PROJECTS AND MANAGEMENT ACTIONS

15 PROJECTS AND MANAGEMENT ACTIONS

§ 354.42. Introduction to Projects and Management Actions

This Subarticle describes the criteria for projects and management actions to be included in a Plan to meet the sustainability goal for the basin in a manner that can be maintained over the planning and implementation horizon.

☑ **23 CCR § 354.42**

This section presents the Projects and Management Actions (P/MAs) currently under implementation by the Delta-Mendota Subbasin (Basin) Groundwater Sustainability Agencies (GSAs), or otherwise proposed for future implementation to support achievement of Basin sustainability. The Basin has been actively implementing specific plans, programs, and P/MAs to sustainably manage groundwater resources for beneficial uses and users of groundwater within the Basin. The Basin's strategy to achieve sustainability includes a combination of P/MAs that both reduce Basin-wide groundwater pumping and augment groundwater supplies with other sources.

The Basin GSAs are currently developing and intend to implement a Pumping Reduction Plan (PRP) by January 2025 that will achieve a 42,000 acre-feet per year (AFY) reduction in pumping from the Basin by 2030 and avoid Minimum Threshold (MT) exceedances. The PRP is detailed in **Section 16.1.1** and included in this section as a "Tier 2" P/MA (**Section 15.3.2**). Descriptions of all planned P/MAs, including their implementation status and expected benefits, are included in **Table PMA-2** and summarized herein.

15.1 Summary of P/MAs Implementation Status and Effects on Groundwater Conditions

The Basin GSAs have made substantial progress in implementing the P/MAs identified in the revised 2022 Groundwater Sustainability Plans (GSPs). **Table PMA-3** includes an implementation summary of the P/MAs that have been implemented since 2020 and are currently operational (i.e., "Tier 1" P/MAs), as well as their resulting benefits to groundwater conditions and/or groundwater management in the Basin. Implementation is underway for several more P/MAs with anticipated implementation dates by 2030 and 2040 ("Tier 2" and "Tier 3" P/MAs, respectively). The status of all Tier 2, Tier 3, and Tier 4 P/MAs are listed in **Table PMA-1**.

Table PMA-3. Tier 1 Project and Management Action Implementation Summary (2020 – 2024)

ID	Name	Status	Summary of Current Benefits
Tier 1 Projects			
AWD-2	San Joaquin River and Chowchilla Bypass Flood Water	In WY 2023, the SWRCB authorized and approved the Temporary Water Right Permit for AWD to appropriate water pursuant to Water Code, Section 1425 et seq. AWD continues to pursue a permanent appropriative water right permit. A standard water right application was accepted in 2021 and is under review by the SWRCB.	This permit allows for the diversion of up to 10,000 AFY of available San Joaquin River flood water from the Chowchilla Bypass. In WY 2023, AWD diverted approximately 7,500 AF of flood flows for recharge by application to crops and direct recharge (see AWD-3).
AWD-3	Chowchilla Bypass Recharge Facility	A temporary turnout was constructed in WY 2023 to deliver water from the Bypass to the proposed Facility. A permanent turnout will be constructed in the future.	80 acres of previous tree crop land was retired to construct recharge ponds, resulting in an estimated 250 AFY of pumping reduction. In WY 2023, AWD used a temporary turnout to apply water for direct recharge. In the future, water may be used to implement groundwater recharge on a larger area.
CDM-2 / GWD-1 / SJREC-5	Los Banos Creek Diversion Facility	Construction completed in 2017.	This project has an average yield of 7,000 AFY and provides benefits to the Riparian corridor along the Los Banos Creek, improves wetland habitat, flood protection to the City of Los Banos (a DAC) and water supply for the Riparian water users. Project yield is split evenly between CCID, SLWD, and GWD.
CDM-3 / GWD-2 / SJREC-6	Los Banos Creek Storage Project	A pilot project was completed in Fall 2020, and funding for this project was received as part of the SGM Program SGMA Implementation – Round 1 Grant awarded in April 2022. Construction for full project buildout is scheduled for 2025.	This project will provide 8,000 AF of additional water storage. It provides flood protection to the City of Los Banos and temporary storage of water or groundwater that can be used to meet peak irrigation and wildlife water management demands. Project storage is split evenly between CCID, SLWD, and GWD.

ID	Name	Status	Summary of Current Benefits
GWD-3	North Grassland Water Conservation and Water Quality Control Project	Construction of facilities was completed in 2020. An enhancement adding new points of diversion and an intertie pipeline is scheduled for construction in 2024 and 2025.	This project currently provides an average yield of approximately 16,000 AFY of recirculated Level 2 CVP refuge supply. The planned project enhancements are estimated to yield an additional 14,000 AFY by 2026.
GWD-4 / NDM-3	North Valley Regional Recycled Water Program - Modesto and Early Turlock Years	Recycled water deliveries to DPWD customers from the City of Modesto and City of Turlock began in December 2017 and March 2020, respectively. Additional recycled water supplies are expected to increase gradually from project completion, from 14,000 AFY in 2020 to 59,000 AFY in 2040 and onward as the cities grow.	The Program currently delivers a total of 27,000 AFY of recycled water to Grassland GSA and DPWD that offsets groundwater pumping, reducing declines in groundwater elevation and storage and associated potential degradation in water quality. Additionally, this project offsets groundwater pumping from the Lower Aquifer, resulting in a reduced risk of inelastic land subsidence, and reduces pumping near Interconnected Surface Water.
NDM-4 / SJREC-7	Orestimba Creek Recharge and Recovery Project	Construction of a 20-acre recharge facility and 60-acre recharge facility were completed in 2018 and 2024, respectively. Water is currently delivered through an existing pipeline from the DMC. A Temporary Water Right Permit has been issued and an application for an appropriative water right has been filed for this project. Construction of a new turnout to divert water from Orestimba Creek began in July 2023 and is anticipated to be completed in early 2025.	Project proponents (DPWD and CCID) each store up to 7,500 AFY in the previously farmed 80-acre facility. During Below Normal WYs, project proponents can withdraw 3,750 AF, less a 10 percent leave behind. In Dry and Critical WYs, project proponents can withdraw 7,500 AF, less a 10 percent leave behind. On average, the project is expected to yield 1,485 AFY each (2,970 AFY total). Additionally, retirement of 80 acres of previously irrigated land has resulted in an estimated 250 AFY pumping reduction. Flood flows will be diverted from Orestimba Creek reducing downstream pressure on the City of Newman, CCID's main canal, and the San Joaquin River.

ID	Name	Status	Summary of Current Benefits
SJREC-8	Red Top Area Subsidence Mitigation	Construction was completed in 2017. In 2017, almost 50,000 AF was recharged directly into the adjacent Chowchilla Subbasin and in-lieu of pumping groundwater. In 2018, an additional 10,000 AF of surface water was put to beneficial use.	This project targets reducing subsidence in the Basin caused by pumping outside of the Basin. The subsidence rate at Sack Dam (San Luis Canal Company headworks) was reduced from 0.042 feet/year to 0.012 feet/year, or 70 percent. Subsidence rates in the following years have remained substantially lower than pre-implementation rates.
Tier 1 Management Actions			
ALL-1	GSA Well Permitting and Metering	Implementation of the Well Permitting Review is underway for all counties and their respective GSA(s). All counties in the Basin have updated their well permitting process and requirements to include a step for GSA review (see **Section 5.3.4**). Several GSAs (AWD, Central Delta-Mendota, PID, DPWD, WSID, Madera County) have a metering policy in place. Water Budget Monitoring is ongoing and will be continued as part of the Basin-wide Monitoring and Data Collection Plan (**Section 16.1.1.2**).	Increased GSA access to and input on well permits help to determine if the pumping associated with a new well will cause undesirable results in each GSA's jurisdictional area and to ensure that groundwater extractions are metered or measured in some fashion, ensuring that new wells are compliant with current and future sustainable practices.
ALL-2	Well Cataloging	Implementation is underway and supported by ALL-1 (GSA Well Permitting and Metering). The Basin GSAs have field-verified and logged the locations of several wells, as discussed in **Section 5.1.5**.	Cataloging and registering Basin wells into a database, which includes information about well construction, pump sizes, extraction amounts, water quality, etc., and helps to maintain accurate and up-to-date information about local groundwater conditions.

ID	Name	Status	Summary of Current Benefits
AWD-1 / NDM-1	Groundwater Extraction Fees / Incentives for Surface Water Use	AWD levies a groundwater extraction fee of $13.44/AF. Groundwater use is estimated based on a cropping-data estimate, or the grower may opt to provide flow meter data. AWD may adjust this fee following a Proposition 218 hearing. Landowners importing surface water receive up to a 4:1 credit against groundwater extraction fees. Specifically, for each AF of surface water imported, landowners receive credit to offset the extraction fees for up to 4 AF of groundwater. Similarly, Del Puerto Water District has enacted a policy that requires growers to pay a surface water allocation fee irrespective of surface water use. This policy therefore incentivizes growers to use available surface before pumping groundwater.	This policy encourages AWD and DPWD growers to use surface water supplies, reducing overall groundwater demands. The AWD policy incentivizes the use of up to 10,000 AFY of San Joaquin River flood flows (see AWD-2). Since 2020, some AWD growers have temporarily fallowed fields on an annual basis, which has reduced their groundwater extraction fees
CDM-1	Revision to Tranquillity Irrigation District Lower Aquifer Pumping	A Well Water Operations Plan was established in 2017 and is implemented on an annual basis.	This revised pumping strategy limits extraction from Lower Aquifer wells has an estimated groundwater savings of 5,000 - 7,000 AFY.
NDM-2	Drought Contingency Planning in Urban Areas	Included and actively being implemented as part of the City of Patterson's adopted 2020 Urban Water Management Plan.	These planning strategies can be expanded upon, if necessary, and applied in order to minimize impacts to groundwater storage and water levels when supplies become limited.
SJREC-1	Groundwater Allocations - Madera County GSA	From 2021 to 2025, allocations are designed to reduce transitional water by 2 percent annually.	Approximately 80 AFY of water savings, counted towards the Madera County GSA's allocation in the Basin-wide Overdraft Mitigation Plan (**Section 16.1.1.2**)

ID	Name	Status	Summary of Current Benefits
SJREC-2	Private Well Pumping for Credits	Since implementation in the 1990s, private landowners can pump private well water into district facilities. As part of this P/MA, all water pumped for credit is subject to policies including established trigger water levels to restrict the mining of groundwater in impacted areas, water quality standards, and maximum mining limits. These policies also prohibit the export of groundwater out of an impacted area if the water level is below the trigger level.	This policy allows the SJREC to regulate pumping and minimize impacts due to pumping in high-risk areas.
SJREC-3	Mitigation for Migration of Shallow Saline Groundwater	Projects including the San Joaquin River Improvement Project and Westside Drainage Management Plan have been implemented, which have encouraged management actions including the installation of subsurface tile lines and the installation of 18 wells to lower the perched water table and reduce discharge of subsurface drainage systems.	Discharge of poor-quality groundwater from upslope drainage areas to the south and west has been reduced, conserving groundwater quality in SJREC agricultural areas.
SJREC-4	Annual Groundwater Assessment Report	The SJREC completes a Groundwater Assessment Report annually.	The report establishes recommended limits of exported groundwater in impacted areas if the groundwater elevation is below an established trigger level and advises how each monitoring zone within the SJREC area should be managed for the current year.

Abbreviations:

AF = acre-feet
AFY = acre-feet per year
AWD = Aliso Water District
CCID = Central California Irrigation District
CDM = Central Delta-Mendota
CVP = Central Valley Project
DAC = Disadvantaged Community
DPWD = Del Puerto Water District
GSA = Groundwater Sustainability Agency GWD = Grassland Water District
NDM = Northern Delta-Mendota
P/MA = Project and Management Action
SGM = Sustainable Groundwater Management
SGMA = Sustainable Groundwater Management Act
SJREC = San Joaquin River Exchange Contractors
SLWD = San Luis Water District
SWRCB = State Water Resources Control Board
WY = Water Year

15.2 Goals and Objectives of Projects and Management Actions

15.2.1 Relevant Sustainability Indicators

Per California Code of Regulations Title 23 (23 CCR) § 354.44, GSPs must include P/MAs to achieve the Sustainability Goal for the Basin and respond to changing conditions, such as those that may cause existing or potential future Undesirable Results for the identified relevant Sustainability Indicators.

As discussed in **Section 11**, the relevant Sustainability Indicators in the Basin for which Sustainable Management Criteria (SMCs) have been defined include: (1) Chronic Lowering of Groundwater Levels, (2) Reduction of Groundwater Storage, (3) Degraded Water Quality, (4) Land Subsidence, and (5) Depletion of Interconnected Surface Water (ISW). Because groundwater levels and storage area directly correlated, P/MAs that address groundwater levels also address groundwater storage, and the two Sustainability Indicators are considered together in this discussion of P/MAs. In total, the goal of the P/MAs discussed herein is to address significant and unreasonable effects related to the Sustainability Indicators in the relevant areas.

15.2.2 Benefit Categories

☑ **23 CCR § 354.44(b)(5)**

The primary water management "tools" by which GSAs can address conditions that may lead to Undesirable Results for the applicable Sustainability Indicators are the management of water inflows (supplies) and outflows (demands). The primary categories of realized or expected benefits from P/MAs include the following, though many P/MAs can provide one or more secondary benefits such as flood control, ecosystem protection/enhancement, etc.

1. Water Supply Augmentation, including:
    a. Surface water acquisition and access
    b. Recharge of normal or wet-year surface supplies
    c. Stormwater and recycled water development
    d. Projects to increase surface storage capacity / delivery flexibility
2. Groundwater Pumping Reduction
3. Data-Gap Removal Efforts, Monitoring, and Reporting

15.3 List of Projects and Management Actions

§ 354.44. Projects and Management Actions

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

☑ 23 CCR § 354.44(b)(1)

This section provides a list of the P/MAs that have been identified to help the Basin achieve its Sustainability Goal. The P/MAs have been organized into four tiers based on implementation status or anticipated implementation date. As discussed above, the proposed P/MAs generally provide the

following benefits: (1) Water Supply Augmentation, (2) Groundwater Pumping Reduction, and (3) Data-Gap Removal Efforts, Monitoring, and Reporting.

The project descriptions, benefits, and the implementation timeline for each P/MA are provided in **Table PMA-1**. Project benefits, water sources, and costs are provided in **Table PMA-2**. **Figure PMA-1** shows the locations of the proposed projects and indicators of project operational status. The acronym(s) identifying each P/MA refer to the corresponding GSA Group(s): all GSA Groups (ALL), Aliso Water District (AWD), Central Delta-Mendota Region (CDM), Grassland (GWD), Northern Delta-Mendota Region (NDM), and San Joaquin River Exchange Contractors (SJREC).

15.3.1 Tier 1 Projects and Management Actions

The "Tier 1" P/MAs are in active operation or currently undergoing implementation with the expectation that the Basin will experience benefits from the P/MA by 2025. These P/MAs are considered feasible and readily implementable to address current overdraft conditions. Tier 1 P/MAs are estimated to provide up to 89,000 AFY of supply augmentation and over 5,000 AFY of pumping reduction by 2025. These P/MAs are primarily funded through local GSA funds (e.g., revenue from water fees) and grant awards, including the Sustainable Groundwater Management (SGM) Program Sustainable Groundwater Management Act (SGMA) Implementation – Round 1 Grant awarded to the Basin in April 2022.

The Tier 1 P/MAs are listed below with individual P/MA information presented in **Table PMA-1** and **Table PMA-2**.

Tier 1 Management Actions

- ALL-1: GSA Well Permitting and Metering
- ALL-2: Well Cataloging
- AWD-1 / NDM-1: Groundwater Extraction Fees / Incentives for Surface Water Use
- CDM-1: Revision to Tranquillity Irrigation District Lower Aquifer Pumping
- NDM-2: Drought Contingency Planning in Urban Areas
- SJREC-1: Groundwater Allocations – Madera County GSA
- SJREC-2: Private Well Pumping for Credits
- SJREC-3: Mitigation for Migration of Shallow Saline Groundwater
- SJREC-4: Annual Groundwater Assessment Report

Tier 1 Projects

- AWD-2: San Joaquin River and Chowchilla Bypass Flood Water
- AWD-3: Chowchilla Bypass Recharge Facility
- CDM-2 / GWD-1 / SJREC-5: Los Banos Creek Diversion Facility
- CDM-3 / GWD-2 / SJREC-6: Los Banos Creek Storage Project
- GWD-3: North Grassland Water Conservation and Water Quality Control Project

- GWD-4 / NDM-3: North Valley Regional Recycled Water Program - Modesto and Early Turlock Years
- NDM-4 / SJREC-7: Orestimba Creek Recharge and Recovery Project
- SJREC-8 Red Top Area Subsidence Mitigation

15.3.2 Tier 2 Projects and Management Actions

The "Tier 2" P/MAs refer to P/MAs that are actively being implemented with the expectation that the Basin will experience benefits from the P/MA by 2030. These P/MAs are considered feasible and readily implementable to address overdraft conditions in the near future. Tier 1 and Tier 2 P/MAs are collectively estimated to provide up to 172,000 AFY of supply augmentation and at least 42,000 AFY of pumping reduction by 2030. These P/MAs are primarily funded through local GSA funds (e.g., revenue from water fees) and grant awards, including the SGM Program SGMA Implementation – Round 1 Grant awarded to the Basin in April 2022. For some of these projects, the GSAs intend to continue applying for grant funding as opportunities arise.

The Tier 2 P/MAs are listed below, with individual P/MA information presented in **Table PMA-1** and **Table PMA-2.**

Tier 2 Management Actions

- ALL-3: Basin-wide Pumping Reduction Plan
- AWD-4: Fallowing and Crop Conversion

Tier 2 Projects

- CDM-4/SJREC-9: Los Banos Creek Recharge and Recovery Project
- CDM-5: Ortigalita Creek Groundwater Recharge and Recovery Project
- CDM-6: Kaljian Drainwater Reuse Project
- GWD-5: Basins and Storm Water Capture Project
- NDM-5: WSID Lateral 4-North Recapture and Recirculation Reservoir
- NDM-6: WSID Lateral 4-South Recapture and Recirculation Reservoir
- NDM-7: PID Groundwater Bank and/or Flood-Managed Aquifer Recharge (MAR)-type project
- NDM-8: East-West Conveyance Project
- SJREC-10: City of Los Banos Wastewater Treatment Facility Tertiary Upgrade

15.3.3 Tier 3 Projects and Management Actions

The "Tier 3" P/MAs refer to P/MAs that the Basin intends to implement to address overdraft conditions, but have a higher degree uncertainty (e.g., related to funding, design, or water source). The Basin aims to implement and experience benefits from these P/MAs sometime before 2040. Tier 1, Tier 2, and Tier 3 P/MAs are collectively estimated to provide up 224,000 AFY of supply augmentation and at least 42,000 AFY of pumping reduction by 2040. These P/MAs will be funded through local GSA funds or future grant opportunities.

The Tier 3 P/MAs are listed below, with individual P/MA information presented in **Table PMA-1** and **Table PMA-2**.

Tier 3 Projects

- NDM-9: Little Salado Creek Groundwater Recharge and Flood Control Basin
- NDM-10: City of Patterson Percolation Ponds for Stormwater Capture and Recharge
- NDM-11: Del Puerto Canyon Reservoir Project
- SJREC-11: BB Limited Groundwater Recharge and Recovery
- SJREC-12: City of Los Banos Stormwater Management Master Plan

15.3.4 Tier 4 Projects and Management Actions

The "Tier 4" P/MAs are conceptual projects that will be implemented after 2040 or on an as-needed basis to meet SMCs after implementation of Tier 1, Tier 2, and Tier 3 P/MAs. Since these projects are still conceptual, the GSAs have not estimated potential benefits or secured a funding source. Therefore, these projects are not included in the Basin's "glide path" (**Section 15.6.1**) to achieve sustainability and will be added as-needed upon evaluation of groundwater conditions during the first GSP Periodic Evaluation.

Tier 4 Management Actions

- AWD-5: Incentivize On-Farm Irrigation Efficiency Improvements
- AWD-6: Internal Groundwater Marketing Program
- CDM-7 / NDM-12: Maximizing Use of Other Water Supplies
- CDM-8 / NDM-13: Rotational Fallowing of Crop Lands
- CDM-9 / NDM-14: Groundwater Extraction Fee with Land Use Modifications
- GWD-6: Increasing Access to Excess Non-CVP Surface Water
- GWD-7: Canal Improvements
- GWD-8: Require Developments to Prove Sustainable Water Supplies
- GWD-9: Recharge Estimation Methods
- NDM-15: City of Patterson Reduced Groundwater Use Portfolio

Tier 4 Projects

- AWD-7: USBR 215 Flood Water
- AWD-8: Banking Out-of-District Water
- AWD-9: Latent Water Rights
- AWD-10: Water Contracts
- AWD-11: Water Exchange/Transfers/Purchases
- AWD-12: Improving Aliso Canal Turnout on San Joaquin River

- AWD-13: Restoration of the Aliso Canal for Conveyance from SJR to Cottonwood Creek
- AWD-14: Bypass Pipeline Crossing
- AWD-15: Restoration of the Aliso Canal for Conveyance from Cottonwood Creek to Northerly Boundary
- AWD-16: Aliso Lateral as Linear Recharge Ponds
- AWD-17: Recharge in Bypass
- AWD-18: Groundwater Injection Wells

15.4 Circumstances for Implementation

☑ **23 CCR § 354.44(b)(1)(A)**

Table PMA-1 describes the timeline and circumstances under which individual P/MAs shall be implemented. The goals and objectives of the P/MAs presented herein are to avoid the occurrence of Undesirable Results by the GSP implementation deadline (i.e., by January 2040). At this time, the Basin GSAs anticipate that implementation of P/MAs will be necessary to ensure sustainability of the Basin under the uncertainty of future climate and land use conditions. The P/MAs will be implemented based on further consideration of the local or regional needs, the magnitude of expected benefit, the relative cost and ease of implementation, and other factors. Some P/MAs are already implemented or will be implemented immediately upon adoption of this GSP (e.g., ALL-3: Basin-wide Pumping Reduction Plan). Others will be implemented on an adaptive management basis (i.e., to avoid Undesirable Results), when MTs violations are anticipated upon completion of feasibility studies, economic evaluations, and/or other necessary planning studies. As discussed above, an overall P/MA implementation schedule, or preliminary "glide path", has been developed that serves as a framework to estimate the level of benefits that are anticipated to be achieved over the GSP implementation period (see **Section 15.6.1**).

Accelerated implementation of P/MAs (i.e., at expected benefit accrual rates faster than those shown in **Table PMA-1**) could be triggered if a substantial number of Representative Monitoring Sites (RMS) approach MTs for any of the applicable Sustainability Indicators. Processes for avoiding and/or responding to MT exceedances are outlined in the Basin's *Groundwater Levels Minimum Threshold* (*GWL-MT) Avoidance Plan* (**Section 16.1.1.3**), *Water Quality Minimum Threshold* (*WQ-MT) Exceedance Plan* (**Section 16.1.1.4**), and *Subsidence Avoidance Plan* (**Section 16.1.1.5**). If the GSA(s) are not able to avoid Undesirable Results through implementation of P/MAs or other mitigation measures and have MT exceedances for two consecutive years due to groundwater management within their respective jurisdictional area, the GSA will be required to implement a *Groundwater Allocation Backstop*, as described in **Section 16.1.1.6**. Additionally, impacts to individual drinking water wells that may occur due to declining groundwater conditions will be addressed through the Basin-wide Well Mitigation Policy (**Section 16.1.7**). The planning and implementation of P/MAs will be done under an adaptive management framework and supported by the best available information and science.

15.5 Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the P/MAs listed above. Some projects that only involve assessment may not require specific public noticing, whereas certain other management actions that involve, for example, imposition of fees by the GSAs, may require public noticing pursuant to Proposition 218. In general, P/MAs being considered for implementation will be discussed during regular Basin Coordination Committee meetings as well as GSA Board/City Council meetings, which are open to the public. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by the law. The public notice requirements for individual P/MAs are listed in **Table PMA-1**.

15.6 Addressing Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9.3.4**, the water budget deficit (overdraft) within the Basin is estimated to have been approximately 140,000 AFY over the 2003-2023 time period (the "Historical" and "Current" water budget time periods) and is used to develop the Sustainable Yield estimate (**Section 9.5**). The GSAs plan to address the estimated overdraft and reduce groundwater pumping to within the Sustainable Yield by 2040 through implementation of P/MAs, including the PRP.

Multiple evaluations have been conducted to assess whether the GSAs' current plan to achieve sustainability is reasonable and achievable. Specifically, the following evaluations have been conducted as documented below:

- Approach #1: P/MA Glidepath and Sensitivity Analysis
- Approach #2: Undesirable Results Test
- Approach #3: Overdraft Elimination Test

15.6.1 P/MA Glidepath and Sensitivity Analysis

A general implementation schedule, also known as a "glide path", has been developed and is summarized in **Table PMA-4** below. The estimated average annual benefit from these P/MAs is calculated from the expected benefits and implementation timetable for the Tier 1, Tier 2, and Tier 3 P/MAs, as presented in **Table PMA-2**. For projects dependent on normal to wet-year supplies (e.g., recharge projects), the estimated average annual benefit considers the historical frequency of certain hydrologic conditions. This preliminary glide path aims to address a certain percentage of the overdraft during each five-year period through 2040, which in turn will increase or stabilize Basin groundwater levels. A graphical representation of this glide path is shown in **Figure PMA-2**.

Groundwater levels in some areas of the Basin have shown persistent decreasing trends, suggesting a local imbalance of supplies versus groundwater pumping. The *GWL-MT Avoidance Plan* (**Section 16.1.1.3**) and *Subsidence Avoidance Plan* (**Section 16.1.1.5**) will be implemented to mitigate potential Undesirable Results that may occur before 2030, or beyond as necessary, as a result of the remaining or localized overdraft. Further, the GSA(s) that have MT exceedances for groundwater levels for two consecutive years

due to groundwater management within their respective jurisdictional area will be required to implement a mandatory *Groundwater Allocation Backstop*, as described in **Section 16.1.1.6**.

Table PMA-4. Glide Path to Address Average Annual Overdraft

	Average Annual Volume (AFY) [1]			
	2025	**2030**	**2035**	**2040**
Average Annual Overdraft[2](2003-2023)	**140,000**	**140,000**	**140,000**	**140,000**
Pumping Reduction	0	25,300	42,100	42,100
Supply Augmentation	58,800	112,700	140,600	151,800
Total Planned P/MAs	***58,800***	***138,000***	***182,700***	***193,900***
Adaptive Management[3]: GWL-MT Avoidance Plan, Subsidence Avoidance Plan, and/or Groundwater Allocation Backstop	0	2,000	0	0
Remaining Deficit	***81,200***	***0***	***0***	***0***

Abbreviations:
AFY = acre-feet per year
GWL-MT = Groundwater Levels Minimum Threshold
P/MA = Projects and Management Actions

Notes:
1. The average annual volume represents the average expected benefits for the five-year period prior to the year shown. For example, the "2030" column represents the average annual benefits expected from P/MAs from 2026-2030. Annual averages consider project implementation dates as well as historical wet-year frequencies for projects reliant on a wet-year water source, and therefore differ from the maximum benefit described in **Section 15.3**.
2. Includes water released caused by Land Subsidence.
3. Calculations provided in this table follow the best available information regarding the P/MAs' timeline, conditions for implementation, and resulting benefits. Adaptive management pumping reductions for each period are calculated as the subtraction of total planned P/MA benefits from the average annual overdraft and assumes perfect efficiency. Actual and/or simulated P/MA efficiency and the resultant necessary pumping reductions may be different from what is shown.

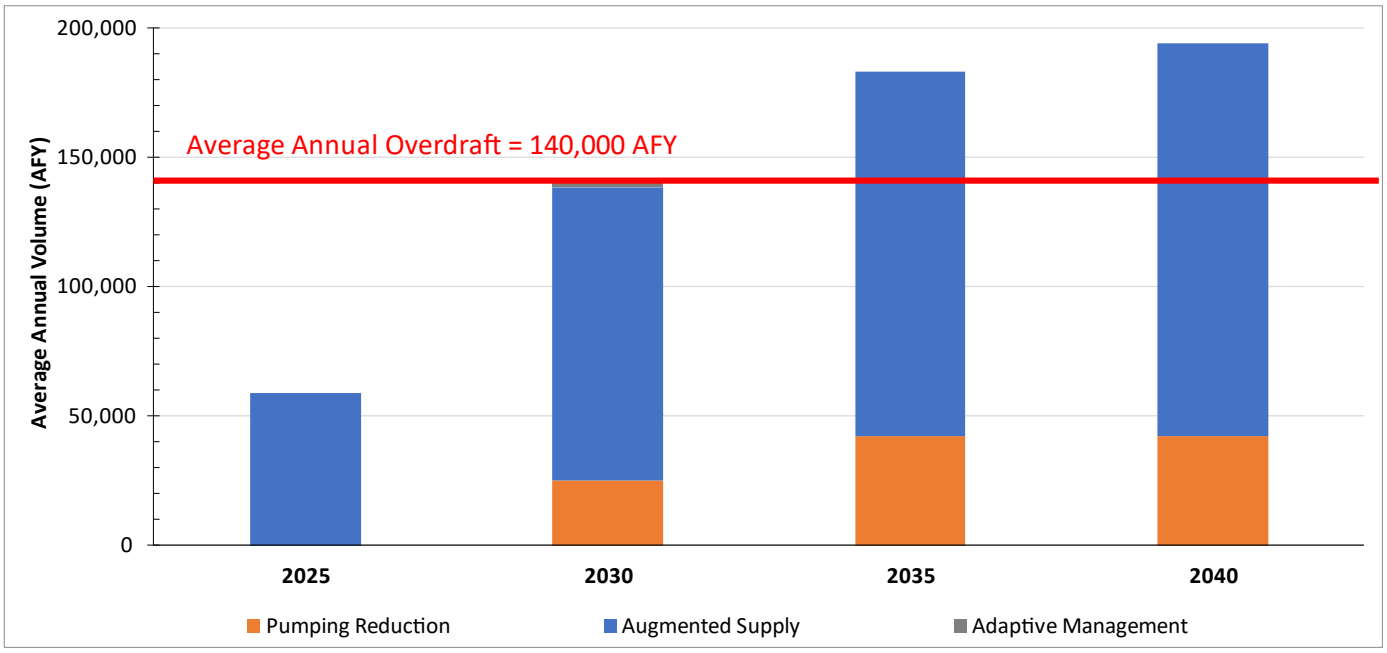

Figure PMA-2. Project and Management Action Glide Path

The glide path above presents the estimate of benefits from P/MA implementation based on the best available data and information. However, many uncertainties exist, particularly related to availability of water supplies for supply augmentation projects and hydrologic conditions under climate change scenarios, as well as impacts to the Basin from conditions and pumping outside of the Basin. Consequently, a sensitivity analysis was conducted to ensure that the planned P/MAs are adaptable in the event of extreme conditions. The sensitivity analysis considers three scenarios:

- **Scenario #1:** Supply augmentation projects provide 50 percent of the benefit estimated in **Table PMA-2**. This could represent a reduction of the expected supply augmentation due to multiple dry years that result in shortages of imported water supplies, or scenarios where the implementation of some of the planned P/MAs are delayed due to funding, permitting, or other constraints.
- **Scenario #2:** Hydrologic conditions occur that result in an increase in the Basin's projected storage loss beyond the calculated historical/current overdraft, as simulated by the projected 2070 Climate Change – Extreme Dry projection (**Section 9.4.2.2**), representing a worst-case scenario.
- **Scenario #3:** Hydrologic conditions occur that result in a decrease in the Basin's projected storage loss compared to the calculated historical/current overdraft, as simulated by the projected 2070 Climate Change – Extreme Wet projection (**Section 9.4.2.2**), representing the wide spectrum of potential changes due to climate change and the significant uncertainty in projecting future conditions that must be considered and adaptively managed by the Basin.

Scenario #1: 50 percent of the Expected Benefit from Supply Augmentation Projects

This scenario is presented to show the Basin's path to address the estimated overdraft under a scenario where the planned supply augmentation projects provide 50 percent of the expected benefits. This situation is not considered to be a likely outcome; rather, it is presented to demonstrate that the Basin is

not completely reliant on additional supplies and is able to address a substantial portion of the Basin's overdraft through pumping reductions as part of the proposed PRP (**Section 16.1.1**). As shown in **Table PMA-5** and **Figure PMA-3**, if P/MAs are not sufficient to address the Basin's overdraft, the GSAs will implement mandatory pumping reductions triggered by declining groundwater conditions per the *GWL-MT Avoidance Plan, Subsidence Avoidance Plan,* and *Groundwater Allocation Backstop* (**Sections 16.1.1.3**, **16.1.1.5,** and **16.1.1.6**). Therefore, the Basin will still be on track to address overdraft by 2030 under this scenario.

Table PMA-5. Glide Path to Address Scenario #1

	Average Annual Volume (AFY) [1]			
	2025	**2030**	**2035**	**2040**
Average Annual Overdraft[2] (2003-2023)	**140,000**	**140,000**	**140,000**	**140,000**
Pumping Reduction	0	25,300	42,100	42,100
Supply Augmentation	29,400	56,400	70,300	75,900
Total Planned P/MAs	***29,400***	***81,700***	***112,400***	***118,000***
Adaptive Management[3]: GWL-MT Avoidance Plan, Subsidence Avoidance Plan, and/or Groundwater Allocation Backstop	0	58,300	27,600	22,000
Remaining Deficit	***110,600***	***0***	***0***	***0***

Abbreviations:
AFY = acre-feet per year
GWL-MT = Groundwater Levels Minimum Threshold
P/MA = Projects and Management Actions

Notes:
1. The average annual volume represents the average expected benefits for the five-year period prior to the year shown. For example, the "2030" column represents 50 percent of the average annual benefits expected from P/MAs from 2026-2030. Annual averages consider project implementation dates as well as historical wet-year frequencies for projects reliant on a wet-year water source.
2. Includes water released caused by Land Subsidence.
3. Calculations provided in this table follow the best available information regarding the P/MAs' timeline, conditions for implementation, and resulting benefits. Adaptive management pumping reductions for each period are calculated as the subtraction of total planned P/MA benefits from the average annual overdraft and assumes perfect efficiency. Actual and/or simulated P/MA efficiency and the resultant necessary pumping reductions may be different from what is shown.

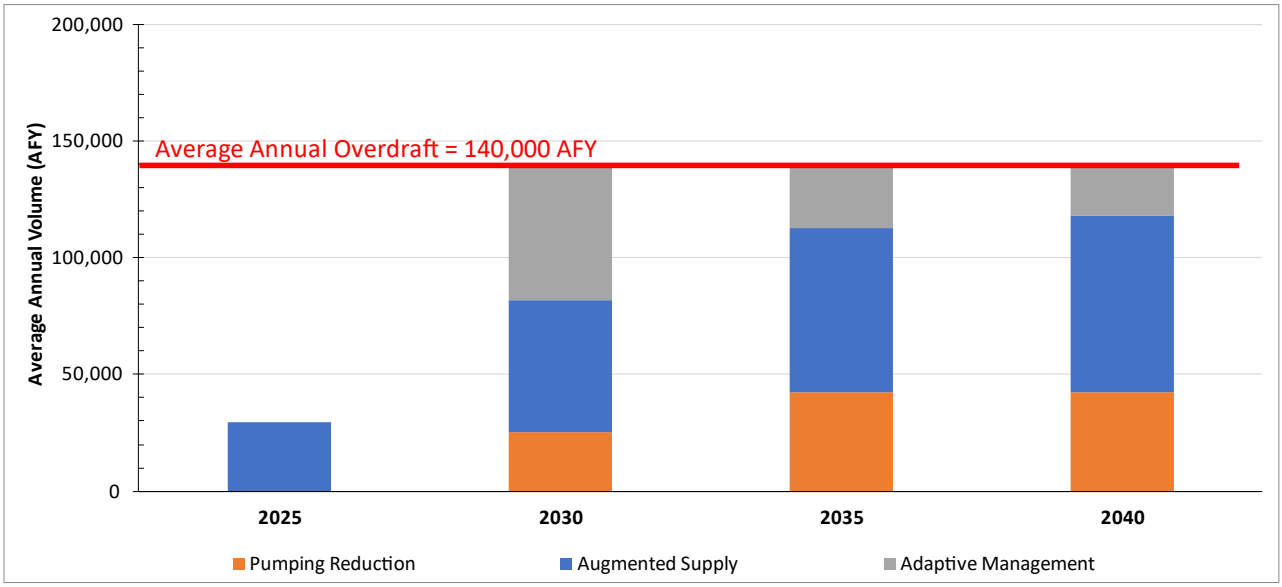

Figure PMA-3. Project and Management Action Glide Path (Scenario #1)

Scenario #2: Projected 2070 Climate Change – Extreme Dry Scenario

This scenario is presented to show the Basin's path to address the projected storage loss under the 2070 Climate Change – Extreme Dry Scenario, which is greater than the Basin's calculated historical overdraft and demonstrates "worst-case" conditions for the Basin. Under this scenario, the average annual projected storage loss is 181,000 AFY and the planned supply augmentation projects provide approximately 90 percent of the expected benefits. The assumed 10 percent reduction in supply augmentation benefits reflects a decrease in precipitation and surface water supply under this scenario. As described for Scenario #1 above, additional pumping reductions will be triggered by declining groundwater conditions, and per the *GWL-MT Avoidance Plan, Subsidence Avoidance Plan,* and *Groundwater Allocation Backstop* (**Sections 16.1.1.3**, **16.1.1.5,** and **16.1.1.6**) will address the additional deficit that may occur under this scenario's extreme dry climate change conditions. **Table PMA-6** and **Figure PMA-4** show that the Basin will still be on track to address its deficit by 2030 under this scenario.

Table PMA-6. Glide Path to Address Scenario #2

	Average Annual Volume (AFY) [1]			
	2025	**2030**	**2035**	**2040**
Annual Average Projected Storage Loss (2070 Climate Change – Extreme Dry) [2]	**181,000**	**181,000**	**181,000**	**181,000**
Pumping Reduction	0	25,300	42,100	42,100
Supply Augmentation	52,900	101,500	126,500	136,700
Total Planned P/MAs	***52,900***	***126,800***	***168,600***	***178,800***
Adaptive Management [3]***:*** GWL-MT Avoidance Plan, Subsidence Avoidance Plan, and/or Groundwater Allocation Backstop	0	54,200	12,400	2,200
Remaining Deficit	***128,100***	***0***	***0***	***0***

Abbreviations:
AFY = acre-feet per year
GWL-MT = Groundwater Levels Minimum Threshold
P/MA = Projects and Management Actions

Notes:
1. The average annual volume represents the average expected benefits for the five-year period prior to the year shown. For example, the "2030" column represents the average annual benefits expected from P/MAs from 2026-2030. Annual averages consider project implementation dates as well as historical wet-year frequencies for projects reliant on a wet-year water source.
2. Includes water released caused by Land Subsidence.
3. Calculations provided in this table follow the best available information regarding the P/MAs' timeline, conditions for implementation, and resulting benefits. Adaptive management pumping reductions for each period are calculated as the subtraction of total planned P/MA benefits from the average annual overdraft and assumes perfect efficiency. Actual and/or simulated P/MA efficiency and the resultant necessary pumping reductions may be different from what is shown.

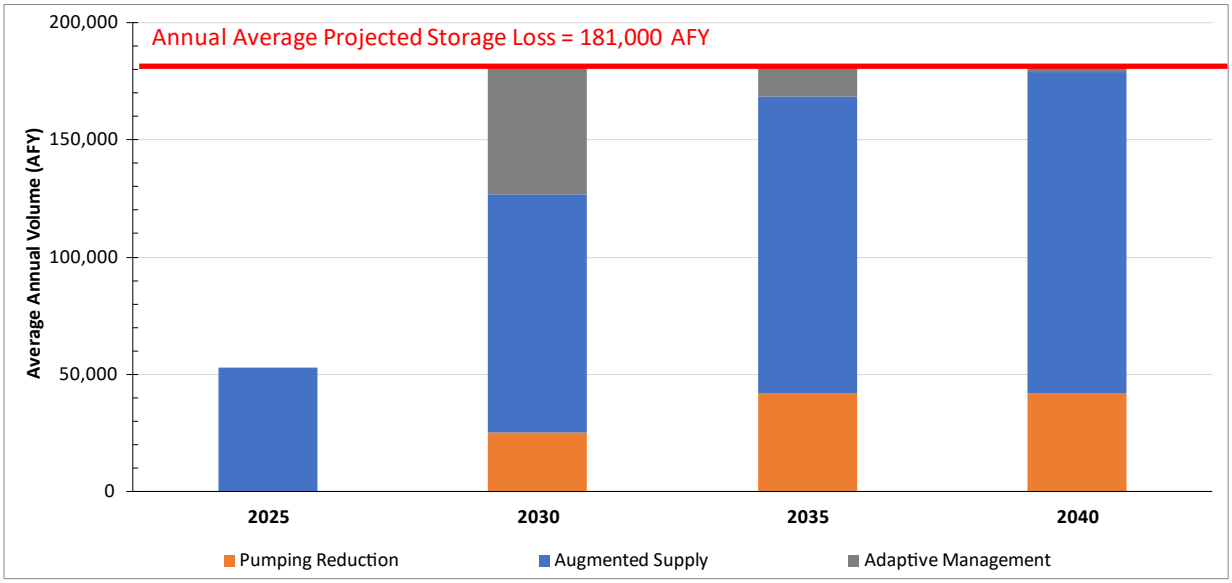

Figure PMA-4. Project and Management Action Glide Path (Scenario #2)

Scenario #3: Projected 2070 Climate Change – Extreme Wet Scenario

This scenario is presented to show the Basin's path to address the estimated storage loss under the 2070 Climate Change – Extreme Wet Scenario. In comparison with Scenario #2, the 2070 Climate Change – Extreme Dry Scenario, this scenario represents the significant uncertainty in projecting future conditions and the wide spectrum of potential Basin conditions due to climate change that must be adaptively managed. Under this scenario, the average annual storage loss was 99,000 AFY. Planned P/MAs, including pumping reduction and supply augmentation, will address the annual average storage loss in the Basin, and adaptive management will only be triggered to address local conditions and needs. **Table PMA-7** and **Figure PMA-5** show that the Basin will be on track to address its deficit by 2030 under this scenario.

Table PMA-7. Glide Path to Address Scenario #3

	Average Annual Volume (AFY) [1]			
	2025	**2030**	**2035**	**2040**
Annual Average Projected Storage Loss (2070 Climate Change – Extreme Wet) [2]	**99,000**	**99,000**	**99,000**	**99,000**
Pumping Reduction	0	25,300	42,100	42,100
Supply Augmentation	58,800	112,700	140,600	151,800
Total Planned P/MAs	***58,800***	***138,000***	***182,700***	***193,900***
Adaptive Management [3]***:*** GWL-MT Avoidance Plan, Subsidence Avoidance Plan, and/or Groundwater Allocation Backstop	0	0	0	0
Remaining Deficit	***40,200***	***0***	***0***	***0***

Abbreviations:
AFY = acre-feet per year GWL-MT = Groundwater Levels Minimum Threshold
P/MA = Projects and Management Actions

Notes:
1. The average annual volume represents the average expected benefits for the five-year period prior to the year shown. For example, the "2030" column represents the average annual benefits expected from P/MAs from 2026-2030. Annual averages consider project implementation dates as well as historical wet-year frequencies for projects reliant on a wet-year water source.
2. Includes water released caused by Land Subsidence.
3. Calculations provided in this table follow the best available information regarding the P/MAs' timeline, conditions for implementation, and resulting benefits. Adaptive management pumping reductions for each period are calculated as the subtraction of total planned P/MA benefits from the average annual overdraft and assumes perfect efficiency. Actual and/or simulated P/MA efficiency and the resultant necessary pumping reductions may be different from what is shown.

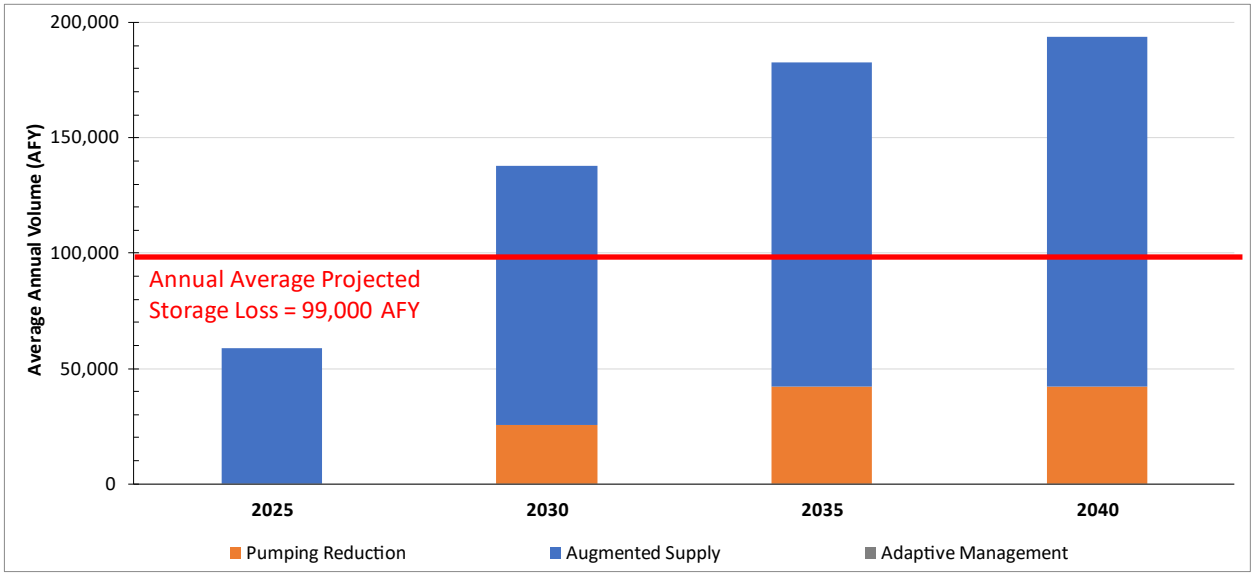

Figure PMA-5. Project and Management Action Glide Path (Scenario #3)

15.6.2 Undesirable Results Test

The Model was applied to predict future water level conditions with the implementation of the P/MAs and to assess if Undesirable Results[50] would be expected to occur in the Basin between now and 2040, under 2030 Central Tendency Climate Change Scenario. To conduct this analysis, and as described further in **Appendix H**, the following modifications were made to the Projected Future Baseline version of the Model:

- Tier 1, Tier 2 and Tier 3 P/MAs were "added" directly to the Model to reflect the anticipated location and volume of the associated benefits. For example, new recharge project locations and anticipated volumetric benefits were represented spatially and in time-series in the Model inputs.

[50] For the purposes of this assessment, this portion of the Decline in Groundwater Levels Undesirable Results definition was used: "Groundwater levels decline below the established MTs in 25 percent or more of the RMW-WLs for two consecutive years (i.e., based on measurements from two seasonal high groundwater level periods and two seasonal low groundwater level periods)".

- A constant head boundary was assigned near the boundary of the Basin to represent the expected condition wherein the adjacent basins also achieve sustainability (i.e., a minimum of 2015 water levels) by 2040 and thereby reduce the adjacent basin-related impacts to conditions in the Basin.
- The PRP implementation (i.e., the 42,000 AFY of overdraft reduction) was simulated to occur in the portions of the Basin where pumping reduction was most needed to address overdraft conditions. The simulation does not include additional pumping reduction due to adaptive management to avoid exceedance of MTs. Such reductions can be used to address local conditions and/or imbalances in the water budget.

Following Model revision and application, the hydrographs at 71 of the Representative Monitoring Wells-Water Levels (RMW-WLs) that are explicitly represented in the Model were evaluated to assess if more than 25 percent of them exceeded their Minium Threshold (MT) between now and 2040.[51] As shown in **Figure WB-5** and **Appendix H**, fewer than 25 percent of the RMW-WLs are projected to exceed their respective MTs in any given year between now and 2040 and no Undesirable Results are projected to occur with successful implementation of the P/MAs and the PRP.

15.6.3 Overdraft Elimination Test

SGMA requires that the Basin achieves sustainability by 2040. Under the assumption that sustainability means the elimination of groundwater overdraft by 2040, then demonstration of overdraft reduction by and following 2040 is critical.

Using the 2030 Central Tendency Climate Change with P/MAs Scenario, the water budget for the Basin was calculated for Water Year (WY) 2024-2073. The WY 2024-2073 period used for this analysis is the same as the Projected period defined in **Section 9.1** and uses a repeat of the historical 50-year period from WY 1973 to WY 2022, as required under 23 CCR § 354.18(c). Development of this 50-year analog period and generation of the 2030 Central Tendency Climate Change with P/MAs Scenario follow the data, methodology, and assumptions outlined in **Section 9.4**. This simulation showcases the achievement of sustainability in the Basin through planned implementation of P/MAs and application of the Basin's adaptive PRP (**Section 16.1.1**) under the assumed climate conditions.

The simulation of P/MA benefits is highly correlated with the sequence of historical water years used to develop the 50-year analog period due to P/MA implementation's dependence on water year type, surface water delivery, estimated evapotranspiration, and the availability of surplus streamflow or surface water delivery. Consequently, prolonged and frequent droughts can lead to underestimating P/MA benefits and overestimating groundwater declines, storage loss, and water release due to subsidence.

The precise projection of future climate is impossible, and what is utilized for planning in this GSP is a single realization of a set of potential climate scenarios with infinite members. Recognizing these uncertainties, the GSAs designed the 50-year analog period to include significant dry periods during the implementation period (WY 2024-2040) and to reflect recent historical droughts at the end of the projection period. Furthermore, the GSAs used the most recent 50-year period available without making

[51] Because some of the RMW-WLs did not have any historical data or have not yet been constructed they were not explicitly represented in the Model. As such this analysis assumed that as long as no more than 25 percent of the 71 RMW-WLs exceed that MT, then by inference no more than 25 percent of the entire RMW-WL network will exceed the MT and create an Undesirable Result.

any changes to the arrangement of years or data timeseries, assuming an exact repeat of recent hydrology would provide the best available method for planning. These assumptions aim to provide conservative estimates of storage loss and worst-case groundwater conditions during the implementation period (WY 2024-2039) while representing average hydrology in the years between WY 2040-2073.

As shown in **Table WB-14**, the average annual and cumulative storage change in the Upper Aquifer relative to WY 2015 conditions during WY 2016-2040 and WY 2041-2073 is positive, indicating sustainable conditions with no overdraft. The SGMA and DWR proposed methodology for assessing climate change impacts (DWR, 2018c) emphasizes using long-term periodic averages for GSP planning and sustainability evaluation, understanding hydroclimatic variability, and recognizing the need for operational flexibility. However, the adaptive management framework adopted by the GSAs in the Basin allows for the proactive mitigation of overdraft, as demonstrated under this scenario through adaptive management pumping reduction.

Figure WB-6 (a) shows the projected cumulative aquifer storage change relative to WY 2015 conditions in the Upper Aquifer (i.e., the zero cumulative storage change reference value). As shown therein, assuming successful implementation of P/MAs and focused implementation of the PRP, Upper Aquifer storage will remain above WY 2015 levels throughout WY 2016-2073 period. The estimated usable storage in Fall 2014 (**Section 13.2.2.1**) is 8,649,619 acre-feet (AF) in the Upper Aquifer and 4,607,156 AF in the Lower Aquifer (13,256,775 AF in total).

Due to the significant impact of neighboring basins on Lower Aquifer storage change and subsidence, as discussed in **Sections 9.3.3** and **9.4.4**, the GSAs plan to achieve sustainability by WY 2040 in the Lower Aquifer, assuming that groundwater conditions in the neighboring basins will improve under SGMA implementation and resemble WY 2015 conditions. As shown in **Table WB-14**, the average annual and cumulative storage change in the Lower Aquifer during WY 2016-2040 and WY 2041-2073 relative to WY 2015 conditions are positive, indicating sustainable conditions with no overdraft. Further emphasizing the effectiveness of the GSAs' P/MAs and adaptive management pumping reduction, **Figure WB-6 (b)** shows that Lower Aquifer storage change will remain above WY 2015 levels starting from WY 2040, consistent with the Basin's Sustainability Goal.

The volumes shown in **Table WB-14** and **Figure WB-6** exclude water released by subsidence, representing the change in aquitard storage, due to its irrecoverable nature. However, under the same scenario, the average annual change in aquitard storage during WY 2041-2073 is well within the Model's computational error tolerance, confirming the mitigation of subsidence in the Basin. As discussed in **Section 9.4.4**, the Basin GSAs cannot mitigate the subsidence occurring in the Basin without the expected sustainable conditions in neighboring basins, as groundwater conditions outside the Basin cause more than 50 percent of the observed subsidence within the Basin.

Figure WB-6 (c) shows how the implementation of the P/MAs and adaptive management through the PRP are projected to achieve sustainability at the Basin scale by WY 2040. The distribution of P/MA benefits based on different water year types and the application of the adaptive management (PRP) framework emphasizes the flexibility of the Basin's planning and implementation in absorbing uncertainties due to hydroclimatic variability. The significant improvement in Basin conditions after WY 2035, along with the substantial reduction in the need for adaptive management except in critical water years, showcases the effectiveness of the planned and implemented P/MAs.

15.7 Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs. P/MA-specific permitting and regulatory requirements are listed in **Table PMA-1**. The various types of permitting and regulatory requirements for the planned P/MAs in the Basin include, but are not limited to, the following:

- Federal
    - National Environmental Policy Act (NEPA) documentation, if federal grant funds are used or federally-owned facilities are involved;
    - United States Army Corps of Engineers (USACE) Clean Water Act Section 404 Permits;
    - National Pollution Discharge Elimination System (NPDES) permit for water reuse;
    - United States Bureau of Reclamation (USBR) contracts (Section 215 water contract, contract with Central Valley Project [CVP]);
    - United States Fish and Wildlife Service permits;
    - National Marine Fisheries Service permits;
    - United States Environmental Protection Agency (USEPA) Underground Injection Control permits.
- State
    - California State Water Resources Control Board (SWRCB) permits and regulations, including Application to Appropriate Water, Point of Diversion and Storage permit, and Waste Discharge Requirement (WDR) permit;
    - SWRCB Stormwater Pollution Prevention Plan (SWPPP);
    - California Department of Fish and Wildlife (CDFW) Streambed Alteration permits and Incidental Take permits;
    - California Environmental Quality Act (CEQA) documentation;
    - California State Lands Commission Lease.
- Regional
    - Central Valley Regional Water Quality Control Board (CVRWQCB) Clean Water Act Section 401 Permits;
    - Central Valley Flood Protection Board (CVFPB) Permits, including encroachment permits;
    - San Joaquin Valley Air Pollution Control District permits.
- County/Local
    - County well construction permits and updates to well permitting processes (see **Section 5.3.4**);

- County/local grading and building permits.

Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be re-examined.

15.8 Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

The status and implementation timetable of each P/MA are presented in **Table PMA-2**. The P/MA implementation schedule ("glide path") presented in **Section 15.6** demonstrates that the planned P/MAs are sufficient to address the estimated Basin-wide overdraft over the historical and current period by 2030. Additionally, a sensitivity analysis was conducted that demonstrates the Basin's planned P/MAs are sufficient to address potential overdraft under projected 2070 Dry Climate Change conditions and if only 50 percent of supply augmentation occurs.

15.9 Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The different categories of expected benefits are presented above in **Section 15.2.2**, and the specific expected benefits of each P/MA are presented in **Table PMA-2**. Below is a discussion of how the expected benefits will be evaluated. **Section 15.6** presents the Model's representation of the P/MA benefits as well in terms of eliminating overdraft and avoiding Undesirable Results.

15.9.1 Evaluation of Benefits

Each P/MA has anticipated benefits related to water quantity, with several P/MAs having secondary benefits related to water quality, flood control, and/or water management flexibility. Once a P/MA is implemented, GSAs shall evaluate, ideally to quantify, the benefits resulting from that P/MA.

P/MA benefits will be evaluated based on changes observed in the Basin-wide SGMA monitoring network. For example, benefits for supply augmentation projects will be quantified directly through measurement of recharge flows and corresponding response in water levels in Representative Monitoring Wells for Chronic Lowering of Groundwater Levels (RMW-WLS; **Section 14.2.1**). For P/MAs with water quality benefits, evaluation of benefits will be done through regular water quality monitoring of nearby Representative Monitoring Wells for Degraded Water Quality (RMW-WQs) (**Section 14.2.4**). The GSAs will evaluate and report resulted benefits from implemented P/MAs as part of the Basin's annual reporting process and in the GSP Periodic Evaluations.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of the Basin's overdraft (i.e., the "glide path"), the goals and objectives of P/MA implementation are to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, the *GWL-MT Avoidance Plan* (**Section 16.1.1.3**), *WQ-MT Exceedance Plan* (**Section 16.1.1.4**), and *Subsidence Avoidance Plan* (**Section 16.1.1.5**) will be implemented as needed to mitigate potential Undesirable Results that may occur before 2030, or beyond as necessary.

15.10 Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Several of the P/MAs discussed below and shown in **Table PMA-1** rely on additional water supplies from outside the Basin. Specifically, certain P/MAs rely on the availability of water during normal to wet years to fill surface storage, conduct managed recharge, and offset groundwater pumping. Also, several of the GSA parent districts have water supply rights and contracts as described in the Basin Setting Section of the GSP. Use of these rights and allocation criteria are spelled out in the permits and include access to high flow water for recharge as well as irrigation which can be used to meet many of the needs of P/MAs.

Pursuant to Water Code Section 1425, the SWRCB may authorize the Temporary Water Right Permit for an entity to appropriate water by temporary permit. A temporary permit is a conditional approval to divert and use available water that has not been claimed by an existing water right holder. There are two options for temporary permits for groundwater recharge, the 180-Day Temporary Permit and the 5-Year Permit. The 180-Day Temporary Permit for groundwater recharge may be appropriate for short-term projects where an urgent need exists, and the 5-Year Permit for groundwater recharge is a temporary authorization for local agencies to divert water to underground storage. As discussed in **Section 15.1**, the SWRCB authorized and approved a Temporary Water Right Permit for AWD to divert available San Joaquin River flood water from the Chowchilla Bypass. AWD continues to pursue a permanent appropriative water right permit. A standard water right application was accepted in 2021 and is currently under review by the SWRCB. A similar permit and an application for an appropriative water right were also filed for P/MA NDM-4 / SJREC-7. In the future, flood water may be used to implement groundwater recharge.

The reliability of surface water deliveries from outside the Basin depends on hydrology. During drought conditions, surface water deliveries are anticipated to decrease. However, some entities within the Basin have relatively more reliable surface water supplies due to their senior water rights. Entities including SJREC, Patterson Irrigation District, and West Stanislaus Irrigation District receives a 100 percent allocation in all water year types except for the Shasta Critical years, during which the SJREC will receive a reduced surface water allocation. Projected surface water delivery is discussed in **Section 9.4** and varies based on Climate Change factors. The volume of surface water deliveries is anticipated to decrease under the various Climate Change Scenarios relative to the Baseline Scenario. These projected scenarios have been considered to inform future planning and decision-making.

15.11 Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

Each of the 23 Basin GSAs is a Party in the development and implementation of this GSP, which is formalized in a Memorandum of Agreement (MOA; **Appendix D**). Each Party and member agency (as listed in **Table Intro-1**), possesses the legal authority to implement the supply augmentation P/MAs discussed herein as water-providing entities (i.e., as Cities, water districts, irrigation districts, public water systems, resource conservation districts, and private water companies).

As GSAs, per California Water Code (CWC) § 10725 through 10726.8, the Basin GSAs possess the legal authority necessary to implement the demand management P/MAs described herein and will either act

upon the GSAs' behalf to enforce these P/MAs as necessary or will delegate authority to the member agencies to enforce the GSP themselves within their jurisdictional boundaries.

15.12 Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in **Table PMA-2**. In all cases the costs are considered approximate subject to refinement. These costs include "one-time" costs, such as capital costs associated with construction, feasibility studies, design, permitting, environmental compliance, or other costs required to initiate a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs including the following:

- General funds and taxes, generally supported by fees charged to landowners or water users within each jurisdiction. Some GSAs, including Grassland GSA have already conducted assessments on landowners to cover the administrative costs of SGMA planning, implementation, and monitoring.
- Financing through the Clean Water State Revolving Fund (CWSRF) as part of the Water Recycling Funding Program (WRFP) and other similar low-cost loan programs.
- Grant program funding from sources including but not limited to the California Department of Water Resources (DWR), SWRCB, California Natural Resources Agency (CNRA), United States Environmental Protection Agency (EPA), or USBR, such as:
    - Integrated Regional Water Management (IRWM) Grant Programs
    - Storm Water Grant Program
    - SGM Grant Program
    - Water Infrastructure Improvements for the Nation (WIIN) Grant
    - WaterSMART Program

15.13 Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As stated in **Section 9**, the water budget deficit (overdraft) within the Basin is estimated to have been approximately 140,000 AFY over the 2003-2023 time period (the "historical" and "current" water budget time periods). Modeling scenarios indicate that a combination of both supply augmentation and pumping reduction actions will be required for the Basin to avoid Undesirable Results.

One primary means by which the deficit will be addressed is through the implementation of P/MAs that obtain additional outside sources of water, in particular during normal to wet years. Many of the projects discussed herein and shown in **Table PMA-1** and **Table PMA-2** take advantage of additional normal to wet

year supplies that have been analyzed and shown to be available. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility. Supply augmentation P/MAs are designed to increase the likelihood that groundwater levels and storage declines during future drought periods will be offset, to the extent possible, by increases in groundwater levels and storage during other periods, especially during wet years.

In addition to these supply augmentation P/MAs, the portfolio also includes policy-based management actions aimed at reducing groundwater pumping, namely the Basin-wide PRP (**Section 16.1.1**). Through this combination of increased recharge during wet years and pumping reduction, the P/MA efforts will ensure that chronic lowering of groundwater levels and storage during drought will be offset by increases in groundwater levels and storage during other periods.

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
Tier 1 - Management Actions (Implemented by 2025)											
ALL-1	**GSA Well Permitting and Metering**	**All Counties/ All GSAs**	This project involves an agreement between counties and their respective GSA(s) to review any new well drilling permits within the county, including white areas. All counties in the Basin have developed and/or revised internal well-permitting policies to include consultation with GSAs on the location of proposed wells. These policies now also involve GSA oversight on aspects such as well depth, perforated intervals, extractions from the upper and lower aquifers, and the appropriate installation of appurtenances like flowmeters to determine if the pumping associated with a new well will cause Undesirable Results in the GSA's jurisdictional area and ensure that groundwater extractions are metered or measured in some fashion. These policies allow GSAs to incorporate any new wells into management programs developed in this GSP. The agreement also benefits the counties by alleviating the counties' management workloads as GSAs step into the additional responsibilities designated by SGMA. While the counties are ultimately responsible for approving well permits, GSA review of the permits helps ensure that new wells are compliant with current and future sustainable practices. Additionally, installing flow meters on all irrigation wells (current and future) allows for better management of groundwater extractions by allowing the GSA to quantify pumping and its effects on groundwater storage, quality, and other sustainability indicators. Collection of volumetric groundwater extraction data are necessary to implement the Basin's Pumping Reduction Plan.	X	X	X	X	Implementation underway; GSA access to and input on well permits ongoing	County well permitting program websites	County adoption of ordinance/resolution to update well permitting process; Adoption of GSA or District-level well metering policy	All Counties have updated their well permitting process and requirements to include a step for GSA review Several GSAs and/or districts have adopted well metering policies. See Section 16.1.1.1 for implementation schedule outlined in the Pumping Reduction Plan.
ALL-2	**Well Cataloging**	**All Counties/ All GSAs**	Several GSAs have required that all wells be cataloged and registered. Individual GSAs are or will keep a GSA-wide well database that include information about well construction, pump sizes, extraction amounts, water quality, etc. In some cases, landowners may be asked for any information available on their wells (well logs, pump tests, water quality reports, etc.). If well construction information was not available, or wells are not metered, landowners may be required to provide or acquire other information in order to calculate pumping, such as video logging wells	X	X	X		Implementation Underway; supported by ALL-1 (Well Permitting Review)	N/A	N/A	Several GSAs have field-verified and logged the locations of several wells, as discussed in Section 5.5.1 of this GSP
AWD-1 / NDM-1	**Groundwater Extraction Fees / Incentives for Surface Water Use**	**AWD / DPWD**	Since January 1, 2020, AWD has levied a groundwater extraction fee of $13.44/AF. Groundwater use is estimated based on a cropping-data estimate, or the grower may opt to provide flow meter data. AWD may adjust this fee following a Proposition 218 hearing. Landowners importing surface water receive up to a 4:1 credit against groundwater extraction fees. Specifically, for each AF of surface water imported, landowners receive credit to offset the extraction fees for up to 4 AF of groundwater. In the future, AWD may consider other incentives for surface water use as needed to reduce groundwater pumping. Since 2020, some growers have temporarily fallowed fields on an annual basis, which has reduced their groundwater extraction fees. Similarly, Del Puerto Water District has enacted a policy that requires growers to pay a surface water allocation fee irrespective of surface water use. This policy therefore incentivizes growers to use available surface before pumping groundwater.	X	X	X		Implementation Underway	Public notice and hearing	Prop. 218	AWD and DPWD policies have been adopted

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
CDM-1	**Revision to Tranquility Irrigation District Lower Aquifer Pumping**	**Tranquility Irrigation District**	Tranquillity Irrigation District maintains and operates 26 wells that extract water from the Lower Aquifer and four wells from the Upper Aquifer (agricultural and municipal supply). At times, depending on the water year, the 30 wells have pumped from the two aquifers continuously. Based on historic records, the most groundwater pumped in a single year was 24,000 AF. Beginning in 2017, TRID revised the pumping regime from the Lower Aquifer within district boundaries, allowing roughly only 10 wells to be operational at a time and shutting the wells off at night to allow for drawdown to recover. Under this revised pumping regime, the most water to be pumped within a year will be around 8,000 AF. During Average and Wet WYs, an estimated 1,000 AF could be pumped from the Lower Aquifer. During Dry WYs, up to 8,000 AF could be pumped from the Lower Aquifer. Tranquillity Irrigation District began implementing this revised pumping regime in 2017, with actual Lower Aquifer groundwater extractions totaling 200 AFY each in 2017 and 2018.	X		X		Implementation Underway	N/A	N/A	Well Water Operations Plan established in 2017 and implemented on an annual basis
NDM-2	**Drought Contingency Planning in Urban Areas**	**City of Patterson**	The City of Patterson has implemented drought contingency planning in urban areas in order to prepare for and respond to water shortages during times of drought. Urban water suppliers are already required to address water shortage contingency planning in their Urban Water Management Plans prepared every five years. These planning strategies can be expanded upon, if necessary, and applied in order to minimize impacts to groundwater storage and water levels when supplies become limited.	X		X		Adoption of UWMP; planning strategies can be expanded upon as-needed to comply with SMCs	City of Patterson Water Conservation website; direct mail	N/A	Included in the City of Patterson's adopted 2020 Urban Water Management Plan
SJREC-1	**Groundwater Allocations - Madera County GSA**	**Madera County GSA - Delta-Mendota**	Allocations for sustainable yield and transitional water have been established for irrigated acres within the Madera County GSA- Delta Mendota Subbasin. The allocations decrease over time per set schedule until the sustainable yield is met. From 2021 to 2025, allocations were designed to reduce transitional water by 2% annually. Transitional water will be reduced by 6% annually from 2025 to 2040 pending the GSP Periodic Evaluation.	X		X	X	Implementation underway	Allocation reports, acreages, and measurement options are sent yearly	N/A	Ongoing; From 2021 to 2025, allocations are designed to reduce transitional water by 2% annually
SJREC-2	**Private Well Pumping for Credits**	**SJREC**	The member entities of the SJREC allow landowners to pump private well water into the district facilities for credit. However, the SJREC entities have implemented a policy to regulate pumping and minimize impacts to at-risk areas. In the 1990's, the entities were divided up into management areas, now termed monitoring zones. The SJREC Board adopted a policy to establish trigger water levels to restrict the mining of groundwater in impacted areas and prohibit the export of groundwater out of an impacted area if the water level is below the trigger level. Additionally, all water pumped for credit must meet water quality standards, and there is a maximum allowable total volume that can be pumped for credit, which is further limited by the amount of groundwater which can be pumped without damaging other landowners or depleting groundwater storage. A groundwater consultant may be required to determine the potential impacts of pumping the well for credit. Pumping for credit must be terminated if the pumping has a detrimental impact on neighboring wells or on the groundwater table. Since 2000, about 70% of the total pumping was subject to the curtailment of these policies.	X	X			Implementation underway	Direct outreach to well operator and adjacent landowners	N/A	Ongoing; implemented in the 1990s

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SJREC-3	**Mitigation for Migration of Shallow Saline Groundwater**	**FCWD / CCID**	The SJREC, particularly FCWD and a portion of CCID (Camp 13), have been engaged in litigation over the migration of poor quality (high electrical conductivity and high selenium) from upslope drainage areas to the south and west. While this issue remains unresolved, FCWD and CCID have developed several management actions to help control the further migration of this poor-quality groundwater. FCWD and Camp 13 have a perched water table, that if not controlled, would cause the overlying land to be unfarmable. Landowners in CCID and FCWD have installed buried tile lines (subsurface drainage) to control the perched groundwater table in the area and are participating in the San Joaquin River Improvement Project to manage subsurface drain water produced within the region. One successful management action for the region has been the implementation of the various components of the Westside Regional Drainage Plan. Four effective strategies have been implemented to reduce drainage discharge including 1) source control, 2) groundwater management, 3) drainage reuse and 4) treatment and disposal. Source control reduces the volume of water contributing to subsurface drainage by reducing deep percolation of applied water and reducing seepage from canals and ditches. In 2002, through a joint study between the SJREC and the USBR, it was determined that the pumping of strategically placed wells could lower the perched water table and reduce discharge of subsurface drainage systems. As a result, 18 wells have been installed and have successfully reduced the discharge from subsurface drainage systems.		X			Implementation underway	N/A	N/A	Ongoing
SJREC-4	**Annual Groundwater Assessment Report**	**SJREC**	Each year the SJREC prepare an annual report (Report) of the current and historical conditions of groundwater. The report includes: pumping volumes, pump tests, water quality, and water levels. This report is reviewed by our Hydrogeologist, who prepares a supplemental assessment report. The hydrogeologist makes a recommendation on how each monitoring zone (or sub-area) within the SJREC area should be managed for the current year. The primary management tool is to review water levels in impacted areas. Historically, the hydrogeologist has recommended limiting the export of groundwater in those impacted areas if the groundwater elevation is below an established trigger level.	X				Annual	N/A	N/A	Completed annually
Tier 1 Projects (Implemented by 2025)											
AWD-2	**San Joaquin River and Chowchilla Bypass Flood Water**	**AWD**	AWD has acquired temporary rights to divert up to 10,000 AFY of unappropriated high-flow waters from the Chowchilla Bypass via existing flap gates, non-permanent pump stations, and future turnouts into AWD. During extreme wet years, non-contracted water sourced from high-flow events is released into the SJR. When the lower reaches of the SJR are at capacity, water is diverted from those lower reaches into the Chowchilla Bypass, a man-made flood control structure that bisects AWD. The Chowchilla Bypass only runs during high-flow years when the combined flows from both the SJR and the Kings River exceed the capacity of the lower SJR. Temporary water rights are applied for on an annual basis until permanent water rights can be acquired by the GSA (application under review by SWRCB). The temporary water rights allow AWD to capture surface water during high-flow events from the Chowchilla Bypass and implement groundwater recharge, in-lieu recharge, and flood relief projects. Water diverted from the Chowchilla Bypass can be applied directly to crops or used for direct recharge in the Chowchilla Bypass Recharge Facility (see AWD-3).	X	X	X		Implementation underway	Noticing in progress	SWRCB Application to Appropriate Water; CDFW streambed alteration permit	Temporary permit granted in WY 2023; Standard water right application accepted in 2021, under review by SWRCB. In WY 2023, AWD diverted approximately 7,500 AF of flood flows for recharge by application to crops and direct recharge on about 80 acres of previous tree crop land

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				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
AWD-3	**Chowchilla Bypass Recharge Facility**	**AWD**	This project includes a turnout to divert water from the Chowchilla Bypass, a pipeline, and an 80-acre recharge basin constructed on land previously used for irrigated agriculture. The primary purpose of this facility is to divert unappropriated high-flow waters from the Chowchilla Bypass via a new turnout to be owned and operated by AWD. Until the permanent turnout is constructed, a temporary turnout will be utilized beginning in 2023. Water will be delivered from the Bypass to the proposed Facility via a pipeline. The main objective of the project is to divert an average of approximately 10,000 AF of water per year during wet years. Once other conveyance projects are developed (Bypass Crossing Pipeline or Aliso Lateral), this project would also be able to utilize non-flood water.	X	X	X		Implementation underway	Public noticing as part of CEQA	CEQA; CDFW Streambed Alteration Permit; SWRCB Application to Appropriate Water; Central Valley RWQCB Clean Water Act Section 401 Permit, and USACE Clean Water Act Section 404 Permit; CVFPB Encroachment Permit; Madera County Building Permit; San Joaquin Valley Air Pollution Control District permit; SWRCB SWPPP	Funding Received in April 2022 from DWR's SGM Program SGMA Implementation - Round 1; In WY 2023, AWD used a temporary turnout to apply water for direct recharge
CDM-2 / GWD-1 / SJREC-5	**Los Banos Creek Diversion Facility**	**SJREC / SLWD / GWD**	The Los Banos Creek Diversion Facility is located just upstream of where the DMC siphon crosses the Los Banos Creek. The project consists of a gated check structure spanning Los Banos Creek, a turnout structure on the creek, an outlet structure on the DMC, and a box culvert connecting the turnout and outlet. The operation of this facility keeps the first 50 cfs of flood flows released from the Los Banos Creek Detention Reservoir in the creek to maintain historical recharge and can divert up to 250 cfs of flood releases into the DMC. The source water for this project is from runoff in the Los Banos Creek watershed and is put to beneficial use during times of reservoir releases. The project is designed to also deliver water from the DMC into the Los Banos Creek. This project provides additional flood protection to the City of Los Banos, a Disadvantaged Community, and also provides wetland benefits through relieved pressure from flood flows on wetland habitat and an additional useable water supply.	X				Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA; CDFW Section 1600 Streambed Alteration Permit, Central Valley RWQCB Clean Water Act Section 401 Permit, and USACE Clean Water Act Section 404 Permit	Operational
CDM-3 / GWD-2 / SJREC-6	**Los Banos Creek Storage Project**	**SJREC / SLWD / GWD**	The Los Banos Creek Detention Dam (LBCDD) and Los Banos Creek Detention Reservoir (LBCDR) are CVP facilities constructed to provide flood control protection to the San Luis Canal. The LBCDR because of its proximity also provides flood protection to the City of Los Banos. Currently the dam is strictly operated as a flood control facility during the late fall and winter months. A group of local agencies have proposed to operate the LBCDD in the spring to route natural Los Banos Creek flows to riparian lands downstream of the facility making space available for storage and thereby increasing the overall benefit of the Los Banos Creek Diversion Facility. The purpose of the Project is to more effectively manage the LBCDR in order to maximize flood control and downstream benefits while maintaining recreational use of the reservoir. The water pumped into the reservoir for storage by the Project Participants would be either conserved water or groundwater. During the flood control season, and potentially year-round, water in the reservoir would be allowed to accumulate and be released from the reservoir to meet Project Participant riparian demand. Starting in the spring, the project participants would pump their conserved water or groundwater into available LBCDD space for temporary storage and return to one or all participant to meet peak irrigation or wildlife water management demands.	X				Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA; SWRCB Point of Rediversion and Restorage, CDFW Section 1600 Streambed Alteration Permit, Central Valley RWQCB Clean Water Act Section 401 Permit, USACE Clean Water Act Section 404 Permit	Completed pilot project in Fall 2020; CEQA/NEPA anticipated for public comment Dec 2023; Funding received as part of the SGM Program SGMA Implementation – Round 1 Grant awarded in April 2022; Construction scheduled for 2024

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
GWD-3	**North Grassland Water Conservation and Water Quality Control Project**	**GWD**	The North Grassland Water Conservation and Water Quality Control Project (NGWCWQCP or Project) provides additional surface water to assist GWD in meeting its water demand within the GGSA. High-quality water from the District's water conveyance system and maintenance flows from managed wetlands in the northern portion of the District are captured prior to leaving GWD during fall and early winter. Recovered water is recirculated and returned to GWD's conveyance system to meet a portion of fall and winter demand. The amount of surface water available for recirculation through the NGWCWQCP facilities varies based on Level 2 CVP refuge water supply allocations, with an estimated 11,700 to 16,000 acre-feet per year available in years with 100% allocation (125,000 AF) and an estimated minimum of 5,200 acre-feet per year available in years with reduced Level 2 allocations (75% allocation: 93,750 AF). Based on the historical reliability of Level 2 water supplies, it is estimated that the average annual yield of the project is approximately 16,000 acre-feet per year. An enhancement adding new points of diversion and an intertie pipeline is scheduled for construction in 2024 and 2025 which is estimated to yield an additional 14,000 acre-feet/year by 2026.	X	X			Implementation Underway	N/A	No additional permitting required	Operational; An enhancement adding new points of diversion and an intertie pipeline is scheduled for construction in 2024 and 2025 (estimated yield 14,000 AF/year by 2026)
GWD-4 / NDM-3	**North Valley Regional Recycled Water Program - Modesto and Early Turlock Years**	**DPWD / GWD**	The North Valley Regional Recycled Water Program conveys tertiary-treated recycled water from the cities of Modesto and Turlock to the DMC for conveyance to growers in the DPWD service area, as well as south-of-the- Delta wildlife refuges within the Grassland GSA Group area. With the development of conveyance capability, at buildout, up to 59,000 AFY of tertiary treated recycled water produced from municipal wastewater and stormwater collected from the cities of Ceres, Turlock, and Modesto will be delivered DPWD growers and wildlife refuges. Recycled water is conveyed to DPWD lands to supplement CVP supplies and offset groundwater pumping that has been occurring to make up for delivery shortages. Recycled water delivered by this project is also conveyed by USBR to supplement water supplies to wildlife refuges.	X	X	X	X	Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA; NPDES	Wastewater from the Cities of Modesto and Turlock is currently being collected and treated; Funding received to expand the program to the City of Ceres
NDM-4 / SJREC-7	**Orestimba Creek Recharge and Recovery Project**	**DPWD / CCID**	The Orestimba Creek Recharge and Recovery Expansion Project is a joint project between DPWD and CCID. The Project is designed to capture flood flows, excess winter flows, and Section 215 contract water (non-storable flows authorized by the USBR) from Orestimba Creek and the DMC for groundwater recharge and later use during dry periods. This project consists of a 20-acre recharge facility and a 60-acre recharge facility that were constructed in 2018 and 2024, respectively. Flood flows and surface water from DPWD and/or the SJREC entities are delivered to the site through an existing pipeline from the DMC. Another source of water for the recharge facility is excess flood flows from Orestimba Creek to be routed through a proposed pipeline to the project site. Diverting excess flood flows from Orestimba Creek provides additional flood protection to the City of Newman. The total 80-acre facility is estimated to recharge up to 15,000 acre-feet in a given year. During a Critical Year, the member agencies of the SJREC can extract up to 7,500 AF of stored groundwater. The Project is estimated to generate 1,485 AF/year on average for the Project partners. Additionally, up to 35 cfs of flood flows can be diverted from Orestimba Creek reducing downstream pressure on the City of Newman, CCID's main canal, and the San Joaquin River.	X	X	X	X	Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA; Stanislaus County Well Construction Permit; CDFW Section 1600 Streambed Alteration Permit; Central Valley RWQCB Clean Water Act Section 401 Permit; USACE Clean Water Act Section 404 Permit	Construction of recharge facilities complete; Construction of a new turnout to divert water from Orestimba Creek in progress; A Temporary Water Right Permit has been issued and an application for an appropriative water right has been filed

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				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
SJREC-8	**Red Top Area Subsidence Mitigation**	**SJREC / Triangle T Water District**	The Red Top Subsidence Mitigation project is located east of the San Joaquin River in the Red Top Area. This project is in an area significantly impacted by subsidence due to extracting groundwater from the aquifer below the Corcoran Clay. The Triangle T Water District, historically solely relying on groundwater, has purchased and delivered surface water through the pipeline under the San Joaquin River. Water delivered to Triangle T Water District is either used directly in lieu of pumping groundwater or delivered to recharge ponds. As a direct result of delivering surface water and developing a shallow groundwater recharge and recovery facility, the area uses the stored shallow groundwater and pump less water from the aquifer below the Corcoran Clay. An expert panel has reviewed the area and determine the sustainable yield from the aquifer below the Corcoran Clay that does not cause significant or unreasonable subsidence. There is also a mandatory step-down reduction each year from 2017-2021 for groundwater extractions from below the Corcoran Clay. The annual allowable extraction from below the Corcoran Clay per acre in the Triangle T Water District is respectively; 0.90, 0.75, 0.65, 0.60 and 0.50.The overall extraction is limited by the lesser of the mandatory step-down reduction or recommendation from the expert panel.	X		X		Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA; California State Lands Commission Lease, CVFPB Permit, CDFW Streambed Alteration Permit, Central Valley RWQCB Clean Water Act Section 401 Permit, and USACE Clean Water Act Section 404 Permit	Operational
Tier 2 - Management Actions (Implemented by 2030)											
ALL-3	**Basin-wide Pumping Reduction Plan**	**All GSAs**	The GSAs have adopted a policy committing to collectively reduce the total groundwater pumping in the Basin by at least 42,000 AFY by 2030. Starting in January 2025 and for each year over the subsequent five years, each GSA Group will accomplish at least 20% of its total apportioned pumping reduction, accomplishing the total minimum reduction by the end of 2030. The GSA will determine and adopt by September 2024 the technical framework(s) under which pumping reductions can be achieved. The Pumping Reduction Plan also includes a Monitoring and Data Collection Plan, Groundwater Level Minimum Threshold Avoidance Plan, Water Quality Minimum Threshold Exceedance Plan, and Subsidence Mitigation Plan, as detailed in Section 16.1.1 of this GSP.	X		X		Implementation underway	Adoption of individual policies at GSA Board Meetings	N/A	GSAs have committed to pumping reductions. Technical frameworks for each GSA to be adopted by September 2024.
AWD-4	**Fallowing and Crop Conversion**	**AWD**	Voluntary land fallowing is contingent on the willingness of farmers to either temporarily or permanently fallow their land. Farmers could be offered incentives to volunteer to fallow their fields through subsidies, land purchases, and water credits for other fields. All farmers could pay into a GSA fund established by AWD, which could then be used as a subsidy to farmers who choose to fallow their land on a seasonal/annual basis. Farmers could take a portion of the water normally to be used on the fallowed acreage and apply it to different fields for a reduction in the fallow subsidy. For example, once an almond orchard has reached the end of its useful life, instead of the owner replanting, they would receive an incentive from the GSA not to replant. Another option could be incentives for crop conversion to lower demand crops. Replacing existing crops with lower-demand crops could increase basin sustainability and reduce groundwater overdraft through a reduction in extractions for irrigation	X	X	X		As-needed to meet SMCs and address groundwater deficit	Outreach and education	N/A	Not yet initiated; Included as part of AWD's pumping reduction in ALL-3.

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				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
Tier 2 - Projects (Implemented by 2030)											
CDM-4 / SJREC-9	**Los Banos Creek Recharge and Recovery Project**	**SLWD / SJREC**	The Los Banos Creek Recharge and Recovery Project is located in and adjacent to Los Banos Creek, which is south of the City of Los Banos between the San Luis Canal and CCID's Outside Canal. The project will develop a recharge basin, convert three rock quarry pits to temporary storage/recharge basins, construct three storage recovery sump pumps, six shallow groundwater recovery wells, a bridge crossing of Los Banos Creek, and a weir located just downstream of the Outside Canal. Project flood waters and surplus irrigation supply will be temporarily stored in the pits/basin for beneficial use and flood mitigation purposes with surplus waters percolated into the Upper Aquifer.	X	X		X	Implementation underway	Public noticing as part of CEQA	CEQA; NEPA; SWRCB Waste Discharge Requirement permit; Merced County Well drilling permit	Preliminary design completed in 2018; Funding Received in April 2022 from DWR's SGM Program SGMA Implementation - Round 1; Construction scheduled for 2024
CDM-5	**Ortigalita Creek Groundwater Recharge and Recovery Project**	**SLWD**	The Ortigalita Creek Groundwater Recharge and Recovery Project would use surplus surface water available to SLWD to recharge the Upper Aquifer near Ortigalita Creek.	X	X	X	X	Available Funding; Triggered by implementation of PRP	Public noticing as part of CEQA; Landowner outreach conducted	CEQA	Preliminary design complete; Funding requested under DWR's SGM Program SGMA Implementation - Round 2, but not received
CDM-6	**Kaljian Drainwater Reuse Project**	**SLWD**	The Kaljian Drainwater Reuse Project is located within SLWD's service area, approximately nine miles from the City of Los Banos. Project improvements include re-grading and/or installing lift pumps within the drainage ditches; construction of a turnout pipeline; modification of the Kaljian pump structure; and restoration of the Fitted and Kaljian pump stations, Kaljian pipeline, and 1st Lift Canal. The project will reclaim tile drain water from Charleston Drainage District for blending and permit conveyance of other supplies for beneficial use. Of the 1,200 AFY average yield, it is estimated that up to 500 AFY can be available for recharge, where a portion of this water may be directly recharged in the Los Banos Creek Recharge Project. This project will reduce dependence on imported water coming from the Delta by increasing local supply in utilizing the local tile drain water to augment irrigation supplies (including offset groundwater pumping to meet crop demand not met by surface water supplies).	X	X	X	X	Implementation underway	Public noticing as part of CEQA	CEQA; NEPA	FS complete; Design and CEQA/permitting in progress; Design planned between 2020 and 2025; Construction planned beginning in 2025.
GWD-5	**Basins and Storm Water Capture Project**	**GWD**	The City of Los Banos, Grassland Water District, and associated GSAs are exploring options to expand and improve storm water capture from local rivers and streams, as well as flood protection, groundwater recharge, wildlife refuge supply flexibility, groundwater quality and quantity improvements. Initially, a 150-acre+/- City of Los Banos owned/farmed site has been identified. Site investigations, CEQA and preliminary plans for turnouts and basin cells are being prepared for this City "Recharge Basins and Stormwater Capture Project."	X	X		X	Implementation underway	Public noticing as part of CEQA; Public noticing and notice to Board for consideration. Additional public noticing/workshops may occur.	CEQA; Approval for diversion of flood flows, permitting under AB 658	Construction anticipated in 2025

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				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
NDM-5	**WSID Lateral 4-North Recapture and Recirculation Reservoir**	**WSID**	The WSID Lateral 4-North Recapture and Recirculation Reservoir project will be implemented by WSID. This project consists of a reservoir on a 7-acre parcel currently not in production. The reservoir, once complete, will collect operational spill from two distribution laterals and irrigation tailwater on the north side of WSID's service area and store those waters for reliable use downstream. This project will also provide two additional benefits: First, the project will allow flexible water delivery service to users during times of drought or capture constraints; and second, the project will improve water quality to downstream users by mixing water from the DMC with surface water of lesser quality from the San Joaquin River. This project is estimated to result in roughly 1,800 AFY of recapture, of which approximately 270 AFY will percolate through the reservoir bottom and recharge the underlying Upper Aquifer helping to offset groundwater extractions in other locations of the Subbasin.	X	X	X	X	Implementation underway	CEQA is Complete	CEQA	FS completed in September 2021; Funding received as part of the SGM Program SGMA Implementation – Round 1 Grant awarded in April 2022; CEQA complete; final design in progress
NDM-6	**WSID Lateral 4-South Recapture and Recirculation Reservoir**	**WSID**	The WSID Lateral 4-South Recapture and Recirculation Reservoir project would be similar to the WSID 4-North Recapture and Recirculation Reservoir project, but on the south side of the District's service area. WSID would identify a parcel to construct a new reservoir to collect operational spill from distribution laterals and irrigation tailwater on the south side of the District and store those waters for reliable use downstream. For planning purposes, it is assumed 1,800 AFY could be recaptured and reused. Like the recapture and recirculation reservoir project on the northern end of the District, this project would also improve water supply reliability during droughts or in times of capture constraints. It is assumed 270 AFY of water would percolate through the reservoir bottom and recharge the underlying Upper Aquifer, helping to offset groundwater extractions in other locations of the Subbasin.	X	X	X	X	Implementation underway	Public noticing as part of CEQA	CEQA	Preliminary design anticipated to start in September 2024
NDM-7	**PID Groundwater Bank and/or Flood-Managed Aquifer Recharge (MAR)-type Project**	**PID**	Within PID's service area, there are currently approximately 800 to 900 acres fallow each year. The University of California at Davis' SAGBI index was used to assess the range of potential groundwater recharge volumes that could be achieved given those fallow acres. Based on the analysis conducted, the PID service area has the potential to recharge between 3,000 AFY and 9,700 AFY on the fallowed land. As a pre-1914 water rights holder, PID has access to surplus surface water from the San Joaquin River that can be used for Upper Aquifer recharge. It is assumed 3,000 AFY could be percolated in Average WYs with a larger volume during Wet WYs. Recharge would occur over a 120-day period from January through March.	X	X		X	Implementation underway	Public noticing as part of CEQA	CEQA	Feasibility study complete; Purchased potential property for small project; pilot study anticipated for 2024
NDM-8	**East-West Conveyance Project**	**PID**	The East-West Conveyance Project is a series of improvements along the Patterson Irrigation District (PID) Main Canal all the way to the Delta-Mendota Canal (DMC). The goal of the improvements are to increase PID's conveyance capacity from the beginning to the end of the facilities to match PID's diversion off of the San Joaquin River to 200 cubic-feet per second (cfs). Currently, PID can divert 200 cfs under its current water right; however, the discharge into the DMC is only 35 cfs. The increase to 200 cfs (i.e., increase of up to 120,000 AFY) will provide PID the ability to move water for others to aid in facilitating water transfers, recapturing San Joaquin River Restoration Flows, and recapturing spills from other agencies to recirculate into the DMC to help with water supply shortages.	X				Implementation Underway	Public noticing as part of CEQA / NEPA	CEQA, NEPA, Cal Trans encroachment, Northern Pacific Railroad encroachment, Stanislaus County Pipe Maintenance Agreement & Encroachment Permits, and Local Landowners for Right-of-Way	Under Construction

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
SJREC-10	**City of Los Banos Wastewater Treatment Facility Tertiary Upgrade**	**City of Los Banos**	This project will upgrade the City of Los Banos' existing wastewater treatment facility to provide tertiary treatment for recycled water. It is estimated that the City will be able to reuse and reclaim 7,000 AFY.	X	X	X		Implementation underway	Public noticing as part of CEQA	CEQA, RWQCB, DWR	Planning phase; conducting feasibility study
Tier 3 Projects (Implemented by 2040)											
NDM-9	**Little Salado Creek Groundwater Recharge and Flood Control Basin**	**Stanislaus County**	The Little Salado Creek Groundwater Recharge and Flood Control Basin project, proposed by Stanislaus County, consists of constructing a stormwater detention basin to partially divert, retain, and percolate up to 270 cfs of flow from Little Salado Creek. Little Salado Creek has a drainage of 874 AFY. It was assumed the detention basin would recharge 489 AFY in Wet WYs (San Joaquin River WY Index). The basin would be located in the future Crows Landing Industrial Business Park and would have a capacity of 380 AF. The project will provide flood relief to the downstream City of Patterson and the Upper Aquifer recharge will offset groundwater pumping required to supply the new development, thereby limiting impacts on Upper Aquifer groundwater elevations and storage due to this project's development.	X	X		X	Available Funding; Triggered by implementation of PRP	Public noticing as part of CEQA	CEQA	Will proceed with design once funding is secured; Drainage study completed in November 2016; EIR completed in 2018; Project will be constructed as part of the mitigation activities related to the construction and operation of the rows Landing Industrial Business Park
NDM-10	**City of Patterson Percolation Ponds for Stormwater Capture and Recharge**	**City of Patterson**	The City of Patterson Percolation Ponds for Stormwater Capture and Recharge project consists of constructing percolation ponds to capture and infiltrate stormwater from Del Puerto Creek. The ponds will cover roughly 14 acres. Sizing of the percolation ponds is based on existing infiltration rate data and will be updated when field investigations are completed. Implementation of this project may be phased such that the ponds are constructed over a number of years. The project is anticipated to result in 1,700 AFY of direct groundwater recharge using stormwater runoff captured within the City and conveyed to recharge locations.	X	X	X	X	Available Funding; Triggered by implementation of PRP	Public noticing as part of CEQA	CEQA	Included in Water Master Plan; Project still in conceptual/planning phase; project design activities commenced in WY2022 City is looking to expand project with multiple benefits and project partners.
NDM-11	**Del Puerto Canyon Reservoir Project**	**DPWD**	The Del Puerto Canyon Reservoir Project will construct a 270-foot tall earthen dam at the mouth of Del Puerto Canyon providing 82,000 AF of storage for DPWD and the member agencies of the San Joaquin River Exchange Contractors Water Authority (SJRECWA). Water would be pumped into the reservoir from the DMC when excess water is available and discharged back to the DMC when necessary. Minimal seasonal storm flows through Del Puerto Canyon would be captured by the reservoir and discharged perennially to Del Puerto Creek for downstream use. The Districts would be storing CVP supplies from their annual entitlements when excess to their immediate needs. Thus, this project would benefit the region by allowing the Districts to store water south of the Delta when excess water is available to them and utilize that water during dry periods when supplies may be limited. On average, 2,756 AFY from Del Puerto Creek could be captured and stored in the reservoir. During Wet WYs (San Joaquin River WY Index), up to 35,570 AFY of creek flows could be stored for later use in the reservoir. Project partners anticipate that they will utilize up to 20,000 AFY of their portion of the reservoir during dry years.	X	X	X	X	Implementation underway	Public noticing as part of CEQA and NEPA	CEQA; NEPA	Revised CEQA expected to be certified by February 2024; NEPA draft expected by November 2023; 30% design completed in 2023; Permitting and final design are anticipated to be complete in 2024; Construction is estimated to be complete in 2035

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

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				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
SJREC-11	**BB Limited Groundwater Recharge and Recovery**	**SJREC**	The BB Limited Recharge and Recovery project is located in an existing 13-acre site north of the existing Meyers Water Bank east of the City of Mendota. Surface water from the SJREC will be delivered to the site. Additionally, excess flood water from the Kings River and/or San Joaquin Rivers will be diverted to the site. The total 13-acre facility is expected to recharge upwards of 1,500 acre-feet in a given year. During a Critical Year, the member agencies of the SJREC can extract up to 4,000 acre-feet of stored groundwater. It is anticipated that the SJREC will recharge over 4,000 AF over three consecutive years and ultimately extract 4,000 AF in a subsequent Critical Year. This facility will be managed to recharge and store more water than will be extracted. The excess recharged water will help offset regional groundwater usage near the Mendota Pool.	X	X			Implementation underway	Public noticing as part of CEQA	CEQA; NEPA; Fresno County Well Construction Permit	Environmental review in progress; implementation on hold
SJREC-12	**City of Los Banos Stormwater Management Master Plan**	**City of Los Banos**	This project involves the development of a stormwater detention basin as part of the implementation of the Los Banos regional storm management plan. Captured stormwater will be used for the City's water supply and groundwater recharge. The project is expected to provide an additional 10,000 AFY of supply.	X				Implementation underway	Public noticing as part of CEQA	Merced County permitting; CEQA	Planning phase; conducting feasibility study
Tier 4 Management Actions (Implemented After 2040 or As-Needed)											
AWD-5	**Incentivize On-Farm irrigation Efficiency Improvements**	**AWD**	AWD has an area of approximately 26,000 acres comprised mostly of farmland irrigated primarily by private wells. Typical irrigation methods include sprinklers, drip/micro irrigation, and surface/flood irrigation. The average on-farm irrigation system was estimated to be approximately 70% efficient over the 10-year historic water budget period (2003-2012; Aliso Water District, 2022). However, actual irrecoverable losses due to irrigation efficiency may be underestimated. Offering incentives to farmers for implementing projects that will increase on-farm efficiencies can promote aquifer sustainability by reducing or eliminating water that leaves the District via irrigation runoff, wind and spray loss, and leaks. Growers may also see decreased operational and pumping costs and possible increases in yield per acre-foot of water applied as a result of raising irrigation efficiency. Possible projects to incentivize may include installation of soil moisture sensors, utilization of high-efficiency irrigation methods, installation of meters, and updated delivery systems.	X	X	X		Will be implemented if more incentive is needed beyond groundwater extraction fees (AWD-1)	45-day notice and public hearing for Fees	Prop. 218	Incentives currently being realized by Groundwater Extraction fees
AWD-6	**Internal Groundwater Marketing Program**	**AWD**	This project would establish a groundwater marketing program within the GSA. The GSA should acknowledge and discuss any other groundwater credit systems before creating a new one. The establishment of groundwater marketing programs require significant pre-planning, including establishing extraction policies and developing water quality standards. If implemented, this project would provide groundwater users with the flexibility to fairly and responsibly store groundwater allocations in order to reserve their allocation for later use or transfer their allocation to other parties.	X	X	X		Will be implemented if more incentive is needed beyond groundwater extraction fees (AWD-1)	Outreach and education	N/A	Not yet initiated

Table PMA-1. Projects and Management Actions – Sustainability Benefits and Implementation Process

P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
CDM-7 / NDM-12	**Maximizing Use of Other Water Supplies**	**GSAs in the Northern and Central Delta-Mendota GSA Groups**	Maximizing the use of water supplies other than groundwater can improve the quality and volume of groundwater in storage in each principal aquifer. Where possible, surface water, recycled water, stormwater, and tile drain water will be used to offset groundwater deficits. In order to implement this management action, the GSAs will develop a program to incentivize the use of alternative supplies over groundwater when possible. This program may also include, but is not limited to, taking advantage of available surplus surface water for groundwater recharge in order to increase groundwater levels in the Upper Aquifer. Surplus surface water is typically available during Wet and Above Normal WYs when surface water supplies exceed demand. If a GSA or GSA member agency has rights to surface water and all demands have been met, the surplus water can be used for recharge through an existing groundwater recharge project or fallowed lands and/or sold to entities without surface water rights to offset groundwater pumping. As less groundwater is pumped, groundwater levels and storage could remain the same or increase, overall groundwater quality could improve, and subsidence could be reduced or eliminated in certain areas.	X	X	X	X	To be implemented upon adoption of this GSP	N/A	N/A	Not yet initiated
CDM-8 / NDM-13	**Rotational Fallowing of Crop Lands**	**GSAs in the Northern and Central Delta-Mendota GSA Groups**	Agricultural water use can be temporarily reduced by fallowing crop lands. While this can have economic impacts to a region, the benefits can include improved water supply reliability, improved groundwater quality, increased groundwater levels, reduced subsidence, and operational flexibility. Rotational fallowing of crop lands reduces the economic impacts to any one area by rotating the areas of fallowing. This management action could be combined with a recharge project through the application of surplus water supplies to the fallowed lands resulting in in-lieu groundwater recharge.	X	X	X		As-needed to meet SMCs after implementation of other P/MAs	Public noticing as part of CEQA	CEQA	Not yet initiated
CDM-9 / NDM-14	**Groundwater Extraction Fee with Land Use Modifications**	**GSAs in the Northern and Central Delta-Mendota GSA Groups**	A groundwater extraction fee or groundwater production charge could be collected from entities that own or operate a water-producing well. Revenue from these fees could then be used to pay for a variety of activities such as the construction of water infrastructure, protection of groundwater, proper construction and destruction of wells to prevent contamination, groundwater recharge and recovery projects, purchase of imported water or other supplies to replenish the groundwater basin, and/or purchasing and permanent fallowing of marginally-productive agricultural lands dependent on groundwater. Several agencies in California have already implemented such a program and have seen success in utilizing revenue to benefit the local groundwater basin. A similar methodology could be applied by various agencies within the Northern and Central Delta-Mendota Regions.	X	X	X	X	As-needed to meet SMCs after implementation of other P/MAs	TBD	Proposition 218 or through local rate setting	Not yet initiated
GWD-6	**Increasing Access to Excess Non-CVP Surface Water**	**Grasslands GSA and MCDMGSA**	The GSAs may adopt a policy to define a method by which excess non-CVP surface water can be conveyed to groundwater users within the Plan Area. The GSAs may consider a variety of structures that adhere to the limitations of available water supplies and allowable water uses.	X				As-needed to meet SMCs after implementation of other P/MAs	Public noticing and Board for consideration. Additional public noticing and workshops may occur	Adoption of GSA resolution	Not yet initiated
GWD-7	**Canal Improvements**	**Grasslands GSA and MCDMGSA**	The GSA will continue to modernize its water control facilities, restore conveyance capacities, and increase monitoring for decision support and remote control and may develop further policies to assist in these endeavors.	X				As-needed to meet SMCs after implementation of other P/MAs	Public noticing and Board for consideration. Additional public noticing and workshops may occur	N/A	Not yet initiated

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P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
GWD-8	**Require Developments to Prove Sustainable Water Supplies**	**Grasslands GSA and MCDMGSA**	The GSAs may adopt a policy to require new developments (non-de minimis extractors) to prove their usage of sustainable water supplies based upon current SMC. The GSAs may review and comment on environmental review documents for proposed development projects to ensure a sustainable water balance and the adoption of corresponding mitigation measures. Requires County support.	X				As-needed to meet SMCs after implementation of other P/MAs	Public noticing and Board for consideration. Additional public noticing and workshops may occur	GSA adoption of resolution	Not yet initiated
GWD-9	**Recharge Estimation Methods**	**Grasslands GSA and MCDMGSA**	The GSAs may adopt a policy to better estimate recharge occurring from managed wetland uses within the Plan Area. The GSAs may consider a variety of methods, likely based on field measurements of inflows, outflows, pond levels, and groundwater elevations. The GSAs may conduct soil and percolation studies to better understand site-specific recharge.	X			X	As-needed to meet SMCs after implementation of other P/MAs	N/A	N/A	Not yet initiated
NDM-15	**City of Patterson Reduced Groundwater Use Portfolio**	**City of Patterson**	The City of Patterson's 2018 Water Master Plan evaluated various water supply portfolios to meet anticipated future supply gaps (i.e., the City's existing supply subtracted from future demands). The two most relevant portfolios include the Patterson Control Portfolio and Low Reliance on Groundwater (2) Portfolio. The preferred portfolio, Patterson Control Portfolio, provides the City independent control of its water supply and easier implementation of water supply projects. The Low Reliance on Groundwater (2) Portfolio would diversify the City's water supply portfolio to reduce the City's groundwater use with the addition of a long-term surface water transfer in which the City negotiates a long-term contract to purchase water from another entity. The City could explore a long-term water transfer and move forward towards the Low Reliance on Groundwater (2) Portfolio to further reduce groundwater extractions from the Lower Aquifer, if needed.	X		X		As-needed to meet SMCs after implementation of other P/MAs	N/A	N/A	Not yet initiated
Tier 4 Projects (Implemented After 2040 or As-Needed)											
AWD-7	**USBR 215 Flood Water**	**AWD**	Section 215 of the Reclamation Reform Act of 1982 (Public Law 97-293) defines temporary non-storable water supplies that can be released by the USBR from their facilities. The release of Section 215 water occurs during years of above-average precipitation when water levels encroach on flood-control levels. Section 215 flows are defined as unusually large temporary water supplies that cannot be stored for project purposes. Acquiring a Section 215 contract allows these flows to be applied to lands that would otherwise not receive Federal water. This water would be accessed by the District from the San Joaquin River through existing turnouts if made available from the CVP Friant system.	X	X	X		Initiation upon acquiring water contract	N/A	Section 215 water contract with USBR	Not yet initiated
AWD-8	**Banking Out-of-District Water**	**AWD**	There is potential for AWD to bank water on behalf of other entities. AWD's proximity to the Mendota Pool gives them a connection to various sources of water. This water could be banked within AWD via direct or in-lieu methods. Additionally, AWD's vast number of wells would have the capacity to return the banked water. AWD would bank the water through an unbalanced exchange. For example, they could take 3 AF of wet year water from an agency and return 1 AF in a dry year (3:1 exchange). This nets 2 AF of import available to AWD's sustainable yield. It is recognized that any banking projects within Madera County will need to be in compliance with groundwater exporting and banking regulations per Madera County.	X	X	X		Agreements with surrounding entities	N/A	N/A	Not yet initiated

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P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
AWD-9	**Latent Water Rights**	**AWD**	Cursory investigations indicate that prior to the formation of the AWD, water rights have historically existed in the area. This land was originally partially Miller and Lux land holdings. The lands were subsequently and progressively subdivided to their current state. An appropriative water right license (License 1986) originally served the Aliso Canal from a turnout on the San Joaquin River. With the development of the CVP Friant System, this appropriation was sold to the USBR. Later court cases (Haines Decree, Rank Vs. Krug) awarded riparian water rights and groundwater to lands adjacent to the SJR. The District will consider investigating whether latent rights to water exist and to what extent.	X	X	X		Initiation upon water right investigation findings	N/A	N/A	Not yet initiated
AWD-10	**Water Contracts**	**AWD**	AWD's proximity to the SJR and the Mendota Pool makes it possible to receive CVP water from either the Friant or Westside systems. Purchasing an assignment of CVP contract water could provide a secure supply of water to the District on a long-term basis. It also streamlines access to Section 215 water and transfers with other contractors.	X	X	X		Initiation upon water right investigation findings	N/A	CVP contract with USBR	Not yet initiated
AWD-11	**Water Exchange/Transfers/Purchases**	**AWD**	The AWD GSA could exchange, transfer, or purchase water from other public or private agencies as opportunities arise. This water is likely to be expensive and would probably be negotiated on an annual basis. Water could be used within AWD for direct or indirect recharge to help alleviate overdraft conditions and establish aquifer sustainability. If a lack of infrastructure prevents purchased water from being used within the GSA, agreements could be made with neighboring agencies to bank or recharge the water on behalf of AWD.	X	X	X		Pending agreements and opportunities to exchange/transfer/purchase water from other agencies	N/A	CEQA	Not yet initiated
AWD-12	**Improving Aliso Canal Turnout on San Joaquin River**	**AWD**	The current condition of the Aliso Canal turnout does not allow for adequate flow through it except during extremely high flows. Presently, the district cannot physically divert water at this turnout until the flow in the San Joaquin River at the Gravelly Ford gaging station is 3,000 cfs. There are two reasons for this: 1) the turnout sits too high above the San Joaquin River invert to allow water to enter, and 2) lack of maintenance in the river has created an impediment prohibiting the water from reaching the turnout. Improving the existing turnout on the San Joaquin River would allow AWD to access water at lower flow rates which could facilitate access to non-flood water (e.g., transfers) as well as excess flood waters at lower flow rates without relying on the Chowchilla Bypass. Access to water from this location would also encourage the development of other projects such as restoration of the Aliso Canal and usage of the Aliso Lateral as a recharge facility.	X	X	X		Pending turnout improvements	N/A	CDFW streambed alteration permit	Not yet initiated
AWD-13	**Restoration of the Aliso Canal for Conveyance from SJR to Cottonwood Creek**	**AWD**	This project would reestablish use of the Aliso Canal from the San Joaquin River at the Aliso Turnout (southerly border) to Cottonwood Creek in order to provide landowners with access to surface water. The Aliso Canal once started at the San Joaquin River and terminated just south of the Fresno River. As the farmland in the area was subdivided, the channel was filled in and farmed on by individual landowners. With the reestablishment of the Aliso Canal, properties on the easternmost side of the District would have opportunities to utilize surface water diverted from the Chowchilla Bypass or the San Joaquin River for irrigation or recharge. This project has the potential to double the amount of acreage that can currently utilize surface water, essentially doubling the amount of surface water diverted into the district. This project will be feasible once the Aliso Canal turnout is improved and a turnout is established on the Chowchilla Bypass at Cottonwood Creek.	X	X	X		Pending turnout improvements	N/A	CEQA	Not yet initiated

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P/MA Number	P/MA Name	Project Proponent	Summary Description	Relevant Sustainability Indicators Affected				Circumstances / Timetable for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status
				Groundwater Levels & Storage	Groundwater Quality	Land Subsidence	Interconnected Surface Water				
AWD-14	**Bypass Pipeline Crossing**	**AWD**	This project consists of construction of a buried pipeline across the Chowchilla Bypass in order to deliver non-flood water purchased from the Mendota pool to be wheeled through the Columbia Canal Company and New Columbia Ranch to the east side of the District. Water could be placed in recharge cells or used directly for irrigation. The benefit would depend on available supplies and capital costs would be higher than the other projects.	X	X	X		Pending water agreements	Public noticing as part of CEQA	CVFPB, CDFW streambed alteration permit	Not yet initiated
AWD-15	**Restoration of the Aliso Canal for Conveyance from Cottonwood Creek to Northerly Boundary**	**AWD**	This project would reestablish use of the Aliso Canal from Cottonwood Creek to the northerly border of the District in order to provide landowners with access to surface water. The Aliso Canal once started at the San Joaquin River and terminated just south of the Fresno River. As the farmland in the area was subdivided, the channel was filled in and farmed on by individual landowners. With the reestablishment of the Aliso Canal, properties on the easternmost side of the District would have opportunities to utilize surface water diverted from the Chowchilla Bypass or the San Joaquin River for irrigation or recharge. This project has the potential to double the amount of acreage that can currently utilize surface water, essentially doubling the amount of surface water diverted into the district. This project will be feasible once the Aliso Canal turnout is improved and a turnout is established on the Chowchilla Bypass at Cottonwood Creek.	X	X	X		Pending water rights from Chowchilla Bypass	Public noticing as part of CEQA	CEQA	Not yet initiated
AWD-16	**Aliso Lateral as Linear Recharge Ponds**	**AWD**	Under this project, the existing Aliso Lateral would be utilized as a linear recharge pond. The Aliso Lateral is impacted during flood periods with relocated seepage water, meaning that usage of the Lateral as a recharge pond would only be feasible with non-flood water. There are no earthwork modifications or additional check structures necessary for the Lateral to operate as a linear recharge pond.	X	X	X		Initiation upon securing non-flood water supplies	N/A	N/A	Not yet initiated
AWD-17	**Recharge in Bypass**	**AWD**	This project would recharge water in the Chowchilla Bypass when it is not in use conveying flood water. This would require coordination with the Lower San Joaquin Levee District for access and operations agreements. It would also require a non-flood source of water.	X	X	X		Initiation upon coordination with the Lower San Joaquin Levee District	N/A	N/A	Not yet initiated
AWD-18	**Groundwater Injection Wells**	**AWD**	Groundwater injection wells recharge groundwater by pumping surface water into the aquifer through a well or set of wells. This type of recharge can be beneficial for recharging the lower aquifer as well as the upper. Injection wells have the same benefits as recharge basins, but they pose a vastly different set of challenges. Injection wells are not as limited by available land due to their small footprint and are not affected by evaporation losses. They are dependent on soil types for recharge rates, but not in the same way as recharge basins. Challenges unique to injection wells are the need to treat surface water prior to injection to protect aquifer water quality, variations in recharge rates due to differing water quality, the dangers of air content between injected water and groundwater, and the time and budget challenges associated with additional permitting. Existing water wells may be useable for retrofitting to injections wells.	X	X	X		As-needed to meet SMCs and address groundwater deficit; likely after 2035	Public noticing as part of CEQA	CEQA	Not yet initiated

Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
Tier 1 - Management Actions (Implemented Prior to 2025)														
ALL-1	**GSA Well Permitting and Metering**	Ongoing	2021					X	X	N/A	Authority as a GSA under Governor Newsom's Executive Order N-7-22	$5,000 / well (Metering)	TBD	Well permit application fees (permitting); GSAs/Districts (metering)
ALL-2	**Well Cataloging**	Ongoing	2021					X	X	N/A	N/A	$50,000	$5,000	GSAs/Districts
AWD-1 / NDM-1	**Groundwater Extraction Fees / Incentives for Surface Water Use**	Ongoing	2020		TBD					N/A	Authority of GSA under SGMA to develop and implement the GSP	$0	TBD	AWD/DPWD
CDM-1	**Revision to Tranquility Irrigation District Lower Aquifer Pumping**	Ongoing; Operations established on an annual basis	2017		5,000 - 7,000 AFY					N/A	Existing authority	$0	$0	N/A
NDM-2	**Drought Contingency Planning in Urban Areas**	Ongoing	2020		TBD			X		N/A	Authority of Urban Water supplies to implement the UWMP	TBD	TBD	City of Patterson
SJREC-1	**Groundwater Allocations - Madera County GSA**	Ongoing	2021		Included in the Basin-wide Pumping Reduction Plan (ALL-2)				X	N/A	Authority of GSA under SGMA to develop and implement the GSP	$0	$0	N/A
SJREC-2	**Private Well Pumping for Credits**	Ongoing	Ongoing					X		N/A	Existing authority	$0	$0	N/A
SJREC-3	**Mitigation for Migration of Shallow Saline Groundwater**	Ongoing	Ongoing			X				N/A	Existing authority	N/A	N/A	FCWD / CCID
SJREC-4	**Annual Groundwater Assessment Report**	Ongoing	Ongoing						X	N/A	N/A	$0	$10,000	SJREC

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P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
Tier 1 - Projects (Implemented Prior to 2025)														
AWD-2	**San Joaquin River and Chowchilla Bypass Flood Water**	Temporary permit granted in 2023	2023	up to 10,000 AFY during wet years		X	X	X		San Joaquin River flood flows (via the Chowchilla Bypass)	SWRCB Approval of Right to Appropriate Water	Temporary Water Rights Application: $6,000 Permanent Water Rights Application: $150,850	Temporary Water Rights Renewal: $3,500 / year Permanent Water Rights fees: $225 / year	AWD
AWD-3	**Chowchilla Bypass Recharge Facility**	2020	2023	up to 10,000 AFY recharge in wet years (same supply as AWD-2)	250 AFY from retirement of agricultural land		X	X		San Joaquin River flood waters (via the Chowchilla Bypass)	Land acquisition; easements for new turnouts; agreement from CVFPB and USACE to construction turnout in the Bypass levee system; SWRCB appropriative water rights	$5-10 Million	$80,000	AWD; Grants
CDM-2 / GWD-1 / SJREC-5	**Los Banos Creek Diversion Facility**	Completed in 2017	2017	7,000 AFY			X	X		Los Banos Creek Watershed	Existing authority	$3,100,000	$1,000	CCID / GWD / SLWD
CDM-3 / GWD-2 / SJREC-6	**Los Banos Creek Storage Project**	2025	2025	8,000 AF of storage			X	X		Conserved water or groundwater	Existing authority	$3,900,000	TBD	SGM Program SGMA Implementation – Round 1 Grant
GWD-3	**North Grassland Water Conservation and Water Quality Control Project**	Construction of enhacements anticipated complete in 2026	2020	16,000 AFY (current); additional 14,000 AFY beginning in 2026		X	X	X		Recirculation of GWD conveyance system and maintenance flows	Existing authority	$17,700,000	$700,000	GWD

Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
GWD-4 / NDM-3	**North Valley Regional Recycled Water Program - Modesto and Early Turlock Years**	2017	Beginning in 2017; increasing benefits through 2040	27,000 AFY (2023) to 59,000 AFY (2040)				X		Municipal wastewater and stormwater from the Cities of Ceres, Turlock, and Modesto	Existing authority	$96,000,000	$1,400,000	Grant funding (Clean Water State Revolving Fund; Water Recycling Funding Program; Title XVI-WIIN; CNRA Prop 1 and USBR)
NDM-4 / SJREC-7	**Orestimba Creek Recharge and Recovery Project**	2025	2025	up to 7,500 AFY of recharge for each project partner in wet years	250 AFY from retirement of agricultural land	X	X	X		Orestimba Creek flood flows, Section 215 contract water	Existing authority	$15,000,000	$500,000	Grant funding (IRWM Grant Program; SWRCB Stormwater Grant Program, USBR); DPWD; CCID
SJREC-8	**Red Top Area Subsidence Mitigation**	2017	2017	5,000 AFY (outside of the Basin)						Surface Supplies from CCID's Poso Canal	Existing authority	$1,125,000	$0	SJREC
Tier 2 - Management Actions (Implemented by 2030)														
ALL-3	**Basin-wide Pumping Reduction Plan**	2025	2030		42,000 AFY					N/A	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	All GSAs
AWD-4	**Fallowing and Crop Conversion**	2025	2030		Included in ALL-3	X				N/A	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	AWD

Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
Tier 2 - Projects (Implemented by 2030)														
CDM-4 / SJREC-9	**Los Banos Creek Recharge and Recovery Project**	2027	2027	2,000 AFY during Shasta Non-Critical Years		X	X	X		Los Banos Creek flood flows; surplus irrigation supply	Existing authority	$9,116,374	$5,000	SGM Program SGMA Implementation – Round 1 Grant
CDM-5	**Ortigalita Creek Groundwater Recharge and Recovery Project**	2026	2026	up to 16,000 AFY of recharge in wet years		X	X	X		Storm water; surplus supplies available to SLWD	Existing authority	$6,466,200	TBD	Grant funding (USBR); SLWD
CDM-6	**Kaljian Drainwater Reuse Project**	2025	2026	1,200 AFY		X	X	X		San Joaquin River and Kings River flood waters	Existing authority	$16,500,000	TBD	Grant funding (USBR); SLWD
GWD-5	**Basins and Storm Water Capture Project**	2025	2025	500 AFY of recharge in wet years		X	X	X		Excess water from local precipitation	Authorization from USBR	$3,200,000	$20/AF	GWD
NDM-5	**WSID Lateral 4-North Recapture and Recirculation Reservoir**	2025	2025	1,800 AFY of recapture; 270 AFY recharge		X		X		Operational spill	Existing authority	$5,200,000	$15,000	SGM Program SGMA Implementation – Round 1 Grant
NDM-6	**WSID Lateral 4-South Recapture and Recirculation Reservoir**	2026	2026	1,800 AFY of recapture; 270 AFY recharge		X		X		Operational spill, CVP Supplies	Existing authority	$5,200,000	$15,000	State Grant Funds (TBD)
NDM-7	**PID Groundwater Bank and/or Flood-Managed Aquifer Recharge (MAR)-type Project**	2029	2029	up to 3,000 AFY recharge in wet years		X	X	X		Surplus surface water from the San Joaquin River (pre-1914 water rights)	Existing authority	$3,286,000	N/A	PID; Grant funding (TBD)
NDM-8	**East-West Conveyance Project**	2027	2029	Increase in capacity to provide up to an additional 120,000 AFY of supply in wet years				X		San Joaquin River (pre-1914 water rights)	Existing authority	$69,000,000	$2,000,000	Federal Inflation Reduction Act funding ($40M), Proposition 1 ($2.9M), California General Fund Appropriations ($5M), PID ($21M)

Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary									
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring				Capital Costs	On-going Costs	Potential Funding Source(s)
SJREC-10	**City of Los Banos Wastewater Treatment Facility Tertiary Upgrade**	2028	2030	7,000 AFY		X		X			Wastewater from the City of Los Banos	Existing authority	$80,000,000	$2,000,000	City
Tier 3 - Projects (Implemented by 2040)															
NDM-9	**Little Salado Creek Groundwater Recharge and Flood Control Basin**	2032	2032	up to 489 AFY recharge in wet years		X	X	X			Little Salado Creek flood flows	Existing authority	$7,710,000	TBD	State Grant Funds (TBD); Local Funds
NDM-10	**City of Patterson Percolation Ponds for Stormwater Capture and Recharge**	2 years for design and permitting, pending available funding	2035	1,700 AFY				X			Stormwater from Del Puerto Creek	Existing authority	$7,800,000	TBD	State Grant Funds (TBD); City of Patterson
NDM-11	**Del Puerto Canyon Reservoir Project**	Permitting and final design anticipated completion in 2024; construction completion in 2035	2035	up to 35,570 AFY in wet years			X	X			CVP supplies; flood flows from Del Puerto Creek	Existing authority	$1,000,000,000	TBD	WIIN Grant Program; DPWD; SJREC
SJREC-11	**BB Limited Groundwater Recharge and Recovery**	2030	2030	up to 4,000 AFY recharge in wet years			X	X			SJREC surface supplies; Kings River and/or San Joaquin River flood flows	Existing authority	$600,000	$2,000	SJREC
SJREC-12	**City of Los Banos Stormwater Management Master Plan**	2030	2035	10,000 AFY			X	X			Stormwater capture (precipitation)	Existing authority	$5,000,000	$300,000	City
Tier 4 Management Actions (Implemented After 2040 or As-Needed)															
AWD-5	**Incentivize On-Farm irrigation Efficiency Improvements**	TBD	TBD		TBD						N/A	Authority of GSA under SGMA to develop and implement the GSP	$50,000	N/A	AWD
AWD-6	**Internal Groundwater Marketing Program**	TBD	TBD		TBD						N/A	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	AWD

Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
CDM-7 / NDM-12	**Maximizing Use of Other Water Supplies**	TBD	TBD		TBD	X	X	X		Surplus surface water, recycled water, stormwater, and/or tile drain water would be used to offset groundwater deficits	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	Local funds
CDM-8 / NDM-13	**Rotational Fallowing of Crop Lands**	TBD	TBD		TBD	X				N/A	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	Local Funds
CDM-9 / NDM-14	**Groundwater Extraction Fee with Land Use Modifications**	TBD	TBD		TBD					N/A	Authority of GSA under SGMA to develop and implement the GSP	$0	$0	N/A
GWD-6	**Increasing Access to Excess Non-CVP Surface Water**	TBD	TBD	2,000 AFY						TBD	Existing authority	TBD	TBD	Grasslands GSA and MCDMGSA
GWD-7	**Canal Improvements**	TBD	TBD	5,000 AFY						TBD	Existing authority	TBD	TBD	Grasslands GSA and MCDMGSA
GWD-8	**Require Developments to Prove Sustainable Water Supplies**	TBD	TBD						X	N/A	Authority of GSA under SGMA to develop and implement the GSP	TBD	TBD	Grasslands GSA and MCDMGSA
GWD-9	**Recharge Estimation Methods**	TBD	TBD						X	N/A	N/A	TBD	TBD	Grasslands GSA and MCDMGSA
NDM-15	**City of Patterson Reduced Groundwater Use Portfolio**	TBD	TBD		TBD			X		TBD	Existing authority	TBD	TBD	City of Patterson
Tier 4 Projects (Implemented After 2040 or As-Needed)														
AWD-7	**USBR 215 Flood Water**	TBD	First wet year after water rights are granted	TBD			X	X		Section 215 water (non-storable water)	Section 215 water contract with USBR	TBD	Market water rate	AWD
AWD-8	**Banking Out-of-District Water**	TBD	TBD	TBD				X		Out-of-District water	Existing authority	TBD	TBD	AWD

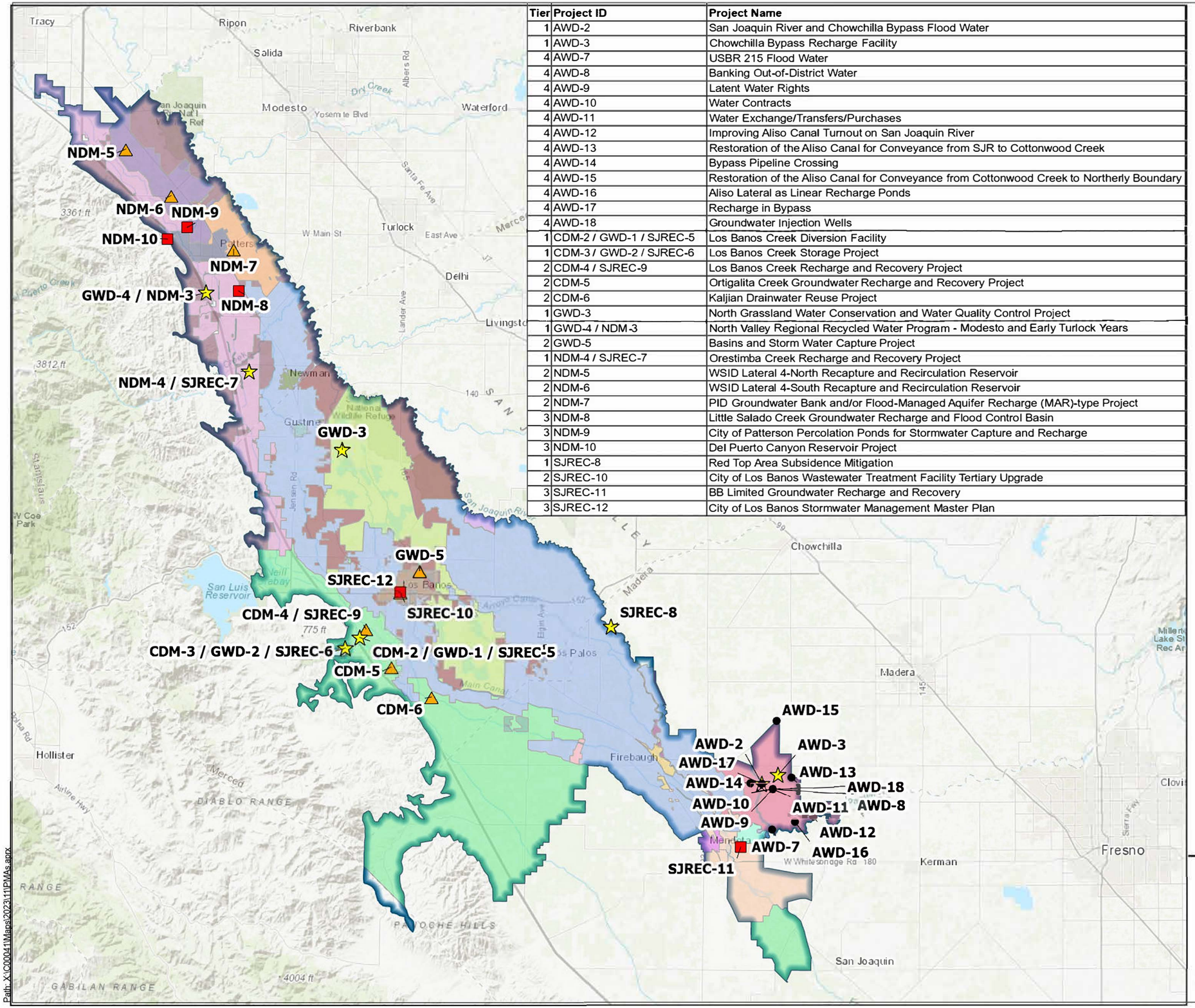
Table PMA-2. Expected Benefits, Water Source, and Costs

P/MA Number	P/MA Name	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits						Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
				Primary		Secondary								
				Water Supply Augmentation	Water Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility	Data Gap Filling/ Monitoring			Capital Costs	On-going Costs	Potential Funding Source(s)
AWD-9	**Latent Water Rights**	TBD	If/when latent water rights are established	TBD						Latent water rights	N/A	Approximately $50,000	None	AWD
AWD-10	**Water Contracts**	TBD	First year after contract is established	TBD						CVP supplies	CVP contract	TBD	Market water rate	AWD
AWD-11	**Water Exchange/Transfers/Purchases**	TBD	First year after agreements are established	TBD						Out-of-District water	Agreements with other water districts and/or agencies	TBD	Market water rate	AWD
AWD-12	**Improving Aliso Canal Turnout on San Joaquin River**	TBD	TBD, Pending turnout improvements	TBD						San Joaquin River	Easments and permits	$1,000,000	TBD	AWD; Grants (TBD)
AWD-13	**Restoration of the Aliso Canal for Conveyance from SJR to Cottonwood Creek**	TBD	TBD, Pending turnout improvements	TBD						San Joaquin River (via the Aliso Canal)	Landowner partnerships	$5-10 Million	TBD	AWD; Grants (TBD)
AWD-14	**Bypass Pipeline Crossing**	TBD	TBD, Pending water agreements	TBD						Mendota Pool	Easments and permits	$1-5 Million	TBD	AWD; Grants (TBD)
AWD-15	**Restoration of the Aliso Canal for Conveyance from Cottonwood Creek to Northerly Boundary**	TBD	TBD	TBD						San Joaquin River (via the Aliso Canal)	Landowner partnerships	$5-10 Million	TBD	AWD; Grants (TBD)
AWD-16	**Aliso Lateral as Linear Recharge Ponds**	TBD	TBD	TBD				X		Non-flood source (TBD)	Landowner partnerships	$0	TBD	AWD
AWD-17	**Recharge in Bypass**	TBD	TBD	TBD				X		Non-flood source (TBD)	Agency Partnership	$0	TBD	AWD; Grants (TBD)
AWD-18	**Groundwater Injection Wells**	As-needed to meet SMCs and address groundwater deficit; likely after 2035	As-needed to meet SMCs and address groundwater deficit; likely after 2035	TBD				X		TBD	RWQCB permits	$1-5 Million	TBD	AWD; Grants (TBD)

Table PMA-2. Expected Benefits, Water Source, and Costs

Abbreviations

AF = acre-feet
AFY = acre-feet per year
AWD = Aliso Water District
CCID = Central California Irrigation District
CEQA = California Environmental Quality Act
CNRA = California Natural Resources Agency
CVFPB = Central Valley Flood Protection Board
CVP = Central Valley Project
CWSRF = Clean Water State Revolving Fund
DMR = California Division of Mine Reclamation
DPWD = Del Puerto Water District
FCWD = Firebaugh Canal Water District
FEMA = Federal Emergency Management Agency
GSA = Groundwater Sustainability Agency
GSP = Groundwater Sustainability Plan
GWD = Grasslands Water District
IRWM = Integrated Regional Water Management
MCDMGSA = Merced County - Delta-Mendota GSA
N/A = Not Applicable
NEPA = National Environmental Protection Act
PID = Patterson Irrigation District
P/MA = Projects and Management Actions
RMW = Representative Monitoring Well
RWQCB = Regional Water Quality Control Board
SAGBI = Soil Agricultural Groundwater Banking Index
SLWD = San Luis Water District
SMC = Sustainable Management Criteria
SGM = Sustainable Groundwater Management
SGMA = Sustainable Groundwater Management Act
SJREC = San Joaquin River Exchange Contractors
SWRCB = State Water Resources Control Board
TBD = To Be Determined
UWMP = Urban Water Management Plan
WIIN = Water Infrastructure Improvements for the Nation
USACE = United States Army Corps of Engineers
USBR = United States Bureau of Reclamation
WSID = West Stanislaus Irrigation District
WY = Water Year



Tier	Project ID	Project Name
1	AWD-2	San Joaquin River and Chowchilla Bypass Flood Water
1	AWD-3	Chowchilla Bypass Recharge Facility
4	AWD-7	USBR 215 Flood Water
4	AWD-8	Banking Out-of-District Water
4	AWD-9	Latent Water Rights
4	AWD-10	Water Contracts
4	AWD-11	Water Exchange/Transfers/Purchases
4	AWD-12	Improving Aliso Canal Turnout on San Joaquin River
4	AWD-13	Restoration of the Aliso Canal for Conveyance from SJR to Cottonwood Creek
4	AWD-14	Bypass Pipeline Crossing
4	AWD-15	Restoration of the Aliso Canal for Conveyance from Cottonwood Creek to Northerly Boundary
4	AWD-16	Aliso Lateral as Linear Recharge Ponds
4	AWD-17	Recharge in Bypass
4	AWD-18	Groundwater Injection Wells
1	CDM-2 / GWD-1 / SJREC-5	Los Banos Creek Diversion Facility
1	CDM-3 / GWD-2 / SJREC-6	Los Banos Creek Storage Project
2	CDM-4 / SJREC-9	Los Banos Creek Recharge and Recovery Project
2	CDM-5	Ortigalita Creek Groundwater Recharge and Recovery Project
2	CDM-6	Kaljian Drainwater Reuse Project
1	GWD-3	North Grassland Water Conservation and Water Quality Control Project
1	GWD-4 / NDM-3	North Valley Regional Recycled Water Program - Modesto and Early Turlock Years
2	GWD-5	Basins and Storm Water Capture Project
1	NDM-4 / SJREC-7	Orestimba Creek Recharge and Recovery Project
2	NDM-5	WSID Lateral 4-North Recapture and Recirculation Reservoir
2	NDM-6	WSID Lateral 4-South Recapture and Recirculation Reservoir
2	NDM-7	PID Groundwater Bank and/or Flood-Managed Aquifer Recharge (MAR)-type Project
3	NDM-8	Little Salado Creek Groundwater Recharge and Flood Control Basin
3	NDM-9	City of Patterson Percolation Ponds for Stormwater Capture and Recharge
3	NDM-10	Del Puerto Canyon Reservoir Project
1	SJREC-8	Red Top Area Subsidence Mitigation
2	SJREC-10	City of Los Banos Wastewater Treatment Facility Tertiary Upgrade
3	SJREC-11	BB Limited Groundwater Recharge and Recovery
3	SJREC-12	City of Los Banos Stormwater Management Master Plan

Legend

Delta-Mendota Subbasin (DWR Basin No. 5-022.07)

Planned Projects

- Tier 1 (Implemented by 2025)
- Tier 2 (Implemented by 2030)
- Tier 3 (Implemented by 2040)
- Tier 4 (Implemented As-Needed)

GSA

- Aliso Water District
- Central Delta-Mendota Region Multi-Agency GSA
- City of Dos Palos GSA
- City of Firebaugh
- City of Gustine
- City of Los Banos
- City of Mendota
- City of Newman
- City of Patterson
- County of Madera
- DM-II
- Farmers Water District
- Fresno County
- Grasslands Groundwater Sustainability Agency
- Merced County
- Northwestern Delta-Mendota GSA
- Ora Loma Water District
- Patterson Irrigation District
- San Joaquin River Exchange Contractors Water Authority
- Turner Island Water District
- West Stanislaus Irrigation District
- Widren Water District GSA

Abbreviations

DWR = California Department of Water Resources
GSA = Groundwater Sustainability Agency

Sources

1. Groundwater basins and subbasins. California Department of Water Resources. August 25, 2023.
2. If accommodation or alternative format is needed for this figure, please contact the Plan Manager for assistance.

Notes

1. Projects without known locations are shown at the centroid of the applicable GSA.
2. Management Actions are applied to the entire Basin or GSA and therefore are not shown on this map.

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Projects in the Delta-Mendota Subbasin

eki environment & water

Delta-Mendota Subbasin
July 2024
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Figure PMA-1