Eastern San Joaquin Groundwater Subbasin

2025 Periodic Evaluation

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EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

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EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

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EXECUTIVE SUMMARY

The Eastern San Joaquin Subbasin (Subbasin) Groundwater Sustainability Plan (GSP) Periodic Evaluation documents progress in implementing the Eastern San Joaquin GSP for the time period of 2020-2024 as required by California Water Code (CWC) Section 10728.2. During this period, significant new information was acquired during the evaluation cycle and utilized in updating the Subbasin's integrated flow model, ESWRM Version 3.0, and in responding to the DWR's Recommended Corrective Actions as contained in their July 6, 2023 Determination Letter. The analyses completed utilizing these new data and other responses to the Recommended Corrective Actions were carried forward into the Subbasin's 2024 GSP Amendment, along with summaries of the relevant data sets.

In general, the Eastern San Joaquin Subbasin continues to make progress towards achieving its sustainability goals. Groundwater levels in the representative monitoring network (RMN) for the chronic lowering of groundwater levels sustainability indicator are generally stable, with 14 of the representative monitoring wells at or above their measurable objectives and meeting their interim milestones. Seven representative monitoring wells do, however, show declining groundwater level trends, and the average annual change in storage over the last five years (2019-2023) was 89,000 AF net loss in storage[1]. Total change in storage between 2019 to 2023 was estimated at a loss of 467,000 AF or 0.26% as a percentage of total storage. The GSAs are working to correct that imbalance through the implementation of projects and management actions (PMAs). The GSAs divide currently planned or implemented projects into two categories:

- Category A projects - projects that were completed or are anticipated to advance in the next five years and have existing water rights or agreements.
- Category B projects - projects that are not anticipated to advance in the next five years, but may be implemented in the future, particularly if Category A projects do not fully achieve stated recharge and/or offset targets.

The GSAs have made steady progress in moving Category A projects forward, with several projects having been completed or in the implementation stage. Status of Category B projects are tracked as well, with several in the planning or design stages.

Groundwater quality in the Subbasin is generally sufficient to meet beneficial uses and is on track to surpass measurable objectives; no minimum threshold exceedances have been observed. There is no concern about surpassing Measurable Objectives (MOs) or Minimum Thresholds (MTs) in the next five years with respect to groundwater quality.

[1] When comparing average annual change in storage and total change in storage values across documents (such as the Annual Reports, 2020 GSP, and 2022 Revised GSP), it is important to note the version of the Historical ESJWRM model that was used to generate those specific values. For example, Historical ESJWRM Version 1.1 extended the 2020 GSP model version through 2019 and 2020. Historical ESJWRM Version 2.0 included a substantial model upgrade and extended simulation to 2021. Historical ESJWRM Version 2.2 included minor updates to Version 2.0 and extended simulation through 2022 and 2023. ESJWRM v3.0 included a substantial model update and was used to prepare this Periodic Evaluation Report and the 2024 GSP Amendment. The ongoing model improvements inherently impact the model results to some extent, so any comparison of these numbers between reports should be done with this in mind.

To date, Continuous Global Positioning System (CGPS) subsidence monitoring stations in the Subbasin have shown no land subsidence (as defined by land surface elevation declines); the CNDR station has shown 0.01 feet of land subsidence (within the realm of error) over the last water year. These results are reflected in the most recently available InSAR data which also show that no land subsidence occurred in the Subbasin greater than 0.2 feet (the minimum threshold for this sustainability indicator). Therefore, undesirable results are not presently occurring in the Subbasin relative to inelastic land subsidence, and the Subbasin is on track to achieving the interim milestones (IMs) for this sustainability indicator.

Finally, the 2020 GSP and 2022 Revised GSP use the groundwater level sustainable management criteria (SMC) as a proxy for the interconnected surface waters sustainability indicator. As such, current groundwater conditions relative to the chronic lowering of groundwater level SMC also apply to the interconnected surface water sustainability indicator. There are no data to suggest undesirable results with respect to interconnected surface waters in the Subbasin, and the Subbasin is on track to continue meeting this sustainability indicator.

In summary, for each sustainability indicator, the Subbasin has been meeting its interim milestones and anticipates continuing to do the same by the 2030 Periodic Evaluation. The Subbasin GSAs have completed additional work and analyses in response to the California Department of Water Resources' (DWR's) July 6, 2023 Determination Letter approving the Subbasin's 2022 Revised GSP, resulting in further refinements and enhancements to the Subbasin's SMCs and RMNs. These revisions have resulted in the preparation of the 2024 GSP Amendment. This progress toward sustainability, and the changes to the GSP, are explained in detail in this report.

1. NEW INFORMATION COLLECTED

- Describe any new information that the GSA has acquired during the evaluation cycle, including whether the new information warrants changes to any aspect of the Plan.
- Evaluate whether those changes associated with the new information led to a Plan Amendment.

New information was acquired between January 2020 (when the Eastern San Joaquin Subbasin GSP was first submitted) and 2024, which was utilized in updating the Eastern San Joaquin Water Resources Model (ESJWRM) Version 3.0, and in responding to DWR's Recommended Corrective Actions (RCAs). The analyses completed utilizing new data were addressed in the 2024 GSP Amendment, along with summaries of the relevant data sets. **Table 1-1** summarizes how the new data sets affected the GSP and where the associated changes can be found in the 2024 GSP Amendment.

TABLE 1-1: SUMMARY OF NEW INFORMATION USED IN 2024 GSP AMENDMENT

Significant New Information	Description	Aspects if GSP Affected	Warrant Changes to Any Aspect of the GSP
AEM data	Airborne electromagnetic (AEM) survey data collected by DWR as available on DWR website at https://water.ca.gov/Programs/Groundwater-Management/Data-and-Tools/AEM	Hydrogeologic Conceptual Model; Numerical Model Update	Yes; GSP Chapter 2
Hydrostratigraphy	Boring logs and well construction reports for five new interconnected surface water wells and one new well adjacent to the Sacramento-San Joaquin River Delta	Hydrogeologic Conceptual Model; Representative Monitoring Networks	Yes; GSP Chapters 2 and 4
Additional monitoring data	Annual groundwater level and groundwater quality data collected by the GSAs and reported in Annual Reports	Groundwater Conditions; Numerical Model Update	Yes; GSP Chapter 2
Statewide Crop Mapping	Incorporated in the ESJWRM Version 3.0 to refine water budgets	Water Budgets	Yes, GSP Chapter 2
OSWCR well data	Used to evaluate well depths of domestic or public supply wells to respond to DWR's Recommended Corrective Action 1 on groundwater levels Additional well construction reports collected by DWR as available on DWR website at https://data.cnra.ca.gov/dataset?q=well+completion+report&organization=dwr	Justification of SMC; Representative Monitoring Networks	No
InSAR data	TRE ALTAMIRA InSAR Subsidence data collected by DWR as available on DWR website at https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence	Subsidence SMC and Representative Monitoring Network	Yes; GSP Chapter 4

Significant New Information	Description	Aspects if GSP Affected	Warrant Changes to Any Aspect of the GSP
Public Water System Area Boundaries	Shapefiles were downloaded from SWRCB's database (https://hub.arcgis.com/datasets/fbba842bf134497c9d611ad506ec48cc_0/about) to respond to DWR's Recommended Corrective Action #1 related to groundwater levels	Justification of SMC; Representative Monitoring Networks	No
CGPS Stations	New subsidence monitoring locations added at CGPS stations, provided by SOPAC and JPL	Representative Monitoring Networks	Yes; GSP Chapter 4
Subsidence Benchmarks	Additional benchmark monitoring location and elevation data points added in the subsidence representative monitoring network Additionally, benchmark data is used to validate InSAR data	Subsidence SMC; Representative Monitoring Networks	Yes; GSP Chapter 4
Groundwater Ambient Monitoring and Assessment (GAMA)	Additional water quality data analyzed to respond to DWR's Recommended Corrective Actions #5, 7, and 8 related to seawater intrusion and groundwater quality	Justification of SMC; Representative Monitoring Networks	Yes; GSP Chapter 4
United States Geological Survey (USGS) streamflow data	Streamflow data was analyzed to respond to DWR's Recommended Corrective Action #6 related to interconnected surface water	Justification of SMC;	No

2. GROUNDWATER CONDITIONS BY SUSTAINABILITY INDICATOR

- Summarize current groundwater conditions for each applicable sustainability indicator relative to the SMC established in the GSP.
- If GSP implementation is not making progress, describe potential reasons and provide description as to how the GSAs plan to get back on track.
- Include a forecast of likelihood of achieving interim milestones or MOs in next 5 years.
- Discuss how the corrective actions in the Determination Letter were addressed and if the recommended CAs were addressed with a Plan Amendment.

DWR's July 6, 2023 Determination Letter contained eight RCAs to be addressed during the Periodic Evaluation. In response, the GSAs conducted additional analyses and activities to address each RCA, resulting in the 2024 GSP Amendment. The results of the analyses were documented in five technical memoranda (TMs), which have been included in the 2024 GSP Amendment.

The Subbasin continues to make progress towards achieving its sustainability goals. As noted below by sustainability indicator, the Subbasin has consistently met its interim milestones for all sustainability indicators and the GSAs anticipate this positive trend to continue through the 2030 Periodic Evaluation.

2.1 Chronic Lowering of Groundwater Levels

2.1.1 Current Conditions and Progress Towards Sustainability Goal

Undesirable results in the Subbasin for the chronic lowering of groundwater levels are defined by 25 percent or more of representative monitoring wells (RMWs) exceeding their minimum thresholds for two consecutive years. This has not occurred between 2020-2024 and is not expected to occur in the next 5 years.

Groundwater levels in the Subbasin are generally stable, with hydrographs presented in the WY 2023 Annual Report showing groundwater levels declining in the summer (due to a lack of precipitation and continued groundwater pumping) and recovering in the winter. Of the 21 RMWs monitored in the Subbasin over the last five years, only one well, Manteca 18, exceeded its minimum threshold (once in 2022), and seven wells presently exhibit declining trendlines of varying degrees over the past 10 years (RMWs Lockeford 3 Bear Creek, 04N07E20H003M, OID-8, OID-4, 02S08E08A001M, 01S10E26J001M, and 01N07E14J002M). The remaining 14 of the Subbasin's RMWs are at or above their measurable objectives and are meeting their interim milestones, with the exception of the aforementioned wells with declining groundwater level trends. No undesirable results related to chronic lowering of groundwater levels occurred in the Subbasin from 2020-2024. As of 2023, the Subbasin had 12 dry wells reported, according to DWR's Dry Well Reporting System. There is no information, however, as to what caused the wells to go dry and whether it was linked to declining groundwater levels. For the 2024 GSP Amendment, the Subbasin GSAs developed a Domestic Well Mitigation Program to address dry wells. Dry wells did not impact any other sustainability indicators.

Based on the Subbasin's relatively stable groundwater levels, that groundwater levels are generally at or above MTs and MOs, and the GSAs development of the Domestic Well Mitigation Program, the Subbasin is making progress towards its sustainability goal.

2.1.2 Response to DWR Recommended Corrective Actions Regarding Chronic Lowering of Groundwater Levels

Deficiencies and corrective actions identified in DWR's Determination Letter dated January 28, 2022, for the 2020 GSP were addressed in the 2022 Revised GSP by: removing the water year type requirement from the definition of undesirable results for the chronic lowering of groundwater levels; explaining the rationale for the threshold exceedance (25 percent of RMN wells exceeding their minimum thresholds for two consecutive years); explaining how other factors were considered in the development of the undesirable results definition; and explaining how drinking water well users were considered in the development of the SMC.

DWR's July 6, 2023 Determination Letter approving the 2022 Revised GSP included Recommended Corrective Actions (1a-1d) for groundwater levels as follows:

1a. Explain the selection of 25 percent of exceedances as considered undesirable, including details describing the groundwater conditions and how those conditions constitute a significant and unreasonable effect of beneficial uses and users. Additionally, update modeling results to quantify and disclose the potential impacts to groundwater well users during projected conditions where minimum thresholds are exceeded but undesirable results do not occur.

1b. Evaluate the impacts to environmental uses and users related to the groundwater level minimum thresholds, or, at minimum, describe a plan to perform this evaluation in the future when additional data become available.

1c. Evaluate the minimum thresholds in relation to the depths of nearby public water systems and state small water systems reliant on groundwater wells.

1d. Develop a more detailed plan describing how the assessment of groundwater quality in relation to declining groundwater levels will be conducted.

The Subbasin GSAs updated the ESJWRM integrated flow model and performed additional analyses which resulted in changes to SMC and the RMN, necessitating a Plan Amendment. Specific revisions to the GSP included:

- Revision to the minimum threshold methodology removing the deeper of 1992, 2015, or 2016 groundwater level lows and setting them at 2015 groundwater level lows.
- Revision of the minimum threshold definition to either 1) the shallowest 2015 groundwater level low at each RMW with a buffer of 100 percent of historical range applied, or 2) the 10th percentile total depth of domestic wells within a 3-mile radius of the RMW.
- Addition of three new representative monitoring locations (Well ID 01S10E04C001M, NSJWCD-01, and SEWD-01). The latter two wells are new and as a result do not yet have SMC. Monitoring will begin at these two locations in Fall 2024.

A technical memorandum describing the additional analyses conducted in response to Recommended Corrective Action #1 can be found in Appendix 1-G in the 2024 GSP Amendment.

2.2 Reduction in Groundwater Storage

2.2.1 Current Conditions and Progress Towards Sustainability

Change in storage varies annually based on hydrologic conditions. Historically, change in storage has remained fairly stable, but as simulated in the ESJWRM integrated flow model, cumulative change in storage started declining around 2012. Total change in storage from 2019 to 2023 was estimated at a loss of 467,000 AF or 0.26% of total storage, with an estimated annual average change in storage of 89,000 AFY net loss in storage over that same period. Total change in storage stabilized during hydrologically wet years (2017 to 2019) but started declining again around 2020 (a dry year). As a result of recent wet years, the volume of groundwater in storage has increased.

As noted in the 2020 GSP and 2022 Revised GSP, the Eastern San Joaquin Subbasin has approximately 53 million acre-feet (MAF) of groundwater in storage. Based on both past and recent simulations with the ESJWRM integrated flow model, groundwater in storage fluctuates approximately 0.01 percent per year. In the 2020 GSP (and carried forward into the 2022 Revised GSP), it was determined that groundwater demand for beneficial use occurs within the shallowest 23 MAF of the Subbasin, as this is the zone corresponding to the depth at which most pumping occurs and where it is reasonably expected to occur in the future. As such, 23 MAF was set as the minimum threshold for the reduction in groundwater storage sustainability indicator. Additionally, groundwater level SMC were used as a proxy for both the measurable objectives and interim milestones for this sustainability indicator. As estimated in the Water Year (WY) 2023 Annual Report, approximately 1.3 MAF of groundwater was removed from the Subbasin between WY 1996 and WY 2023, therefore no undesirable results have occurred for the reduction of groundwater storage sustainability indicator.

2.2.2 Response to DWR Recommended Corrective Actions Regarding Groundwater Storage

There were no deficiencies related to the reduction in groundwater storage included in DWR's 2022 Determination Letter. DWR's 2023 Determination Letter included one Recommended Corrective Action for the reduction in groundwater storage:

- Provide a revised estimate for the reduction of groundwater storage volume that is considered an undesirable result, or alternatively, highlight how the maximum reduction of groundwater storage related to the chronic lowering of groundwater level minimum thresholds would not result in significant and unreasonable impacts related to groundwater storage and omit the 23 million acre-feet (MAF) estimate.

The defined undesirable result for chronic lowering of groundwater levels is that five representative monitoring wells (or 25% of the RMN) would have groundwater levels lowered below minimum thresholds. Therefore, an analysis was conducted using the updated ESJWRM Version 3.0 integrated flow model to estimate the volume of groundwater that would need to be removed from storage to result in five representative monitoring wells (or 25% of the RMN) to exceed their chronic lowering of groundwater level minimum thresholds.

After running a variety of model scenarios where various groups of 5 wells were selected to 'exceed' their minimum thresholds, the model results indicated that reductions in storage would need to range from 10 to 13 MAF for an undesirable result for groundwater levels to occur. As a result, the definition for undesirable result for reductions in groundwater storage was revised to be a reduction in groundwater storage of

between 10 to 13 MAF. While this revision aligns the reductions in groundwater storage SMC with the chronic lowering of groundwater level SMC, it does not change the chronic lowering of groundwater level SMC.

This analysis is summarized in Appendix 3-D in the 2024 GSP Amendment.

2.3 Degraded Water Quality

2.3.1 Current Conditions and Progress Towards Sustainability

Groundwater quality in the Subbasin is generally sufficient to meet beneficial uses and is on track to surpass measurable objectives; no minimum threshold exceedances have been observed. There is no concern about surpassing MOs or MTs in the next five years with respect to groundwater quality.

Groundwater quality sampling in the Subbasin is for total dissolved solids (TDS) and chloride. Quality data available through other sources are evaluated on an annual basis and further discussed in the 2024 GSP Amendment.

Current chloride conditions in the Subbasin are generally low and most wells had chloride concentrations well below the secondary maximum contaminant level (SMCL) of 250 mg/L. The majority of chloride measurements (80%) fell within the 0–250 mg/L range. Additionally, 14% of chloride observations were in the 250–500 mg/L range and 94% of measurements were below the 500 mg/L threshold. The instances of higher concentrations are localized within the central and western regions of the Subbasin and do not form a seawater intrusion front pattern. Current TDS conditions in the Subbasin are also low with all measurements reported below the 600 mg/L measurable objective. In WY 2023, five of the ten RMWs reported TDS measurements. TDS was not reported at the remaining five wells for a variety of reasons, including inactive wells due to other water quality concerns.

2.3.2 Response to DWR Recommended Corrective Actions Regarding Water Quality

DWR's 2022 Determination Letter for the 2020 GSP indicated two potential deficiencies for the degradation of groundwater quality sustainability indicator. These deficiencies were addressed in the 2022 Revised GSP by: analyzing correlations between groundwater levels and degradation of water quality; describing how the GSAs will coordinate with the appropriate groundwater users; and discussing the GSAs' efforts to coordinate with water quality regulatory agencies and programs in the Subbasin to understand if continued lowering of groundwater levels resulted in degraded water quality. DWR's 2023 Determination Letter included three Recommended Corrective Actions (#5, 7, and 8) for the degradation of groundwater quality as follows:

- Provide additional explanation for how the 2,000 mg/L chloride isocontour line will prevent significant and unreasonable impacts to beneficial uses and users of groundwater and provide the current chloride conditions and interim milestones for seawater intrusion.
- Evaluate the groundwater quality monitoring network to fill data gaps in the eastern portion of the Subbasin.
- Develop a chloride isocontour line utilizing all groundwater quality wells in the western portion of the Subbasin.

The 2,000 mg/L chloride isocontour line was established as a proposed minimum threshold for seawater intrusion. However, in responding to the Recommended Corrective Actions contained in DWR's 2023 Determination Letter, the Subbasin technical team reevaluated the logic of seawater intrusion as an applicable sustainability indicator for the Subbasin. The Subbasin technical team determined that seawater intrusion is not an applicable sustainability indicator for the Subbasin because the Sacramento-San Joaquin River Delta (Delta) is managed as a freshwater body by the State, there is minimal groundwater pumping near the Delta, and there are relatively low chloride concentrations in the Subbasin (as demonstrated by the mapping of current chloride concentrations in the Subbasin). The Subbasin will continue to address salinity as a groundwater quality issue through groundwater quality SMCs, and the Subbasin is committed to monitoring and changing management strategies if conditions warrant. As a result, in the 2024 GSP Amendment, the Subbasin GSAs removed seawater intrusion as an applicable sustainability indicator and added chloride to the degradation of groundwater quality sustainability indicator as a constituent of concern.

With the addition of chloride as a constituent of concern to the degradation of groundwater sustainability indicator, the 2024 GSP Amendment includes a new SMC for chloride. SMC for TDS remained as established in the 2022 Revised GSP. For the two constituents of concern, minimum thresholds were set at 1,000 mg/L for TDS and 250 mg/L for chloride based on stakeholder concerns for drinking water and agricultural beneficial uses. At all RMW locations, the measurable objective for degraded water quality for TDS was set at 600 mg/L TDS. For chloride, the measurable objective is the maximum recent historical measurement (as measured between 2015 and 2023). Finally, 5-year interim milestones were established in the 2020 GSP for TDS and in the 2024 GSP Amendment for chloride, both following a linear trend between the current condition (defined as the average constituent concentration between 2015 and 2023) and the measurable objective.

In addition to revisions to the SMC, the groundwater quality RMN was evaluated and revised in response to DWR's 2023 Determination Letter. Modifications to the RMN included identifying one or more wells to fill data gaps in the eastern portion of the Subbasin and within the groundwater depression in the north-central portion, and incorporating relevant monitoring wells from the former Broad Monitoring Network into the groundwater quality RMN. In all, the 2024 GSP Amendment added 11 new monitoring wells to the RMN. A technical memorandum describing the additional analyses conducted in response to the Recommended Corrective Actions relating to degradation of groundwater quality can be found in Appendix 3-E of the 2024 GSP Amendment.

2.4 Seawater Intrusion

Seawater intrusion has been removed as a sustainability indicator in the 2024 GSP Amendment. Chloride in groundwater has been included as a constituent of concern relative to the degradation of groundwater quality and going forward, will be monitored and evaluated as part of that sustainability indicator, as described in Section 2.3.

2.5 Land Subsidence

2.5.1 Current Conditions and Progress Towards Sustainability

Both the 2020 ESJ GSP and 2022 Revised GSP used the groundwater level SMC as a proxy for the land subsidence sustainability indicator; as such, Subbasin conditions have been assessed using groundwater

levels and other publicly available datasets including three Continuous GPS (CGPS) subsidence monitoring stations in the Subbasin (P273, CNDR, and P309) and InSAR data provided by DWR.

To date, P309 and P273 have shown no land subsidence (as defined by land surface elevation declines), and CNDR has shown 0.01 feet of land subsidence (within the realm of error) over the last water year. These results are reflected in the most recently available InSAR data which show that no land subsidence occurred in the Subbasin greater than 0.2 feet (the minimum threshold for this sustainability indicator). Therefore, undesirable results are not presently occurring in the Subbasin relative to inelastic land subsidence. The Subbasin is on track to achieving the interim milestones for this sustainability indicator and beneficial users and uses in the Subbasin and other sustainability indicators are not being affected by current conditions.

2.5.2 Response to DWR Recommended Corrective Actions Regarding Land Subsidence

DWR's 2022 Determination Letter for the 2020 ESJ GSP indicated potential deficiencies for inelastic land subsidence. These deficiencies were addressed in the 2022 Revised GSP by identifying critical infrastructure; discussing the mechanisms for subsidence in the Subbasin; providing additional justification for use of groundwater levels as a proxy for subsidence monitoring; and revising the process for evaluating land subsidence on an annual basis by incorporating publicly available sources of additional data. DWR's July 6, 2023 Determination Letter approving the 2022 Revised GSP included a Recommended Corrective Action for subsidence, specifically directing the GSAs to use direct subsidence monitoring data to define sustainable management criteria or to clearly describe how potential subsidence associated with groundwater level declines below minimum thresholds would not have the potential to cause significant and unreasonable impacts and undesirable results related to subsidence. In response to the Recommended Corrective Action #2, the SMC measurement metric for inelastic land subsidence was changed from groundwater levels (as a proxy) to land surface elevation. Specifically, new SMC were established using both total extent of subsidence and a 5-year rolling average rate of subsidence as change in land surface elevation. Additionally, the RMN for this sustainability indicator was revised to use a combination of CGPS stations and survey benchmarks that, with InSAR data, will be used going forward to evaluate land subsidence in the Subbasin. These changes have been documented in 2024 GSP Amendment and in the technical memorandum included in Appendix 3-C of the GSP Amendment.

2.6 Depletions of Interconnected Surface Water

2.6.1 Current Conditions and Progress Towards Sustainability

The 2020 GSP and 2022 Revised GSP use groundwater level SMC as a proxy for the interconnected surface waters sustainability indicator. As such, current groundwater conditions relative to each SMC described in Section 2.1.1 also apply to this sustainability indicator. There are no data to suggest undesirable results with respect to interconnected surface waters in the Subbasin, and the Subbasin is on track to continue sustainability as to this indicator. Notably, as described in the 2024 Amendments to the GSP and Technical Memo in Appendix 3-F, the Subbasin has added new monitoring wells to gather additional information relative to interconnected surface waters and continues to improve its knowledge and ability to manage this sustainability indicator.

2.6.2 Response to DWR Recommended Corrective Actions Regarding Interconnected Surface Water

There were no deficiencies related to the depletions of interconnected surface water included in DWR's 2022 Determination Letter. DWR's 2023 Determination Letter included Recommended Corrective Actions (6a – 6c) relating to this sustainability indicator as follows:

6a. Establish undesirable results, minimum thresholds, and measurable objectives consistent with the GSP Regulations the same metric used for minimum thresholds, including quantifying the location, quantity, and timing of depletions of interconnected surface water due to groundwater extraction.

6b. Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing, including updating the monitoring network to reflect any corresponding changes and approaches.

6c. Prioritize collaborating and coordinating with local, state, and federal regulatory agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion within the GSA's jurisdictional area.

Significant changes were made to the ESJWRM integrated flow model to incorporate new information, update the hydrology to 2023, refine the model to better simulate shallow groundwater flow processes, recalibrate the historical model to the updated hydrology, and develop new projected model and scenarios. The updated model, ESJWRM Version 3.0, was used to improve the mapping of interconnected reaches of the Subbasin's rivers and streams, to quantify the interconnected reaches relative to the location, quantity, and timing of depletions of interconnected surface water due to groundwater extraction, and to develop SMC for interconnected surface waters. While the 2020 GSP and 2022 Revised GSP used groundwater levels as a proxy for the interconnected surface water SMC, the new SMC for interconnected surface waters are based on stream losses and seepages as simulated in the ESJWRM model but continue to use groundwater levels as metric for monitoring and for evaluating Subbasin conditions against the SMC.

Updates and revisions made to the ESJWRM integrated flow model are described in Appendix 2-A of the 2024 GSP Amendment; analyses conducted relative to impacts to interconnected surface waters, derivation of the new SMC, and the new representative monitoring network compiled specifically for this sustainability indicator are summarized in Appendix 3-F of the 2024 GSP Amendment. The revised SMC for interconnected surface waters are included in Chapter 3 of the 2024 GSP Amendment and the new representative monitoring network for interconnected surface waters is described in Chapter 4 of the 2024 GSP Amendment.

3. STATUS OF PROJECTS AND MANAGEMENT ACTIONS

- Summarizes the GSA implementation activities related to projects and management.
- Discuss anticipated projects to be developed over the next evaluation cycle.
- Assess PMAs included in the original GSP explain if they are still relevant and feasible.
- Summarize PMAs that have been added and/or removed from the GSP, and if removed, why, and which PMAs have been delayed and why.
- Describe the challenges or setbacks that have prevented or delayed implementation of PMAs.

Table 3-1summarizes the currently planned or implemented projects and management actions (PMAs) in the Subbasin, divided into two categories as follows:

- Category A projects - projects that were completed or are anticipated to advance in the next five years and have existing water rights or agreements.
- Category B projects - projects that are not anticipated to advance in the next five years, but may be implemented in the future, particularly if Category A projects do not fully achieve stated recharge and/or offset targets or do not produce a response as simulated in the model.

Category B projects may be elevated to a Category A project should feasibility studies demonstrate a viable project, if water rights or contracts are firmly identified, if partnerships are formed, and if economic evaluation demonstrate that the projects are cost effective. Management actions are denoted in

Table 3-1 as MA and constitute actions that support GSP implementation but do not provide any direct benefits. The column "Status Description" describes the implementation activities relating to various projects and management actions that occurred between 2020 and 2024.

Since completion and submittal of the 2022 Revised GSP, one project has been removed, and the following projects and management actions have been added to the list of those to be implemented by the Subbasin GSAs:

- South Stockton Well Rehabilitation Program (City of Stockton)
- City of Stockton Phase 1: Groundwater Recharge Project (City of Stockton)
- Mokelumne River Loss Study (North San Joaquin Water Conservation District)
- Wallace-Burson Conjunctive Use Program (Calaveras County Water District)
- Calaveras River Wholesale Water Service Expansion (Calaveras County Water District)
- AMI Replacement and Conversion (Calaveras County Water District)
- Groundwater Monitoring Plan (North San Joaquin Water Conservation District)
- Recycled Water to Manteca Golf Course (City of Manteca)
- West Groundwater Recharge Basin (Stockton East Water District)
- Threfall Ranch Reservoir, In-Lieu and Direct Recharge Project (Stanislaus County SMWC)
- NSJWCD Private Pump Partnerships (North San Joaquin Water Conservation District)
- Advanced Metering Infrastructure (City of Stockton)

All projects and management actions listed in **Table 3-1** are expected to be completed during the period as denoted in the column "Schedule (initiation and completion)." For those projects and management actions with completion dates beyond 2030, progress towards meeting their respective schedules is expected to occur over the next evaluation cycle.

As previously noted, one project – The Recycled Water Transfer to Agriculture Project, a Category B project sponsored by the City of Manteca - was removed from the list of PMAs. This project would have transferred recycled water produced by the City to nearby agricultural fields for irrigation. The project was removed as the City was able to determine that it had sufficient demands for the recycled water within the City's jurisdictional boundaries. Additionally, the City of Stockon DWTP Groundwater Recharge – Design and Construction project was integrated into the City of Stockton Phase 1: Groundwater Recharge Project since they were originally listed as two phases of the same project. All remaining projects listed in **Table 3-1** are considered to still be relevant and feasible. The "Status Description" column of **Table 3-1** describes the challenges that have prevented or delayed implementation of the respective PMA. The quantified benefit of each project as of June 2024 is noted in **Table 3-1** in the column entitled "Benefits Observed to Date or Anticipated Benefits;" and the range of anticipated benefits once each project is constructed and fully operational (hydrology and water accessibility permitting) is shown in the column entitled "Range of Estimated Accrued Benefits at Completion (acre-feet per year [AFY] based on WY Type)."

Table A- 1 and **Table A- 2**, included in Appendix A, provides additional information on the Subbasin's PMAs. **Table A- 1**summarizes the following information for PMAs that are ongoing or completed:

- Project status/description
- Realized benefits, expected benefits
- Benefits/impacts to beneficial users & uses
- Contribution to achieving the sustainability goal.

Projects that involve direct recharge include project-specific monitoring wells. Monitoring in the Subbasin's representative monitoring networks, combined with that conducted in project-specific wells, will be used to evaluate progress made towards sustainability and to confirm that the projects (both in-lieu and direct recharge) are not impacting nearby beneficial users. Other demand-management projects, such as the installation of AMI meters, do not directly impact the Subbasin, and their contribution towards sustainability will be measured using the representative monitoring networks and through project-specific evaluations using the ESJWRM integrated flow model.

Table A- 2 summarizes the following information for PMAs that have yet to begin or are still conceptual:

- Need for the project based on the current conditions
- Expected outcomes
- Potential timeline for implementation, and/or needs to move the PMA from the conceptual or as-needed phase to the "shovel ready" phase.

For all the listed PMAs, the GSAs have taken several steps to notify the public and interested parties, including:

- *Public Outreach:* Posting up-to-date information on websites and social media platforms, improving website accessibility and outreach materials, providing flyers and display tables available at various celebrations and workshops, establishing communication and outreach committees, and conducting project-specific outreach events.

- *Newsletters*: Sending bi-annual newsletters to landowners that highlight water conditions, project updates, and Sustainable Groundwater Management Act (SGMA) efforts.
- *Presentations:* Conducting regular presentations at Board, Committee, interest group, and community forum meetings.
- *Public Comment Periods:* Noticing public comment periods when environmental impact reports are posted.
- *Site Visits:* Conducting site visits at project sites for interested parties.

TABLE 3-1: PROJECTS AND MANAGEMENT ACTIONS IN THE EASTERN SAN JOAQUIN SUBBASIN

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Lake Grupe In-lieu Recharge	A	In-Lieu Recharge	Complete	Project is complete. Meter is installed.	2020-2023	750	2,000 – 4,900
SEWD Surface Water Implementation Expansion	A	In-Lieu Recharge	Implementation	The expansion is being implemented in stages. SEWD has completed the conversion of 2,505 acres to surface water and is in the planning phase to convert an additional 1,135 acres. During WY 2024, the SEWD plans to continue constituent outreach efforts and address the necessary improvements to facilitate the conversions, including providing funding of up to $200,000 per farm through the CDFA SWEEP BLOCK Pilot Program.	2019-2029	11,570	4,000 - 19,000
City of Manteca Advanced Metering Infrastructure	B	Conservation	Delayed	The Project status information presented in the GSP is up to date. Project implementation will take place once funding is available.	Not Determined	0	272
City of Lodi Surface Water Facility Expansion & Delivery Pipeline	B	In-Lieu Recharge	Planning	The Project status information presented in the GSP is up to date. Project implementation did not occur during WY 2023 since implementation is not planned until 2030. Updates regarding activity progress will be included in future Annual Reports.	2030-2033	0	4,750
White Slough Water Pollution Control Facility Expansion	A	Direct Recharge	Construction completed	The Project status information presented in the GSP is up to date. The Project is complete.	2019-2020	518 AF in 2023	1,000
CSJWCD Capital Improvement Program	A	In-Lieu Recharge	On-going	The Project status information presented in the GSP is up to date. The Project has been implemented and is on-going each year of available water delivery. This continues to be the case as new customers and locations are added. Updates regarding activity progress will be included in future Annual Reports.	2020-2027, on-going with 7-year completion cycles	Increased delivery of surface water by 5,000 AF in 2023	12,000-24,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
NSJWCD South System Modernization	A	In-Lieu Recharge	Environmental review complete, funding secured for Phases 1, 2 and 3. Landowner improvement district formed. Phases 1-2 complete.	This Project is progressing. Phase 1 completed in 2019-2021 included: new pump station, variable frequency drive (VFD), meters, automation equipment, SCADA, new main junction box at Tretheway and Brandt Road. Phase 2 completed 2023-early 2024 including new sections of main pipeline and adding meters and SCADA. ID3A formed in 2021 for construction of the Pixley lateral, which was completed in 2022. Working on formation of ID3B for Handel lateral (for which NSJWCD received $1 mil federal grant). NSJWCD was just awarded a $3M IRWM grant for Phase 3 South System improvements to focus on more mainline replacement and groundwater recharge capacity. Phase 3 will be constructed 24-25. NSJWCD applied for a $5 mil WaterSmart Grant for Phase 4. Future phases will include additional laterals and recharge capacity along the south system to expand capacity to take wet year water for recharge, including MICUP water	2018-2025 (Phases 1, 2, 3 Pixley Lateral and Handel Lateral); 2025-2028 for Phase 4; 2028-2035 for future phases	4,000	1,200-10,000 per year for Phases 1-4. Additional 15,000 in wet years with future phases.
Long-term Water Transfer to SEWD	A	Transfers	Infrastructure is in place. CEQA competed and agreements in place as of 2023.	In 2023, OID and SJJID approved a 10-year water transfer to SEWD. The water will be delivered through the existing Goodwin Tunnel and the Upper Farmington Canal for final delivery to SEWD's municipal and agricultural customers. OID and SSJID will make available to SEWD up to 10,000 AF in critical years and up to 20,000 AF in non-critical years depending on availability of pre-1914 Stanislaus River water. The water transfer was approved following adoption of a negative declaration per CEQA. Due to extremely wet conditions, no water was transferred in 2023 as part of the 10-year water transfer. In a separate approval in 2023, OID and SSJID did complete a transfer to SEWD for 1,200 AF to serve lands dependent on groundwater, but outside of SEWD's designated CVP service area. The Districts filed a Notice of Exemption for the water transfer.	2019-2021	600	10,000-20,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
BNSF Railway Company Intermodal Facility Recharge Pond	B	Direct Recharge	Planning	The Project status information presented in the GSP is up to date. Project implementation did not occur during WY 2021 due to delays as a result of the COVID-19 pandemic. The project was again delayed in WY 2022 due to severe drought conditions. CSJWCD has moved forward with the Project and has made contact with the property owner to negotiate an agreement to allow use of the ponds for percolation purposes. CSJ is currently seeking bids for the estimated cost of a diversion structure and pipeline from District channel into the project area. Estimated completion of project is end of 2025	2020-2025	0	1,000
City of Stockton Advanced Metering Infrastructure	A	Conservation	RFP for full AMI issued in March 2023. Contract awarded in March 2024.	Project will convert touch read meters to full AMI. Planned to be completed over 6 years with a $17M budget. Initial study completed in 2011. Contract award in March 2024. Project completion in 2028.	2023-2028	0	2,000
South System Groundwater Banking with East Bay Municipal Utilities District (EBMUD)	A	In-Lieu Recharge	Pilot Dream Project will be complete by February 2024. Working on expanded banking project	NSJWCD and EBMUD completed contracts, new facilities, water right change petitions, water delivery and extraction for the pilot DREAM Project (1,000 AF). Planning efforts for a larger scale banking project are underway.	2020-2024 for Dream Project. Larger PDA project planning in 2024-2025 and implement by 2030	500	750-4,000
NSJWCD North System Modernization/Lakso Recharge	A	In-Lieu Recharge	Constructed Phase 1A, in progress on Phase 1B. Planning Phase 2	Project is advancing. NSJWCD awarded Proposition 68 Round 2 funding $3.9 mil. Phase 1A constructed and operated in 2023-24 to recharge in two locations. Phase 1B under construction to add irrigation deliveries. NSJWCD is working with North System landowners to form improvement district to use surface water for irrigation and conduct on-farm recharge in wet years. Planning Phase 2 to add new Pump Station and fish screen	2021-2026	420 AF in 2023	1,000-4,000 Future phases to use MICUP water add another 5,000 AFY
Manaserro Recharge Project	B	Direct Recharge	Planning	The Project status information presented in the GSP is up to date. NSJWCD is continuing to work on a strategic plan and funding options for the implementation of this Project and negotiate with landowner or find alternative location. Recently adopted NSJWCD groundwater charge may provide funding to advance this project in future years.	2023-2025	0	8,000
Tecklenburg Recharge Project	A	Direct Recharge	Substantially complete.	The District acquired a 10-acre parcel in 2023 and constructed and operated recharge basin from July 2023 to present. District working on new lateral from South System mainline to increase project capacity.	2022-2024	1,500	300-2,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
City of Escalon Wastewater Reuse	B	Recycling/In-Lieu Recharge/Transfers	Planning	The Project status information presented in the GSP is up to date. The Project is in the early conceptual stages and requires additional feasibility analysis and long-term planning. The City of Escalon has hired a consultant to explore the feasibility of project alternatives and to develop engineering plans and specifications.	2020-2028	0	672
City of Ripon Surface Water Supply	B	In-Lieu Recharge	Design complete; environmental permitting underway; negotiations for the right to connect are underway.	The City of Ripon is set to receive $3.5 Million in directed congressional funding through the State Drinking Water Revolving Fund. The City of Ripon is seeking terms to connect to the Nick DeGroot Water Treatment Plant from the current South County Water Supply Program participants and will also need to work through SSJID design criteria for connection to its drinking water facilities.	2028-2030	0	6,000
City of Escalon Connection to Nick DeGroot Water Treatment Plant	B	In-Lieu Recharge	Conceptual design; environmental review complete; Council approval is pending further design work and rate study	The City of Escalon completed an initial feasibility study of alternatives currently ranging between $3.5 million - $8 million. In 2023, the City of Escalon is further developing its engineering design to incorporate design criteria for connection to SSJID drinking water facilities and right-of-way acquisition needs. Escalon is nearing the 35% design milestone.	2028-2030	0	2,015
Farmington Dam Repurpose Project	B	Direct Recharge	Planning/Initial Study	The Project status information presented in the GSP is up to date. Project implementation did not occur during WY 2022 as SEWD dedicated resources to bring short-term projects online first. SEWD has been working with Congressman Harder to include this project within the 2024 Water Resources Development Act (WRDA) bill to re-authorize a new feasibility study. More resources will be directed toward the feasibility study, expected to begin in 2024. Updates regarding activity progress will be included in future Annual Reports.	2030-2050	0	15,500-60,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Mobilizing Recharge Opportunities (MICUP)	B	Direct Recharge	Project Development	Under a Sustainable Groundwater Management Implementation Grant Program Round 1 award, San Joaquin County is advancing a suite of projects through the Mokelumne Integrated Conjunctive Use Program (MICUP) to put to beneficial use water appropriated through the Mokelumne River Water and Power Authority's water right application using existing and new infrastructure owned and operated by MICUP Coordinating Committee member agencies. Project identification in 2024, CEQA and water right in 2025, implementation from 2025-2040.	2024-2040	0	110,000-158,000 AFY in Wet Years
NSJWCD Winery Recycled Water	B	Recycling/In-Lieu Recharge/Direct Recharge	Conceptual planning and discussion	The Project status information presented in the GSP is up to date. NSJWCD is continuing to work on a strategic plan and funding options for the implementation of this Project or a similar project with winery.	2025-2027	0	750
SSJID Storm Water Reuse	B	Storm Water/In-Lieu Recharge/Direct Recharge	Planning	The Project status information presented in the GSP is up to date. Project 23 remains a project concept that could be considered for as WMP projects are advanced, and the concept integrated during the engineering design process.	2027-2030	0	1,100
South Stockton Well Rehabilitation Program	MA	Monitoring and Reporting	Rehab existing wells. Design in progress to add well head treatment to existing Well SSS8. Back-up power to be added to Well SSS3 & SSS9.	Design of SSS8 well head treatment is complete and construction to be complete in Feb 2024. HCS Engineering to design backup power to Well SSS3 and SSS9. The design is scheduled to be complete in early 2024.	2021-2024	Not Applicable	Not Applicable
City of Stockton Phase 1: Groundwater Recharge Project	A	Direct Recharge	Feasibility study completed in December 2023. Basin design in progress. Construction to begin spring 2025.	The request for proposals was released in early spring of 2022. Geosyntec was awarded the contract, and the geotechnical study began in July of 2022. The geotechnical and feasibility studies were completed in December 2023. The basin design is in progress and construction of the basin(s) will begin in Spring 2025.	2022-2026	0	20,000
Mokelumne River Loss Study	MA	Model Refinement and Validation	Conceptual planning and discussion	The Project status information presented in the GSP is up to date. Project implementation did not occur during WY 2021 due to a lack of funding and lack of staff resources to complete the plans and move the projects forward. NSJWCD is continuing to work on strategic plan and funding options for the implementation of this Project.	2020-2025	Not Applicable	Not Applicable

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Monitoring and recording of groundwater levels and groundwater quality data	MA	Monitoring and Reporting	Ongoing	The Project status information presented in the GSP is up to date. This is the fifth Annual Report that reports groundwater level and groundwater quality monitoring data. Updates regarding activity progress will be included in future Annual Reports.	2020-2040	Not Applicable	Not Applicable
Maintaining and updating the Subbasin Data Management System (DMS) with newly collected data	MA	Monitoring and Reporting	Ongoing	The Project status information presented in the GSP is up to date. The DMS was maintained and updated to include monitoring data for WY 2023. Updates regarding activity progress will be included in future Annual Reports.	2020-2040	Not Applicable	Not Applicable
Annual monitoring of progress toward sustainability	MA	Monitoring and Reporting	Ongoing	The Project status information presented in the GSP is up to date. This is the fifth Annual Report that monitors the progress toward sustainability. Updates regarding progress toward sustainability will be included in future Annual Reports.	2020-2040	Not Applicable	Not Applicable
Annual reporting of Subbasin conditions to DWR as required by SGMA	MA	Monitoring and Reporting	Ongoing	The Project status information presented in the GSP is up to date. This is the fifth Annual Report that describes the current conditions in the Subbasin and will be submitted to DWR as required by SGMA. Updates regarding Subbasin conditions will be included in future Annual Reports.	2020-2040	Not Applicable	Not Applicable
Addressing Data Gaps	MA	Monitoring and Reporting	Ongoing	During WY 2021, NSJWCD contracted with DWR and San Joaquin County to install a TSS monitoring well with in the NSJWCD area.	2020-2040	Not Applicable	Not Applicable
Wallace-Burson Conjunctive Use Program	B	Conjunctive Use/Direct Recharge	Conceptual planning and discussion	Hydrogeology and water supply studies developed; designing and developing specific program facilities (e.g., recharge basins, conveyance).	2030-2040	0	500-3,000
Calaveras River Wholesale Water Service Expansion	B	In-Lieu Recharge	Conceptual planning	CCWD has available surface water supply to set up agreement(s) facilitating in-lieu recharge in Calaveras County portion of Subbasin. Studies needed based on specific partners, arrangements, etc.	2020-2040	0	200-600
AMI Replacement and Conversion	MA	Monitoring and Reporting/Conservation	Completed	CCWD completed replacement and conversion of customer water meters to Automated Meter Infrastructure (AMI) in March 2022. Anticipated improved customer-level consumption data going forward.	2022	Not Applicable	Not Applicable

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Groundwater Monitoring Plan	MA	Monitoring and Reporting	Ongoing	NSJWCD retained a hydrogeologist, installed one monitoring well in 2023, and is contracted to install 3 more monitoring wells in 2024. District also began collecting water level data from ag wells in 2023 to inform a larger scale monitoring program.	2023	Not Applicable	Not Applicable
Recycled Water to Manteca Golf Course	B	Recycling	12-in pipeline installed. Waiting for DWR to determine grant recipients	The Reclaimed Water Facilities Master Plan was adopted in January 2023. The city is pursuing recycled water projects, one of which is sending reclaimed water to irrigate the Manteca Golf Course. 12-in piping to deliver reclaimed water has been installed. The city is pursuing funding, like grants, to finance the construction of a pump station, and storage tank(s) to transmit water to the golf course.	To Be Determined	0	406
West Groundwater Recharge Basin	A	Direct Recharge	Ongoing	The project is currently in the design stage with first phase construction beginning spring 2024 and is estimated to be completed in approximately 2032.	2032	0	1,500-16,000
Threfall Ranch Reservoir, In-Lieu and Direct Recharge Project	B	In-Lieu Recharge/Direct Recharge	Design	Final design has been completed, and environmental review and permitting is pending receipt of project funding.	2025	0	2,000
NSJWCD Private Pump Partnerships	A	In-Lieu Recharge/Direct Recharge	Ongoing	NSJWCD has executed one agreement with an existing riparian pumper in 2024 to use NSJWCD water permit to irrigate 200 acres and plans to add an additional 200 acres each year for 5 years.	2024	0	1,500-3,000
Perfecting Mokelumne River Water Right	B	In-Lieu Recharge	Planning	Petition for Amendment to MRWPA Water Right Application 29835 and Underground Storage Supplement Application being prepared to the State Board Division of Water Rights. Notice of Preparation for CEQA document issued on July 2, 2024	2024-2025	0	110,000-158,000 AFY in Wet Years
North System Groundwater Recharge Project - Phase 2	B	Direct Recharge/In-Lieu Recharge	Design phase with planned construction in 2025-2026	Team retained to design and bid new pump station in 2024-2026. The Master Plan for the entire North System is current in progress. The Master Plan will identify opportunities for direct and in-lieu recharge in the North System portion of the District.	2026-2029	0	1,000-3,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Stormwater Collection, Treatment, and Infiltration	B	Direct Recharge/ Stormwater	Planning/Initial Study	The city is currently working to identify a funding source for the study.	To Be Determined	0	To Be Determined
Off-Stream Regulating Reservoir	B	Direct Recharge	Conceptual Phase	The Project is still in the design phase. A preliminary list of the most ideal locations has been developed based off operational benefits of the distribution system. These proposed locations will be cross-referenced with ideal areas for recharge. Land will need to be purchased.	2026-2050	0	To Be Determined
On-Farm Recharge Project	B	Direct Recharge	Planning/Initial Study	The District has developed and approved an On-Farm Recharge Policy to incentivize farmers to participate in flood-MAR.	2024-2030	0	To Be Determined
Bellota Weir Modifications Project	B	Direct Recharge/Stormwater	Design	The purpose of the Bellota Weir Modifications Project (Project) is to provide fish passage for the Central Valley Steelhead in addition to providing more efficient water diversion and flow metering of agricultural, municipal, and ecological water. The Project will conserve approximately 1,100 AF annually of surface water upon completion of Phase 1 with the installation of the concrete sill. The Project will increase the Old Calaveras River recharge from 6,300 acre-feet (AF) to 11,500 AF annually per the District's water rights on the Calaveras River.	2023-2030	0	2,000 – 5,000
West Linden Project	B	In-Lieu Recharge/Direct Recharge	Planning/Design	The project would bring Mokelumne and Calaveras Rivers water to the area west of Linden where the groundwater table is at its lowest	2024-2035	0	5,000-60,000
Water Supply Enhancement Project - Direct Recharge	B	Direct Recharge	Design	This project would use surface water from the New Hogan distribution system to implement direct recharge projects such as dry wells or recharge basins along the distribution system.	2024-2030	0	To Be Determined

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
SSJID Water Master Plan - System Improvements	B	In-Lieu Recharge	Feasibility study complete	In 2022, SSJID completed a comprehensive Water Master Plan to address its aging infrastructure and to make strategic improvements to SSJID irrigation system. SSJID hopes to improve the level of service to customers through increased lateral capacity, new reservoirs, and additional SCADA controls. In total, SSJID has identified $191 Million in capital improvements and to fund these projects, SSJID completed a substantial Prop 218 rate increase in July 2023.	2023-2040	0	10,000-15,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Oakdale Irrigation District In-lieu and Direct Recharge Project	A	Direct Recharge/In-Lieu Recharge	Ongoing	The Oakdale Irrigation District In-lieu and Direct Recharge Project (Project) is intended to be a cooperative long-term Project between OID and landowners to the east of OID's boundaries within the East Side San Joaquin GSA. The purpose of this Project is to allow OID to facilitate surface water deliveries for in-lieu use or direct recharge for East Side San Joaquin GSA landowners during times and conditions that will not impact OID's existing agricultural customers. The Project envisions the development of up to approximately 25,000 AF of surface water from the Stanislaus River being made available to landowners east of OID's service area boundaries in both the Eastern San Joaquin and Modesto Subbasins in all, except Critically Dry, water years. Water deliveries would occur through a limited number of existing and newly constructed private irrigation conveyance infrastructure for use between March 1st and September 30th. Some direct recharge is expected to occur from the Project as canal or reservoir seepage in the conveyance network. OID surface water will not be delivered as part of the Project between October 1st and March 1st. The OID Board of Directors will continue to consider and define the volume of water (if any) available to this Project on an annual basis in non-Critically Dry water years. The OID 10-Year out-of-District Water Sales Program (10-Year Program) began in 2023 and includes 4,292 irrigated acres in the Eastern San Joaquin Subbasin within the East Side San Joaquin GSA. Under the 10-Year Program, participating landowners are required to purchase a minimum of 1.5 acre-feet per irrigated acre when surplus surface water is available from OID resulting in a minimum of 6,438 acre-feet being purchased each year. The landowners also have the opportunity to purchase and use additional surplus surface water throughout the irrigation season if available.	2023-2032	4,783	0-25,000
Water Supply Enhancement Project - Distribution Pipelines	B	In-Lieu Recharge/Direct Recharge	Design	This project would provide surface water distribution to the area of Linden through proposed pipelines. The proposed pipelines are named Clements Gravity Pipeline, Houston Gravity Pipeline, Demartini, and Mosher.	2024-2040	0	5,000-17,000

Project or Management Action Name	Category	Project Type	Current Status	Status Description	Schedule (initiation and completion)	Benefits Observed to Date or Anticipated Benefits	Range of Estimated Accrued Benefits at Completion (AFY based on WY Type)
Water Treatment Plant Aquifer Storage Recovery Well - 7401	B	Direct Recharge	Implementation	This Project is currently being implemented. The design is complete and funding is secured. The construction is scheduled for the beginning of 2025. It includes refurbishing an existing extraction well to make it compatible for injection and extraction.	2024-2026	0	1,000-2,420
Beckman Well	B	Direct Recharge	Refurbish	The Beckman well is a project that was implemented in the early 2000's with the collaboration of East Bay Mud along the Mokelumne Aqueduct.	2024-2028	0	To Be Determined
Tom Allen Recharge Project	B	Direct Recharge	Implementation	This Project includes a 0.3-acre recharge reservoir constructed as a pilot project in 2023. It is functional as a recharge basin with low recharge rates. It is estimated that the recharge is approximately 24 AF per year if operational from April to October. The District is looking into installing dry wells at the same location, to increase infiltration rates and recharge.	2024-2025	10	24 - 100

Notes:
Category A projects - projects that are likely to advance in the next five years and have existing water rights or agreements.
Category B projects - projects that are not anticipated to advance in the next five years, but could be leveraged in the future, particularly if Category A projects do not fully achieve stated recharge and/or offset targets or do not produce a response as simulated in the model.
MA – Management Action

4. BASIN SETTING BASED ON NEW INFORMATION OR CHANGES IN WATER USE

- Describe any new authorities the basin's GSAs have gained, established or exercised since the GSP submittal (e.g., new ordinances or regulations) and summarize what has been implemented to advance groundwater sustainability; demonstrate how these components will help the GSAs reach sustainability
- Evaluate the basin setting based on new information or changes in basin water use.
- Explain the major causes of any new significant changes in understanding the basin setting.

The following summarizes how new information was incorporated into various parts of the Basin Setting Chapter (Chapter 2) of the 2024 GSP Amendment.

4.1 Hydrogeologic Conceptual Model

The airborne electromagnetic (AEM) data collected by DWR and boring logs from the new monitoring wells constructed in the Subbasin provided the primary basis for updates to the Subbasin's Hydrogeologic Conceptual Model (HCM) and subsequently the ESJWRM integrated flow model. In general, the new information allowed for a better understanding of the Subbasin aquifer system, leading to the addition of a new model layer representing shallow alluvial deposits as well as other refinements to ESJWRM.

4.2 Groundwater Conditions

Groundwater conditions were updated based on ongoing groundwater elevation monitoring, newly available groundwater quality data, updates to the HCM, and data gathered from State datasets. The new understanding of regional groundwater conditions is described below.

Groundwater Elevation

Groundwater elevation conditions were updated to include data collected through the first quarter of 2023. A pumping depression at the center of the Subbasin, east of the City of Stockton, generally occurs during periods of lower groundwater elevations. In wetter years, this pumping depression has recovered. Similar to historical conditions, groundwater generally flows from the outer edges of the Subbasin towards the depression in the middle of the Subbasin. The predominant hydraulic gradient across the Subbasin is from east to west. Groundwater elevation data indicates yearly cycles of declines in the summer due to typical patterns in groundwater pumping, followed by recharge during the winter.

According to DWR's Dry Well Reporting System, San Joaquin County had 106 reported water shortages from dry wells since the start of WY 2020. Reports of dry wells were higher in the critically dry years of WY 2021 and 2022 than in WY 2023, a wet year. In WY 2023, there were 12 reported dry wells to DWR's reporting system.

Groundwater Storage

The ESJWRM Version 3.0 was used to estimate the average annual and cumulative change in storage, including current condition years WY 2020 to 2023. Over the last five years (2019-2023), the average annual change in storage was an 89,000 AF net loss in storage. Total change in storage over the last five years (from 2019 to 2023) was estimated at a loss of 467,000 AF or 0.26% as a percentage of total storage.

Seawater Intrusion

Seawater intrusion has been removed as a sustainability indicator in the 2024 GSP Amendment as it has not historically been observed within the Subbasin nor is it likely to occur in the future due to State-led management of the Delta that restricts saline water migration eastward beyond the extensive network of levees and engineering alterations to the original natural channels, commonly referred to as the X2 barrier.

Groundwater Quality

Recent TDS and chloride data from the GAMA program were analyzed to characterize current groundwater quality conditions. As described above, chloride concentrations are well below the SMCL in most wells. TDS concentrations in a majority of wells are below the measurable objective of 600 mg/L. A small number of wells have recent TDS concentrations above the minimum threshold of 1,000 mg/L and are primarily located near the City of Stockton.

Land Subsidence

Within the Subbasin, there are three primary sources of subsidence data, each with different periods of record and methods of data collection:

- CGPS vertical displacement data obtained from the DWR SGMA Data Viewer
- InSAR subsidence rates obtained from the SGMA Data Viewer
- Survey benchmarks from U.S. Geological Survey (USGS), the U.S. Army Corps of Engineers (ACOE), California Department of Transportation (CalTrans), the San Joaquin County Department of Public Works, and local agencies

Historically, the Subbasin has not had significant or undesirable effects caused by inelastic land subsidence. Examining recent CGPS vertical displacement data, less than one foot of total subsidence was observed throughout the Subbasin between 2015 and 2023. While the 2020 ESJ GSP and 2022 Revised GSP originally used groundwater levels as a proxy for subsidence, a correlation between groundwater level changes and land surface elevation declines was not observed. During the Periodic Evaluation, the GSAs reviewed historical groundwater levels below the 2015 minimum thresholds and land surface elevation throughout the Subbasin. While groundwater levels reached historical lows, unreasonable impacts caused by subsidence were not observed.

Interconnected Surface Water Systems

Current conditions of interconnected surface water systems have been updated based on guidance provided by DWR and updates to the ESJWRM. Within the ESJWRM, the model shows that parts of the Mokelumne River, Stanislaus River, and lower San Joaquin River are connected at least 75 percent of the time. Streams that are not connected at least 75 percent of the time include Dry Creek, Calaveras River, and

Mormon Slough. Other smaller creeks within the Subbasin were not represented in ESJWRM because they are not gaged and flow and/or stage data are not available.

While some downstream segments of the Mokelumne River are connected at least 75 percent of the time in most years, the river is largely losing water to the aquifer system in reaches upstream of the confluence with the Cosumnes River and gaining water from the aquifer system downstream of the cofluence with the Cosumnes River, on average. The Stanislaus River has segments in the center portion of the river that are losing water to the aquifer under current conditions. The lower San Joaquin River is gaining in many sections near its confluence with the Stanislaus River, Calaveras River, and in the Delta region. Interpretation of stream-aquifer interactions are dependent on ESJWRM Version 3.0 which contains uncertainties and will be updated and recalibrated after additional data collection.

Groundwater-Dependent Ecosystems

In the 2020 GSP, the potential groundwater dependent ecosystem (GDE) mapping relied on the Natural Communities Commonly Associated with Groundwater (NCCAG) database, from which additional refinements were made to remove areas that met the criteria listed in Section 2.2.7.

The mapping of potential GDEs was not changed as part of the 2024 GSP Amendment. Changes to the impacts to potential GDEs analysis are discussed in Appendix 1-G in the 2024 GSP Amendment.

4.3 Water Use Changes and Associated Water Budget

As noted in Section 4.4 below, the ESJWRM numerical flow model was updated to better represent current conditions. Model inputs that were revised included land use, surface water supply, urban rural residential water demands, surface water and groundwater deliveries, and simulated water courses. The hydrologic period of the model was also extended to 2023 and recalibrated to recent data. Appendix 2-A of the 2024 GSP Amendment provides more detail regarding the ESJWRM model revisions.

The ESJWRM Version 3.0 model was used to update the following seven model scenarios and to provide updated current and projected water budgets:

- Current Conditions
- Projected Conditions Baseline or PCBL Version 3.0
- Projected Conditions Baseline with Climate Change (PCBL-CC) Version 3.0
- Projected Conditions Baseline with Demand Reduction (PCBL-DR) Version 3.0
- Projected Conditions Baseline with Climate Change and Demand Reduction (PCBL-CC-DR) Version 3.0
- Projected Conditions Baseline with Projects & Management Actions (PCBL-PMA) Version 3.0
- Projected Conditions Baseline with Climate Change and Projects & Management Actions (PCBL-CC-PMA) Version 3.0

Updated water budgets for the Eastern San Joaquin Subbasin can be found in Chapter 2 of the 2024 GSP Amendment and in Appendix 2-A.

The ESJWRM Version 3.0 was used to update the Subbasin's estimated sustainable yield. The description of the process used to estimate the sustainable yield is included in Chapter 2 of the 2024 GSP Amendment; the sustainable yield of the Subbasin is 704,000 AFY without consideration of climate change, and 713,000 AFY considering climate change.

The ESJWRM Version 3.0 was also used to quantify the current Subbasin overdraft. Given the interconnection of hydrologic systems in the Subbasin, approximately 95,000 AFY of pumping reduction would be necessary to achieve a 0 AFY change in storage under projected conditions. It was estimated that Category A projects and management actions included in the 2024 GSP Amendment would contribute approximately 33,000 AFY towards the required 95,000 AFY pumping reduction needed to achieve a 0 AFY change in storage; the remaining shortage would be addressed through additional project and management actions and/or the demand management program included as Appendix 6-A in the 2024 GSP Amendment.

4.4 Model Updates

The ESJWRM numerical flow model was updated in response to DWR's Recommended Corrective Action in the July 2023 Determination Letter and to incorporate new hydrogeologic data and other information. ESJWRM Version 3.0 now represents the latest version of the model; the major model changes are summarized in **Table 4-1**.

TABLE 4-1: ESJWRM VERSION 3.0 MAJOR CHANGES

Model Element	2024 Update
Layering	Refined based on AEM and added shallow alluvium layer
Streams	Removed Bear Creek from simulated streams
Land Use	Incorporated recent DWR Statewide Crop Mapping (5 years) and removed previous data used for WY 2007-2015
Urban Water Demand	Updated rural residential population estimate using Census Tract data
Surface Water Supply	Added estimate of Farmington seepage and revised carriage/canal losses for SEWD. Made slight adjustments to diversions for NSJWCD, OID, and SSJID.
SW and GW Delivery Groups	Small updates based on local information received and to limit area overlaps

More information regarding the ESJWRM model updates can be found in the 2024 GSP Amendment Appendix 2-A.

5. MONITORING NETWORKS

- Provide an assessment of the GSP's monitoring networks for the sustainability indicators.
- Summarize changes made to the representative monitoring networks.
- Discuss findings from the evaluation of the GSP's monitoring networks for each sustainability indicator and describe the following:
    - Provide an overall summary of changes to monitoring networks
    - Describe whether identified monitoring network data gaps have been filled.
    - Explain why previously identified data gaps were not filled, why or what prevented these from being filled, and what is required to fill these data gaps.
    - Discuss any new data gaps that have been identified.
- Assess the functionality of the water level monitoring network and whether any existing GSP monitoring network locations are no longer viable.
- Review sustainable management criteria relative to well construction, and alternative monitoring approaches or well replacement plan.
- Describe remaining actions necessary to improve the monitoring networks.
- Summarize any adjustments made to monitoring frequency and density of monitoring sites and any changes to the GSP's monitoring network.

All Subbasin RMNs were evaluated to identify and address issues related to well access and to fill data gaps. Changes to the groundwater quality RMN were made to incorporate specific wells from the former Broad Monitoring Network and to fill data gaps. Changes to the subsidence RMN were made to allow for the use of ground surface elevations as a metric for measurement, rather than the previously used groundwater levels. Additionally, an interconnected surface water-specific RMN was established for that sustainability indicator. More details about the new RMNs for the Subbasin can be found in Chapter 4 of the 2024 GSP Amendment.

5.1 Chronic Lowering of Groundwater Levels

The 2020 GSP and 2022 Revised GSP included two monitoring networks for groundwater levels – the RMN and the Broad Monitoring Network. As described in these GSPs, the Representative Monitoring Network consisted of wells used to track groundwater conditions relative to SMC in the Subbasin. The Broad Monitoring Network consisted of additional wells used to collect supplemental groundwater level data. Unlike wells in the RMN, these wells do not have associated SMC. In order to clarify the 2022 Revised GSP and avoid confusion, discussion of the Broad Monitoring Network was removed from the 2024 GSP Amendment. However, these wells may continue to be monitored and, along with other publicly available groundwater data, will be used in the annual assessment of Subbasin conditions relative to SMC.

As part of the work efforts to address the Recommended Corrective Actions from the 2023 Determination Letter, the RMN for groundwater levels was reviewed for consistency with existing best management practices. The RMN remains unchanged from previous GSPs apart from the addition of three new wells. Well 01S10E04C001M, added in 2021, is located within the Eastside GSA. Wells SEWD-01 and NSJWCD-01 are two new multi-completion wells installed by DWR under the Technical Support Services (TSS) program. With the addition of these three new wells, the total number of wells in the groundwater level RMN is 23.

Please see Chapters 3 and 4 and Appendix 1-G of the 2024 GSP Amendment for additional information and a map showing the current locations of wells in this RMN.

As noted in the 2022 Revised GSP, groundwater level monitoring data gaps exist in areas where data are limited; specifically, areas of high data needs include monitoring near streams, Subbasin boundaries, and the groundwater depression in the central part of the Subbasin. These data gaps were considered in the establishment of the new RMN for groundwater levels and have been addressed, to some extent, through the construction of six new monitoring wells in the Subbasin – five specifically for interconnected surface waters, and one in the northwest corner of the Subbasin near the Sacramento-San Joaquin River Delta. These new wells have been included in the RMN for interconnected surface waters (see Section 5.6, below). GSAs in the Subbasin will continue to work to improve the RMNs as part of GSP implementation.

5.2 Reduction in Groundwater Storage

The reduction in groundwater storage sustainability indicator uses groundwater levels as a proxy; as such, the RMN for groundwater levels serves as the RMN for groundwater storage. Please see Section 5.1, above, and Chapter 4 of the 2024 GSP Amendment.

5.3 Degraded Water Quality

One key modification made in the 2024 GSP Amendment was the removal of seawater intrusion as a relevant sustainability indicator and the addition of chloride as a constituent of concern to the degraded water quality sustainability indicator. This modification resulted in the reassessment of the RMN for degraded water quality.

In response to DWR's 2023 Determination Letter and in coordination with the addition of chloride as a constituent of concern, the RMN for water quality was revised. The original 10 wells from the 2020 GSP RMN were retained, and 11 wells were added. New wells were included to improve coverage in the eastern side of the Subbasin and within the groundwater depression in the north-central portion. Wells were selected in accordance with DWR's *Monitoring Networks and Identification of Data Gaps Best Management Practice* (DWR 2016). The following summarizes the 11 new wells that were added to the representative network in further detail.

- New Stockton Wells: Stockton 26 in the original representative monitoring network has been decommissioned since the 2020 GSP. Therefore, Stockton 26 was removed, and as part of the 2024 RMN, Stockton 27 and 31 have been added to the representative network. These two new wells will be monitored in addition to the remaining two Stockton wells in the existing network, for a total of four Representative Monitoring Wells (RMWs) in the City of Stockon.

- Representative Network for Groundwater Levels: Swenson-3, Lodi City Well #2, and OID-8 are groundwater level RMWs that have been added to the network for groundwater quality. These wells expand coverage within data gap areas. Additionally, these wells also serve to support the commitment to tracking trends in groundwater quality with trends in groundwater levels at these three wells. While there is no evidence of a strong connection between declining water levels and degraded water quality, these wells will be used to track trends in both annually going forward.

- Existing Broad Monitoring Network Well: One well from the 2020 GSP's broad monitoring network, CCWD 010/011/012, was included in the updated network in the 2024 RMN. This well provides

beneficial spatial coverage in the northeast part of the Subbasin as well as valuable coverage at various depths.

- Additional Wells: Five new wells were added to the RMN. These wells include Well No. 05 monitored by Lockeford CSD, Well No. 07 monitored by Linden County WD, Well #2 at Shady Rest Trailer County, and Well No. 11 and 16 monitored by City of Ripon. Each of these wells fill remaining data gaps on the eastern side and southern portion of the Subbasin. Several of these wells are already being monitored for CA Water Watch through the SWRCB every three years. Permission was obtained by each of these monitoring entities and a commitment to monitor for SGMA compliance has been made going forward.

The updated groundwater quality RMN has a diverse vertical extent and spans both shallow and deep aquifers allowing for a three-dimensional mapping of degraded water quality, as recommended by DWR's Monitoring Network BMPs. (See 2024 GSP Amend. Chapter 4 and Appendix 3-E).

The addition of these new wells to the water quality RMN addresses data gaps identified in the 2022 Revised GSP. However, the GSAs will continue to look for opportunities to expand and improve the monitoring network as part of GSP implementation.

5.4 Seawater Intrusion

The Seawater Intrusion sustainability criterion is not an applicable criterion for the Eastern San Joaquin Subbasin and therefore a representative monitoring network does not exist for this sustainability indicator.

5.5 Land Subsidence

In both the 2020 GSP and 2022 Revised GSP, the RMN and associated SMC for inelastic land subsidence used groundwater levels as a proxy. As such, the RMN for groundwater levels has served as the RMN for land subsidence over the time period covered by this Periodic Evaluation. (See Section 5.1, above, and 2024 GSP Amend. Chapter 4). In response to DWR's July 2023 Determination Letter, the RMN and associated SMCs for inelastic land subsidence were revised to use direct subsidence monitoring data. Subsidence datasets considered included the CGPS vertical displacement data from the DWR Sustainable Groundwater Management Act (SGMA) Data Viewer, InSAR subsidence rates from the SGMA Data Viewer, and survey benchmarks from USGS, ACOE, CalTrans, the San Joaquin County Department of Public Works, and local agencies. There are no DWR or USGS extensometers in the Eastern San Joaquin Subbasin.

Four CGPS stations were selected for the Subbasin's RMN for inelastic land subsidence based on data availability, location, and monitoring status. Additionally, two stations from the University of Nevada Geodetic Laboratory (UNGL) were included in the RMN to provide further spatial coverage and address data gaps. Finally, six survey benchmarks from San Joaquin County and NGS were selected to supplement the CGPS data. New SMC were set for these representative monitoring locations, and InSAR will be used in the future as a supplemental data source for the rest of the Subbasin, and its accuracy will be validated using CGPS and benchmark data.

5.6 Depletions of Interconnected Surface Water

In both the 2020 GSP and 2022 Revised GSP, the RMN and associated SMC for the depletions of interconnected surface water used groundwater levels as a proxy. As such, the RMN for groundwater levels

has served as the RMN for interconnected surface water over the time period covered by this Periodic Evaluation.

In response to DWR's July 2023 Determination Letter, the RMN and associated SMC for interconnected surface water were revised to better address data collection to evaluate the rate, timing, and volume of depletions of interconnected surface water, and to incorporate six new monitoring wells in the Subbasin. The new RMN for interconnected surface water is comprised of a subset of representative monitoring wells that are located within five miles of interconnected water courses plus six new monitoring wells constructed in 2023 and 2024 to fill data gaps associated with interconnected surface water monitoring and the northwestern portion of the Subbasin adjacent to the Delta. (See 2024 GSP Amend. Chapter 4 and Appendix 3-F).

6. GSA AUTHORITIES AND ENFORCEMENT ACTIONS

- Describe any new authorities the basin's GSAs have gained, established or exercised since the GSP submittal (e.g., new ordinances or regulations) and summarize what has been implemented to advance groundwater sustainability; demonstrate how these components will help the GSAs reach sustainability.
- Describe how Plan implementation has been affected by external regulatory requirements or executive orders issued by the Governor, if applicable.
- Provide information describing any enforcement or legal actions (SGMA-related or non-SGMA related that could affect achieving sustainability) taken in the basin to further the sustainability goal.

The GSAs of the Eastern San Joaquin Groundwater Subbasin have not gained, established or exercised any new authorities since the 2020 submittal of its GSP nor have they taken any enforcement or legal actions in the Subbasin to date, other than to establish policies for each GSA to address new well permits applications as impacted by the State Governor's Executive Orders N-7-22 and N-3-23.

On an annual basis, the GSAs have conducted required SGMA-related monitoring events (including data compilation and uploads), conducted updates and improvements to both its data management system (DMS) and groundwater flow model (ESJWRM), prepared and submitted annual reports, conducted regular meetings of the Subbasin's management agency (the Eastern San Joaquin Groundwater Authority or ESJGWA) and Steering Committee, and conducted regular outreach via its SGMA website. Other activities completed by the Subbasin include the following:

- Responded to DWR's 2022 Incomplete Determination letter, and revised, adopted and submitted to DWR a revised ESJ GSP in July of 2022.
- Constructed five (5) new monitoring wells for monitoring for impacts with interconnected surface waters and one (1) new multi-completion well in the northwestern portion of the Subbasin, adjacent to the Delta. All well locations were identified as data gaps in the 2020 ESJ GSP.
- Purchased and installed groundwater level transducers in six monitoring wells in the Subbasin.
- Developed and utilized a financing tool to assist with fiscal planning for GSP implementation.
- Conducted an analysis of the impacts of Mokelumne River surface water projects on groundwater basin management using the Subbasin integrated flow model, the Eastern San Joaquin Water Resources Model (ESJWRM), to assess project benefits.
- Conducted a feasibility study to identify opportunities for maximizing the use of the Mokelumne River Water and Power Authority (MRWPA) Water Right Application 29835 (A029835) and to identify projects that could be included in the Mokelumne Integrated Conjunctive Use Program (MICUP).
- Worked toward developing a Water Accounting Framework (WAF) to alleviate overdraft and identify costs associated with shared projects designed to address overdraft to individual GSAs.
- Conducted a Call for Projects to update the list of projects and management actions to be implemented in the Subbasin. Additions were included in the Revised ESJ GSP submitted to DWR in July of 2022.
- Applied for and received grant funding for various GSP-related projects and analyses.

Together, these activities have addressed some of the Subbasin's identified data gaps, improved data collection, and provided information on which projects and/or management actions will provide the greatest benefits to the Subbasin. Additionally, some of the work efforts improved the functionality of the governance of the Subbasin, sustaining GSP implementation.

7. OUTREACH, ENGAGEMENT AND COORDINATION WITH OTHER AGENCIES

- Describe/summarize the coordination efforts and activities that occurred between the GSAs, between hydrologically connected basins, and with land use agencies in addition to federal, state, and local agency coordination that was relative to SGMA implementation.
- Provide an assessment of public comments submitted to the GSA after the initial Plan submittal/resubmittal or during evaluation cycle.
- Describe public engagement efforts.
- Evaluate and verify that the methods described in the Plan for outreach and engagement activities are relevant to implementation and are being maintained and updated.

Outreach, stakeholder engagement and coordination are ongoing in the Eastern San Joaquin Subbasin. Information on GSA-specific outreach and stakeholder engagement efforts are summarized in the Subbasin's Annual Report.

Subbasin-wide outreach and GSA coordination activities occur predominantly through the Eastern San Joaquin Groundwater Authority (ESJGWA). All GSAs are members of the ESJGWA Board, and the Subbasin's Steering Committee is composed of representatives of the various users of groundwater in the Subbasin. All regular meetings of both organizations are noticed and open to the public. Associated documents relating to those meetings (meeting notices, agenda and meeting materials) are posted on the ESJGWA website at https://www.esjgroundwater.org/.

GSA representatives of the cities and counties in the Subbasin coordinate with their counterparts in the land use planning departments. Coordination with federal, state, and other local agencies relative to GSP implementation occurs on an as-needed basis and are predominantly related to permitting, land acquisition/easements, and project mitigations. In addition, each of the GSAs in the Subbasin holds regular public board meetings (typically monthly) which include updates on GSP implementation.

The Subbasin's Plan Administrator has been participating in DWR-hosted meetings of GSP points of contacts (POC) in the San Joaquin Valley. Additionally, DWR representatives regularly attend the ESJGWA Board meetings and Steering Committee meetings and provide updates as part of the regular agenda.

Public engagement efforts conducted by the GSAs as part of Plan implementation include:

- Updates at regular GSA Board of Directors meetings, City Council meetings, and Water Advisory Committee meetings.
- Continued updates to GSA-specific websites regarding SGMA and GSP implementation progress and related posts on social media.
- Regular newsletters with SGMA and groundwater related articles.
- Annual landowner/growers' meetings and workshops sponsored by GSAs and by GSAs in coordination with other local stakeholder groups.
- Targeted presentations/workshops to landowners, growers Chambers of Commerce, and other groups to discuss projects and GSP implementation.

- Guided tours of facilities for community members to describe physical conditions and proposed projects.
- Direct outreach as needed (e.g., to the Sierra Club, Self Help and Catholic Charities to discuss domestic well failure experience in our area and ideas for a well mitigation policy).

The Subbasin GSAs address potential impacts on beneficial users through these engagement efforts by educating the community, landowners and growers about SGMA and the Subbasin sustainability goal, by showcasing and discussing projects to be implemented (including any associated monitoring programs), and by providing materials to the public with relevant information (such as newsletters and postcard mailers).

A total of 12 letters or emails were submitted to DWR following the July 2022 submittal of the Revised ESJ GSP. Eleven of the documents were emails submitted by Mary Elizabeth, Delta-Sierra Group Conservation Chair, to DWR or the ESJGWA; these comments were as follows:

- Comments on the January 11, 2023 ESJGWA Board of Directors meeting agenda (January 10, 2023 letter to the ESJGWA).
- Comments on the February 8, 2023 Steering Committee agenda regarding the workplan for outreach and engagement plan development, surface water and well update and the county drought task force pursuant to SB552) (February 8, 2023 emails to the ESJGWA).
- Requested link to Subbasin DMS be included on Eastern San Joaquin Groundwater Authority website (March 25, 2023 email to the ESJGWA).
- Comments on the June 15, 2023 ESJGWA Board Meeting regarding the outreach plan development and lack of dry well reporting at the board meeting (June 13, 2023 email to ESJGWA).
- Noted that San Joaquin County does not have a drought task force pursuant to SB552 (June 15, 2023 email to DWR).
- Noted that the Subbasin's stakeholder workgroup was no longer meeting and requesting that the San Joaquin Grant Jury Report be added to the SGMA Portal (July 7, 2023 email to DWR).
- Comments on the agenda for the August 23, 2023 Steering Committee agenda (August 23, 2023 email to the ESJGWA).
- Comments on the October 11, 2023 Steering Committee meeting agenda (October 10, 2023 letter to the ESJ Steering Committee).
- Comments on agenda for January 10, 2024 ESJGWA Board meeting regarding the proposed domestic well mitigation policy and program and question regarding the updated C&E Plan (January 10, 2024 email to the ESJGWA).
- Comments on the April 10, 2024 Steering Committee meeting agenda (April 10, 2024 letter to the ESJGWA).

As none of these letters/emails specifically addressed the 2022 Revised GSP, no responses were made as part of the 2024 GSP Amendment. The twelfth letter, dated October 12, 2022, was from the National Marine Fisheries Service (NMFS). The NMFS letter contained six general comments and two specific comments, summarized below:

- The 2022 Revised GSP has not adequately explained how the proposed minimum threshold for streamflow depletion avoids the undesirable result of significant and unreasonable impacts to beneficial uses of surface water.

- Expressed concerns that the sustainable management criteria for the "streamflow depletion undesirable result" are inappropriate for avoiding significant impacts to salmon, sturgeon, and their habitats.
- The undesirable result definition for depletions of interconnected surface water in the 2022 Revised GSP only offers the generic definition from the SGMA regulations and does not define any specific effects or groundwater conditions that would produce those effects. Additionally, the RGSP also does not adequately describe the effect of undesirable results on the beneficial uses and users of groundwater, including salmon, sturgeon, and their habitat.
- Expressed concern with the defined minimum thresholds defining two successive years of minimum threshold exceedance in the definition and recommend adopting a yearly threshold appropriate to the species and their habitat requirements for the Eastern San Joaquin River Subbasin. Additionally, recommended providing rationale for the 25 percent threshold for representative monitoring sites that have been proposed to signify the "streamflow depletion undesirable result."
- The 2022 Revised GSP does not meet the requirement to describe and consider impacts to Groundwater Dependent Ecosystems, including areas where groundwater accretion supports salmonid and green sturgeon habitat and waterways overlying the Subbasin.
- In developing sustainable management criteria, projects, and management actions, the 2022 Revised GSP does not contain adequate analysis and consideration of public trust resources, as required by the Public Trust Doctrine.
- The statement that "historical conditions are protective of beneficial uses related to interconnected surface water." was based upon discussions among GSA Board, Advisory Committee, Workgroup members, and GSA staff who determined conditions and is not supported by evidence.
- The determination that streamflow depletion impacts are unlikely because the projected depletion volume (50,000 acre-feet per year) is "approximately 1 percent of total stream outflows from the Eastern San Joaquin Subbasin." Is inappropriate because the timeframe when GDEs and aquatic species are at most risk from streamflow depletion is in the summer and fall.

As part of the response to Recommended Corrective Action #6, the sustainability management criteria and representative monitoring network for interconnected surface waters was re-evaluated and revised using the updated ESJWRM Version 3.0 model. The results of this effort were incorporated into the 2024 GSP Amendment. While limited data restricted the depth of the analysis, the Subbasin looks forward to the release of DWR's guidance documents on the assessment of this sustainability criterion and will continue to update the plan and actions as needed and as additional information is gained from the expanded monitoring efforts.

As part of the 2020 GSP, the Eastern San Joaquin Groundwater Authority (ESJGWA) developed an initial Stakeholder Outreach and Engagement Plan. The outreach plan was updated as part of the 2024 GSP Amendment and renamed the Eastern San Joaquin Communication and Engagement (C&E) Plan. This plan (2024 GSP Amend. Appendix 1-H) details communications and engagement recommendations for GSAs to consider as the GSP continues to be implemented and the needs of interested parties in the region evolves.

8. OTHER INFORMATION

- Summarize any additional information that helps describe progress made towards achieving the sustainability goal for the basin.
- Describe how the Plan considers adjacent basins.
- Highlight any technical and/or financial challenges, and identify the most significant challenges and assistance needs.
- Assess how the amended plan may affect relevant city and county general plans related to water resources management, natural resource management and/or land use planning.
- Discuss any technical and/or financial resource limitations and legal matters.

8.1 Progress Towards GSP Implementation

The Subbasin GSAs have been making progress towards GSP implementation and the Subbasin sustainability goal through the development and implementation of the listed projects and management actions and by filling data gaps. Specifically, Subbasin GSAs have completed the following actions:

- Revised the Subbasin 2020 GSP to address deficiencies identified in DWR's 2022 Determination Letter and resubmit the 2022 GSP to DWR.
- Completed and submitted annual reports to DWR.
- Constructed six new dedicated monitoring wells to expand the interconnected surface water (ISW) representative monitoring network and to fill and an identified data gap in the northwestern portion of the Subbasin, adjacent to the Delta.
- Installed dedicated pressure transducers to expand the collection of groundwater level data.
- Completed improvements to the Subbasin Data Management System (DMS) to improve data analysis.
- Completed a mobile and tablet interface for the DMS to facilitate the real-time upload of data collected in the field.
- Developed a financing planning tool to improve GSP implementation-related budgeting and fee estimation.
- Completed significant improvements to the ESJWRM flow model, supporting improved analysis of future scenarios and project design.
- Conducted a study to identify opportunities to maximize the Mokelumne River Water and Power Authority (MRWPA) Mokelumne River water right for beneficial use.
- Continued communication and outreach, both internally within the Subbasin and externally with adjacent basins.

It should be noted that since early 2020, GSP implementation has been affected by the coronavirus pandemic (COVID-19) as GSA employees were encouraged to work from home and avoid public gatherings to prevent the spread of the virus. Pandemic restrictions may have also delayed implementation progress of projects, management actions, and adaptive management activities between 2020-2022. However, progress in WY 2023 showed many agencies are back on track toward project implementation.

8.2 Consideration of Adjacent Basins

The ESJ Subbasin is bordered by the South American and Cosumnes Subbasins to the north, the Tracy and East Contra Costa Subbasins to the west, and the Modesto Subbasin to the south. All of these basins were required to submit their GSPs in January of 2022, and received their Determination Letters from DWR in 2023. The GSPs for all bordering subbasins were deemed adequate by DWR, except for the Modesto Subbasin which was deemed incomplete. This subbasin submitted a revised GSP in July of 2024 and therefore has not yet been determined to be adequate.

In addressing the Recommended Corrective Actions contained in the July 2023 Determination Letter and preparing this Periodic Evaluation and associated 2024 GSP Amendment, the 2022 GSP submittals for all three adjoining basins were reviewed and considered. Specifically, the SMC and representative monitoring networks for these basins were considered in revisions to those in the 2024 GSP Amendment.

Historically, the Subbasin's Plan Administrator has been participating in DWR-hosted meetings of GSP points of contacts (POC) in the San Joaquin Valley. In August 2023, the Subbasin's plan administrator position was vacated, and the position was filled in June of 2024. The Subbasin's new plan administrator has begun re-engaging in the POC meetings. (See 2024 GSP Amend. Chapter 1).

8.3 Technical/Financial Challenges and Limitations

The Subbasin is currently facing two primary technical challenges – one relating to interconnected surface waters and the other relating to change in storage. As noted in both the 2020 GSP and 2022 Revised GSP, the GSAs recognize the lack of data needed to support detailed analyses of interconnected surface waters and have identified that as a data gap area. While work has been completed to improve this situation, including the construction of five new monitoring wells specifically for ISW monitoring, additional data need to be collected to support analyses, and additional monitoring wells may need to be constructed to expand the ISW representative monitoring network.

The second technical challenge the Subbasin is currently facing relates to understanding the potential volume of groundwater shortage that may occur under projected future conditions and projected conditions with climate change, developing a program to address the shortage, and gaining acceptance of that program by Subbasin growers without resulting in a significant economic impact to the Subbasin.

Funding for projects also remains a challenge. GSP implementation is extremely costly with the fiscal burden being borne predominantly by the GSAs. These costs continue to be a burden to local stakeholders who are concurrently facing reduced commodity prices, inflation, and increasing costs of regulatory compliance.

8.4 2024 GSP Amendment Impacts to Relevant City and County General Plans

The Demand Management Program, a new management action included in Appendix 6-A of the 2024 GSP Amendment, may impact relevant city and county general plans by limiting the amount of groundwater that may be extracted from the Subbasin, thereby impacting the ability to fulfill new housing requirements, tempering growth and impacting the local economy. How, specifically, the plan will impact the city and county plans has not yet been determined.

9. SUMMARY OF PROPOSED OR COMPILED REVISIONS TO PLAN ELEMENTS

- Summarizes the key take-aways from the Periodic Evaluation
- Provide a brief overview of next steps and how the GSAs intend to use this evaluation to continue moving the basin towards their sustainability goal.
- Summarize revisions to GSP elements

Significant revisions were made to the 2022 Eastern San Joaquin Subbasin GSP. The most significant revisions were:

- Updates to the ESJWRM integrated flow model to incorporate changes to the hydrogeologic conceptual model resulting from the State's AEM surveys.
- Analyses to justify the definition of undesirable results for the groundwater level sustainability indicator and revisions to the minimum thresholds and representative monitoring network for that sustainability indicator.
- Revisions to the definition of undesirable results for the groundwater in storage sustainably indicator.
- Removal of seawater intrusion as a sustainability indicator.
- Addition of chloride as a constituent of concern and revisions to the representative monitoring network for the groundwater quality sustainability indicator.
- Revisions to the representative monitoring network and measurement metrics for the subsidence and interconnected surface water sustainability indicators.
- The addition of a Domestic Well Mitigation Program.
- The addition of a Demand Management Program.

The GSP appendices were also revised to incorporate the updated model report, additional analyses conducted in responding to the Recommended Corrective Actions and document the public review and adoption of the 2024 GSP Amendment.

The Subbasin GSAs will continue to implement the GSP, including the new monitoring programs and management actions, and continue to make progress towards the implementation of projects. The GSAs will continue to use the annual reports as their primary mechanism for regular 'check-ins' on the state of the basin relative to established sustainable management criteria.

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Appendix A – Additional Information About Projects and Management Actions

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Table A- 1: Ongoing or Completed Projects and Management Actions

Project or Management Action Name	Project Type	Current Status	Status Description	Realized Benefits to Date (AF)	Range of Expected Benefits (AFY)	Benefits/Impacts to Beneficial Users & Uses	Contribution to Achieving Sustainability Goal
Lake Grupe In-lieu Recharge	In-Lieu Recharge	Complete	Project is complete. Meter is installed.	750	2,000 – 4,900	Once operational, the project will benefit the Subbasin by providing in-lieu recharge for irrigators in the Stockton East Water District service area, addressing the chronic lowering of groundwater levels.	Construction on the project was completed in 2023. The project has not yet been operational, so there has been no contribution towards sustainability to date.
SEWD Surface Water Implementation Expansion	In-Lieu Recharge	Implementation phase	The expansion is being implemented in stages. SEWD has completed the conversion of 2,505 acres to surface water and is in the planning phase to convert an additional 1,135 acres. During WY 2024, the SEWD plans to continue constituent outreach efforts and address the necessary improvements to facilitate the conversions, including providing funding of up to $200,000 per farm through the CDFA SWEEP BLOCK Pilot Program.	11,570	4,000 - 19,000	The Subbasin has benefited from the in-lieu use of surface water for the irrigation of 2,505 acres previously irrigated with groundwater. This project addresses the chronic lowering of groundwater levels.	The project provided 11,570 AF of in-lieu groundwater recharge, contributing towards the achievement of the Subbasin's sustainability goal.
White Slough Water Pollution Control Facility Expansion	Direct Recharge	Construction completed	Construction of the White Slough Water Pollution Control Facility expansion is complete.	518	3,729	The project allows for direct recharge of groundwater in the subbasin.	The project provided 518 AF of direct groundwater recharge, contributing towards the achievement of the Subbasin's sustainability goal.
CSJWCD Capital Improvement Program	In-Lieu Recharge	Can be implemented immediately	The Project has been implemented and is on-going each year of available water delivery. This continues to be the case as new customers and locations are added. Updates regarding activity progress will be included in future Annual Reports.	5,000	12,000-24,000	The project will provide groundwater recharge through the in-lieu use of alternate water supply, offsetting groundwater use and addressing the chronic lowering of groundwater levels.	The project provided 5,000 of in-lieu groundwater recharge, contributing towards the achievement of the Subbasin's sustainability goal.

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NSJWCD South System Modernization	In-Lieu Recharge	Environmental review complete, funding secured for Phases 1, 2 and 3. Landowner improvement district formed. Phases 1-2 complete.	This Project is progressing. Phase 1 completed in 2019-2021 included: new pump station, variable frequency drive (VFD), meters, automation equipment, SCADA, new main junction box at Tretheway and Brandt Road. Phase 2 completed 2023-early 2024 including new sections of main pipeline and adding meters and SCADA. ID3A formed in 2021 for construction of the Pixley lateral, which was completed in 2022. Working on formation of ID3B for Handel lateral (for which NSJWCD received $1 mil federal grant). NSJWCD was just awarded a $3M IRWM grant for Phase 3 South System improvements to focus on more mainline replacement and groundwater recharge capacity. Phase 3 will be constructed 24-25. NSJWCD applied for a $5 mil WaterSmart Grant for Phase 4. Future phases will include additional laterals and recharge capacity along the south system to expand capacity to take wet year water for recharge, including MICUP water.	4,000	1,200-10,000. Additional 15,000 in wet years with future phases	Once operational, the project will benefit the Subbasin by providing in-lieu recharge for irrigators in the NSJWCD South System service area and adding direct recharge capacity along the South System, addressing the chronic lowering of groundwater levels.	In 2023 the South System used approximately 1,600 AF of surface water and in 2024 it is estimated to use 4,000 AF of surface water. Use has been for in-lieu or direct groundwater recharge. Upon completion of Phase 2 and 3, the system is expected to use up to 8,000 AFY for in-lieu and direct recharge.
Long-term Water Transfer to SEWD	Transfers	Infrastructure is in place. CEQA competed and agreements in place as of 2023.	In 2023, OID and SJJID approved a 10-year water transfer to SEWD. The water will be delivered through the existing Goodwin Tunnel and the Upper Farmington Canal for final delivery to SEWD's municipal and agricultural customers. OID and SSJID will make available to SEWD up to 10,000 AF in critical years and up to 20,000 AF in non-critical years depending on availability of pre-1914 Stanislaus River water. The water transfer was approved following adoption of a negative declaration per CEQA. Due to extremely wet conditions, no water was transferred in 2023 as part of the 10-year water transfer. In a separate approval in 2023, OID and SSJID did complete a transfer to SEWD for 1,200 AF to serve lands dependent on groundwater, but outside of SEWD's designated CVP service area. The Districts filed a Notice of Exemption for the water transfer.	600	10,000-20,000	The water transfer reduces groundwater pumping by the City of Stockton and Cal Water by serving treated Stanislas River water in critical and dry years. SEWD also has the option to serve transfer water to Ag customers in lieu of groundwater pumping.	Due to extremely wet conditions, no water was transferred in 2023 as part of the 10-year water transfer as SEWD received their full New Melones allocation from the Bureau of Reclamation. In 2022, OID and SSJID approved a one-year transfer to SEWD for 13,824 AF to offset groundwater pumping.
South System Groundwater Banking with East Bay Municipal Utilities District (EBMUD)	In-Lieu Recharge	Pilot Dream Project will be complete by February 2024. Working on expanded banking project	NSJWCD and EBMUD completed contracts, new facilities, water right change petitions, water delivery and extraction for the pilot DREAM Project (1,000 AF). Planning efforts for a larger scale banking project are underway.	500	750-4,000	Dream Project added 500 AF of new water to the Subbasin and the future project is expected to add up to 4,000 AF of new water to the subbasin each year it operates.	500 AF of new water to subbasin from Dream Project to date.

Project or Management Action Name	Project Type	Current Status	Status Description	Realized Benefits to Date (AF)	Range of Expected Benefits (AFY)	Benefits/Impacts to Beneficial Users & Uses	Contribution to Achieving Sustainability Goal
NSJWCD North System Modernization/Lakso Recharge	In-Lieu Recharge	Constructed Phase 1A, in progress on Phase 1B. Planning Phase 2	Project is advancing and operating. NSJWCD awarded Proposition 68 Round 2 funding $3.9 mil. Phase 1A constructed and operated in 2023-24 to recharge in two locations. Phase 1B under construction to add irrigation deliveries. NSJWCD is working with North System landowners to form improvement district to use surface water for irrigation and conduct on-farm recharge in wet years. Planning Phase 2 to add new Pump Station and fish screen.	420	1,000-4,000	This project will repair, upgrade, and modernize the North System Pump and Distribution System to facilitate delivery of 4,000 to 6,000 AF/year of surface water to farmers in-lieu of groundwater pumping and for direct recharge.	Project is advancing. NSJWCD awarded Proposition 68 Round 2 funding $3.9 mil. Phase 1A constructed and operated in 2023-24 to recharge in two locations. Phase 1B under construction to add irrigation deliveries. Phase 3 in planning phase and grant received for partial cost of new pump station
Tecklenburg Recharge Project	Direct Recharge	Substantially complete	The District acquired a 10-acre parcel in 2023 and constructed and operated recharge basin from July 2023 to present. District working on new lateral from South System mainline to increase project capacity.	1,500	300-2,000	The project benefitted the Subbasin by providing additional direct recharge to the underlying groundwater basin, addressing the chronic lowering of groundwater levels.	In 2023 the district recharged 300 AF in Tecklenburg and the district estimates it will recharge over 1,500 AF in Tecklenburg in 2024
City of Stockton Phase 1: Groundwater Recharge Project	Direct Recharge	Feasibility study completed in December 2023. Basin design in progress. Construction to begin spring 2025.	The request for proposals was released in early spring of 2022. Geosyntec was awarded the contract, and the geotechnical study began in July of 2022. The geotechnical and feasibility study were completed in December 2023. The basin design is in progress and construction of the basin(s) will begin in Spring 2025.	0	20,000	Once operational, the project will benefit the Subbasin by providing direct recharge, addressing the chronic lowering of groundwater levels.	The project has not yet been constructed, so there has been no contribution towards sustainability to date.
Monitoring and recording of groundwater levels and groundwater quality data	Monitoring and Reporting	Ongoing	Subbasin status information was presented most recently in the WY2023 Annual Report, describing groundwater level and groundwater quality monitoring data collected to date. Updates regarding Subbasin status relative to SMC will be included in future Annual Reports.	Not Applicable	Not Applicable	Ongoing data collection to support evaluation of Subbasin conditions relative to established SMC.	Additional data to inform Subbasin management.
Maintaining and updating the Subbasin Data Management System (DMS) with newly collected data	Monitoring and Reporting	Ongoing	The Subbasin DMS was maintained and updated to include monitoring data for WY 2023 and to incorporate improvements and upgrades.	Not Applicable	Not Applicable	Improvements to the Subbasin DMS facilitates improved efficiency in data collection and analysis.	DMS improvements facilitates data analyses to inform Subbasin management.
Annual monitoring of progress toward sustainability	Monitoring and Reporting	Ongoing	PMA status information was presented more recently in the WY2023 Annual Report along with updated monitoring data and analyses to assess Subbasin condition.	Not Applicable	Not Applicable	Regular (annual) assessment of Subbasin conditions relative to established SMC.	Regular analyses to inform Subbasin management and progress toward achieving the Subbasin's sustainability goal.

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Annual reporting of Subbasin conditions to DWR as required by SGMA	Monitoring and Reporting	Ongoing	The Project status information was presented more recently in the WY2023 Annual Report, describing current Subbasin conditions relative to established SMC and progress towards meeting the interim milestones.	Not Applicable	Not Applicable	Regular (annual) communication to Subbasin groundwater users and the State as to current Subbasin conditions relative to the sustainability goal and progress towards meeting established interim milestones.	Mapping of progress towards achieving and maintaining the Subbasin's sustainability goal.
Addressing Data Gaps	Monitoring and Reporting	Ongoing	During WY 2021, NSJWCD contracted with DWR and San Joaquin County to install a TSS monitoring well with in the NSJWCD area.	Not Applicable	Not Applicable	Additional hydrogeological information in the NSJWCD area and a new data point for annual monitoring.	Filled an identified data gap.
AMI Replacement and Conversion	Monitoring and Reporting/Conservation	Complete	CCWD completed replacement and conversion of customer water meters to Automated Meter Infrastructure (AMI) in March 2022. Anticipated improved customer-level consumption data going forward.	Not Applicable	Not Applicable	Use of advanced metering will expand data collection to improve customer use information.	Improved customer use information
Groundwater Monitoring Plan	Monitoring and Reporting	Ongoing	NSJWCD retained a hydrogeologist, installed one monitoring well in 2023, and is contracted to install 3 more monitoring wells in 2024. District also began collecting water level data from ag wells in 2023 to inform a larger scale monitoring program.	Not Applicable	Not Applicable	Additional hydrogeological information in the NSJWCD area and new data points for annual monitoring.	Additional data collection points for improved Subbasin management.
West Groundwater Recharge Basin	Direct Recharge	Ongoing	The project is currently in the design stage with first phase construction beginning spring 2024 and is estimated to be completed in approximately 2032.	0	1,500-16,000	The project is currently under construction. Once operational, the project will benefit the Subbasin by directly recharging the Subbasin with surface water when available, addressing the chronic lowering of groundwater levels.	Construction on the project was started in 2024. The project has not yet been operational, so there has been no direct contribution towards sustainability to date.
NSJWCD Private Pump Partnerships	In-Lieu and Direct Recharge	Ongoing	NSJWCD has executed one agreement with an existing riparian pumper in 2024 to use NSJWCD water permit to irrigate 200 acres and plans to add an additional 200 acres each year for 5 years.	0	1,50-3,000	The first phase of the project was completed in early 2024. With the execution of additional agreements and availability of surface water, both in-lieu and direct groundwater recharge will occur, addressing the chronic lowering of groundwater levels.	The project has not yet been operational, so there has been no direct contribution towards sustainability to date.

Project or Management Action Name	Project Type	Current Status	Status Description	Realized Benefits to Date (AF)	Range of Expected Benefits (AFY)	Benefits/Impacts to Beneficial Users & Uses	Contribution to Achieving Sustainability Goal
Oakdale Irrigation District In-lieu and Direct Recharge Project	Direct Recharge/In-Lieu Recharge	Ongoing	The project envisions the development of up to approximately 25,000 AF of surface water from the Stanislaus River being made available to landowners east of OID's service area boundaries in both the Eastern San Joaquin and Modesto Subbasins in all, except Critically Dry, water years. Water deliveries would occur through a limited number of existing and newly constructed private irrigation conveyance infrastructure for use between March 1st and September 30th. Some direct recharge is expected to occur from the Project as canal or reservoir seepage in the conveyance network.	4,783	0-25,000	The additional surface water supplies were delivered to out-of-District lands in the Subbasin for use in-lieu of groundwater pumping. This allowed the cultivated lands to continue to be used while reducing impacts to the critically overdrafted Subbasin.	The project offset in 2023 is 4,783 AF and a future offset of 6,438 AF of groundwater that would have otherwise been used for agricultural irrigation.
City of Stockton Advanced Metering Infrastructure	Conservation	RFP for full AMI issued in March 2023. Contract awarded in March 2024.	Project will convert touch read meters to full AMI. Planned to be completed over 6 years with a $17M budget. Initial study completed in 2011. Contract award in March 2024. Project completion in 2028.	0	2,000	The project will convert touch read meters to full AMI. The improved technology will increase efficiency and decrease costs associated with manual reading. Additional benefits beyond cost savings include improved leak detection and demand-side water conservation. Conservation will reduce the City of Stockton's use of groundwater as a drinking water supply.	The project has not yet been operational, so there has been no direct contribution towards sustainability to date.

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Table A- 2: Conceptual and Planned Projects and Management Actions

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
City of Manteca Advanced Metering Infrastructure	Conservation	The project would be used to help residents track their water use, report leaks, and potentially reduce their consumption.	The project is anticipated to reduce groundwater demand by 272 AF/year through leak detection and real-time consumption information to the customer.	To Be Determined	Project implementation will take place once funding is available.
City of Lodi Surface Water Facility Expansion & Delivery Pipeline	In-Lieu Recharge	The project is needed to expand the use of surface water in the City for drinking water in lieu of groundwater pumping.	This project would expand the City of Lodi's Surface Water Facility and add an additional 10 million gallons per day (MGD) capacity of surface water treatment. Groundwater savings could be as high as 6,000 AF/year; however, 4,500 to 5,000 AF/year is expected.	2030-2033	The delivery of additional raw surface water will need to be secured for this project to proceed.
BNSF Railway Company Intermodal Facility Recharge Pond	Direct Recharge	The project is needed to directly augment groundwater recharge in the critically overdrafted subbasin.	CSJWCD would form an agreement with the BNSF railroad owner to access an existing drainage pond near the CSJWCD delivery channel to be used as a recharge area. This project would contribute an estimated 1,000 AF/year of groundwater offset through direct recharge to the groundwater aquifer	2020-2025	Project implementation was delayed in WY2021 due to COVID, and in WY2022 due to severe drought conditions. CSJWCD is currently seeking bids for projects diversion structures.
Manaserro Recharge Project	Direct Recharge	This project would construct and operate a 10-acre recharge pond on the North side of the Mokelumne River on property owned by the Manaserro family through a long-term lease.	This project could recharge 10,000 AF/year or more in years when water is available.	2023-2025	NSJWCD is working on a strategic plan and funding options for the implementation of the project and to negotiate with landowner or find alternative location.
City of Escalon Wastewater Reuse	Recycling/In-Lieu Recharge/Transfers	This project entails the reuse of tertiary treatment wastewater blended with surface water in SSJID's irrigation distribution system.	This project could provide approximately 672 AF/year of an alternative water supply for either reuse or recharge.	2030-2035	The project is in the early conceptual stages and requires additional feasibility analysis and long-term planning. The City of Escalon has hired a consultant to explore the feasibility of project alternatives and to develop engineering plans and specifications.
City of Ripon Surface Water Supply	In-Lieu Recharge	This project would supplement the City of Ripon's municipal water supply with treated surface water from SSJID.	The project would supply approximately 6,000 AF/year of treated surface water for use in lieu of groundwater currently used for drinking water.	2028-2030	The City of Ripon is seeking terms to connect to the Nick DeGroot Water Treatment Plant from the current South County Water Supply Program participants and also needs to work through SSJID design criteria for connection to its drinking water facilities.

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
City of Escalon Connection to Nick DeGroot Water Treatment Plant	In-Lieu Recharge	The project would provide the City of Escalon with the turnout and distribution system improvements necessary to receive their surface water allotments from the Nick DeGroot Water Treatment Plan.	The project would provide the city with approximately 2,015 AF/year of treated surface water for use in lieu of groundwater currently used for drinking water.	2028-2030	In 2023, the city furthered development of its engineering design to incorporate design criteria for connection to SSJID drinking water facilities and right-of-way acquisition needs. Work on this project is currently ongoing.
Farmington Dam Repurpose Project	Direct Recharge	The project would convert the Farmington Dam, currently a flood control structure, into a water supply reservoir for storage to provide surface water to growers for irrigation and as a buffer against drought.	The project would increase the total reservoir capacity from 52,000 AF to 112,000 AF, which includes 60,000 AF for water supply and 52,000 AF for flood control.	2030-2050	SEWD has been working with Congressman Harder to include this project within the 2024 Water Resources Development Act (WRDA) bill to re-authorize a new feasibility study. More resources will be directed toward the feasibility study, expected to begin in 2024.
Mobilizing Recharge Opportunities (MICUP)	Direct Recharge	This program defines and implements direct and indirect groundwater recharge through the use of recharge basins, Aquifer Storage and Recovery (ASR) wells, in-lieu (direct irrigation application), and Flood Managed Aquifer Recharge (FloodMAR) activities.	Conjunctive Use of Surface and Groundwater to respond to drought and climate change, improved groundwater levels, and integrated water supply and environmental benefits to the Lower Mokelumne River.	2024-2040	The Project has been expanded into a multi-benefit project. Funding will be required to further the design and construction of projects identified in the framework.
NSJWCD Winery Recycled Water	Recycling/In-Lieu Recharge/Direct Recharge	The project would blend NSJWCD Permit 10477 water with wastewater from winery(ies) and deliver the blended water for irrigation to accomplish in-lieu recharge or put in recharge ponds and accomplish direct groundwater recharge.	The project would provide approximately 750 AF/year of reuse water for in-lieu or direct recharge.	2025-2027	NSJWCD is continuing to work on a strategic plan and funding options for the implementation of this project or a similar project with winery.

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
SSJID Storm Water Reuse	Storm Water/In-Lieu Recharge/Direct Recharge	The cities of Escalon and Ripon discharge storm water into SSJID facilities during the winter months which is conveyed through SSJID's main canal or lateral irrigation distribution system to the Stanislaus or San Joaquin Rivers. Capturing and storing excess storm water would allow for quantities of water that could be used to offset or enhance groundwater in multiple ways.	It is estimated that 1,100 AF/year of stormwater runoff can be captured and reused for recharge based on two 20-acre storm drain retention basins.	2027-2030	The project currently remains a project concept that could be considered as SSJID's WMP projects are advanced, and the concept integrated during the engineering design process.
South Stockton Well Rehabilitation Program	Monitoring and Reporting	Well SSS8 well head treatment is complete and back in operation. Back-up power to Wells SSS3 & SSS9.	This project will provide well reliability for the City of Stockton.	2021-2024	Construction of SSS8 well head treatment is complete. Backup power to Well SSS3 and SSS9 construction to be complete in 2024.
Recycled Water to Manteca Golf Course	Recycling	The project is needed to reduce the use of groundwater for golf course irrigation.	Gold course irrigation was identified as a potential user of recycled water in the City's Reclaimed Water Facilities Master Plan. Once the recycled water infrastructure is in place, an estimated 5,000 AFY of groundwater use could be offset by the use of recycled water for irrigation.	To Be Determined	The Reclaimed Water Facilities Master Plan was adopted in January 2023. The city is currently pursuing funding, like grants, to finance the construction of a pump station, and storage tank(s) to deliver recycled water.
Mokelumne River Loss Study	Model Refinement and Validation	This project would refine and validate the Subbasin's ESJWRM integrated flow model to better understand interconnections between the Subbasin and the Mokelumne River	This study will provide valuable insights to the interconnections between the Mokelumne River and the ESJ Subbasin, which will aid in improving basin management.	2020-2025	Project implementation did not occur during WY 2021 due to a lack of funding and lack of staff resources to complete the plans and move the projects forward. NSJWCD is continuing to work on strategic plan and funding options for the implementation of this Project.
Wallace-Burson Conjunctive Use Program	Conjunctive Use/Direct Recharge	The project would use surface water from New Hogan Reservoir and/or Mokelumne State-Filed Rights Application and/or purchased water for direct recharge into the Subbasin. Recharged water will help stabilize local domestic groundwater wells in area provide supplemental water to offset other Eastside GSA consumptive uses.	Conjunctive use and recharge opportunities identified, designed and construction will facilitate the in-lieu and/or direct recharge of surface water into the underlying groundwater basin near the Wallace Service Area and the communities of Burson and Southworth. The estimated project benefit will be 500-3,000 AF/year depending on the size and extent of the program.	2030-2040	The hydrogeology and water supply studies have been developed; designing of specific program facilities is ongoing.

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
Calaveras River Wholesale Water Service Expansion	In-Lieu Recharge	The project would identify opportunities for conjunctive use and recharge.	CCWD has available surface water supply to set up agreement(s) facilitating in-lieu recharge in Calaveras County portion of subbasin. The amount of recharge will be dependent on the opportunities identified, developed, and constructed.	2020-2040	Studies are needed based on specific partners, arrangements, etc. to identify and develop opportunities for in-lieu recharge through the use of available surface water supplies.
Threfall Ranch Reservoir, In-Lieu and Direct Recharge Project	In-Lieu Recharge/Direct Recharge	The project will provide water for in-lieu and direct recharge in the critically overdrafted subbasin.	The project would provide an estimated 2,000 AF/year of in-lieu recharge. Additionally, the unlined reservoir will provide direct recharge of a volume yet to be quantified.	2025	Final design has been completed, and environmental review and permitting is pending receipt of project funding.
Perfecting Mokelumne River Water Right	In-Lieu Recharge	Advances MRWPA's Water Right Application 29835 (A029835) to Water Right Permit	Water Right Permit	2024-2025	The water right application is currently in process.
North System Groundwater Recharge Project - Phase 2	Direct Recharge/In-Lieu Recharge	The North System Master Plan will identify opportunities for direct and/or in-lieu recharge of the underlying critically overdrafted subbasin. New Pump station will increase capacity	Preliminary estimates indicate that between 1,000-3,000 AF/year of recharge could occur off the North System in wet and normal years through either direct and/or in-lieu recharge.	2026-2029	The Master Plan for the entire North System is current in progress.
Stormwater Collection, Treatment, and Infiltration	Direct Recharge/ Stormwater	The City of Manteca will conduct a study to determine what space may be available for use in a stormwater recharge program, identify treatment technologies available and determine volume of rainwater available for groundwater recharge.	To be determined based on the results of the study.	To Be Determined	The City is currently working to identify a funding source for the study.
Off-Stream Regulating Reservoir	Direct Recharge	The project would use water from New Hogan Reservoir through existing and pending water rights for direct recharge into the underlying critically overdrafted subbasin.	The project would increase water supply flexibility while actively recharging.	2026-2050	SEWD will investigate potential sites and discuss with landowners.
On-Farm Recharge Project	Direct Recharge	The project would use existing tile drain systems or dry wells to recharge the underlying critically overdrafted subbasin with surface water from New Hogan Reservoir.	To Be Determined	2024-2030	SEWD needs ag customers to participate.

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
Bellota Weir Modifications Project	Direct Recharge/Stormwater	The project would control flows into Old Calaveras River to promote recharge into the underlying critically overdrafted subbasin.	The project will allow for the controlled flow into the Old Calaveras River to increase infiltration of surface water into the underlying critically overdrafted Subbasin.	2023-2030	SEWD has promoted the project in Washington DC in order to secure funding through appropriations. SEWD has submitted appropriation requests through Senator Padilla, Congressman Harder, and Senator Butler. SEWD needs to secure more funds and finalize loans.
Water Supply Enhancement Project - Distribution Pipelines	In-Lieu Recharge/Direct Recharge	The project would provide access to surface water to farmers that currently don't have access. This would greatly reduce groundwater overdraft once fully implemented.	The project would increase water supply accessibility for on-farm in-lieu recharge.	2024-2040	SEWD needs to set up meetings with the landowners within these Project areas to secure easements and understand their interest in involvement.
Water Treatment Plant Aquifer Storage Recovery Well - 7401	Direct Recharge	The project would recharge treated water, then store the water in the aquifer to later be extracted in times of drought.	Reduced groundwater deficit.	2024-2026	Construction is scheduled for the beginning of 2025.
Beckman Well	Direct Recharge	The project would recharge surface water from East Bay Mud Aqueduct or New Hogan, then store the water in the aquifer to later be extracted in times of drought.	Reduced groundwater deficit.	2024-2028	SEWD needs to hire a company to understand the current state of the well and what needs to be done to revive it as a functioning ASR well.
Tom Allen Recharge Project	Direct Recharge	Further Design for recharge tactics to maximize recharge at the site.	The project allows direct recharge of New Melones and New Hogan Water.	2024-2025	SEWD needs to invest resources to establish different recharge alternatives to maximize recharge at this site. This could include dry wells.
West Linden Project	In-Lieu Recharge/Direct Recharge	Collaboration with EBMUD and MICUP	In-lieu recharge and direct recharge using Mokelumne Aqueduct Water and New Hogan Surface Water	2024-2035	SEWD is working on discussions with MICUP and EBMUD to discuss collaboration and funding.
Water Supply Enhancement Project - Direct Recharge	Direct Recharge	The project would use New Hogan Water Supplies for Direct Recharge along the distribution system.	Direct recharge of New Hogan Water supply.	2024-2030	SEWD needs to speak with landowners of potential sites.

Project or Management Action Name	Project Type	Project Need	Expected Outcome	Schedule (initiation and completion)	Needs to Advance PMA
SSJID Water Master Plan - System Improvements	In-Lieu Recharge	Several thousands of acres within SSJID are unable to utilize surface water or have limited surface water service due to capacity issues or evolving needs as orchards are converted from flood to micro-sprinkler irrigation. The District has identified a number of capital projects to improve capacity and utilize flow controls to accommodate additional growers coming back to SSJID surface water deliveries.	Through 2040, SSJID expects to implement a number of capital projects either self-funded or with grant funds.	2030-2040	SSJID embarked on a comprehensive Water Master Plan to address its aging infrastructure and to make strategic improvements to SSJID irrigation systems. SSJID has identified $191 Million in capital improvements and to fund these projects, SSJID completed a substantial Prop 218 rate increase in July 2023.