



MEMORANDUM

TO: SLDMWA Board of Directors, Alternates

FROM: John Brodie, Water Resource Programs Manager
Joe McGahan, Regional Drainage/Westside Watershed Coalition Coordinator

DATE: January 13, 2022

RE: Activity Agreements – Staff Report for December 2021

This memorandum serves as the Staff Report for December 2021 regarding specified¹ Water Authority activities not separately addressed on the Board meeting agenda.

1. Integrated Regional Water Management (IRWM) Activity Summary

San Joaquin River Funding Area (SJRFA)

Approximately \$955,000 will be available to the Westside-San Joaquin (WSJ) IRWM Region within the SJRFA for the Proposition 1 Round 2 (P1R2) IRWM funding by prior agreement among the IRWM regions in the SJRFA. The Department of Water Resources (DWR) is accepting comments on the draft P1R2 Guidelines and Proposal Solicitation Package until February 8, 2022. Work continues on three projects in SJRFA from the Proposition 1 Round 1 funding, administered through SLDMWA.

Tulare-Kern Funding Area (TKFA)

The WSJ IRWM Region will also prepare an application for the P1R2 funding within the TKFA. There was no prior agreement between the IRWM regions in the TKFA on a funding split. Criteria are being developed for determining which projects in the TKFA will be submitted to DWR. A total of \$34 Million will be available across the TKFA in Round 2.

Draft documents released by DWR say the original March 31, 2022 application deadline will be updated after the comment period closes next month.

General Westside-San Joaquin Integrated Regional Water Management Plan (IRWMP)

The WSJ IRWM Region's Project Proponents and SLDMWA staff are updating the Opti database of projects. The Technical Advisory Committee will rank the projects once DWR establishes a list

¹ For the sake of completeness, this includes those Activity Agreements that have been approved by the Board of Directors, but not yet signed by all interested members and/or participants (i.e., the Los Vaqueros Expansion Project Activity Agreement, the Exchange Contractors 2019-2023 Transfer Program Activity Agreement, and the Westside-San Joaquin Integrated Regional Water Management Activity Agreement).

of priorities, eligible projects and expenses, and completion deadlines for the P1R2 funding opportunity.

Staff is working on an annual report for the WSJ IRWM Region. The report will highlight activities during the 2021 water year across the region. The targeted release date for the report is February 1, 2022.

2. Sustainable Groundwater Management Activity (SGMA) Activity Summary

Northern and Central Delta-Mendota Regions

The Northern and Central Management Committees held their regular joint meeting in mid-December. The Committees approved a strategy for cooperating with other GSP Groups in the Subbasin to apply for an anticipated \$7.6 million of SGMA Round 1 Implementation funding. Round 1 funding is targeted for critically over-drafted subbasins, including the Delta-Mendota Subbasin.

Northern and Central Representatives met with representatives from the Tracy Subbasin for an informal interbasin coordination session in early January. In addition to the draft Tracy Subbasin GSP, discussion items included goals and desired outcomes for long-term interbasin coordination and identifying a process for data and information sharing.

General SGMA Activities

DWR issued an initial "assessment" letter for its evaluation of the approach used by the six GSP Groups in the Delta-Mendota Subbasin. Unlike other similar letters issued previously by DWR's SGMA unit, this letter provided no detailed comments for local GSP Groups to use in developing strategies to bring the plans into compliance. Each Group is analyzing its own GSP to identify possible areas where DWR might deem them insufficient, based on letters previously issued by DWR to other subbasins.

DWR did say the Delta-Mendota Subbasin's GSPs will be deemed "inadequate" when the the official evaluation is released later this month. The Subbasin will have six months from the official evaluation release date to submit satisfactory plans or risk implementation intervention from the State Water Resources Control Board.

The Subbasin's GSP Group representatives are working on project activities to submit for the upcoming SGMA Round 1 Implementation funding opportunity. The funds are from SB 170 and will be administered by DWR. Funding applications are due to DWR by 12 noon on February 18, 2022. Allowable activities include projects and preparing responses to DWR comments on the Subbasin's GSPs. Per the adopted guidelines, one GSA must submit a single application on behalf of the entire Subbasin.

Work is in the final stages for the Subbasin's Proposition 68 Sustainable Groundwater Management (SGM) grant. Both a well census and inventory project and a Subbasin-wide subsidence characterization and project feasibility study will be completed by the end of the fiscal year. The consultant conducting the Delta-Mendota Subbasin Subsidence Characterization and Project Feasibility Study will hold the second of a possible three presentations to a special

Technical Working Group meeting in late January. Information from each GSP Group's well census and inventory project will be used in the Subsidence Study.

All GSAs and member agencies worked with staff to upload Fall water level monitoring results to DWR's SGMA Portal prior to the January 1, 2022 deadline. Staff is also working with GSAs to complete volumetric reporting information as part of the Subbasin's Annual Report information. The SGMA Annual Report is due April 1, 2022.

3. Drainage Activity Summary

Grassland Basin Drainage Management Steering Committee Activity Summary

Mud Slough Restoration Project: The project is to restore Mud Slough (north) flows to the Newman Lake north of Highway 140 and to remove structures within the state's China Island Refuge. The CEQA Initial Study was circulated for public comment on June, 30, 2021 and comments were due on July 30, 2021. Comments were received from the State Water Resources Control Board Division of Water Rights, the California Department of Fish and Wildlife and a group of 18 parties comprised of the Planning and Conservation League and others. Consultants have reviewed the comments. The Grassland Basin Drainers Steering Committee reviewed the comments and responses on November 19, 2021 and, recommended adoption of the Final Mitigated Negative Declaration and Project Approval by the Authority at the December 9, 2021 meeting, which was adopted.

Threat to Fish Report: The GBD were required to submit a report on July 31, 2021 under Section 13267 of the California Water Code that would include all data available on fish tissue sampling since the beginning of the Grassland Bypass Project since 1996. Comments were received by the Regional Board and responses are being prepared.

Other ongoing activities: Continue to review GBD invoices, prepare annual monitoring reports, support for ongoing litigation and data management and management of the Third Party Group for the Grassland Drainage Area Coalition to implement the Irrigated Lands Regulatory Program. Work includes participation in activities for groundwater protection values. Additionally, the program updated the Regional Board on the status of the GBP at the December 9, 2021 Board workshop and is working with the subcommittee overseeing expenditure of the supplemental mitigation fund. Coordinate response to rainfall events regarding possible discharges to the GBP. No discharges were required.

San Joaquin Valley Drainage Authority Activity Summary

Continue management of the Westside San Joaquin River Watershed Coalition to comply with the Irrigated Lands Regulatory Program. Follow up calls and emails were answered to assist farmers in completing their paperwork requirements. Manage field monitoring program and provide update of the management plan to the Regional Board. Review invoices from consultants and prepare letters to admin staff. Continue to update membership database. Organize and make presentation to outreach meetings for surface and groundwater management plan. Assist grower members in completing the required reporting forms and self-certification requirements. Enter farmer evaluation and nitrogen summary reports into coalition database.

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Participate in group conference calls regarding surface and groundwater management plans, groundwater protection formulas and the CVSalts prioritization and optimization studies. Participate in Central Valley Groundwater Monitoring Collaborative conference calls. Participate in Regional Board quarterly conference calls.

Begin planning for development of Management Zone implementation. Manage ongoing monitoring. Revise the QAPP for the monitoring program.

Management continued for the Prop 84 Real Time Management Program Grant for compliance with the San Joaquin River Salt and Boron TMDL. Follow up and direct field work in northerly stations. Organize and lead September SJVDA Board meeting.

VIII. A.

Westside-San Joaquin IRWM Region
Activity Agreement Members Meeting

Tuesday, December 21, 2021, 10:00 AM

[Click here to join meeting](#)

Call-in Number: 1-669-900-6833

Meeting ID: 876 8032 3276

Passcode: 728194

AGENDA

1. Introductions
2. IRWM Proposition 1 Round 2 Funding Opportunity
 - a. Overview of Funding Opportunity
 - b. Direction from Members on Project Selection
3. Overview of Fiscal Year 2023 Draft Budget
4. Status of Proposition 1 Round 1 Projects
5. Discussion of Water Year 2021 Annual Report and Format Recommendation from TAC
6. Next Steps
7. Adjournment

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Westside San Joaquin River Watershed Coalition
Paperwork Status Update for Del Puerto WD & Oak Flat WD as of 1/25/2022

<u>Survey Type</u>	<u>recvd</u>	<u>total</u>	<u>pct recvd</u>
Farm Evaluation	124	129	96%
INMPSR	122	127	96%
Overall compliance	128	133	96%

IDNo	Member Name	SurveyType	2020 FE/MWE	2020 INMPSR	paperwork
25035A	Jag Farm Management, Inc.	Farm Evaluation	not recvd	recvd	FE Missing
25058A	Apna Farms	Farm Evaluation	not recvd	not recvd	both forms missing
25073A	JKB Development, Inc.	Farm Evaluation	not recvd	not recvd	both forms missing
25145A	NISRA Farms, LLC	Farm Evaluation	not recvd	not recvd	both forms missing
25156A	La Fortaleza LLC	Farm Evaluation	not recvd	not recvd	both forms missing
25159A	Escobar Properties LLC et al	Farm Evaluation	recvd	not recvd	INMPSR Missing

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VIII. C.



CALIFORNIA DEPARTMENT OF WATER RESOURCES

SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE

715 P Street | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

January 21, 2022

John Brodie
Delta-Mendota Subbasin Point of Contact
San Luis & Delta-Mendota Water Authority
842 6th Street
Los Banos, CA 93635
john.brodie@sldmwa.org

RE: "Incomplete" Determination of the 2020 Groundwater Sustainability Plans Submitted for the San Joaquin Valley – Delta-Mendota Subbasin

Dear John Brodie,

The Department of Water Resources (Department) has evaluated the six groundwater sustainability plans (GSPs) submitted for the San Joaquin Valley – Delta-Mendota Subbasin (Subbasin), as well as the materials considered to be part of the required coordination agreement. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. The Department has determined that the Plan is "incomplete" pursuant to Section 355.2(e)(2) of the GSP Regulations.

The Department based its incomplete determination on recommendations from the Staff Report, included as an enclosure to the attached Statement of Findings, which describes that the Subbasin's Plan does not satisfy the objectives of the Sustainable Groundwater Management Act (SGMA) nor substantially comply with the GSP Regulations. The Staff Report also provides corrective actions which the Department recommends the Subbasin's 23 groundwater sustainability agencies (GSAs) review while determining how and whether to address the deficiencies in a coordinated manner.

The Subbasin's GSAs have 180 days, the maximum allowed by the GSP Regulations, to address the identified deficiencies. Where addressing the deficiencies requires modification of the Plan, the GSAs must adopt those modifications into their respective GSPs and all applicable coordination agreement materials, or otherwise demonstrate that those modifications are part of the Plan before resubmitting it to the Department for evaluation no later than July 20, 2022. The Department understands that much work has occurred to advance sustainable groundwater management since the GSAs submitted their GSPs in January 2020. To the extent to which those efforts are related or responsive to the Department's identified deficiencies, we encourage you to document that as part of your Plan resubmittal. The Department prepared a Frequently Asked Questions document to provide general information and guidance on the process of addressing deficiencies in an "incomplete" determination.

Department staff will work expeditiously to review the revised components of your Plan resubmittal. If the revisions sufficiently address the identified deficiencies, the Department will determine that the Plan is "approved". In that scenario, Department staff will identify additional recommended corrective actions that the GSAs should address early in implementing their GSPs (i.e., no later than the first required periodic evaluation). Among other items, those corrective actions will recommend the GSAs provide more detail on their plans and schedules to address data gaps. Those recommendations will call for significantly expanded

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documentation of the plans and schedules to implement specific projects and management actions. Regardless of those recommended corrective actions, the Department expects the first periodic evaluations, required no later than January 2025 – one-quarter of the way through the 20-year implementation period – to document significant progress toward achieving sustainable groundwater management.

If the Subbasin's GSAs cannot address the deficiencies identified in this letter by July 20, 2022, then the Department, after consultation with the State Water Resources Control Board, will determine the GSP to be "inadequate". In that scenario, the State Water Resources Control Board may identify additional deficiencies that the GSAs would need to address in the state intervention processes outlined in SGMA.

Please contact Sustainable Groundwater Management Office staff by emailing sgmps@water.ca.gov if you have any questions about the Department's assessment, implementation of your Plan, or to arrange a meeting with the Department.

Thank you,

Paul Gosselin

Paul Gosselin
Deputy Director of Sustainable Groundwater Management

Attachment: Statement of Findings Regarding the Determination of Incomplete Status of the San Joaquin Valley – Delta-Mendota Subbasin Groundwater Sustainability Plans

**STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES**

**STATEMENT OF FINDINGS REGARDING THE
DETERMINATION OF INCOMPLETE STATUS OF THE
SAN JOAQUIN VALLEY – DELTA-MENDOTA SUBBASIN
GROUNDWATER SUSTAINABILITY PLANS**

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA), is likely to achieve the sustainability goal for the basin covered by the GSP, and whether the GSP adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the GSP within two years of its submission. (Water Code § 10733.4.)

SGMA allows for multiple GSPs implemented by multiple groundwater sustainability agencies (GSAs) and coordinated pursuant to a single coordination agreement that covers the entire basin to be an acceptable planning scenario. (Water Code § 10727.) In the San Joaquin Valley – Delta-Mendota Subbasin (Subbasin), six separate GSPs were prepared by 23 GSAs pursuant to the required coordination agreement. This Statement of Findings explains the Department's decision regarding the multiple GSPs covering the Subbasin submitted jointly by the multiple GSAs. Collectively, the six GSPs and the coordination agreement are referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- *Aliso Water District Groundwater Sustainability Plan (Aliso GSP)* – the Aliso GSP is implemented by a single GSA, the Aliso Water District GSA.
- *Groundwater Sustainability Plan, Delta-Mendota Subbasin, Farmers Water District (Farmers GSP)* – the Farmers GSP is implemented by a single GSA, the Farmers Water District GSA.
- *Groundwater Sustainability Plan for County of Fresno GSA Management Area A & Management Area B – Delta-Mendota Subbasin (Fresno County GSP)* – the Fresno County GSP is implemented by a single GSA, the County of Fresno GSA.
- *Grassland Groundwater Sustainability Agency Groundwater Sustainability Plan (Grassland GSP)* – the Grassland GSP is implemented by two GSAs, the Grasslands GSA and the County of Merced GSA.
- *Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Regions (Northern and Central GSP)* – the Northern and Central GSP is

Statement of Findings
 San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

implemented by the following eight GSAs: Oro Loma GSA, DM-II GSA, Patterson Irrigation District GSA, Widren Water District GSA, City of Patterson GSA, Northwestern Delta-Mendota GSA, West Stanislaus Irrigation District GSA, and Central Delta-Mendota GSA.

- *Groundwater Sustainability Plan for the San Joaquin River Exchange Contractors GSP Group in the Delta-Mendota Subbasin (SJREC GSP)* – the SJREC GSP is implemented by the following 11 GSAs: San Joaquin River Exchange Contractors GSA; City of Firebaugh GSA, City of Los Banos GSA, City of Newman GSA, City of Dos Palos GSA, City of Gustine GSA, City of Mendota GSA, County of Merced GSA, County of Madera GSA, and Turner Island Water District GSA, as well as a portion of the County of Fresno Management Area B GSA.

Department management has reviewed the enclosed Staff Report, which recommends that the deficiencies identified should preclude approval of the Plan. Based on its review of the Staff Report, Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with, and hereby adopts, staff’s recommendation and all the corrective actions provided. The Department thus deems the Plan incomplete based on the Staff Report and the findings contained herein.

A. The GSPs do not use the same data and methodologies.

1. The Plan makes general statements that the collection and presentation of data are coordinated throughout the Subbasin, but the Plan lacks detail and confirmation that the six GSPs not only consider the other GSPs within and adjacent to the Subbasin but have addressed the regulatory aspects of SGMA in a manner that substantially complies with the GSP Regulations.
 - i. A statement that the GSPs are coordinated without accompanying explanation is not sufficient coordination. Department staff find that the Plan for the Subbasin does not utilize same data and methodologies to support the various water budget, change in storage, and sustainable yield approaches; therefore, it is unclear how the GSAs will reach, let alone track, sustainability throughout the Subbasin in a coordinated manner.
 - ii. By allowing each of the GSPs to move forward with collecting, compiling, and analyzing data on its own, set sustainable management criteria that support the respective GSP area’s definition of what is considered sustainable within its boundaries, and relying upon a “sum-of-the-parts” approach to reflect the

Subbasin's conditions, it is uncertain whether or how the six GSPs use the same data and methodologies.

B. The GSPs have not established common definitions of undesirable results in the Subbasin.

1. Because each of the six GSPs prepared in the Subbasin defined its own sustainable management criteria, each applicable sustainability indicator has up to six different definitions of what are considered significant and unreasonable conditions.
 - i. While this approach was agreed upon by the 23 GSAs in the Subbasin using the required coordination agreement, by approaching the sustainability indicators in such an individualistic and isolated manner, Department staff do not believe that the Plan satisfies the SGMA requirement to the use of same data and methodologies.
 - ii. A broad, generic definition of undesirable results was developed for the entire Subbasin, but the various GSAs responsible for each GSP further defined what they considered "significant and unreasonable." This process has resulted in setting different thresholds with different metrics and establishing a wide range of measurable objectives, if at all, often for very small portions of the Subbasin that do not seem to align with adjacent areas governed by other GSPs. Department staff find that this fragmented approach towards establishing separate criteria that define sustainable conditions in various parts of the Subbasin does not meet the intent of SGMA or the requirements of the GSP Regulations.

C. The GSPs in the Subbasin have not set sustainable management criteria in accordance with the GSP Regulations.

1. While a sustainability goal was agreed upon for the Subbasin, each of the six GSPs includes its own version of what its GSP-area goal is and does not correlate those goals with the Subbasin's sustainable yield.
 - i. The individual GSPs do not include supporting information that is sufficiently detailed, but instead provide statements, for example, that the GSP areas have "a significant amount of flexibility in defining and implementing Sustainable Management Criteria in

Statement of Findings

San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

the absence of undesirable results.” Like the Subbasin’s definition of undesirable results, which has up to six different GSP definitions of what is considered a significant and unreasonable condition, the Subbasin appears to have multiple definitions of its sustainability goal depending upon which GSP is referenced.

2. Each of the six GSPs prepared in the Subbasin defined its own sustainable management criteria and each sustainability indicator has up to six different definitions of what are considered significant and unreasonable conditions.
 - i. As demonstrated by the review of each GSP’s definition of undesirable results, the Plan, while purporting to be coordinated, actually presents a very complicated and disparate range of definitions for what constitutes an undesirable result for each category, such that whether or not something is considered an undesirable result depends on where in the Subbasin the condition is occurring.
3. The establishment of minimum thresholds and measurable objectives in the Subbasin are not coordinated, nor are they supported by information that is sufficiently detailed.
 - i. Each GSP generally contains a wide variety of what are considered significant and unreasonable conditions, sets different interim goals, minimum thresholds, and measurable objectives, often with different units of measurement, or determines that a particular sustainability indicator is not applicable to its GSP area without providing sufficient justification.

D. The management areas established in the Plan have not sufficiently addressed the requirements specified in 23 CCR § 354.20.

1. The six GSPs prepared in the Subbasin have established a total of 17 management areas.
 - i. While the use of management areas is technically allowed in a basin if the GSAs determine that the creation of management areas will facilitate implementation of their GSPs, the use of management areas in a basin that is already managed under six separate GSPs significantly complicates the Subbasin’s implementation of SGMA. It also impedes the ability of

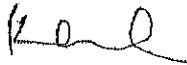
Statement of Findings

San Joaquin Valley – Delta-Mendota Subbasin (Basin No. 5-022.07)

Department staff to determine if the sustainability goal established for the Subbasin is being met, especially if established management areas do not have monitoring points and it is uncertain what sustainable management criteria apply to each area.

Based on the above, the Plan submitted by the GSAs in the San Joaquin Valley – Delta-Mendota Subbasin is determined to be incomplete because the Plan does not satisfy the requirements of SGMA, nor does it substantially comply with the GSP Regulations. The corrective actions provided in the enclosed Staff Report are intended to address the deficiencies that, at this time, preclude the Plan's approval. The GSAs have up to 180 days to address the deficiencies outlined above and detailed in the Staff Report. Once the GSAs resubmit their respective GSPs and the required coordination agreement, the Department will review the revised Plan to evaluate whether the deficiencies were sufficiently addressed. Should the GSAs fail to take sufficient actions to correct the deficiencies identified by the Department, the Department shall disapprove the Plan if, after consultation with the State Water Resources Control Board, the Department determines the Plan to be inadequate pursuant to 23 CCR § 355.2(e)(3)(C).

Signed:



Karla Nemeth, Director
Date: January 21, 2022

Enclosure: Groundwater Sustainability Plan Assessment Staff Report – San Joaquin Valley – Delta-Mendota Subbasin

State of California
Department of Water Resources
Sustainable Groundwater Management Program
Groundwater Sustainability Plan Assessment Staff Report

Groundwater Basin Name: San Joaquin Valley Basin – Delta-Mendota Subbasin (No. 5-022.07)
Number of GSPs: 6 (see list below)
Number of GSAs: 23 (see list below)
Point of Contact: John Brodie, San Luis & Delta-Mendota Water Authority
Recommendation: Incomplete
Date: January 21, 2022

The Sustainable Groundwater Management Act (SGMA)¹ allows for any of the three following planning scenarios: a single groundwater sustainability plan (GSP) developed and implemented by a single groundwater sustainability agency (GSA); a single GSP developed and implemented by multiple GSAs; and multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement.² GSAs developing GSPs are expected to comply with SGMA and substantially comply with the Department of Water Resources' (Department) GSP Regulations.³ The Department is required to evaluate an adopted GSP within two years of its submittal date and issue a written assessment.⁴

In the Delta-Mendota Subbasin (Subbasin), six separate GSPs were prepared by 23 GSAs pursuant to a required coordination agreement.⁵ Collectively, the six GSPs and the coordination agreement, for evaluation and assessment purposes, will be treated and referred to as the Plan for the Subbasin. Individually, the GSPs include the following:

- *Aliso Water District Groundwater Sustainability Plan (Aliso GSP)* – covers approximately 3.5 percent of the Subbasin. The Aliso GSP is implemented by a single GSA, the Aliso Water District GSA.
- *Groundwater Sustainability Plan, Delta-Mendota Subbasin, Farmers Water District (Farmers GSP)* – covers approximately 0.3 percent of the Subbasin. The Farmers GSP is implemented by a single GSA, the Farmers Water District GSA, and has two management areas.

¹ Water Code § 10720 *et seq.*

² Water Code § 10727.

³ 23 CCR § 350 *et seq.*

⁴ Water Code § 10733.4(d); 23 CCR § 355.2(e).

⁵ Water Code § 10733.4(b).

- *Groundwater Sustainability Plan for County of Fresno GSA Management Area A & Management Area B – Delta-Mendota Subbasin (Fresno County GSP)* – covers approximately 3 percent of the Subbasin. The Fresno County GSP is implemented by a single GSA, the County of Fresno GSA, and has two management areas.
- *Grassland Groundwater Sustainability Agency Groundwater Sustainability Plan (Grassland GSP)* – covers approximately 14 percent of the Subbasin. The Grassland GSP is implemented by two GSAs, the Grasslands GSA and the County of Merced GSA.
- *Groundwater Sustainability Plan for the Northern and Central Delta-Mendota Regions (Northern and Central GSP)* – covers approximately 41 percent of the Subbasin. The Northern and Central GSP creates two management areas and is implemented by the following eight GSAs: Oro Loma GSA, DM-II GSA, Patterson Irrigation District GSA, Widren Water District GSA, City of Patterson GSA, Northwestern Delta-Mendota GSA, West Stanislaus Irrigation District GSA, and Central Delta-Mendota GSA.
- *Groundwater Sustainability Plan for the San Joaquin River Exchange Contractors GSP Group in the Delta-Mendota Subbasin (SJREC GSP)* – covers approximately 39 percent of the Subbasin. The SJREC GSP creates 11 management areas and is implemented by the following 11 GSAs: San Joaquin River Exchange Contractors GSA; City of Firebaugh GSA, City of Los Banos GSA, City of Newman GSA, City of Dos Palos GSA, City of Guistine GSA, City of Mendota GSA, County of Merced GSA, County of Madera GSA, and Turner Island Water District GSA, as well as a portion of the County of Fresno Management Area B GSA.

Included as an appendix in each GSP is a document called the *Common Chapter for the Delta-Mendota Subbasin Groundwater Sustainability Plan (Common Chapter)*⁶ which was prepared under the oversight of the Delta-Mendota Subbasin Coordination Committee (Coordination Committee) to “[integrate] key parts of the six GSPs to meet subbasin-level requirements per [SGMA and the GSP Regulations].”⁷ The Common Chapter contains eight technical memoranda addressing a variety of SGMA topics (Technical Memoranda).⁸ The Common Chapter and the following Technical Memoranda are referenced throughout this staff report:

⁶ Allso GSP, Appendix B, pp. 262-456; Farmers GSP, Appendix A, pp. 187-379; Fresno County GSP, Appendix A, pp. 226-418; Grassland GSP, Appendix A, pp. 236-430; Northern and Central GSP, Identified as Appendix B in the GSP Table of Contents but provided as Supporting Information on the SGMA Portal; SJREC GSP, Appendix B, pp. 226-419.

⁷ Allso GSP, Common Chapter, Section 1.1, p. 274. Note: While each GSP contains the same Common Chapter and Technical Memoranda, all footnote references herein will only be made with reference to the Allso GSP.

⁸ Allso GSP, Appendix B, pp. 513-549; Farmers GSP, Appendix A, pp. 436-472; Fresno County GSP, Appendix B, pp. 475-511; Grassland GSP, Appendix B, pp. 487-523; Northern and Central GSP, Identified as Appendix B in the GSP Table of Contents but provided as Supporting Information on the SGMA Portal; SJREC GSP, Appendix B, pp. 476-512.

- *Technical Memorandum #1 – Common Datasets and Assumptions used in the Delta-Mendota Subbasin GSPs*
- *Technical Memorandum #2 – Assumptions for Hydrogeological Conceptual Model of the Delta-Mendota Subbasin*
- *Technical Memorandum #3 – Assumptions for the Historic, Current and Projected Water Budgets of the Delta-Mendota Subbasin, Change in Storage Cross-Check and Sustainable Yield*
- *Technical Memorandum #4 – Assumptions for Delta-Mendota Subbasin Management Areas, Sustainability Management Criteria*
- *Technical Memorandum #5 – Assumptions for Delta-Mendota Subbasin Monitoring Network*
- *Technical Memorandum #6 – Coordination of the Delta-Mendota Subbasin Data Management System*
- *Technical Memorandum #7 – Adoption and Use of the Subbasin Coordination Agreement*
- *Technical Memorandum #8 – Coordinated Noticing, Communication, and Outreach Activities in the Delta-Mendota Subbasin*

The Technical Memoranda are specified in the Plan's coordination agreement.⁹ The Plan's coordination agreement addresses each of the components identified in the GSP Regulations. Department staff do not have comments on the legal aspects of that document but do have concerns regarding some of the explanations in the Common Chapter as they relate to Water Code Section 10733.4(b)(2) and the assumptions agreed upon in the Technical Memoranda – primarily how or whether the six GSPs have been applied and implemented in the Subbasin in a consistent and coordinated manner. As stated in the Common Chapter, “[g]iven the variability of conditions within the Delta-Mendota Subbasin, a subbasin-wide sustainability goal and definitions of undesirable results were developed at the subbasin-level, while the definitions of significant and unreasonable, minimum thresholds, measurable objectives and 5-year interim goals were established at the GSP Plan area-level.”¹⁰ This approach has created multiple sustainability goals, multiple definitions of undesirable results, and a wide variety of minimum thresholds, measurable objectives and interim goals, with several GSP-specific hydrogeological conceptual models.

The overall context presented in the Plan is that the critically overdrafted Subbasin has been operating sustainably in the past, the six GSP areas are currently sustainable and are not experiencing undesirable results, and the proposed management approach

⁹ Aliso GSP, Delta-Mendota Subbasin Coordination Agreement, p. 472.

¹⁰ Aliso GSP, Common Chapter, Section 5, p. 418.

moving forward is to generally maintain the status quo during SGMA's planning and implementation horizon while maintaining historical pumping amounts. This approach would further lower groundwater levels and does not appear to sufficiently account for recharge from depleting surface flows in the San Joaquin River, and would not eliminate or mitigate overdraft. Additionally, some of the GSPs have not set sustainable management criteria for applicable sustainability indicators as required by the GSP Regulations, and each of the applicable sustainability indicators has up to six undesirable result definitions for what are considered significant and unreasonable conditions.

Department staff have thoroughly evaluated the Plan, the Subbasin's coordination agreement, and other information provided or available and known to staff, and have exercised their professional expertise and judgment to identify several deficiencies that staff recommends should preclude its approval.¹¹ In addition, consistent with the GSP Regulations, Department staff have provided corrective actions that the GSAs should review while determining how and whether to address the deficiencies in a coordinated manner.¹² The deficiencies and corrective actions are explained in greater detail in Section 3 of this staff report but are generally related to the approach taken to coordinate the six GSPs, the creation of multiple definitions of what are considered significant and unreasonable conditions throughout the Subbasin, the insufficient application of sustainable management criteria used to evaluate sustainability, and the use of numerous management areas in an already fragmented Plan.

This assessment includes the following four sections:

- **Section 1 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 2 – Required Conditions:** Describes the submission, Plan completeness, and basin coverage requirements for a Plan to be evaluated by the Department.
- **Section 3 – Plan Evaluation:** Provides a detailed assessment of identified deficiencies in the Plan. Consistent with the GSP Regulations, Department staff have provided corrective actions for the GSAs to address the deficiencies.
- **Section 4 – Staff Recommendation:** Provides the recommendation of staff regarding the Department's determination.

¹¹ 23 CCR §355.2(e)(2).

¹² 23 CCR §355.2(e)(2)(B).

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1 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA¹³ and is likely to achieve the basin's sustainability goal.¹⁴ To achieve the sustainability goal, the Plan must demonstrate that implementation will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.¹⁵ Undesirable results are required to be defined quantitatively by the GSAs overlying a basin and occur when significant and unreasonable effects for any of the applicable sustainability indicators are caused by groundwater conditions occurring throughout the basin.¹⁶ The Department is also required to evaluate whether the Plan will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.¹⁷

For a Plan to be evaluated by the Department, it must first be determined that it was submitted by the statutory deadline¹⁸ and that it is complete and covers the entire basin.¹⁹ Additionally, for those GSAs choosing to develop multiple GSPs, the Plan submission must include a coordination agreement.²⁰ The coordination agreement must explain how the multiple GSPs in the basin have been developed and implemented utilizing the same data and methodologies and that the elements of the multiple GSPs are based upon consistent interpretations of the basin's setting. If these required conditions are satisfied, the Department evaluates the Plan to determine whether it complies with SGMA and substantially complies with the GSP Regulations.²¹ As stated in the GSP Regulations, "[s]ubstantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal."²²

When evaluating whether the Plan is likely to achieve the sustainability goal for the basin, Department staff review the information provided for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.²³ The Department's review considers whether there is a reasonable relationship between the

¹³ Water Code §§ 10727.2, 10727.4, 10727.6.

¹⁴ Water Code § 10733(a).

¹⁵ Water Code § 10721(v).

¹⁶ 23 CCR § 354.26.

¹⁷ Water Code § 10733(c).

¹⁸ 23 CCR § 355.4(a)(1).

¹⁹ 23 CCR §§ 355.4(a)(2), 355.4(a)(3).

²⁰ 23 CCR § 357.4.

²¹ 23 CCR § 350 *et seq.*

²² 23 CCR § 355.4(b).

²³ 23 CCR § 351(h).

information provided by the GSAs and the assumptions and conclusions presented in the Plan, including whether the interests of the beneficial uses and users of groundwater in the basin have been considered; whether sustainable management criteria and projects and management actions described in the Plan are commensurate with the level of understanding of the basin setting; and whether those projects and management actions are feasible and likely to prevent undesirable results.²⁴ The Department also considers whether the GSAs have the legal authority and financial resources necessary to implement the Plan.²⁵

To the extent overdraft is present in a basin, the Department evaluates whether the Plan provides a reasonable assessment of the overdraft and includes reasonable means to mitigate it.²⁶ When applicable, the Department will assess whether coordination agreements have been adopted by all relevant parties and satisfy the requirements of SGMA and the GSP Regulations.²⁷ The Department also considers whether the Plan provides reasonable measures and schedules to eliminate identified data gaps.²⁸ Lastly, the Department's review considers the comments submitted on the Plan and evaluates whether the GSAs have adequately responded to the comments that raise credible technical or policy issues with the Plan.²⁹

The Department is required to evaluate the Plan within two years of its submittal date and issue a written assessment.³⁰ The assessment is required to include a determination of the Plan's status.³¹ The GSP Regulations provide three options for determining the status of a Plan: approved,³² incomplete,³³ or inadequate.³⁴

After review of the Plan, Department staff may find that the information provided is not sufficiently detailed, or the analyses not sufficiently thorough and reasonable, to evaluate whether it is likely to achieve the sustainability goal for the basin. If the Department determines the deficiencies precluding approval may be capable of being corrected by the GSAs in a timely manner,³⁵ the Department will determine the status of the Plan to be incomplete. A formerly deemed incomplete Plan may be resubmitted to the Department for reevaluation after all deficiencies have been addressed and incorporated into the Plan within 180 days after the Department makes its incomplete determination. The Department will review the revised Plan to evaluate whether the identified deficiencies were sufficiently addressed. Depending on the outcome of that evaluation,

²⁴ 23 CCR §§ 355.4(b)(1), (3), (4) and (5).

²⁵ 23 CCR § 355.4(b)(9).

²⁶ 23 CCR § 355.4(b)(6).

²⁷ 23 CCR § 355.4(b)(8).

²⁸ 23 CCR § 355.4(b)(2).

²⁹ 23 CCR § 355.4(b)(10).

³⁰ Water Code § 10733.4(d); 23 CCR § 355.2(e).

³¹ Water Code § 10733.4(d); 23 CCR § 355.2(e).

³² 23 CCR § 355.2(e)(1).

³³ 23 CCR § 355.2(e)(2).

³⁴ 23 CCR § 355.2(e)(3).

³⁵ 23 CCR § 355.2(e)(2)(B)(i).

the Department may determine the resubmitted Plan is approved. Alternatively, the Department may find a formerly deemed incomplete GSP is inadequate if, after consultation with the State Water Resources Control Board, it determines that the GSAs have not taken sufficient actions to correct any identified deficiencies.³⁶

The staff assessment of the Plan involves the review of information presented by the GSAs, including models and assumptions, and an evaluation of that information based on scientific reasonableness. In conducting its assessment, the Department does not recalculate or reevaluate technical information provided in the Plan or perform its own geologic or engineering analysis of that information. The recommendation to approve a Plan does not signify that Department staff, were they to exercise the professional judgment required to develop a Plan for the basin, would make the same assumptions and interpretations as those contained in the Plan, but simply that Department staff have determined that the assumptions and interpretations relied upon by the submitting GSAs are supported by adequate, credible evidence, and are scientifically reasonable.

Lastly, the Department's review and assessment of an approved Plan is a continual process. Both SGMA and the GSP Regulations provide the Department with the ongoing authority and duty to review the implementation of the Plan.³⁷ Also, GSAs have an ongoing duty to reassess their GSPs, provide annual reports to the Department, and, when necessary, update or amend their GSPs.³⁸ The passage of time or new information may make what is reasonable and feasible at the time of this review to not be so in the future. The emphasis of the Department's periodic reviews will be to assess the GSA's progress toward achieving the basin's sustainability goal and whether implementation of the Plan adversely affects the ability of GSAs in adjacent basins to achieve their sustainability goals.

³⁶ 23 CCR § 355.2(e)(3)(C).

³⁷ Water Code § 10733.8; 23 CCR § 355.6 *et seq.*

³⁸ Water Code §§ 10728 *et seq.*, 10728.2.

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2 REQUIRED CONDITIONS

A GSP, to be evaluated by the Department, must be submitted within the applicable statutory deadline.³⁹ The GSP must also be complete and must, either on its own or in coordination with other GSPs, cover the entire basin.⁴⁰ Additionally, when multiple GSPs are developed in a basin, the submission of all GSPs must include a coordination agreement.⁴¹ The coordination agreement must explain how the multiple GSPs in the basin have been developed and implemented utilizing the same data and methodologies and that the elements of the multiple GSPs are based upon consistent interpretations of the basin's setting. If a Plan is determined to be incomplete, Department staff may require corrective actions that address minor or potentially significant deficiencies identified in the Plan. The GSAs in a basin, whether developing a single GSP covering the basin or multiple GSPs, must sufficiently address those required corrective actions within the time provided, not to exceed 180 days, for the Plan to be reevaluated by the Department and potentially approved.

2.1 SUBMISSION DEADLINE

SGMA required basins categorized as high- or medium-priority as of January 1, 2017 and that were subject to critical conditions of overdraft to submit a GSP no later than January 31, 2020.⁴²

The Point of Contact representing 23 GSAs submitted the Subbasin's Plan on January 23, 2020, in compliance with the statutory deadline. The Plan consists of six adopted GSPs and the required coordination agreement.

2.2 COMPLETENESS

GSP Regulations specify that the Department shall evaluate a Plan if that Plan is complete and includes the information required by SGMA and the GSP Regulations.⁴³ For those basins choosing to submit multiple GSPs, a coordination agreement is required.

The Subbasin's 23 GSAs submitted six adopted GSPs that cover the Subbasin. Department staff found the GSPs, and the collective Plan, to be complete and include the required information, sufficient to warrant an evaluation by the Department. The Department posted the Subbasin's six GSPs and coordination agreement to its website on January 31, 2020.

³⁹ Water Code § 10720.7.

⁴⁰ 23 CCR § 355.4(a)(3).

⁴¹ Water Code § 10733.4(b); 23 CCR § 357.4.

⁴² Water Code § 10720.7(a)(1).

⁴³ 23 CCR § 355.4(a)(2).

2.3 BASIN COVERAGE

A GSP, either on its own or in coordination with other GSPs, must cover the entire basin.⁴⁴ A Plan that intends to cover the entire basin may be presumed to do so if the basin is fully contained within the jurisdictional boundaries of the submitting GSAs.

The Plan intends to manage the entire Delta-Mendota Subbasin and the jurisdictional boundaries of the submitting GSAs cover the entire Subbasin.

⁴⁴ Water Code § 10727(b); 23 CCR § 355.4(a)(3).

3 PLAN EVALUATION

As stated in Section 355.4 of the GSP Regulations, a basin “shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act.” The Department’s assessment is based on a number of related factors⁴⁵ including whether the elements of a GSP were developed in the manner required by the GSP Regulations,⁴⁶ whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable,⁴⁷ and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.⁴⁸

Department staff have identified deficiencies in the GSPs, the most serious of which preclude staff from recommending approval of the Plan at this time. Department staff believe the GSAs may be able to correct the identified deficiencies within 180 days. Consistent with the GSP Regulations, Department staff are providing corrective actions related to the deficiencies, detailed below, including the general regulatory background, the specific deficiency identified in the Plan, and the specific actions to address the deficiency.

GENERAL BACKGROUND

SGMA allows for multiple GSPs to be implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers an entire basin.⁴⁹ The GSP Regulations and SGMA detail the requirements for a coordination agreement and the elements of the GSPs necessary to be coordinated to achieve the basin’s sustainability goal.⁵⁰ The coordination agreement must provide both administrative and technical coordination and consistency between all the GSPs. The collective submittals for the basin are to be based upon consistent interpretations of the basin setting and utilize the same data and methodologies.⁵¹ In the context of utilizing the same data and methodologies, the coordination agreement must provide the following:⁵²

- a coordinated water budget for the basin, including groundwater extraction data, surface water supply, total water use, and change in groundwater in storage;
- a sustainable yield for the basin, supported by a description of the undesirable results for the basin, and an explanation of how the minimum thresholds and

⁴⁵ 23 CCR § 355.4.

⁴⁶ 23 CCR § 355.4(a)(1).

⁴⁷ 23 CCR § 355.4(b)(1).

⁴⁸ 23 CCR §§ 355.4(b)(5), 355.4(b)(6).

⁴⁹ Water Code § 10727(b)(3).

⁵⁰ 23 CCR § 357.4; Water Code § 10727.6.

⁵¹ 23 CCR § 357.4(a).

⁵² Water Code § 10727.6 *et al*; 23 CCR §§ 357.4(b)(3)(B), 357.4(b)(3)(C), 357.4(c).

measurable objectives defined by each GSP relate to those undesirable results, based on information described in the basin setting; and

- an explanation of how the GSPs implemented together satisfy the requirements of SGMA and are in substantial compliance with the GSP Regulations.

The Department is tasked with evaluating whether the GSPs, in coordination with one another, conform with the required regulatory contents and are likely to achieve the sustainability goal for the basin.⁵³

3.1 DEFICIENCY 1. THE GSPs DO NOT USE THE SAME DATA AND METHODOLOGIES.

3.1.1 Background

The Plan is subject to Water Code Section 10727.6 as well as Section 357.4 of the GSP Regulations. The GSPs require coordination to ensure that they utilize the same data and methodologies for the following sustainable groundwater management assumptions: *groundwater elevation data; groundwater extraction data; surface water supply; total water use; change in groundwater storage; water budget; and sustainable yield.*⁵⁴ For GSAs developing multiple GSPs, the GSAs are also required to jointly submit an explanation of how the GSPs implemented together satisfy Water Code Sections 10727.2, 10727.4 and 10727.6, as well as a copy of the coordination agreement.⁵⁵ Coordination agreements are required to address a variety of regulatory topics, including how the GSAs have used the same data and methodologies to prepare coordinated GSPs where the sustainable yield is supported by a description of the undesirable results and an explanation of how the minimum thresholds and measurable objectives relate to those undesirable results.⁵⁶

3.1.2 Deficiency Details

The Plan makes general statements that the collection and presentation of data are coordinated throughout the Subbasin, but the Plan lacks detail and confirmation that the six GSPs not only consider the other GSPs within and adjacent to the Subbasin but have addressed the regulatory aspects of SGMA in a manner that substantially complies with the GSP Regulations. A statement that the GSPs are coordinated without accompanying explanation is not sufficient coordination. Department staff find that the Plan for the Subbasin does not utilize same data and methodologies to support the various water budget, change in storage, and sustainable yield approaches; therefore, it is unclear how the GSAs will reach, let alone track, sustainability throughout the Subbasin in a coordinated manner.

By allowing each of the GSPs to move forward with collecting, compiling, and analyzing data on its own, set sustainable management criteria that supports the respective GSP

⁵³ Water Code § 10733(b); 23 CCR § 355.4(b).

⁵⁴ Water Code § 10727.6.

⁵⁵ Water Code §§ 10733.4(b)(2), 10733.4(b)(3).

⁵⁶ 23 CCR § 357.4(b)(3).



area's definition of what is considered sustainable within its boundaries, and relying upon a "sum-of-the-parts" approach to reflect the Subbasin's conditions, it is uncertain whether or how the six GSPs use the same data and methodologies. Technical Memorandum documents do not resolve this uncertainty. In many cases, as presented below, the six GSPs do not use the same data and methodologies and do not provide a detailed explanation that complies with Water Code Section 10733.4(b)(2), other than general reference to insufficient discussions in the Common Chapter.

Common to all six GSPs is Technical Memorandum #1, which is "Common Datasets and Assumptions used in the Delta-Mendota Subbasin GSPs."⁵⁷ According to the memorandum, "[d]uring development of the six coordinated Groundwater Sustainability Plans (GSPs) for the Delta-Mendota Subbasin (Subbasin), the twenty-three Groundwater Sustainability Agencies (GSAs) in the Subbasin agreed upon methodologies and assumptions for water budgets, change in storage, and sustainable yield." The following briefly describes the approaches taken to address the three assumptions referenced in Technical Memoranda #1.

Water Budget

Water Budget information is presented in Section 4.3 of the Common Chapter and in Technical Memorandum #3.⁵⁸ While the categories of inflows and outflows were agreed upon by the Coordination Committee for the land surface budget and groundwater budget, each of the GSP areas prepared separate water budgets⁵⁹ using different modeling methods while often relying upon customized hydrogeological conceptual models⁶⁰ which were then "rolled-up" to the Subbasin level. It is uncertain whether the outflow from a particular GSP area within the Subbasin is comparable to the inflow from an adjacent GSP area, as there is no coordinated explanation provided in the Plan.

The historical water budget reflects water years 2003-2012 (the minimum number of years required under the GSP Regulations), the current water budget is for 2013, and the projected budget is years 2014-2070. A series of analyses were done for periods ranging from 1990-2015, but it was decided by the Subbasin's Coordination Committee that the period chosen should avoid the most recent drought.⁶¹ The Plan also acknowledges that, "[w]hile 'current water budget conditions' are defined in the GSP Emergency Regulations §354.18(c)(1) as the year with 'the most recent population, land use, and hydrologic

⁵⁷ Aliso GSP, Technical Memorandum #1, pp. 514-524.

⁵⁸ Aliso GSP, Common Chapter, Section 4.3, pp. 404-414, Technical Memorandum #3, pp. 527-531.

⁵⁹ Aliso GSP, Section 3.3.1, pp. 68-69; Farmers GSP, Section 3.3, pp. 115-134; Fresno County GSP, Water Budget Section, p. 22; Fresno County GSP, Section 3.3, pp. 131-155; Grassland GSP, Section 3.3.1, pp. 129-154; Northern and Central GSP, Section 5.4.4, p. 404; SJREC GSP, Sections 2.2.3 through 2.2.5, pp. 77-119.

⁶⁰ Aliso GSP, Common Chapter, Section 4.1, pp. 324-356, Appendix A, pp. 204-260; Farmers GSP, Section 3.1, pp. 60-80; Fresno County GSP, Section 3.1, pp. 73-95; Grassland GSP, Section 3.1, pp. 89-109; Northern and Central GSP, Section 5.2, pp. 213-244; SJREC GSP, Section 2.2.1, p. 77, Appendix I, pp. 810-1018.

⁶¹ Aliso GSP, Section 3.3.1, p. 69.

conditions,' WY2015, WY2016 and WY2017 were not thought to be representative of the Delta-Mendota Subbasin under 'normal' or 'average' conditions."⁶²

As presented below, some of the GSP groups used numerical models to calculate the inflows and outflows from the respective GSP areas while others used non-numerical and spreadsheet models – there was no explanation in the Common Chapter that indicated how these differing modeling approaches used the same data or methodology. Additionally, some of the GSP groups used a hydrogeological conceptual model that was prepared specifically for its GSP area, which was different than the hydrogeological conceptual model submitted as part of the Common Chapter and Technical Memorandum #2.⁶³

In general, the details in the respective GSPs are presented in a manner that support each GSP area's perspective that no undesirable results are currently present within its boundaries and will not occur in the future, essentially setting the stage for maintaining the status quo during SGMA's planning and implementation horizon. The following briefly describes the process for developing different water budgets in each of the respective GSP areas:

- *Aliso GSP*: "Due to the homogeneous nature of the District area regarding water use, cropping patterns, and climate, AWD has decided to use an analytical accounting tool to quantify the historic water budget conditions and project historic trends into the future while incorporating factors such as climate change and land use that may alter these trends going forward."⁶⁴
- *Farmers GSP*: "For the FWD GSA in the Delta-Mendota Subbasin, a numerical model tool was developed and used to simulate the geographic extent of the FWD and adjacent areas."⁶⁵
- *Fresno County GSP*: "For the FCMA GSA in the DM Subbasin, a numerical model tool was developed utilizing the United States Geological Survey's MODFLOW-NWT and used to simulate the geographic extent of the FCMA and adjacent areas."⁶⁶
- *Grassland GSP*: "In order to gain a greater understanding of operational and natural conditions in the Plan Area, the GSAs decided to use an analytical accounting tool to quantify the water budget conditions for specific year types where data was prevalent."⁶⁷

⁶² Northern and Central GSP, Section 5.4.3, p. 400. Note: 23 CCR § 354.18(c)(1) states, "Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, water demand, and land use information."

⁶³ Aliso GSP, Common Chapter, Section 4.1, pp. 324-356, Technical Memorandum #2, pp. 525-526.

⁶⁴ Aliso GSP, Section 3.3.1, pp. 68-69.

⁶⁵ Farmers GSP, Section 3.3, pp. 115-134.

⁶⁶ Fresno County GSP, Water Budget Section, p. 22; Section 3.3, pp. 131-155.

⁶⁷ Grassland GSP, Section 3.3, pp. 129-154.

- *Northern and Central GSP*: "The selected alternative approach for water budget development for the Northern and Central Delta-Mendota Regions is a hybrid approach that combines the use of local data and CVHM2 parameters with standard numerical calculations derived from peer-reviewed literature or professional judgment. All water budgets presented herein are based primarily on local land use, water supply, and groundwater elevation data received from agencies as well as data from publicly available sources. Where local data are unavailable, data from CVHM2 is used."⁶⁸
- *SJREC GSP*: "The Historical, Current and Projected Water Budgets were prepared primarily by the SJREC GSA Staff and KDSA in close coordination with the other GSP groups in the Delta-Mendota Subbasin to ensure that each GSP uses the same data and methodologies."⁶⁹ However, the methodology, or methodologies, used to develop the various water budgets in the SJREC GSP area is not clearly defined, other than general reference to modified versions of the Department's Best Management Practices documents that address water budgets and modeling, which are provided as Appendices K and L in the SJREC GSP.⁷⁰ The SJREC GSP contains a water budget for only the SJREC GSA area, as well as a combined budget that represents the collective SJREC GSP group, which includes the SJREC GSA and the SJREC GSP's 11 management areas.⁷¹ The water budget information for the 11 management areas is far less detailed and relies upon information provided in sections 7 through 16 of the GSP, often relying upon separate hydrogeological conceptual models.⁷²

Change in Groundwater Storage

The explanation related to coordinated change in storage calculations and water budgets is insufficient, especially since information presented in text, and data displayed in figures and tables, do not seem to correlate with each other and it is uncertain what the current loss of storage is throughout the Subbasin.⁷³ Statements in Common Chapter Section 4.2.3, state that, "*For information on how change in storage was calculated, refer to Section 4.3.2 – Water Budgets of this Common Chapter.*" However, Section 4.3.2 only states, "*Individual historical, current, and projected water budgets were developed by each GSP Group for their respective Plan Area. For more information on the development of those water budgets, as well as tabular and graphical representation of the results, refer to the respective sections of the individual GSPs.*" This fragmented and multi-staged

⁶⁸ North and Central GSP, Section 5.5.4, p. 404.

⁶⁹ SJREC GSP, Section 2.2.3, pp. 77-112.

⁷⁰ SJREC GSP, Section 2.2.3, p. 78, Appendix K, pp. 1038-1079, Appendix L, pp. 1080-1113.

⁷¹ SJREC GSP, Sections 2.2.3 and 2.2.4, pp. 77-115; Section 2.2.5, p. 115-119.

⁷² SJREC GSP, Section 2.2.5, pp. 115-119, Section 7.0 through 16.5, pp. 151-215, Appendices Q through W, pp. 1210-1643.

⁷³ Aliso GSP, Technical Memorandum #3, pp. 527-531, Section 3.3.3.1, p. 84; Farmers GSP, Section 3.2.4, p. 84; Fresno County GSP, Section 3.2.2, p. 99; Grassland GSP, Section 3.2.6, pp. 121-122; Northern and Central GSP, Section 5.3.3, p. 331; SJREC GSP, Section 3.3.2, p. 126.

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presentation of information is insufficient to demonstrate that the various GSPs are coordinated – Section 4.2.3 of the Common Chapter refers readers to Section 4.3.2, which then refers readers to six different GSP sections.

The Plan's change in groundwater storage assessment considered a sum-of-the-parts methodology, combining the change in groundwater storage from each GSP area to determine the overall change in groundwater storage for the Subbasin without a clear quantification of overdraft occurring throughout the Subbasin. Per the Common Chapter, despite recharge outpacing extractions, an overall declining trend in groundwater storage was observed in both aquifers between 2003-2013.⁷⁴ Cumulative change in storage declined more rapidly in the Upper Aquifer compared to the Lower Aquifer, declining by about 1,300,000 acre-feet in the Upper Aquifer and 678,000 acre-feet in the Lower Aquifer (a total of 1,978,000 acre-feet). However, when "rolling-up" the water budget information in Tables CC-9 and CC-11, which reflect the Subbasin's historical and current water budgets, the cumulative change in storage in the Upper Aquifer reflects a loss of 624,000 acre-feet and a loss of 375,000 acre-feet in the Lower Aquifer, with a total loss of storage within the Subbasin of 1,003,000 acre-feet.⁷⁵ Clarification on the Subbasin's cumulative change in storage and total amount of overdraft is required, because the overdraft information does not align throughout the six GSPs.

For the Upper Aquifer, Technical Memorandum #1 states, "Upper aquifer change in groundwater storage was evaluated using annual groundwater level contours from Spring 2003 to Spring 2013 developed using the same datasets identified above and applying specific yield (defined as the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table) provided by each individual GSP Group. The Delta-Mendota Subbasin upper aquifer change in groundwater storage assessment considered a 'sum-of-the-parts' methodology, combining the change in groundwater storage for each GSP to determine the overall change in groundwater storage for the Subbasin."⁷⁶ However, according to the annual report filed for water year 2020, "four methods [were] chosen by the respective GSP regions and summed to a Subbasin total [for the Upper Aquifer]: change in groundwater elevation contours used by Aliso Water District, Farmers Water District, and Fresno County Management Areas A and B GSP regions; water budget with calibration to historic below normal water year conditions by Grassland GSP Region; a combination of change in groundwater elevation contours and representative hydrograph methods by the Northern & Central Delta-Mendota Region GSP Region; and representative hydrographs used by the San Joaquin River Exchange Contracts GSP Region."⁷⁷ Although it therefore appears that the GSPs use different methodologies and data, there is no coordinated

⁷⁴ Aliso GSP, Common Chapter, Section 4.2.3, pp. 372-373.

⁷⁵ Aliso GSP, Common Chapter, Tables CC-9 and CC-11, pp. 408-409.

⁷⁶ Aliso GSP, Technical Memorandum #1, p. 517.

⁷⁷ Delta-Mendota Subbasin WY 2020 Annual Report, p. 31.

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explanation in the Plan of how or why the four change in storage methods can be considered as using the same data and methodology.

For the Lower Aquifer, Technical Memorandum #1 states, “On January 15, 2019, the Technical Working Group discussed addressing the historic period change in groundwater storage in the lower aquifer. Instead of using scarce data, the change was compared against loss of storage from inelastic land subsidence as calculated using change in land surface elevation multiplied by the area and supplemented by change in groundwater levels and storativity in areas of the Subbasin where those data were available.”⁷⁸ But the annual report filed for water year 2020 states, “two methods [were] chosen by the respective GSP regions and summed to a Subbasin total: change in land surface elevation using the best available data was used by the Aliso Water District, Grassland, Northern & Central Delta-Mendota Region, and San Joaquin River Exchange Contractors GSP regions...”, where the Northern & Central Delta-Mendota Region used additional data sources “to provide complete spatial coverage...”; and “change in groundwater elevation at GSP monitoring wells was utilized by the Farmers Water District and Fresno Management Areas A and B GSP regions.”⁷⁹ Again, there is no coordinated explanation in the Plan of how the two approaches to estimate change in storage can be considered as using the same data and methodology.

Additional explanation of historical, current, and projected change in groundwater storage for the Subbasin is warranted, as well as a straightforward quantification of overdraft throughout the Subbasin. The compilation of water budgets and the estimation of change in groundwater storage for the Subbasin do not appear to use the same data and methodology, or the Plan lacks adequate explanation for how or why the various approaches in the GSPs can be considered as using the same data and methodologies.

Sustainable Yield

The Common Chapter (Section 4.3.4)⁸⁰ and Technical Memoranda #3⁸¹ address the methodology for calculating sustainable yield in the Subbasin. Of the six GSPs, three provide a sustainable yield specifically for the GSP area while the other three rely upon the estimate for the entire Subbasin. Similar to the discussion for Deficiency #2, each GSP established its own definitions of significant and unreasonable conditions for each of the applicable sustainability indicators, which allows for up to six different situations of what is considered an undesirable result in the Subbasin for each sustainability indicator. Four of the six GSPs have a total of 17 management areas, as discussed in Deficiency #4, and it is uncertain what sustainable management criteria are being followed in all these management areas to define or reach sustainable conditions, especially since some of the management areas do not have monitoring sites.

⁷⁸ Aliso GSP, Technical Memorandum #1, pp. 517-518.

⁷⁹ Delta-Mendota Subbasin WY 2020 Annual Report, p. 32.

⁸⁰ Aliso GSP, Common Chapter, Section 4.3.4, pp. 415-417.

⁸¹ Aliso GSP, Technical Memorandum #3, pp. 527-531.

The SJREC GSP states, “The sustainable yield is determined independent of sustainability criteria and is provided as a guide for water budget planning purposes.”⁸² Therefore, it does not appear that the various approaches used in the Subbasin to define sustainable yield have been set by considering undesirable results. As indicated throughout the Plan, a sustainable yield estimate is not established for each GSP area and those estimates are not correlated with undesirable results. Department staff note that under management presented in the Plan, groundwater overdraft in the critically overdrafted Subbasin does not appear to stop by 2040 or during SGMA’s 50-year planning and implementation horizon.

As stated in the Common Chapter, “Given existing Subbasin data gaps and uncertainties associated with the data used to develop the water budgets and this estimate, it was also decided that a +/- 10% factor should be applied to determine a range for the Upper Aquifer sustainable yield value. The +/- 10% factor is applied based on the percentage difference between the values from change in storage Subbasin contour mapping for the historic water budget period and the reported changes in storage from the Subbasin consolidated historic water budgets (WY2003-2012) for the Upper Aquifer.”⁸³ However, at a Subbasin scale, the Common Chapter did not clarify what the “data gaps and uncertainties associated with the data used” were and did not further explain why the 10 percent factor was chosen. Additionally, Technical Memorandum #3 states, “[t]he distribution of known lower aquifer water level data and extraction volume data are limited and not sufficient to allow for a calculation of lower aquifer sustainable yield.”⁸⁴

The following briefly describes the process for developing sustainable yield estimates in the respective GSP areas:

- *Aliso GSP*: “The sustainable yield for the AWD GSA upper aquifer was calculated as the sum of the average pumping in the upper aquifer and the average change in storage calculated using the specific yield method.”⁸⁵ The Aliso GSP does not differentiate between the Upper Aquifer and Lower Aquifer when calculating sustainable yield because “the GSP area has a significant number of composite wells which draw water from both the upper and lower aquifers” and the GSA considers the two principal aquifers to “act as a single system.” The sustainable yield for the Aliso GSP area is estimated to be 83,600 AFY.
- *Farmers GSP*: “Based on the projected water budget analysis, FWD will be sustainably pumping groundwater at an average annual rate of 9,200 AFY. This value is intended to represent a long-term average and not an annual maximum.”⁸⁶

⁸² SJREC GSP, Section 3.1.1, p. 120.

⁸³ Aliso GSP, Common Chapter, Section 4.3.4, p. 415.

⁸⁴ Aliso GSP, Technical Memorandum #3, p. 531.

⁸⁵ Aliso GSP, Section 3.3.3.2, pp. 85-86.

⁸⁶ Farmers GSP, Section 3.3.3, p. 122.

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- *Fresno County GSP*: There is no sustainable yield established for the Fresno County GSP area, only for the entire Subbasin.⁸⁷
- *Grassland GSP*: A sustainable yield for the GSP area is not defined for either the Upper Aquifer or the Lower Aquifer.⁸⁸ Section 3.3.3.2 of the GSP states, "The Plan Area does minimal pumping on a per-acre basis, and undesirable results have not been observed. It is unknown whether increases in pumping will affect the groundwater storage volume or cause undesirable results. Because of the lack of understanding regarding how pumping affects the aquifer, calculating sustainable yield can be complicated."
- *Northern and Central GSP*: There is no sustainable yield established for the North and Central GSP area, only for the entire Subbasin.⁸⁹
- *SJREC GSP*: A sustainable yield of 189,000 AFY (with a one-year sustainable yield of at least 268,000 AFY) has been calculated for the Upper Aquifer. The Lower Aquifer sustainable yield is "primarily driven by avoiding an Undesirable Result for land subsidence."⁹⁰

Additional Coordination Components

In addition to water budget, change in groundwater storage, and sustainable yield, Water Code Section 10727.6 requires the following additional components to use the same data and methodologies when developing a Plan. As summarized below, these components also do not appear to use the same data and methodologies, or the Plan lacks sufficient explanation of how or why these various approaches should be considered as using the same data or methodologies.

Groundwater Elevation Data

General statements in the Technical Memoranda indicate groundwater elevation data would use information provided by local agencies, State and federal sources, and rely upon best management practices and/or best modeled or projected data available; however, few details were provided to explain what those sources were.⁹¹ Most details were spread throughout the six GSPs in an uncoordinated manner.⁹² Some GSP areas plan to measure groundwater elevations to the nearest 0.01 foot while others state elevations will be measured to the nearest 1.0 foot. Some of the GSPs state that measuring to the nearest 0.1 foot or 0.01 foot is not feasible for most measurement

⁸⁷ Fresno County GSP, Section 3.3.5, p. 137.

⁸⁸ Grassland GSP, Section 3.3.3.2, p. 145.

⁸⁹ North and Central GSP, Section 5.4.11, pp. 449-450.

⁹⁰ SJREC GSP, Sections 3.1.1 and 3.1.2, pp. 120-121.

⁹¹ Allso GSP, Technical Memorandum #1, pp. 514-524, Technical Memorandum #5, pp. 534-535, Technical Memorandum #6, pp. 536-538.

⁹² Allso GSP, Section 5.1, p. 136, Section 5.2, pp. 159-160; Farmers GSP, Section 4.6.2.1, p. 158; Grassland GSP, Section 5.3, p. 211; Northern and Central GSP, Section 7.2.5.1.2, pp. 551-553; SJREC GSP, Section 3.5.2, p. 135, Appendix N, p. 1152.

methodologies; which is not an accurate statement: The GSP Regulations require measuring groundwater elevations to an accuracy of at least 0.1 feet.⁹³

Groundwater Extraction Data

Technical Memorandum #1 states, "Extraction data were estimated or measured by local GSAs for use in the development of individual GSPs. Groundwater extraction volumes used for the Delta-Mendota Subbasin water budgets were compiled from the six individual GSP water budgets."⁹⁴ Other than stating groundwater extraction data were estimated or measured by local GSAs for use in individual GSPs, no other organized effort to describe this coordination requirement was provided in the Common Chapter – information was found throughout the six GSPs covering the Subbasin.⁹⁵ As presented in the six GSPs, groundwater extraction data was estimated using cropping data, recorded by meters, was "well documented" using land use and climatic data, compiled and estimated through model output, or was voluntarily reported by others. Few details, if any, were found in the six GSPs that describe the coordinated extraction data collection methodology and how it will be applied comparably throughout the Subbasin's groundwater sustainability program.

Surface Water Supply

Technical Memorandum #1 states, "Surface Water Supply allocations, deliveries, imports, and projected supplies were provided or estimated by local GSAs for use in the development of individual GSPs. Applied surface water volumes used for the Delta-Mendota Subbasin water budgets were compiled from the six individual GSP water budgets."⁹⁶ Surface water supply and the methods used to quantify that supply is provided using modeling assumptions, landowner reported data, and other methodology. Few details, if any, were found in the six GSPs that describe the coordinated surface water supply data collection methodology, other than using a "sum-of-the-parts" water budgeting approach.⁹⁷

Total Water Use

Historical, current, and projected water budgets for land surface and groundwater are provided in tables CC-8 through CC-13 of the Common Chapter; however, total water use is not provided for the Subbasin.⁹⁸ Technical Memorandum #1 states, "Total Water Use

⁹³ 23 CCR § 352.4(a)(3).

⁹⁴ Aliso GSP, Technical Memorandum #1, p. 517.

⁹⁵ Aliso GSP, Section 3.3.2.4.1, p. 83; Section 3.3.2.1.5, p. 72; Farmers GSP, Section 3.3.1.2.2, p. 121; Fresno County GSP, Section 3.3.3.2, p. 136; Grassland GSP, Section 3.3.2.1, p. 137; Northern and Central GSP, Appendix D, p. 11 (Appendix D available on the SGMA Portal); SJREC GSP, Section 2.1.2, p. 60, Section 2.2.3.1, p. 81.

⁹⁶ Aliso GSP, Technical Memorandum #1, p. 517.

⁹⁷ Aliso GSP, Section 3.3.2.1.1, p. 70; Farmers GSP, Section 3.3.1.1.1, p. 119; Fresno County GSP, Section 3.3.2.1, pp. 134-135; Grassland GSP, Section 3.3.2.1, p. 136; Northern and Central GSP, Appendix D, p. 10 (Appendix D available on the SGMA Portal); SJREC GSP, Section 2.2.3.1, p. 81.

⁹⁸ Aliso GSP, Common Chapter, Tables CC-8 through CC-13, pp. 408-413.

was estimated or measured by local GSAs for use in the development of Individual GSPs. Total water use included in the Delta-Mendota Subbasin water budgets was compiled from the individual GSP water budgets.⁹⁹ Total inflows and total outflows are presented on the tables, but not total water use.¹⁰⁰

3.1.3 Corrective Action

The Common Chapter and the Technical Memoranda do not provide sufficient explanation to confirm that the GSPs have been developed using the same data and methodologies and that elements of the GSPs have been based upon consistent interpretations of the Subbasin's setting. As presented, the GSPs use different data and different methodologies that rely upon multiple versions of the Subbasin setting, with many of the GSPs defining their own version of a hydrogeological conceptual model, often for very small areas of the Subbasin. The 23 GSAs developing the six GSPs should provide supporting information that is sufficiently detailed and provide explanations that are sufficiently thorough and reasonable to explain how the various components of each GSP will together achieve the Subbasin's common sustainability goal. The explanation should describe how the sustainable management criteria established for each GSP (including the management areas if applicable) relate to each other and how they are collectively informed by the basin setting, including the water budget, change in groundwater storage, and sustainable yield, on the Subbasin-wide level.

3.2 DEFICIENCY 2. THE GSPs HAVE NOT ESTABLISHED COMMON DEFINITIONS OF UNDESIRABLE RESULTS IN THE SUBBASIN.

3.2.1 Background

Section 354.26 of the GSP Regulations states that GSAs shall describe the processes and criteria relied upon to define undesirable results *applicable to the basin* and that undesirable results in a basin occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions *occurring throughout the basin*. The description of undesirable results applicable to the basin shall include the following:¹⁰¹

- The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results.
- The criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator.

⁹⁹ Aliso GSP, Technical Memorandum #1, p. 517.

¹⁰⁰ Aliso GSP, Section 3.3.4.2, Table 3-7, p. 90; Farmers GSP, Executive Summary, p. 21, Section 3.3.4, pp. 122-128; Fresno County GSP, Tables 3-7 and 3-8, pp. 142-143; Grassland GSP, Section 3.3.4.2, Table 3-6, pp. 149-150; Northern and Central GSP, Section 5.4.6, through 5.4.10, pp. 412-449; SJREC GSP, Section 2.2.3, pp. 77-112, Section 2.2.4, pp. 113-119.

¹⁰¹ 23 CCR § 354.26(b)(1), 354.26(b)(2), 354.26(b)(3).

- Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results.

The definition of sustainable yield in a basin is directly tied to undesirable results. As established in SGMA, sustainable yield means the maximum quantity of water, calculated over a base period representative of long-term conditions in a basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.¹⁰²

3.2.2 Deficiency Details

Because each of the six GSPs prepared in the Subbasin defined its own sustainable management criteria, each applicable sustainability indicator has up to six different definitions of what are considered significant and unreasonable conditions. While this approach was agreed upon by the 23 GSAs in the Subbasin using the required Coordination Agreement, by approaching the sustainability indicators in such an individualistic and isolated manner, Department staff do not believe that the Plan satisfies the SGMA requirement to the use of same data and methodologies.¹⁰³ Department staff also believe that this approach does not achieve a coordinated Plan for the Subbasin, and that this approach fragments the Department's ability to track sustainable conditions that are common throughout the Subbasin.

Sustainable management criteria are discussed in Section 5 of the Common Chapter and in Technical Memorandum #4.¹⁰⁴ Section 5 "*describes the coordinated sustainability goal and definition of undesirable results at a subbasin-level and the sustainable management criteria at a GSP-level.*" Technical Memorandum #4 acknowledges that "*definitions of undesirable results must be provided at the Subbasin level.*" A broad, generic definition of undesirable results was developed for the entire Subbasin, but the various GSAs responsible for each GSP further defined what they considered "significant and unreasonable." This process has resulted in setting different thresholds with different metrics and establishing a wide range of measurable objectives, if at all, often for very small portions of the Subbasin that do not seem to align with adjacent areas governed by other GSPs. Department staff find that this fragmented approach towards establishing separate criteria that define sustainable conditions in various parts of the Subbasin does not meet the intent of SGMA or the requirements of the GSP Regulations.

The following is what was agreed upon in the Subbasin to define undesirable results for each of the six sustainability indicators (main bullet), with multiple definitions of what each GSP group considers to be significant and unreasonable (sub-bullet); this information is presented in tables CC-14 through CC-18 in the Common Chapter.¹⁰⁵ As shown, each sustainability indicator has up to six different definitions of what is considered significant

¹⁰² Water Code § 10721(w).

¹⁰³ 23 CCR § 357.4(a).

¹⁰⁴ Aliso GSP, Common Chapter, Section 5, pp. 418-429, Technical Memorandum #4, pp. 532-533.

¹⁰⁵ Aliso GSP, Common Chapter, Section 5.4, Tables CC-14 through CC-18, pp. 420-429.

and unreasonable in the Subbasin, which makes tracking basinwide SGMA implementation and sustainability challenging for Department staff, interested parties, and the beneficial uses and users of groundwater located throughout the Subbasin. Additionally, while each of the six GSPs provided some general discussion related to how the beneficial uses and users of groundwater were considered when setting sustainable management criteria, the individual GSPs were generally concerned with only those beneficial uses and users located within the respective GSP areas and not those collectively located throughout the Subbasin.

- **Chronic lowering of groundwater levels:** *Significant and unreasonable chronic change in water levels, as defined by each GSP Group, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions.*
 - A wide range of definitions of significant and unreasonable conditions related to groundwater levels were established throughout the Subbasin depending on GSP coverage.¹⁰⁶ For instance, the **Aliso GSP** states its GSP area is not experiencing significant and unreasonable effects associated with water levels or storage and has linked minimum thresholds with rates of subsidence while setting groundwater level thresholds to provide a 100-foot buffer from the top of the Corcoran Clay.¹⁰⁷ The **Farmers GSP** and the **Fresno County GSP** define groundwater levels dropping below historical lows (2015-2016) as significant and unreasonable.¹⁰⁸ The **Grassland GSP** defines significant and unreasonable as the “lowering of groundwater levels that would lead to increased costs associated with higher total lift, lowering pumps, need to drill deeper wells or costs securing alternative water sources.”¹⁰⁹ The **Northern and Central GSP** indicates a significant and unreasonable condition would be “dropping below the Minimum Threshold criteria at 40% of representative monitoring locations concurrently over a given water year resulting in shallow domestic wells going dry in the same subregion as the representative monitoring points in violation, higher pumping costs, and/or the need to modify wells to obtain groundwater.”¹¹⁰ And the **SJREC GSP** states, “The San Joaquin River Exchange Contractors (SJREC) GSP Group has a positive impact on the aquifer and is unlikely to cause Significant and/or Unreasonable lowering of groundwater levels. Triggers have been established to recover aquifer water levels before nearing an Undesirable Result. Currently, an approximation of 25% below historic low for each management area is used

¹⁰⁶ Aliso GSP, Common Chapter, Table CC-14, pp. 420-421.

¹⁰⁷ Aliso GSP, Table 4-1, p. 100.

¹⁰⁸ Farmers GSP, Table 4-6, p. 146; Fresno County GSP, Table 4-6, p. 167.

¹⁰⁹ Grassland GSP, Table 4-5, p. 171.

¹¹⁰ Northern and Central GSP, Tables 6-1 and 6-2, pp. 477 and 478.

to indicate an Undesirable Result which will be refined based on annual updates and integration with other GSP Groups.”¹¹¹

- **Reduction in groundwater storage:** *Significant and unreasonable chronic decrease in groundwater storage, as defined by each GSP Group, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions.*
 - A wide range of significant and unreasonable definitions related to groundwater storage were established throughout the Subbasin.¹¹² The **Aliso GSP** has defined significant and unreasonable conditions of chronic reduction in groundwater storage in the same manner as it did for groundwater elevations. The **Farmers GSP** and the **Fresno County GSP** have identified depletion of storage greater than the 2012-2016 period as significant and unreasonable. For the **Grassland GSP**, significant and unreasonable groundwater storage is defined as “insufficient water storage to develop necessary water to maintain critical habitat. Reduction in storage would lead to increased costs associated with higher total lift, lowering pumps, need to drill deeper wells or costs securing alternative water sources. Impacts to habitat would require mitigation, including alternative water supplies and habitat restoration.” In the **Northern and Central GSP**, no definition is provided, other than the following statement: “If water levels are managed to meet the Minimum Thresholds, the Northern & Central Delta-Mendota Region GSP Group does not anticipate long-term reductions in storage.” The **SJREC GSP** takes a similar approach towards defining significant and unreasonable conditions of groundwater storage as it does groundwater levels, stating that its GSP has a positive impact on the aquifer.
- **Seawater Intrusion:** Determined not applicable to the Subbasin.
- **Degraded water quality:** *Significant and unreasonable degradation of groundwater quality, as defined by each GSP Group, that has an impact on the beneficial users of groundwater in the Subbasin through either intra- and/or inter-basin actions and/or activities.*
 - A wide range of significant and unreasonable definitions related to the degradation of water quality were applied throughout the Subbasin.¹¹³ The **Aliso GSP** states, “Significant and unreasonable is defined as a reduction in crop production due to water quality issues and if 30% of the wells exceed the minimum threshold value on a 4-year consecutive average without treatment.” The **Farmers GSP**, which has two management areas, provides the following: “(1) Continued migration of the Steffens plume (elevated Total

¹¹¹ SJREC GSP, Section 3.3.1, pp. 122-125.

¹¹² Aliso GSP, Common Chapter, Table CC-15, pp. 422-423.

¹¹³ Aliso GSP, Common Chapter, Table CC-16, pp. 424-425.

dissolved solids [TDS]) in Upper Aquifer both within Management Area A and towards Farmers Water District. (2) Unreasonable rates of migration of groundwater in the Upper Aquifer with naturally-occurring elevated concentrations of total dissolved solids in Management Area B. (3) Potential effects on the beneficial uses of groundwater include agricultural and domestic uses. (4) Degraded water quality in the Fresno Slough effect [sic] beneficial users of surface water.” The **Fresno County GSP**, which also has two management areas, indicates that the following would be considered significant and unreasonable: “(1) Impairment of groundwater quality from the migration of the Steffens Plume from Fresno County’s Management Area A. Impacts from the Steffens plume impacts Farmers Water District’s ability to utilize groundwater for adjacent use and discharge into the Mendota Pool. (2) Potential effects on the beneficial users of groundwater include water quality levels that impact crops and drinking water standards for domestic uses. (3) Degraded water quality in the Fresno Slough effecting beneficial users of surface water.” In the **Grassland GSP**, significant and unreasonable is described as “Degradation of groundwater quality resulting in reduced ability to develop and manage groundwater for habitat productivity.” The **Northern and Central GSP** applies the following, “(1) Exceedance of maximum contaminant levels (MCLs) or water quality objectives (WQOs) for irrigation in public water systems for three (3) consecutive sampling events in non- drought years or the additional degradation of current groundwater quality where current groundwater quality exceeds the MCLs or WQOs for irrigation. (2) Water quality degradation due to recharge projects that exceeds 20% of the aquifer’s assimilative capacity for one or more constituents without justification of a greater public benefit achieved.” And the **SJREC GSP** defines significant and unreasonable as, “[m]igration of contamination plume that makes the water unusable for beneficial use”; however, beneficial use is not expressly defined when establishing significant and unreasonable conditions.

- **Land subsidence:** *Changes in ground surface elevation that cause damage to critical infrastructure that would cause significant and unreasonable reductions of conveyance capacity, damage to personal property, impacts to natural resources or create conditions that threaten public health and safety.*
 - The **Aliso GSP** states, “Aliso is not currently experiencing any significant and unreasonable effects of subsidence. Significant and unreasonable impacts are assumed to occur when the levees within the District have subsided to an elevation causing impacts to the water carrying capacity of the San Joaquin River and Chowchilla Bypass beyond their design flow rates, causing significant and unreasonable flooding or crop damage.”¹¹⁴ In

¹¹⁴ Aliso GSP, Common Chapter, Table CC-17, p. 426-427.

the **Farmers GSP**, significant and unreasonable is defined as “Damage to infrastructure and loss of conveyance capacity in neighboring Groundwater Sustainability Agencies” and in the **Fresno County GSP** it is defined as “Damage to infrastructure, loss of conveyance capacity, and potential inability to flood or drain by gravity and associated habitat impacts.” The **Grassland GSP** considers “Damage to infrastructure, permanent loss of conveyance capacity beyond mitigation, and potential inability to flood or drain by gravity and associated habitat impacts” to be a significant and unreasonable condition. The definition applied by the **Northern and Central GSP** in the WSID-TID management area is: “Impacts to laterals from differential settlement that reduces the ability to deliver surface water supplies” and in the TRID management area “Inadequate freeboard on levee system in wet years as a result of significant additional land subsidence resulting from groundwater extractions.” In the remaining Northern and Central GSP area, significant and unreasonable is defined as, “Increases in 2014-2016 subsidence rates due to groundwater pumping in two or more subregions that results in 50% loss of standup capacity and/or 75% overtopping of lining in the Delta-Mendota Canal as a result of inelastic land subsidence.” In the **SJREC GSP**, “Reduction in the conveyance capacity for water distribution and/or damage to critical infrastructure” is considered significant and unreasonable.

- **Depletions of interconnected surface water:** *Depletions of interconnected surface water, as defined by each GSP Group, that have significant and unreasonable adverse impacts on the beneficial uses of surface water.*
 - The **Aliso GSP** does not consider the depletion of interconnected surface water to be applicable to its area, but states, “A significant and unreasonable result would be a reduction in water availability to downstream beneficial users beyond what was experienced in similar water years in recent history as a result of groundwater extractions.”¹¹⁵ The **Farmers GSP** considers the following to constitute a significant and unreasonable condition, “(1) San Joaquin River Restoration Project (SJRRP) operations and groundwater extractions from the Upper Aquifer that will influence stream depletion along San Joaquin River; (2) Water level measurements along the San Joaquin River in the shallow zone of the Upper Aquifer to determine degree of vertical gradient; (3) Potential degradation to groundwater dependent ecosystems (GDEs) along San Joaquin River primarily dependent on SJRRP operations of San Joaquin River flows since groundwater pumping expected to remain stable and consistent with historical (pre-SJRRP) levels.” The **Fresno County GSP** has applied the following definition, “Decrease in surface water stage in

¹¹⁵ Aliso GSP, Common Chapter, Table CC-18, p. 428-429.

Mendota Pool from Bureau of Reclamation and Central California Irrigation District (CCID) operations that impact groundwater dependent ecosystems (GDEs) and operations in Mendota Wildlife Area.” The **Grassland GSP** states groundwater pumping does not influence surface water depletion but defines a significant and unreasonable undesirable result to be impaired habitat directly associated with interconnected surface waters.” The **Northern and Central GSP** has not defined what a significant and unreasonable condition related to depletions of interconnected surface water would be, and the **SJREC GSP** states, “When groundwater extraction directly decreases streamflow in losing stretch of the San Joaquin River.”

As demonstrated by the review of each specific GSP’s definition of undesirable results, the Plan, while purporting to be coordinated, actually presents a very complicated and disparate range of definitions for what constitutes an undesirable result for each category, such that whether or not something is considered an undesirable result depends on where in the Subbasin the condition is occurring and the definition applicable to that location. Department staff find that this methodology does not conform to the requirement of Water Code Section 10727.6 that individual plans utilize the same data and methodologies for the assumed sustainable yield in developing a basin’s Plan.

3.2.3 Corrective Action

The GSAs in the Subbasin should modify each of their respective GSPs, as well as any applicable coordination materials, to substantially comply with the GSP Regulations and define undesirable results in a manner that addresses groundwater conditions occurring throughout the Subbasin, not for only the small portion of the Subbasin represented by the respective GSPs. One way for this deficiency to be remedied is for each of the six separate GSPs to use the same quantitative minimum thresholds, or the same methodology to develop the thresholds, and explicit criteria for undesirable results. Alternatively, if the GSAs believe it is not possible, or for some other reason still desire to use different definitions and metrics for undesirable results within each of the Subbasin’s six GSP areas, the Plan must specifically explain how any differences do not affect the requirement to utilize the same data and methodologies for the assumed sustainable yield of the Subbasin. Additionally, if a GSP determines that a sustainability indicator is not applicable within the defined GSP area, then that information must be supported by the best available information and best available science.

3.3 DEFICIENCY 3. THE GSPs IN THE SUBBASIN HAVE NOT SET SUSTAINABLE MANAGEMENT CRITERIA IN ACCORDANCE WITH THE GSP REGULATIONS.

3.3.1 Background

The GSP Regulations, in Subarticle 3, describe criteria by which a GSA defines conditions in its Plan that constitute sustainable groundwater management for the basin, including the process by which the GSA, or GSAs, shall characterize undesirable results, and establish minimum thresholds and measurable objectives for each applicable

sustainability indicator.¹¹⁶ The Plan shall include a description of the sustainability goal, including information from the basin setting used to establish the sustainability goal, a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation and is likely to be maintained through the planning and implementation horizon.¹¹⁷ Additionally, each GSA shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin, which occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.¹¹⁸ Finally, each GSA in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.¹¹⁹ Minimum thresholds for each sustainability indicator shall be defined as follows:¹²⁰

- The minimum threshold for chronic lowering of groundwater levels shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.
- The minimum threshold for reduction of groundwater storage shall be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results.
- The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results. Note that this sustainability indicator is not applicable to the Subbasin.
- The minimum threshold for degraded water quality shall be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the GSA that may lead to undesirable results.
- The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.
- The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has

¹¹⁶ 23 CCR § 354.22.

¹¹⁷ 23 CCR § 354.24.

¹¹⁸ 23 CCR § 354.26.

¹¹⁹ 23 CCR § 354.28(a).

¹²⁰ 23 CCR § 354.28(b).

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adverse impacts on beneficial uses of the surface water and may lead to undesirable results.

3.3.2 Deficiency Details

Coordinated sustainable management criteria are briefly discussed in Section 5 of the Common Plan and in Technical Memorandum #4.¹²¹ The following summarizes the deficiencies associated with the approaches taken to define the Subbasin's sustainability goal, undesirable results, and minimum thresholds.

Sustainability Goal

Section 5.2 of the Common Chapter states, "The sustainability goal for the Delta-Mendota Subbasin was established to succinctly state the objectives and desired conditions of the Subbasin that culminates in the absence of undesirable results by 2040."¹²² The sustainability goal for the Subbasin is:

The Delta-Mendota Subbasin will manage groundwater resources for the benefit of all users of groundwater in a manner that allows for operational flexibility, ensures resource availability under drought conditions, and does not negatively impact surface water diversion and conveyance and delivery capabilities. This goal will be achieved through the implementation of the proposed projects and management actions to reach identified measurable objectives and milestones through the implementation of the GSP(s), and through continued coordination with neighboring subbasins to ensure the absence of undesirable results by 2040.

While this is the agreed upon sustainability goal for the Subbasin, each of the six GSPs includes its own version of what its GSP-area goal is and does not correlate those goals with the Subbasin's sustainable yield.¹²³ As indicated in the GSP Regulations, the Plan shall include a description of the sustainability goal, including information from the basin setting used to establish the sustainability goal, a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan Implementation and is likely to be maintained through the planning and implementation horizon.¹²⁴ The Common Chapter does not provide any of this required information, but instead references the individual GSPs which present this information in a manner that is not sufficiently detailed nor coordinated. The individual GSPs also do not include supporting information that is sufficiently detailed, but instead provide statements, for example, that the GSP areas have "a significant amount of flexibility in defining and implementing Sustainable Management Criteria in the absence of undesirable results."¹²⁵

¹²¹ Aliso GSP, Common Chapter, Section 5, pp. 418-429, Technical Memorandum #4, pp. 532-533.

¹²² Aliso GSP, Common Chapter, Section 5.2, pp. 418-419.

¹²³ Aliso GSP, Section 4.1, pp. 97-98; Farmers GSP, Section 4.1, p. 138; Fresno County GSP, Section 4.1, p. 159; Grassland GSP, Section 4.1, pp. 156-157; Northern and Central GSP, Section 6.2, pp. 470-471; SJREC GSP, Section 3.1, p. 120.

¹²⁴ 23 CCR § 354.24.

¹²⁵ Grassland GSP, Section 4.1, pp. 156-157.

Like the Subbasin's definition of undesirable results, which has up to six different GSP definitions of what is considered a significant and unreasonable condition, the Subbasin appears to have multiple definitions of its sustainability goal depending upon which GSP is referenced.

Undesirable Results

The details associated with this insufficient aspect of the Plan's sustainable management criteria are presented in the discussion for Deficiency #2. As previously stated, each of the six GSPs prepared in the Subbasin defined its own sustainable management criteria and each sustainability indicator has up to six different definitions of what are considered significant and unreasonable conditions.¹²⁶ While this approach was agreed upon by the 23 GSAs in the Subbasin using the required coordination agreement, by approaching the sustainability indicators in such an individualistic and isolated manner, Department staff do not believe that the Plan satisfies the SGMA requirement to use the same data and methodologies.¹²⁷ Department staff also believe that this approach does not achieve a coordinated Plan for the Subbasin, and this approach fragments the Department's ability to track sustainable conditions that are common throughout the Subbasin.

As demonstrated by the review of each specific GSP's definition of undesirable results, the Plan, while purporting to be coordinated, actually presents a very complicated and disparate range of definitions for what constitutes an undesirable result for each category, such that whether or not something is considered an undesirable result depends on where in the Subbasin the condition is occurring. Department staff find that this methodology does not conform to the requirement of Water Code Section 10727.6 that individual plans utilize the same data and methodologies for the assumed sustainable yield in developing a Plan.

Minimum Thresholds and Measurable Objectives

The establishment of minimum thresholds and measurable objectives in the Subbasin are not coordinated, nor are they supported by information that is sufficiently detailed. Section 5.3 of the Common Chapter simply states, "For more information on the development of the sustainable management criteria and information used to support the established sustainable management criteria for the individual GSP Groups, refer to the individual GSPs. Each GSP Group defined what is considered significant and unreasonable in their Plan Area for each applicable sustainability indicators, in addition to establishing minimum thresholds, measurable objectives and 5-year interim goals for their Plan Area."¹²⁸ Section 5.4 of the Common Chapter provides, in Tables CC-14 through CC-18,¹²⁹ a summary of the Subbasin-wide definition of an undesirable result, GSP-level definition of significant and unreasonable, sustainability goals, 5-year interim goals, minimum

¹²⁶ Aliso GSP, Common Chapter, Tables CC-14 through CC-18, pp. 420-429.

¹²⁷ Water Code § 10727.6; 23 CCR § 357.4(a).

¹²⁸ Aliso GSP, Common Chapter, Section 5.3, p. 419.

¹²⁹ Aliso GSP, Common Chapter, Tables CC-14 through CC-18, pp. 420-429.

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thresholds, and measurable objectives. However, as shown in the tables, each GSP generally contains a wide variety of what are considered significant and unreasonable conditions, sets different interim goals, minimum thresholds, and measurable objectives, often with different units of measurement, or determines that a particular sustainability indicator is not applicable to its GSP area without providing sufficient justification. Below is a summary of what the minimum thresholds are for each of the five applicable sustainability indicators – note that some of the GSPs have determined that relevant sustainability indicators are not applicable and have not set thresholds or objectives.

- Chronic lowering of groundwater levels: Table CC-14 in the Common Chapter summarizes sustainable management criteria for groundwater levels.¹³⁰
 - The Aliso GSP has set its minimum thresholds in four wells to provide a 100-foot buffer from the top of the Corcoran Clay to the top of the water table.¹³¹ However, some of the wells used in the Aliso GSP to monitor groundwater levels are composite wells screened through the Corcoran Clay which cannot provide an accurate indication of Upper Aquifer and Lower Aquifer conditions. The Aliso GSP assumes, differently than the other GSPs, that the Upper and Lower aquifers function as “one aquifer.” Additionally, the definition of significant and unreasonable is linked to accelerated rates of subsidence which is stated to occur “if 30% of the wells in the monitoring zone exceed the minimum threshold value on a 4-year consecutive average under normal or average year conditions,”¹³² which needs further explanation to understand how or why this threshold was selected and precisely how it will be applied.
 - The Farmers GSP and the Fresno County GSP have identified seasonal highs and seasonable lows in units of feet below ground surface (ft bgs) in the Common Chapter, indicating that an undesirable result would be exceeding historic lows from 2015-2016, but the details in the respective GSPs present different descriptions, such as elevation declines observed between 2011-2016, and threshold metrics are shown as an elevation not feet below ground surface.¹³³
 - The Grassland GSP defines its water level thresholds to “not exceed a 20% lowered water elevation from the recent historical low set uniquely at each representative monitoring site. Recent Historical is defined as the period from 2000 to the present.” Some of the monitoring wells in the Grassland GSP do not have any historical data.¹³⁴

¹³⁰ Aliso GSP, Common Chapter, Table CC-14, pp. 420-421.

¹³¹ Aliso GSP, Table 4-2, p. 111.

¹³² Aliso GSP, Common Chapter, Table CC-14, p. 420.

¹³³ Farmers GSP, Section 4.3.1, pp. 145-147; Fresno County GSP, Section 4.3.1, pp. 167-169.

¹³⁴ Grassland GSP, Table 4-5, p. 171.

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- For the Northern and Central GSP, minimum thresholds are set at the hydrologic low for wells perforated in the Upper Aquifer and 95 percent of the hydrologic low for the Lower Aquifer, but an undesirable result would not occur until 40 percent of monitoring locations exceed thresholds (7 out of 17 wells in the Upper Aquifer and/or 8 out of 18 wells in the Lower Aquifer).¹³⁵ If these conditions were to occur, the GSP anticipates that shallow domestic wells would go dry and/or these conditions would result in higher pumping costs and/or the need to modify wells to obtain groundwater.
- And in the SJREC GSP, trigger levels have been established in each of the 11 management areas, which if exceeded, would not allow groundwater to be transferred out of the management area, but would not limit the extraction and application of groundwater on the overlying land. The minimum threshold represents a 25 percent increase in the depth to water than the trigger water surface elevation.¹³⁶
- Reduction in groundwater storage: Table CC-15 in the Common chapter summarizes sustainable management criteria for groundwater storage.¹³⁷
 - The Aliso GSP has set minimum thresholds for reduction of groundwater storage just as it has for chronic lowering of groundwater levels – the GSP is using groundwater levels as a proxy and ties undesirable results with rates of subsidence.¹³⁸
 - The minimum thresholds set in the Farmers GSP do not match what is presented in the Common Chapter.¹³⁹ The Farmers GSP states annual change in storage will be estimated based on changes observed between seasonal high contours and indicates the threshold for total storage change in the Upper Aquifer is 11,000 acre-feet and 4,400 acre-feet in the Lower Aquifer – the Common Chapter indicates 12,000 acre-feet and 4,600 acre-feet, respectively, but over an extended dry period.
 - The Fresno County GSP takes a similar approach as the Farmers GSP, and the thresholds presented in the GSP do not match the Common Chapter.¹⁴⁰ The Fresno County GSP indicates the threshold for total storage change in the Upper Aquifer is 110,000 acre-feet and 38,000 acre-feet in the Lower Aquifer – the Common Chapter indicates 90,000 acre-feet and 55,000 acre-feet, respectively, but over an extended dry period.

¹³⁵ Northern and Central GSP, Sections 6.3.1.1.2 and 6.3.1.2, pp. 472-474.

¹³⁶ SJREC GSP, Section 3.3, pp. 122-125.

¹³⁷ Aliso GSP, Common Chapter, Table CC-15, pp. 422-423.

¹³⁸ Aliso GSP, Section 4.4.1.1, pp. 111-113.

¹³⁹ Farmers GSP, Section 4.3.2, pp. 147-148, Common Chapter, Table CC-15, p. 345.

¹⁴⁰ Fresno County GSP, Section 4.3.2, pp. 169-170, Common Chapter Table CC-15, p. 384.

- The Grassland GSP uses groundwater levels as a proxy to determine change in storage and applies a “20% lowered water elevation from recent historic low” as its minimum threshold (recent historical is the period 2000 to present).¹⁴¹
- The Northern and Central GSP uses groundwater elevations as a proxy for groundwater storage.¹⁴²
- The SJREC GSP uses groundwater elevations as a proxy for groundwater storage.¹⁴³
- Degraded water quality: Table CC-16 in the Common Chapter summarizes sustainable management criteria for degraded water quality.¹⁴⁴
 - In the Aliso GSP minimum thresholds have been set for electrical conductivity (4.5 dS/m), chloride (13.3 meq/L), and nitrate as nitrogen (30 mg/L) following Food and Agriculture Organization guidelines. None of the monitoring wells within the Aliso GSP area have historical or current water quality information attributed to them.¹⁴⁵
 - The Common Chapter indicates the Farmers GSP, which has created a water quality management area due to the Steffens Plume, has established “an annual rate of degradation of 60 mg/L total dissolved solids (TDS) for the saline front” but the Farmers GSP states the minimum threshold was set “at a slightly higher value than historic high TDS to maintain agricultural practices”.¹⁴⁶ The threshold set in five wells is 1,200 mg/L for TDS – the Farmers GSP acknowledges that the EPA secondary standard for TDS in drinking water is 500 mg/L, but states it is a non-enforceable guideline.
 - The minimum thresholds for degraded water quality in the Fresno County GSP “were set by two different methods depending on the cause of degraded groundwater. Wells along the west side of the Fresno Sough affected by naturally occurring saline water had values set based on the maximum annual change in TDS concentration, and wells in areas where groundwater quality is affected by the Steffens Plume were set at a fixed concentration of TDS.”¹⁴⁷ The Common Chapter indicates the minimum threshold for TDS is 1,100 mg/L, which is different than what the Fresno County GSP presents.¹⁴⁸

¹⁴¹ Grassland GSP, Section 4.4.1, pp. 170-173.

¹⁴² Northern and Central GSP, Section 6.3.2, pp. 480-482.

¹⁴³ SJREC GSP, Section 3.3.2, p. 126.

¹⁴⁴ Aliso GSP, Common Chapter, Table CC-16, pp. 424-425.

¹⁴⁵ Aliso GSP, Table 4-6, p. 134.

¹⁴⁶ Farmers GSP, Section 4.3.4, pp. 149-150.

¹⁴⁷ Fresno County GSP, Section 4.3.4.1, pp. 171-172.

¹⁴⁸ Fresno County GSP, Common Chapter, Table CC-16, p. 386.

- The Grassland GSP states, “The minimum threshold for water quality is set to a TDS measurement of 2500 mg/L for all representative monitoring wells in both the Upper Aquifer and Lower Aquifer.”¹⁴⁹
- In the Northern and Central GSP, minimum thresholds for water quality “are set as the upper Secondary MCL for TDS (1,000 mg/L), the Primary MCL for nitrate (10 mg/L as N), and the agricultural WQO for irrigation for boron (0.7 mg/L) or current groundwater quality as of December 2018 for both the Upper Aquifer and Lower Aquifer if the listed MCL or WQO is already exceeded.”¹⁵⁰ Minimum thresholds assigned to the Upper Aquifer and Lower Aquifer in the Northern and Central GSP are shown in Tables 6-5 and 6-6, respectively, and thresholds for TDS range from 1,000 mg/L to 4,000 mg/L.
- And in the SJREC GSP, the minimum threshold is simply defined as the amount of poor-quality groundwater that is greater than what can be successfully managed through the management actions.
- Land subsidence: Table CC-17 in the Common Chapter summarizes sustainable management criteria for land subsidence.¹⁵¹
 - In the Aliso GSP, the minimum threshold is based on the average rate of subsidence observed by the San Joaquin River Restoration Program and the U.S. Bureau of Reclamation and is set at 0.2 feet per year, or a total of 4.0 feet of additional subsidence by 2040. However, Department staff note that this rate of subsidence is not projected to cease after 2040.¹⁵²
 - The Farmers GSP states, “The minimum threshold was established as the maximum rate of subsidence or compaction that occurred during the historic groundwater period (2000-present).”¹⁵³ The minimum threshold at the Yearout site is 0.017 ft per year and 0.1 feet per year at site P304 – both representing rates for the Upper Aquifer only.
 - The Fresno County GSP is similar to the Farmers GSP – minimum thresholds for “were based on conditions observed during historic groundwater conditions. The MT was established as the maximum rate of subsidence or compaction that occurred during historic groundwater conditions. These values coincided with the greatest decline in groundwater elevation which occurred between the years of 2011 and 2016.”¹⁵⁴ The

¹⁴⁹ Grassland GSP, Table 4-5, p. 171, Section 4.4.1.4, p. 175.

¹⁵⁰ Northern and Central GSP, Section 6.3.3.2, pp. 484-487.

¹⁵¹ Aliso GSP, Common Chapter Table CC-17, pp. 426-427.

¹⁵² Aliso GSP, Section 4.4.1.2, pp. 116-120, Appendix A, 246-248.

¹⁵³ Farmers GSP, Section 4.3.3, p. 148.

¹⁵⁴ Fresno County GSP, Section 4.3.3, pp. 170-171.

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minimum threshold at the Fordel site is 0.011 ft per year and 0.1 feet per year at site P304.

- In the Grassland GSP the minimum threshold “is set to not exceed the historical annual average rate of subsidence from December 2011 to December 2015.”¹⁵⁵ At subsidence monitoring points 108, 152 and 137 the minimum thresholds in feet per year are -0.11, -0.15 and -0.13, respectively.
- The Northern and Central GSP has subsidence management areas.¹⁵⁶ In the WSID-PID Management Area “the minimum threshold is set as the acceptable loss in distribution capacity as a result of subsidence resulting from groundwater pumping as based on future capacity study.” In the TRID Management Area “the minimum threshold is set as four (4) feet additional subsidence compared to 2019 benchmark elevation.” In the remaining GSP area, “The minimum threshold is set as target rate/goal by monitoring subregion, based on the average 2014-2016 elevation change from recent DMC surveys.” Subsidence threshold rates are generally between -0.13 and -0.26 ft/year.
- And in the SJREC GSP, no numerical minimum thresholds are provided. The minimum threshold for land subsidence “shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results. Minimum thresholds shall be supported by maps and graphs showing the extent and rate of subsidence and the potential impact to land use and property interests.”¹⁵⁷
- Depletions of interconnected surface water: Table CC-18 in the Common Chapter summarizes sustainable management criteria for interconnected surface water.¹⁵⁸
 - The Aliso GSP has not established sustainable management criteria for interconnected surface water because of an existing legal agreement, despite the GSP area being located adjacent to the San Joaquin River.¹⁵⁹
 - The Farmers GSP acknowledged interaction between surface water and groundwater but set a minimum threshold as a gradient between two wells.¹⁶⁰
 - The Fresno County GSP set its minimum threshold “based on the historic decline in stage values in the Mendota Pool and Fresno Slough. The historic average stage was set as the MO and the MT was determined from the average historic decline of 0.5 ft/year from the MO which corresponds with

¹⁵⁵ Grassland GSP, Table 4-5, p. 171.

¹⁵⁶ Northern and Central GSP, Section 6.3.5.2, pp. 494-496, Table 6-9, p. 499.

¹⁵⁷ SJREC GSP, Section 3.3.5, pp. 127-129.

¹⁵⁸ Aliso GSP, Common Chapter, Table CC-18, pp. 428-429.

¹⁵⁹ Aliso GSP, Section 4.3.7, p. 110.

¹⁶⁰ Farmers GSP, Section 3.2.8, p. 87, Section 4.3.5, pp. 151-152.



recent stage levels.” The minimum threshold at the Mendota Pool Staff Gauge is 13 feet and the measurable objective is 14 feet.¹⁶¹

- The Grassland GSP proposes to use groundwater elevation as a proxy and states, “If a twenty percent or greater decrease from the recent historical (2000 to 2019) upper aquifer groundwater level lows are experienced or exceeded at more than fifty percent of the representative monitoring network wells for three consecutive years, then it can be assumed that significant and unreasonable undesirable results have occurred.”¹⁶²
- Sustainable management criteria for interconnected surface water have not been established for the Northern and Central GSP. The Northern and Central GSP states, “At the time of GSP development, there are insufficient data available to set numeric values for minimum thresholds for the depletions of interconnected surface water sustainability indicator in a manner that is not subjective. A qualitative statement of minimum thresholds has been developed in the interim for this sustainability indicator as follows: An X percent increase in surface water depletions along interconnected stretches of surface water as a result of groundwater pumping, where ‘X’ is the present increase in depletions to be determined from monitoring data collected between 2020 and 2025 and associated analyses of these data.”¹⁶³
- The SJREC GSP has not set numerical sustainable management criteria for interconnected surface water. The qualitative minimum threshold is, “Observed increase in seepage from the San Joaquin River due to groundwater extractions in the SJREC GSP Group area. The SJREC plan to work with the counties to restrict perforating wells above the first encountered restrictive clay layer (near the San Joaquin River) to prevent induced seepage similar to the established operations defined in the Herminghaus Agreement on Reach 2 of the San Joaquin River.”¹⁶⁴

3.3.3 Corrective Action

The GSAs in the Subbasin should adhere to Subarticle 3 of the GSP Regulations which describes sustainable management criteria. The Plan should explain the coordinated criteria by which the GSAs define conditions occurring throughout the Subbasin that constitute sustainable groundwater management, including the process or processes by which the GSAs characterize undesirable results, establish minimum thresholds, and set measurable objectives for each applicable sustainability indicator. Undesirable results should be coordinated and should define when significant and unreasonable effects for any of the sustainable indicators are caused by groundwater conditions occurring

¹⁶¹ Fresno County GSP, Section 4.2.5, pp. 165-166, Section 4.3.5, pp. 174-176.

¹⁶² Grassland GSP, Section 4.3.3, pp. 163-165, Table 4-5, p. 171.

¹⁶³ Northern and Central GSP, Section 6.3.6.2, p. 503.

¹⁶⁴ SJREC GSP, Section 3.3.6, p. 130.

throughout the Subbasin, not only in small GSP areas or even smaller management areas. The minimum thresholds must set numeric values that, if exceeded, may cause undesirable results, and must be defined in accordance with 23 CCR § 354.28(c). The supporting information must be sufficiently detailed and the analyses sufficiently thorough and reasonable, and any effort to disregard the applicability of a sustainability indicator in a GSP must be supported by the best available information and best available science. Additionally, if management areas will continue to be used throughout the Subbasin, the management areas must comply with 23 CCR § 354.20, as discussed in Deficiency #4.

3.4 DEFICIENCY 4: THE MANAGEMENT AREAS ESTABLISHED IN THE PLAN HAVE NOT SUFFICIENTLY ADDRESSED THE REQUIREMENTS SPECIFIED IN 23 CCR § 354.20.

3.4.1 Background

The term “management area” refers to an area within a basin for which a Plan may identify different minimum thresholds, measurable objectives, monitoring, or projects and management actions based on differences in water use sector, water source type, geology, aquifer characteristics, or other factors.¹⁶⁵ The use of management areas is optional in a Plan, and each GSA may define one or more management areas within a basin “if the GSA has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and may be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin.”¹⁶⁶ As previously discussed, undesirable results are not defined consistently throughout the Subbasin – each GSP group has defined differently what is considered significant and unreasonable for each of the applicable sustainability indicators, and each of the GSP groups have decided which areas of the Subbasin are subject to a range of established thresholds and measurable objectives.

If a GSA determines that the creation of management areas will help facilitate Plan implementation, the GSA must provide the following, while including descriptions, maps, and other information sufficient to describe the conditions in those areas:¹⁶⁷

- The reason for the creation of each management area.
- The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large.
- The level of monitoring and analysis appropriate for each management area.

¹⁶⁵ 23 CCR § 351(r).

¹⁶⁶ 23 CCR § 354.20(a).

¹⁶⁷ 23 CCR § 354.20(b).

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- An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable.

Additionally, if management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.¹⁶⁸

3.4.2 Deficiency Details

This deficiency is related to the use of management areas in four of the six GSPs prepared for the Subbasin. There are a total of 17 management areas in the Subbasin.

Technical Memorandum #4 addresses the use of management areas with the following statement: *"The Coordination Committee left management areas and management of their respective GSPs to the six GSP Groups. Management areas were determined individually by each GSP Group with Woodard & Curran preparing a map showing all management areas ('sum of the parts' approach)."*¹⁶⁹ However, the map referenced was not part of the Technical Memoranda and could not be found as part of the Common Chapter – management area maps are only found in the respective GSPs. The following describes the use of management areas in each of the six GSPs prepared for the Subbasin:

- Aliso GSP: No management areas are being used.¹⁷⁰
- Farmers GSP: Two management areas appear to be used. The Farmers GSP states, "FWD elected to become a management area for two of the five applicable sustainability indicators, Degraded Water Quality and Interconnected Surface Waters. A management area was created for these sustainability indicators due to their high sensitivity to the management actions of surrounding areas."¹⁷¹ Without further explanation, it is uncertain why management areas were created in the Farmers GSP, particularly in light of the fact that the Farmers GSP area occupies such a small portion of the Subbasin (0.3 percent).
- Fresno County GSP: Two management areas appear to be used. The Fresno County GSP states, "FCMA elected to become a management area for two of the five applicable sustainability indicators, degraded water quality and Interconnected Surface Waters. A management area was created for degraded water quality due to the existing contamination and Regional Board regulatory requirements for the Steffens plume in MAA [Management Area A]. A management area for interconnected surface waters for MAB [Management Area B] was developed because levels in the Fresno Slough are managed by SJREC, SLDMWA and

¹⁶⁸ 23 CCR § 354.34(d).

¹⁶⁹ Aliso GSP, Technical Memorandum #4, pp. 532-533.

¹⁷⁰ Aliso GSP, Section 3.4, p. 96.

¹⁷¹ Farmers GSP, Section 3.4, pp. 135-136.

USBR and not a function of naturally occurring conditions.”¹⁷² While the Fresno County GSP provides an explanation as to why two management areas were created in its small GSP area (3 percent of the Subbasin), it is not clear how the use of management areas in the GSP will work in conjunction with the SJREC GSP, since the management area is managed by other entities. The Fresno County GSP should provide an explanation of how the management area can operate under different sustainable management criteria without causing undesirable results which, as discussed in this staff report, have not be set following the GSP Regulations.

- Grassland GSP: No management areas are being used.¹⁷³
- North and Central GSP: Two management areas have been established for land subsidence.¹⁷⁴ The West Stanislaus Irrigation District and Patterson Irrigation District (WSID-PID) Management Area and the Tranquility Irrigation District (TRID) Management Area were “established to better manage progress toward sustainability through sustainable management criteria for the land subsidence sustainability indicator.” The TRID Management Area is in the southern tip of the Subbasin and is adjacent to the Fresno County GSP. The GSP states, “subsidence occurring within this [WSID-PID] MA is expected to be minimal and is not anticipated to have significant potential to impact water conveyance infrastructure of statewide importance” because “WSID and PID both hold appropriative water rights...and minimal pumping occurs from the Lower Aquifer...” The TRID Management Area was established “because it is geographically separated from the remainder of the Plan Area and distant from the DMC [Delta-Mendota Canal].” Each of these management areas have their own defined thresholds and measurable objectives and versions of what conditions are considered undesirable results.
- SJREC GSP: The SJREC GSP has established 11 management areas.¹⁷⁵ The management areas defined as Management Areas A through K appear to roughly follow the boundaries of the 11 GSAs included in the SJREC GSP. The management areas are reportedly defined by water supply, aquifer, and drainage characteristics, but detailed maps of those management areas and how well they correlate with established GSA boundaries do not seem to be readily available. Additional descriptions of the areas, with customized hydrologic conceptual models, are provided in Sections 7 through 16 of the SJREC GSP¹⁷⁶ and in Appendices Q through W.¹⁷⁷ Not all the management areas have monitoring

¹⁷² Fresno County GSP, Section 3.4, pp. 156-157.

¹⁷³ Grassland GSP, Section 3.4, p. 155.

¹⁷⁴ North and Central GSP, Section 5.5, pp. 450-452.

¹⁷⁵ SJREC GSP, Section 2.2.4, pp. 113-115.

¹⁷⁶ SJREC GSP, Sections 7 through 16, pp. 151-215.

¹⁷⁷ SJREC GSP, Appendices Q through W, pp. 1210-1643.

locations to determine if thresholds or objectives are being met.¹⁷⁸ Additionally, as discussed in other sections of this document, the SJREC GSP has not set numerical sustainable management criteria for a variety of sustainability indicators and it is uncertain what thresholds or objectives these management areas must adhere to. Most of the management areas are assigned individual basin settings, hydrogeologic conceptual models, water budgets, and “sustainable management criteria,” and each of the descriptions generally have statements that the SJREC GSP management areas are operating sustainably. Additionally, the information related to the separate GSA areas indicate whether the thresholds and measurable objectives relevant to the SJREC GSP are applicable to those sub-areas – many management areas disregard the sustainable management criteria set for the GSP area. One complexity of using the management area approach in the SJREC GSP is the creation of a management area for the Fresno County GSA areas since Fresno County prepared its own GSP for its small portion of the Subbasin. It is not clear how the use of management areas in the SJREC GSP will work with the Fresno County GSP, and it raises the question as to whether the creation of a Fresno County GSP was justified if portions of that small GSP area are being managed by the SJREC GSP group.

While the use of management areas is technically allowed in a basin if the GSAs determine that the creation of management areas will facilitate implementation of their GSPs, the use of management areas in a basin that is already managed under six separate GSPs significantly complicates the Subbasin’s implementation of SGMA. It also impedes the ability of Department staff to determine if the sustainability goal established for the Subbasin is being met, especially if established management areas do not have monitoring points and it is uncertain what sustainable management criteria apply to each area.

3.4.3 Corrective Action

As previously stated, if management areas are used in a basin, the management areas must adhere to Section 354.20 of the GSP Regulations. The GSAs in their respective GSPs have not: (1) clearly defined a reasonable reason for the creation of each management area; (2) explained what the thresholds and measurable objectives are for each of the management areas; (3) presented the levels of monitoring and analysis appropriate for each of the management areas; and (4) explained using the best available information and best available science, with supporting data, that the management areas can operate under different thresholds and objectives without causing undesirable results outside of the management area.

The Common Chapter and coordination materials prepared for the Subbasin should describe all the management areas established in each of the six GSPs and clearly define the applicable minimum thresholds and measurable objectives and indicate where the monitoring points are within each of the management areas for all applicable sustainability

¹⁷⁸ SJREC GSP, Figure 22, p. 125.

indicators. Also, because many of the defined management areas follow GSA boundaries, additional information related to legal authority and financial resources necessary to implement the respective GSPs should be explained. If details specific to the management areas are not available or the GSAs cannot justify, in accordance with the GSP Regulations, the use of management areas, then the GSAs in the Subbasin should reconsider the use of management areas in the Subbasin's Plan.

4 STAFF RECOMMENDATION

Department staff believe that the deficiencies identified in this assessment should preclude approval of the Plan for the Delta-Mendota Subbasin. Department staff recommend that the Plan be determined incomplete.

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