

## **INFORMATION ITEM**

### **Sustainable Groundwater Management and the Delta Plan**

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**Summary:** The Council's 2020-2021 priorities includes implementation of Delta Plan Five-Year Review recommendations, one of which is to develop strategies and approaches for outreach, engagement, and collaboration with agencies implementing Delta Plan recommendations. Today, a panel of representatives from the Department of Water Resources (DWR) and the State Water Resources Control Board (Water Board) will present a high-level overview of the Sustainable Groundwater Management Act (SGMA), which implements Delta Plan recommendations regarding groundwater sustainability and reduced reliance on the Delta. Council staff will also present recent analyses of projects and management actions described in Groundwater Sustainability Plans prepared in response to SGMA, identifying implications for the Delta.

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#### **BACKGROUND**

Historically, in California's semi-arid Mediterranean climate, where access to river flows and surface water are limited, urban and agricultural water uses required alternative sources of water. To move surface water to developing areas like Southern California and San Francisco from distant sources, aqueducts were constructed in the early 19<sup>th</sup> century, including the Los Angeles<sup>1</sup> and Hetch Hetchy<sup>2</sup> aqueducts. These types of projects were both costly and time-consuming. By comparison, groundwater represented both a more accessible and less expensive water source. Many landowners could access groundwater beneath their land using wells and pumps, and their land rights included the right to pump water from underground aquifers directly.

Prior to SGMA, State regulations regarding groundwater focused on water quality and well standards and only required that pumped groundwater be put to "beneficial use." In general, groundwater use has not historically been reported to the Water Board or another state agency.

Today, groundwater use is estimated to comprise 40 percent of the State's total supply in a typical year, increasing to 60 percent in dry years<sup>3</sup>. Groundwater use typically

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<sup>1</sup> LADWP. 2013. Los Angeles Department of Water and Power.  
[https://www.ladwp.com/ladwp/faces/wcnav\\_externalId/a-w-fact-hist?\\_adf.ctrl-state=qjoc0f4l1\\_4&\\_afLoop=40472691142551](https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-w-fact-hist?_adf.ctrl-state=qjoc0f4l1_4&_afLoop=40472691142551)

<sup>2</sup> SFPUC. 2013. Services of San Francisco Public Utility Commission.  
<https://sfwater.org/modules/showdocument.aspx?documentid=84>

<sup>3</sup>Water Board. 2018. State Water Resources Control Board  
[https://www.waterboards.ca.gov/water\\_issues/programs/groundwater/issue\\_supply.html#:~:text=Groundwater%20resources%20play%20a%20vital%20role%20in%20maintaining,against%20the%20impacts%20of%20drought%20and%20climate%20change](https://www.waterboards.ca.gov/water_issues/programs/groundwater/issue_supply.html#:~:text=Groundwater%20resources%20play%20a%20vital%20role%20in%20maintaining,against%20the%20impacts%20of%20drought%20and%20climate%20change)

increases when surface water is not readily available, such as when allocations are lowered due to drought.

Overdraft of groundwater (both during droughts and through normal operations) has been linked to several undesirable conditions in California, including land subsidence, declining groundwater levels, reduced groundwater storage capacity, water quality degradation, depletions in interconnected surface water, and seawater intrusion in coastal basins. For example, in the 1950s the U.S. Geological Survey (USGS) determined that subsidence in the Central Valley was the result of large withdrawals of subsurface groundwater. In the community of Mendota, ground levels sunk about 30 feet between 1925 and 1977.<sup>4</sup> Subsidence in California is also linked to other negative consequences such as alteration of water conveyance channels (including the Delta-Mendota Canal<sup>5</sup>), increased potential for flooding, cracking of irrigation canals, underground infrastructure inefficiencies and failures, and damage to roads and bridges.<sup>6</sup>

During and following the recent drought years of 2012-2016, the State took several actions to address drought conditions. Governor Jerry Brown issued a number of emergency executive orders<sup>7</sup> to prepare the State for drought conditions as State Water Project (SWP) allocations<sup>8</sup> were lowered from 65 percent in 2012, to 35 percent in 2013, 5 percent in 2014, and 20 percent in 2015, before returning to 60 percent in 2016. During the drought period, increased groundwater use in the Central Valley led to decreased aquifer levels, increased subsidence and rates of subsidence, and unintended consequences to water infrastructure from subsidence.<sup>9</sup> It became clear that California needed to better understand the water balance in each groundwater basin to manage water resources more sustainably. To achieve this, the State needed a new regulatory structure to manage the transition to sustainable groundwater management.

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<sup>4</sup> U.S. Geological Survey (USGS). 1975. Land Subsidence in the San Joaquin Valley, California: H20, Figure 17. <https://pubs.usgs.gov/pp/0437h/report.pdf>

<sup>5</sup> U.S. Geological Survey (USGS). 2013. Land Subsidence along the Delta-Mendota Canal in the Northern Part of the San Joaquin Valley, California. P 9. <https://pubs.usgs.gov/sir/2013/5142/pdf/sir2013-5142.pdf>

<sup>6</sup> Maven's Notebook. 2013. <https://mavensnotebook.com/2013/11/22/in-her-own-words-usgs-hydrologist-discusses-subsidence-in-the-central-valley/>

<sup>7</sup> Water Board. 2018. State Water Resources Control Board [https://www.waterboards.ca.gov/water\\_issues/programs/conservation\\_portal/executive\\_orders.html](https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/executive_orders.html)

<sup>8</sup> DWR. 2020. State Water Project, Historical Table A Allocations. <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/1996-2020-Allocation-Progression-V-1f-rev.pdf?la=en&hash=8C66CCF3E1A79A11F2D77AC9A51CCE8987B82596>

<sup>9</sup> U.S. Geological Survey (USGS). 2015. Water Availability and Land Subsidence in the Central Valley, California. <https://ca.water.usgs.gov/pubs/2015/FauntEtAl2015.pdf>

## **SUSTAINABLE GROUNDWATER MANAGEMENT ACT**

In 2014, California legislators passed three bills; AB 1739, SB 1168, and SB 1319, collectively known as the Sustainable Groundwater Management Act.<sup>10</sup> Although California groundwater levels were monitored and studied for decades, SGMA was groundbreaking because it created the first regulatory framework for sustainable management of groundwater and aquifers. SGMA provides a portfolio of tools for State and local agencies to implement and sustainably manage groundwater (see Attachment 1: SGMA Portfolio of Tools). SGMA required DWR to identify the groundwater basins in the State and categorize them into high-, medium-, low-, or very low-priority (see Attachment 2: SGMA Basins by Priority). DWR also divided the four categories into critical and non-critical classifications (see Attachment 3: SGMA Critically Over-drafted, High- and Medium-Priority Basins). SGMA established a deadline for Groundwater Sustainability Plans (GSPs) for critically over-drafted, high- and medium-priority basins to be submitted to DWR and the Water Board for review by January 31, 2020, and for GSPs for non-critically over-drafted, high- and medium-priority basins to be submitted by January 31, 2022.

The basins are managed under the authority of locally-formed and managed Groundwater Sustainability Agencies (GSAs). The GSAs must develop and implement their GSPs to achieve sustainability within a 20-year time horizon. The GSPs include potential projects and management actions, that may be implemented in the future. GSPs for critically over-drafted basins, which were submitted to DWR in January 2020, provide a first look into how locally formed GSAs plan to monitor groundwater conditions and the projects and management actions they plan to undertake to achieve groundwater sustainability by 2040. SGMA includes provisions that enable the Water Board to develop a GSP or element of a GSP if a locally developed GSP fails to meet its objectives.

## **SUSTAINABLE GROUNDWATER AND THE DELTA PLAN**

As highlighted in the Water Resilience Portfolio,<sup>11</sup> SGMA will help drive efficiency of water use and help regions secure groundwater supplies by supporting the transition to sustainable use. Achieving sustainable groundwater management will require State agencies and GSAs to coordinate and implement SGMA requirements in concert with other water management regulatory policies.

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<sup>10</sup> California Legislative Information. Water Code 10720 to 10737.8 et seq.

[http://leginfo.legislature.ca.gov/faces/codes\\_displayexpandedbranch.xhtml?tocCode=WAT&division=6.&title=&part=2.74.&chapter=&article=](http://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=WAT&division=6.&title=&part=2.74.&chapter=&article=)

<sup>11</sup> California Natural Resources Agency (CNRA). 2020. Water Resilience Portfolio.

[https://waterresilience.ca.gov/wp-content/uploads/2020/07/Final\\_California-Water-Resilience-Portfolio-2020\\_ADA3\\_v2\\_ay11-opt.pdf](https://waterresilience.ca.gov/wp-content/uploads/2020/07/Final_California-Water-Resilience-Portfolio-2020_ADA3_v2_ay11-opt.pdf)

*Improving Groundwater Management*

The Delta Plan addresses groundwater management in Chapter 3, [\*A More Reliable Water Supply for California\*](#), where *Improve Groundwater Management* is one of the core water management strategies. The Council envisions the achievement of the coequal goals to include sustainably managing groundwater resources, expanding groundwater storage, and eliminating critical overdraft of groundwater basins.

The core strategy includes the following recommendations, which were adopted by the Council in 2013, prior to SGMA:

- **WR R9.** *Update Bulletin 118, California's Groundwater Plan.*
- **WR R10.** *Implement Groundwater Management Plans in Areas that Receive Water from the Delta Watershed.*
- **WR R11.** *Recover and Manage Critically Over-Drafted Groundwater Basins.*

Bulletin 118 is a report published by the Department of Water Resources that provides critical conditions of overdraft, basin boundaries, and basin priorities to support SGMA implementation. The Bulletin 118 update described in WR R9 was published in December 2016. Bulletin 118 will be updated again in 2020 and every five years thereafter. SGMA required GSAs for critically over-drafted basins to submit GSPs to DWR and the Water Board for review by January 31, 2020. When GSPs for non-critically over-drafted basins are submitted by January 31, 2022, Delta Plan Recommendation WR R10 will be fulfilled.

Implementation of GSPs for critically over-drafted and non-critically over-drafted basins aligns with Delta Plan Recommendation WR R11. Projects and management actions proposed in these GSPs will be important to understand and monitor. They will likely have impacts on the Delta as most of these basins lie within the Delta watershed and Delta water export area (see Attachments 2 and 3).

*Improving Conveyance, Expanding Storage, and Improving the Operations of Both for Groundwater Management*

Another Delta Plan Chapter 3 core water management strategy, *Improve Conveyance, Expand Storage, and Improve the Operation of Both*, includes the following recommendations which were adopted by the Council in 2018 (after SGMA). While broad in scope and applicability, each of these recommendations promotes one or more aspects of groundwater management that are also embedded in SGMA.

- **WR R12d.** *Promote Options for New or Expanded Water Storage*
- **WR R12f.** *Implement New or Expanded Groundwater Storage*
- **WR R12g.** *Promote Options for Operations of Storage and Conveyance Facilities*

- **WR R12h.** *Operate Delta Water Management Facilities Using Adaptive Management Principles*
- **WR R12j.** *Operate New or Improved Conveyance and Diversion Facilities Outside of the Delta*

Proposition 1 - the Water Quality, Supply, and Infrastructure Improvement Act of 2014 - funded a number of projects under the Water Storage Investment Program that identify groundwater recharge, storage, and conjunctive use benefits (see Attachment 4: Water Storage Investment Program Projects Providing Groundwater Recharge, Storage, and Conjunctive Use Benefits).

### **GROUNDWATER SUSTAINABILITY IMPACTS ON THE DELTA**

Achieving groundwater sustainability through SGMA relates to the Delta because water exported from the Delta and diverted from the Delta watershed represents a potential source of water supply needed by GSAs to sustainably manage aquifers. Projects, plans, or programs meeting the definition of a covered action that involve water that would be exported from, transferred through, or used in the Delta could trigger consideration of Delta Plan Regulatory Policy WR P1. In addition, increased diversions of water from the Delta watershed could have negative impacts on the Delta and the coequal goals.

Water managers and GSAs implementing GSPs now and in the future must balance priorities for groundwater sustainability, regional self-reliance, and reduced reliance on the Delta. As Chair Tatayon wrote in a June 2019 blog, "(n)ot only does the State's most significant groundwater use occur in regions that also rely upon water from the Delta watershed, reduced reliance on the Delta and improved regional self-reliance are central to many of the goals outlined in the...Delta Plan...Over the next 20 years, we'll have valuable opportunities to learn more about how our water storage systems can work together to create a more sustainable, resilient statewide water supply and to reduce reliance on the Delta."<sup>12</sup>

In June 2020, the Public Policy Institute of California (PPIC) published a commentary on "How to address groundwater planning gaps," analyzing GSPs submitted to DWR by the GSAs responsible for 21 critically over-drafted basins.<sup>13</sup> PPIC found that these GSPs focused more on supply needs than on reducing demands, and that the projected cumulative water demand needed to support proposed projects and management actions identified in GSPs for critically over-drafted basins appears to exceed available surface water supplies.<sup>14</sup> Council staff also reviewed projects and management actions

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<sup>12</sup> Tatayon 2019. *What Does Groundwater Have to Do with the Delta? – A Lot*. Delta Stewardship Council. <https://deltacouncil.ca.gov/blogs/what-does-groundwater-have-to-do-with-the-delta-a-lot>

<sup>13</sup> <https://www.ppic.org/blog/commentary-how-to-address-groundwater-planning-gaps/>

<sup>14</sup> PPIC. 2020. A Review of Groundwater Sustainability Plans in the San Joaquin Valley, Public comments submitted to the California Department of Water Resources. <https://www.ppic.org/wp-content/uploads/ppic-review-of-groundwater-sustainability-plans-in-the-san-joaquin-valley.pdf>

proposed within these same basins that could involve increased use of water diverted from the Delta watershed or exported from the Delta. Staff found that proposals for increased water transfers and stormwater capture projects are included in most GSPs.

When considered together, the scale of the water needed to support projects and management actions proposed in the GSPs submitted to DWR to date raises concerns about Delta impacts. Council staff will continue to monitor and report on developments and implementation of SGMA, including engaging with DWR and the Water Board at key SGMA milestones (e.g., January 2022 when non-critically over-drafted basin plans are due). Staff will periodically report to the Council as additional information becomes available and as additional analysis is completed.

### **TODAY'S MEETING**

At today's meeting, a panel representing DWR, the Water Board, and Council staff will provide an overview of SGMA, describe ongoing coordination activities, update the Council on current implementation milestones, and describe the next steps in the SGMA process.

- Taryn Ravazzini, Deputy Director of Statewide Groundwater Management with DWR, will present an overview of SGMA, how it is implemented, and DWR's role in implementation.
- Natalie Stork, PG, Chief of the Groundwater Management Program and Senior Engineer, Geologist with the Water Board, will present the Water Board's responsibilities and authorities to implement SGMA, how the Water Board coordinates with DWR for the review of submitted GSPs, and the triggers for the Water Board's oversight responsibilities and authorities.
- Molly Williams, Sea Grant Fellow with the Council, will present recent analyses of projects and management actions described in GSPs, identifying common themes related to the Delta.

### **FISCAL INFORMATION**

Not applicable.

### **LIST OF ATTACHMENTS**

Attachment 1: Sustainable Groundwater Management Act Portfolio of Tools

Attachment 2: Sustainable Groundwater Management Act Basins by Priority

Attachment 3: Sustainable Groundwater Management Act Critically Over-drafted, High- and Medium-Priority Basins

Attachment 4: Water Storage Investment Program Projects Providing Groundwater Recharge, Storage, and Conjunctive Use Benefits

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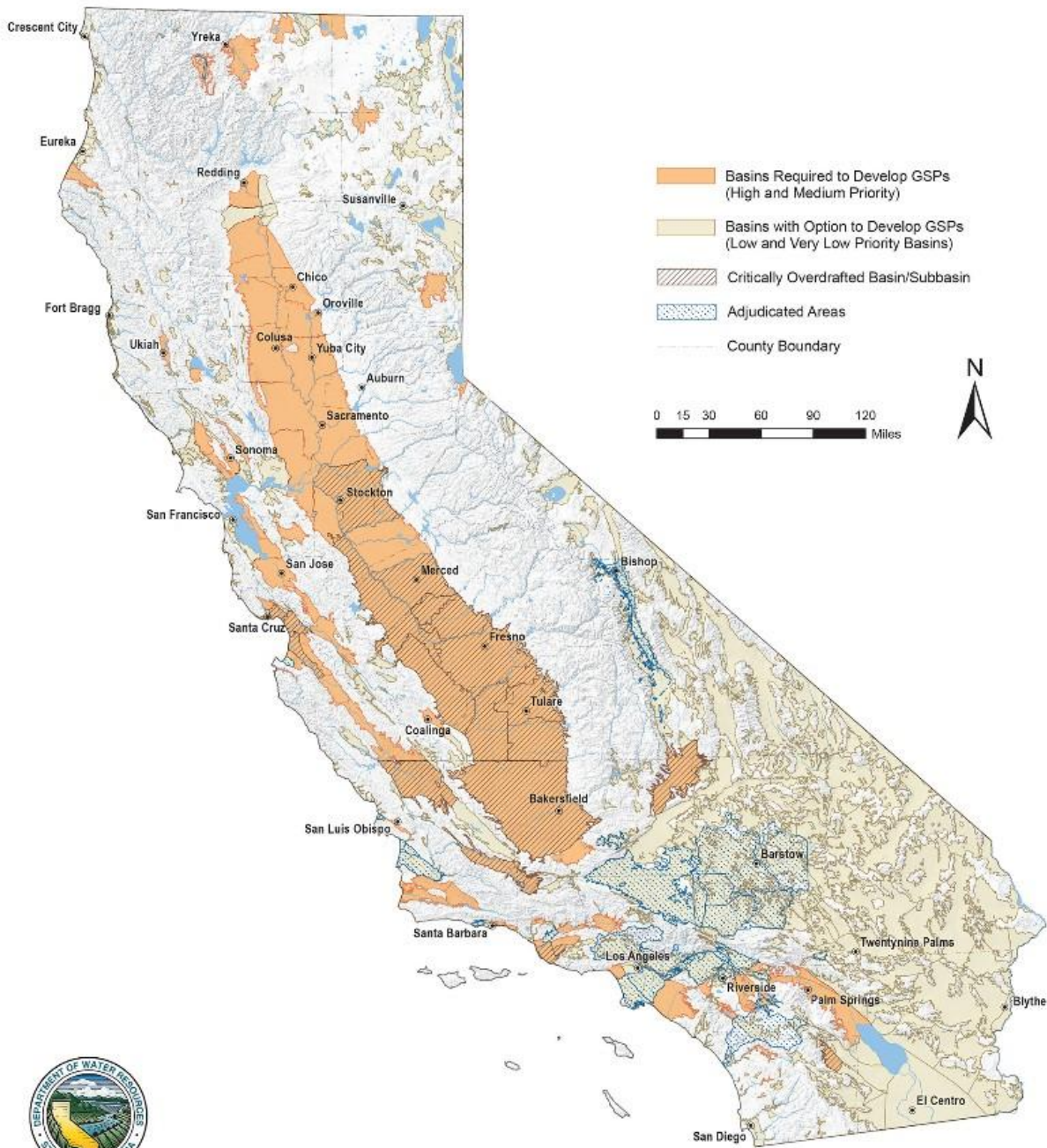
**ATTACHMENT 1: SUSTAINABLE GROUNDWATER MANAGEMENT ACT PORTFOLIO OF TOOLS**

The Sustainable Groundwater Management Act provided a portfolio of tools for State and local agencies to implement and sustainably manage groundwater, including, but not limited to, the following (responsible agency in parentheses):

- Establish new authorities, responsibilities, and funding (State and local agencies)
- Require identification of the State's aquifers, basins, and sub-basins (Department of Water Resources (DWR))
- Establish new locally-based Groundwater Sustainability Agencies (GSAs) to cover basins and sub-basins (DWR)
- Set timelines to increase State and local agencies' understanding of groundwater use and best management practices (DWR)
- Set timelines to develop Groundwater Sustainability Plans (GSPs) for critical and non-critical over-drafted basins categorized as high-, medium-, low-, or very low priority and for submittal of GSPs to DWR and the Water Board for evaluation and assessment (DWR and State Water Resources Control Board (Water Board))
- Mandate development of technical knowledge and assistance related to groundwater, aquifer recharge, soil conditions for aquifer recharge, and water availability for the replenishment of groundwater in California (DWR)
- Provide funding to assist in the development of GSAs, GSPs, and management of aquifer groundwater quality (DWR and Water Board)
- Establish GSA reporting requirements (DWR and Water Board)
- Implement GSPs by 2040 with 5-year check-ins with DWR and Water Board to guide local GSAs toward achieving groundwater sustainability (DWR, Water Board, and GSAs)
- Provide GSAs authority to impose fees within their jurisdiction to fund GSA activities and GSP implementation to control groundwater demand (GSAs)
- Establish local GSAs responsible for the implementation of GSPs and achievement of groundwater sustainability goals, with Water Board oversight if implementation and achievement of groundwater sustainability is not effectuated by the local GSA (Water Board and GSAs).
- Conduct inspections and obtain inspection warrants as needed (Water Board)
- Development of a GSP or any element of a GSP if the locally developed GSP is found to be deficient (Water Board)



ATTACHMENT 2: SUSTAINABLE GROUNDWATER MANAGEMENT ACT BASINS BY PRIORITY



Department of Water Resources, Public Affairs Office April 28, 2020

DWR SGMA Prioritization Basin map 2020-04: [https://og-production-open-data-cnra-892364687672.s3.amazonaws.com/resources/aa480726-e92c-421c-bd7c-3f2ffece1e19/sgma\\_bp\\_statewide\\_map.jpg?Signature=NkAb4dLJw2LEv%2BVL0%2BV1DFidsUc%3D&Expires=1599094114&AWSAccessKeyId=AKIAJJIENTAPKHZMIPXQ](https://og-production-open-data-cnra-892364687672.s3.amazonaws.com/resources/aa480726-e92c-421c-bd7c-3f2ffece1e19/sgma_bp_statewide_map.jpg?Signature=NkAb4dLJw2LEv%2BVL0%2BV1DFidsUc%3D&Expires=1599094114&AWSAccessKeyId=AKIAJJIENTAPKHZMIPXQ)

ATTACHMENT 3: SUSTAINABLE GROUNDWATER MANAGEMENT ACT CRITICALLY OVER-DRAFTED

## California's Critically Overdrafted Groundwater Basins



Map created from B118 Groundwater Basin Boundaries Published 02/11/2019. This map published 01/2020.

Basin/ Subbasin Number	Basin/Subbasin Name		
3-001	Santa Cruz Mid-County	5-022.06	San Joaquin Valley - Madera
3-002.01	Corralitos - Pajaro Valley*	5-022.07	San Joaquin Valley - Delta-Mendota
3-004.01	Salinas Valley - 180/400 Foot Aquifer	5-022.08	San Joaquin Valley - Kings
3-004.06	Salinas Valley - Paso Robles Area	5-022.09	San Joaquin Valley - Westside
3-008.01	Los Osos Valley - Los Osos Area**	5-022.11	San Joaquin Valley - Kaweah
3-013	Cuyama Valley	5-022.12	San Joaquin Valley - Tulare Lake
4-004.02	Santa Clara River Valley - Oxnard	5-022.13	San Joaquin Valley - Tule
4-006	Pleasant Valley	5-022.14	San Joaquin Valley - Kern County
5-022.01	San Joaquin Valley - Eastern San Joaquin	6-054	Indian Wells Valley
5-022.04	San Joaquin Valley - Merced	7-024.01	Borrego Valley - Borrego Springs
5-022.05	San Joaquin Valley - Chowchilla		

\* Approved Alternative to Groundwater Sustainability Plan  
 \*\* Adjudicated, No Groundwater Sustainability Plan Required



**ATTACHMENT 4: WATER STORAGE INVESTMENT PROGRAM PROJECTS PROVIDING GROUNDWATER RECHARGE, STORAGE, AND CONJUNCTIVE USE BENEFITS**

Proposition 1 funded projects under the Water Storage Investment Program that identify groundwater recharge, storage, and conjunctive use benefits include, but are not limited to, the following:

- The proposed Harvest Water Program includes an estimated 50,000 acre-feet of water per year of recycled water that would be made available for irrigation in lieu of groundwater.
- The proposed Kern Fan Groundwater Storage Project includes an estimated additional 100,000 acre-feet of storage capacity; up to 100,000 acre-feet of recharge capacity per year would also be created.
- The proposed Pacheco Reservoir Expansion Project includes an estimated increase in storage capacity of 130,000 acre-feet of water that can be used during water shortage emergencies reducing reliance on groundwater supplies during water shortages.
- The proposed Sites Reservoir Project includes an estimated additional 500,000 acre-feet of water that would be available to support various needs, including groundwater recharge.
- The proposed Temperance Flat Dam and Reservoir Project includes an estimated additional 1,260,000 acre-feet of water that would be available to support various needs, including groundwater recharge.
- The proposed Willow Springs Water Bank Conjunctive Use Project estimates it will store up to 500,000 acre-feet of existing groundwater storage facilities to operate conjunctively with the SWP.