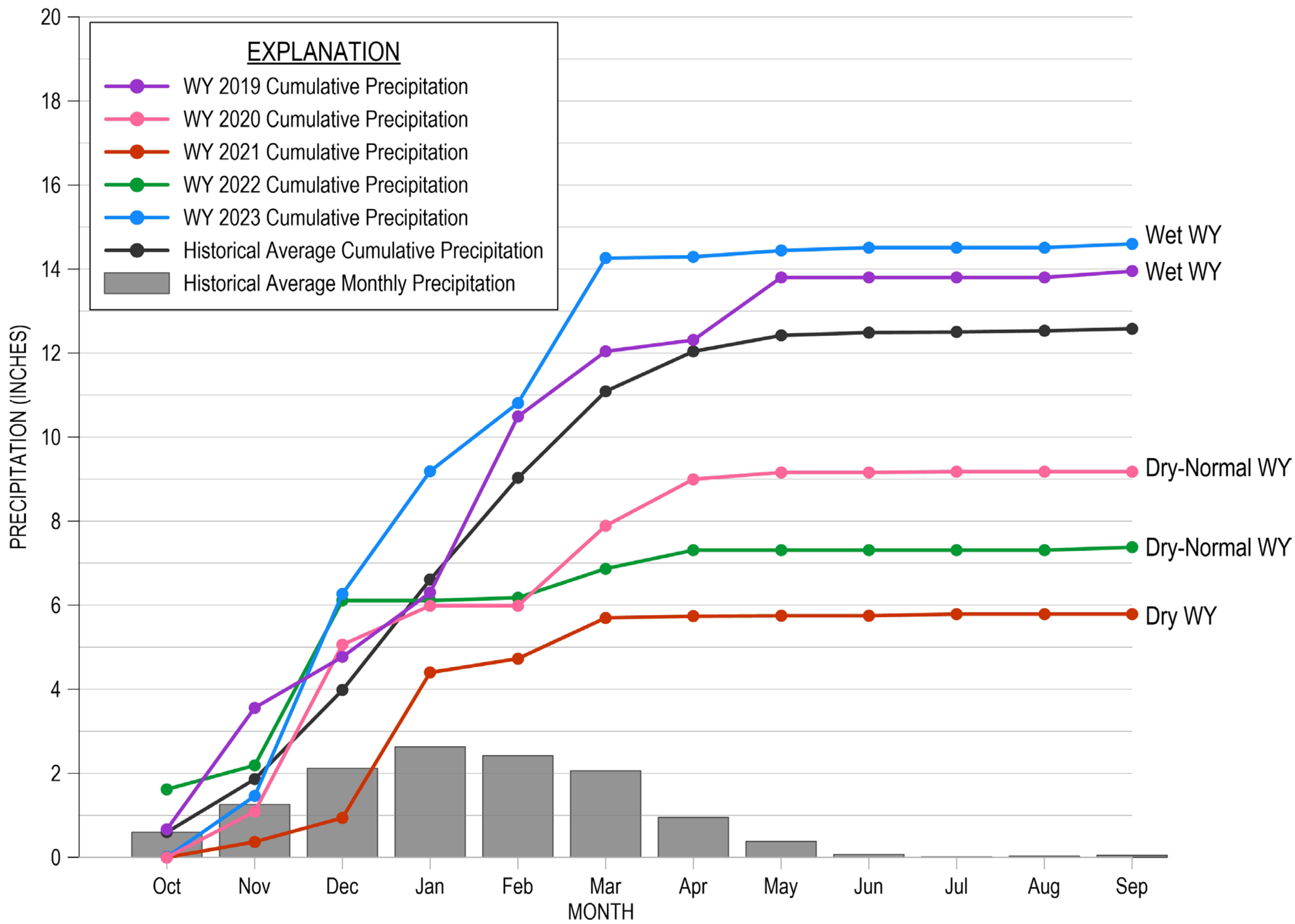
	Salinas Airport Precipitation (Inches)
Historical Average (WY 1991-2020)	12.6
Average After GSP Implementation (WY 2019-2023)	10.2
2030 Projected Average	12.0
2070 Projected Average	12.5

2.1.1 Conditions that Impact Groundwater Use and Management

2.1.1.1 Precipitation and Water Year Type

Precipitation that falls within the 180/400 Subbasin and its watershed contributes to runoff and percolation components of the water budget. The Salinas Airport gage (National Oceanographic and Atmospheric Administration (NOAA) Station USW00023233) is used to measure precipitation in the 180/400 Subbasin. Figure 2-1 shows the cumulative precipitation from WY 2019 to WY 2023 compared to the cumulative and monthly historical average based over the most recent 30-year period between WY 1991 and WY 2020, as determined by MCWRA. This figure also identifies the water year types for each year in the evaluation period. SVBGSA adopts the methodology used by MCWRA for determining the water year type. MCWRA assigns a water year type of either dry, dry-normal, normal, wet-normal, or wet based on an indexing of annual mean flows at the USGS stream gage on the Arroyo Seco River near Soledad (USGS Gage 11152000) (MCWRA, 2005).

The evaluation period began with a wet year in WY 2019 and was followed by 3 consecutive dry years from WY 2020 to WY 2022. The evaluation period ended with WY 2023, which was a very wet year and had the highest precipitation, followed closely by WY 2019, as shown on Figure 2-1.



(Adapted from MCWRA, November 2023a)

Figure 2-1. WY 2019 to WY 2023 and Historical Average Rainfall at Salinas Airport

2.1.1.2 Water Year Context for Water Use and Groundwater Management

Many factors affect groundwater use and management. In the Salinas Valley, MCWRA operates the Nacimiento and San Antonio Reservoirs for multiple purposes, including groundwater recharge, delivery of surface water to the Castroville Seawater Intrusion Project (CSIP) as an in-lieu irrigation supply in the seawater intruded area, and flood control. Reservoir operation, the amount of surface water diverted to CSIP at the Salinas River Diversion Facility (SRDF), and CSIP deliveries from the SRDF and recycled water provide meaningful context for water use and management in the Salinas Valley.

Flooding

The timing and magnitude of precipitation can lead to unique flooding events and impacts. The high precipitation volumes and timing of rainfall of the winter storms during WY 2023 led to flooding along the Salinas River. In Monterey County, the January and March 2023 storm events cumulatively impacted a total of 20,073 acres and created $600 million of damage to the agricultural industry (Monterey County Agricultural Commissioner, 2023).

Water Use and Management

Water use steadily increased over the evaluation period, with groundwater comprising the majority of the supply. Section 2.1.2 describes the water use and groundwater extraction in greater depth.

Several factors affect water use and management, in particular the following:

- **Precipitation and Temperature**: In general, the drier conditions of WY 2020 to WY 2022 led to increases in pumping. Precipitation in the winter of WY 2023 reduced the need for groundwater extraction during those months. In the neighboring Forebay Subbasin, interested parties noted that spring 2023 was colder than normal, which lowered irrigation water demand by decreasing evapotranspiration losses. Together, the wet year, cooler climate, and flooding contributed to pumping increasing later in the year than normal.
- **Flooding:** as a result of the winter storms in WY 2023, USGS stream gages at Bradley and Spreckels, the Salinas River reached Flood Stage in January and March, and reached Moderate Flood Stage once at Spreckels in March (National Weather Service, 2024a; 2024b). As a result, 20,073 acres could not be farmed until the flooding resided and soils dried out (Monterey County Agricultural Commissioner, 2023). This reduced groundwater extraction typically needed to irrigate those lands. This wet year followed the 3 dry years, which contributed to lower infiltration rates.
- **State urban mandates:** affect water use within drinking water systems subject to the following mandates (SWRCB, 2023):
    - **For urban water suppliers, end of statewide Level 2 demand reduction actions:** The requirement to implement demand-reduction actions that correspond to at least Level 2 of their water shortage contingency plans was in place until June 5, 2023.

- **For commercial, institutional, and HOA common areas, decorative grass watering remains banned:** The Emergency Regulation to Ban Decorative Grass Watering (non-functional turf irrigation) in commercial, industrial, and institutional areas is in effect; it expired in June 2024. In October 2023, the California State Legislature passed Assembly Bill 1572, which phases in a permanent ban on decorative grass watering in commercial, industrial, and institutional areas.
- **Emergency prohibition on wasteful water uses has expired:** The Emergency Regulation to Prohibit Wasteful Water Uses (like refilling fountains without recirculating pumps, overwatering landscapes, etc.) expired on December 21, 2023.

CSIP Operations

CSIP delivers a combination of recycled water, stored reservoir surface water, and groundwater as an irrigation supply to growers in part of the seawater intruded area. MCWRA operates Nacimiento and San Antonio Reservoirs in part to make summer conservation releases and divert surface water at the SRDF to CSIP. Recycled and surface water provided most of the water to CSIP during WY 2023, reducing groundwater pumping when compared to previous years. Figure 2-2 shows monthly CSIP water deliveries by water type January 2019 – September 2023. Since there was no surface water diverted in summer 2022, groundwater extraction made up a large portion of supply. In 2023, surface water and recycled water made up the majority of CSIP supply, with much lower groundwater extraction than in the prior year.

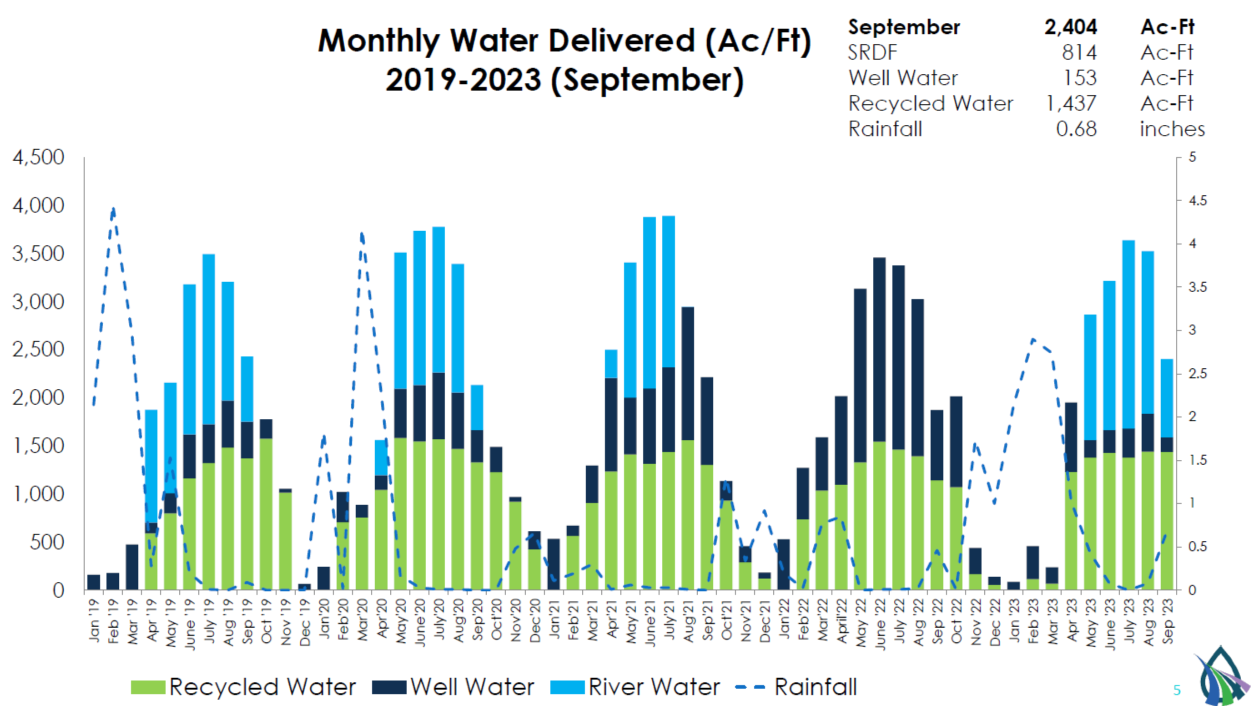


Figure 2-2 Monthly Water Delivered to CSIP 2019-2023 (M1W, 2024)

2.1.2 Reported Water Supply and Use over Evaluation Period

For WY 2019 to WY 2023, total average annual water use in the 180/400 Subbasin was 134,640 AF/yr, as summarized in Table 2-3. For these years, 91% of water use was for agriculture purposes, 9% for urban and industrial use, and a relatively small amount used by rural residential households, wetlands, and native vegetation. On average, 88% of the water supply came from groundwater. Surface water diverted at the SRDF for CSIP contributed 4% of the supply, and recycled water contributed 8% of the supply, most of which was for CSIP. Seasonally, water use is greatest during the summer months, as it is peak growing season, and higher temperatures and lack of precipitation necessitate greater applied irrigation water.

Salinas River watershed diversion data from the SWRCB's Electronic Water Rights Information Management System (eWRIMS) website is also used to account for surface water use in the Subbasin. Many growers and residents have noted that some irrigation is reported both to the SWRCB as Salinas River diversions and to the MCWRA as groundwater pumping. To avoid double counting, the SVBGSA's estimate of total surface water use limited to the SRDF river diversions and appropriative surface water diversions reported to eWRIMS. All other reported surface water uses are excluded from SVBGSA's surface water use estimates. It is possible that not all of the excluded surface water diversions are being reported to both SWRCB and MCWRA, in which case total water use may be greater than calculated here. This accounting is done to calculate the total water use and is not meant to imply that SVBGSA classifies any or all the reported diversions as groundwater. SVBGSA will continue to work with interested parties to refine the method used to resolve double counting.

Table 2-3 reports the annual average water use by water use sector and water type since WY 2018, and Figure 2-3 shows the total water use by year, broken down by sector and water type. SVBGSA is not aware of any changes in cropping patterns that affected water use. The lack of surface water diversions for CSIP in 2022 contributed to greater CSIP extraction than previous years to meet demand. Figure 2-4 illustrates the general location and volume of groundwater extractions in the Subbasin. Figure 2-5 includes the annual average water use by sector and aquifer for the WY 2019 to WY 2023 period.

Table 2-3. Average Annual Water Use by Water Use Sector and Source for WY 2018 to WY 2023

Water Use Sector	Groundwater Extraction (AF/yr)	Surface Water (AF/yr)	Recycled Water (AF/yr)	Source/Notes
Rural Domestic	200	0	0	Groundwater estimated by number of domestic dwelling units multiplied by 0.39 AF/yr per unit
Urban (including industrial)	11,940	0	0	Groundwater use reported through MCWRA's Groundwater Extraction Reporting Program, which includes wells with an internal discharge pipe diameter greater than 3 inches within Zones 2, 2A, and 2B. Surface water use is derived from CSIP and Statement of Diversion and Use. To avoid double counting with extraction, Statement of Diversion and Use surface water diversions are subtracted from the total water use. Recycled water use is derived from CSIP and California American Water.
Agricultural	105,820	5,880	10,800	
Managed Wetlands	0	0	0	Water use by managed wetlands is assumed to be *de minimis* and was not estimated
Managed Recharge	0	0	0	Water use by managed recharge is assumed to be *de minimis* and was not estimated
Natural Vegetation	Unknown	Unknown	Unknown	Water use by natural vegetation is assumed to be *de minimis* and not estimated
SUBTOTALS	117,960	5,880	10,800	
TOTAL	**134,640**			

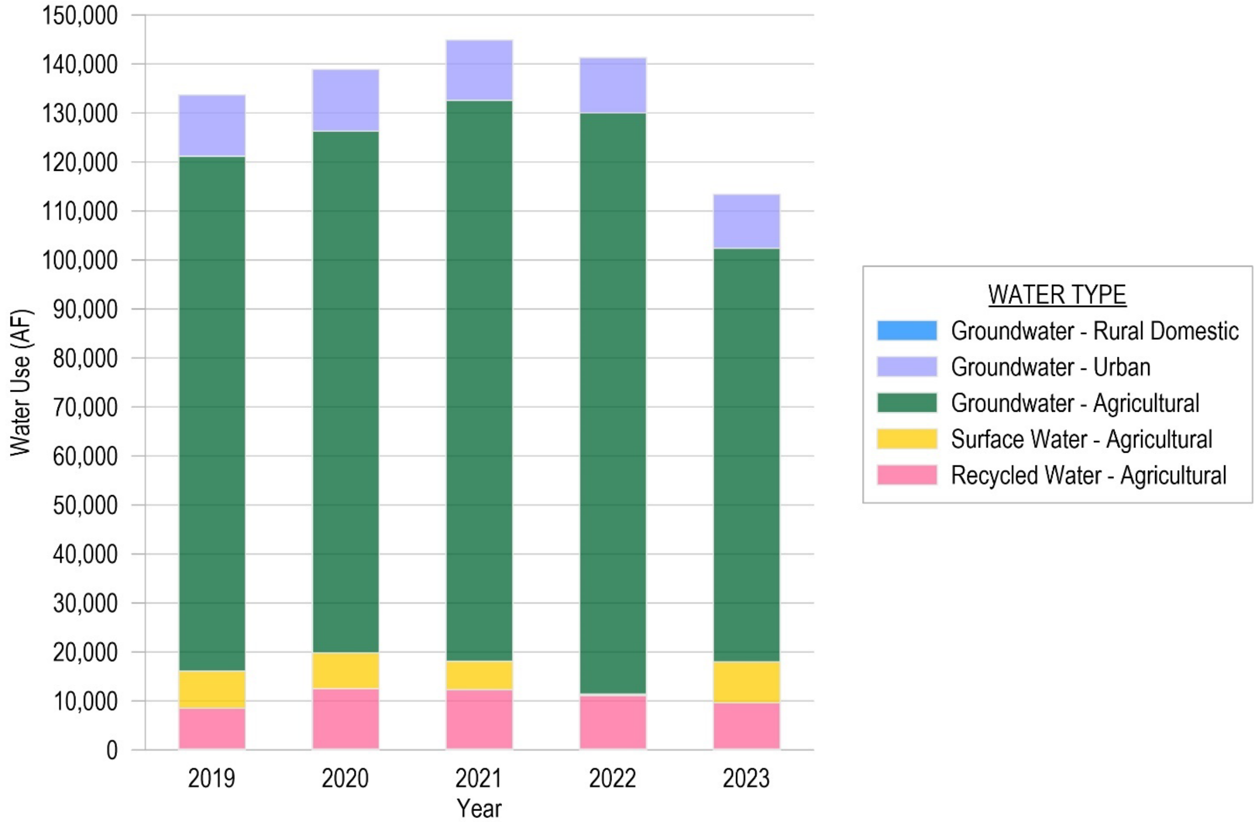


Figure 2-3. Total Water Use by Water Use Sector Since WY 2019

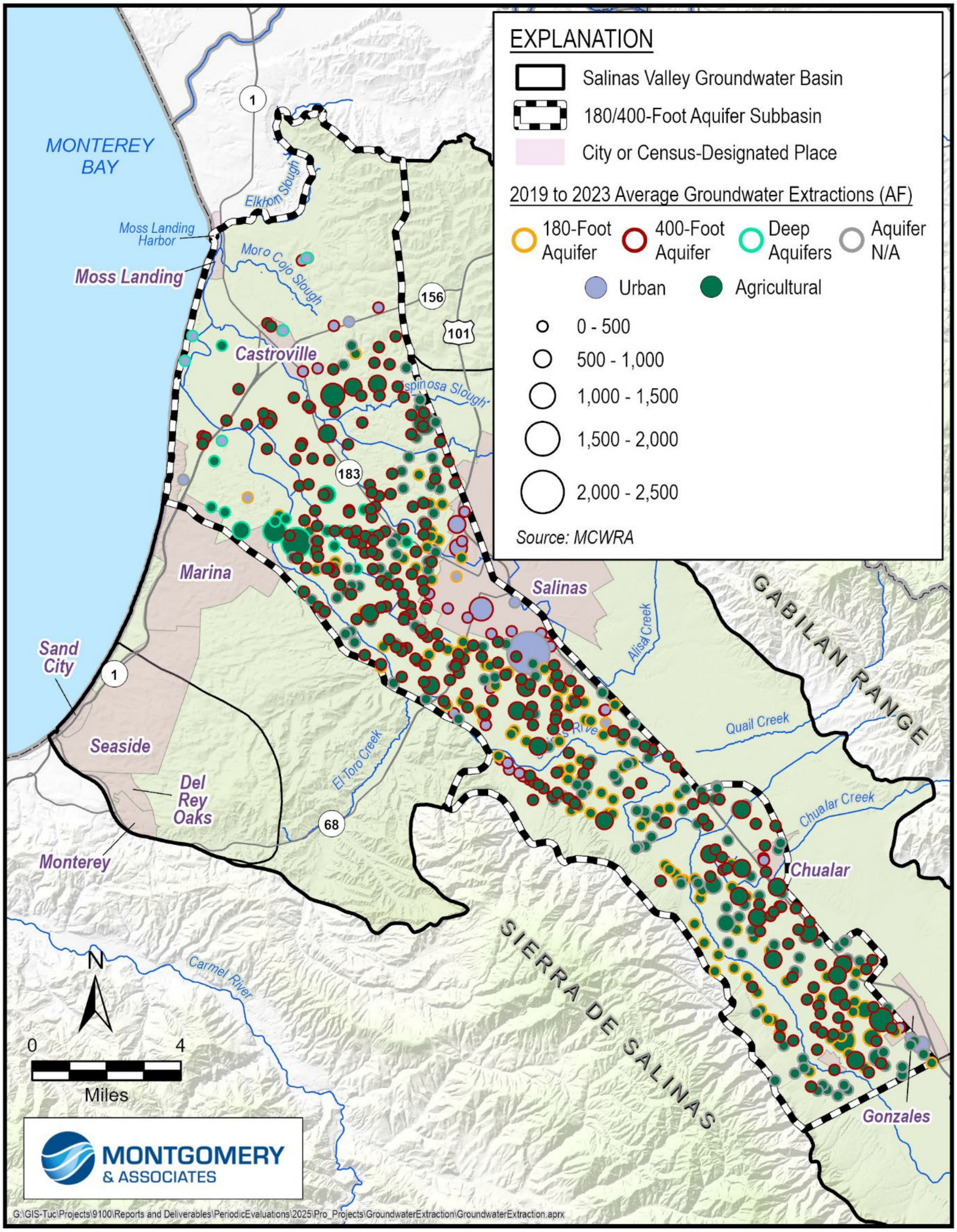


Figure 2-4. General Location and Volume of Groundwater Extractions for WY 2019 to WY 2023

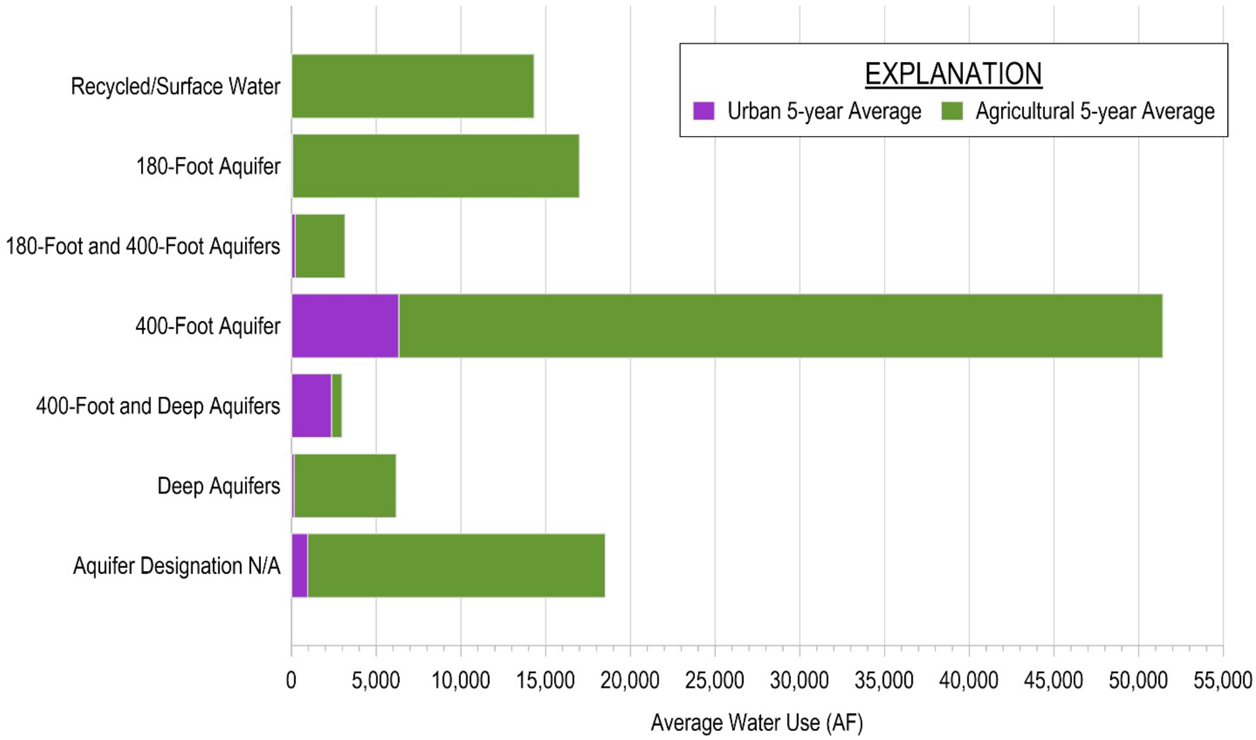


Figure 2-5. WY 2019 to WY 2023 Annual Average Water Use Sector, Type, and Aquifer

2.2 Chronic Lowering of Groundwater Levels

Although groundwater levels in the 180/400 Subbasin have been declining on average over the past few decades. Between 2019 and 2023, groundwater levels have been generally static or slightly risen due to 2023 being a very wet year; however, that is not necessarily indicative of long-term trends. Changes vary geographically throughout the Subbasin, by aquifer, and temporally. The greatest declines have been in the coastal area west of Salinas, along the Eastside Aquifer Subbasin boundary, and in the Deep Aquifers. The confined conditions in this area lead to less or slower recharge, and no evidence of surficial recharge of modern (post-1953) water has been found in the Deep Aquifers. Unconfined parts of the Subbasin have a greater ability to recharge, which exist mainly in the southern part of the Subbasin and northern part near the Elkhorn Slough. However, some wells in these areas still show groundwater level decline. In general, groundwater levels increase or decrease less during wet years; however, increases are not enough to offset groundwater level declines, leading to chronic lowering of groundwater levels. CSIP has significantly helped to offset extraction from private wells, but is still heavily dependent on groundwater, especially during years such as 2022 when there were no surface water diversions. These declines contribute to seawater intrusion and potentially dry wells and add risk of land subsidence due to declines in the clay-rich Deep Aquifers.

Per the GSP, locally defined significant and unreasonable groundwater elevations in the Subbasin are those that:

- *Are at or below the observed groundwater elevations in 2015. Public and stakeholder input identified these historical groundwater elevations as significant and unreasonable.*
- *Cause significant financial burden to local agricultural interests.*
- *Interfere with other sustainability indicators.*

The measurable objective for chronic lowering of groundwater levels is for groundwater levels to be at or above 2003 levels. The minimum threshold for chronic lowering of groundwater levels is for groundwater levels to remain above 2015 conditions to avoid significant and unreasonable conditions. The SMC are also designed to avoid impacts related to other sustainability indicators, such as seawater intrusion, depletion of interconnected surface water, and reduction of groundwater in storage. SMC for chronic lowering of groundwater levels are summarized in Table 2-4.

Table 2-4. Summary of Sustainable Management Critera for Chronic Lowering of Groundwater Levels

Sustainable Management Criteria	Description
Metric	Groundwater elevations measured at RMS wells
Minimum Threshold	Set to 1 foot above 2015 groundwater elevations
2025 Interim Milestone	Set to ¼ of the way between 2020 groundwater elevations and the Measurable Objective
Measurable Objective	Set to 2003 groundwater elevations
Undesirable Results	More than 15% of RMS wells exceed groundwater elevation minimum thresholds in any aquifer

Figure 2-6 shows the average annual and cumulative change in groundwater levels, with a box to highlight 2018 to 2023. This figure is based on Subbasin-wide average groundwater elevation changes. This figure includes groundwater extraction from 1995 to 2023, and the 1995 to 2016 average historical extraction. The orange line represents cumulative groundwater level change since 1944, and it is the equivalent of an average hydrograph for the Subbasin (i.e., zero is the amount of groundwater in storage in 1944, and each year the annual change in storage is added to produce the cumulative change in storage). The green line represents the annual average change in groundwater level from the previous year (i.e. the 1995 annual change in storage value is based on change in storage from 1994). The cumulative change is driven by the groundwater elevations changes that occur in the 180-Foot and 400-Foot Aquifers since most wells are in those aquifers but limited data for the Deep Aquifers is included. As more data becomes available for the Deep Aquifers, the plot will be refined accordingly.

By WY 2019, groundwater levels had rebounded partially from the 2015 drought. Groundwater elevations declined again during the 3 consecutive dry years from WY 2020 to WY 2022. Several winter storms in early 2023 led to above-normal recharge and reduced pumping, contributing to the highest rise in groundwater elevations during the evaluation period. However, the rise from the 2023 wet water year is not indicative that there has been a change in the long-term downward trend.

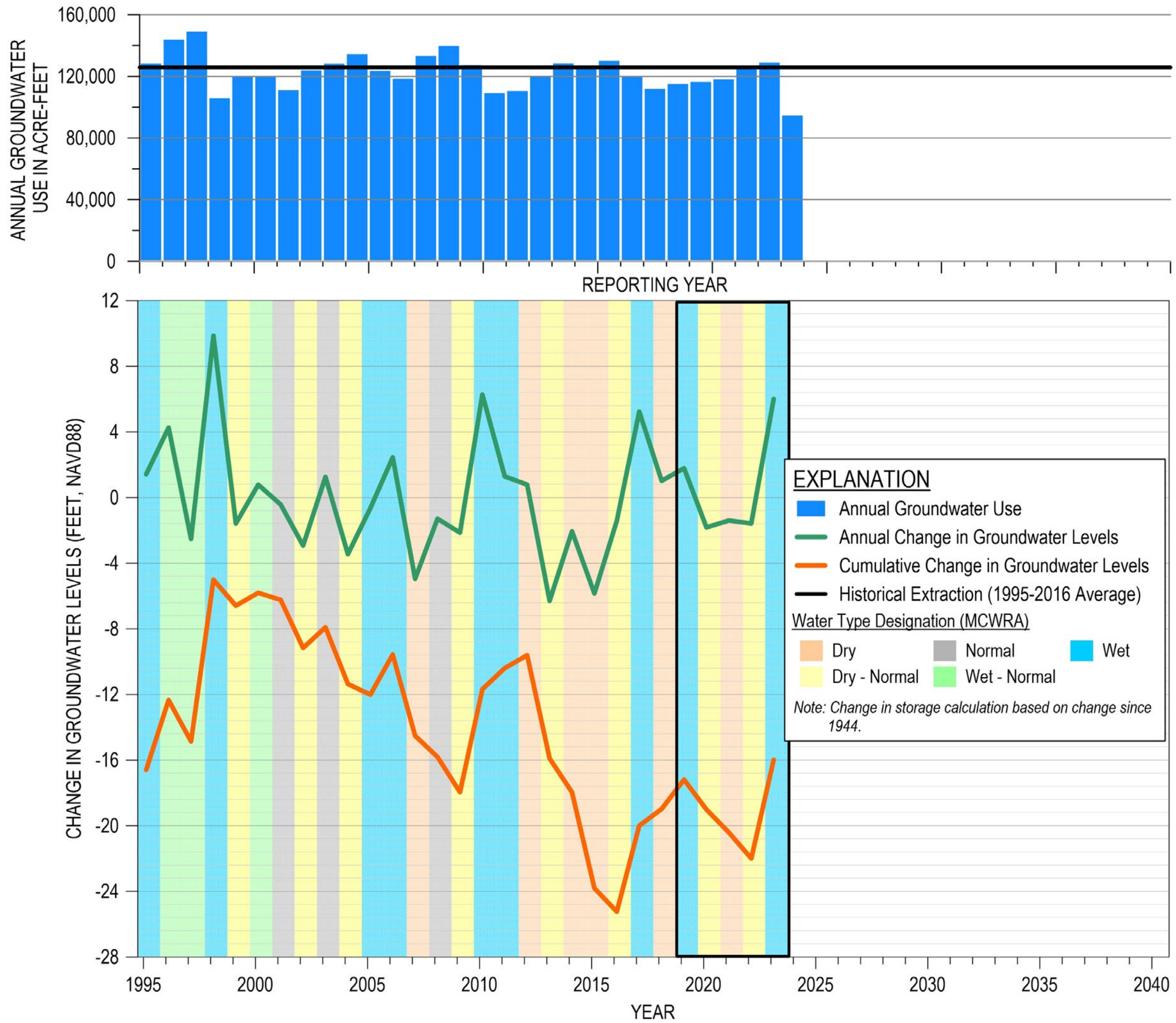


Figure 2-6. Cumulative Change in Groundwater Levels Since 1944

2.2.1 Groundwater Conditions Relative to SMC

Groundwater elevations respond to climate and extraction differently in each of the Subbasin's principal aquifers depending on depth, confinement, and distance from the coast. While precipitation readily recharges groundwater in unconfined portions of the 180-Foot Aquifer, coastal groundwater elevations confined by the Salinas Valley Aquitard and other shallow clays show a less clear response to annual changes in recharge from precipitation. In coastal confined aquifers, groundwater levels respond more directly to changes in groundwater extraction than precipitation. This is particularly true of the Deep Aquifers.

MCWRA measures fall groundwater elevations primarily in November and December. Groundwater elevations during this period represent stable aquifer conditions when annual groundwater demand is at its lowest and before groundwater elevations are influenced by winter recharge events. These fall measurements represent the seasonal high for SGMA reporting.

For this GSP 2025 Evaluation, the 2025 interim milestones are compared to: (1) the fall 2023 groundwater elevations, which represent the most recent data, and (2) where the 5-year 2019-2023 groundwater elevation trend line is plotted at 2023. Groundwater elevation trends, using both 20-years and the most recent 5-years of data, were analyzed for this GSP 2025 Evaluation. Hydrographs showing the minimum threshold, 2025 interim milestone, measurable objective, and linear regression trendline were developed for each Representative Monitoring Site (RMS) well; these hydrographs are included in Appendix 3A and an example is shown on Figure 2-7.

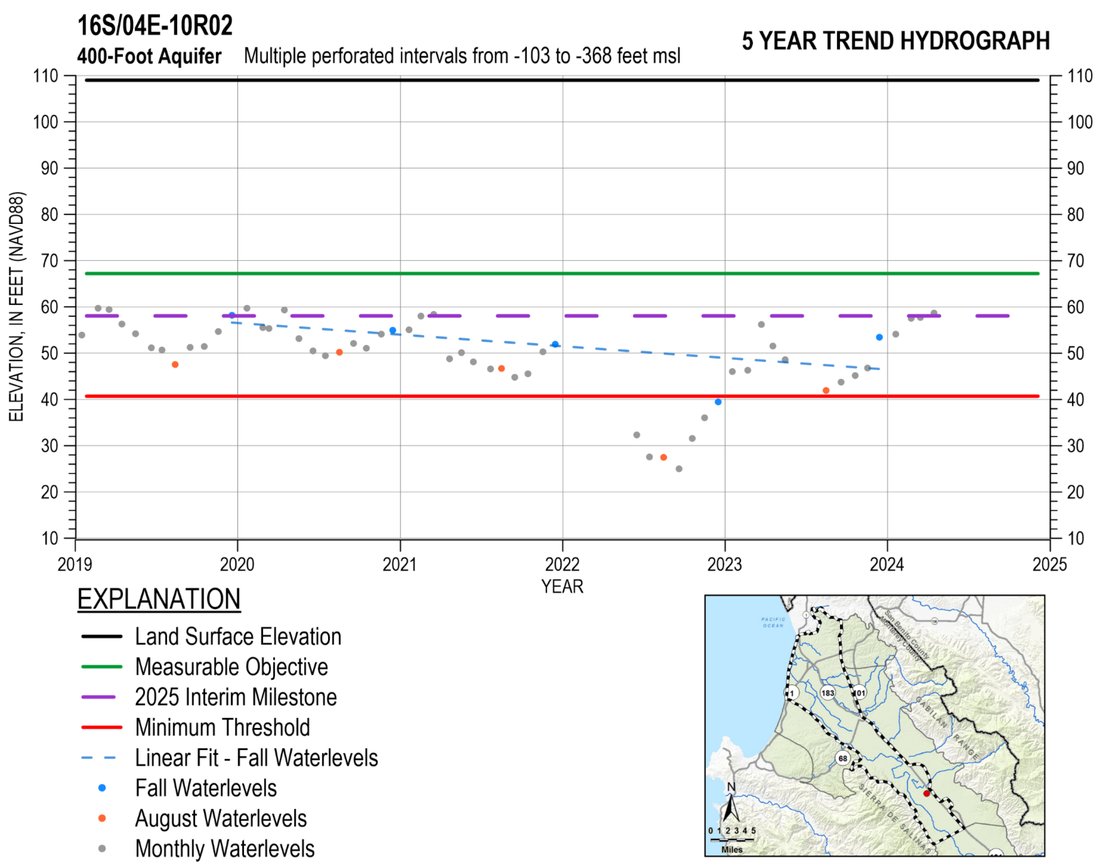


Figure 2-7. Example Groundwater Elevation Hydrograph and 5-year Trend Line

Rates of change in the 180-Foot and 400-Foot Aquifer wells were on average negative for the 20-year period and slightly positive for the 5-year period. The increasing 5-year trends in these aquifers are primarily due to high groundwater elevations in WY 2023, compared to the 4 prior years. The wet water year was not enough to result in an increasing 5-year trend in the Deep Aquifers. Similar to the other aquifers, the average 20-year trend in the Deep Aquifers is decreasing at a greater rate than the 5-year trend. During both periods, the Deep Aquifers had the greatest decline in groundwater elevations compared to the other principal aquifers.

Table 2-5 summarizes the number of RMS wells that are above the minimum threshold, 2025 interim milestone, and measurable objective as of fall 2023. This table also includes the groundwater elevation evaluated to the 5-year trendline compared to the SMC. About half as few RMS wells reached the 2025 interim milestone based on the 5-year trendline indicating that assessing groundwater elevations solely on the wet conditions observed in WY 2023 is not representative of groundwater elevations during the entire evaluation period. Furthermore, a third of RMS wells showed a very slight rising trend over the 5-year period but had a declining trend over the 20-year period, demonstrating the effect of the unusually wet conditions experienced in WY 2023. This suggests that the 5-year trends may not reflect average groundwater conditions in the Subbasin.

Table 2-5. Summary of Groundwater Level SMC as of WY 2023

Aquifer	Number of RMS Wells	Number of RMS Wells Sampled Fall 2023[1]	Number of RMS Meeting SMC					
			Based on Observed Measurements			Based on 5-year Trendline		
			Minimum Threshold (* indicates Undesirable Result)	Interim Milestone 2025	Measurable Objective	Minimum Threshold	Interim Milestone 2025	Measurable Objective
180-Foot Aquifer	35	34	32	21	9	30	13	3
400-Foot Aquifer	43	40	37	24	5	36	12	4
Deep Aquifers	21	17	5*	5	2	2	2	1
Total	**99**	**91**	**74**	**50**	**16**	**68**	**27**	**8**

[1] 1 180-Foot Aquifer well, 3 400-Foot Aquifer wells, and 4 Deep Aquifers wells did not have fall 2023 samples.

As shown in Table 2-6, in 2019, 2020, 2021, and 2023, there was an undesirable result only in the Deep Aquifers. In 2022, there were undesirable results in all 3 aquifers. Since an undesirable result in any aquifer constitutes an undesirable result for the Subbasin, there has been a Groundwater Levels SMC undesirable result for all 5 years.

Many of the RMS wells in the Deep Aquifers were completed during this evaluation period. Therefore, these wells do not have the 2003 or 2015 groundwater elevation measurements that were used to define the groundwater level SMC. Appendix 3B describes how SMC were developed for the new Deep Aquifers RMS wells.

Table 2-6. Annual Summary of Groundwater Level Undesirable Results

Aquifer	Less Than 15% of RMS Wells are Exceeding their Minimum Threshold			More Than 15% of RMS Wells are Exceeding their Minimum Threshold	
	Percent of RMS Wells Below MT				
	2019	2020	2021	2022	2023
180-Foot Aquifer	0	9%	9%	37%	6%
400-Foot Aquifer	11%	0	13%	34%	7%
Deep Aquifers	45%	100%	82%	78%	55%
Subbasin Groundwater Level Undesirable Result	**2019 Undesirable Result**	**2020 Undesirable Result**	**2021 Undesirable Result**	**2022 Undesirable Result**	**2023 Undesirable Result**

Figure 2-8 to Figure 2-10 show the WY 2019 to WY 2023 average annual change in fall groundwater elevations and fall 2023 groundwater elevations compared to SMC for each of the principal aquifers. In the 180-Foot Aquifer, 18 out of 35 RMS wells have an increasing trend, 21 wells met the interim milestone, and 2 wells exceeded their minimum thresholds. Wells that met the interim milestone are primarily in the southern part of the Subbasin that receives recharge more quickly due to the absence of the Salinas Valley Aquitard or other shallow clays. In the 400-Foot Aquifer, 23 out of 43 RMS wells had increasing 5-year trends, 24 wells met their interim milestones, and 3 wells had groundwater elevations lower than their minimum threshold in fall 2023. The greatest increasing trends occur in some of the wells along the boundary with the Eastside Subbasin, which could be due to the decrease in pumping in WY 2023. In the Deep Aquifers, 3 out of 17 RMS wells have an increasing 5-year trend, 5 wells had fall 2023 groundwater elevations higher than the interim milestone, and 12 wells exceed the minimum threshold. Out of the 17 Deep Aquifers RMS, 3 wells are not included in the 5-year trend analysis because they only have 2 fall groundwater elevation records. Data for this period in the Deep Aquifers are concentrated west of Salinas, in contrast to the overlying aquifers where RMS wells exist throughout the extent of the Subbasin. However, as described in Section 1.2.2, groundwater elevations are higher in the new Deep Aquifers monitoring well (180/400-DA-2) near Gonzales than in the coastal areas.

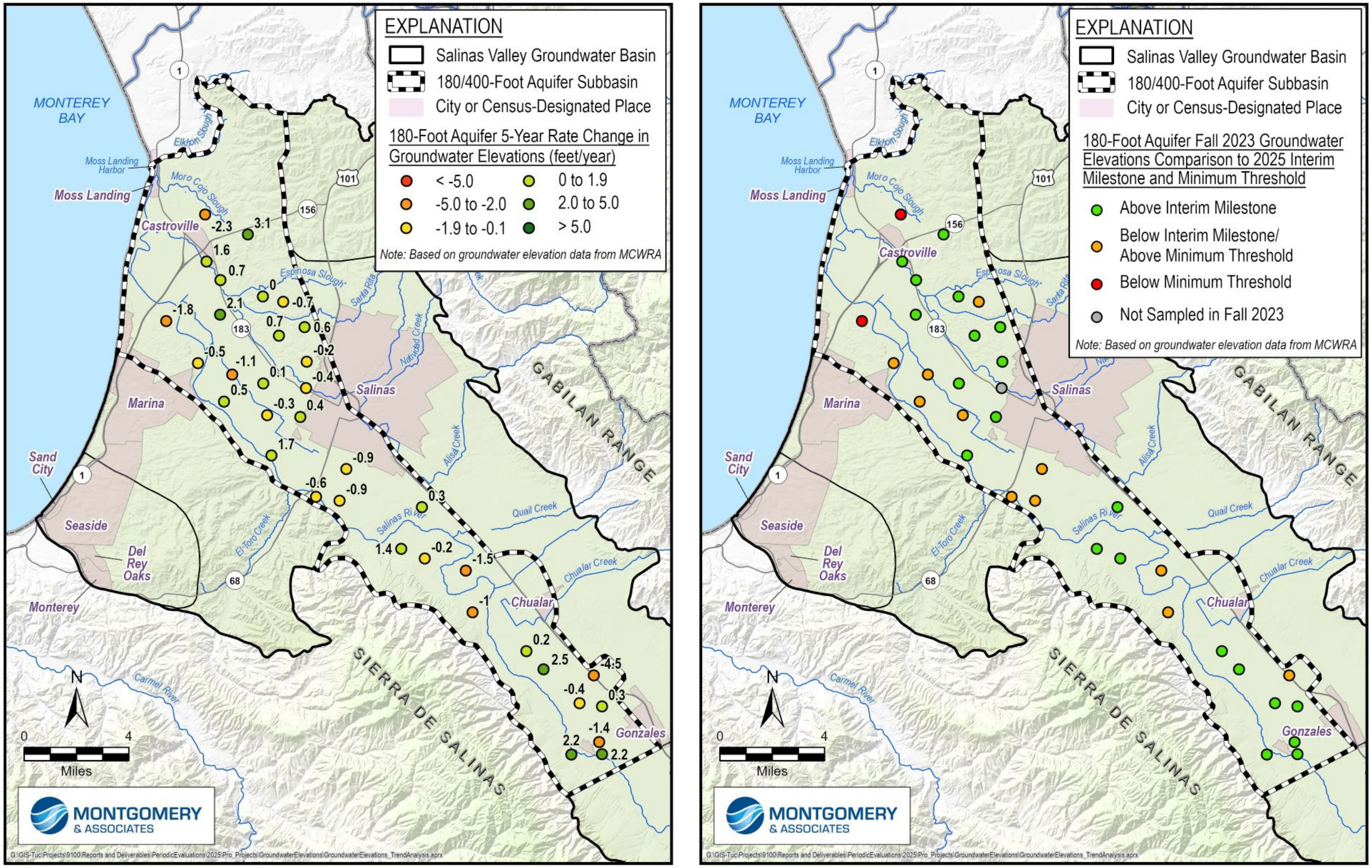


Figure 2-8. 180-Foot Aquifer Fall 2019 to 2023 Average Annual Change in Groundwater Elevations and Fall 2023 Groundwater Elevations Compared to SMC

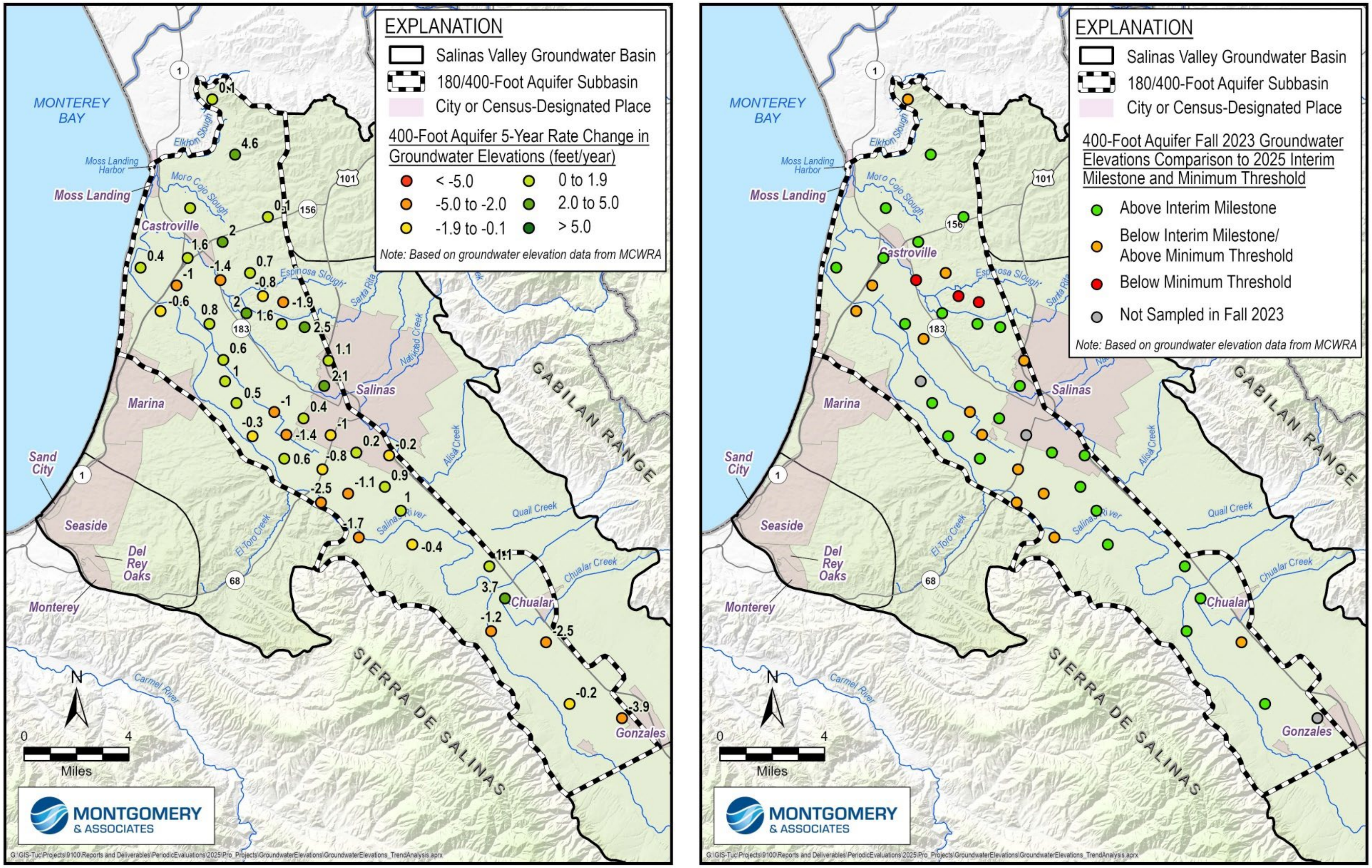


Figure 2-9. 400-Foot Aquifer Fall 2019 to 2023 Average Annual Change in Groundwater Elevations and Fall 2023 Groundwater Elevations Compared to SMC

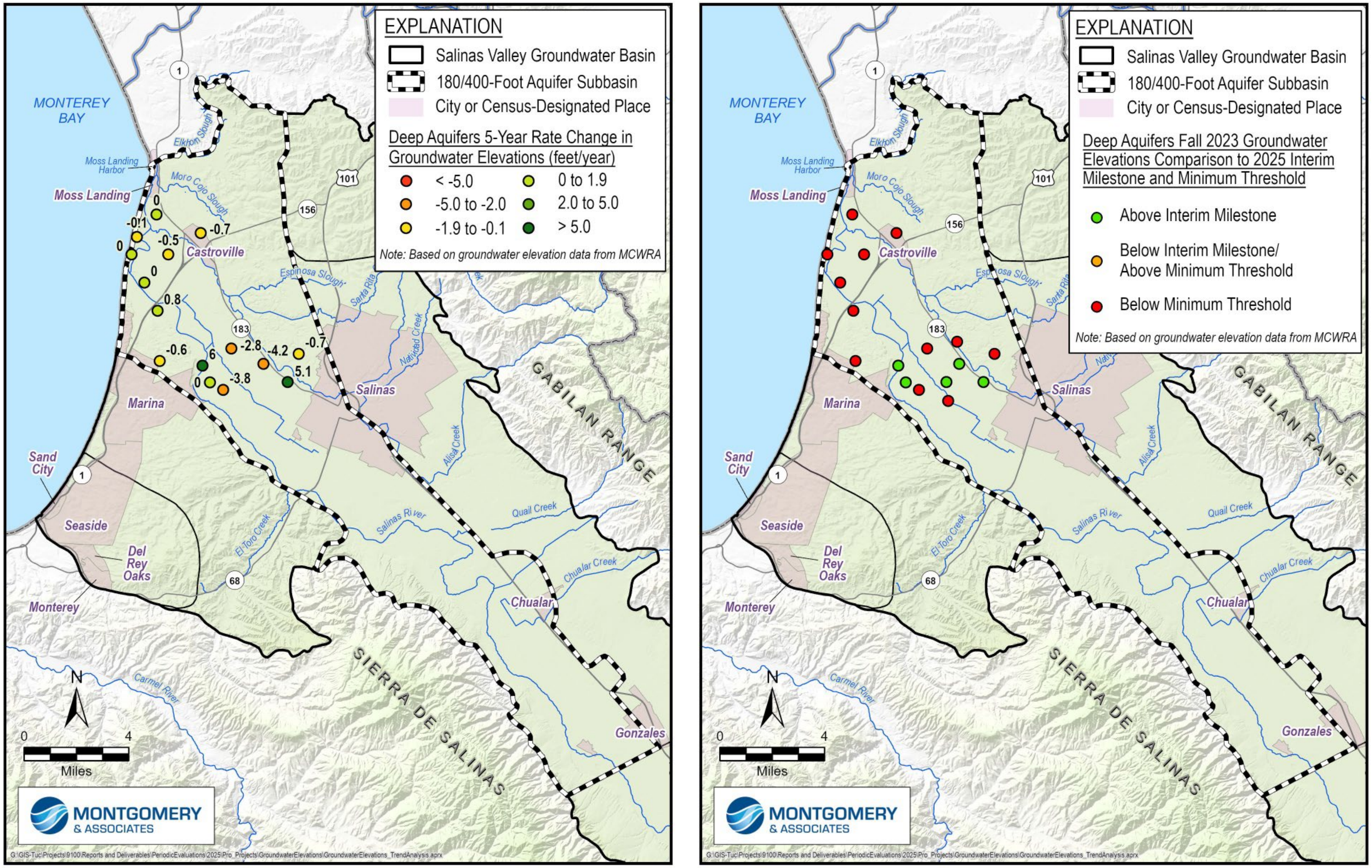


Figure 2-10. Deep Aquifers Fall 2019 to 2023 Average Annual Change in Groundwater Elevations and Fall 2023 Groundwater Elevations Compared to SMC

2.2.2 Deep Aquifers

As discussed in Section 1.2.2, three new groundwater elevation monitoring wells have recently been installed in the Deep Aquifers, filling most of the groundwater elevation data gaps. The new wells, along with other monitoring wells identified by SVBGSA, expanded the number of RMS wells in the Deep Aquifers from 11 to 17. Appendix 3B specifies the minimum thresholds, interim milestones, and measurable objectives for each of the new wells. In addition, since most wells have been installed in recent years and therefore do not have historical 2015 or 2003 groundwater elevation measurements, the attachment describes the process to estimate groundwater elevations in those years, which form the basis of the SMC.

Initial groundwater elevations were taken at the 3 new monitoring sites after installation. While 2 measurements are typically taken before reporting groundwater elevations so that the first can be a baseline, initial groundwater elevations are included in Section 1.2.2. SVBGSA will include them in the WY 2024 Annual Report.

With the expansion of the groundwater level monitoring network and installation of new wells, there are now sufficient wells to develop groundwater elevation contours in a greater area of the Deep Aquifers. While not a requirement of periodic evaluations, the fall 2023 contours are included in Appendix 3B. The contours will enable SVBGSA to estimate change in storage in the Deep Aquifers in the WY 2024 annual report.

2.2.3 Impact on Beneficial Users

Domestic well users are an important beneficial user that needs to be considered in order to address the human right to water. The DWR's Online System for Well Completion Reports (OSWCR) database is used to estimate the number of domestic wells in the 180/400 Subbasin. The OSWCR database includes tabulated well completion information for individual wells and well completion statistics (e.g., average well depth) summarized by Public Land Survey System (PLSS) sections. The average computed depth of domestic wells in the Subbasin is 320 feet using the PLSS data in the OSWCR database.

The 2020 GSP did not include an analysis of groundwater elevation's impact on domestic wells. GSP Amendment 1 includes a limited analysis that only used wells that were accurately located. Most wells in the OSWCR database are located in the centroid of the PLSS section meaning that less than 5% of domestic wells were used in the analysis included in GSP Amendment 1.

For this GSP 2025 Evaluation, the analysis was improved and includes more domestic wells. The OSWCR database contains 562 domestic well completion records within the Subbasin. Out of the 562 wells, 450 wells were determined to be installed in the principal aquifers and are used for this updated analysis. Groundwater elevations from contour maps are compared to the wells' completion information based on the domestic well locations. The average groundwater elevation of the PLSS section was used to compare to most domestic wells. The analysis included 97 domestic wells that were accurately located, and these wells were compared to more precise groundwater elevation estimates.

Fall groundwater elevations from 2019 to 2023 are compared to the range of domestic well depths in the Subbasin. Table 2-7 shows the percentage of wells where groundwater levels are at least 25 feet above the bottom of the well in fall 2019 to 2023 for the 3 principal aquifers. Well saturation of 25 feet was chosen to allow for some reasonable pumping drawdown. Results of this comparison indicated that groundwater levels at most domestic wells in each principal aquifer are at least 25 feet above the bottom of the wells from 2019 to 2023. With respect to the wells in the 400-Foot and Deep Aquifers, the domestic wells in the 180-Foot Aquifer were the most impacted by groundwater elevation changes during the evaluation period. On average, 76% of domestic wells in the 180-Foot Aquifer had at least 25 feet of water from 2019 to 2023. In the 400-Foot and Deep Aquifers, 91% and 100% of domestic wells had at least 25 feet of water, respectively. These are reasonable values, considering that many of the domestic wells in the OSWCR database may no longer exist, having been replaced by newer wells.

Table 2-7. Percent of Domestic Wells with at Least 25 Feet of Water from 2019 to 2023

Aquifer	Well Count	% Wells with at least 25 feet of water					
		2019	2020	2021	2022	2023	Average
180-Foot Aquifer	216	75%	75%	73%	75%	80%	76%
400-Foot Aquifer	231	91%	91%	91%	91%	91%	91%
Deep Aquifers	3	100%	100%	100%	100%	100%	100%

GDEs may also be affected by groundwater elevations. Baseline GDE data was collected in 2024. Any changes in conditions will be reported in future periodic evaluations.

2.2.4 Impact on Other Sustainability Indicators

Groundwater elevation minimum thresholds can influence other sustainability indicators. SVBGSA set groundwater level minimum thresholds to avoid undesirable results for the other sustainability indicators. However, it will take time to plan and implement projects and management actions that show groundwater elevation improvements. Therefore, even if groundwater levels during this evaluation period have affected other sustainability indicators, the Subbasin may still avoid undesirable results by 2040.

- **Reduction in groundwater storage.** The chronic lowering of groundwater levels minimum thresholds are used to calculate the groundwater storage minimum thresholds. Therefore, the significant rises in groundwater levels in 2023 have contributed to a slight increase in groundwater storage since 2019.

- **Seawater intrusion.** While the groundwater elevation minimum thresholds were set to not exacerbate seawater intrusion, and potentially help control it, groundwater elevations during the evaluation period declined during some years and seawater intrusion has continued to advance in both the 180- and 400-Foot Aquifers. Meeting groundwater level and seawater intrusion goals are anticipated to take several years; however, as noted in Chapter 4, SVBGSA and partner agencies have made progress toward determining how to reach sustainability.
- **Degraded water quality.** The chronic lowering of groundwater levels minimum thresholds were set to not exacerbate groundwater quality; however, the relationship between groundwater pumping, levels, and quality is complex. While SVBGSA has not implemented any actions that would have impacted groundwater conditions during the evaluation period, pumping that causes groundwater level declines could contribute to water quality degradation. SVBGSA plans to conduct a more thorough analysis of the relationship between groundwater pumping, levels, and quality in order to better understand this relationship, and ensure pumping and groundwater level declines do not cause groundwater quality degradation.
- **Land subsidence.** Inelastic land subsidence has not been observed to date. However, the Deep Aquifers Study identified a risk of land subsidence if groundwater elevations in the Deep Aquifers continue to drop below historical lows due to high prevalence of clays in the Deep Aquifers.
- **Depletion of ISW.** The chronic lowering of groundwater levels minimum thresholds are identical to the ISW minimum thresholds. Depletion of ISW was considered significant and unreasonable in WY 2022 when groundwater levels in the ISW well was below the minimum threshold.

2.2.5 Evaluation of SMC

SVBGSA set groundwater level minimum thresholds and measurable objectives to avoid significant and unreasonable conditions that occurred during the 2015 drought, namely dry wells, advancement of seawater intrusion, and negative impacts to GDEs. At this point, no new data on well depths or GDEs justify changing the minimum thresholds.

In the Deep Aquifers, groundwater levels during the evaluation period remained far below the 2003 groundwater elevations that define the measurable objectives. 2003 may be unrealistically high for the SGMA management horizon since there is no evidence of surficial recharge. The Deep Aquifers Study found that even when most agricultural Deep Aquifers pumping temporarily stopped after CSIP came online in 1998 and groundwater elevations rebounded, storage was significantly depleted based on early groundwater elevation measurements. This does not warrant a change in the measurable objective goal at this point; however, future analysis could consider the conditions that would be protective of the Deep Aquifers with respect to seawater intrusion and subsidence risk.

Projects and management actions would affect groundwater levels in different ways. For example, while aquifer storage and recovery (ASR) may raise groundwater levels inland to halt and push back seawater intrusion, the Brackish Groundwater Replenishment Project would include a seawater extraction barrier that would lower groundwater levels along the coast to form a hydraulic barrier against seawater intrusion in combination with pumping offsets from delivery of an in-lieu supply to both urban and agricultural end users. Given the differing approaches and difficulty in addressing seawater intrusion, SVBGSA and partner agencies may face trade-offs between meeting the sustainability goals of 1 sustainability indicator versus another, which may necessitate adjusting SMC once an approach is selected in order to best meet the needs of beneficial uses and users.

Currently, no new information indicates the SMC should be changed. SVBGSA will continue to monitor groundwater levels and will adjust the groundwater level SMC in future amendments if needed to manage the Subbasin according to all sustainability indicators.

2.3 Seawater Intrusion

Seawater intrusion has been documented in the Salinas Valley since 1944. To date, it has been observed in the 180-Foot and 400-Foot Aquifers. It has not been observed in the Deep Aquifers. Seawater intrusion is the primary reason why the Subbasin is classified as critically overdrafted. Therefore, addressing seawater intrusion is the main focus of the SVBGSA's sustainability planning for this Subbasin.

After surface water diversions at the SRDF began to supplement CSIP supplies in 2010, the area of land overlying the seawater intrusion front slowed, as measured by the 500 milligrams per liter (mg/L) chloride isocontour. During the 2015 drought, when there were no surface water diversions for 3 consecutive years so groundwater extraction as a source of supply for CSIP increased, there was a jump in seawater intrusion in the 400-Foot Aquifer. During this period, seawater vertically migrated from the 180-Foot to 400-Foot Aquifer in an inland area due to a combination of leaky wells and a thin or absent aquitard. MCWRA has since implemented a well destruction program and destroyed wells that are a conduit of vertical migration or could be.

Per GSP Amendment 1, locally defined significant and unreasonable seawater intrusion in the Subbasin is defined as follows:

- *Any additional seawater intrusion in the Subbasin since 2017 is significant and unreasonable.*

The SMC for seawater intrusion aims to push seawater intrusion back toward the coast, providing operational flexibility and prevent seawater intrusion from extending past its 2017 extent. The SMC are also designed to avoid impacts related to other sustainability indicators, such as reduction of groundwater in storage. SMC for seawater intrusion are summarized in Table 2-8.

Table 2-8. Summary of Sustainable Management Critera for Seawater Intrusion

Sustainable Management Criteria	Description
Metric	500 mg/L chloride isocontour maps developed by MCWRA
Minimum Threshold	2017 extent of 500 mg/L chloride isocontour for the 180- and 400-Foot Aquifers, and the line defined by Highway 1 for the Deep Aquifers
2025 Interim Milestone	Identical to 2017
Measurable Objective	Highway 1 for the 180-Foot, 400-Foot, and Deep Aquifers
Undesirable Results	Exceedance of the minimum threshold

2.3.1 Groundwater Conditions Relative to SMC

As defined by the 500 mg/L chloride isocontour, seawater advanced in both the 180-Foot and 400-Foot Aquifers from WY 2019 to WY 2023. In the 180-Foot Aquifer, advancement slowed and only occurred in some years. In the 400-Foot Aquifer, advancement continued in several areas along the front and connected several isolated “islands.” No seawater intrusion has been detected in the Deep Aquifers.

In the 180-Foot Aquifer, seawater intrusion advanced in 2018, 2019, 2020, and 2023, as shown on Figure 2-11. Advancement was slow, and it was mainly concentrated on the southern plume intruding along the boundary of the 180/400 and Monterey Subbasins. Additionally, Figure 2-11 shows how the area overlying the seawater intruded area of the 180-Foot Aquifer has slowed since the SRDF began diverting surface water for CSIP. This figure also includes the 2023 250 mg/L chloride isocontour, which provides an early warning of intrusion, particularly for the City of Salinas where the 250 mg/L chloride isocontour is only 830 feet away.

In the 400-Foot Aquifer, seawater has spread at a faster rate in terms of land area than the 180-Foot Aquifer, connecting some of the “islands” that resulted from vertical migration, as shown on Figure 2-11. Figure 2-11 also includes a graph of the acreage impacted by seawater intrusion in the 400-Foot Aquifer and the 2023 250 mg/L chloride isocontour. Like the overlying 180-Foot Aquifer, the 250 mg/L chloride isocontour in the 400-Foot Aquifer is only 990 feet away from the City of Salinas. With the development of CSIP to deliver recycled and river water for irrigation, the advancement of the 500 mg/L chloride isocontour slowed in the 180-Foot Aquifer, but not the 400-Foot Aquifer.

The minimum threshold is a single isocontour that connects the inland leading edges of the 500 mg/L chloride isocontours, so that infill of seawater intrusion does not impact the minimum threshold; however, it does affect groundwater use in the area and actions to address seawater intrusion. An assessment focusing on the effect of increased groundwater extraction from 2021 to 2022 on seawater intrusion is included in Appendix 3C. The advancement of seawater intrusion is not solely dependent on groundwater use—there must be a pathway in the subsurface that enables its advancement. However, pumping in most wells along the main areas of additional intrusion increased from 2021 to 2022. Groundwater elevation data in these areas is limited compared to pumping data, but many wells experienced a decrease in August groundwater elevations since 2021.

In the Deep Aquifers, seawater intrusion has not been detected to date. The Deep Aquifers Study identifies seawater intrusion in the Deep Aquifers as a potential risk given that in most of the coastal area groundwater elevations in the Deep Aquifers are lower than the overlying 400-Foot Aquifer. However, MCWRA monitors 30 Deep Aquifers wells in the Subbasin for chloride and has not found evidence of seawater intrusion.

Table 2-9 summarizes the undesirable results by aquifer for WY 2019 to 2023. Since an undesirable result in any aquifer constitutes an undesirable result for the Subbasin, there has been a Seawater Intrusion SMC undesirable result for all 5 years.

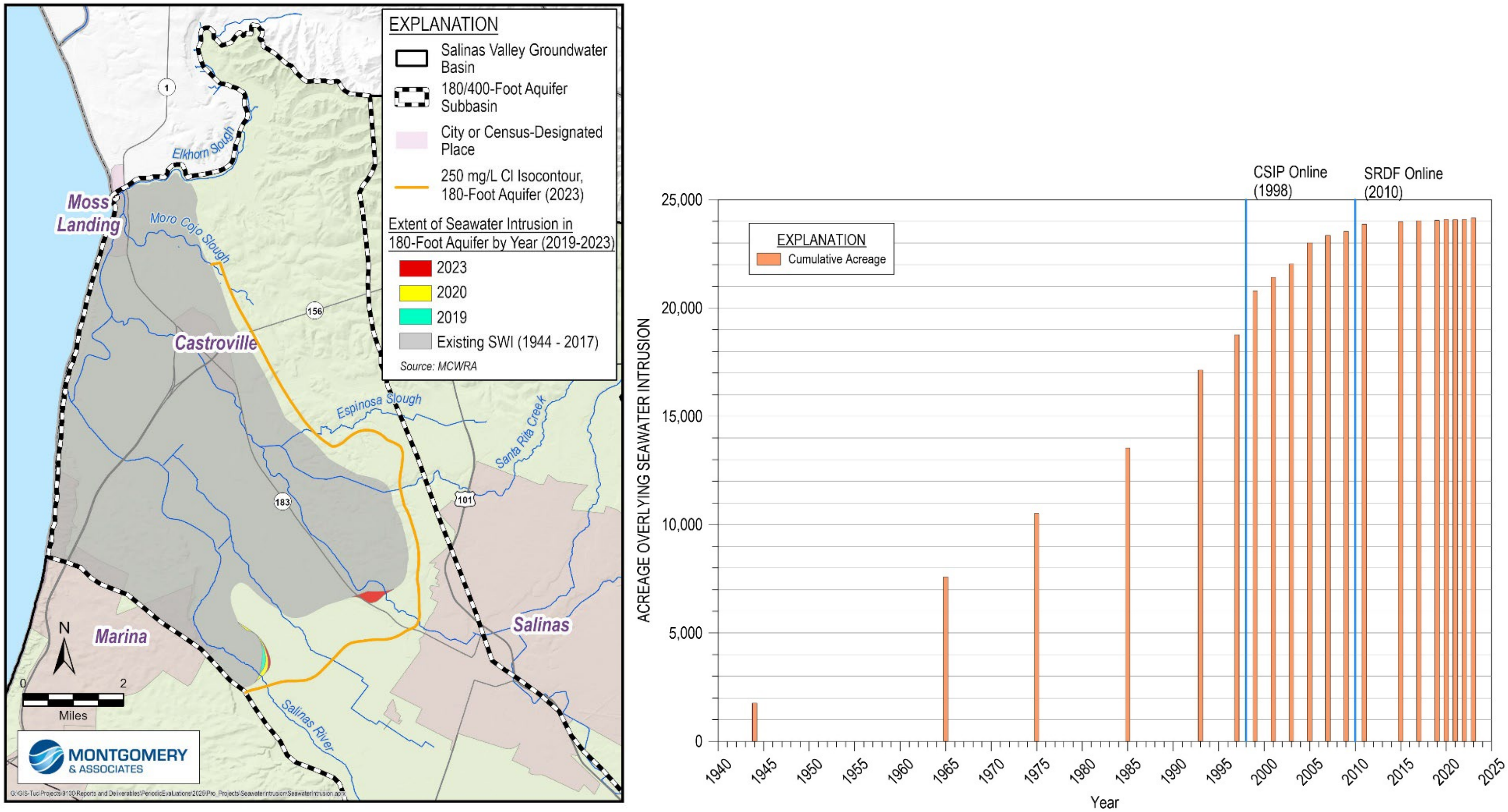


Figure 2-11. Seawater Intrusion Extent and Acres Overlying Seawater Intrusion in the 180-Foot Aquifer

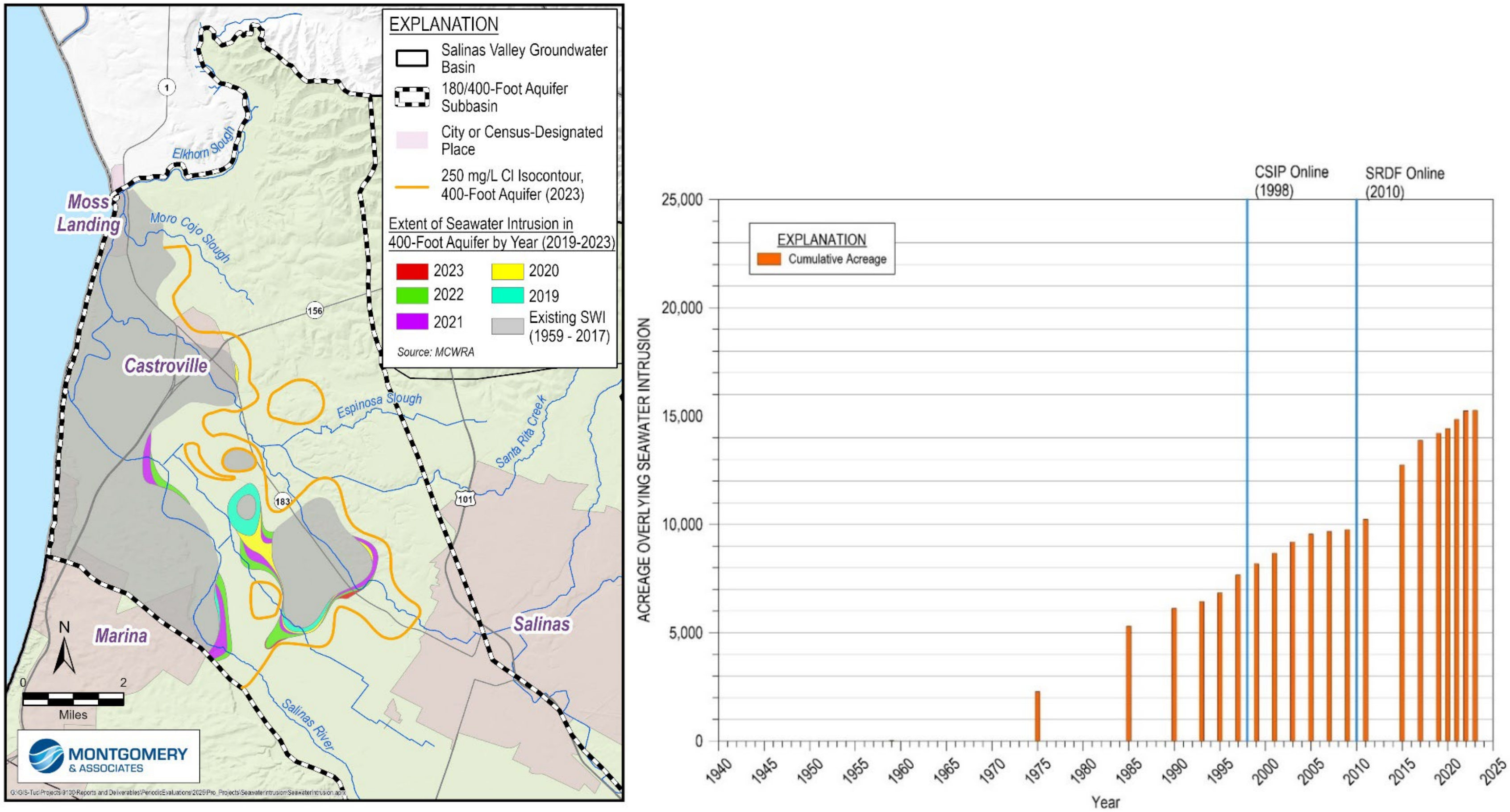


Figure 2-12. Seawater Intrusion Extent and Acres Overlying Seawater Intrusion in the 400-Foot Aquifer

Table 2-9. Annual Summary of Seawater Intrusion Undesirable Results

	2019	2020	2021	2022	2023
180-Foot Aquifer	Intrusion	Intrusion	No new intrusion but beyond 2017	No new intrusion but beyond 2017	Intrusion
400-Foot Aquifer	Intrusion	Intrusion	Intrusion	Intrusion	Intrusion
Deep Aquifers	No intrusion	No intrusion	No intrusion	No intrusion	No intrusion
Subbasin Groundwater Level Undesirable Result	2019 Undesirable Result	2020 Undesirable Result	2021 Undesirable Result	2022 Undesirable Result	2023 Undesirable Result

2.3.2 Impact on Beneficial Users

The seawater intruded area in the 180-Foot Aquifer increased in 2019, 2020, and 2023, as delineated by the 500 mg/L chloride isocontour. In the 400-Foot Aquifer, the seawater intruded area increased annually from 2019 to 2023. In 2021, a Castroville Community Services District well in the 400-Foot Aquifer was taken offline due to high chloride levels.

For wells without regular chloride sampling, the chloride isocontours are used as a best estimate of where chloride concentration in groundwater is above 500 mg/L, which is based on the MCWRA seawater intrusion monitoring network. During the evaluation period, seawater intrusion in the 180-Foot Aquifer expanded beneath 1 domestic well. The expansion of seawater intrusion in the 400-Foot Aquifer affected an area where 9 agricultural 400-Foot Aquifer wells and 2 agricultural wells in both the 180-Foot and 400-Foot Aquifers are located. Among the wells located within the newly intruded areas, 2 400-Foot Aquifer wells have been destroyed.

2.3.3 Impact on Other Sustainability Indicators

Seawater intrusion minimum thresholds can influence other sustainability indicators such as groundwater in storage. SVBGSA set seawater intrusion minimum thresholds so that seawater intrusion minimum thresholds will not cause undesirable results for the other sustainability indicators. However, it will take time to plan and implement projects and management actions that control and reduce seawater intrusion. Therefore, even if groundwater levels during this evaluation period have affected other sustainability indicators, the Subbasin may still avoid undesirable results by 2040.

- **Chronic lowering of groundwater levels.** Seawater intrusion is a result of low groundwater levels, not a cause. Therefore, the increases in seawater intrusion during the evaluation period did not have an effect on groundwater levels.
    - **Reduction in groundwater storage.** The seawater intrusion minimum thresholds are used to calculate the groundwater storage minimum thresholds. Therefore, as

compared to 2017, increases in seawater intrusion have contributed to a slight decrease in groundwater storage since 2019.

- **Degraded water quality.** Chloride is 1 of the groundwater quality constituents monitored for the groundwater quality SMC. No additional wells exceeded regulatory limits for groundwater quality in the areas of intrusion during the evaluation period. As actions are implemented to meet the seawater intrusion minimum threshold, it may have a beneficial impact on groundwater quality by preventing increases in chloride concentrations in supply wells.
- **Land subsidence.** Seawater intrusion has not impacted land subsidence because no inelastic land subsidence has been detected to date.
- **Depletion of ISW.** Seawater intrusion does not promote additional pumping, and therefore does not contribute to a significant or unreasonable depletion of ISW.

2.3.4 Evaluation of SMC

SVBGSA set seawater intrusion minimum thresholds to avoid additional seawater intrusion beyond 2017, which was the current extent when drafting the GSP. However, seawater intruded further even before GSP submittal. Based on interested parties feedback during the GSP development process, the measurable objective was set at Highway 1 to improve the Subbasin's groundwater quality and provide access to usable groundwater to additional beneficial users. The GSP stated this may need to be revised as the projects and actions to address seawater intrusion are refined.

Projects and management actions will address seawater intrusion to different extents. Differing approaches to addressing seawater intrusion may have different impacts on other sustainability indicators, namely groundwater levels and storage. As such, SVBGSA and partner agencies may face trade-offs between meeting the sustainability goals of 1 sustainability indicator versus another, which may necessitate adjusting SMC once an approach is selected in order to best meet the needs of beneficial uses and users.

At this point, no new information indicates the SMC should be changed. SVBGSA will continue to monitor seawater intrusion and will adjust the seawater intrusion SMC in future amendments if needed to manage the Subbasin according to all sustainability indicators.

2.4 Reduction of Groundwater in Storage

The Subbasin GSP adopted the concept of change in usable groundwater storage, defined as the annual average increase or decrease in groundwater that can be safely used for municipal, industrial, or agricultural purposes. On average over the past few decades, the 180/400 Subbasin has experienced declines in groundwater elevations, advancement of seawater intrusion, and loss of groundwater in storage. Average groundwater elevations rise after wet years like WY 2023, leading to an increase in groundwater in storage. This is expected during wet years but does not indicate a change in the overall downward trend.

Locally defined significant and unreasonable conditions in reduction in groundwater storage in the Subbasin are those that:

- *Lead to chronic, long-term reduction in groundwater storage, or*
- *Interfere with other sustainability indicators*

2.4.1 GSP Amendment 1 Change to Reduction of Groundwater in Storage SMC

While the understanding of what constitutes significant and unreasonable conditions for the reduction of groundwater in storage remains similar to the 2020 GSP, the metric and SMC are updated in GSP Amendment 1. The 2020 GSP was an amount of pumping based on a modeled long-term sustainable yield. However, groundwater models are estimates and will be refined with new information, which makes it a difficult benchmark for the SMC. Furthermore, the sustainable yield as the groundwater elevations within the Subbasin and adjacent subbasins change. GSP Amendment 1 generally aligns the SMC with the approach in the 2022 Salinas Valley GSPs, which benchmark the reduction of groundwater in storage to observed groundwater levels. Since seawater intrusion is also present in the Subbasin, rather than as a direct proxy from the groundwater level SMC, the groundwater level and seawater intrusion minimum thresholds and measurable objectives are used to calculate changes in storage. Total change in groundwater storage between minimum threshold conditions and measurable objective conditions is the sum of the storage change due to groundwater elevations and the storage change due to seawater intrusion.

As defined in GSP Amendment 1, change in usable groundwater storage is the sum of change in storage due to groundwater elevation changes and the change in storage due to seawater intrusion. The measurable objective for reduction of groundwater in storage is the amount of groundwater in storage when groundwater levels are at 2003 levels and seawater intrusion is at Highway 1, providing operational flexibility above the minimum threshold to avoid significant and unreasonable conditions. The SMC for reduction of groundwater in storage are summarized in Table 2-10.

Although not the metric for establishing change in groundwater storage, the GSAs are committed to pumping at or less than the Subbasin’s long-term sustainable yield.

Table 2-10. Summary of Sustainable Management Critera for Reduction of Groundwater in Storage

Sustainable Management Criteria	Description
Metric	Calculated change of groundwater in storage based on proxy measurements of groundwater levels and seawater intrusion
Minimum Threshold	626,000 AF below the measurable objective
2025 Interim Milestone	454,200 AF below the measurable objective
Measurable Objective	0 AF change from Groundwater Level and Seawater Intrusion measurable objectives
Undesirable Results	Exceedance of the minimum threshold

Groundwater in storage decreased from WY 2019 to WY 2022. Several winter storms in early 2023 led to higher-than-normal recharge and reduced pumping, contributing to an increase of groundwater in storage from WY 2022 to WY 2023. Ending with a wet water year resulted in an overall increase of groundwater in storage over the evaluation period; however, it does not change the long-term trend of declining groundwater in storage.

2.4.2 Groundwater Conditions Relative to SMC

Since the groundwater storage SMC is dependent on both groundwater elevations and seawater intrusion, a wet year will not necessarily lead to an increase in groundwater storage. For example, although WY 2019 was a wet year, there was an exceedance of the groundwater storage minimum threshold. This was mainly caused by the decrease in storage due to seawater intrusion. WY 2020 through WY 2022 were all dry years that experienced decreases in usable groundwater storage due to both decreasing groundwater elevations and advancement of seawater intrusion. In WY 2023, the groundwater in storage increased because of a large increase in groundwater elevations in the 180-Foot Aquifer during the wet year. Table 2-11 summarizes the undesirable results from WY 2019 to WY 2023. Out of the 5-year evaluation period, all years but WY 2023 had a Groundwater Storge SMC undesirable result. Groundwater in storage was 5,000 acre-feet (AF) above the minimum threshold in WY 2023.

Table 2-11. Annual Summary of Groundwater Storage Undesirable Results

	2019	2020	2021	2022	2023
Groundwater in storage needed to reach the Measurable Objective (acre-feet)	642,000	648,000	666,000	678,000	621,000
Subbasin Groundwater Level Undesirable Result	Undesirable Result	Undesirable Result	Undesirable Result	Undesirable Result	No Undesirable Result

2.4.3 Impact on Beneficial Users

The reduction in groundwater storage over the evaluation period has not had a direct impact on beneficial uses and users within the evaluation period.

2.4.4 Impact on Other Sustainability Indicators

Since the reduction of groundwater in storage SMC is calculated by proxy based on the groundwater level and seawater intrusion SMC, it has no further impact on other sustainability indicators beyond those SMC.

2.4.5 Evaluation of SMC

The reduction of groundwater in storage SMC were changed in GSP Amendment 1 to a subbasin-wide calculation based on the groundwater levels and seawater intrusion SMC. The GSP Amendment 1 also includes revisions to the aquifer-specific change in storage calculation required for Annual Reports. Because of variations in groundwater elevations, the subbasin-wide and aquifer specific storage change calculations use difference storage coefficients that may lead to discrepancies in the storage change totals that are included in Annual Reports. Additionally, the calculated storage change is inconsistent with the storage change from the SVIHM. In future GSP amendments, the storage coefficients used to calculate change in storage will be reviewed and revised as needed for consistency among all storage change estimates.

2.5 Degraded Groundwater Quality

Per the GSP, locally defined significant and unreasonable changes in groundwater quality in the Subbasin are increases in a constituent of concern (COC) caused by a direct result of a GSA groundwater management action that either:

- *Results in groundwater concentrations in a potable water supply well above an established MCL or SMCL, or*
- *Leads to significantly reduced crop production.*

Table 2-12. Summary of Sustainable Management Critera for Degradation of Water Quality

Sustainable Management Criteria	Description
Metric	Groundwater quality data from the groundwater ambient monitoring & assessment program (GAMA) groundwater information system supplemented with additional data from CCRWQCB
Minimum Threshold	No new exceedances past the existing number of wells that are above the regulatory standard for each COC
2025 Interim Milestone	Same as the minimum threshold
Measurable Objective	Same as the minimum threshold
Undesirable Results	Future or new minimum thresholds exceedances are caused by a direct result of GSA groundwater management action(s), including projects or management actions and regulation of groundwater extraction

2.5.1 GSP Amendment 1 Change to Degraded Groundwater Quality SMC

As noted in Section 1.1.5, to address DWR's review comment that GSAs are not just responsible for managing impacts of projects and management actions on groundwater quality, but also required to manage groundwater quality impacts from extraction, in GSP Amendment 1 SVBGSA revised the undesirable result to be:

> *Future or new minimum thresholds exceedances are caused by a direct result of GSA groundwater management action(s), including projects or management actions and regulation of groundwater extraction.*

In addition, SVBGSA added text in the Amendment to further describe the regulatory context, coordination with other agencies, and the approach underlying the development of the SMC. Since the chronic lowering of groundwater levels SMC sets minimum thresholds above historical lows, additional constituents should not be mobilized. An analysis of the groundwater quality exceedances compared to groundwater levels or extraction is currently not possible given that the aquifer or screen interval is not designated in most irrigation supply wells, as noted in Section 2.5. However, there have been a notable number of water quality minimum threshold exceedances and SVBGSA is working with partner agencies to resolve these data challenges.

This revised undesirable result statement was included in SVBGSA 2022 GSPs. In its review of those GSPs, DWR included an RCA to revise the definition of undesirable results so that exceedances of minimum thresholds caused by groundwater extraction, whether the GSA has implemented pumping regulations or not, are considered in the assessment of undesirable results.

While DWR did not note this RCAs for the 180/400 Subbasin, SVBGSA plans to take a Valley-wide approach and make this adjustment to all GSPs in future GSP amendments.

2.5.2 Groundwater Conditions Relative to SMC

Groundwater quality is assessed in both drinking water and irrigation supply wells. Drinking water quality data is available for public water supply wells through the SWRCB's Division of Drinking Water (DDW) and on-farm domestic wells through the CCRWQCB's Irrigated Lands Regulatory Program (ILRP), all of which are considered RMS wells for groundwater quality. The ILRP dataset is also used to obtain water quality data for irrigation supply wells. The COCs for each well type are those outlined in GSP Amendment 1 (Table 2-13). The MCLs and SMCLs established by the State's Title 22 drinking water regulatory standards are used to evaluate water quality in public water system supply wells and on-farm domestic wells. Water quality in irrigation supply wells is compared to the COC levels that may lead to reduced crop production specified in the CCRWQCB (2019) Water Quality Control Plan for the Central Coast Basin.

Water quality data is mainly sourced from the State's Groundwater Ambient Monitoring and Assessment (GAMA) groundwater information system. However, through collaboration with the CCRWQCB and Central Coast Water Quality Preservation, Inc., after the submittal of the WY 2023 Annual Report it was determined that the GAMA groundwater information system is missing ILRP data. Therefore, in this GSP 2025 Evaluation and future reports produced by the SVBGSA, data downloaded from the GAMA groundwater information system will be supplemented with ILRP data directly from the CCRWQCB. In addition, the 2017 baseline that forms the basis for the minimum thresholds and measurable objectives were adjusted for ILRP wells based on the more complete dataset provided by the CCRWCB.

Table 2-13 lists the COC for each well type and summarizes the number of wells that exceed the regulatory standard for any given COC from the GSP baseline year, 2017, through the most recent year of data, 2023. The exceedance values for each year are based on the last sample collected for each RMS well. Table 2-13 does not include all Title 22 constituents for drinking water wells, and not all listed COCs were sampled during the 7-year period. For a given year, if a COC had no exceedance or was not sampled, the recorded value in the table is zero. The ILRP on-farm domestic wells exhibited the most variability in exceedances between 2017 and 2023, which is likely due to the recently available ILRP data from CCRWQCB. A comparison of the annual exceedances of each COC are included in Appendix 3D.

In 2023, 15 COCs exceeded their groundwater quality minimum thresholds. The last column in Table 2-13 includes the number of wells above the 2017 baseline that had higher concentrations than the regulatory standard. If a COC has more wells with concentrations above the regulatory standard than the minimum threshold, the row is highlighted in orange to indicate an exceedance. The negative numbers in the last column indicate a drop in the total number of wells with concentrations above the regulatory limit, and a zero indicates no change in exceedances compared to 2017 when the minimum threshold was established. The COCs with the highest minimum threshold exceedances were Nitrate + Nitrite (sum as nitrogen) and Specific Conductance in ILRP on-farm domestic wells.

Table 2-13. Water Quality Constituent of Concern Exceedances for 2017 and 2023

Constituent of Concern (COC)	Existing Exceedances of Regulatory Standard in 2017 (Minimum Threshold/Measurable Objective)	Exceedances of Regulatory Standard in 2023	Number of Wells in 2023 with Exceedances above 2017 (negative if fewer than 2017 exceedances)
DDW Wells			
1,2,3-Trichloropropane	0	2	2
Aluminum	1	0	-1
Arsenic	2	1	-1
Chloride	3	5	2
Chromium	1	0	-1
Chromium, Hexavalent (Cr6)	16	0	-16
Di(2-ethylhexyl) phthalate	2	2	0
Foaming Agents (MBAS)	7	8	1
Gross Alpha radioactivity	4	2	-2
Iron	8	11	3
Manganese	3	10	7
Methyl-tert-butyl ether (MTBE)	0	3	3
Nitrate (as nitrogen)	9	11	2
Selenium	1	0	-1
Specific Conductance	6	7	1
Sulfate	1	0	-1
Total Dissolved Solids	6	9	3
ILRP On-Farm Domestic Wells			
Chloride	17	14	-3
Iron	9	10	1
Manganese	3	3	0
Nitrate (as nitrogen)	64	68	4
Nitrate + Nitrite (sum as nitrogen)	12	50	38
Nitrite	2	2	0
Specific Conductance	59	92	33
Sulfate	4	4	0
Total Dissolved Solids	64	72	8
ILRP Irrigation Wells			
Chloride	26	28	2
Iron	2	2	0
Manganese	2	2	0

Table 2-14 summarizes the undesirable results from WY 2019 to WY 2023. There were minimum threshold exceedances of some COC in each year of the 5-year evaluation period. Since SVBGSA has yet to implement any projects or management actions in the Subbasin, these exceedances are not determined to be due to GSA action; however, an analysis should be done after the initial analyses to address the RCAs for the 2022 GSPs, as noted above. Therefore, at this time, the groundwater quality exceedances are not considered an undesirable result.

Groundwater quality minimum threshold exceedances, compared with the undesirable results, are included in Table 2-14 for each year of the evaluation period. If exceedances of the minimum threshold are determined to be due to a GSA groundwater management action or inaction, it would constitute an undesirable result.

SVBGSA is working to develop the baselines and a process through which exceedances will be reviewed. In the meantime, SVBGSA shares and discusses minimum threshold exceedances with the Water Quality Coordination Group.

Table 2-14. Annual Summary of Groundwater Quality Undesirable Results

	2019	2020	2021	2022	2023
Groundwater Quality Minimum Thresholds Exceeded	Exceeded for 12 Constituents	Exceeded for 14 Constituents	Exceeded for 14 Constituents	Exceeded for 15 Constituents	Exceeded for 15 Constituents
Subbasin Groundwater Quality Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result

2.5.3 Impact on Beneficial Users

The SMC were set to avoid financial costs to drinking water and agricultural water users. SVBGSA is not aware of any costs that have been incurred by beneficial uses and users from further water quality exceedances; however, Castroville Community Services District will have costs associated with replacing the well that has been taken offline due to seawater intrusion.

2.5.4 Impact on Other Sustainability Indicators

Degradation of groundwater quality does not affect other sustainability indicators.

2.5.5 Evaluation of SMC

In DWR's review of the 2022 Salinas Valley GSPs that had similar water quality SMC to GSP Amendment 1, DWR gave additional guidance through RCAs. These included the need to explain why the baseline year was not 2015 and recommendation to conduct necessary investigation or studies to understand the degree to which groundwater extraction affects groundwater quality. While these RCAs were not specified for the 180/400 Subbasin, SVBGSA plans to take a consistent approach across its subbasins. As described in Section 8, SVBGSA is working with partner agencies to resolve data challenges, which is needed to undertake this analysis in the 180/400 Subbasin. It plans to complete the analysis in 2025 for inclusion in the

GSP 2027 Evaluations. If any adjustments to the SMC are needed based on this analysis or changes to the water quality monitoring network, those will be included in a future amendment.

2.6 Land Subsidence

Land subsidence due to lowering of groundwater levels is not known to occur in the Subbasin. However, the presence of clay aquitards and interspersed clay lenses creates the conditions under which subsidence may occur.

Per GSP Amendment 1, locally defined significant and unreasonable subsidence in the Subbasin is defined as follows:

- *Any inelastic land subsidence that is caused by lowering of groundwater elevations in the Subbasin, or*
- *Any inelastic subsidence that causes an increase of flood risk.*

The minimum threshold and measurable objective for land subsidence is to continue to have no inelastic land subsidence in the Subbasin caused by lowering of groundwater elevations. The SMC are also designed to avoid impacts related to other sustainability indicators, such as seawater intrusion and reduction of groundwater in storage. SMC for land subsidence are summarized in Table 2-15.

Table 2-15. Summary of Sustainable Management Critera for Land Subsidence

Sustainable Management Criteria	Description
Metric	Measured using DWR provided Interferometric Synthetic-Aperture Radar (InSAR) data
Minimum Threshold	Zero net long-term subsidence, with no more than 0.1 foot per year of estimated land movement measured subsidence to account for InSAR measurement errors
2025 Interim Milestone	Same as the minimum threshold
Measurable Objective	Same as the minimum threshold
Undesirable Results	An exceedance of the minimum threshold due to lowered groundwater elevations

2.6.1 Groundwater Conditions Relative to SMC

Land subsidence is monitored annually through Interferometric Synthetic-Aperture Radar (InSAR) data. To avoid potentially aggregating measurement error, rather than summing the annual change over each of the evaluation period 5 years, the change from 2015 to 2024 was used to review cumulative land subsidence. Figure 2-13 shows land subsidence within versus outside of the minimum threshold of 0.1 foot per year change.

There are 3 points in the subbasin with maximum cumulative subsidence from June 2015 to October 2023 greater than 0.1 foot. Subsidence change over time and groundwater elevation change in all 3 aquifers are evaluated to assess the extent to which subsidence was inelastic, and therefore pertains to the SMC. Each of the 3 locations displays elastic response to groundwater level changes, as shown in Appendix 3E. Maximum cumulative subsidence was between 0.15 and 0.2 foot and was observed in fall 2022 when groundwater levels were at their lowest regionally following the 2020-2022 drought. Since fall 2022 the land surface has rebounded partially, as groundwater levels recovered following the wet winter and spring in 2023, indicating subsidence is predominantly elastic in all 3 locations. The March 2024 land surface at the 3 points is about 0.5 foot below the land surface in June 2015. Lowering land surface during droughts and rising land surface during wetter periods suggests that subsidence in the subbasin is primarily elastic, or recoverable, subsidence. The inelastic portion of subsidence is 0.05 foot or less.

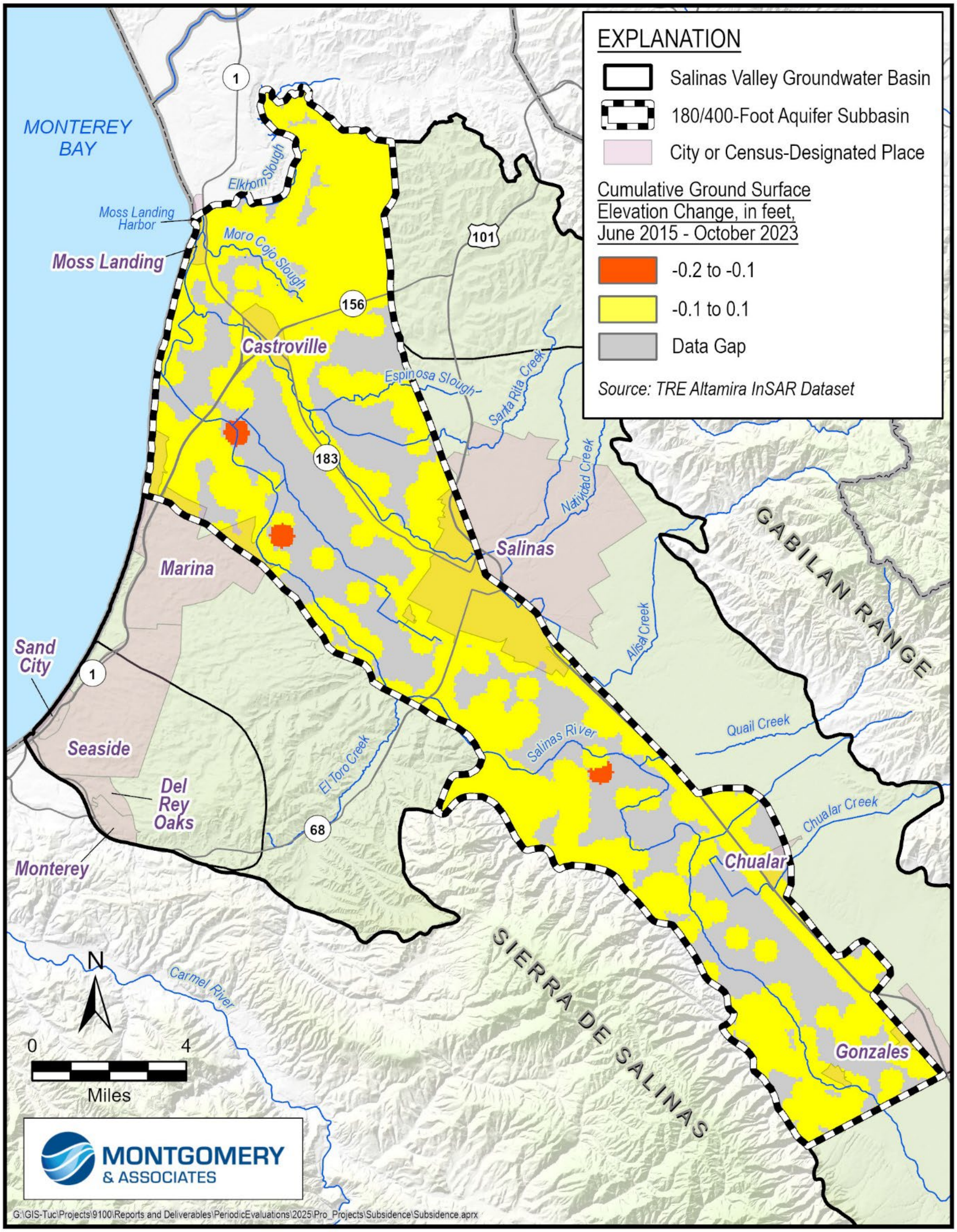


Figure 2-13. Land Subsidence from June 2015 to October 2023

Table 2-15 summarizes the undesirable results from WY 2019 to WY 2023. There were no minimum threshold exceedances in any year of the 5-year evaluation period; therefore, there were no Land Subsidence SMC undesirable results.

Table 2-16. Annual Summary of Land Subsidence Undesirable Results

	2019	2020	2021	2022	2023
Land Subsidence Outside of the Minimum Threshold	No	No	No	No	No
Subbasin Land Subsidence Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result

2.6.2 Impact on Beneficial Users

No impact on beneficial users or land use because no inelastic subsidence has occurred due to lowered groundwater elevations.

2.6.3 Relationship Other Sustainability Indicators

No inelastic land subsidence has been observed, and therefore there has been no impact of land subsidence on other sustainability indicators.

2.6.4 Evaluation of SMC

SVBGSA set land subsidence minimum thresholds and measurable objectives to avoid significant and unreasonable conditions associated with inelastic subsidence. At this point, no new information indicates the SMC should be changed. SVBGSA will continue to monitor subsidence and groundwater levels and will adjust the groundwater level SMC in future amendments if needed to manage the Subbasin according to all sustainability indicators.

2.7 Depletion of Interconnected Surface Water

SVBGSA's current understanding of surface water and groundwater interactions are informed by streamflow monitoring, groundwater level monitoring, and simulated surface water/ groundwater interactions using the SVIHM, an integrated surface water groundwater model. SVBGSA used the SVIHM to map locations of surface water and groundwater interconnection. It identified areas along the Salinas River where the Salinas Valley Aquitard is not present, and some smaller areas of potential interconnection in the northern part of the Subbasin, such as the Moro Cojo Slough.

Per GSP Amendment 1, locally defined significant and unreasonable depletion of ISW in the Subbasin is defined as:

- *Depletion from groundwater extraction that would result in a significant and unreasonable impact on other beneficial uses and users such as riparian water rights holders, appropriative surface water rights holders, ecological surface water users, and recreational surface water uses.*
- *Depletion from groundwater extraction more than observed in 2015, as measured by shallow groundwater elevations near locations of ISW. While a documented determination of whether past depletions was significant is not available, staying above 2016 depletions was determined to be a reasonable balance for all the beneficial uses and users.*

2.7.1 GSP Amendment 1 Change to Depletion of ISW SMC

While the understanding of what constitutes significant and unreasonable conditions for depletion of ISW remains similar to the 2020 GSP, the metric and SMC for depletion of ISW are updated in GSP Amendment 1. The 2020 GSP based depletion on a modeled quantity; however, it is unrealistic that the SVIHM will be updated annually to make this determination. GSP Amendment 1 aligns with the approach of the 2022 Salinas Valley GSPs that monitors depletion of ISW by proxy through shallow groundwater levels near locations of interconnection.

The SMC for depletion of ISW aims for shallow groundwater levels at or above 2003 levels, providing operational flexibility to keep groundwater levels above 2015 conditions to avoid significant and unreasonable conditions. The SMC are also designed to avoid impacts related to other sustainability indicators. The updated SMC is summarized in Table 2-17.

Table 2-17. Summary of Sustainable Management Critera for Depletion of ISW

Sustainable Management Criteria	Description
Metric	Groundwater elevations measured at ISW RMS wells
Minimum Threshold	Established by proxy using shallow groundwater elevations 1 foot above those observed in 2015 near locations of ISW
2025 Interim Milestone	Set to ¼ of the way between 2020 groundwater elevations and the measurable objective
Measurable Objective	Established by proxy using shallow groundwater elevations observed in 2003 near locations of ISW
Undesirable Results	An exceedance of the minimum threshold

2.7.2 Groundwater Conditions Relative to SMC

During the evaluation period, the ISW monitoring network consisted of 1 well. A second well in the monitoring network was determined to be screened beneath the Salinas Valley Aquitard, which prevented accurate analysis of interconnection between surface water and groundwater in that location. This well was removed from the monitoring network. In 2023, SVBGSA installed an additional shallow monitoring well that will start reporting data in the WY 2024 Annual Report. In addition, new shallow monitoring wells recommended for GDE monitoring will be part of a GDE Program the SVBGSA Board will be considering in the future.

Figure 2-14 shows how the groundwater elevations in the existing ISW monitoring well declined from January 2019 to November 2022, falling below the minimum threshold in fall 2022. Groundwater elevations rebounded with the winter storms of late 2022 and early 2023. By the fall 2023 measurement, the groundwater level was between the 2025 interim milestone and measurable objective. The blue dashed trendline on Figure 2-14 shows a slight decline in the groundwater elevation over the evaluation period, with the trendline falling below the 2025 interim milestone and above the minimum threshold by fall 2023.

The figure also notes the monthly average streamflow at the nearest USGS gage #11152300 (Salinas River Near Chualar). It shows a correlation between the shallow groundwater elevation and streamflow. It shows that groundwater levels, and therefore depletion of surface water by proxy, was only less than in 2015 during 2022. In 2022, there were no summer conservation releases from the reservoirs, which led to little to no streamflow throughout the year. After the winter storms and high streamflow in early 2023, groundwater levels rebounded and ended the year above the 5-year interim milestone. Similar to the groundwater levels SMC, measurement in a wet year is not necessarily indicative of long-term trends. Similar to the analysis of groundwater elevations, Figure 2-14 shows the 5-year trend based on fall groundwater level measurements by the blue dashed line. The trendline crosses fall 2023 above the minimum threshold and below the interim milestone.

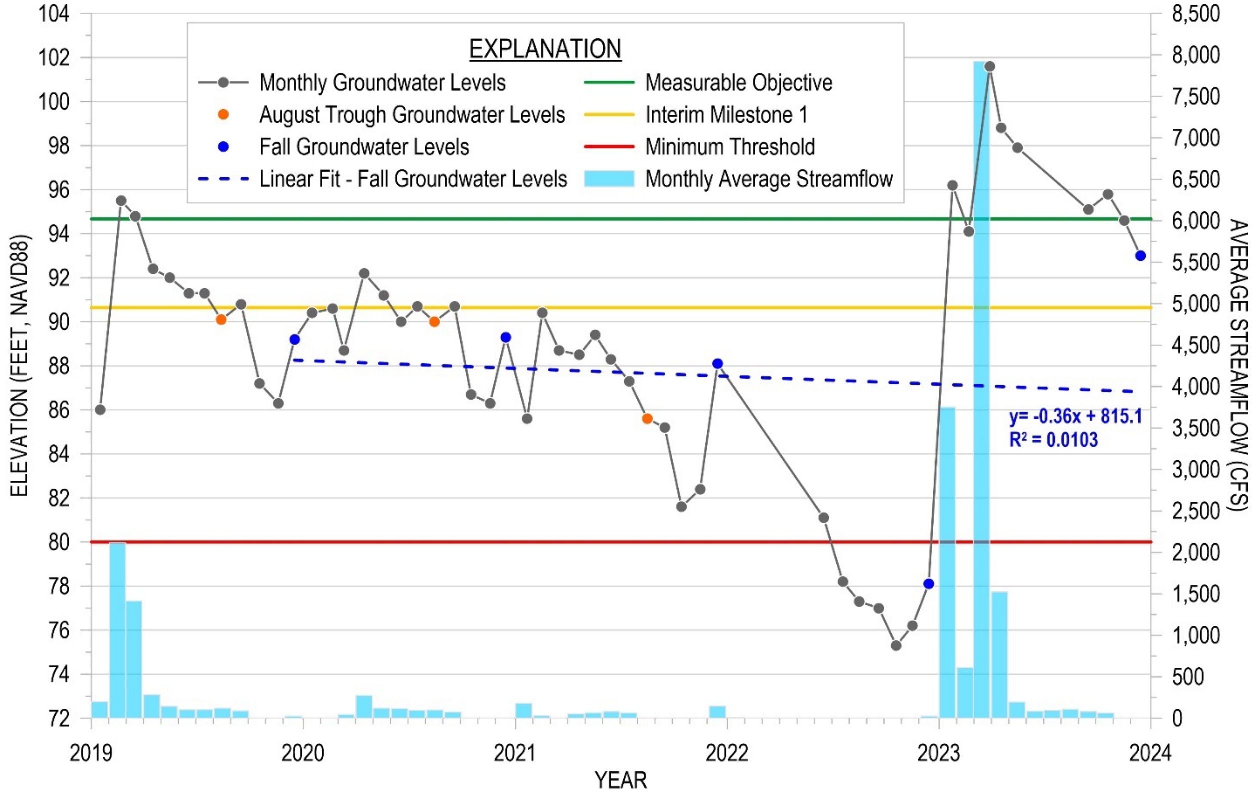


Figure 2-14. Shallow Groundwater Elevations Compared to SMC in Interconnected Surface Water RMS

Table 2-17 summarizes the undesirable results from WY 2019 to WY 2023. Even though the SMC approach was not revised until 2022, a summary of the undesirable results based on the revised SMC is included in the table. As also shown on Figure 2-14, there was only a minimum threshold exceedance and undesirable result in WY 2022.

Table 2-18. Annual Summary of ISW SMC Undesirable Results

	2019	2020	2021	2022	2023
Minimum Threshold Exceedances	0	0	0	1	0
Subbasin ISW Undesirable Result	No Undesirable Result	No Undesirable Result	No Undesirable Result	Undesirable Result	No Undesirable Result

For the 2022 GSPs, DWR issued an RCA related to ISW. While not received for the 180/400 Subbasin 2020 GSP, SVBGSA plans to include the 180/400 Subbasin in addressing the RCA to have consistency across the Subbasin. To address the RCA, SVBGSA will review the forthcoming DWR ISW Guidance and apply as appropriate.

2.7.3 Impact on Beneficial Users

There are currently no data that determine what level of depletion from groundwater extraction has a significant adverse effect on steelhead trout or other beneficial use or user. Should there be a determination regarding what level of depletion from groundwater extraction is significant, SVBGSA will take that into consideration as it reviews how it locally defines significant and unreasonable conditions for the SMC. Monitoring is needed to evaluate the impact of depletion of ISW on GDEs. SVBGSA is in the process of developing GDE monitoring protocols.

The SVBGSA is not aware of any current water rights litigation or water rights enforcement complaints by any riparian water rights holders in the Subbasin. Therefore, SVBGSA assumes that the current level of depletion has not injured any riparian water rights holders in the Subbasin.

MCWRA rediverts water stored in the reservoirs at the SRDF; however, reservoir releases are intended for both groundwater recharge and diversion at the SRDF, so recharge of surface water to the aquifers is not considered surface water depletion.

2.7.4 Impact on Other Sustainability Indicators

Depletion of ISW can be affected by reservoir releases, groundwater levels, pumping, and other factors. MCWRA manages reservoir releases to increase groundwater recharge, among other objectives. The 2022 undesirable result for depletion of ISW may have had an impact on beneficial users; however, depletion of ISW does not have impact on other sustainability indicators. Depletion of ISW is measured by proxy using groundwater elevations, and the SMC are set at the same levels as the groundwater level SMC. Therefore, depletion of ISW has not impacted groundwater levels. Similarly, since reduction of groundwater in storage is based in part on observed groundwater levels, depletion of ISW has not impacted groundwater storage. Depletion of ISW does not directly affect seawater intrusion, degraded groundwater quality, or land subsidence.

2.7.5 Evaluation of SMC

SVBGSA set ISW minimum thresholds and measurable objectives to avoid significant and unreasonable conditions that occurred during the 2015 drought. At this point, no new information indicates the SMC should be changed. SVBGSA will continue to monitor shallow groundwater levels and will adjust the groundwater level SMC in future amendments if needed to manage the Subbasin according to all sustainability indicators. In addition, SVBGSA will review the ISW guidance when released by DWR and apply as appropriate in the Subbasin.

3 STATUS OF PROJECTS AND MANAGEMENT ACTIONS

3.1 5-Year Evaluation of Projects and Management Actions

In the last 5 years, SVBGSA has made steady progress on projects and management actions (PMAs) in the GSP. This section provides a summary of the activities from January 2020 to December 2024. The 2020 GSP and Amendment 1 PMAs provide adequate options for reaching sustainability in the 180/400Subbasin within 20 years and maintaining sustainability for an additional 30 years; however, as stated in the GSP, not all will need to be implemented.

Both the 2020 GSP and Amendment 1 stress that projects in this Subbasin should be integrated with projects for the other SVBGSA subbasins as appropriate during GSP implementation. Development of the 2020 GSP involved a broad stakeholder process and considered a Valley-wide approach to PMAs. Following its submittal, SVBGSA shifted to an integrated subbasin approach, whereby PMAs were identified for each subbasin and then integrated across the Valley.

In September 2022, SVBGSA completed Amendment 1 to the 180/400 Subbasin to align with the GSPs for the other 5 SVBGSA subbasins. Amendment 1 updated the list of PMA and their descriptions, incorporating input from partner agencies, the 180/400 Subbasin Planning Committee, and other interested parties. A summary of the PMA changes made in Amendment 1 is included in Section 3.2 below.

With GSPs prepared for the remaining subbasins, the Amendment 1 PMA list was updated with more focus on the 180/400 Subbasin. A new category was created for “Cross Boundary” PMAs that are included in other GSPs but would likely provide some groundwater benefit to the 180/400 Subbasin. In 2022, SVBGSA also developed an Integrated Implementation Plan (IIP) to tie the SVBGSA GSPs together and describe how the Salinas Valley’s groundwater system functions holistically. This plan was called for in the 2020 GSP. While this plan has been put on hold pending additional modeling and other activities, it will be revisited as a tool for an integrated approach to PMAs in the Salinas Valley, where applicable.

MCWRA has built water resources projects for the Salinas Valley since the 1940’s. Several projects in the GSPs rely on infrastructure owned by MCWRA. Past projects led by MCWRA include the Nacimiento and San Antonio Reservoirs and the Monterey County Recycled Water Projects, which comprises 3 main components: 1) CSIP, 2) Salinas Valley Reclamation Project (SVRP), and 3) SRDF. M1W owns the SVRP and operates the recycled water facilities with funding from MCWRA. CSIP distributes in lieu agricultural irrigation supplies from 3 sources: SVRP recycled water, SRDF re-diversion of stored water from the reservoirs, and groundwater pumping from supplemental wells. The CSIP distribution system covers approximately 12,000 acres of the historically seawater intruded area in the 180/400 Subbasin.

GSP Amendment 1 includes projects that provide upgrades to MCWRA's facilities and operates through SVBGSA partnership with MCWRA and M1W. In 2022, MCWRA and SVBGSA finalized a Memorandum of Understanding that outlines the roles of the 2 agencies in implementation of the GSPs. SVBGSA executed a subgrant agreement with MCWRA to provide funding from the Round 1 SGM Implementation Grant to make modifications to the SVRP and CSIP distribution system. SVBGSA also executed a technical services agreement with MCWRA for data collection, other support services, and cooperative activities.

SVBGSA collaborates with several other agencies on PMAs. In the 180/400 Subbasin, SVBGSA coordinates GSP implementation with the Marina Coast Water District Groundwater Sustainability Agency (MCWDGSA). GSP Amendment 1 adds several MCWDGSA projects that are also included in the Monterey Subbasin GSP as cross-boundary projects. The Resource Conservation District of Monterey County (RCDMC) oversees the priority project, P1 Multi-benefit Stream Channel Improvements, in both the 2020 GSP and 2022 Amendment 1.

Since 2022, SVBGSA's main focus has been on grant-funded activities further discussed below. A large share of this work involves feasibility studies to address seawater intrusion, a long standing and critical issue in the Subbasin, as well as other activities discussed in Section 3.3 below. Table 3-1 provides a summary of each PMA and its status.

An all-encompassing project selection process is needed to determine a suite of projects for moving forward across all Salinas Valley subbasins. SVBGSA plans to complete this by January 2027, concurrently with the GSP 2025 Evaluations for SVBGSA's 5 other subbasins. SVBGSA intends to prepare the next periodic evaluation of the 180/400 Subbasin GSP at the same time, to align future GSP periodic evaluations across the 6 SVBGSA subbasins, as well to review and consider next steps on PMAs across all subbasins concurrently. A range of PMAs that would improve groundwater conditions in multiple subbasins will continue to be analyzed and considered in that selection process. Some PMAs will be implemented across multiple subbasins or, if appropriate, Valley-wide. SVBGSA received a DWR Round 1 SGM Implementation Grant for the 180/400 Subbasin that funded many of the efforts related to PMAs in this Subbasin. Some efforts related to PMAs that are primarily or partially in other SVBGSA subbasins are funded through DWR Round 2 SGM Implementation Grants for the Monterey Subbasin or the Eastside, Forebay, Langley, and Upper Valley Subbasins.

3.2 Project and Management Actions Updates in GSP Amendment 1

GSP Amendment 1 updates the 2020 GSP list of PMAs. During WY 2022, SVBGSA held 11 meetings of the 180/400 Subbasin Planning Committee to develop Amendment 1. They considered the PMA chapter at 3 points in the process: giving input prior to making revisions, reviewing a draft revised chapter, and considering comments on the public review draft of

Amendment 1. In addition, the Advisory Committee and Board received and commented on the PMA chapter. In general, the priority of projects between 2020 and 2022 stayed the same.

Amendment 1 makes the following types of updates: accounting for actions taken following GSP submittal, updating descriptions based on further refinement and needed clarifications, and separating demand planning from funding. It also added Implementation Actions that contribute to groundwater management and GSP implementation but do not directly help the Subbasin reach or maintain sustainability. These Implementation Actions are discussed further in Sections 7 and 8.

The category of "Alternative Projects" was taken out in Amendment 1. Instead, projects that occur in or address groundwater conditions in adjacent subbasins were separated into a new category called Cross Boundary projects, if they would have positive groundwater benefits for the 180/400 Subbasin. New projects were added through the development of GSPs in adjacent subbasins.

Table 3-1 summarizes the updates to 2020 GSP PMAs in GSP Amendment 1. The italicized rows represent Cross Boundary projects.

Table 3-1. Summary of Amendment 1 Projects and Management Action Updates, Modifications or Additions

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
P1	Invasive Species Eradication	P1	Multi-benefit Stream Channel Improvements	Amendment 1 revised project to P1: Multi-benefit Stream Channel Improvements. The project has been widened from the Invasive Species Eradication project in the 2020 GSP to combine complementary and overlapping programs into 1 project. It includes the invasive species eradication work that was in the 2020 GSP, plus the Stream Maintenance Program and floodplain restoration for a more holistic project. This program takes a 3-pronged approach to stream channel improvements. First, it addresses vegetation growth and geomorphic conditions in the river channel by removing perennial native and non-native vegetation in designated maintenance channels (and removing Arundo donax (arundo) and Tamarix sp. (tamarisk) throughout the river corridor. Second, the program reduces the height of sediment bars that have been identified to meet criteria for impeding flow. Third, it enhances floodplains to increase groundwater recharge.
P2	Optimize CSIP Operations	P2	CSIP Optimization	The CSIP system is owned by the MCWRA and operated by M1W by agreement with MCWRA. MCWRA and M1W are continuing to evaluate opportunities to optimize the CSIP distribution system. The 2020 GSP identified the following approach for general activities under CSIP system optimization: 1) hydraulic modeling, 2) irrigation/scheduling system development, 3) how to add water storage, and 4) distribution system pipe upgrades. Amendment 1 added 2 activities: the installation of remote monitoring units and how to add new source water. It also moved/consolidated the "Maximize Existing SRDF Diversion" project as an activity under CSIP Optimization.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
P3	Modify M1W Recycled Water Plant	P3	Modify M1W Recycled Water Plant	The 2020 GSP identified that modifications are required at the Monterey One Water (M1W) Regional Treatment Plant to efficiently treat and deliver recycled water during the wet weather months. Under the M1W Recycled Water Plant Modifications Project, the SVRP will be improved to allow delivery of tertiary treated wastewater to the CSIP system when recycled water demand is less than 5 million gallons per day (mgd). In Amendment 1, this was further refined to identify that the project consists of 2 parts: upgrading the chlorine scrubbers to minimize the winter maintenance shutdown and improving the Reclamation Plant to allow delivery of tertiary treated wastewater to CSIP when water demand is less than 5 mgd. Improvements to the SVRP include minor modifications to the chlorine contact basins and construction of a new conveyance pipeline to the distribution system.
P4	Expand Area Served by CSIP	P4	CSIP Expansion	Amendment 1 clarifies the 2020 GSP project that existing CSIP supplies may not be sufficient to meet the summertime demand of an expanded CSIP area without an increase in water supply from the SRDF or another source. New water sources other than river water will require additional project costs. If additional water supply sources are available in the summer, an expanded service area could deliver summer irrigation water. The CSIP Optimization Project must be implemented prior to CSIP Expansion due to existing system constraints.
P5	Maximize Existing SRDF Diversion	P2	CSIP Optimization	Dependent on CSIP optimization; moved/consolidated into P2 CSIP Optimization.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
P6	Seawater Intrusion Pumping Barrier	P5	Seawater Intrusion Extraction Barrier	Amendment 1 refines the GSP project concept to add that extracted water could be conveyed to a new or existing desalting facility where it could be treated for direct use, such as the Regional Municipal Supply Project (P6). The water extracted from these wells will be brackish due to historical seawater intrusion. It states that feasibility studies will evaluate the best location for extraction barrier wells and the associated benefits.
P7	*11043 Diversion Facilities Phase I: Chualar*	*R2*	*11043 Diversion Facilities at Chualar*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. It primarily benefits the Eastside Subbasin but may have groundwater benefits for the 180/400 Subbasin. The scoping progressed with the development of Project B1 of the Eastside Subbasin GSP.*
P8	*11043 Diversion Facilities Phase II: Soledad*	*R3*	*11043 Diversion Facilities at Soledad*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. It primarily benefits the Eastside Subbasin but may have groundwater benefits for the 180/400 Subbasin. The scoping progressed with the development of Project B2 of the Eastside Subbasin GSP.*

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
P9	SRDF Winter Flow Injection	P7	Seasonal Release with ASR	Amendment 1 updates the SRDF Winter Flow Injection Project based on further discussions with MCWRA and interested parties' input. A reservoir reoperation feasibility study could be paired with this project. The project concept modifies reservoir releases for the MCWRA's Conservation Program and SRDF re-diversions to store at least a portion of these releases during wet seasons in the 180-Foot and 400-Foot Aquifers. Water released during the wet season from Nacimiento and San Antonio Reservoirs would be diverted from the Salinas River using the existing SRDF at a maximum flow rate of 36 cfs. Water would then be pumped to a surface water treatment plant where it would be treated to the standard necessary for groundwater injection and conveyed to new injection wells in the 180/400 Subbasin. In addition to direct injection for groundwater recharge, seasonal releases could be used for direct delivery for municipal supply.
Alt P1	Desalt Water from the Seawater Barrier Extraction Wells	P6	Regional Municipal Supply Project	Amendment 1 updates the 2020 GSP to clarify that this is not a stand-alone project but could be a potential supplemental project to the seawater intrusion extraction barrier project. This project would construct a regional desalting plant to treat the brackish water extracted from the proposed seawater intrusion extraction barrier. It would deliver water for direct potable use to municipal systems in the 180/400 Subbasin and other subbasins within Salinas Valley. This project provides in lieu recharge to the groundwater system through reduced extraction by municipal systems. If the plant produced more water than could be used for direct potable use, excess water could be used for irrigation or reinjected into the 180-Foot or 400-Foot Aquifer. The water would be available year-round.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
Alt P2	*Recharge Local Runoff from Eastside Range*	*R1*	*Eastside Floodplain Enhancement and Recharge*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. It primarily benefits the Eastside Subbasin but may have groundwater benefits for the 180/400 Subbasin. The scoping progressed with the development of Project A2 of the Eastside Subbasin GSP.*
-	*Not included in 2020*	*M1*	*MCWD Demand Management Measures*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. It primarily benefits the Monterey Subbasin through potable demand reductions.*
-	*Not included in 2020*	*M2*	*Stormwater Recharge Management*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. It primarily benefits the Monterey Subbasin through policies that will facilitate additional stormwater catchment and infiltration beyond existing efforts as development and redevelopment occurs, providing recharge to the groundwater basin.*

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
Alt P3	*Winter Potable Reuse Water Injection*	*M3*	*Recycled Water Reuse Through Landscape Irrigation and Indirect Potable Reuse*	*This project is moved under the Cross Boundary Project category of projects outside the Subbasin that likely would have indirect benefits for the 180/400 Subbasin or reduce the need for other projects and management actions. This MCWD GSA Project consists of recycled water reuse through landscape irrigation and/or indirect potable reuse (IPR) within MCWD's service area. As described below, the source water for both of these options is recycled water from the M1W Regional Treatment Plant (RTP), which would undergo advanced treatment to meet criteria under Title 22 of the California Code Regulations (CCR) for subsurface applications of recycled water. Advanced treated recycled water is non-potable. Reuse of this water through IPR involves injection into a groundwater aquifer and recovery through an appropriately permitted Groundwater Replenishment Reuse Project (GRRP), which provides seasonal storage and generates potable water that can meet a larger portion of MCWD's water demand beyond irrigation and non-potable needs.*
Alt P4	Use the Southern Portion of the 180/400 Subbasin for Seasonal Storage	P8	Irrigation Water Supply Project (or Somavia Road Project)	Amendment 1 updates the project name and revises the project concept similar to Eastside Irrigation Water Supply Project (Somavia Road) in the 2022 Eastside Subbasin GSP. Both projects rely on extracting the same source water but distribute it to different locations, so 1 project would need to be selected or source water split between the 2 projects.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
-	*Not included in 2020*	*C1*	*Corral de Tierra Pumping Allocation and Control*	*Amendment 1 adds this Cross Boundary Project. While it primarily benefits the Corral de Tierra, the management action may have groundwater benefits for the 180/400 Subbasin. This, or other types of demand management, would focus on reducing pumping. It could take many forms and be developed based on various criteria.*
OTHER	*Water Charges Framework*	MA1	Demand Planning (funding moved to Ch 10)	The 2020 GSP proposed a Water Charges Framework for the Salinas Valley. Amendment 1 widens the management action to Demand Planning to include other types of demand planning. It separates demand planning from the funding mechanism, so as to not preclude options. Demand planning includes, but is not limited to, pumping allocations, pumping controls, and pumping reductions. It is included in the GSP to show that there are options that can be developed; however, further action is needed to establish pumping allocations nor pumping controls. A full stakeholder engagement process and in-depth analysis needs to be undertaken to assess demand planning options and implement actions. Stakeholder engagement will include outreach to water systems, homeowners, and landowners so that those interested can participate in the development of demand planning.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
MA1	Agricultural Land and Pumping Allowance Retirement	MA2	Fallowing, Fallow Bank, and Agricultural Land Retirement	Revised such that it could be undertaken with or without pumping allocations. To reduce groundwater extraction temporarily or permanently, this management action includes 3 actions that could be implemented on an as-needed basis to reduce irrigated land. These actions provide options for voluntary fallowing and land retirement that can be targeted to specific locations that have declining groundwater elevations or recharge potential, such as floodplains. Water quality and access to drinking water wells will also be considered when deciding where to incentivize fallowing or land retirement.
MA2	Outreach and Education for Agricultural BMPs	MA3	Conservation and Agricultural BMPs	BMPs are being developed as part of Ag Order 4.0. SVBGSA will work to complement and not replicate those efforts. Potential practices that will be part of a program include: 1) ET Data - The incorporation of ET data with soil moisture sensors, soil nutrient data, and flow meter data can help inform more efficient irrigation practices. The GSA could support the development and utilization of these tools through securing funding or coordinating with existing local agricultural extension specialists who conduct research and provide technical assistance to growers. 2) Education and Outreach -. SVBGSA will support existing local agricultural extension specialists with their education and outreach on BMPs that would increase water conservation and decrease pumping.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
MA3	Reservoir Reoperation	MA4	Reservoir Reoperation	Amendment 1 includes an updated version of the Reservoir Reoperation management action that was in the 2020 GSP based on further interested parties discussions. Requires collaboration with MCWRA and other interested parties to evaluate potential reoperation scenarios that promote sustainability while operating within the committed purposes of existing infrastructure. Analysis of reservoir reoperation would consider other beneficial users dependent on reservoir flows, such as steelhead trout and users in other subbasins. Focus is on reoperation of the Nacimiento and San Antonio Reservoirs that would prevent or reduce the curtailment of reservoir releases in consecutive years. Includes a feasibility study by working with MCWRA to simulate reservoir operations and groundwater-surface water interactions along the Salinas River. These projects will affect the entire Salinas Valley, and the analyses of these projects must consider the impact on all subbasins. Reservoir reoperation is a management action to help maintain groundwater sustainability along the Salinas River, including some portion that augments groundwater in the 180/400 Subbasin. Details of this management action are dependent on the outcome and progress of other activities, including the Habitat Conservation Plan (HCP) that is under development by MCWRA. It could be paired with potential capital projects that are within the sustainability horizon of the GSP. New source of dedicated funding would be required.
MA4	Restrict Pumping in CSIP Area	MA1	Demand Planning	Moved under MA1 - Demand Planning. Some projects included in Amendment 1 are designed to ensure a reliable, year-round supply of water to growers in the CSIP area. These projects will reduce need for groundwater pumping in the CSIP area. To promote use of CSIP water, an ordinance could be adopted preventing any pumping for irrigating agricultural lands served by CSIP. MCWRA already has some restrictions in place that need to be reviewed.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
MA5	Support and Strengthen Monterey County Restrictions on Additional Wells in the Deep Aquifers	MA5	Undertake and Operationalize Guidance from Deep Aquifers Study	The need for additional studies about the Deep Aquifers has been identified in the context of stopping seawater intrusion and effectively managing groundwater sustainability. 2020 GSP called for the SVBGSA to support Monterey County reimposing a prohibition on drilling any new wells into the Deep Aquifers until more information is known about the Deep Aquifers' sustainable yield. However, in 2020 the County's interim ordinance expired. The Seawater Intrusion Working Group (SWIG) supported the development of an RFP and scope of work for the Deep Aquifers Study. The Deep Aquifers Study was planned for in 2021, funded in 2022, and completed in April 2024. The Deep Aquifers Study describes the geology, hydrogeology, and extents of the Deep Aquifers; develops a water budget; and includes guidance on management issues and recommendations for monitoring. Since completion of the Study, agencies have been meeting as the Deep Aquifers Agency Working Group to determine how to operationalize guidance from the Study.
MA6	Seawater Intrusion Working Group (SWIG)	-	Completed; not included in Amendment 1	This group was established to develop consensus on the current understanding of seawater intrusion in the Subbasin and adjacent subbasins subject to seawater intrusion, identify data gaps, and develop a broad-based plan for controlling seawater intrusion. In 2022, SVBGSA Board of Directors transitioned the responsibilities of the SWIG and Integrated Implementation Committee to the existing Advisory Committee, and the responsibilities of the SWIG Technical Advisory Committee to a new, broader Groundwater Technical Advisory Committee. Moved to Completed Actions.

2020 GSP Priority #	2020 GSP Project or Management Action	Amendment 1 #	Amendment 1 GSP Project or Management Action	Summary of Amendment 1 Updates
-	Not included in 2020	MA6	MCWRA Drought Reoperation	In 2020, MCWRA formed a drought operations technical advisory committee (D-TAC) to develop standards and guiding principles for managing the operations of Nacimiento and San Antonio reservoirs during multi-year drought periods. In February 2021, MCWRA adopted the D-TAC recommended standards and guiding principles for drought operations. The D-TAC will meet any time a drought trigger occurs to develop a recommended release schedule for Nacimiento and San Antonio Reservoirs.

Italics – GSP Amendment 1 Cross Boundary Project

3.3 Project and Management Actions Activities

The following is a summary of activities and work performed on PMAs during the 5-year evaluation period.

3.3.1 P1 Multi-benefit Stream Channel Improvements

Multi-benefit Stream Channel Improvement components apply across the 180/400, Monterey, Forebay Aquifer, and Upper Valley Aquifer subbasins along the entire length of the Salinas River in Monterey County. Updates on the work completed are for the Program as a whole, and not by subbasin.

- Component 1: Salinas River Stream Maintenance Program (SMP) – The SMP, led by the Resource Conservation District of Monterey County (RCDMC), continues to coordinate with project partners to maintain the river corridor to reduce flood risk and minimize bank and levee erosion, while maintaining and improving ecological conditions for fish and wildlife consistent with other priorities for the Salinas River. Building on 88 acres of arundo removed between 2014 and 2018, there were 32.64 acres removed for the SMP from 2019 to 2024.

  FlowWest developed a hydraulic model (Salinas River HEC-RAS) to inform the original design of the SMP in 2015. In 2024, FlowWest updated the HEC-RAS model to 2023 topography and 2024 statistical hydrology. Stream flow gage records were analyzed for their variability and accuracy of prediction of flows, which relates to channel capacity. Channel capacity and the stage of water in secondary channels are datasets that inform the potential for groundwater recharge. A sample of hydraulic model outputs from HEC-RAS was used to assess the potential for coupling or otherwise integrating the HEC-RAS model with groundwater models and analysis to assess the potential groundwater benefit from vegetation removal and sediment management.

- Component 2: Invasive Species Eradication – The RCDMC grant-funded Arundo Control Program initiated treatment of 448 acres of arundo between 2014 and 2018, and another 489 acres between 2019 and the start of 2024. Initially treated arundo is re-treated every 1-5 years. Approximately 733 acres were retreated. Untreated arundo continues to expand and a new estimate of remaining arundo in the river is underway.

  The RCDMC conducted a study to estimate water savings from arundo removal, also considering the replacement vegetation that grows in treated arundo stands (Zefferman and Barker 2024). The study calculates the approximate water savings via a reduction in consumptive use of 21.1 (+/- 3.0) inches or 1.76 (+/- 0.25) feet of water per year over the treated area based on the average difference in ET between untreated arundo and herbaceous vegetation. For the Salinas River Arundo Eradication Program as a whole, 1,054.4 acres of arundo have been treated since 2014. The cumulative water savings is estimated at 1,855.7 (+/- 263.6) AF/yr that is from both groundwater and surface water sources. Over time, these water savings may diminish as some former arundo stands develop later-successional vegetation like large willows and cottonwoods.

- Component 3: Floodplain Enhancement and Recharge – Recharge potential is being studied by under the Multi-benefit Land Repurposing Grant (MLRP) and conducted by researchers from U.C. Davis.

The SMP and Arundo Control programs and activities are funded by multiple sources. The SMP program is primarily funded by landowners, who pay for all of the on-the-ground vegetation and sediment management activities and some of the administration and permit compliance costs. Administration and permit compliance are also funded by grants from DWR's Integrated Regional Water Management Program, MCWRA, and SVBGSA regulatory fees.

The Arundo Control program has been funded mostly by state and federal grants from several agencies, including the California Wildlife Conservation Board, USDA NRCS Regional Conservation Partnership Program, California Department of Food and Agriculture's Noxious Weed Program, DWR's Integrated Regional Water Management Program, and US Bureau of Reclamation. Local funding has come from the Monterey County Agricultural Commissioner, private landowner contributions and contracts, and mitigation fees. Ongoing funding requirements and reliance on grants pose a challenge for long-term implementation.

The RCDMC tracks changes in the plant communities in areas where arundo has been controlled to determine the efficacy of arundo treatments and the progress of natural revegetation. In the next evaluation period, additional work under the SMP will depend on landowner interest, and continued arundo removal will depend on the ability to secure additional funding. The permits to comply with the Federal and State Clean Water Acts and the California Department of Fish and Wildlife Routine Maintenance Agreement will need to be renewed, in addition to the approval of the Annual Work Plans for the SMP.

3.3.2 P2 CSIP Optimization

The P2 CSIP Optimization Program includes CSIP, SVRP, and the SRDF. Its purpose is to slow seawater intrusion in the 180/400 Subbasin through the delivery of alternative water supplies for irrigation within the CSIP service area in lieu of groundwater pumping. SVRP recycles wastewater for agricultural use, and SRDF rediverts stored water from MCWRA's Nacimiento and San Antonio Reservoirs to further augment the CSIP alternative water supplies. CSIP also includes supplemental wells as a source of supply and provides groundwater when the SVRP and/or SRDF re-diversions are unavailable, meet high/increased demand, and increase system pressure as part of the distribution system design.

The CSIP system is operated and maintained by M1W under a contract with MCWRA. During the evaluation period, MCWRA and M1W undertook several activities to address existing CSIP system constraints and to identify infrastructure and operational improvements needed to optimize the CSIP Program. These activities are intended to better accommodate diurnal and seasonal fluctuation in irrigation demand, to maximize use of water supplied from the SVRP and SRDF, and to reduce the need for groundwater pumping from the CSIP supplemental wells. Amendment 1 updated these activities and moved and consolidated the 2020 GSP project concept to maximize existing SRDF diversion under CSIP optimization.

During the evaluation period, MCWRA and M1W made progress on several activities. SVBGSA has partially supported these activities through a subgrant agreement with MCWRA from the Round 1 SGM Implementation Grant for the 180/400 Subbasin, augmenting funding from MCWRA's revenue coming from assessments, fees, and charges for the CSIP Program. This work has included the following:

- <u>CSIP Pipeline Pressure Verification Project</u>: Installation of remote pressure monitoring devices to fill data gaps for pressure in the CSIP System to assist in the Dynamic Hydraulic Modeling Project, continuously collecting data to improve model calibration and model results. MCWRA has also been rebuilding and recalibrating flow meters at the turnouts with the goal to improve accuracy on water usage and volumes for the remote monitoring units.
- <u>Dynamic Hydraulic Modeling Project</u>: MCWRA developed a dynamic hydraulic model of the CSIP Program, focusing on SVRP production, system storage, CSIP distribution system conveyance capacity (pressure and flows throughout the system), and current irrigation flow demands to inform the programming and control narrative for safe, efficient operations of the system and appropriate demand limits throughout the system to inform the development of a water scheduling system and other needed improvements.
- <u>Development of a Water Scheduling System</u>: M1W has been developing water scheduling system to provide MCWRA and M1W the ability to schedule water orders from CSIP irrigators to use recycled water based on the results of the dynamic hydraulic modeling. The scheduling system will be integrated with the hydraulic model in the next evaluation period and used to conduct ongoing monitoring to ensure that CSIP irrigators use recycled water as ordered and to manage the CSIP system proactively and adaptively. The scheduling system development has beta tested by members of the Water Quality and Operations Committee, as well as through additional outreach to CSIP irrigators.
- <u>Booster Station Enhancements</u>: There are 3 booster stations located in the CSIP distribution system that were designed to provide increased pressure during low pressure situations in the system as well as aid in circulating water to the far end lines of the system during high demand usage. M1W and MCWRA have been implementing performance enhancements on the Molera, Lapis, and Espinosa booster stations to allow

more variability and control of the station pressure output and flow, equalizing the pressure needed. The booster pump enhancements will provide increased pressure in the system at critical low-pressure areas, which then decreases the need to turn on groundwater wells.

Building from this work, MCWRA has now proposed a CSIP Program Water Master Plan (WMP) to further define and guide CSIP optimization projects and funding requirements to implement them in the future. The WMP may include a budget and financing program, technical elements, implementation plan schedules, data compilation and data analysis, and definition of facility needs and alternatives. Expected outcomes are to understand current and future water system needs, strategically invest resources, and plan for infrastructure improvements. It will help to adopt sustainable financing strategies, prioritize Capital Improvement Program (CIP) projects, and identify a sustainable financial program.

MCWRA is currently soliciting proposals for consultant support to prepare the WMP and plans to initiate this effort in the first half of 2025. MCWRA staff estimate 12-18 months for WMP completion; however, a better schedule will be known upon receipt of proposals.

3.3.3 P3 Modify M1W Recycled Water Plant – Winter Modifications

The Winter Modifications project consists of 2 parts: upgrading the chlorine scrubbers to minimize the winter maintenance shutdown and improving the Reclamation Plant to allow delivery of tertiary treated wastewater to CSIP when water demand is less than 5 million gallons per day (mgd).

In June 2024, M1W completed the upgrade to chlorine scrubbers, installing a new dry scrubber system to reduce annual maintenance requirements. This project was completed with funding from the Round 1 SGM Implementation Grant through a subgrant agreement with MCWRA.

Additional SVRP improvements to allow winter delivery of tertiary treated wastewater to the CSIP distribution system will continue to be considered during the next evaluation period, pending funding availability. This project could be considered in the CSIP Program WMP and further evaluated and prioritized among other needed improvements.

3.3.4 P4 CSIP Expansion

As stated in Amendment 1, because of system constraints, the CSIP Optimization Project must be implemented prior to CSIP expansion. During the next evaluation period, SVBGSA will work with MCWRA to conduct a feasibility study to further evaluate CSIP expansion. Funding for a preliminary feasibility study is available in SVBGSA's Round 2 SGM Implementation Grant due to the potential for CSIP expansion to also serve the Eastside and Langley Subbasins.

Considerations for CSIP expansion include identification of potential source waters, the potential service area, how it would relate to the existing CSIP system, and other policy issues.

3.3.5 Brackish Groundwater Restoration Project (P5 - Seawater Intrusion Extraction Barrier/P6 Regional Municipal Supply Project)

SVBGSA is working with Carollo Engineers (Carollo) and M&A to prepare a feasibility study for these 2 projects, with funding from the Round 1 SGM Implementation Grant. The current approach is moving forward as a single project with a revised project name, the Brackish Groundwater Restoration Project. The concept for this project is to establish a line of extraction wells across the aquifer roughly parallel to the coast to form an extraction barrier and capture seawater on the coastal side of the wells while starting to pull back intruded groundwater from the inland side of the wells. This extracted brackish groundwater would then be treated through reverse osmosis to remove salts and create a supply that meets potable water standards. The treated water would be distributed inland to offset groundwater users for both domestic and agricultural customers. The extraction wells and treatment would be run at a steady flow rate to prevent seawater intrusion from leaking past the wells. This would result in times—particularly winter months—where more treated water is available than user demands. This excess treated water would be injected back into the groundwater basin inland along the edge of the seawater intrusion front to assist in raising groundwater levels to push the intruded zone back toward the coast. The injection of high-quality water would also improve groundwater quality.

The project concept was developed over the course of many months with SVBGSA, Carollo, and the M&A groundwater modeling team working closely together to model the project's effects on addressing seawater intrusion, chronically low groundwater levels, and overdraft conditions. The feasibility study includes 3 alternatives for a small-, medium-, and large-scale project. The small project would extract 39,700 AF/yr of brackish water and produce 28,000 AF/yr of treated water. The medium project would extract 66,900 AF/yr of brackish water and produce 46,900 AF/yr of treated water. The medium project would extract 96,800 AF/yr of brackish water and produce 64,900 AF/yr of treated water.

These alternatives were developed through an iterative process to assess viability and performance of different configurations of extraction wells, groundwater user offsets, and injection wells. Optimal extraction well configurations were determined by trying to strike a balance between avoiding coastal environmental resources and floodplains, while not placing the wells too far inland. Potential end users and locations for deliveries were identified through review of groundwater extraction, water use records, and personal communication with utility representatives. The strategy of adding injection wells was evaluated by modeling configurations with and without the injection wells. The finding from the modeling runs was that injection wells augment the overall effectiveness of the project.

Project cost estimates for the small, medium, and large alternatives are more than substantial, from $720M, $1B, or $1.48B. The annualized unit cost for each alternative is less than $3,000 AF/yr, which is comparable to many of the recycled water projects being implemented across California to provide a drought proof, reliable source of potable water. While this cost is much greater than the existing cost to pump groundwater, as shown by the historical problems in the region, it is not sustainable to continue the current pumping practices. The regional benefits provided by this project would allow the spreading of costs out to a broader area rather than only charging the specific end users of the new water supply. In the next evaluation period, SVBGSA will investigate ways to cost share for implementation of regional projects.

The feasibility study is planned to be completed in the first quarter of 2025, concurrent with the submittal of the GSP 2025 Evaluation. A summary memo of the project is included as Appendix 4A. The preliminary feasibility study findings will be included in a project update report (discussed below), as well as preliminary feasibility of demand management, to help guide decision making on the next phase of GSP PMA implementation. Should SVBGSA decide to move forward with the Brackish Groundwater Restoration Project, the following steps will be necessary to implement the project (listed in no specific order):

- Continue to position for grant funding for planning, design, environmental, and construction costs.
- Line up end users, regional support, and agreements for participation, funding, ownership, and operation of project.
- Develop financial plan and rate study.
- Design and construct the recommended alternative.
- Obtain permits and clearances from applicable regulatory agencies (CCRWQCB, SWRCB, State and Federal Agencies).
- Conduct environmental process (California Environmental Quality Act [CEQA] and National Environmental Policy Act [NEPA] compliance and compliance documents).

To inform implementation, there are 3 areas that would benefit from additional research prior to design/environmental analysis/construction: 1) a reverse osmosis pilot to determine effectiveness and required treatment configuration, 2) additional groundwater quality data, and 3) an injection well pilot.

This project has the potential to address seawater intrusion and raise groundwater levels in multiple subbasins, including Eastside and Monterey. In the next year, SVBGSA has funding to continue to assess feasibility with preliminary distribution system design and preparation of a CEQA Initial Study in its Round 2 SGM Implementation Grant.

3.3.6 P7 Seasonal Release with ASR

With Round 1 SGM Implementation Grant funding, SVBGSA and M&A are preparing a preliminary feasibility analysis of this project. As conceptualized in the 2022 GSP Amendment 1, the Seasonal Release with ASR project would be achieved through 2 separate but related processes. First, conservation releases from MCWRA Nacimiento and San Antonio Dams would be shifted to the winter and spring. These releases would recharge groundwater along the Salinas River and be rediverted at the SRDF. Second, the rediverted reservoir water would be injected into the 180-Foot and 400-Foot Aquifers for storage and later use. Injected water would help increase groundwater levels, improve water quality, and prevent further seawater intrusion.

The GSP project concept was designed to use existing water rights and facilities to the extent practical. Therefore, the purpose of the current study has been to complete a conceptual analysis that evaluates the feasibility of ASR to meet GSP sustainability goals, and to uncover any potential constraints in the existing reservoir and CSIP distribution system with respect to the project concept. To that end, SVBGSA and MCWRA, as well as M1W, held focused meetings on the existing systems and operations of the reservoirs and re-diversion under MCWRA's water right licenses for these facilities, and considered the feasibility of and constraints to the GSP project concept. In addition, the preliminary, grant-funded study reviews MCWRA's water rights and opportunity to use existing permits or licenses for the project concept and summarizes other project permitting considerations. The study also includes an analysis of existing and readily available Salinas River water quality data and the development of a water sampling plan that would need to be implemented in subsequent phases of feasibility to fill data gaps and support the analysis for treatment design. Finally, groundwater modeling was conducted to evaluate the project's ability to address seawater intrusion and raise groundwater levels. It is planned to be completed in early 2025, concurrent with the submittal of the GSP 2025 Evaluation.

Key findings of the initial feasibility analyses include:

- Winter reservoir releases are challenging primarily due to the need to respond to uncertain reservoir inflows while trying to prevent flooding and maintain as much water in storage for later in the year as possible, to meet all supply demands and environmental requirements.
- Existing CSIP and SRDF infrastructure upgrades would be required, and operation of the SRDF with high winter flows would have operational challenges.
- Diverted water would need to be treated to Title 22 drinking water standards before injection.
- New infrastructure required to supplement the existing system includes conveyance from SRDF to storage, storage facilities, water treatment plant, distribution pipelines to ASR wells, ASR wells, and distribution of extracted water to CSIP system.

- Groundwater modeling shows this project concept would not achieve the goal of meeting the minimum threshold for seawater intrusion defined in the GSP.

Based on the constraints identified for the GSP project concept, Alternatives 1 and 1A were developed as an approach to use a parallel system to the current SRDF/CSIP system that avoid constraints and allow more flexibility in ASR operations. With these alternatives, normal reservoir operations would continue from April to October in support of the conservation program and SRDF operations. The ASR system would be developed with a separate diversion facility to divert surface water for injection, likely using a radial well collector screened in the alluvium under the river. Modification of an existing Salinas River water right or a new water right would be required to use other available watershed flows for this diversion. These alternatives address concerns with operating the SRDF during the winter, and not supplying CSIP with surface water during the peak growing season. Alternative 1A is essentially the same as Alternative 1, except the injection occurs only in the 400-Foot Aquifer. Groundwater modeling shows that Alternative 1 does not meet the seawater intrusion minimum thresholds. Alternative 1A comes close to meeting the minimum threshold in the 400-Foot Aquifer by 2070.

Work conducted at this stage does not include any facility siting or engineering design. The GSP project concept cost estimate was updated based on the preliminary feasibility analysis, with a capital cost of $333,420,000 and total annualized cost of $33,133,400. Alternative 1 has an estimated capital cost of $231,800,000 (assumes only 1 radial well collector at $18,900,000) and total annualized cost of $21,862,700.

As noted in the GSP, reservoir reoperations resulting from the Reservoir Reoperation Management Action feasibility study could be paired with this project in a future study. Any reservoir reoperation would affect the entire Salinas River, and therefore analyses and decisions regarding reservoir reoperation must consider the impact on all Salinas Valley subbasins. Work planned under this PMA title is discussed below in Section 3.3.11.

3.3.7 P8 Irrigation Water Supply Project (or Somavia Road Project)

The Irrigation Water Supply Project at Somavia Road informs the 180/400 Subbasin Irrigation Water Supply Project and other projects described in the Eastside Subbasin GSP. The Salinas River Recharge project assesses Salinas River recharge around Somavia Road, an area where the Salinas Valley Aquitard is less prominent. Potential projects could potentially use extraction wells to increase aquifer recharge from the Salinas River to some of the more productive aquifer zones and supply irrigation water for delivery in the summer.

In summer 2024, SVBGSA initiated feasibility work for this project. The goal of the analysis is to characterize the spatial distribution and timing of Salinas River losses to the groundwater system using multiple lines of reasoning, including reach-scale gaging, point-specific riverbed flux measurement methods, and analysis of historical streamflow records and reservoir release data. Balance Hydrologics is completing field studies that began in fall 2024. They have completed 2 dry-season baseflow synoptic flow surveys, installed 1 temporary gaging station, and installed piezometers and shallow temperature probes to estimate recharge rates. The study will be conducted through 2025.

Once the recharge analysis is completed, the findings will be included in a sustainability strategy report which will summarize updated information on PMAs and refine estimates of project costs and groundwater impacts.

3.3.8 MA1 Demand Planning

GSP Amendment 1 added a new management action for demand planning to determine how extraction should be regulated and controlled, if needed. With funding from the Round 1 SGM Implementation Grant, SVBGSA contracted with Mr. David Ceppos of the California State University Sacramento Consensus and Collaboration Program (CCP) to complete a Situation Assessment in late 2022 and early 2023. This assessment was intended to gage understanding and readiness for demand management policy or program development.

The overarching finding of the 2022/2023 assessment was that it was premature to pursue a formal Demand Management Policy because of diverse and periodically inaccurate perspectives about what demand management is, and the associated social and economic concerns that these discrepancies raised. The concern was that immediate political actions by the SVBGSA Board would exacerbate regional tension about the topic. Therefore, the further recommendation was that rather than action on a Valley-wide policy, instead SVBGSA should sponsor a comprehensive, stakeholder-based Demand Management Dialogue Process to engage interested parties in the Valley in a meaningful, transparent, focused, and time limited collaborative process. The purpose of this approach was to inform the broad community of interested parties about the range of demand management options available as a means to reframe the regional discussion. SVBGSA has since followed this recommendation as described below.

In the spring of 2024, SVBGSA held 5 community workshops titled - *Our Water Future in the Salinas Valley: Planning for Uncertainty.* The workshops were held across the Salinas Valley and provided an opportunity for dialogue about the following:

- The future of water availability and protection in the Salinas Valley
- Local water management responsibilities and partnerships
- Ongoing efforts on water use efficiency
- Management tools for urban and agricultural water users in times of uncertainty
- Methods for water demand management and regulation

The workshops—which offered Spanish interpretation—provided valuable information about how water is managed in the Valley, the steps residents and businesses have taken toward more efficient water use, and the wide range of options to consider in minimizing water waste, improving efficiencies, and reallocating resources to ensure continued availability of water for the Salinas Valley. Materials from these workshops are available on SVBGSA's website here: https://svbgsa.org/demand-management-workshops/

Similarly consistent with the adopted recommendations, the SVBGSA commenced more subbasin-specific, demand planning discussions with beneficial users in fall 2024with the 180/400 Committee, as well as with the Eastside and Monterey Committees. The committees for the other SVBGSA subbasins will follow in 2025. Recognizing the geographic scale and governance complexity of the Salinas Valley, the process has been designed to implement in phases and with opportunities for the SVBGSA Board to evaluate how the process is going and determine if any modifications are necessary.

SVBGSA has contracted with Minasian Law, LLP, to prepare a legal analysis for demand management measures. That work is underway and is intended to be a resource for evaluating the feasibility of implementing various demand management measures. It is being prepared with input from legal counsel for the other partner GSAs and agencies with local authorities (County of Monterey and MCWRA).

In August 2024, the SVBGSA added another component to this workstream by executing a contract with ERA Economics to conduct an economic analysis of demand management options. The economic analysis similarly is planned to be done not only for the 180/400 Subbasin but in all other subbasins, concurrent with the planning work described above. The work is being funded by both Round 1 and Round 2 SGM Implementation Grants.

In the next evaluation period, SVBGSA will continue demand planning and program development to determine subbasin, regional, or Valley-wide mechanisms to reduce groundwater use. In addition to necessary interested party engagement, work will include using both groundwater and economic models to evaluate methods, options, and costs; addressing economic, legal, and policy considerations; and creating work plans for implementation of preferred approaches to demand management.

3.3.9 MA2 Fallowing, Fallow Bank, and Agricultural Land Retirement

At this time, SVBGSA is considering this management action as part of the demand planning and MLRP programs.

3.3.10 MA3 Conservation and Agricultural Best Management Practices (BMPs)

MCWRA has been tracking agricultural irrigation efficiency and use of BMPs since 1995. Agriculture Water Conservation Plans (AWCP) track conservation measures implemented each year, as well as the irrigation methods used for each crop type. MCWRA issued a report in 2021 summarizing the past 25 years of groundwater extraction reporting. The report indicates that agricultural water efficiency across the reporting area in the Salinas Valley has improved over the period of record, with all areas applying less than 2.5 acre-feet/acre on all crops. Also, over the past 25 years, 85% of reported irrigated acres use automatic time clocks on pumps and/or pressure switches on booster pumps and many others use a range of practices from leakage reduction, off-wind irrigation, pre-irrigation reduction, and others.

SVBGSA's focus is to support existing extension efforts for implementing agricultural BMPs for irrigation efficiency through the development of the Central Coast Ag Water Efficiency Website (CCAWE). CCAWE is being created with the University of California Cooperative Extension, Pajaro Valley Water Management Agency, SVBGSA, and the Resource Conservation Districts of Santa Cruz and Monterey Counties. The goal of CCAWE is to provide a Central Coast specific resource for irrigation efficiency information and tools that are easily accessible. In the next evaluation period, CCAWE will be made public, use and impact will be tracked and the content will be updated and managed by irrigation management specialists.

3.3.11 MA4 Reservoir Reoperation

SVBGSA is planning to further evaluate the Reservoir Reoperation management action in a feasibility study. This work is planned to be done in 2025 with funding from SVBGSA's Round 2 SGM Implementation Grant. The feasibility study will design and model reservoir reoperation scenarios for enhanced groundwater recharge and/or to help meet GSP interconnected surface water SMC goals. This high-level feasibility study will be conducted in collaboration with MCWRA, ASGSA, and other interested parties to simulate reservoir operations and groundwater surface water interactions along the Salinas River. The updated SVOM will be used to build on MCWRA's work to develop a Habitat Conservation Plan (HCP) and incorporate other Salinas Valley groundwater projects as needed. For example, the scenarios could modify reservoir reoperations in response to projects that shift the seasonality of reservoir releases for ASR. Reservoir reoperation scenarios will be developed in collaboration with MCWRA, and modeled scenarios will be evaluated for groundwater benefits and to better assess stream depletion. In the next evaluation period, CCAWE will be made public, use and impact will be tracked, and the content will be updated and managed by irrigation management specialists.

3.3.12 MA5 Undertake and Operationalize Guidance from Deep Aquifers Study

The need for additional study of the Deep Aquifers was identified in the context of stopping seawater intrusion and effectively managing groundwater sustainably. In 2017, MCWRA issued "Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin" (MCWRA, 2017). In 2018, the County of Monterey issued interim ordinance No. 5302 (extended by No. 5303), which prohibited construction of new wells in the Deep Aquifers unless exempted by ordinance and directed MCWRA to complete a study of the Deep Aquifers. In 2020, MCWRA updated its 2017 report (MCWRA, 2020); however, some recommendations were not implemented and the interim ordinance expired. The expiration of the ordinance, coupled with data on well construction and groundwater extraction in the Deep Aquifers that occurred while the ordinance was in place, highlighted the need to complete this critical study.

In the fall of 2021, SVBGSA put together a funding agreement, issued a request for qualifications (RFQ) and, with input from other agencies, selected M&A to complete the study. The collaborative funding partners include ALCO Water, California Water Service, Castroville Community Services District, City of Salinas, Irrigated Agriculture, MCWD GSA, County of Monterey, SVBGSA, and MCWRA. The Study began in January 2022 and was planned to take 2 years to complete.

During the Study preparation, SVBGSA invited diverse technical expert input on M&A's interim work products and findings from the Groundwater Technical Advisory Committee (GTAC), which evolved out of the SWIG Technical Advisory Committee. GTAC peer review of an administrative draft extended the original December 2023 completion timeline to April 2024. The GTAC provided input on numerous aspects of the Study, including the following:

- Key tasks to be included in the scope of the study
- Definition of Deep Aquifers
- Review of preliminary findings and interim guidance
- Newly collected data and how they inform the Deep Aquifers HCM
- Water budget
- Current conditions, monitoring recommendations, and guidance for management

The Deep Aquifers Study was completed in April 2024. It compiles all available data into a scientifically robust report characterizing the geology and hydrogeology of the Deep Aquifers in the Salinas Valley. Collection and integration of different types of data fills key data gaps and provides science-based guidance for management. It provides definition of the Deep Aquifers and an HCM that describes the geology and hydrogeology, extent of the Deep Aquifers, aquifer hydraulic properties, groundwater chemistry, and potential natural recharge and discharge pathways. It includes a water budget and reviews historical and recent conditions. Lastly, it provides guidance for management. See Section 4.1.1 for additional description of the Study's findings.

Over the summer of 2024, the Deep Aquifers Study was received by the SVBGSA, MCWRA, MCWDGSA Boards, and Monterey County Board of Supervisors. Staff from these agencies have formed a working group to develop recommendations to operationalize the study guidance. The Study is available on SVBGSA's website here: https://svbgsa.org/deep-aquifer-study/

The Deep Aquifers Agency Working Group will continue to work together to develop a monitoring plan and next steps for management of the Deep Aquifers based on the Study guidance in 2025 and will continue ongoing management into the future.

3.3.13 MA6 MCWRA Drought Reoperation

In 2020, MCWRA formed the Drought Operations Technical Advisory Committee (D-TAC). As noted in GSP Amendment 1, the purpose of the D-TAC is to provide technical input and advice when drought triggers occur regarding the operations of Nacimiento and San Antonio Reservoirs. The D-TAC developed Standards and Guiding Principles to be used in the development of a proposed reservoir release schedule triggered under specific, seasonally defined conditions. This management action would result in decisions on reservoir operations and flow releases during a drought. The recommendations of the D-TAC may change with the development and adoption of an HCP, but the D-TAC Standards, Guiding Principles, and Implementation procedures will remain in place unless modified by an HCP.

The winter of 2020-2021 produced only a single significant inflow event, resulting in combined reservoir storage volumes sufficient for only an abbreviated SRDF operation season (April-July, instead of April-October). Drought conditions and limited reservoir inflow persisted in the winter of 2021-2022. The D-TAC was convened and reached consensus that, barring significant late season inflow events, minimum fisheries release rates be made for the entirety of 2022. The D-TAC unsuccessfully tried to develop a Dry Winter Scenario Narrative for January-March 2023; however, large storm events during that period ended up negating the need for it. If drought triggers occur over the next evaluation period, MCWRA will convene the D-TAC to advise on the reservoir release schedule and winter scenario narrative.

3.3.14 Seawater Intrusion Working Group (not included in GSP Amendment 1)

The Seawater Intrusion Working Group (SWIG) management action was completed during the 5-year evaluation period. In 2020, SVBGSA formed the SWIG and a SWIG Technical Advisory Committee to provide input on early project planning.

In 2020 and 2021, SWIG TAC provided technical advice on the effectiveness of potential projects or actions that may halt or reverse seawater intrusion. It also supported the development of a scope of work and RFQ for a Deep Aquifers Study and reviewed the Monterey County Well Ordinance and the well permitting processes to gain a better understanding of the concerns regarding the Deep Aquifers. Other activities included improving the working knowledge of CSIP, and focused on better understanding additional projects that could stop seawater intrusion. This included demand management, various project types, and specific project ideas such as an extraction barrier and ASR. This input from the SWIG and SWIG TAC resulted in the GSP Amendment 1 PMA updates.

In 2022, SVBGSA Board of Directors transitioned the responsibilities of the SWIG to the existing Advisory Committee, and the responsibilities of the SWIG TAC to a new, broader GTAC.

3.3.15 Cross Boundary and Other PMAs

In addition to PMAs in the GSP, SVBGSA and other partner organizations have conducted additional activities for PMAs that further groundwater management goals of the GSAs. Cross boundary projects that may have indirect benefits to the 180/400 Subbasin are discussed here.

3.3.15.1 R2 and R3 Permit 11043 Cross-Boundary Projects

Diversion of water using MCWRA’s Permit 11043 has been intended to primarily benefit the Eastside Subbasin, so with the 2022 GSPs it was shifted to the Eastside Subbasin GSP. It was listed as a cross-boundary project in the 180/400 Subbasin GSP Amendment 1 since it may have groundwater benefits for the 180/400 Subbasin.

In 2025, SVBGSA will coordinate with MCWRA to further evaluate the feasibility of projects to use MCWRA’s Permit 11043 for diversion of surface water off the Salinas River. Permit conditions only allow water to be diverted when there are natural flows in the river that exceed minimum specified criteria, constrained by an established maximum diversion rate. In coordination with MCWRA, a preliminary feasibility analysis will use the updated SVIHM/SVOM, and potentially the USGS’ HSPF model, to refine initial estimates of benefits from diverting water from the river for recharge or in lieu use. The analysis will assess the feasibility of recharging the diverted water through infiltration basins or injection wells and identify favorable areas using well logs, geologic cross sections, and AEM data. The analysis will identify where site-specific analyses could subsequently be conducted if the project is further pursued. The analysis will consider potential impacts from at least 2 climate change scenarios, at least 2 diversion points, different sizes of diversion structures, and options for end uses. Once the preliminary feasibility study is completed, the findings will be included in a sustainability strategy report that will summarize updated information on PMAs and refine estimates of project costs and groundwater impacts.

3.3.15.2 M1, M2, and M3 Marina Coast Water District Cross Boundary Projects

MCWDGSA has made progress on 3 cross-boundary projects located in the Monterey Subbasin:

- M1 – MCWD Demand Management Measures: MCWD continues to implement conservation efforts within its service area to meet and exceed legislative requirements as part of Senate Bill x7-7 and the "Making Water Conservation a California Way of Life" framework. Additional information on the conservation effort can be found in the 2020 MCWD Urban Water Management Plan (MCWD, 2020) and the District's website (https://www.mcwd.org/conserve.html)[2].

- M2 – Stormwater Recharge Management: The Cities of Marina and Seaside, the 2 major municipalities within the Marina-Ord Area, have policies to facilitate additional stormwater catchment and infiltration beyond existing efforts as development and redevelopment occurs. The policies allow ongoing recharge of stormwater into the underlying groundwater basins. Information regarding the cities' stormwater management policies can be found on the city websites (https://www.ci.seaside.ca.us/436/Stormwater and https://cityofmarina.org/757/Stormwater-Management-Program).

- M3 – Recycled Water Reuse Through Landscape Irrigation and Indirect Potable Reuse: The project consists of recycled water reuse through landscape irrigation and/or indirect potable reuse (IPR) within MCWD's service area. MCWD began providing recycled water for irrigation to the Seaside Golf Course and other customers in 2022. Approximately 600 AF/yr of recycled water is delivered to customers in the Monterey and Seaside Subbasins on an annual basis.

  In November 2022, MCWD completed a feasibility study and confirmed the possibility of implementing an IPR project and recommended injection into the Deep Aquifers as the preferred option. The recommended project includes injecting 827 AF/yr advanced treated recycled water into the Monterey Subbasin for extraction by MCWD's existing Deep Aquifer production wells. The study was partially funded by a grant through the SWRCB's Water Recycling Funding Program and was finalized and submitted to the SWRCB. The study (1) conducted a multi-factor screening of project alternatives; (2) performed groundwater modeling to determine the project capture zone and verified aquifer residence times; and (3) performed engineering analysis of cost, energy use, and water quality impacts.

  The MCWDGSA is tracking and pursuing funding opportunities to support implementation of the IPR project. The IPR project was included in the Monterey

Subbasin's Round 2 Implementation Grant application; however, funding was not awarded for this component. The MCWDGSA is currently applying for a U.S. Bureau of Reclamation grant for a first phase of the project. The IPR project is currently scheduled on the MCWDGSA's CIP as a grant-funded project but may be financed through GSA funds if grant funding is unavailable. It is estimated that completion of the project is anticipated in the next 3.5 to 5 years, depending on funding and financing.

3.3.15.3 Protection of Domestic Drinking Water Supplies for the Lower Salinas Valley Project (Not in GSP or Amendment 1)

In 2019, MCWRA initiated the Protection of Domestic Drinking Water Supplies for the Lower Salinas Valley Project, with funding from a Proposition 1 Implementation Grant administered by the State Water Resources Control Board. The purpose of this project is to destroy abandoned or inactive wells to prevent conduits that allow movement of seawater- and nitrate-contaminated groundwater into drinking water supply wells. The current goal is to destroy a minimum of 59 wells. MCWRA's timeline for this effort has been extended to February 2026.

3.3.15.4 Multi-benefit Land Repurposing Program (Not in GSP or Amendment 1)

MLRP is a California Department of Conservation initiative to reduce reliance on overdrafted groundwater basins. Working with a broad coalition of interested parties, an MLRP Plan is being drafted to outline and structure how to strategically and voluntarily repurpose the least viable agricultural lands in the Lower Salinas Valley that can provide multiple water resource benefits.

The California Marine Sanctuary Foundation (CMSF), Central Coast Wetlands Group, Greater Monterey County Integrated Regional Water Management (IRWM) Group, and SVBGSA are implementing a $10 million MLRP grant for the acquisition of portions of agricultural ranches where interested landowners wish to transition farmlands to projects that require less water and create additional community and environmental benefits. Some potential project benefits could be increased groundwater recharge and storage, reduced flooding, habitat enhancement, and water quality improvement. Community input is being requested to help identify the communities' desired benefits.

Technical work includes recharge suitability mapping to help understand where there are potential opportunities for recharging surface water runoff into principal aquifers. The SVBGSA and MLRP partners are working with researchers from the University of California Davis to develop a recharge suitability map and Multi-Criteria Decision Analysis (MCDA) tool. Recharge Suitability Mapping begins with identifying the local goals of groundwater recharge. A Multi-Criteria Decision Analysis (MCDA) will be an outcome of this work that will help the region prioritize suitable recharge locations.

Where recharge potential is limited—for example where there are thick layers of clay and old lake beds—surface water storage and treatment might be a water resource benefit for several project ideas identified in the 180/400 Subbasin. The project concept is to take irrigated acres out of production because they are flood prone, difficult to farm, and the landowner is interested in selling. In addition to reduced groundwater pumping, the potential benefits would be to improve surface water quality, provide flood attenuation, and create freshwater habitat. The projects could also explore surface water storage and conveyance after a water rights analysis.

The MLRP project team is working with landowners who have expressed interest in participating. Future activities include appraisals and high-level project scoping. In addition, the MLRP Plan is being drafted and will be completed in 2025. Land acquisition or long-term leases will be completed by 2027. The MLRP Plan will help guide the program into subsequent years if there is community interest and funding.

Table 3-2 provides a summary of the above discussion on each PMA and its status.

Table 3-2. Status of Projects and Management Actions in Amendment 1

Project/ Management Action #	Project/ Management Action Name	Project/ Management Action Description	Project Benefits	Quantification of Project Benefits	Cost[3]	Targeted Sustainability Indicator	Project Status	Expected Schedule
MA – MANAGEMENT ACTIONS								
MA1	Demand Planning	Proactively determines how extraction should be controlled and planned for	Decreases extraction if needed	Range of potential benefits	Approximately $415,000 for program development, ongoing/annual and future costs being evaluated in planning process	Groundwater Levels, Storage, Subsidence, Seawater intrusion, ISW	Underway. Completed Situation Assessment in 2023. Held Valley-wide workshops held in spring 2024. 180/400 Committee dialogue was initiated fall 2024. Legal and economic analyses underway.	2025 – Develop recommendations, including economic and legal considerations, and create a work plan for a demand management program. 2026 forward - program implementation.
MA2	Fallowing, Fallow Bank, and Agricultural Land Retirement	Includes voluntary fallowing, a fallow bank whereby anybody fallowing land could draw against the bank to offset lost profit from fallowing, and retirement of agricultural land	Decreased groundwater extraction for irrigated agriculture	Dependent on program participation	$675-$2,095/AF if land is fallowed $1,295-$3,210/AF if land is retired Demand planning economic analyses to further refine land values and costs.	Groundwater Levels, Storage, Subsidence, Seawater intrusion	May be implemented through MLRP projects or considered under demand planning. 2023-2024 – CCWG developed plan and structure to voluntarily repurpose agricultural land under MLRP.	2024-2025 – UCD developing recharge suitability mapping. If selected, see above demand planning schedule.
MA3	Conservation and Agricultural BMPs	Promote agricultural best management practices and support use of ET data as an irrigation management tool for growers	Better tools assist growers to use water more efficiently; decreased groundwater extraction	Dependent on specific BMPs implemented	Approximately $104,000 for 4 workshops, grant writing, and demonstration trials. Cost could be reduced if shared between subbasins.	Groundwater Levels, Storage, Subsidence, Seawater intrusion	2023-2024 – RCDMC, RCDSC, PVWMA, SVBGSA and UCCE development of Central Coast Ag BMP website.	Ongoing - maintain website and update as needed, conduct additional outreach activities.
MA4	Reservoir Reoperation	Collaborate with MCWRA to evaluate potential reoperation scenarios, which could be paired with projects such as the Interlake Tunnel, seasonal reservoir releases with aquifer storage and recovery (ASR), or other potential projects	More regular annual reservoir releases, including dry years, which could provide water for seasonal storage through ASR in the northern Salinas Valley	Unable to quantify benefits until feasibility study is completed	Multi-subbasin: Approximately $518,000	Groundwater Levels, Storage, Subsidence, Seawater intrusion, ISW	Feasibility partially funded (modeling), not yet started.	2025-2026 – complete feasibility modeling.
MA5	Undertake and Operationalize Guidance from Deep Aquifers Study	Complete study of the Deep Aquifers to enable better management of groundwater and seawater intrusion and operationalize guidance	Increase understanding of Deep Aquifers; protect Deep Aquifers from seawater intrusion and groundwater level decline	Unable to quantify until Deep Aquifers Study completed	Multi-subbasin: $875,000 for Study; cost for operationalizing depends on monitoring plan and management activities, to be determined.	Groundwater Levels, Storage, Subsidence, Seawater intrusion	Deep Aquifers Study completed May 2024, presented to agency Boards summer 2024, and working group started fall 2024.	2025 –Agencies Working Group to develop monitoring plan and recommend management activities. 2026 forward, ongoing management.
MA6	MCWRA Drought Reoperation	Support the existing D-TAC when it develops plans for how to manage reservoir releases during drought	Multi-subbasin benefits: more regular seasonal reservoir releases; drought resilience	Unable to quantify benefits since drought operations have yet to be triggered	Minimal SVBGSA staffing costs for participation. No additional MCWRA costs since already formed	Groundwater Levels, Storage, Subsidence, Seawater intrusion	MCWRA convenes in years when triggers are met. D-TAC convened in 2020, 2021, and 2022.	Ongoing, as needed.

[3] For this GSP 2025 Evaluation, the 2022 cost estimates in GSP Amendment 1 have been updated only for inflation on the costs included in GSP Amendment 1 Table 9-1, unless additional feasibility studies have provided more detailed cost estimates than what was included in the GSP.

Project/ Management Action #	Project/ Management Action Name	Project/ Management Action Description	Project Benefits	Quantification of Project Benefits	Cost[3]	Targeted Sustainability Indicator	Project Status	Expected Schedule
P – PROJECTS								
P1	Multi-benefit Stream Channel Improvements	Prune native vegetation and remove non-native vegetation, manage sediment, and enhance floodplains for recharge. Includes 3 components: Stream Maintenance Program (SMP), Invasive Species Eradication, Floodplain Enhancement and Recharge	Groundwater recharge, flood risk reduction, returns streams to a natural state of dynamic equilibrium	Component 1: Multi-subbasin benefits not quantified Component 2: Multi-subbasin benefit of 2,790 to 20,880 AF/yr of increased recharge Component 3: Multi-subbasin benefit of 1,000 AF/yr from 10 recharge basins	Component 1 Multi-subbasin cost: $155,000 for annual administration and $98,000 for occasional certification; $807,000 for the first year of treatment on 650 acres, and $471,000 for annual retreatment of all acres Component 2 Multi-subbasin Average Cost: $17,078,000 Unit Cost: $65 to $625/AF Component 3 Multi-subbasin Cost: $11,550,000 Unit Cost: $965/AF	Groundwater Levels, Storage, Subsidence, Seawater intrusion, ISW	Underway. 2023-2024 – FlowWest assessing groundwater recharge benefits HECRAS model.	SMP and Arundo Control are ongoing (depending on funding, permitting and landowner interest). 2025 and 2026 – Recharge related to the multi-benefit channel improvement will be informed by the recharge suitability analysis under MLRP and HECRAS modeling.
P2	CSIP System Optimization	Infrastructure and program implementation improvements to better accommodate diurnal and seasonal fluctuation in irrigation demand in the CSIP system, maximize use of recycled and Salinas River water, and further reduce groundwater extraction	Decreased groundwater extraction	Benefit of up to 5,000 AF/yr of recycled and river water provided for irrigation in-lieu of groundwater extraction.	Capital cost $25,150,000. Unit cost: $445/AF/yr	Groundwater Levels, Storage, Subsidence, Seawater intrusion	Underway. 2022 - 2024 – Remote monitoring units installed, scheduling system in beta testing, hydraulic model under development.	2025 – Develop Master Plan, design improvements, operationalize scheduling system. 2026 forward – implement Master Plan.
P3	Modify M1W Recycled Water Plant	Infrastructure upgrades to prevent the winter maintenance shutdown and allow delivery of tertiary treated wastewater to CSIP instead of groundwater when water demand is low	Decreased groundwater extraction	Up to 800 AF/yr of recycled water provided for irrigation in-lieu of groundwater extraction.	Capital Cost: $9,281,000, and Unit Cost: $925/AF.	Groundwater Levels, Storage, Subsidence, Seawater intrusion	Partially complete. 2022-2024 – Chlorination System (Dry scrubbers) upgraded.	Other future RTP Winter Modifications TBD.
P4	CSIP Expansion	Expand service area of CSIP to provide a combination of Salinas River water, recycled water, and, when needed, groundwater in lieu of groundwater extraction	Decreased groundwater extraction	Multi-subbasin benefit for 3,500-acre expansion: up to 7,000 AF/yr of recycled and river water provided for irrigation in-lieu of groundwater extraction	Multi-subbasin Capital Cost for 3,500-acre expansion: $91,121,000 Unit Cost: $1,110/AF.	Groundwater Levels, Storage, Subsidence, Seawater intrusion	High level feasibility funded.	2025 – preliminary feasibility including assessment of options for expansion and source waters, address legal and policy issues

Project/ Management Action #	Project/ Management Action Name	Project/ Management Action Description	Project Benefits	Quantification of Project Benefits	Cost[3]	Targeted Sustainability Indicator	Project Status	Expected Schedule
P5/P6	Brackish Groundwater Restoration Project (previously Seawater Intrusion Extraction Barrier/ Regional Municipal Supply Project)	Install a series of wells in the 180-Foot and 400-Foot Aquifers to extract brackish groundwater to form a hydraulic barrier that prevents seawater intrusion from advancing inland of the wells and build a regional brackish treatment plant to supply water to both agricultural and urban end users in this Subbasin and other subbasins	Prevention of seawater intrusion inland of wells, alternative water supply, less groundwater pumping, reduced risk of seawater intrusion	The total agricultural land use that falls within the seawater intrusion boundary is modeled as 27,835 acres by 2070 under the no project scenario. Approximately up to 149 wells fall between the no project alternative and the Brackish Groundwater Restoration Project chloride boundaries. The total usage of groundwater for these 149 wells is 30,077 AF/yr. The proposed project would protect the water quality of these wells. Volume of treated water produced for end users and injection. Small alternative – 28,008 AF/yr of treated water, Medium alternative – 46,858 AF/yr of treated water, Large alternative – 64,920 AF/yr	Feasibility Study Capital Cost Small Alternative - $720,780,000; Unit Cost for 28,008 AF/yr treated: $2,931/AF Capital Cost Medium Alternative - $ 1,013,690,000; Unit Cost for 46,858 AF/yr treated: $2,365/AF Capital Cost Large Alternative - $1,482,690,000; Unit Cost for 64,920 AF/yr treated: $2,669/AF	Seawater intrusion, Groundwater Levels, Storage, Subsidence,	Phase 1 feasibility study initiated in Summer 2023, to be completed first quarter 2025	If selected, project planning through 2025 - 2028, pilot/demonstration phase 2025 - 2029, environmental review, permitting and construction 2027-2034
P7	Seasonal Release with ASR	Release flows from reservoirs during the winter/spring, for groundwater recharge and then diversion at the SRDF. Diverted water will be treated and then injected into the 180-Foot and 400-Foot Aquifers for seasonal storage, and then extracted for delivery to CSIP during the peak irrigation season and/or delivered for direct municipal use.	Seasonal storage of winter/spring flows in the northern Salinas Valley; reduced coastal pumping during peak irrigation season	14,600 AF/yr injected; 6,800 AF/yr of additional groundwater storage in the 180/400 Subbasin (Feasibility Study modeling to update this estimated of benefits)	Preliminary Feasibility Study – To be updated as part of feasibility analysis	Groundwater Levels, Storage, Subsidence, Seawater intrusion, ISW	Preliminary feasibility study to be completed January 2025	If selected, additional feasibility analysis 2025 – 2026
P8	Irrigation Water Supply Project (or Somavia Road Project)	Extract groundwater during the peak irrigation season to induce greater groundwater recharge and storage during the winter/spring	Less groundwater pumping in area where extracted water is delivered	3,000 AF/yr of extracted water for in lieu use or recharge	Capital Cost: $6,133,000 Unit Cost: $455/AF for extraction wells (not including distribution costs)	Groundwater Levels, Storage, Subsidence	Preliminary feasibility and recharge study funded and underway.	Upon completion of preliminary feasibility in 2025, determine next steps.
CROSS-BOUNDARY PROJECTS ***(projects outside the Subbasin that will likely have indirect benefits for the 180/400 Subbasin that may reduce the need for other PMAs)***								
R1	Eastside Floodplain Enhancement and Recharge	Restore creeks and floodplains to slow the flow of water	More infiltration, less erosion, less flooding	2,300 AF/yr of water available for recharge in Eastside Subbasin. 1,000 AF/yr increase in storage in Eastside Subbasin. 200 AF/yr increase in storage in the 180/400 Subbasin	Capital Cost: $13,037,000 Unit Cost: $1,086/AF	Groundwater Levels, Storage, Subsidence	Partially underway through MLRP. During 2023-2024 – CCWG developed plan and structure to voluntarily repurpose agricultural land.	Through 2025 – UCD will develop recharge suitability mapping.
R2	11043 Diversion at Chualar	Build a new facility near Chualar that would be allowed to divert water from the Salinas River when streamflow is high	Less groundwater pumping, moderately less seawater intrusion in other subbasins	Multi-subbasin: Annual average of 6,000 AF/yr of excess streamflow for in lieu use or recharge, resulting in approximately 4,600 AF/yr increase in storage, mainly in the Eastside.	Capital Cost: $57,633,000 Unit Cost: $1,325/AF	Groundwater Levels, Storage, Subsidence	Flow availability analysis funded.	2025 – complete analysis.

Project/ Management Action #	Project/ Management Action Name	Project/ Management Action Description	Project Benefits	Quantification of Project Benefits	Cost[3]	Targeted Sustainability Indicator	Project Status	Expected Schedule
R3	11043 Diversion at Soledad	Build a new facility near Soledad that would be allowed to divert water from the Salinas River when streamflow is high	Less groundwater pumping, slightly less seawater intrusion in other subbasins	Multi-subbasin: Annual average of 6,000 AF/yr of excess streamflow is diverted for in lieu use or recharge, resulting in approximately 4,600 AF/yr increase in storage, mainly in the Eastside.	Capital Cost: $108,353,000 Unit Cost: $2,185/AF	Groundwater Levels, Storage, Subsidence	Flow availability analysis funded.	2025 – complete analysis.
M1	MCWD Demand Management Measures	Provides in-lieu recharge through reducing groundwater demands.	Reduced pumping in the principal aquifers resulting in an in-lieu recharge benefit; slightly less seawater intrusion.	Equivalent to a 2,500 AF/yr in-lieu recharge benefit at the current population for MCWD service area.	$363,000 to $466,000 annually	Groundwater Levels, Storage, Seawater Intrusion	Ongoing.	Ongoing.
M2	Stormwater Recharge Management	Existing policies will facilitate and result in additional stormwater catchment and infiltration over time as redevelopment occurs	Groundwater recharge, urban flood risk reduction	Under the existing urban development footprint approximately 550 AF/yr of stormwater is generated and infiltrated west of Highway 1 in Marina. Groundwater modeling indicates that stormwater recharge catchment and recharge will increase to 1,100 AF/yr on average as further projected development occurs which will increase net subbasin infiltration rates by 200 AF/yr to 500 AF/yr in the Monterey Subbasin.	No additional cost to implement	Groundwater Levels, Storage, Seawater Intrusion	Ongoing.	Ongoing.
M3	Indirect Potable Reuse	Direct non-potable irrigation use and/or injection of advanced treated water from Monterey One Water (M1W) and extraction using existing MCWD wells or new production wells.	Reduced pumping in the principal aquifers resulting in an in-lieu recharge benefit; slightly less seawater intrusion.	Approximately 2,200 AF/yr to 5,500 AF/yr advance treated recycled water available to MCWD based on current and projected wastewater flows.	Investments have already been made to deliver 1,427 AF/yr for landscape irrigation. Unit cost: $2,485/AF Approximately 2,400 AF/yr recharge through IPR: Capital cost: $67.5 million Unit cost: $3,415/AF Costs per AF would likely decrease at higher production capacities due to economies of scale.	Groundwater Levels, Storage, Seawater Intrusion	Providing recycled water to customers in Seaside and Monterey Subbasins for landscape irrigation; Feasibility Study completed for indirect potable reuse.	Continue and expand recycled water deliveries in 2024-25 and continue to identify funding for indirect potable reuse.
C1	Corral de Tierra Pumping Allocation and Control	Proactively determine how extraction should be fairly divided and controlled in the Corral de Tierra Management Area	Decreased extraction; range of potential benefits, which may include increased flows to the 180/400 Subbasin	Variable based on pumping controls	$517,500 for establishment of pumping allocations and controls	Groundwater Levels, Storage, Subsidence, ISW	Now referred to as Demand Management. 2023 – Valley-wide Situation Assessment Completed. Spring 2024 – hold Valley-wide community workshops. Modeling and interested parties' outreach and engagement activities funded through Q1 2026.	If selected, see above demand planning schedule.

3.4 Considerations for Future PMA Updates or Plan Amendments

The following are considerations for updates to the PMAs or additions in the next plan amendment. These items incorporate committee and public input, with notes where work is underway:

- Multi-benefit Land Repurposing Program – As discussed in Section 3.3.15.8, the MLRP has been conducted by SVBGSA and partner agencies. MLRP should be added to the PMAs in the next plan amendment. The 180/400 Committee suggested several potential projects to consider under MLRP.

- CSIP Optimization – As noted in Section 3.3.2, MCWRA intends to develop a Water Master Plan to support this project. Committee suggestions and public comments included looking at additional storage for CSIP, maximizing how much water is passing SRDF that could be captured/impounded with new storage, and sending more water to M1W treatment (e.g. City of Salinas industrial ponds).

  These items are generally included in work underway. MCWRA is evaluating storage options through its CSIP hydraulic modeling scenarios. Initial modeling of the potential for additional diversions at SRDF is being done as part of the ASR feasibility study. The industrial ponds have been under discussion by M1W, MCWRA, and City of Salinas.

- Aquifer Storage and Recovery (ASR) – MCWRA and the 180/400 Committee suggested the ASR concept be modified to capture excess winter flows, not just releases from the reservoirs, and to consider other diversion systems. This has been incorporated into the feasibility study. It has resulted in the identification of a new alternative to the GSP Project Concept.

- Northern 180/400 Subbasin Rural Residential Area – The northern area of the 180/400 Subbasin, north of Highway 156, is predominantly in rural residential land uses and is distinct topographically from the valley floor. It is more similar in character to the adjacent Langley Subbasin on the east, and also shares characteristics with the Pajaro Valley Groundwater Basin on the north. SVBGSA recommends further evaluation of the unique challenges in these areas, as well as coordination with Pajaro Valley Water Management Agency and the Langley Subbasin on PMA to address them.

  Through the demand planning workstream, SVBGSA has identified a need to focus on improving domestic water efficiency and extending conservation programs that have long been available to urban, large public water systems. SVBGSA is initiating a Water Efficiency Pilot Project (WEPP) in targeting rural residential areas of the Salinas Valley, including the northern portion of the 180/400 Subbasin.

- Integrated Implementation Plan – SVBGSA plans to develop a road map for holistic strategy in the GSP implementation in the Salinas Valley.
    - As per 2020 GSP, SVBGSA developed a draft Integrated Implementation Plan (IIP) to tie the SVBGSA GSPs together and describe how the Salinas Valley's groundwater system functions holistically. The draft IIP was put on hold until additional modeling efforts were completed.
    - SVBGSA will revisit this tool for an integrated approach to PMAs in the Salinas Valley.

During the review of GSP Amendment 1 PMAs for this 5-year evaluation, the 180/400 Committee and public also suggested the following new ideas and/or PMAs to consider adding in a future GSP amendment. These ideas require further vetting to determine if they are supported by the full Committee and approved by the Board to be investigated as part of Annual Work plans. These ideas included:

- Adding a project called "Pipeline from Reservoirs to the North"
- Expanding recycled water for outdoor irrigation in urban areas (e.g. Salinas)
- Evaluating feasibility of collecting irrigated lands runoff from tile drains, addressing water quality, and putting it in storage or reuse
- Evaluating a new rubber dam (like SRDF) near Somavia Road to add river diversions to irrigation in this area
    - This concept will be informed by the feasibility work underway for P8 Irrigation Water Supply Project, discussed in Section 3.3.7.

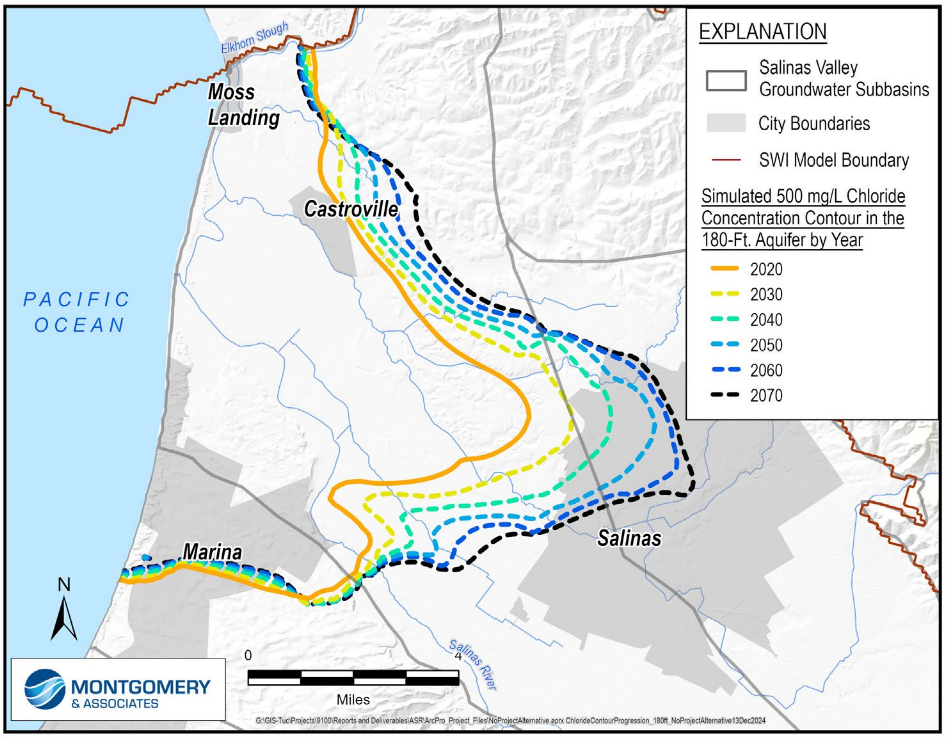
3.5 Quantification of Benefits to Address Seawater Intrusion

Seawater intrusion is the primary reason the Subbasin is classified as critically overdrafted and addressing seawater intrusion is the main focus of PMAs and SVBGSA's sustainability planning for this Subbasin. The Salinas Valley Seawater Intrusion Model (SWI Model) provides a tool to assist in designing and assessing PMAs that address seawater intrusion in the Salinas Valley.

SVBGSA began development of the SWI Model in 2021 to account for the differing densities of freshwater, seawater, and brackish water to simulate seawater intrusion in the Salinas Valley. The SWI Model covers multiple subbasins, including portions of the 180/400 Subbasin and Eastside Subbasin, and the entirety of the Monterey, Langley, and Seaside Subbasins. Reports documenting the SWI Model and model updates are available on SVBGSA's website here: https://svbgsa.org/resources/seawater-intrusion/salinas-valley-seawater-intrusion-model/

The predictive version of the SWI Model enables estimation of future groundwater conditions with and without PMAs. It simulates potential seawater intrusion starting from the end of the historical model, WY 2020, through WY 2070. Projected impacts are typically reviewed by comparing predictive simulation results of various projects and management actions to a no project scenario. The feasibility studies for the Brackish Groundwater Restoration Project, ASR, and Demand Management are using the SWI Model to evaluate effectiveness to meet sustainability criteria for seawater intrusion, as well as to understand potential effects on groundwater levels across the model area.

The No Project Scenario shows the leading edge of the 500 mg/L chloride isocontour of seawater intrusion advancing to the northeast side of Salinas in the 180-Foot Aquifer and its stratigraphic equivalent in the Eastside Subbasin. In the 400-Foot Aquifer, the separated “islands” of seawater intrusion merge together and the 500 mg/L chloride isocontour advances to the City of Salinas, intruding across Castroville and the City of Marina. Figure 3-1 shows the advancement of the 500 mg/L chloride isocontour over time in the No Project Scenario. Figure 3-2 shows the estimated chloride concentration in 2070 for each the 180-Foot and 400-Foot Aquifers and their stratigraphic equivalents. In the 400-Foot Aquifer and its stratigraphic equivalent, the new islands and hook shape show the risk of seawater intrusion from vertical migration down from the 180-Foot Aquifer if there are wells screened across both aquifers. The wells screened across both aquifers in the model have unknown screen intervals or aquifer designations; however, it is unknown if the real wells are actually screened across both aquifers.



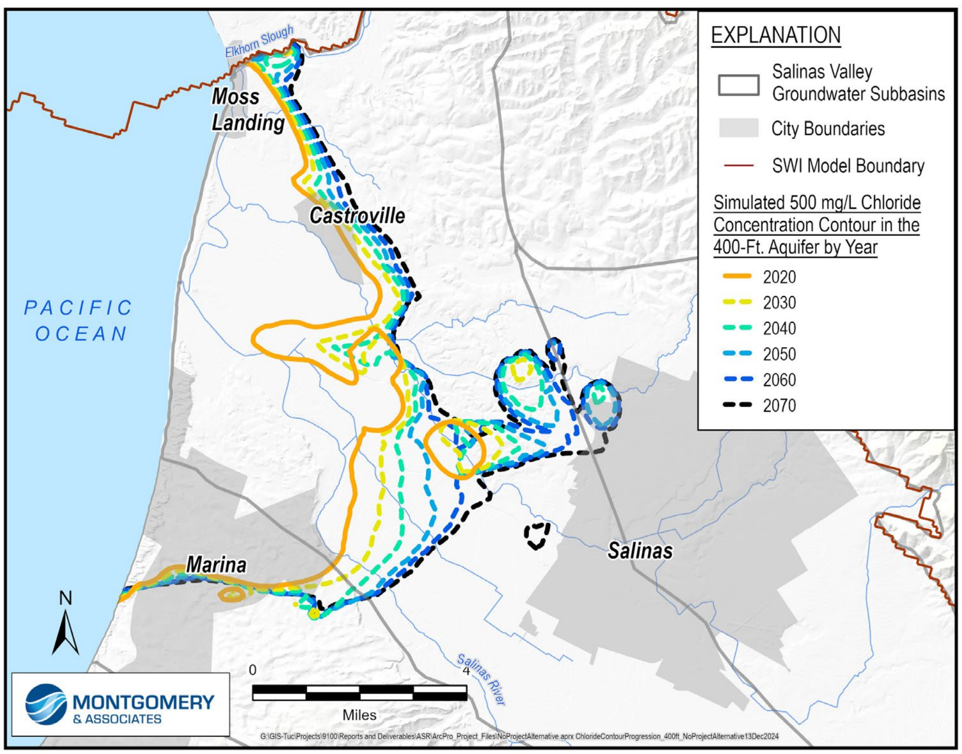


Figure 3-1. No Project Scenario Simulated 500 mg/L Chloride Concentration Contours from 2020 to 2070 in the 180-Foot and 400-Foot Aquifers and their Stratigraphic Equivalents

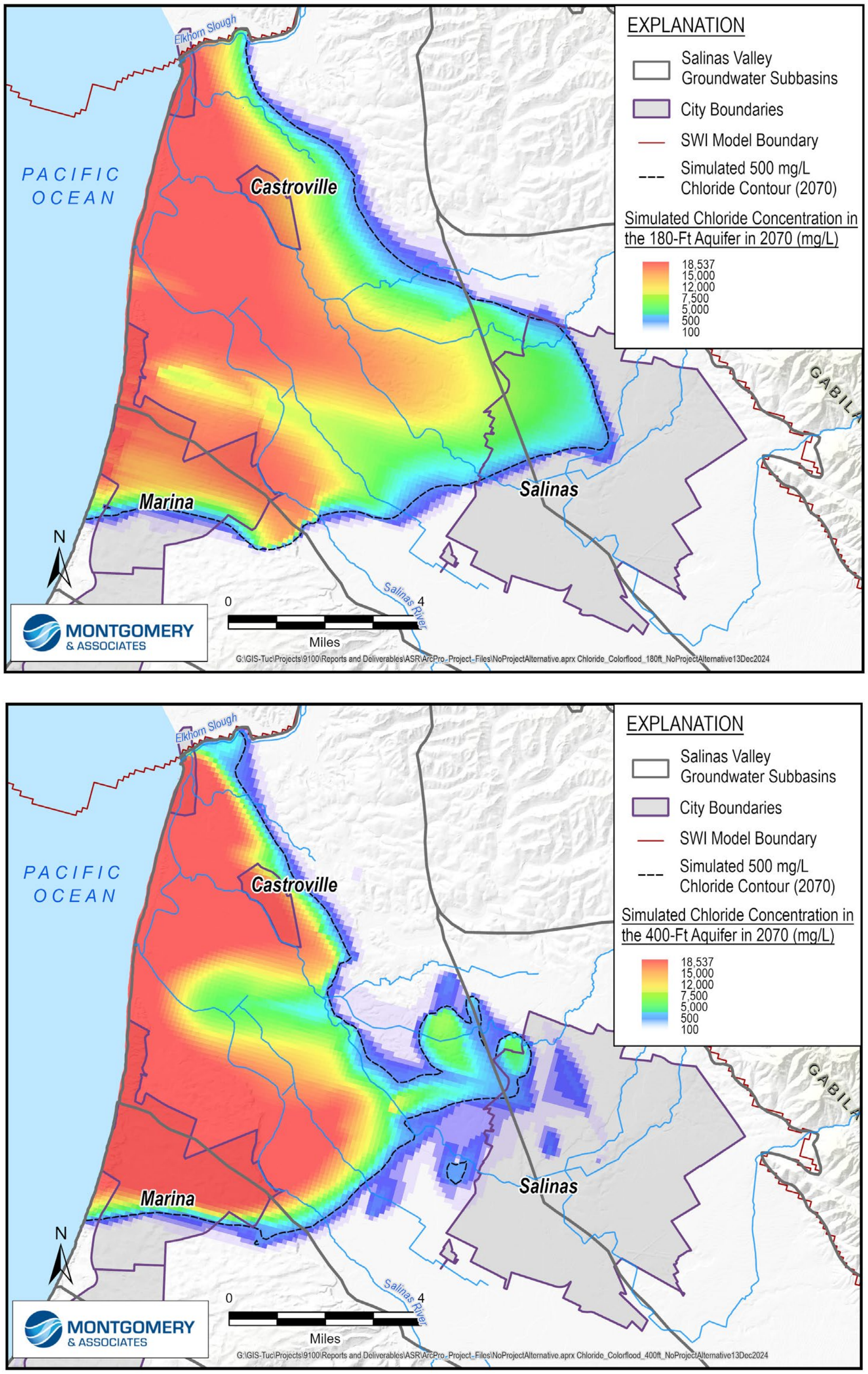


Figure 3-2. No Project Scenario Simulated Chloride Concentration in 2070 for the 180-Foot and 400-Foot Aquifers and their Stratigraphic Equivalents

The No Project Scenario includes current infrastructure and operational rules. It does not include climate change assumptions, as that introduces uncertainty; however, SVBGSA plans to evaluate climate scenarios and compare the results in 2025. The No Project Scenario repeats the representative hydrologic period of 1996-2018, and keeps land use and pumping constant.

The project update report noted above will compare the findings of the feasibility studies for the Brackish Groundwater Restoration Project, Seasonal Release with ASR, and Demand Management. This will include comparing modeling scenarios and results for several alternatives for each of these PMAs with the No Project Scenario. The results inform and update quantification of benefits for these PMAs. This information will be provided in the next annual report and DWR's new SGMA Portal for PMAs. However, at the time of this GSP 2025 Evaluation, this analysis has not yet been completed.

3.6 Project and Management Actions Challenges and Uncertainties

New projects to address seawater intrusion and other groundwater sustainability indicators in the 180/400 Subbasin are still conceptual at the time of this GSP 2025 Evaluation. The pre-construction phase of large-scale infrastructure and projects poses many challenges and uncertainties. Getting through CEQA and NEPA environmental review and permitting will be time consuming and costly. MCWRA has an HCP for current reservoir operations under preparation, and any new operations or projects may trigger a reevaluation of its requirements or other Endangered Species Act (ESA) regulatory compliance. Project construction timelines are likely 5-10 years out.

It is important to ensure that the selected PMAs align with the problems that need to be addressed under the framework of SGMA. As of now, only the Brackish Groundwater Restoration Project appears able to achieve the seawater intrusion minimum thresholds and improve conditions toward the measurable objective. SVBGSA continues to use the SWI Model to evaluate other PMAs and to develop a recommendation on the suite of PMAs for addressing seawater intrusion.

In the next evaluation period, SVBGSA will build on what has been done during the last 5 years. SVBGSA, along with other agencies and interested parties, will conduct a project selection process for the Valley to determine which priority PMAs should be moved forward in an integrated approach, including quantifying the benefits in multiple subbasins where applicable. Through this process, SVBGSA will re-evaluate water budgets and groundwater conditions with and without PMAs. The selection of PMAs to move forward into the next phase of implementation is recommended as part of the GSP 2027 Evaluations for the other 5 Salinas Valley Subbasin and a GSP 2027 Evaluation for the 180/400 Subbasin. This will facilitate a comprehensive and coordinated approach to PMAs across the Valley.

The following section identifies specific challenges facing the SVBGSA.

3.6.1 Maintenance of Existing Facilities

Salinas Valley beneficial users have invested in projects and management actions over many decades prior to the enactment of SGMA. Monterey County does not receive any imported water from State or Federal water projects. MCWRA facilities that serve the Salinas Valley, including the 180/400 Subbasin, are critical components of the existing infrastructure that must be maintained and upgraded along with the construction of any new projects. Recurring operations and maintenance costs of these facilities need to be taken into consideration since they have priority for funding in the near term and add to the overall infrastructure funding needed for SGMA implementation.

Nacimiento and San Antonio Reservoirs play an important role in supplying water to this subbasin. SRDF is operated to redivert stored water through reservoir releases and then supplies that water to CSIP. MCWRA is working on several dam safety projects for Nacimiento and San Antonio Dam facilities to fulfill Federal and State regulatory requirements and to continue to provide flood protection and a sustainable water supply – these are surface water projects that are not included in the GSPs. However, at the estimated price tag of $200 million, the financial burden will be borne by the same constituents that will likely be asked to pay for SGMA PMAs.

CSIP Optimization is the second priority project in the GSP. Since 1998, MCWRA and M1W have operated SVRP and CSIP, with the addition of SRDF in 2010, to reduce groundwater pumping in the seawater intruded area of the Subbasin. Groundwater pumping is estimated to have been reduced by ~250,000 AF/yr. Nevertheless, CSIP still relies partially on groundwater pumping. Only 8 wells are currently operational, out of the 22 supplemental wells in the original CSIP system. Seawater intrusion or other localized impacts have made some wells no longer usable, and some wells passed their usable life. The system is presently not operating as originally designed. Aging infrastructure in the CSIP system, now over 25 years old, is a concern. Pumping from both CSIP supplemental wells and private standby wells will likely increase if insufficient in-lieu recycled and surface water are not supplied. The worst-case scenario in the 180/400 Subbasin would be a failure of these systems. SVBGSA will continue to encourage and support system maintenance but is dependent on MCWRA and M1W for ongoing operations and maintenance of these projects.

3.6.2 Project Costs and Funding

While Salinas Valley water users have made historic and significant investments in projects to address seawater intrusion and ensure adequate water supplies, significant new investments will be needed to achieve sustainability under SGMA. Paying for water projects involves assembling funding from a mix of public, private, and/or innovative sources to cover sizable capital and operating costs. Each project’s financing strategy depends on its size, purpose, and beneficiaries.

Many financial and economic uncertainties could impact project funding. Inflation, rising material costs, and fluctuating labor markets will increase construction costs over time. Securing adequate funding from public or private sources can be challenging, especially for multi-million-dollar projects requiring long-term financing. SVBGSA and other agencies will need to pursue financing mechanisms for new projects that ensure cost recovery while also keeping water affordable.

Funding a large-scale infrastructure project is always a challenge. Currently, the largest scale project with the greatest benefits that SVBGSA is studying is the Brackish Groundwater Restoration Project. It has an astounding capital cost estimate, ranging from $720 million to $1.5 billion depending on the scale, though this figure is on par with other projects of this magnitude in California. Instead, if multiple projects are selected to be implemented, these may collectively amount to a similar magnitude of costs. Demand management may be less expensive to implement but has other social, political, and economic implications. But if no new PMAs are implemented, this too would have economic impacts and costs associated with lack of action (e.g. being out of compliance with SGMA, dry wells, and/or need to treat groundwater due to seawater intrusion). Generally, implementing multiple large dollar projects would likely be infeasible.

This process will consider potential project costs to end users to determine reasonable and equitable cost shares for project financing and willingness to pay them. To implement PMAs, SVBGSA will need to develop agreements with multiple agencies and interested parties to participate in projects that benefit all participants. Urban water providers and the agricultural industry will need to agree to a cost allocation for projects benefiting their operations.

In the next evaluation cycle, SVBGSA is planning to explore different capital project funding options and financing strategies, which may include public financing, such as federal, state, or local grants or low-cost loan programs, user fees and charges, specialized financing mechanisms, or other innovative approaches. By combining funding approaches, large water infrastructure projects can secure the capital needed to meet the growing demands for sustainable and reliable water systems.

3.6.3 Implementation Timelines

Implementation timelines will be a key consideration in the PMA selection process during the next evaluation period. Several of the PMAs, if selected, have long project timelines to move from initial feasibility studies currently being done to “shovel ready” projects. Large projects often require years of planning, design, and approval, during which economic, environmental, or political conditions may change. PMAs could be phased or implemented on different timelines. For example, certain demand management measures may be needed while projects are being developed and implemented.

Various aspects of project pre-construction phases come with delay risks to implementation timelines. The regulatory and permitting process can often cause delays. Securing project approvals and permits under laws like the California Environmental Quality Act (CEQA) or National Environmental Policy Act (NEPA) can be time-intensive, particularly if the project faces opposition. Projects that require approval from multiple agencies (e.g., state, federal, and local) pose coordination and schedule challenges.

3.6.4 Public Acceptance and Social and Political Feasibility

Public support will be important to the success of GSP implementation. It will require ongoing and clear communication about project costs and benefits. Lack of support will pose a significant challenge to PMAs. Through active public outreach and engagement, SVBGSA will assess which PMAs have public support through a selection process to determine which PMAs should move forward to the next phase of GSP implementation.

3.6.5 Other Agency/Utility Projects

There are several other projects not included in the GSP but pertain in part to the 180/400 Subbasin. Implementation of GSP PMAs will very likely require coordination with these other projects to consider multiple initiatives.

3.6.5.1 Pure Water Monterey/Expansion

In the Monterey Peninsula region of Monterey County, water historically came from 2 sources: 1) a local river (Carmel River) and 2) groundwater (Seaside Groundwater Basin). Overuse of these 2 sources threatened water quality and habitats, leading to state and court-ordered reductions in these resources. To help address this challenge, M1W and its partners came together to create a drought-proof new and independent water supply: Pure Water Monterey (PWM).

Using a proven, multi-stage treatment process, PWM turns wastewater into a safe, reliable, and sustainable water supply that complies with or exceeds strict State and Federal drinking water standards. M1W collects, treats, and purifies the wastewater before conveying and injecting the water into the Seaside Groundwater Basin. M1W sells the new water supply to the Monterey Peninsula Water Management District (MPWMD) who has jurisdiction over the Seaside Groundwater Basin. MPWMD has a contract with California American Water (Cal Am) who extracts the water and delivers it to its customers in its Monterey main service district, outside of the Salinas Valley Groundwater Basin.

The PWM Expansion Project will expand the Advanced Water Purification Facility (AWPF) peak capacity from 5 mgd to 7.6 mgd and increase injection to the Seaside Groundwater Basin by an additional 2,250 AF/yr (for a total average yield of 5,750 AF/yr). The Project includes an expanded injection well area and installation of approximately 12,100 linear feet of new product water conveyance pipelines, 2 injection wells, a backflush basin, and associated equipment.

MCWRA and M1W have an “Amended and Restated Water Recycling Agreement” for the CSIP/SVRP and PWM projects. Wastewater treated for both projects come through the Regional Treatment Plant. These agencies will continue to manage and monitor source waters available for recycling under this agreement and are planning updates to it. This may inform work on CSIP Optimization and feasibility of CSIP Expansion.

Because CSIP, PWM, and PWM Expansion Project rely on the availability of the same water, there are concerns about competing operational needs over time. The community of affected and interested stakeholders has diverse perspectives about the role these projects have in the overall management of water resources in the County. SVBGSA applied for the DWR professional facilitation support to conduct a stakeholder assessment and to create a broad and common understanding about CSIP, its benefits, opportunities, and limitations. This work is currently underway.

3.6.5.2 Monterey Peninsula Water Supply Project

The Monterey Peninsula Water Supply Project (MPWSP) will augment Cal-Am’s Carmel River water rights and Seaside Groundwater Basin native supplies that are constrained by legal decisions (SWRCB Cease and Desist Order and Adjudication). In addition to adding PWM to the water supply portfolio, MPWSP includes 5 slant wells located at the site of the CEMEX Lapis sand mining operation that are being retired in the northern coastal area of the City of Marina and would extend offshore into the submerged lands of the Monterey Bay National Marine Sanctuary. A source water pipeline would convey the source water 2.5 miles inland from the wells to a 4.8 mgd capacity desalination plant to be constructed in unincorporated Monterey County. The brine is proposed to be discharged into the Monterey Bay National Marine Sanctuary through M1W’s existing wastewater outfall. It also includes improvements to the existing Seaside Groundwater Basin aquifer storage and recovery (ASR) system facilities, which would enable CalAm to inject desalinated water into the groundwater basin in wetter years for subsequent extraction and distribution to customers in drier years.

CalAm is working on the implementation of the desalination components of the MPWSP. The CEMEX property is in the 180/400 Subbasin and is coincident with the County of Monterey GSA (see Section 6.6.1). Ongoing litigation related to this project will need to be resolved prior to project construction. There is uncertainty around the impact of this project on the 180/400 Subbasin and whether it would affect sustainability under SGMA. Continued controversy over the MPWSP may affect SVBGSA’s PMA implementation if not resolved.

If the Brackish Groundwater Restoration Project is selected to move forward in the Salinas Valley, it too would rely on M1W’s outfall for brine discharge. Both projects would require modifications to the outfall to meet Ocean Plan requirements. Cumulative effects of these discharges will need to be further evaluated during the environmental review process.

3.6.5.3 Interlake Tunnel and San Antonio Spillway Modification Project

MCWRA's Interlake Tunnel and San Antonio Spillway Modification Project (ILT) connects existing facilities at Nacimiento and San Antonio Reservoirs to increase water storage capacity and achieve environmental and water conservation release efficiencies. The Interlake Tunnel Project would utilize existing storage infrastructure by designing and constructing a 12,000-foot underground tunnel between the Nacimiento and San Antonio reservoirs to transfer water and thereby increase the opportunity to store additional water when available. Cost estimates for this project in 2022 were $150 million. This project is not in the 180/400 Subbasin GSP.

MCWRA circulated a Draft EIR for the ILT project in early 2023, and a Final EIR has not yet been completed. MCWRA filed Petitions for Change to their Nacimiento and San Antonio Reservoir Water Rights in 2021 to facilitate its Interlake Tunnel Project, as well as a Petition for Extension of Time to complete use of water under its Permit 21089. The SWRCB has not yet issued orders on these petitions, so the requested changes remain outstanding. MCWRA will prepare a Final EIR once the water rights petitions progress further.

SVBGSA will continue to monitor this project and consider its potential effects on the feasibility of other PMA. It should be included in a cost and benefit analysis comparing PMA options in the Salinas Valley and be part of a project selection process.

3.6.6 Salinas Valley Integrated Implementation Plan

The 2020 GSP called for an integrated sustainability plan to achieve groundwater sustainability in all 6 of the Salinas Valley subbasins under SVBGSA's authority. PMAs included in the GSP were considered part of a larger set of integrated projects and actions for the entire Salinas Valley. In line with the 2022 GSPs prepared for the other 5 subbasins, the 180/400 Subbasin PMAs were updated in Amendment 1. Some PMAs are included in other GSPs where applicable. SVBGSA prepared an Integrated Implementation Plan (IIP) in 2022 that summarized groundwater conditions across the Salinas Valley.

The Advisory Committee recommended putting an IIP on hold until interested parties representing different areas of the Valley could use the USGS final Valley-wide SVIHM model for inter-subbasin modeling. There have been several delays in the completion of the SVIHM under development by USGS, most recently delayed to early 2025. While SVBGSA developed the SWI Model as a tool to estimate the effects of PMAs on seawater intrusion and it is currently being used, the SVIHM is needed for additional PMA feasibility studies and to understand PMA effects across subbasins.

Project priorities for all subbasins should be reviewed considering new information from feasibility studies and reconsidered in the next 2 years as part of the GSP 2027 Evaluations. More information is still needed to compare large scale infrastructure projects, and to determine which PMA or combinations of PMAs will best achieve sustainability goals. An addition to the Integrated Implementation Plan could serve as a tool for a review of PMAs across the Salinas Valley, to understand more broadly where projects would provide benefits and cross-boundary effects in multiple subbasins.

SVBGSA intends to update this document with the recent data and formalize it as a road map for holistic implementation of SGMA in the Salinas Valley.

3.7 Summary of Progress Toward Sustainability

As noted in Section 3, the 180/400 Subbasin has had undesirable results over the evaluation period for 4 of the 6 sustainability indicators: Groundwater Levels, Seawater Intrusion, Groundwater in Storage, and Interconnected Surface Water.

SVBGSA spent the first 5 years of GSP implementation filling data gaps, working with partner agencies to improve existing infrastructure, and conducting feasibility studies to determine which PMAs are best to achieve groundwater sustainability. Filling data gaps is important to understand which PMAs to implement, where to implement them, and how to design them. In addition to expanding the monitoring networks, SVBGSA developed the SWI Model to assess the impact of PMAs on seawater intrusion and groundwater levels in the coastal area.

With help from the Round 1 SGM Implementation Grant, SVBGSA explored the 3 types of PMAs that can potentially mitigate seawater intrusion: an extraction barrier, injection, and reducing extraction. Those will culminate in a project update report in early 2025, and be complemented by consideration of various combinations of PMAs in the 180/400 and other subbasins. These feasibility studies show that at least 1 project can meet the seawater intrusion minimum threshold: the Brackish Groundwater Restoration Project, which pairs an extraction barrier with desalination for a drought-proof alternative in-lieu supply.

In 2025, SVBGSA will explore whether combinations of PMAs would likewise meet the minimum threshold. Groundwater modeling shows the measurable objective may have been set unreasonably ambitious, and SVBGSA will consider if there are other ways to address the needs of beneficial users in the coastal area, such as CSIP expansion, alternative water supplies, and/or management of the Deep Aquifers.

SVBGSA intends to submit the next periodic evaluation for the 180/400 Subbasin in 2027 in line with the other 5 Salinas Valley subbasin periodic evaluations. In the next 2 years leading up to those periodic evaluations, SVBGSA will work on a comprehensive PMA selection process that will meet the sustainability needs of all subbasins individually and in an integrated manner.

4 BASIN SETTING BASED ON NEW INFORMATION

This section evaluates the basin setting based on new information or changes in basin water use within the 180/400 Subbasin. As a preface to the SMC, Section 2.1 describes the basin conditions that impact water use and summary of water use and supply changes. This section builds on that by describing updates to the understanding of the basin setting, including the HCM, groundwater conditions, water budget, and groundwater flow modeling.

4.1 Updated Hydrogeologic Conceptual Model

SVBGSA updated the HCM with new data that became available during the evaluation period. The Salinas Valley Deep Aquifers Study (M&A, 2024a) included data collection that mapped the extent of the Deep Aquifers and analyzed hydrogeological relationships. In addition, new AEM data, aquifer property data, and analysis of water chemistry informed a revised understanding of the Subbasin's HCM that largely filled the HCM data gaps identified in the GSP.

4.1.1 Salinas Valley Deep Aquifers Study

The Deep Aquifers increasingly provide vital groundwater resources for drinking water, irrigation, and industrial use in the Salinas Valley. When shallower wells become intruded with seawater, replacement wells have been drilled into the Deep Aquifers. While only 5% of water use in the 180/400 Subbasin comes from the Deep Aquifers, the communities of Castroville, Marina, and Salinas all depend significantly on the Deep Aquifers for their drinking water supplies. Groundwater elevations in the coastal Deep Aquifers area have declined significantly over the past 2 decades. Previous studies have pointed to the need to monitor and manage the Deep Aquifers due to declining groundwater elevations and resulting risk of seawater intrusion (Feeney and Rosenburg 2003, MCWRA 2017, MCWRA 2020).

The Salinas Valley Deep Aquifers, completed in April 2024, focused on key questions about the HCM to inform management. It developed the first definition of what constitutes the Deep Aquifers, collected additional AEM data, and brought together multiple types of data to delineate the extent of the Deep Aquifers. The Deep Aquifers definition was primarily based on the presence of a continuous aquitard between the 400-Foot Aquifer or its stratigraphic equivalent and the Deep Aquifers. The Study found the Deep Aquifers extends into 6 subbasins of the Salinas Valley.

Using the best available groundwater flow models, the Study completed the first water budget of the Deep Aquifers, dividing them into 3 regions based on geology, water chemistry, a groundwater level divide, and amount of available data. Most extraction occurs in either the Seaside Subbasin or the coastal 180/400 and Monterey Subbasins, in part due to seawater intrusion in the overlying aquifers. Very little extraction occurs, and limited data has been collected, from the Deep Aquifers south of the City of Salinas.

While there is likely subsurface inflow and outflow with adjacent and overlying aquifers, the rate of flow is slow. The Study collected and analyzed isotope data and found no evidence of modern-day (post-1953) surficial recharge reaching the Deep Aquifers. A previous 2002 study (Hanson *et al.*, 2002) age-dated coastal Deep Aquifers water near the City of Marina at 25,000 years old.

SVBGSA presented the findings to the Boards of agencies with jurisdiction over the Deep Aquifers, including the Boards of the SVBGSA, Marina Coast Water District GSA, MCWRA, and the County of Monterey Board of Supervisors. These agencies have formed a Deep Aquifers Agencies Working Group to develop recommended actions to manage the Deep Aquifers. The Study provides 12 pieces of guidance aimed at halting further degradation and improving groundwater elevations to prevent seawater intrusion and subsidence. These focus on providing science-based principles to guide management where there is sufficient data for managing the Deep Aquifers. The guidance does not extend to policy decisions, the type of management actions or projects to implement, or how the guidance should be applied, as those are beyond the Study scope. The working group is planning to bring policy and implementation recommendations to their respective Boards in 2025, as well as recommendations for refining the existing monitoring networks to track trends, identify changes, and enhance the understanding of groundwater conditions.

4.1.2 Geology, Extents, and Hydrogeology Updates

During this evaluation period, SVBGSA focused on filling data gaps and updating the hydrostratigraphic framework section of the HCM in the 180/400 and other subbasins. SVBGSA reviewed new data and identified priorities for further analysis. Multiple data sources were brought together to refine the understanding of the extents, thicknesses, and connectivity between the aquifers. The effort brought data sources together in the 3D visualization software Leapfrog to enable refinement of groundwater flow model layers.

Data included in hydrostratigraphic framework update analysis:

- Published reports – further review of reports including the Fort Ord Investigation (Harding ESE, 2001), the El Toro Groundwater Study (Geosyntec, 2007), Toro Study Follow up Cross-Sections (GeoSyntec, 2010), Deep Aquifers Tech Memo (Feeney and Rosenberg, 2003), North Salinas Valley Hydrostratigraphy (Kennedy/Jenks, 2004), the Monterey Bay Seismic Study (Maier, *et al.*, 2016), and the Hydrological Report of the Deep Aquifers (Thorup, 1976-1983).
- Geophysical data – AEM surveys including DWR Survey Area 1, DWR Survey Area 8, and the Salinas Valley Deep Aquifers Study

- Offshore geophysical data – USGS 2016 Seismic Data in Monterey Bay
- Well completion reports, lithologic logs, and borehole geophysical logs

To update the aquifer and aquitard extents, data were reviewed together in Leapfrog to compare and adjust stratigraphy. Previous groundwater flow model layers were compared to and adjusted based on the new data. Lithologic logs were analyzed and juxtaposed with other geologic data to refine specific areas of the subsurface. Additional studies were also incorporated, such as MCWRA's mapping of thin spots and holes in the 180/400 Aquitard. Groundwater model layers were adjusted and smoothed within Leapfrog based on selection of data to anchor revisions.

Key results include:

- Offshore bedrock and hydrostratigraphy was refined based on updated surface geology maps that showed outcrops of the geologic formations in the Monterey Canyon, the 2016 USGS Seismic study, and current bathymetry.
- The bedrock surface, which includes the Monterey Shale and/or crystalline rocks, was improved based on the 2016 USGS Seismic study and oil exploration well borings, which included data points down the axis of the Valley.
- The lateral and vertical extent of the 400/Deep Aquitard and Deep Aquifers was refined based on the AEM data and lithologic log analysis. The Deep Aquifers extends across most of the Subbasin, and the 400/Deep Aquitard is deeper than previously mapped in the southern part of the Subbasin.
- Holes and thin spots in the 180/400 Aquitard that had been mapped by MCWRA (2017) were included in the layering refinements, as they may impact the relationship of seawater intrusion across or between the 180-Foot and 400-Foot Aquifers.
- Coastal aquitard extents and depths were revised working together with MCWD GSA, and transition zones were noted for modeling in areas of uncertainty between data points.
- The Salinas Valley Aquitard (SVA) extent was updated with new data, and laterally equivalent clays from other sources were also analyzed, to better represent where clays inhibit connectivity between surface water and the 180-Foot Aquifer.
- Some refinements in areas outside of the 180/400 Subbasin also affected the understanding of groundwater conditions within the Subbasin, such as the granite bedrock being shallower in the northern Eastside Subbasin than previously documented and bedrock uplift that separates groundwater in the El Toro part of the Corral de Tierra Management Area from the Toro Park and 180/400 Subbasin.

The data, methods, and findings of the aquifer framework update are attached in Appendix 5A.

4.1.3 Aquifer Properties Updates

During this evaluation period, existing aquifer property data were compiled from literature, agencies, and regional numerical groundwater flow models for the Salinas Valley. In addition, 2 aquifer tests were conducted for the Deep Aquifers Study. The deep wells that were tested were located just outside the 180/400 Subbasin boundary with the Eastside Subbasin; however, the test results still provide information for aquifer properties at similar depths and adjacent to the Deep Aquifers in the 180/400 Subbasin. Additional aquifer test data were compiled from DWR, the CSIP wells, and from previous studies for developing and calibrating the Salinas Valley Seawater Intrusion Model (M&A, 2023).

Hydraulic conductivity measurements vary within aquifers both horizontally and vertically. Measurements within a single aquifer can range by multiple orders of magnitude. Hydraulic conductivity measurements range from less than 1 to about 1,400 feet/day for the 180-Foot Aquifer, from less than 1 to about 500 feet/day for the 400-Foot Aquifer, and from 2 to 44 feet/day for the Deep Aquifers, based on values reported in the Seawater Intrusion Model report (M&A, 2023), the Deep Aquifers Study report (M&A, 2024a), and the well installation report for the new monitoring wells previous described in Section 1 (M&A, 2024b). This updated information is useful for updating groundwater models and evaluating impacts of PMAs.

4.1.4 Groundwater Chemistry Updates

In the 2020 GSP and GSP Amendment 1, the HCM included general mineral chemistry for the Subbasin, undifferentiated by aquifers. Building on the analysis in the Deep Aquifers Study, the HCM update completed for this GSP 2025 Evaluation develops a dataset of the groundwater chemistry by aquifer.

Figure 4-1 shows a trilinear diagram for the most recent sample in selected wells across the 180-Foot, 400-Foot, and Deep Aquifers. Analysis of water chemistry type according to the major cations and anions shows that the groundwater in the 180-Foot and 400-Foot Aquifers are of similar composition. The Deep Aquifers groundwater chemistry is generally distinct from the overlying aquifers, except for in a few wells that have similar composition to the overlying aquifers. Groundwater in each principal aquifer is generally of a mixed water type since they do not fit discretely within a single water type classification. There are some key differences between the 180-Foot and 400-Foot Aquifers as compared to the Deep Aquifers. The chemical compositions in both the overlying aquifers are relatively high in calcium and low in sodium concentrations compared to the Deep Aquifers. Differences in chemistry is due to the differing geochemistry of the aquifer sediments, amount of mixing between aquifers, and the residence time for groundwater interactions with the aquifer sediments. These results suggest greater mixing between the 180-Foot and 400-Foot Aquifers than with the Deep Aquifers; however, there may be some limited mixing of Deep Aquifers groundwater, such as where there is either leakage across the aquitard clays or hydraulic connection with adjacent aquifers.

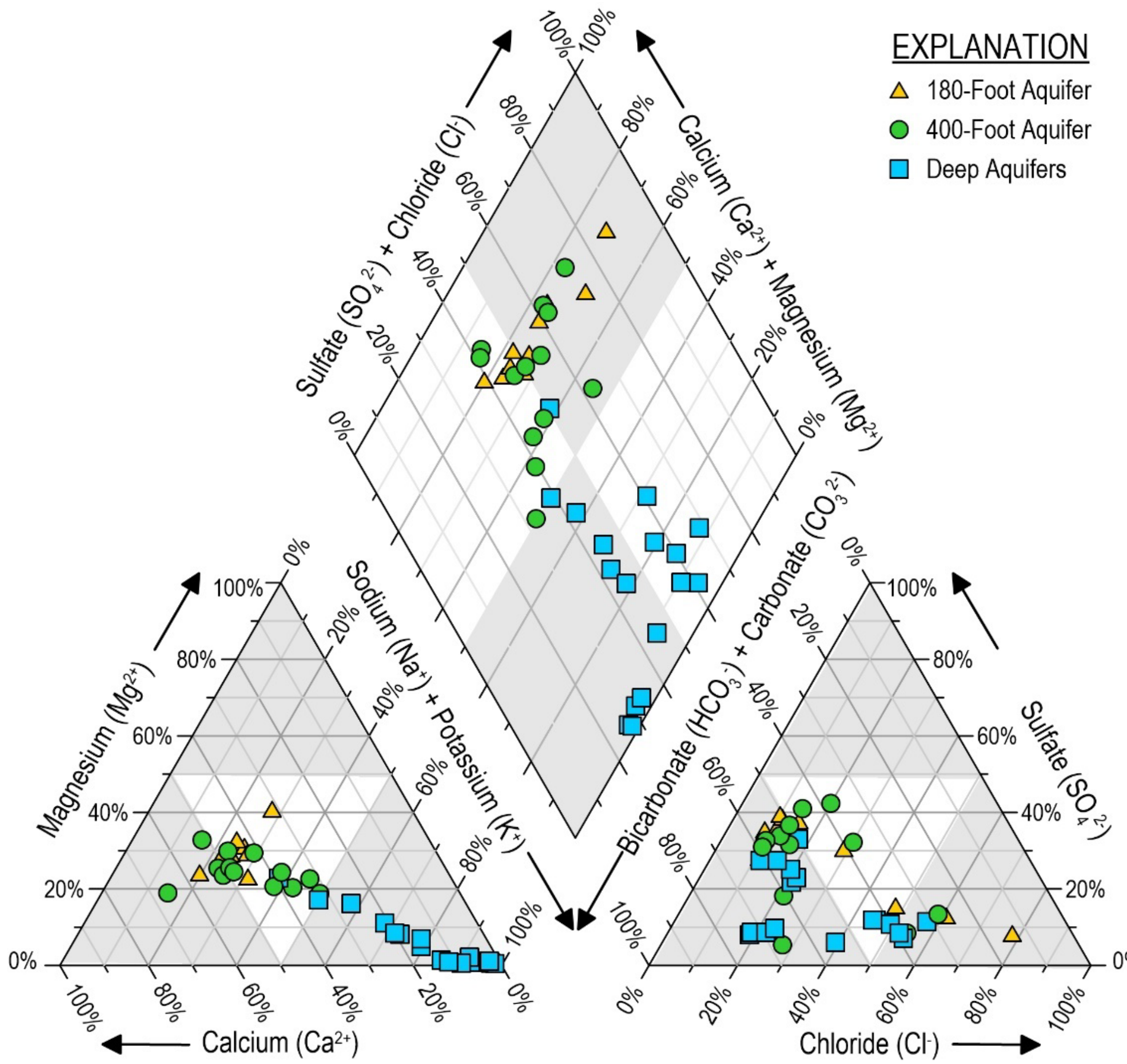


Figure 4-1. Trilinear Diagram for Most Recent Groundwater Samples in Select Wells in the 180-Foot, 400-Foot, and Deep Aquifers

4.2 Updated Groundwater Conditions

During the evaluation period, SVBGSA worked to improve the understanding of regional groundwater conditions. Efforts are underway to reconcile groundwater quality sources and field verify GDEs.

4.2.1 Groundwater Quality

The understanding of regional groundwater quality conditions has not significantly changed in the past 5 years.

In 2024, 2 new MCLs were published that have bearing on the Subbasin's groundwater quality monitoring. In the WY 2022 Annual Report, hexavalent chromium was identified as a COC, its minimum threshold was established using the preliminary maximum contaminant level (MCL) of 10 µg/L for drinking water. In April 2024, the State adopted the concentration of 10 µg/L as the MCL for hexavalent chromium. Furthermore, PFAS had MCLs established by the U.S. Environmental Protection Agency (EPA) in April 2024. Public water systems are required to monitor for PFAS and have until 2027 to complete initial monitoring, followed by ongoing compliance monitoring. PFAS will be added as a COC and concentrations will be reported in the WY 2024 Annual Report. No other new COCs have been identified.

4.2.2 Groundwater Dependent Ecosystems

The 2020 GSP identified potential GDEs through Natural Communities Commonly Associated with Groundwater (NCCAG) Dataset. GSP Amendment 1 included a more robust section (Section 4.4.5.2) that added information summarizing known information about GDEs within the Salinas Valley.

As described in 2.1.3, DWR Recommended Corrective Action 3 asked SVBGSA to clarify its plan to conduct necessary field reconnaissance for GDE identification and report on the results. CCWG has further developed a methodology for SVBGSA to identify, assess, and monitor potential GDEs. GDE Identification and a GDE Monitoring Standard Operating Procedures (SOP) are attached as Appendix 5B. The NCCAG dataset was filtered to reflect local habitat and groundwater conditions. Areas were excluded that were disconnected from the principal aquifers by the Salinas Valley Aquitard. Areas were also excluded if groundwater levels were considered too deep to be a water source for overlying vegetation (30 feet below ground surface for most vegetation, 80 feet below groundwater surface for Oak-dominated habitats). Specific vegetated areas were not excluded if they were identified by the community as ecosystems of importance that should be monitored regardless of their water source. While ecosystems are categorized as GDEs, they likely rely on surface water sources in addition to groundwater.

GDEs were categorized into "GDE Units" based on similar underlying hydrogeology. To determine which GDEs have the greatest habitat value it is recommended to identify which GDEs are drought refugia, have recent observations of threatened and endangered species, and/or are nominated as ecologically important by local subject matter experts (Rohde *et al.*, 2024).

Drought refugia are areas of habitat that stay wet and/or green for longer than their surroundings. By staying wet and green for longer these refugia continue to provide quality habitat for species when the surrounding areas have become too dry to be suitable habitat, thus providing a resource for maintaining sensitive species' populations through periods of drought. Researchers have developed a robust methodology for identifying drought refugia across California and have made their findings publicly available (Rhode *et al.*, 2024). Wherever drought refugia in this dataset overlap with identified GDEs, those GDEs were included in the subset for additional field-based monitoring. In 2024, CCWG conducted field-based monitoring at 4 sites in the Subbasin (with 16 sites to be monitored by the end of 2024) that sets a baseline to which future field assessments are compared, and if potential GDEs are found to be in decline it would trigger a groundwater assessment of whether and to what extent the decline is likely due to groundwater conditions.

Future monitoring of identified GDEs will consist of a desktop-based component, where vegetation vigor is monitored for all GDEs using satellite imagery, and a field-based component, where the habitat condition of a subset of GDEs will be assessed using the California Rapid Assessment Method (CRAM). Within the GDE Units, locations were selected for CRAM based on ecological importance and proximity to existing monitoring well, if applicable.

Remote sensing of vegetation will determine if it is uncharacteristically water stressed. An initial SOP for monitoring using remote sensing is proposed by CCWG, and it will be updated in 2025 to include water stress factors for areas of drought refugia and additional factors to be considered for the main stem of the Salinas River, including releases form Nacimiento and San Antonio reservoirs. CRAM scores will be tracked with an emphasis on the Biological Structure attribute of the tool, as that is expected to be most reflective of changes in the water supply available to support vegetation. Any substantial decrease in CRAM scores should not automatically be attributed as an adverse impact due to groundwater management, and instead be considered a flag to investigate the root cause of the decrease.

Additionally, locations for additional shallow groundwater table monitoring wells will be recommended. These additional wells will ideally be located next to GDEs with CRAM assessments to help determine if there is a relationship between habitat condition and groundwater levels. GDEs for which monitoring indicates a negative impact threshold has been crossed will be flagged for additional investigation into whether this impact was caused by groundwater management activities. The location of GDEs, the monitoring methods, and assessment impact thresholds will be updated iteratively as additional information becomes available and pilot monitoring and assessment efforts are completed.

4.3 Model Updates

Since GSP development, the development and updates of local groundwater flow models have advanced significantly, providing improved tools to assess and plan for actions to reach sustainability. SVBGSA uses 2 groundwater flow models for the 180/400 Subbasin: the SVIHM, including its predictive version the SVOM, and the Salinas Valley Seawater Intrusion Model

(Seawater Intrusion Model). The 2 models have separate and distinct purposes. The SVIHM and SVOM are regional models used for surface water and groundwater planning throughout the Salinas Valley. The Seawater Intrusion Model focuses on managing seawater intrusion and covers the north end of the Salinas Valley.

During the evaluation period, the USGS released additional provisional versions of the SVIHM and SVOM, and SVBGSA and the County of Monterey completed development of, and updates to, the Seawater Intrusion Model. Figure 4-2 shows the extent of the models in relation to the 180/400 Subbasin.

The USGS is nearing completion of the SVIHM and SVOM. During the evaluation period, the USGS released several provisional model versions. For drafting GSP Amendment 1, SVBGSA used a preliminary version of the SVIHM that was consistent with the version used for the 2022 Eastside, Forebay, Langley, and Upper Valley Subbasin GSPs. Details on the SVIHM and SVOM can be found in the USGS Progress Report: Overview of Salinas Valley Models (2021), GSP Amendment 1 Appendix 6A. The USGS are on track to release the final version in February 2025. The most recent version was released in May 2024 and was used to draft the water budget for this GSP 2025 Evaluation. Key model revisions addressed in the most recent version, compared to the version used in the GSP, include the following:

- There is improved calibration of groundwater elevations.
- There is an improved match to reported agricultural pumping. The SVIHM does not include specified agricultural pumping, and instead dynamically estimates agricultural pumping based on land use and climate data.
- There are modifications to specified municipal and industrial pumping.

SVBGSA applied for and received SGM Implementation Grant Funding for SVIHM revisions, anticipated to be completed in 2025. Development of the SVIHM predated GSP development, and key revisions will improve the model for groundwater management purposes. In addition, SVBGSA plans to update the SVIHM according to the Deep Aquifers Study and HCM Updates.

SVBGSA and the County of Monterey funded development of the variable density Seawater Intrusion Model to better assess and address future seawater intrusion. M&A completed the initial version of the Seawater Intrusion Model in March 2023 and an update in November 2024. Details of model development and calibration can be found at: https://svbgsa.org/resources/seawater-intrusion/salinas-valley-seawater-intrusion-model/. During the evaluation period, M&A completed 2 updates that accomplished the following:

- Improved the groundwater elevation calibration
- Better reflected lack of observed seawater intrusion in the Seaside Subbasin

- Incorporated the Deep Aquifers Study findings and HCM updates, including working with MCWD GSA to reach agreement on stratigraphy

SVBGSA has begun to use the provisional SVOM and Seawater Intrusion Model for project feasibility studies.

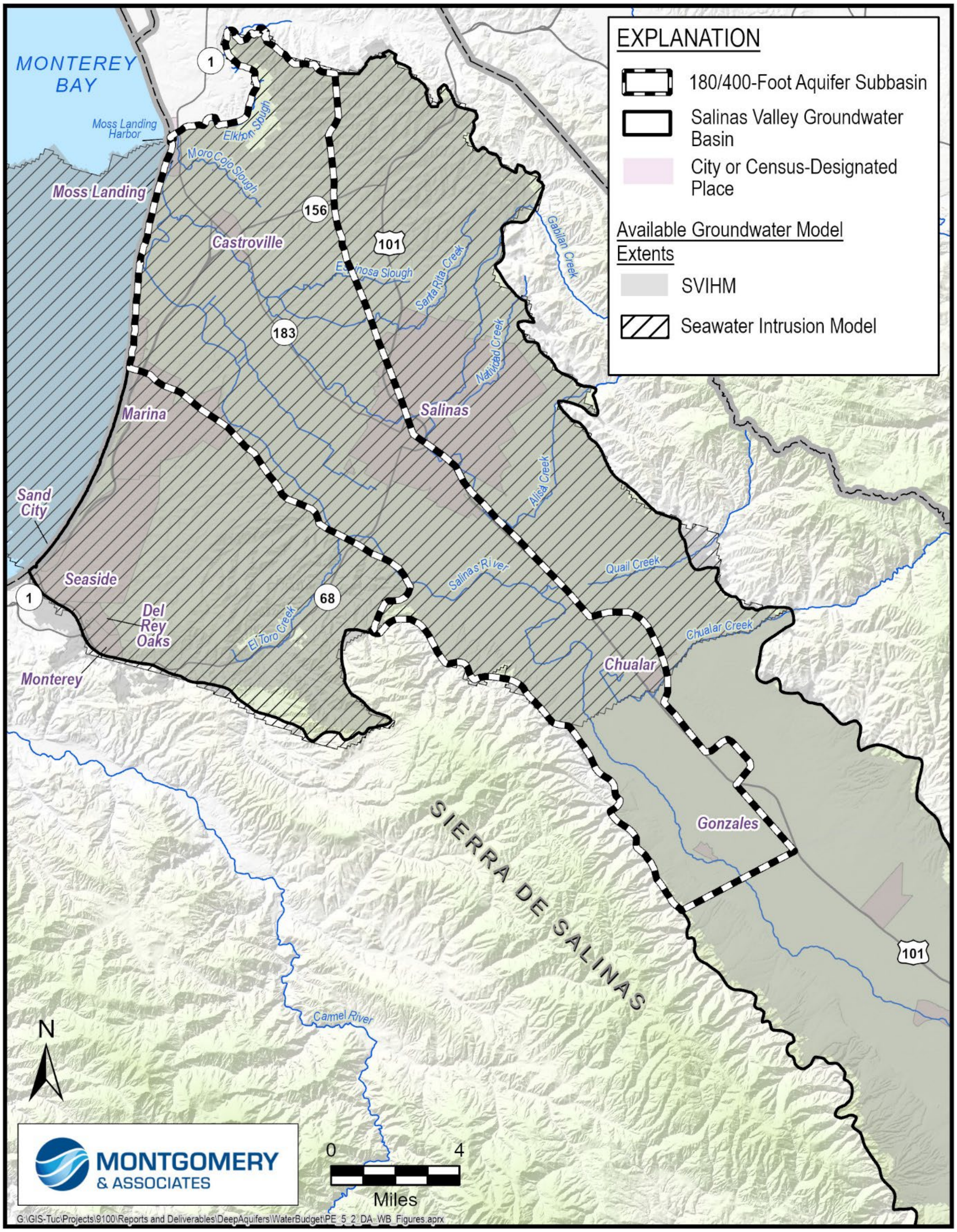


Figure 4-2. Groundwater Flow Model Areas

4.4 Water Budget and Comparison to Water Use

SVBGSA updated the water budgets for the 180/400 Subbasin with the most recent provisional version of the SVIHM for the historical and current water budgets, and used the SVOM for the projected water budget. These are the only models that cover the entire Subbasin. The updated historical, current, and projected water budgets are included in Appendix 5C, and are summarized in the sections below. As noted in Section 4.3, these are developed with versions of the SVIHM and SVOM that are more recent than the models used in GSP Amendment 1. SVBGSA plans to update the SVIHM and SVOM in 2025, and therefore, while these are the most accurate water budgets, they should be considered interim.

4.4.1 Updated Historical and Current Water Budget

SVBGSA develops historical and current water budgets by running the Valley-wide SVIHM and assessing groundwater inflows and outflows in the 180/400 Subbasin. Similar to water budgets developed with previous model versions, it shows that while inflows and outflows vary year to year, the Subbasin is in overdraft on average, leading to a long-term decline of groundwater in storage.

The historical water budget time period is 1980-2018 and the current water budget time period is the last 2 years of the SVIHM, 2017-2018. Of note, 2017 had significantly more precipitation than 2016, resulting in more recharge and less groundwater pumping. Therefore, the current water budget change in groundwater storage is much higher than the long-term average change in storage. Appendix 5C details the historical and current water budget.

The main groundwater inflows into the Subbasin are deep percolation of precipitation and irrigation water, subsurface inflow from adjacent groundwater basins and subbasins, and stream recharge. The predominant groundwater outflows are groundwater pumping, subsurface outflow, and evapotranspiration. Discharge to streams is too small to be seen on the figure below.

Figure 4-3 shows the entire historical groundwater water budget from the SVIHM, including annual change in groundwater storage shown by the purple line. The black line on this figure is the cumulative change in storage. As shown by the purple line, annual changes in groundwater storage are strongly correlated with changes in deep percolation of precipitation. For example, 1983 and 1998 were comparatively very wet years with significant precipitation and stream percolation. These years correspondingly show the greatest increases in groundwater storage during the historical period. Estimated cumulative change in groundwater storage has steadily declined over time with slight increases in response to wet periods.

The change in storage shown on Figure 4-3 only represents change in storage due to groundwater level change. As noted earlier, the change in storage SMC accounts for change in storage from both groundwater level change and seawater intrusion.

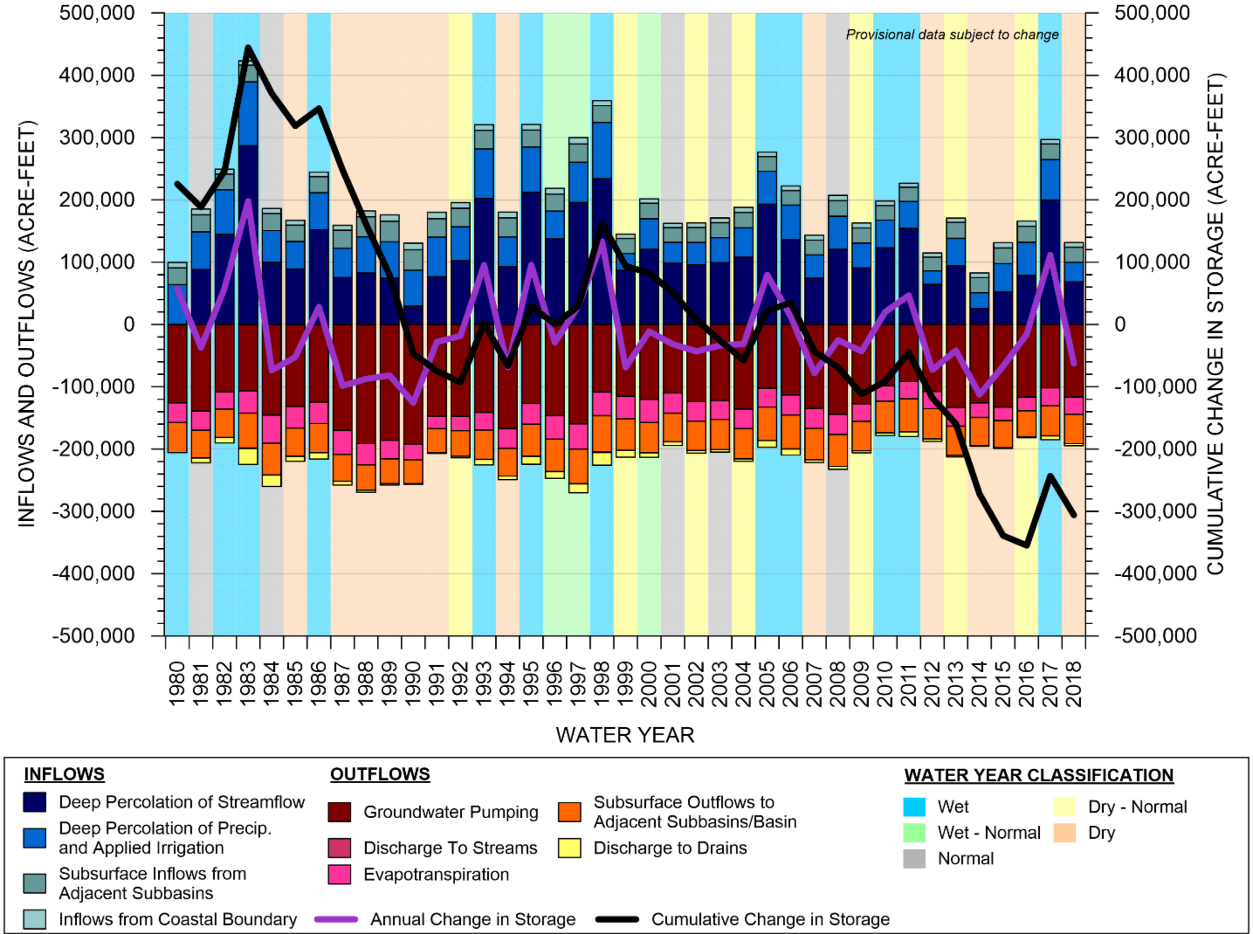


Figure 4-3. SVIHM Simulated Historical and Current Groundwater Budget

The SVIHM estimated the historical average annual decline in storage due to change in groundwater levels was 10,100 AF/yr, which is significantly greater than estimated using measured groundwater level data, as calculated in GSP Amendment 1. Storage estimates will be refined with future model improvements.

A comparison of the historical and current groundwater budgets is shown in Table 4-1. Negative values indicate outflows or depletions. Historical average decline in storage (overdraft) due to groundwater elevations was 10,100 AF/yr. Groundwater flow across the coastline is shown in Table 4-1 as an inflow; however, the SVIHM does not account for water quality. This inflow of saline groundwater into the Subbasin contributes to the loss in usable storage within the subbasin. This table helps show the relative magnitude of various water budget components; however, these results are based on a provisional model and will be updated after the SVIHM is completed and released by the USGS.

The current water budget change in storage is significantly higher than the historical average due to WY 2017 being a wet water year after the 2014-2016 drought. It is not indicative of a change in the average trend of declining groundwater in storage.

Table 4-1. Summary of Groundwater Budget

	Historical Average (WY 1980-2018) (AF/yr)	Current (WY 2017-2018) (AF/yr)
Net Inflows		
Net Stream Exchange (Deep Percolation of Streamflow – Discharge to Streams)	120,700	138,200
Deep Percolation of Precipitation and Applied Irrigation	52,200	48,200
Net Coastal Inflow	7,800	6,900
Net Outflows		
Groundwater Pumping	-131,400	-109,100
Net Flow from Adjacent Subbasins/Basin	-21,200	-22,800
Discharge to Drains	-7,200	-4,500
Groundwater Evapotranspiration	-31,200	-28,500
Net Change In Storage (overdraft)		
Change in Storage due to Groundwater Levels	-10,100	28,700

Note: provisional data subject to change. This groundwater model does not factor in loss of usable storage due to seawater intrusion. The water budget does not balance exactly due to a combination of model error and presenting rounded water budget components.

Sustainable yield is the amount of Subbasin-wide pumping that results in no undesirable results. For this GSP 2025 Evaluation, sustainable yield is estimated by balancing the water budget, resulting in no net decrease in storage of usable groundwater, including both due to groundwater levels and seawater intrusion. This estimate of sustainable yield can guide groundwater management on a subbasin level. However, outflows may need to be reduced or inflows need to be increased in localized areas to meet the sustainability goal. Furthermore, sustainable yield does not account for water budget changes that may be needed to address seawater intrusion.

The sustainable yield can be estimated as:

Sustainable yield = pumping + change in storage due to groundwater levels + change in storage due to seawater intrusion

Table 4-2 provides an estimate of sustainable yield based on results from the SVIHM. The simulated change in groundwater storage is used for this calculation, as well as an estimate of seawater intrusion described in Appendix 5C. The total estimated loss of useable storage for the Subbasin is 22,700 AF/yr, which is the sum of seawater intrusion (12,600 AF/yr loss) and net storage loss due to groundwater level changes (10,100 AF/yr). Using this estimate of loss in storage, the best estimate of sustainable yield for the Subbasin is 108,700 AF/yr. There is uncertainty in this estimate. In addition to the caveats listed above, and the inherent uncertainty that exists in all numerical models, this estimate is based on results from a provisional version of the SVIHM. Sustainable yield estimates will be refined and improved upon when the final version of the SVIHM is released, and subsequently updated.

Table 4-2. Historical Sustainable Yield within the 180/400 from Simulated Pumping and Change in Storage, and Mapped Seawater Intrusion Areas

	Historical Average (WY 1980-2018) (AF/yr)
Total Subbasin Pumping	131,400
Change in Storage due to Groundwater Levels	-10,100
Change in Storage due to Seawater Intrusion	-12,600
Estimated Sustainable Yield	108,700

Note: Pumping is shown as positive value for this computation. Change in storage and pumping values are based on the SVIHM and seawater intrusion is based on mapped areas of intrusion, as previously described in the text.

4.4.2 Updated Projected Water Budget

An updated version of the SVOM was used to develop the 2070 projected water budget. It shows anticipated conditions by the end of the 50-year GSP planning and implementation horizon if current management and land use continues. It may be used to help plan projects and management actions, along with other tools and analyses. These future baseline conditions include hydrology, water demand, and surface water supply over 51 years of potential future conditions. Following DWR guidance on incorporating climate change, the projected water budget is the average of 51 simulated likely hydrologic years that may occur in 2070. Similar to water budgets developed with previous model versions, it shows that while inflows and outflows vary year to year, the Subbasin will continue to be in overdraft on average, unless additional projects and management actions are undertaken.

Appendix 5C details the projected water budget.

The main groundwater inflows into the Subbasin are deep percolation of precipitation and irrigation water, subsurface inflow from adjacent groundwater basins and subbasins, and stream recharge. The predominant groundwater outflows are groundwater pumping and evapotranspiration.

The SVOM estimated the 2070 average annual decline in groundwater in storage due to change in groundwater levels to be -2,300 AF/yr. This is less than in the historical water budget, likely due to additional precipitation and recharge associated with the applied climate change assumptions. Storage estimates will be refined with future model improvements.

The projected groundwater budget is shown in Table 4-1. Negative values indicate outflows or depletions. Projected average decline in storage (overdraft) due to groundwater elevations is -2,300 AF/yr. Average annual loss of groundwater storage due to changes in groundwater levels is less in the projected water budget than in the historical water budget, even though there is no change in land use. Loss of annual groundwater storage is likely due primarily to the applied climate change assumptions. The DWR climate change scenario generally includes warmer and wetter conditions, which has greater precipitation and streamflow and increases agricultural groundwater pumping due to higher evapotranspiration.

Groundwater flow across the coastline is shown as an inflow; however, the SVIHM does not account for water quality. This inflow of saline groundwater into the Subbasin contributes to the loss in usable storage within the Subbasin, but is different from the advancement of the 500 mg/L chloride isocontour that typically denotes seawater intrusion. This table helps show the relative magnitude of various water budget components; however, these results are based on a provisional model and will be updated after the SVOM is completed and released by the USGS.

Table 4-3. Average SVOM Projected Annual Groundwater Budget with Climate Change Conditions

	2070 Projected Groundwater Budget Components (AF/yr)
Net Inflows	
Net Stream Exchange	127,900
Deep Percolation of Precipitation and Applied Irrigation	71,600
Net Coastal Inflow	8,000
Net Outflows	
Groundwater Pumping	-147,300
Net Flow from Adjacent Subbasins/Basin	-20,200
Flow to Drains	-8,600
Groundwater Evapotranspiration	-36,800
Net Change In Storage (overdraft)	
Change in Storage due to Groundwater Levels	-2,300

Note: provisional data subject to change. The water budget does not balance exactly due to a combination of model error and presenting rounded water budget components.

Similar to the historical sustainable yield, the projected sustainable yield is the amount of Subbasin-wide pumping that results in no undesirable results. For this GSP 2025 Evaluation, sustainable yield is estimated by balancing the water budget, resulting in no net decrease in storage of useable groundwater, including both due to groundwater levels and due to seawater intrusion. This estimate of sustainable yield can guide groundwater management on a subbasin level. However, outflows may need to be reduced or inflows increased in localized areas to meet the sustainability goal. Furthermore, sustainable yield does not account for water budget changes that may be needed to address seawater intrusion.

The sustainable yield can be estimated as:

Sustainable yield = pumping + change in storage due to groundwater levels + change in storage due to seawater intrusion

Table 4-2 provides an estimate of the average annual 2070 sustainable yield based on results from the SVOM. The simulated change in groundwater storage is used for this calculation, as well as an estimate of seawater intrusion described in Appendix 5C. The total estimated loss of useable storage for the Subbasin is 10,400 AF/yr, which is the sum of seawater intrusion (8,100 AF/yr loss) and net storage loss due to groundwater level changes (2,300 AF/yr). Using this estimate of loss in storage, the best estimate of sustainable yield for the Subbasin is 136,700 AF/yr. There could be significant uncertainty in this estimate. In addition to the caveats listed above, and the inherent uncertainty that exists in all numerical models, this estimate is based on results from a provisional version of the SVOM. Sustainable yield estimates will be refined and improved upon when the final version of the SVOM is released and subsequently updated.

Table 4-4. Average Annual Sustainable Yield for Historical and Projected 2070 with Climate Change Water Budgets

	2070 Projected Sustainable Yield (AF/yr)	Historical Average (WY 1980-2018) (AF/yr)
Total Subbasin Pumping	147,300	131,400
Change in Storage due to Groundwater Levels	-2,300	-10,100
Change in Storage due to Seawater Intrusion	-8,100	-12,600
Estimated Sustainable Yield	136,700	108,700

Note: Pumping is shown as positive value for this computation. Change in storage and pumping values are based on the SVIHM and seawater intrusion is based on mapped areas of intrusion, as previously described in the text.

4.4.3 Comparison of Simulated Water Use to Reported Water Use

The SVIHM does not extend into the evaluation period; however, a comparison of simulated and reported extraction shows they are similar. Table 4-5 shows simulated and reported extraction for a variety of timespans: the historical water budget period (1980-2018), the historical water budget period for which there is reported extraction data (1995-2018), and the current water budget period (2017-2018). It also shows the reported extraction for the evaluation period (2019-2023) and the simulated extraction for the 2070 projected water budget. 2017 was a wet water year, so extraction was lower than average and not indicative of long-term trends in water use. The SVIHM calibration of extraction is considerably improved from prior model versions; however, it slightly underestimates historical pumping in the Subbasin. Future model versions will refine simulated pumping further. In general, the model simulates pumping accurately enough for the purpose of developing water budgets.

Prior to 1998, all water used in the Subbasin came from groundwater extraction. In 1998, CSIP began delivering a combination of recycled water and groundwater for irrigation in the coastal area of the Subbasin. In 2010, surface water diversions were added to the CSIP supply. The shift in supply contributed to the decline in extraction from the full historical period to more recent years. Increases in efficiency also contribute to changes in water use.

The 2070 water budget is simulated with no change to urban pumping and no change in agricultural land use. Agricultural pumping makes up most of the water use in the Subbasin. However, in the SVIHM and SVOM, agricultural pumping is not specified and is dynamically simulated using the Farm Process (Boyce S.E., 2022) based on land use and crop and climate data. Table 4-5 shows that without changes to land use and due to a warmer climate, projected water use is expected to be greater than it is currently, based on the DWR 2070 recommended climate scenario. The SVOM incorporates current reservoir operational rules, with the reservoirs and CSIP functioning as they currently do. These future pumping estimates do not include actions that are taken to achieve groundwater sustainability, and it does not imply the projected level of pumping is sustainable.

Table 4-5. Comparison of Observed and Simulated Groundwater Extraction

	Observed (AF/yr)	Simulated (AF/yr)	Commentary
Historical Water Budget (1980-2018)	-	131,400	CSIP began delivering recycled water for irrigation in 1998, and added surface water diversions in 2010. Prior to then, groundwater fulfilled irrigation needs in the CSIP area.
Historical Compared to GEMS (1995-2018)	125,000	121,200	
Current Water Budget (2017-2018)	114,000	109,100	2017 was a wet water year with lower than average extraction
2019-2023 5-year Average	118,000	-	
2070 Projected Water Budget	-	147,300	Simulated with the DWR 2070 recommended climate change scenario

4.4.4 Updated Summary of Mitigation of Overdraft

The updated models provide revised estimates of overdraft and improve the ability to assess efforts to reach sustainability. The 180/400 Subbasin has historically been in overdraft, and it is projected to remain in overdraft throughout the GSP planning horizon unless PMAs are implemented. The long-term overdraft in the Subbasin without PMAs is projected to be 10,400 AF/yr; therefore, PMAs need to be implemented to raise groundwater levels and address seawater intrusion to reach sustainability and then mitigate this long-term overdraft mitigated after sustainability is reached. This updated assessment of overdraft is slightly less than projected in GSP Amendment 1; therefore, the PMAs included as options to mitigate overdraft are still sufficient.

The overdraft can be mitigated by reducing pumping or recharging the Subbasin, either through direct or in-lieu means. The potential projects and management actions identified in GSP Amendment 1 are sufficient to mitigate existing overdraft. These include demand management if other PMAs do not reach sustainability goals and mitigate overdraft. The selected PMAs will ensure that the chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods. Mitigation of overdraft is not sufficient to reach sustainability because balancing the water budget will not prevent future seawater intrusion. The amount of water needed to mitigate seawater intrusion depends on the approach taken. Furthermore, mitigation of overdraft is an average number based on inflows, outflows, and seawater intrusion across the Subbasin and does not relay depth or spatial variation. Sustainability must be reached across all 6 sustainability indicators.

5 MONITORING NETWORKS

Since submitting the original GSP in 2020, SVBGSA has focused on filling data gaps and expanding the monitoring networks. This section assesses each applicable sustainability indicator's monitoring network. The descriptions distinguish between changes in the monitoring network included in GSP Amendment 1 versus recommended for a future GSP revision.

5.1 Groundwater Level Monitoring Network Changes

The chronic lowering of groundwater levels SMC is evaluated by groundwater elevations monitored by MCWRA. During the evaluation period, SVBGSA expanded the groundwater elevation monitoring network and filled most data gaps.

The groundwater elevation network in the 2020 GSP consisted of 23 wells that were part of the California Statewide Groundwater Elevation Monitoring (CASGEM) program, all of which were RMS wells. The 2020 GSP identified data gaps in the monitoring network in all principal aquifers.

For GSP Amendment 1, SVBGSA expanded the RMS network to 91 wells by adding more existing wells to the monitoring network. In doing so, SVBGSA filled the data gaps in the 180-Foot and 400-Foot Aquifers. SVBGSA reassessed the Deep Aquifers data gaps and identified 5 remaining data gap areas in GSP Amendment 1. The changes made to the groundwater elevation RMS network in GSP Amendment 1 are shown on Figure 5-1, Figure 5-2, and Figure 5-3 for the 180-Foot, 400-Foot, and Deep Aquifers, respectively. Figure 5-4 shows the remaining data gaps in the Deep Aquifers, as noted in GSP Amendment 1, as well as how SVBGSA filled 3 of these data gaps by installing new Deep Aquifers monitoring wells through the SGM Round 1 Grant, adjusting the locations slightly based on additional analysis.

After GSP Amendment 1 was drafted, most changes made to the RMS network occurred in the Deep Aquifers. In 2024, the Salinas Valley Deep Aquifers Study was completed. It recommended additional existing wells be added to the monitoring network and refined data gaps. Figure 5-5 shows the Deep Aquifers Study's extent of the Deep Aquifers, recommended groundwater elevation monitoring network, and the data gaps. SVBGSA and partner agencies are planning to fill these Deep Aquifers data gaps. This GSP 2025 Evaluation recommends these additional Deep Aquifers data gaps be filled and included in a future GSP amendment.

Table 5-1 summarizes the number of RMS wells in each principal aquifer in the 2020 GSP, GSP Amendment 1, and recommended for a future GSP amendment. It includes wells removed due to well destructions or discontinued groundwater elevation monitoring. All changes will be included in the WY 2024 Annual Report. Appendix 6A includes a list of the groundwater elevation monitoring wells, when they were added to the RMS network, and the reason they were removed from the network, if applicable.

GSP Regulations require a seasonal low and high groundwater elevation measurement for each RMS well annually. The seasonal low is represented by August groundwater elevations and the seasonal high is represented by fall groundwater elevations that occur from November to December. The SVBGSA adopted this approach from MCWRA, which recognizes the fall groundwater levels as the stable groundwater conditions after wells have recovered from seasonal pumping lows. To get biannual groundwater elevation measurements for all RMS wells, SVBGSA worked with MCWRA to add all RMS wells to both the August and Fall measurements. MCWRA collects monthly measurements in a subset of wells, which provides for seasonal analysis and context for understanding the biannual measurements.

Table 5-1. Total Groundwater Elevation Representative Monitoring Sites per Aquifer

Aquifer	2020 GSP	GSP Amendment 1	Recommended for Future GSP Amendment	Wells Removed from the RMS Network
180-Foot Aquifer	12	35	35	4
400-Foot Aquifer	10	45	43	7
Deep Aquifers	1	11	21	2
TOTAL	**23**	**91**	**99**	**13**

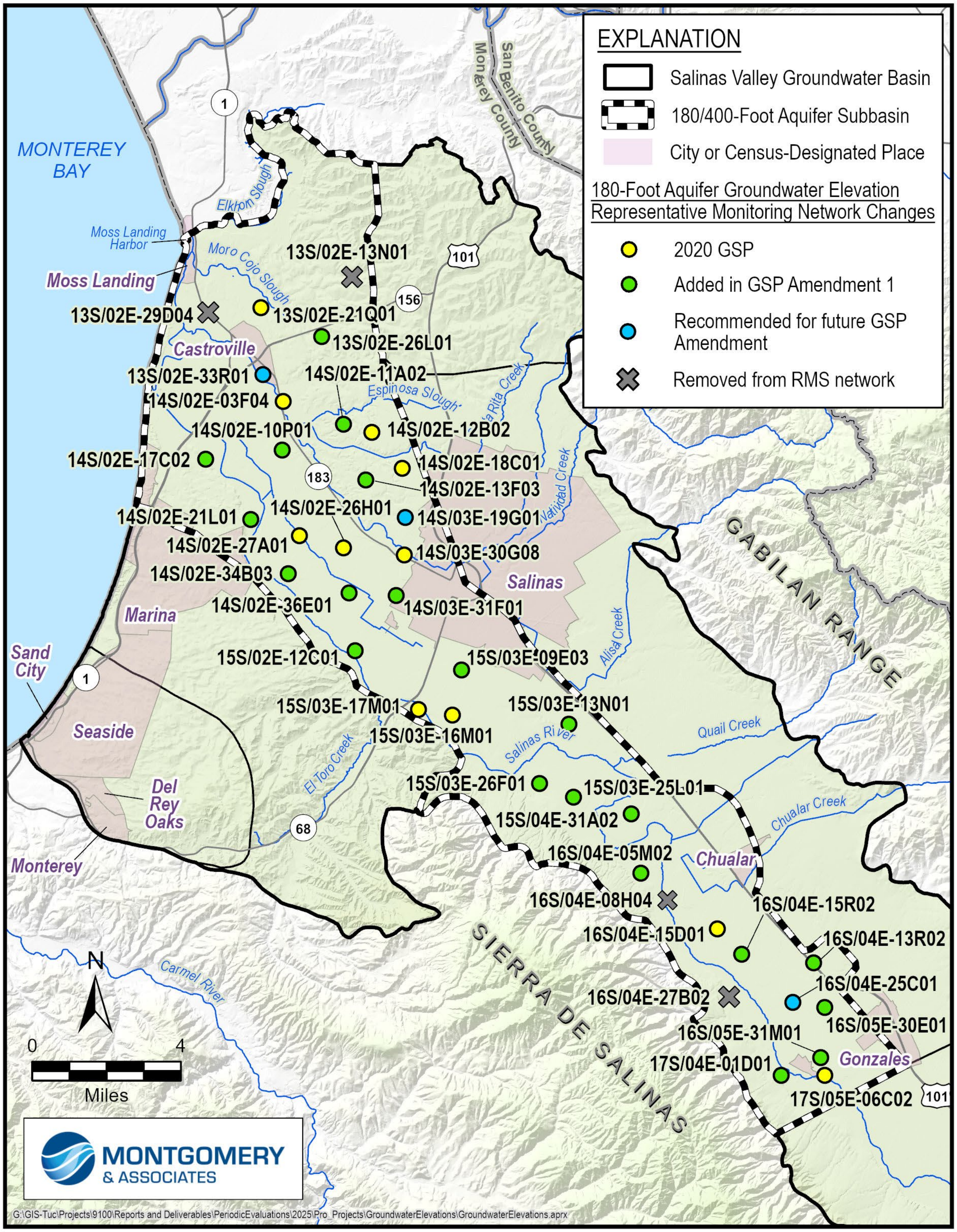


Figure 5-1. 180-Foot Aquifer Groundwater Elevation Representative Monitoring Network Changes

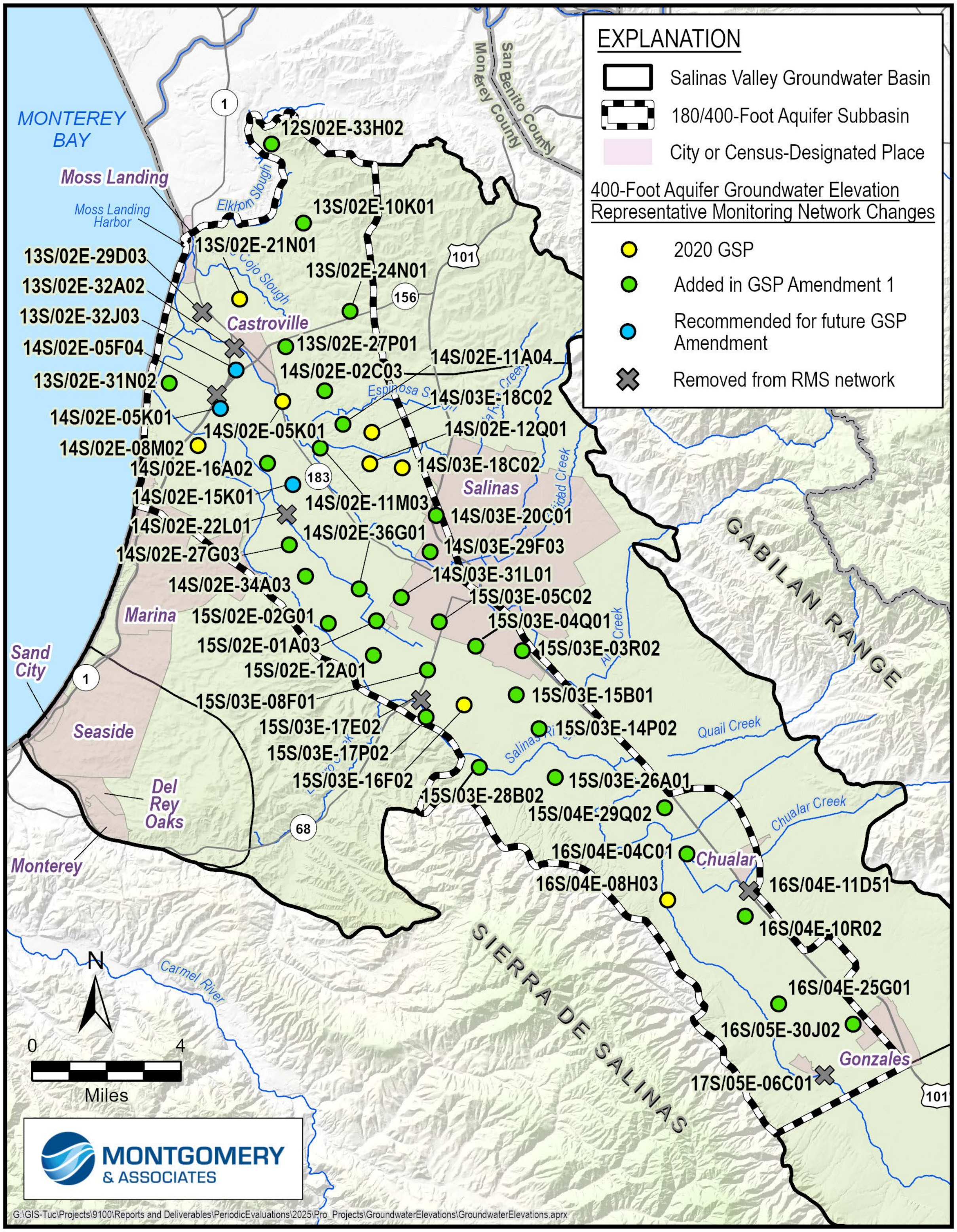


Figure 5-2. 400-Foot Aquifer Groundwater Elevation Representative Monitoring Network Changes

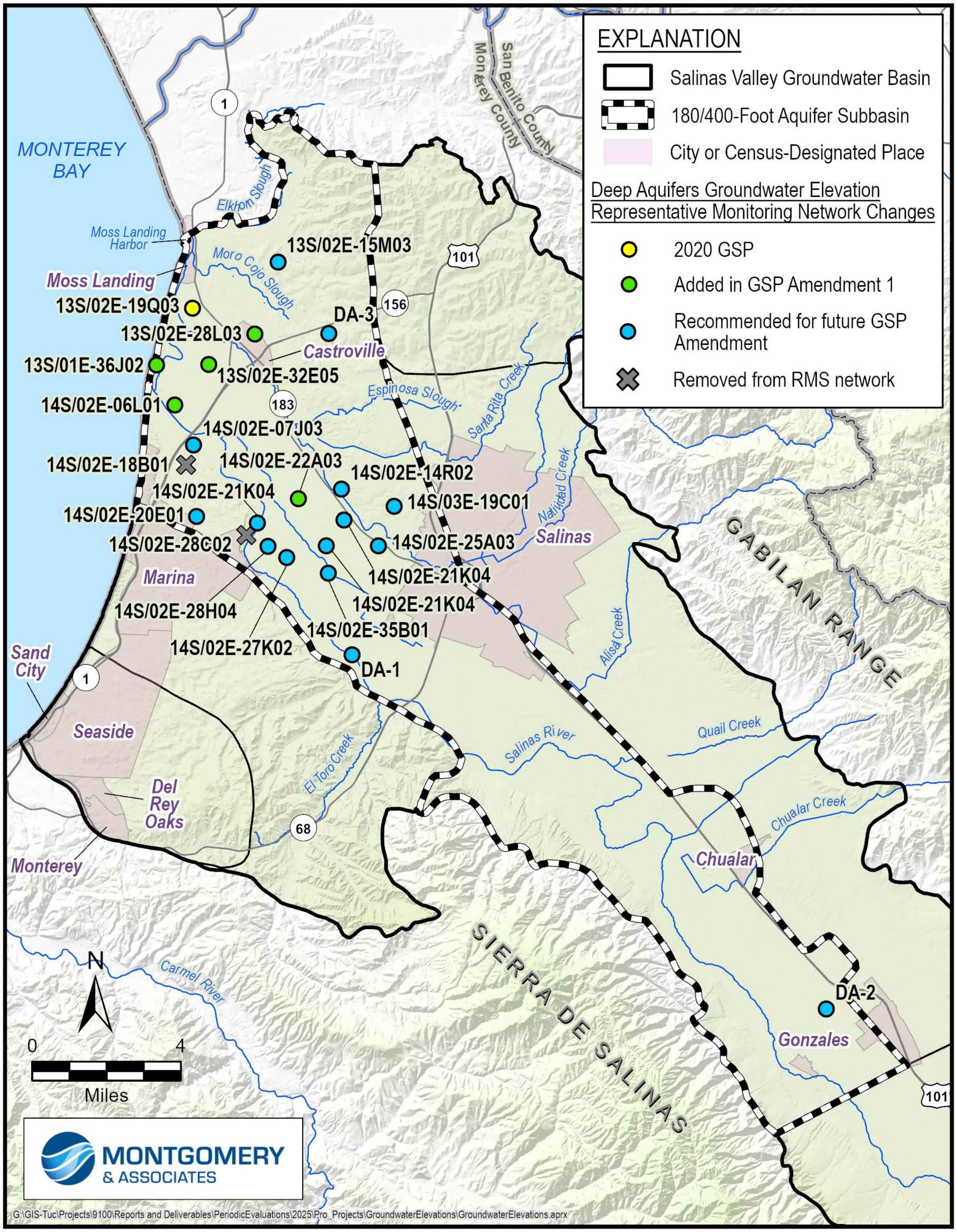


Figure 5-3. Deep Aquifers Groundwater Elevation Representative Monitoring Network Changes

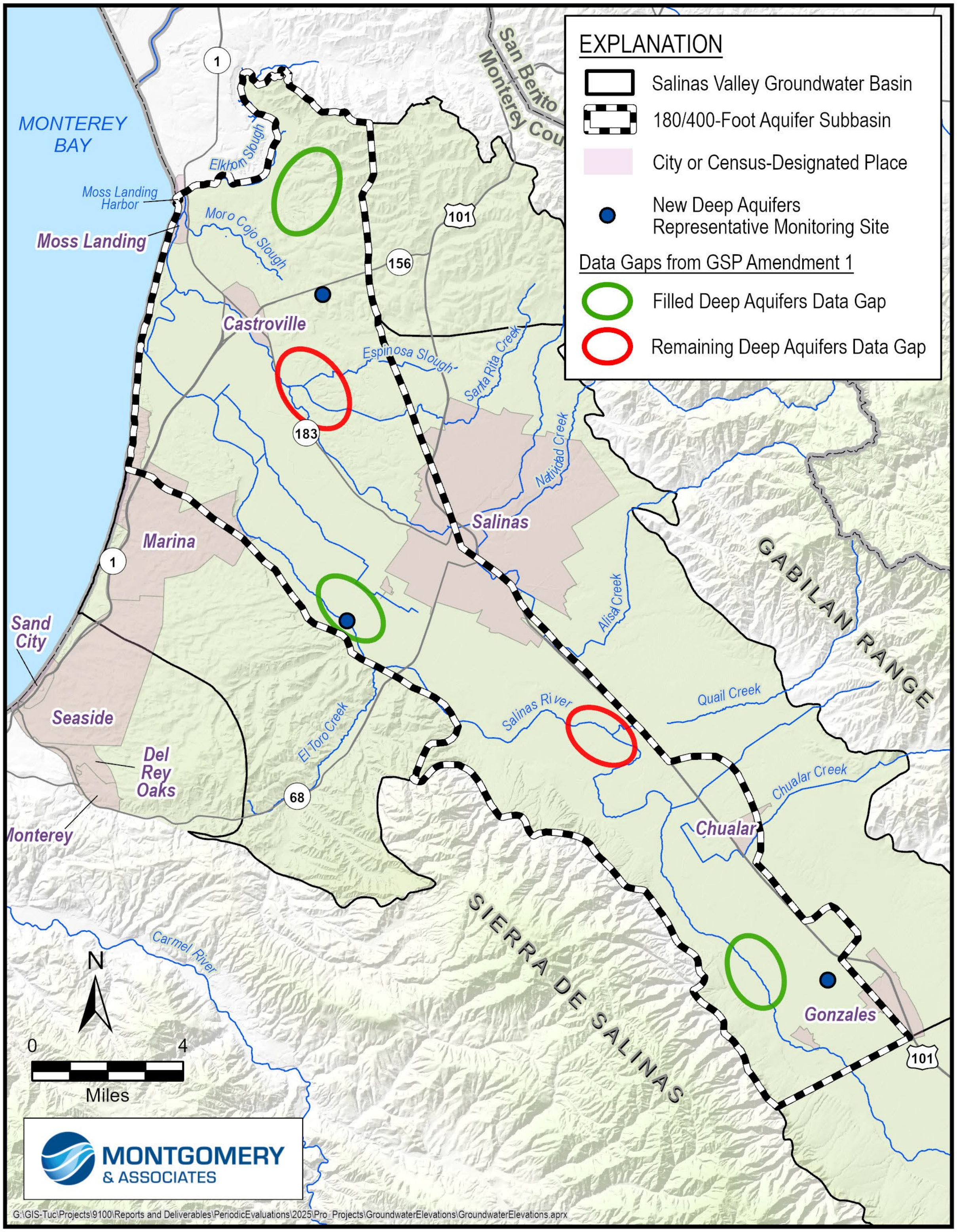


Figure 5-4. GSP Amendment 1 Groundwater Elevation Monitoring Data Gaps

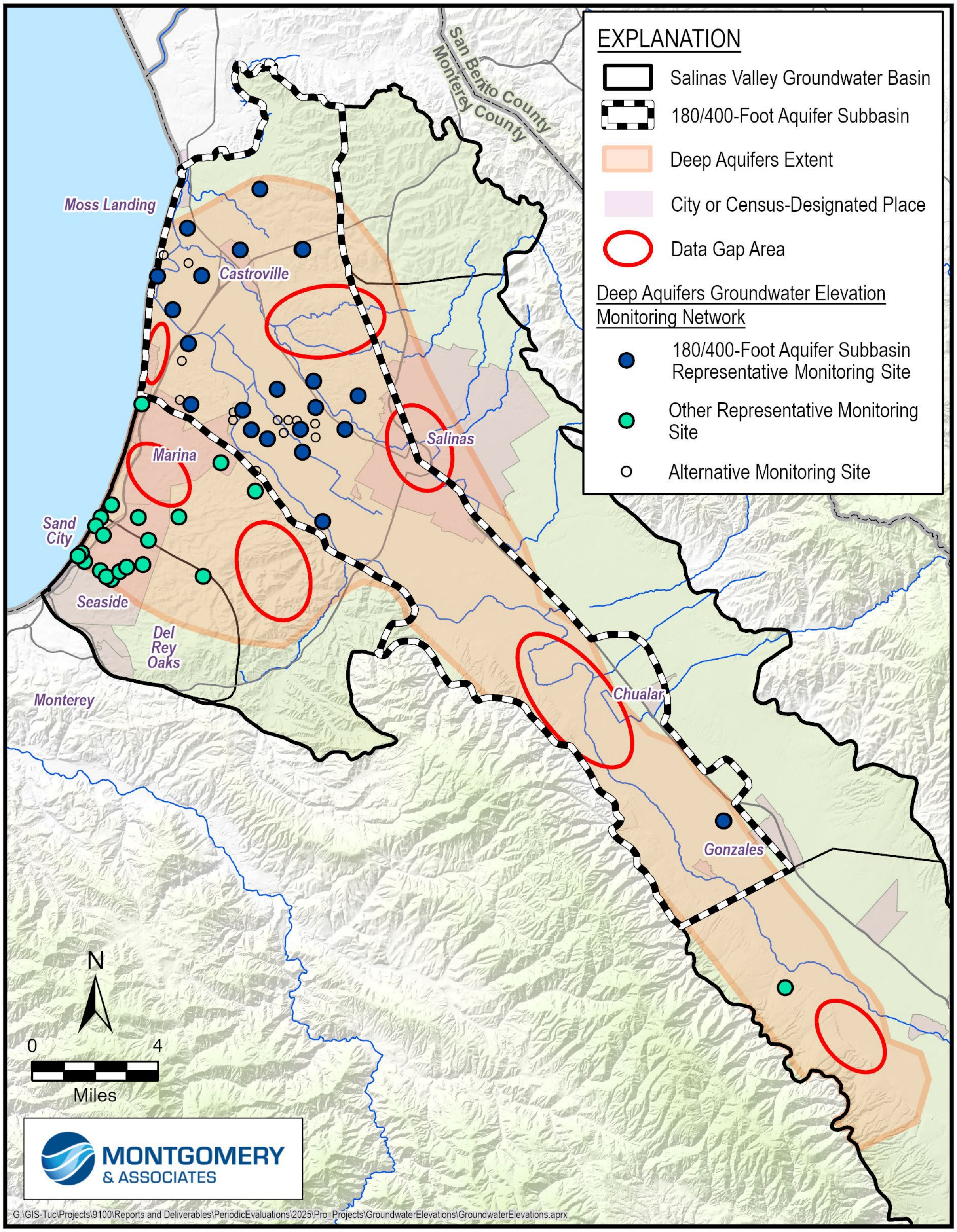


Figure 5-5. Deep Aquifers Study Groundwater Elevation Monitoring Data Gaps

5.2 Seawater Intrusion Monitoring Network Changes

The seawater intrusion SMC is evaluated using data collected and prepared by MCWRA. MCWRA monitors seawater intrusion by measuring the chloride concentration in a network of monitoring wells and mapping the 500 mg/L chloride isocontour that defines the seawater intrusion front. In the 2020 GSP, only a subset of the wells in MCWRA's monitoring network were included as RMS wells for the Subbasin. However, in GSP Amendment 1 SVBGSA adopted all wells in MCWRA's monitoring network in the Subbasin into the RMS network. MCWRA and MCWD GSA also have wells outside of the 180/400 Subbasin that they use to monitor seawater intrusion.

For a future GSP amendment, it is recommended that the wells are transitioned from the SGMA Representative monitoring network to the SGMA monitoring network because the seawater intrusion SMC is not based on chloride concentrations in specific wells. The wells recommended for a future GSP amendment are mainly the same as those included in GSP Amendment 1, except for wells that have been destroyed and 2 wells that were removed from the network because they are not completed in any of the principal aquifers. In 2024, MCWRA added 2 new wells to their monitoring network—1 in the 180-Foot Aquifer and another in the 400-Foot Aquifer. These wells are also recommended as additions to the seawater intrusion monitoring network in future GSP amendment.

Table 5-2 lists the number of wells in each principal aquifer that were included in the GSP, GSP Amendment 1, those recommended for future GSP Amendments, and those that have been removed from the network. The monitoring network includes 3 wells that are completed in both the 180-Foot and 400-Foot Aquifers and 3 other wells that are completed in both the 400-Foot and Deep Aquifers. Appendix 6A includes a list of the seawater intrusion monitoring wells, when they were added to the network, and the reason they were removed from the network, if applicable.

MCWRA's monitoring network provides sufficient coverage to assess the advancement of seawater intrusion in each principal aquifer in the Subbasin. Therefore, no data gaps exist in the seawater intrusion monitoring network.

Table 5-2. Total Seawater Intrusion Monitoring Sites per Aquifer

Aquifer	GSP	GSP Amendment 1	Recommended for Future GSP Amendment	Wells Removed from the Network
180-Foot Aquifer	17	32	33	1
400-Foot Aquifer	31	64	61	13
Deep Aquifers	0	34	30	4
In multiple principal aquifers	0	6	6	0
Not in a principal aquifer	0	2	0	2

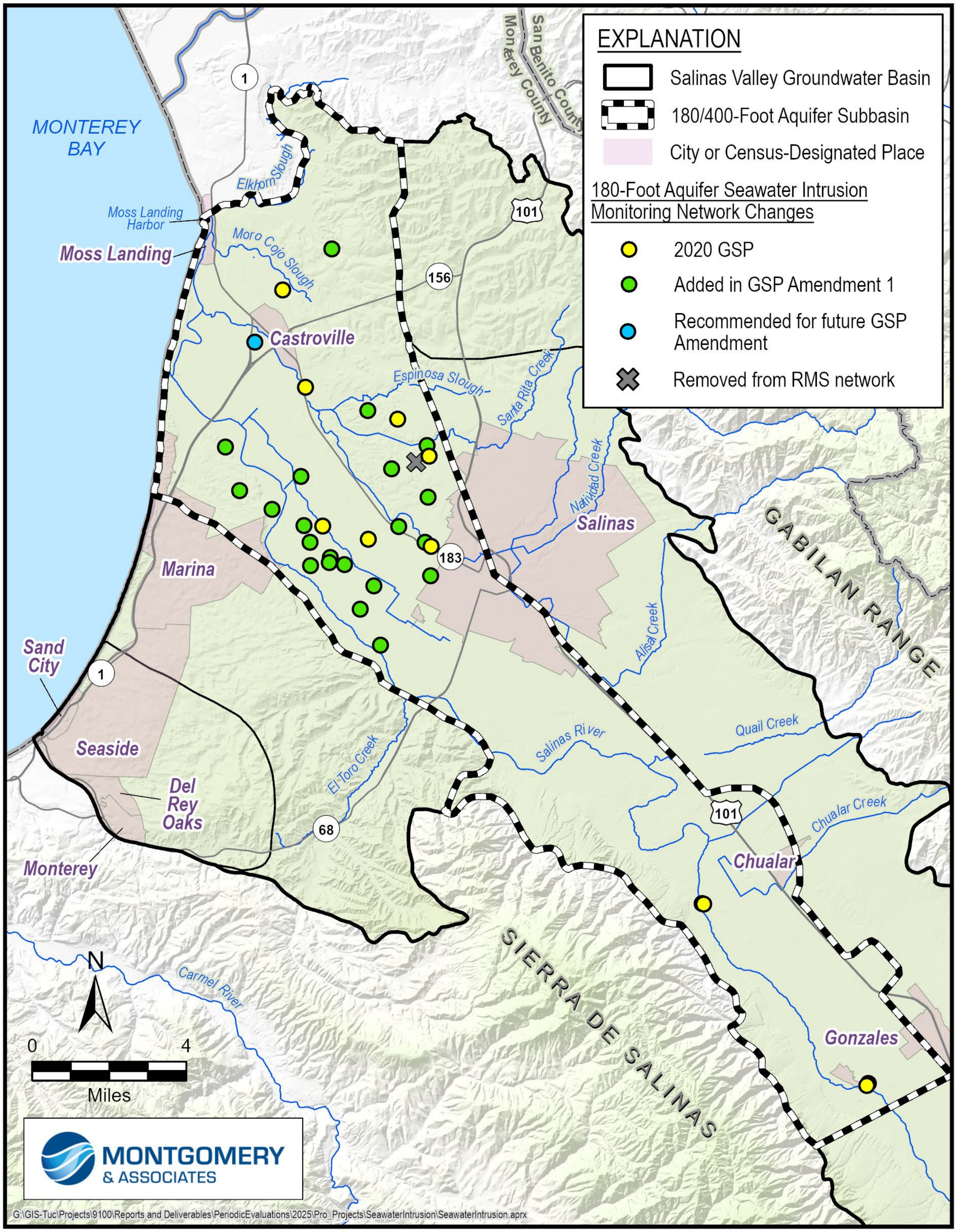


Figure 5-6. 180-Foot Aquifer Seawater Intrusion Monitoring Network Changes

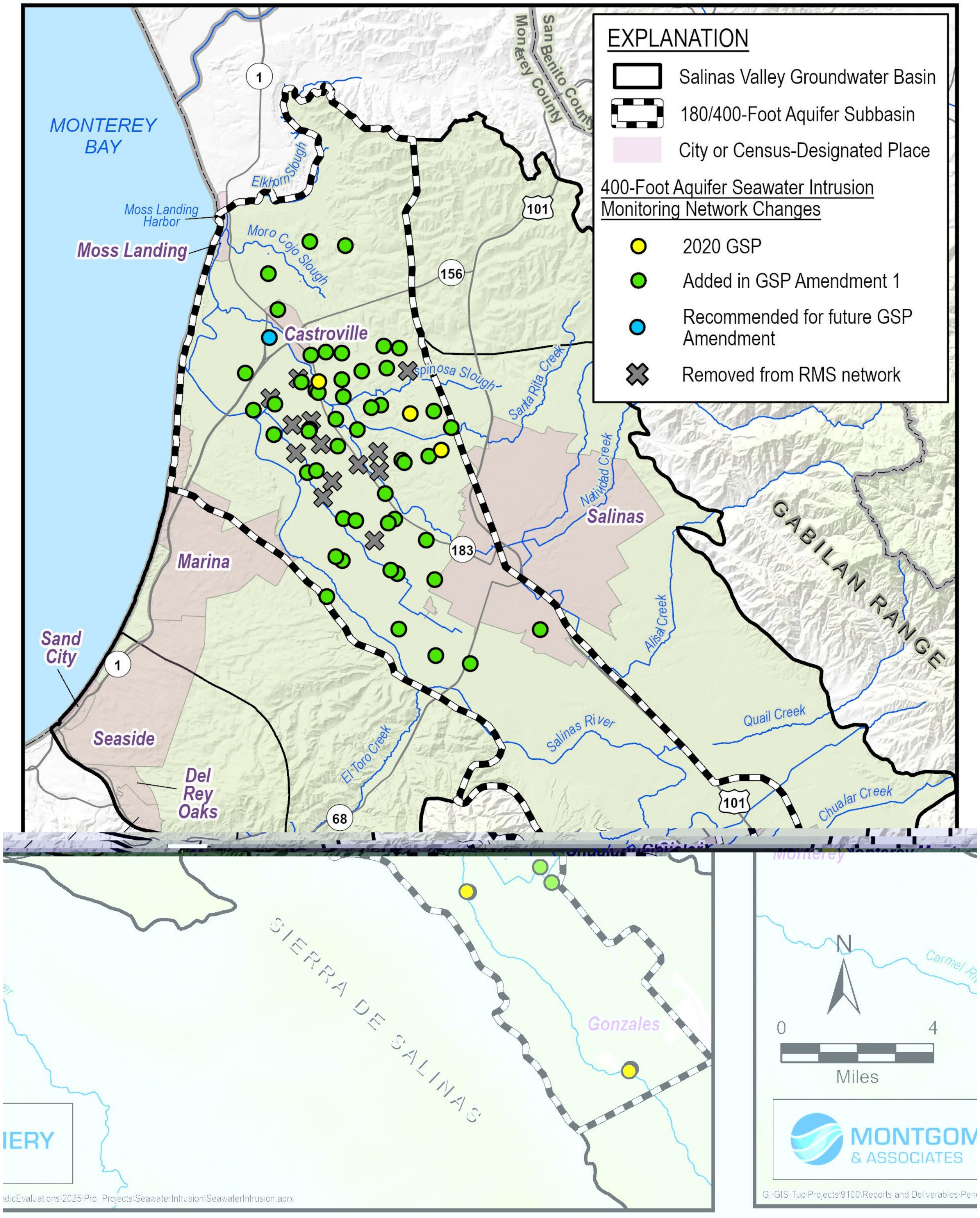


Figure 5-7. 400-Foot Aquifer Seawater Intrusion Monitoring Network

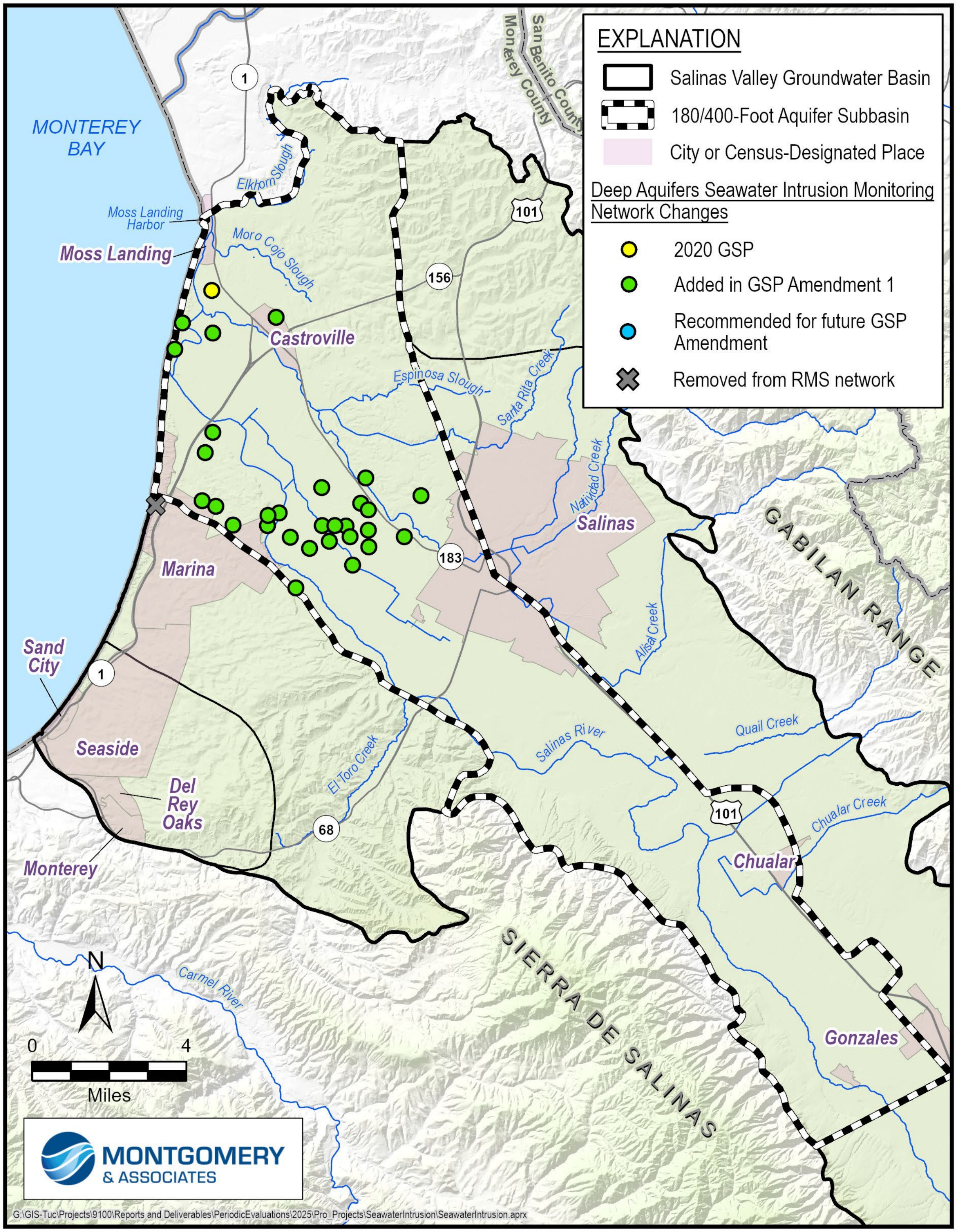


Figure 5-8. Deep Aquifers Seawater Intrusion Monitoring Network

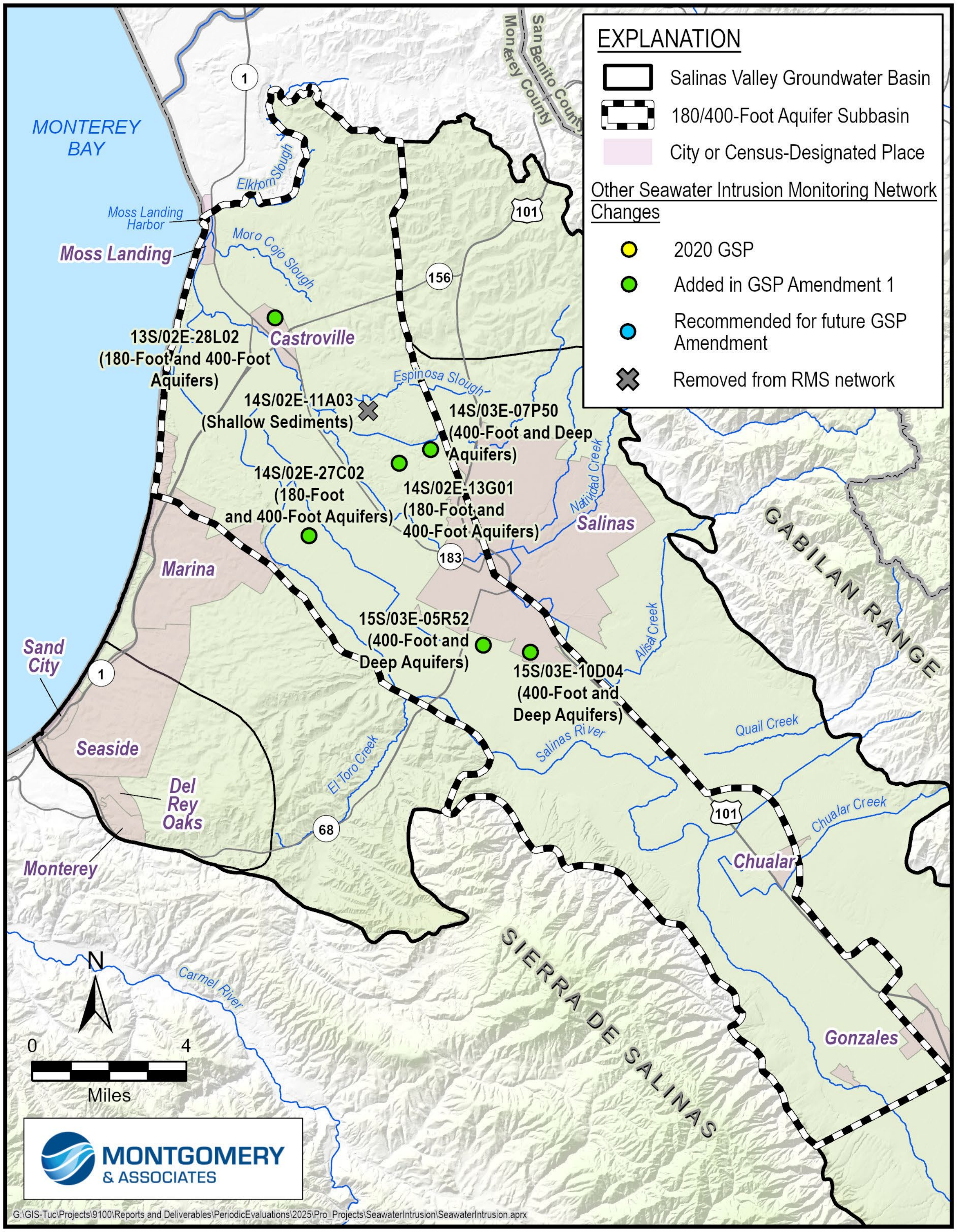


Figure 5-9. Other Seawater Intrusion Monitoring Network

5.3 Groundwater Storage Monitoring Network Changes

In GSP Amendment 1, the metric used to measure the reduction of groundwater in storage SMC was changed from annual pumping to proxy measurements of groundwater levels and seawater intrusion, as described in Section 2.4.1. Therefore, the groundwater storage monitoring network is the same as the groundwater levels monitoring network and seawater intrusion monitoring network. Accordingly, the data gaps in the groundwater level monitoring network also applies to the groundwater storage monitoring network. There are no data gaps in the seawater intrusion monitoring network.

5.4 Groundwater Quality Monitoring Network Changes

The degraded water quality SMC is evaluated by monitoring groundwater quality in water supply wells. Groundwater quality in public water supply wells is assessed using data collected by the SWRCB DDW. Data collected through the CCRWQCB's ILRP is used to assess groundwater quality in on-farm domestic and irrigation wells. Both datasets are available through the GAMA groundwater information system. However, the CCRWQCB and Central Coast Water Quality Preservation, Inc. have noted the ILRP data available through the GAMA groundwater information system is incomplete and will be supplemented with data provided directly by the CCRWQCB in future GSP amendment and annual reports.

The groundwater quality monitoring network presented in the 2020 GSP consisted of DDW and ILRP wells. Generally, this network remained the same in GSP Amendment 1 except for a small number of wells that were destroyed or completed after the 2020 GSP. The same monitoring network of active DDW wells is recommended for a future GSP amendment. The supplementary ILRP data provided by the CCRWQCB included wells that were not included in the ILRP monitoring network on the GAMA groundwater information system. The new wells included in CCRWQCB's ILRP dataset are recommended as additions to the groundwater quality monitoring network in a future GSP amendment.

A key challenge with respect to analyzing groundwater quality and its relation to groundwater management is that wells in the ILRP network often do not have well construction information that denotes the depth or screen interval of the well. Lack of screen interval information inhibits the ability to relate water quality data to groundwater levels or extraction. Additionally, there are likely duplicates among ILRP wells. That, as well as the irregular sampling frequency, means the number of wells in the monitoring network sampled every year varies.

As part of the well registration effort described in Section 1.2.3, MCWRA completed a desktop analysis to identify the location and screen interval of all wells with data on record. ILRP compliance has been reported at the parcel or ranch level historically, so water quality data is associated with any well on that property and not specifically tied to an individual well. Well identifiers used for ILRP monitoring differ from MCWRA well numbers, and in many cases an MCWRA well seems to match to multiple ILRP well identifiers. ILRP well names are not necessarily consistent, and have often changed with operator changes, making the matching of water quality data to well construction information, as well as the development of a historical record, extremely difficult and uncertain. In addition to duplicates of wells, the well type was also noted as an unreliable descriptor, as many are denoted as dual-purpose agriculture and domestic, but are not actually used for both purposes. MCWRA, Preservation, Inc., and SVBGSA continue to work together to reconcile datasets. This work is a precursor to better understanding the relationship between groundwater quality, groundwater levels, and extraction both historically and during the evaluation period.

The DDW and ILRP monitoring networks provide sufficient spatial and temporal coverage to determine groundwater quality trends for the COCs and to assess impacts to beneficial uses and users. Work is underway to enable assessment of water quality by aquifer. Therefore, data gaps do not exist in the groundwater quality monitoring network.

5.5 Land Subsidence Monitoring Network Changes

SVBGSA adopts the land subsidence monitoring protocols used by DWR for InSAR measurements and interpretation. There are no data gaps associated with this monitoring network.

5.6 ISW Monitoring Network Changes

The metric used to evaluate ISW in the 2020 GSP was based on streamflow depletion modeled with the SVIHM, as noted in Section 2.7.1. In GSP Amendment 1, the metric was changed to align with the 2022 Salinas Valley GSPs where depletion of ISW is measured by proxy through shallow groundwater elevations. Depletion of ISW is only measured in areas where the Salinas Valley Aquitard is not present because the shallow sediments that exist above the Salinas Valley Aquitard are not considered a principal aquifer.

SVBGSA focused on wells near exiting streamflow gages to provide insight on the relationship between streamflow and groundwater elevations. The shallow groundwater monitoring network presented in GSP Amendment 1 comprised 2 existing wells monitored by MCWRA. After further assessment it was determined that 1 of these wells (16S/04E-08H02) is located within the extent of the Salinas Valley Aquitard. Therefore, it is recommended that well 16S/04E-08H02 is removed from the monitoring network.

GSP Amendment 1 identified 2 potential data gaps in the shallow groundwater elevation monitoring network near existing streamflow gages. The SVBGSA filled 1 of these data gaps by installing a new monitoring well using SGM Round 1 Grant funding. The remaining data gap is no longer considered a data gap because the Salinas Valley Aquitard is likely present at the planned location based on lithologic logs from wells completed nearby. No other data gaps exist in the shallow groundwater elevation monitoring network.

The changes made to the shallow groundwater elevation RMS network used to monitor ISW are summarized on Figure 5-10. Appendix 6A includes a list of the shallow groundwater elevation wells in the ISW monitoring network, when they were added to the RMS network, and the reason they were removed from the network, if applicable.

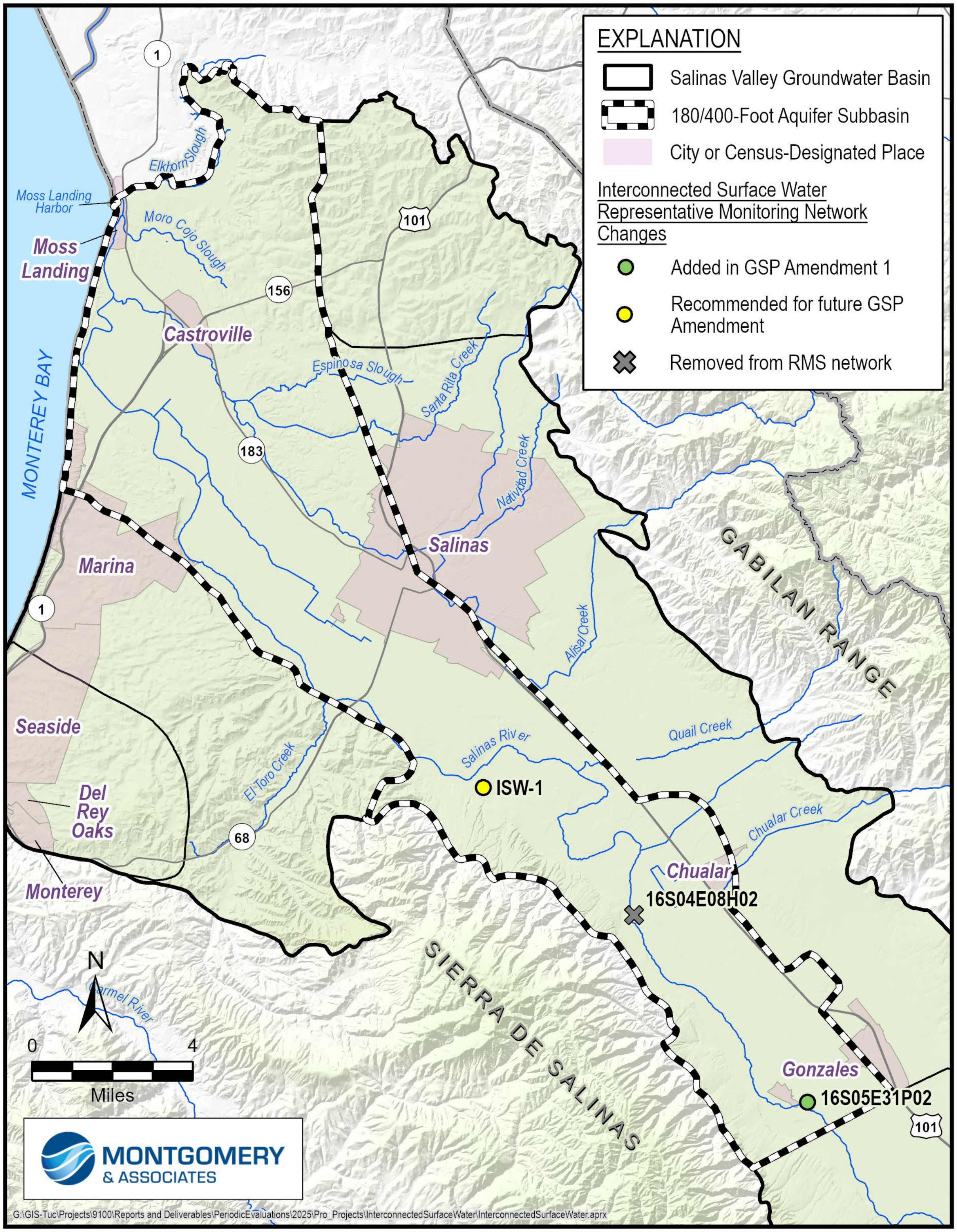


Figure 5-10. Interconnected Surface Water Representative Monitoring Network Changes

5.7 Other Monitoring Program Changes

In addition to the SMC monitoring networks, the monitoring programs for groundwater extraction and surface water use are important for groundwater management and SGMA reporting.

5.7.1 Groundwater Extraction

MCWRA's GEMS program monitors urban and agricultural extraction in the Subbasin. The GEMS program has been expanded since the 2020 GSP and is now a part of MCWRA's Groundwater Monitoring Program (GMP) adopted in October 2024. SVBGSA is working closely with MCWRA to improve collection and storage of regional groundwater data.

Previously, monthly groundwater extraction was reported for wells with an internal discharge pipe diameter greater than 3 inches within MCWRA Zones 2, 2A, and 2B. Extraction was reported annually to MCWRA; however, it was not available in time to be incorporated into the GSP annual reports. Nearly 500 well operators submit groundwater extraction information to MCWRA through GEMS, a program established in 1993, but data gaps exist, specifically on the northern coastal side of the 180/400 Subbasin.

The updated GEMS program requires all wells in the Salinas Valley to be registered with the MCWRA. Those wells extracting more than 2 AF/yr (i.e. non-*de minimis*) will also need to report extraction data to MCWRA through GEMS. Groundwater extraction data can be tracked with the well operator's choice of an approved method. Approved methods currently include water flowmeter, electrical meter, or hour meter (timer). Data must be recorded by the well operator monthly for each water year, from October 1 to September 30, and reported to MCWRA by November 1 of each year.

Making groundwater extraction data available for the annual reports is one improvement to the GEMS program being addressed with this effort and the changes will begin to be reflected in the Water Year 2025 Annual Report. Outreach, registration, and GEMS reporting for all non-*de minimis* users will occur over the next 3 years.

5.7.2 Surface Water

Salinas River watershed monthly diversion data are collected annually through the SWRCB's eWRIMS, with which SVBGSA tracks diversions from the Salinas River. Only diversions reported as Statement of Diversion and Use are used to supplement CSIP surface water use data from Monterey One Water. In WY 2022, the eWRIMS reporting period was changed to align with the water year instead of the calendar year. This was the only data gap identified for this dataset.

5.8 SGMA Monitoring Network Module

The SGMA Monitoring Well Network Module (MNM) has been updated with the changes and recommendations documented in this section of the GSP 2025 Evaluation. All new monitoring wells recommended for future GSP Amendment will be added to the MNM with their unique identification, reference surfaces, geography, well use, and construction during the preparation. Since only DWR can remove wells from the MNM, DWR has been notified of wells to be removed. The MNM has also been updated with SMC associated with new RMS wells for the groundwater elevation and ISW monitoring networks.

6 GSA ADMINISTRATION, FUNDING, AND AUTHORITIES

The following section provides an overview of SVBGSAs administration and funding for GSP implementation. It describes 2 coordination agreements with other GSAs in the 180/400 Subbasin, as well as other agencies with authority over groundwater management and formal actions taken by them. It discusses how SVBGSA has coordinated with these agencies and activities. It includes one legal case related to the 180/400 Subbasin that occurred during the evaluation period.

6.1 SVBGSA Administration

SVBGSA is a Groundwater Sustainability Agency (GSA) in the Salinas Valley responsible for sustainably managing groundwater resources. SVBGSA has the authority to charge fees, conduct investigations, register wells, require reporting, and take other actions to sustainably manage 6 of the 9 groundwater subbasins of the Salinas Valley Groundwater Basin: (1) Monterey, (2) 180/400, (3) Eastside, (4) Forebay, (5) Langley, and (6) Upper Valley.

The above listed activities all constitute the Sustainable Groundwater Management Program of the SVBGSA. By actively planning for and implementing sustainable groundwater management plans in the subbasins, SVBGSA contributes to the cohesive and long-term management of groundwater in the Salinas Valley.

On August 1, 2017, SVBGSA entered into an agreement with Regional Government Services (RGS) to provide management and administrative services for SVBGSA. RGS provides staffing services for SVBGSA with the appropriate service levels determined and agreed upon annually based on SVBGSA's work plan.

6.2 Groundwater Sustainability Fee and Tiered Fee Policy

SVBGSA's Groundwater Sustainability Fee (Fee) was first adopted by the Board of Directors (Board) in March 2019 based on a fee study developed by Hansford Economic Consulting (HEC). The Board commissioned a study in 2023 to explore a tiered Fee structure. The process comprised a broad interested parties engagement, concluded with a final report, and tiered Fee schedule that was adopted on June 29, 2023.

The Fee is paid by groundwater users within SVBGSA jurisdictional boundaries. For imposing the Fee purpose, a groundwater user is defined as an owner of agricultural land or a water user served by a publicly or privately owned water system. *De minimis* extractors, tribal lands, and federally owned properties are exempt from the Fee.

SVBGSA is currently conducting a 5-year Fee Evaluation and in-depth analyses on fee-related issues that stemmed from input by interested parties.

6.2.1 Annual Fee Review

Each year the Board reviews the Fee to determine if the revenue collected from the Fee is sufficient to cover expenses, consistent with the California Constitution and state law. The Board may increase or decrease the Fee as necessary or appropriate. The cost basis of the Fee is determined during the budget setting process considering the following factors:

- Cash reserves
- Timing and amount of grant disbursements
- Revenue requirements for the upcoming 1- to 3-year period determined by the work plan

The methodology for establishing the Groundwater Sustainability Fee is conducted in 3 steps that occur between February and June each year and are overseen by the Board. The Board must approve SVBGSA budget by April each year. The budget defines the expenditures of the agency for administration and operations and includes that year's Sustainable Groundwater Management Program costs for all the subbasins and for individual subbasins.

Step 1: Determine the amount of revenue needed to be raised in the next fiscal year through the regulatory fee – the "cost basis." Allocate the cost between Agricultural and All Other beneficiaries of sustainable groundwater management. Agricultural beneficiaries are allocated 90% of the cost basis. All Other beneficiaries are allocated 10% of the cost basis.

Step 2: Determine the number of Irrigated Acres and Service Connections in the SVBGSA subbasins to be charged the fee in the next fiscal year.

Step 3: Divide the Agricultural beneficiaries' cost basis by the number of Irrigated Acres to calculate the annual fee per acre. Divide the All Other beneficiaries' cost basis by the number of Service Connections to calculate the annual fee per connection.

Once the budget is completed the costs for the upcoming year's activities are further broken down into Tier 1 and Tier 2 costs.

Tier 1 costs include the day-to-day operations of the SVBGSA and other activities that are "reasonable costs" for the regulatory activities of the agency.

Examples of regulatory activities that may be funded include:

- Groundwater Sustainability Plans (GSP) development and updates
- Investigations and inspections
- Data networks and monitoring
- Compliance assistance and enforcement

- Program administration (includes agency staffing, legal counsel, consultants, and associated costs)
- Prudent operating reserves

These activities are important for local management of the groundwater basin and for compliance with SGMA.

Tier 2 costs are those associated with specific studies, management actions, and projects that need to be initiated or completed in a fiscal year. These activities are attributed to only 1 or more, but not all, subbasins managed by SVBGSA. The costs are taken and apportioned to each of the subbasins that will receive benefit for the work completed that fiscal year. An example may be a recharge basin that can provide recharge to 2 subbasin areas.

6.2.2 Annual Work Plan

The primary mechanism currently in place for tracking and administering SVBGSA's Sustainable Groundwater Management Program is the annual work plan (Work Plan). The Work Plan is developed to prepare the fiscal year budget and establish the Fee. It includes all tasks, regardless of the revenue source, and is structured with activities/tasks under the following management objectives:

- Data Expansion and SGMA Compliance
- Stakeholder Coordination and Outreach
- Projects and Management Actions
- General Administrative

While the Work Plan's main focus is on the current fiscal year (FY), it includes tasks in the subsequent years (through FY 2027) to highlight multi-year efforts and recurring tasks, as well as to assure continuity and consistency over the next 3 years. It identifies the SVBGSA subbasins involved, as well as a funding source. Staff prepare and present quarterly status reports to track progress and ensure accountability.

As noted to the Board in March 2024, the current year's work plan is very aggressive with a total of 99 tasks expected to be undertaken in FY 2025. This includes 37 tasks related to PMAs, with 33 of these tasks funded from grants and third-party sources. Many activities in FY 2025 and FY 2026 are carried out in support of the scope of services in Round 2 SGMA Implementation Grants.

By January 2027, SVBGSA will prepare GSP 5-Year Evaluations for the other 5 subbasins. SVBGSA plans to prepare a 2-year Evaluation for the 180/400 Subbasin GSP, and potentially Amendment 2, concurrent with the GSP 5-Year Evaluations of the other subbasins by

January 2027. This will align the 180/400 Subbasin GSP timeline with all SVBGSA subbasins from 2027 moving forward, as originally intended in 2022 with the preparation of Amendment 1.

6.2.3 180/400 Subbasin Tier 2 Fee Funded Activities

Tier 2 Fee funding for 180/400 Subbasin PMA activities in FY 2024 included SVBGSA collaboration on the Seawater Intrusion Model to address GTAC comments, contributions to P1 – Multi-benefit Stream Channel Improvements, MA1 – Demand Planning, and the agency's share and agricultural groundwater user funding share for MA5 – Undertake Deep Aquifers Study. In FY 2025, 180/400 Tier 2 Fee funded preparation of this GSP 5-Year Evaluation and updates to the Hydrogeologic Conceptual Model.

6.3 DWR SGMA Implementation and Other Grant Funding

During the 5-year period, SVBGSA has relied on grants as the primary funding source for GSP preparation and implementation. Without grant funds, SVBGSA would have been challenged to make the progress reported in this 5-year evaluation, including preparing GSP Amendment 1, filling data gaps, and working on PMAs.

Following the 2020 submittal of the original GSP for the 180/400 Subbasin, SVBGSA created a 2-year work plan with funding from DWR Proposition 1 and Proposition 68 Grants to prepare the 5 remining GSPs in the Salinas Valley by January 2022. The grant funding included preparing Amendment 1 to the 180/400 Subbasin GSP in 2022, and updating PMAs as described in this GSP 2025 Evaluation. DWR contributed over $4.5 million in these grants to prepare the Salinas Valley GSPs.

In 2022, DWR awarded SVBGSA with a $7.6 million SGMA Implementation Grant to assist in financing the 180/400 Subbasin GSP Phase 1 Implementation (2022-2024). Significant GSP Implementation and PMA work has advanced or been completed with this DWR grant funding for the following activities:

- Outreach and Engagement
- Filling Data Gaps
    - New monitoring wells
    - Aquifer property tests
    - Groundwater Dependent Ecosystems identification and assessments
    - Modeling updates
    - Well registration program development (now under Groundwater Monitoring Program)
- P2 CSIP Optimization
- P3 Modify M1W Recycled Water Plan

- P5 Seawater Intrusion Extraction Barrier/P6 Regional Municipal Supply Project (Brackish Groundwater Restoration Project)
- P7 Seasonal Release with ASR Feasibility Study
- MA1 Demand Planning
- MA 5 Undertake and Operationalize Deep Aquifer Study

Findings and deliverables from this work will be summarized in a grant project update report. The report will evaluate and compare the findings of the feasibility studies for the Brackish Groundwater Restoration Project, Seasonal Release with ASR, and Demand Management to help guide decision making on the next phase of GSP PMA implementation. This work will be done in the beginning of 2025 following the submittal of the GSP 5-Year Evaluation and completion of the feasibility studies.

Additional grant funds support SVBGSA's work plan. In 2024, SVBGSA began activities under Round 2 SGMA Implementation Grants for the other 5 Salinas Valley Subbasin GSPs, including a $10.3 million grant awarded to SVBGSA and a $3.86 million subgrant from the MCWDGSA. The scope of services for these grants includes PMA funding for feasibility studies on Permit 11043 Diversions, Demand Planning, Reservoir Reoperations, and CSIP Expansion, with continued work on Deep Aquifers management and the Brackish Groundwater Restoration Project. The terms of these agreements are through April 30, 2026.

In partnership with other organizations and with funding from the California Department of Conservation, SVBGSA is implementing MLRP grant funded activities.

In the next evaluation period, SVBGSA will pursue additional grant opportunities to further develop and implement PMAs.

6.4 Coordination Agreements with other GSAs and Water Agencies

The MCWDGSA and the County of Monterey GSA also have authority within the 180/400 Subbasin. The following are brief summaries of agreements and coordination activities with them. In addition, this section describes coordination with other water agencies with groundwater management authorities, including SVBGSA's Memorandum of Understanding with MCWRA.

6.4.1 Coordination Agreement with Marina Coast Water District GSA

In November 2017, SVBGSA entered into a Coordination Agreement with MCWDGSA to submit grant applications to prepare the Monterey and the 180/400 Subbasin GSPs, and these grants were awarded by DWR. In January 2019, SVBGSA and MCWDGSA entered into a Framework Agreement and agreed to work collaboratively to develop a single GSP for the entire Monterey Subbasin and a single GSP for the entire 180/400 Subbasin. SVBGSA and

MCWDGSA agreed SVBGSA would prepare a GSP for the entire 180/400 Subbasin, which incorporated comments from the MCWDGSA.

SVBGSA and MCWDGSA are currently reviewing the Coordination and Framework Agreements to determine if any amendments are needed to better reflect completion and approval of the GSPs for these 2 subbasins and coordination of activities for GSP Implementation. The current Framework Agreement shall not be terminated unless and until the Parties have entered into intra-basin coordination agreements in accordance with Water Code §10727.6 and 23 CCR §357.4 for each Party's respective GSP for their respective portions of the 180/400 Subbasin and the Monterey Subbasin.

6.4.2 Coordination Agreement with County of Monterey GSA

In January 2020, SVBGSA entered into a Coordination Agreement with the County of Monterey GSA (MCGSA). The agreement lays out how the 2 agencies will collaborate on the 180/400 Subbasin, including with the adoption of the single GSP for the Subbasin. The County Board of Supervisors approved the agreement on January 28, 2020, and the SVBGSA Board of Directors approved it on January 30, 2020. The agreement establishes a GSA Workgroup that meets at the request of any member. No meetings were held during the evaluation period while litigation occurred related to this GSA (see Section 6.6.1).

6.4.3 Memorandum of Understanding with MCWRA

In 2018, SVBGSA and MCWRA entered a Memorandum of Understanding (MOU) regarding technical and professional assistance for the development of GSPs. SVBGSA relies on MCWRA for data acquisition, processing and management, as well as for professional advice and technical support, and compensates MCWRA for their critical assistance through this agreement.

In the first 3 years of the evaluation period, SVBGSA and MCWRA increased coordination and collaboration through frequent, sometimes weekly, meetings between agency staff and consultants. In 2022, MCWRA and SVBGSA executed Amendment 1 to the Memorandum of Understanding with minor updates to the compensation terms. In June 2023, MCWRA and SVBGSA executed Amendment 2 to the Memorandum of Understanding with an update to the SVBGSA representative contact information, a revised outline of anticipated services, and a revised length of term. The revised services in FY 2024 included the following:

- Data monitoring and collection for Annual Reports
  - Existing wells
  - Potential new wells
- Fulfilling data requests for Annual Reports or other SVBGSA project needs
- Contributing updates to, and reviewing, draft Annual Reports as requested
- CSIP Fact Finding (DWR Facilitation Support Services funded)

- Planning work and work on implementation projects proposed by the SVBGSA

As noted previously, MCWRA has developed projects for the Salinas Valley since the 1940s. Several projects in the GSP rely on existing infrastructure owned by MCWRA. In 2022, SVBGSA entered into a Subgrant Agreement for the Round 1 SGM Implementation Grant for the 180/400 Subbasin and is planning a Subgrant Agreement for Round 2 SGM Grant activities. Activities in the Round 1 Subgrant Agreement include:

- CSIP Distribution System Upgrades (see Section 3.3.2)
- M1W Recycled Water Plant Dry Chlorine Scrubber Upgrade (see Section 3.3.3)
- Aquifer Storage and Recovery Feasibility Study (see Section 3.3.6)
- Water quality sampling for Brackish Groundwater Restoration Project Feasibility Study (see Section 3.3.5)
- Well Registration (see Section 1.2.3 below)

MCWRA and SVBGSA also collaborate via a joint-funding agreement with the USGS on the "Salinas Valley Cooperative Model and Decision Tool Development to Support Resource Evaluation, Decision Making, and Sustainable Water Management in Monterey County, California" (per USGS agreement #22ZGJFA11000803).

6.4.4 Pajaro Valley Water Management Agency

SVBGSA and the 180/400 Subbasin share a boundary to the north with the Pajaro Valley Water Management Agency (PVWMA). Although there is no formal agreement to coordinate, SVBGSA and PVWMA staff meet to share information on SGMA compliance activities and implementation of projects several times during the evaluation period and will continue to do so in the next evaluation period.

6.5 Other Agency Authorities and Actions

6.5.1 County of Monterey Well Permit Review

In the County of Monterey, the Environmental Health Bureau (EHB) is the primary well permitting agency. After EHB reviews a permit application, it is routed to the necessary partner agencies: MCWRA, Monterey County Housing & Community Development (HCD), SVBGSA, and/or City Planning Departments. MCWRA provides technical input on permits for wells that will pump more than 5 AF/yr, well repairs or reconstruction, well destruction, or new domestic and high-capacity wells. Some of the cities in the SVBGSA's jurisdiction retain well permitting authority.

For compliance with Executive Order N-7-22, SVBGSA adopted procedures to review applicable well permits to verify that extractions will not be inconsistent with the sustainability program in the subbasin and will not otherwise decrease the likelihood of achieving sustainability. In 2023 and 2024, SVBGSA completed the verification for 6 replacement wells in the 180/400 Subbasin. The Executive Order was rescinded for Monterey County by Executive Order N-2-24 in September 2024.

6.5.2 County of Monterey Interim Well Regulations (Deep Aquifers)

As discussed in Section 3.3.12, in 2018, the County of Monterey (County) issued an interim ordinance No. 5302 (extended by No. 5303), which prohibited construction of new wells in the Deep Aquifers unless exempted by ordinance and directed MCWRA to complete a study of the Deep Aquifers. The original 2020 GSP included a management action for the SVBGSA to support Monterey County reimposing a prohibition on drilling any new wells into the Deep Aquifers until more information was known about the Deep Aquifers' sustainable yield. However, the County's interim ordinance expired in 2020.

The expiration of the ordinance—coupled with data on well construction and groundwater extraction in the Deep Aquifers that occurred while the ordinance was in place—highlighted the need to complete the Deep Aquifers Study. SVBGSA took lead on planning the Deep Aquifers Study, executing a shared funding agreement for it in 2022 and completing the Study in April 2024. The Deep Aquifers Agency Working Group, consisting of staff from SVBGSA, MCWRA, MCWDGSA, and County of Monterey Environmental Health Bureau, is reviewing the Study's guidance to determine if a subsequent County of Monterey ordinance related to well permits should be recommended as a management action.

6.5.3 MCWRA Groundwater Monitoring Program (Ordinance No. 5426)

Over the last couple of years, MCWRA and SVBGSA collaborated on the expansion of MCWRA's well registration, groundwater extraction, and groundwater monitoring programs to meet the SVBGSA's current regulatory requirements under the SGMA. To modernize, support the needs of the SVBGSA, and meet the requirements of SGMA, on October 1, 2024, the Board of Supervisors of MCWRA adopted Ordinance No. 5426, which affirms MCWRA's ability and intent to perform groundwater monitoring throughout Monterey County and establishes a cohesive Groundwater Monitoring Program (GMP).

The ordinance repeals 3 existing MCWRA ordinances (No. 3660, 3717, and 3718), that pertain to the registration of groundwater wells and the reporting of groundwater extraction data. The new ordinance sets forth requirements for well registration and groundwater reporting requirements and is accompanied by a manual that describes the details of the MCWRA's groundwater monitoring activities more fully. The manual will be used to guide the implementation of the GMP and provide clarity to the public about the GMP. The ordinance also allows MCWRA to establish a regulatory fee under Proposition 26 that will cover the costs of implementing the GMP. A GMP regulatory fee nexus study was initiated in July 2024 and will be completed in 2025.

MCWRA and SVBGSA initiated broad outreach on the topic of a new ordinance in Fall 2023. After many meetings with various community groups and public presentations, an initial draft of the proposed new ordinance was presented at a number of MCWRA and SVBGSA Board and committee meetings. It was the subject of meetings with interested parties including the Monterey County Farm Bureau, Salinas Basin Water Alliance, and Salinas Valley Water Coalition. The Agency revised the draft ordinance throughout the process in response to public comments and questions received.

The Groundwater Monitoring Program (GMP) will improve collection and storage of regional groundwater data. It includes well registration, GEMS, and groundwater elevation and quality monitoring.

- Well Registration: Through the GMP, the expansion of well registration and the Groundwater Extraction Management System requires all wells in the Salinas Valley Groundwater Basin to be registered with the MCWRA. Well registration with MCWRA involves well owners submitting or verifying well information through a registration portal (under development) or, in the interim, using a form available on the MCWRA website. The data submission requirements include general information about well ownership, well construction specifications, and status of the well among other specifications. Data on well location and depth helps to understand the relationship between wells and groundwater conditions. Well owner name and address information obtained through the GMP is maintained as confidential. Well Registration will occur over the next several years.

- GEMS Expansion and Enhancement: Wells extracting more than 2 AF/yr (i.e. non-*de minimis*) will also need to report extraction data to MCWRA through GEMS. Nearly 500 well operators currently submit groundwater extraction information to MCWRA through GEMS, a program established in 1993. But data gaps exist, including areas on the northern coastal side of the 180/400 Subbasin. The GEMS expansion applies to all non-*de minimis* users, including agricultural users, domestic users with 15 or more connections, and in subsequent years (tentatively October 2025) domestic users with 5-14 connections.

  Groundwater extraction data can be tracked with the well operator's choice of an approved method. Approved methods currently include water flowmeter, electrical meter, or hour meter (timer). The well operator must record data monthly for each water year, from October 1 to September 30, and reported to MCWRA by November 1 of each year. For the 2023 reporting year, 96% of the 1,940 wells that were required to report submitted their data. As the Groundwater Monitoring Program is further developed and enhanced, SVBGSA and MCWRA are striving for efficient data collection to support effective water resources management in the region.

6.6 Legal Issues

6.6.1 City of Marina, *et al.* v. County of Monterey, *et al.*, Monterey County Superior Court, No. 19CV005270

On April 26, 2018, DWR posted the City of Marina Groundwater Sustainability Agency's (MGSA) notice to become the GSA for the CEMEX property. MGSA's late filing created an overlap in the proposed jurisdictional areas at the CEMEX site with the SVBGSA. Due to the overlap, DWR considered the CEMEX site an "unmanaged" area under SGMA. On December 11, 2019, the County of Monterey Board of Supervisors adopted a resolution pursuant to Water Code section 10724, notifying DWR of the County's election to become the GSA for a portion of the 180/400 Foot Aquifer Subbasin in Monterey County, commonly referred to as the CEMEX site, and authorizing and directing the CAO to provide all necessary documentation to the DWR to form the GSA. On December 18, 2019, DWR recognized the County of Monterey as the exclusive GSA on the CEMEX site.

On December 30, 2019, the City of Marina and Marina Groundwater Sustainability Agency filed an action entitled City of Marina, *et al.* v. County of Monterey, *et al.*, Monterey County Superior Court, No. 19CV005270 (SGMA Action). The Court entered judgment in this action on September 27, 2021. Marina filed an appeal of this judgment, and the County filed a cross-appeal. On November 13, 2023, the Court of Appeals for the Sixth Appellate District entered an opinion affirming the trial court judgment and on February 15, 2024, after a petition for review was denied by the California Supreme Court, the Court of Appeal issued a remittitur to Monterey County Superior Court. Three Reverse Validation Complaints (RV) were filed during this time period.

On October 31, 2024, the City of Marina (City), Marina Groundwater Sustainability Agency, and Marina City Council (collectively Marina); the County of Monterey, Monterey County Board of Supervisors, and County of Monterey Groundwater Sustainability Agency (collectively County); Salinas Valley Basin Groundwater Sustainability Agency and Board of Directors of Salinas Valley Basin Groundwater Sustainability Agency (collectively SVBGSA); and California-American Water Company (Cal-Am) entered into a Settlement Agreement that became effective with a global settlement of all outstanding claims in each of these actions to settle all remaining disputes, obligations, and potential claims for costs and attorneys' fees in the SGMA Action, as well as all disputes, obligations, and claims in the stayed Cal-Am RV Action, Marina RV Action #1 and Marina RV Action #2.

Pursuant to the settlement, SVBGSA and the City of Marina will hold a GSP meeting to discuss the City's substantive concerns with the current SVBGSA GSP. The attending Parties agree to confer in good faith to discuss and attempt to resolve the GSP issues, but no Party commits to any follow-up action or meeting at this time.

The CEMEX site is the location of CalAm's proposed Monterey Peninsula Water Supply Project, discussed in Section 3.6.5.2. Although there have been several key project approvals, there is other ongoing litigation related to this project that would need to be resolved prior to project construction.

6.7 Enforcement Actions

SVBGSA did not take any enforcement action during the 5-year evaluation period.

7 OUTREACH, ENGAGEMENT, AND COORDINATION WITH OTHER AGENCIES

Groundwater supports economic activities from small domestic scale to large industrial scale. Groundwater is an important supply for over 400,000 people living within the Salinas Valley Groundwater Basin. Beneficial users in the Basin are the key interested parties targeted for robust public engagement for GSP development and implementation and are highly diverse. Community engagement and public transparency on SVBGSA decisions is paramount to building a sustainable and productive solution to groundwater sustainability in the Basin.

The process for development of the original 180/400 Subbasin GSP from 2020 included a combination of gathering feedback during public meetings with the Advisory Committee and Board of Directors. Subsequently, subbasin planning committees were established in May 2020 by the Board to inform and guide planning for the remaining 5 GSPs submitted in January 2022. SVBGSA Resolution No. 2021-06, adopted in July 2021, established subbasin implementation committees to be convened upon the submittal of the GSP for each subbasin, including a new 180/400 Subbasin Implementation Committee (180/400 Committee).

The Board, Advisory Committee, and Subbasin Implementation committees are working together to implement the 6 GSPs required within the SVBGSA jurisdiction. Subbasin implementation committee meetings follow the requirements of the Brown Act. Meeting agendas and materials are noticed publicly on the SVBGSA website and public comments are taken on all posted agenda items. In addition to these formal public participation processes, SVBGSA maintains robust outreach and engagement with interested parties through multiple channels.

7.1 Public Involvement in Amendment 1

During the preparation of GSP Amendment, SVBGSA held more than 12 public meetings where the Board, committee members, and the public provided comments and input. In April 2022, the 180/400 Committee recommended the draft Amendment 1 Board be released for public comment. Public comments on the draft were compiled and responded to during preparation of the final Amendment for Board approval. SVBGSA provided the required public notices and held a public hearing to adopt Amendment 1 on September 8, 2022.

7.2 Amendment 1 Chapter 2: Communications and Public Engagement

As discussed in Section 1.1.1, GSP Amendment 1 updated the previous 2020 GSP Chapter 11 in a new Chapter 2: Communications and Public Engagement. This purpose of this chapter is to better characterize its approach and strategies to reach a broad audience. It provides additional information to address DWR Recommended Corrective Action 1 on SVBGSA’s implementation of required, ongoing communications elements. It includes sections on the following:

- Identification of interested parties for the purposes of public engagement
- SVBGSA 180/400 Subbasin Planning and Implementation Committees
- Communication and public engagement actions (goals, objectives, target audiences, stakeholder database, key messages and talking points, engagement strategies, timeline and tactics, and an annual evaluation and assessment)
- Strategic engagement and communications with underrepresented communities and disadvantaged communities

7.3 Public Involvement in 5-year Evaluation

During preparation of this 5-year Evaluation in 2024, the 180/400 Committee increased its meeting frequency, holding a total of 11 meetings. These meetings included reviewing the groundwater conditions related to sustainability criteria, discussing the current PMA feasibility studies, reviewing the list of PMAs in the GSP, and discussing other new ideas. The meetings provided an opportunity for committee discussion and public comments on resulted in several suggestions that could be considered further in the next plan amendment, or through variations to GSP projects with additional feasibility analyses.

7.4 Outreach and Engagement Activities

SVBGSA’s outreach strategy engages the public early and frequently, and keeps information flowing among staff, consultants, committee members, and the SVBGSA Board regarding GSP implementation activities. Critical to the success of the 180/400 Subbasin GSP is public understanding of the plan’s goals and objects, projects and management actions planned to achieve sustainability, as well as other groundwater management activities. The following sections provide an overview of outreach and engagement activities during the 5-year evaluation period.

7.4.1 180/400 Subbasin Implementation Committee

The 180/400 Committee was first convened on October 22, 2021. The Committee had 17 members appointed to it. Broadly, the committee was tasked with advising and providing recommendations on the implementation of the GSP to review the sustainability status of the Subbasin and ensure the Subbasin is on a path to sustainability. In the summer of 2024, SVBGSA opened an application process for appointment or reappointment to the Subbasin Committees, each of which has up to 12 members and a term of 2 years.

Topics on Subbasin Committee agendas include updates on SGMA compliance activities and PMAs. The Subbasin Committee provided input throughout preparation of Amendment 1 and was a venue for public comments during the process. The Annual Reports and 5-Year Evaluations provide an important opportunity to discuss sustainability status and goals.

7.4.2 Advisory Committee

The Advisory Committee provides input and recommendations to the Board and uses consensus to make recommendations to the Board. The Advisory Committee was established by Board action and operates according to a Committee Charter which serve as the bylaws of the Advisory Committee. The role of the Advisory Committee evolved after formation of the Subbasin Planning and Implementation Committees. The Advisory Committee currently meets every other month.

In 2022, the Board updated the role of the Advisory Committee to have an emphasis on integrated implementation of the GSPs and addressing seawater intrusion. In July 2022, the Board approved the Advisory Committee nomination process and directed staff to make the necessary changes to the committee Charter and Bylaws. The new Advisory Committee was convened in August of 2022. In the spring of 2023, the Advisory Committee reviewed and provided comments on Charter and Bylaws and a work plan that included the following:

- Support of SVBGSA efforts in addressing Seawater Intrusion
    - Information and Education - Learn about how other areas are managing Seawater Intrusion
    - Feasibility Studies
- Integrated Implementation of the GSPs:
    - Use of USGS Groundwater model and SWI model
    - Water Quality Coordination/Land Use Jurisdiction Coordination
    - Groundwater Dependent Ecosystems
    - Underrepresented Community Representation
- Topics at the Board of Directors' Request

In 2023, the Advisory Committee also began to utilize work groups for ad-hoc, topic specific involvement and input. Thus far, they have created a Groundwater Dependent Ecosystems (GDE) Work Group to collaborate with the CCWG on developing an approach to conduct necessary field reconnaissance for GDE identification.

In the next 5-year evaluation period, the Advisory Committee will likely focus on consideration of multi-subbasin PMAs and revisiting the concept of an Integrated Implementation Plan.

7.4.3 SVBGSA Board

As noted in the GSP, SVBGSA is governed by a local and diverse 11-member Board of Directors (Board) and relies on robust science and public involvement for decision making. The

Board meets monthly—all meetings are open to the public—and they are the final decision makers for the adoption of GSPs as well as any plan amendments. The Annual Work Plan, Budget, and Fees are approved by the Board each year prior to the start of each fiscal year.

The Board has committees, including a Budget and Finance Committee and Executive Committee. Members of the Board also participate as members of subbasin committees.

7.4.4 SVBGSA/MCWDGSA Steering Committee

As discussed in Section 7.4.4, SVBGSA and MCWDGSA maintain ongoing coordination, including on Annual Reports and on this 5-Year Evaluation. In 2024, the 2 GSAs technical consultants closely coordinated on further development of the Salinas Valley Seawater Intrusion Model, discussed elsewhere in this report. MCWDGSA has a subgrant agreement with SVBGSA for its current SGM Round 2 Implementation Grant for the Monterey Subbasin. Work under this grant is informing 180/400 Subbasin management, given shared hydrogeologic characteristics at the boundaries.

SVBGSA and MCWDGSA have a Steering Committee to oversee activities under the Framework Agreement, including developing and maintaining coordinated data management system(s) and facilitating data sharing, preparing coordinated water budgets and basin setting information for the 2 subbasins, and developing coordinated monitoring network objectives. Currently, the Steering Committee meets quarterly.

7.4.5 Water Quality Coordination Group (Implementation Action 4)

GSP Amendment 1 added an implementation action to establish a Water Quality Coordination Group (Coordination Group). SVBGSA coordinates with water quality regulatory agencies and programs in all subbasins. The Coordination Group includes the CCRWQCB, local agencies and organizations, water providers, domestic well owners, technical experts, and other interested parties. The group coordinates between agencies that regulate water quality directly and the SVBGSA, which has an indirect role to monitor water quality and ensure its management does not cause undesirable water quality results.

During the 5-year evaluation period, SVBGSA initiated ongoing meetings with other agencies that regulate and monitor water quality. In support of both the Well Registration and Coordination Group goals, staff meet regularly to coordinate and exchange data. Details about wells such as location, borehole depth, and perforation are essential to know which aquifer the water sample or measurement is representing and how that data should be applied. Active data sharing continues but linking the well identification from water quality samples to well construction records remains a challenge.

In 2023, staff from SVBGSA, MCWRA, CCRWQCB, and Central Coast Water Quality Preservation Inc. (Preservation Inc.) convened to discuss each agencies' role and actions that address water quality concerns. Preservation Inc. is leading the Alternative Compliance Pathway (ACP) for water quality monitoring for compliance with the CCRWQCB's ILRP. Preservation Inc provided updates and sought input for the development of the ACP and the staff group began discussions about SVBGSA's unique role relative to water quality.

The CCRWQCB staff and SVBGSA staff have agreed to meet to review water quality data and achieve effective coordination. The emphasis has been on data coordination as the foundation. MCWRA, Preservation Inc, and SVBGSA continue to work together to reconcile datasets as described in the Groundwater Quality Monitoring Network Changes. In the future, the goal is to broaden the group participation to include technical experts and other additional interested parties after the data coordination has progressed.

The Coordination group meets annually. The first meeting occurred in April of 2024. Staff from SVBGSA, CCRWQCB, and Preservation Inc met to review the Water Quality SMC from the Salinas Valley Annual Reports for WY 2023. Staff identified a better method to share data going forward to include timely ILRP data in the Annual Reports. Staff discussed the development of the approach to address RCA #5 and the opportunities for broader interested party engagement in the future. Part of this effort is understanding and developing a process for determining when groundwater management and extraction result in degraded water quality in the Subbasin. The Coordination Group will also review water quality data, identify data gaps, and coordinate agency communication. The next Coordination Group meeting will be in April 2025.

7.4.6 Land Use Jurisdiction Coordination (Implementation Action 5)

During the evaluation period, SVBGSA met informally with land use jurisdictions to share information about the GSPs and to discuss opportunities to coordinate groundwater management with land use planning. This effort will be further developed and formalized in the next evaluation period. Within the 180/400 Subbasin, land use jurisdictions include the cities of Marina, Salinas, and Gonzales, and the County of Monterey. The County's unincorporated communities within the subbasin include Castroville and Chualar, as well as rural residential areas in the North County Coastal Land Use Plan area.

Potential activities under this program will be to coordinate with the cities and County to better understand future land use plans and anticipated development. Similarly, SVBGSA will work with the land use jurisdictions to provide information on the GSP's to consider in their decision-making processes. Information on future land uses needs to be incorporated into groundwater models used for developing predictive scenarios and to inform additional PMA planning and development. In the next evaluation period, SVBGSA will coordinate with Monterey County on its General Plan policies related to long-term sustainable water supplies, addressing concerns about seawater intrusion in this Subbasin and other groundwater conditions in the Salinas Valley as a whole.

7.4.7 Deep Aquifers Agencies Working Group

The Deep Aquifers Agencies Working Group was formed in 2024 following the completion of the Deep Aquifers Study and after the Boards of several agencies with management authorities over the Deep Aquifers received the Study. The Working Group consists of staff from these agencies: SVBGSA, MCWDGSA, MCWRA, and Monterey County Environmental Health Bureau. It is currently reviewing the Study's management guidance and will make recommendations for long-term management actions in 2025, along with a monitoring plan.

7.4.8 Outreach and Engagement with Underrepresented Communities

Several areas of the 180/400 Subbasin are considered disadvantaged or underrepresented, including the communities of Castroville, Chualar, and other unincorporated rural residential areas of northern Monterey County, and some areas of the cities of Salinas and Gonzales. The following discussion describes SVBGSA's activities to reach out to and engage these beneficial users over the 5-year evaluation period.

7.4.8.1 Disadvantaged Community Engagement Strategy

Following submittal of the 2020 GSP, the Board expressed an interest in understanding more about underrepresented and disadvantaged communities (DAC) experiences in the Salinas Valley and how the GSP development process could help better understand groundwater conditions affecting these communities. SVBGSA worked with the Consensus Building Institute (CBI) to develop an engagement strategy for working with DAC and underrepresented communities (URC). These communities are important interested parties for the Agency to develop meaningful and long-term relationships regarding groundwater sustainability.

CBI conducted interviews to gauge primary groundwater issues of concern in DACs, identified possible areas of focus with DACs, confirmed barriers to engagement with DACs, and identified outreach and education materials and approaches to achieve success with these communities over the long-term. The purpose of the assessment was to capture insights and recommendations to inform an engagement strategy for URCs and DACs. CBI conducted 14 interviews and summarized findings from the assessment to identify initial strategic steps for work with URCs and DACs for GSP planning and implementation. With the onset of the Covid-19 pandemic, the beginning of this work was mostly done virtually.

In February 2021, SVBGSA's Board affirmed CBI's DAC outreach and engagement strategy to deploy during implementation of the GSP. The work products from this effort describe the need for an iterative process and recommended that initial outreach be viewed as the SVBGSA "introducing" itself more intentionally to begin a dialogue about the relevance of regional groundwater management to the lived experience in disadvantaged areas of the Salinas Valley .

Although SVBGSA has not yet established the DAC advisory committee or working group recommended by CBI, SVBGSA staff had ongoing meetings with representatives from the Community Water Center, Monterey Water Keeper, and more recently, California Rural Legal Assistance (CRLA) and the California Association of Family Farmers (CAFF). These organizations are the most frequent community advocates for groundwater sustainability in DACs and URCs in the Salinas Valley.

In the 180/400 Subbasin, Community Water Center provided written comments on Amendment 1 and directly to DWR expressing specific concerns about seawater intrusion impacts and the groundwater conditions near the unincorporated community of Castroville. SVBGSA staff have been meeting with the Castroville Community Services District (CCSD) Board and representatives, as discussed further below.

In the next evaluation period, SVBGSA will continue to work on outreach and engagement strategies to be able to reach a wide audience of residents from diverse backgrounds in the disadvantaged and underrepresented areas of the Subbasin. SVBGSA is currently planning a Water Leadership Institute program in partnership with the Rural Community Assistance Corporation and Environmental Defense Fund in 2025 to support and improve URC participation in SVBGSA meetings and GSP implementation activities.

7.4.8.2 Castroville Community Services District

Castroville Community Services District (CCSD) delivers water and provides other public services to approximately 7,000 residents in Castroville. Groundwater is currently the only water supply. In 2021, one of CCSD's 4 water supply wells was taken offline due to high chloride levels due to seawater intrusion. CCSD has described Castroville as "the canary in the coal mine" for other areas at risk of seawater intrusion. Over the past few years, SVBGSA staff met with the CCSD General Manager and attended several CCSD Board meetings to discuss SVBGSA's activities.

SVBGSA staff, along with the Watershed Coordinator and MLRP program representative, met with the Board specifically about outreach and to discuss how to work together to engage residents in groundwater issues. CCSD board members and staff identified the need for better outreach and educating and engaging Castroville residents and their ratepayers to better understand what could happen if seawater intrusion worsens, including how it will affect residents' health, water bills, and home values: "it's more than just buying bottled water." CCSD's Board expressed concern that residents are not very engaged, public attendance at their meetings is low, and there is little response to inserts included with bills. CCSD feels that if Castroville residents had a better understanding of what was at stake and knew how to voice their concerns, CCSD could get more traction on securing solutions to the impacts of seawater intrusion.

In 2024, SVBGSA coordinated with CCSD to develop outreach materials specific to Castroville, including a poster display with information about 180/400 Subbasin and seawater intrusion. SVBGSA and CCSD, along with the Multi-Benefit Land Repurposing Program outreach coordinator, shared a booth at a Castroville Community Resources Fair put on by the North Monterey County School District.

7.4.9 Other Ongoing Communication Activities

As noted in Amendment 1, SVBGSA uses a variety of tactics to achieve broad, enduring, and productive involvement with interested parties during the development and implementation of the GSPs. GSP Amendment 1, Chapter 2 provides an extensive discussion on the activities that SVBGSA uses to currently engage the public and on anticipated activities for GSP implementation.

During the 5-year evaluation period, SVBGSA continually worked to deploy these outreach and engagement strategies and to reach audiences beyond those who regularly participate through the Subbasin and Advisory Committees. SVBGSA's website, social media, and newsletters are available and easily accessible. The SVBGSA website has been maintained and improved as a communication tool for posting data, reports, and meeting information. This website features a link to an interactive mapping function for viewing Salinas Valley-wide data.

The Dry Well Reporting System is included in Amendment 1 as Implementation Action 3. SVBGSA has used its communication tools to promote the Dry Well Reporting System, which is a free, easy-to-use online tool that tracks wells that have gone dry across California. The data is used to inform state and local agencies about drought impacts on residential water supplies and helps to develop strategies that support long-term sustainability for groundwater sources. In early 2023, one well was reported as dry in Monterey County, just outside of SVBGSA's jurisdiction in Royal Oaks. By using the Dry Well Reporting System, impacted residents can also discover helpful resources.

Lastly, during the evaluation period, SVBGSA became a member of the Water Awareness Committee, which is a non-profit with multiple water agencies and water utilities that have joined in efforts to promote water conservation in Monterey County. SVBGSA has participated in their community outreach events, including the annual water conservation showcase with booths at the Monterey County Fair.

8 REFERENCES

Boyce, S.E., 2022, MODFLOW One-Water Hydrologic Flow Model (MF-OWHM) Conjunctive Use and Integrated Hydrologic Flow Modeling Software, version 2.2.0: U.S. Geological Survey Software Release, https://doi.org/10.5066/P9P8I8GS.

DWR (California Department of Water Resources). 2018. Guidance for Climate Change Data During Groundwater Sustainability Plan Development. 101 p. https://water.ca.gov/-/media/DWR-Website/WebPages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/BestManagement-Practices-and-Guidance-Documents/Files/Resource-Guide-ClimateChange-Guidance_v8_ay_19.pdf.

CCRWQCB (Central Coast Regional Water Quality Control Board). 2019. Water Quality Control Plan for the Central Coast Basin, June 2019 Edition. California Environmental Protection Agency. https://www.waterboards.ca.gov/centralcoast/publications_forms/publications/basin_plan/docs/2019_basin_plan_r3_complete_webaccess.pdf

Feeney, M.B., and L.I. Rosenberg. 2003. Deep aquifer investigation - hydrogeologic data inventory, review, interpretation, and implications, 40 p. Available at: https://www.co.monterey.ca.us/home/showdocument?id=19614.

GeoSyntec. 2007. El Toro Groundwater Study. Available at: Available at: https://www.countyofmonterey.gov/home/showdocument?id=22163

_____. 2010. Geologic Map and Cross-Sections from El Toro to Salinas Valley, June 2010. Available at: https://www.countyofmonterey.gov/home/showdocument?id=19618.

Hanson, R.T., Everett, R. R., Newhouse, M.W., Crawford, S.M., Pimental, M.I., Smith, G.A. 2002. Geohydrology of a deep-aquifer system monitoring-well site at Marina, Monterey County, California. https://www.co.monterey.ca.us/home/showdocument?id=61931

Harding ESE. 2001. Hydrogeologic Investigation of the Salinas Valley Basin in the Vicinity of Fort Ord and Marina, Salinas Valley, California, prepared for Monterey County Water Resources Agency. 12 April. 166 p. Available at http://svbgsa.org/wp-content/uploads/2020/08/2001-Final-Report-Hydrog.pdf

Kennedy/Jenks. 2004. Hydrostratigraphic Analysis of the Northern Salinas Valley. Prepared for Monterey County Water Resources Agency. 113 p. Available at: https://www.countyofmonterey.gov/home/showdocument?id=19634.

Maier, K.L., Johnson, S.Y., Hartwell, S.R., and Sliter, R.W. 2016. Seismic-reflection profiles, Monterey Canyon and Vicinity map area, California, sheet 8 in Dartnell, P., Maier, K.L., Erdey, M.D., Dieter, B.E., Golden, N.E., Johnson, S.Y., Hartwell, S.R., Cochrane, G.R., Ritchie, A.C., Finlayson, D.P., Kvitek, R.G., Sliter, R.W., Greene, H.G., Davenport, C.W., Endris, C.A., and Krigsman, L.M. (P. Dartnell and S.A. Cochran, eds.), California State Waters Map Series—Monterey Canyon and Vicinity: U.S. Geological Survey. Open-File Report 2016–1072, pamphlet 48 p., 10 sheets, scale 1:24,000. Available at: http://dx.doi.org/10.3133/ofr20161072.

Marina Coast Water District (MCWD). 2020. Marina Coast Water District 2020 Urban Water Management Plan. Prepared by Schaff & Wheeler Consulting Civil Engineers https://www.mcwd.org/docs/2021_uwmp/DRAFT_MCWD_2020_UWMP_v20210520.pdf.

Monterey County Agricultural Commissioner. 2023. Agricultural Commissioner's Office Releases March Storm Agriculture Damage Survey Results.

MCWRA (). 2005. *Salinas Valley Water Project Flow Prescription for Steelhead Trout in the Salinas River.*

_____. 2017. Special Reports 17-01. Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin. Available at: https://www.countyofmonterey.gov/home/showdocument?id=57432.

_____. 2020. Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin: 2020 Update. Special Reports 20-01. Available at: https://www.countyofmonterey.gov/home/showpublisheddocument/90578/637255787124030000.

_____. 2023. 2023 Salinas River Discharge Series Results. Monterey County. Available at: https://www.countyofmonterey.gov/home/showpublisheddocument/126953/638344342317370000.

M1W (Monterey One Water). 2024. MCWRP Operations and Maintenance Update. Presented to the Water Quality and Operations Committee. January 2024.

M&A (Montgomery & Associates). 2023a. Salinas Valley Seawater Intrusion Model Report. Available at: https://svbgsa.org/resources/seawater-intrusion/salinas-valley-seawater-intrusion-model/.

_____. 2024a. Salinas Valley Deep Aquifers Study. Prepared for the Salinas Valley Basin Groundwater Sustainability Agency and Collaborative Funding Partners. Available at: https://svbgsa.org/wp-content/uploads/2024/05/Deep-Aquifers-Study-Report_no-appendices_compressed.pdf.

_____. 2024b. 180/400-Foot Aquifer Subbasin Monitoring Well Construction, Development, Testing, Sampling, & Equipping Report.

National Weather Service. 2024a. Salinas River Near Bradley. Advanced Hydrologic Prediction Service. National Weather Service Advanced Hydrologic Prediction Service. Downloaded 2/23/2024.

National Weather Service. 2024b. Salinas River Near Spreckels. Advanced Hydrologic Prediction Service. National Weather Service Advanced Hydrologic Prediction Service. Downloaded 2/23/2024.

SWRCB (California State Water Resources Control Board). 2023. Water Conservation Emergency Regulations. Updated 12/6/23. https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/regs/emergency_regulation.html#:~:text=The%20emergency%20drought%20proclamation%20is,Board)%20water%20conservation%20emergency%20regulations.

Rohde, M.M., J.C. Stella, M.B. Singer, D.A. Roberts, K.K. Caylor and C.M. Albano. 2024. Establishing ecological thresholds and targets for groundwater management. Nature Water. https://doi.org/10.1038/s44221-024-00221-w

Thorup, R.R. 1976-1983. Hydrogeological Report on the Deep Aquifer, Salinas Valley, Monterey County, California. Draft report prepared for Monterey County Board of Supervisors. Available at: http://svbgsa.org/wp-content/uploads/2020/08/1976-Hydrogeological-Report-on-the-Deep-Aquifer-Salinas-Valley-Richard-R.-Thorup.pdf.

USGS (United States Geological Survey). 2021. Overview of the Salinas Valley Models. Project Progress Report. November 2.