

# APPENDIX 3.K. GROUNDWATER LEVEL INTERIM MILESTONES WELL IMPACT ASSESSMENT

Prepared as part of the  
**Groundwater Sustainability Plan**  
**Chowchilla Subbasin**

January 2020  
Revised January 2025

**GSP Team:**

Davids Engineering, Inc (Revised GSP)  
Luhdorff & Scalmanini (Revised GSP)  
ERA Economics  
Stillwater Sciences and  
California State University, Sacramento

## TECHNICAL MEMORANDUM

DATE: July 18, 2024

Project No. 23-1-048

TO: Chowchilla Subbasin GSAs

FROM: LSCE and DE

**SUBJECT: Chowchilla Subbasin Groundwater Level Interim Milestones (IM) Well Impact Assessment**

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### [Groundwater Level Interim Milestones \(IM\) Well Impact Assessment](#)

Groundwater level interim milestones (IMs) were evaluated to determine the impact to wells within Chowchilla Subbasin during the GSP implementation period. This evaluation considered agricultural, domestic, and public supply wells, and primarily focused on Lower Aquifer IMs.

Three water level surfaces were contoured for the 2025, 2030, and 2035 groundwater level IMs, respectively, at lower aquifer RMS wells. Well construction, where available, was compared to the IM surfaces to determine whether a well was likely to go dry when water levels were at the interim milestone level. A well was considered likely to go dry if the bottom of perforations (or total depth where perforation data was not available) was within 50-feet of the IM surface for agricultural and public supply wells or 10-feet of the IM surface for domestic wells. Wells with insufficient construction data were excluded from this analysis. Other reasons for wells to be excluded from the analysis included: wells being constructed prior to 1970, wells indicated to have been destroyed or abandoned, and wells indicated as likely to have gone dry prior to GSP implementation (i.e., bottom of perforations (or total depth) was within 50-feet for agricultural and public supply wells or 10-feet for domestic wells of the maximum simulated depth to water prior to water year 2020).

Agricultural wells in the Subbasin were evaluated using the DWR OSWCR dataset. A total of 714 WCRs for new wells since 1970 were available in Chowchilla Subbasin. A total of 115 wells were excluded from the MT evaluation. 86 wells were excluded from analysis due to having likely gone dry prior to GSP implementation and 29 wells were excluded from the analysis due to insufficient construction data. After exclusion of these wells, a total of 599 agricultural wells were available for the IM impact analysis. 49 wells (8% of wells included in analysis) were determined to be likely to go dry at the 2025 IM and 550 wells were likely not to be impacted at the 2025 IM. Wells that were determined to be likely to go dry at the 2025 IM were then removed from further analysis. This left 550 wells for comparison to the 2030 and 2035 IMs. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2030 IM and 550 wells were likely not to be impacted at the 2030 IM. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2035 IM and 550 wells were likely not to be impacted at the 2035 IM.

Domestic wells in the Subbasin were evaluated using the DWR OSWCR dataset. A total of 464 WCRs for new wells since 1970 were available in Chowchilla Subbasin. A total of 190 wells were excluded from the MT evaluation. 134 wells were excluded from analysis due to having likely gone dry prior to GSP implementation and 56 wells were excluded from the analysis due to insufficient construction data. After exclusion of these wells, a total of 274 domestic wells were available for the IM impact analysis. 49 wells (18% of wells included in analysis) were determined to be likely to go dry at the 2025 IM and 225 wells were likely not to be impacted at the 2025 IM. Wells that were determined to be likely to go dry at the 2025 IM were then removed from further analysis. This left 225 wells for comparison to the 2030 and 2035 IMs. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2030 IM and 225 wells were likely not to be impacted at the 2030 IM. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2035 IM and 225 wells were likely not to be impacted at the 2035 IM.

Public supply wells in the Subbasin were evaluated using the comprehensive dataset compiled for the Revised GSP (described in **Section 2.1.1.2** and **Table 2-4** of the Revised GSP). A total of 39 public supply wells were available in Chowchilla Subbasin. A total of 27 wells were excluded from the MT evaluation. 4 wells were excluded from analysis due to having likely gone dry prior to GSP implementation and 23 wells were excluded from the analysis due to insufficient construction data. After exclusion of these wells, a total of 12 public supply wells were available for the IM impact analysis. Only 1 well<sup>1</sup> (8% of wells included in analysis) was determined to be likely to go dry at the 2025 IM and 11 wells were likely not to be impacted at the 2025 IM. Wells that were determined to be likely to go dry at the 2025 IM were then removed from further analysis. This left 11 wells for comparison to the 2030 and 2035 IMs. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2030 IM and 11 wells were likely not to be impacted at the 2030 IM. No wells (0% of wells included in analysis) were determined to be likely to go dry at the 2035 IM and 11 wells were likely not to be impacted at the 2035 IM.

Results of the IM well impact analysis is summarized in **Table 1**.

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<sup>1</sup> The public supply well that was determined to go dry at the 2025 IM is the City of Chowchilla Well 11.

**Table 1. Interim Milestone Well Impact Analysis**

	<b><u>Agriculture/ Irrigation</u></b> <sup>1</sup>	<b><u>Domestic</u></b> <sup>2</sup>	<b><u>Municipal/ Public Supply</u></b> <sup>1,3</sup>
Total Count of Wells:	714	464	38
Count of Wells with Insufficient Depth Data:	29	56	23
Count of Wells Likely Dry or Replaced Prior to 2020:	86	134	4
Count of Wells for 2025 IM impact analysis:	599	274	12
Count of Wells that Would Go Dry at the 2025 IM:	49	49	1
Percent of Wells Impacted at 2025 IM:	8%	18%	8%
Count of Wells for 2030 IM impact analysis:	550	225	11
Count of Wells that Would Go Dry at the 2030 IM:	0	0	0
Percent of Wells Impacted at 2030 IM:	0%	0%	0%
Count of Wells for 2030 IM impact analysis:	550	225	11
Count of Wells that Would Go Dry at the 2035 IM:	0	0	0
Percent of Wells Impacted at 2035 IM:	0%	0%	0%
Count of Wells Not Impacted:	550	225	11
Percent of Wells Not Impacted at IMs:	92%	82%	92%

**NOTE:**

1. Bottom perforation is considered to be less than DTW/MT if perforation is within 50-feet of water level.
2. Bottom perforation is considered to be less than DTW/MT if perforation is within 10-feet of water level.
3. Municipal/Public Supply analysis utilizes comprehensive PWS dataset, includes both active and inactive wells.

## Comparison to State Water Resources Control Board (SWRCB) Staff Interim Milestone Analysis

As part of their review of the May 2023 Chowchilla Revised GSP, the State Water Resources Control Board (SWRCB) Staff conducted their own IM well impact analysis (details shared with the Chowchilla Subbasin on July 11). A total of 546 domestic wells were included in the SWRCB analysis and 227 were found to go dry at the 2025 IM, 230 to go dry at the 2030 IM, and 90 to go dry at the 2035 IM<sup>2</sup>. A total of 19 public supply wells were included in the SWRCB analysis and 2 were found to go dry at the 2025 IM, 2

<sup>2</sup> While not explicitly stated in communications from the SWRCB Staff, it appears that all wells were compared to each IM interval and that wells that were found to go dry at a previous IM interval were not excluded from further analysis. This likely resulted in a double counting of wells going dry at subsequent IM intervals.

to go dry at the 2030 IM, and 1 to go dry at the 2035 IM<sup>3</sup>. Agricultural wells were not included in the SWRCB analysis.

However, there are several key differences between these two analyses that contribute to the variation in results. The main assumption that is believed to cause the biggest discrepancy between the results of each analysis is that the SWRCB staff only excluded wells that went dry before 2015, while the Chowchilla Subbasin analysis excluded wells that went dry prior to 2020 (when SGMA was implemented). This likely results in a large number of wells that went dry between 2015 and 2020 being included in the SWRCB analysis. Additionally, the SWRCB staff used both the DWR OSWCR database and USGS well data, which likely introduced duplicate wells into the analysis. The SWRCB staff did not filter well records based on year drilled, while the Chowchilla Subbasin GSAs analysis only considered wells drilled after 1970 (older wells were excluded under the assumption that they were likely either abandoned or subsequently modified). Lastly, the SWRCB did not filter wells based on status, while the Chowchilla Subbasin GSAs analysis only considered new well constructions.

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<sup>3</sup> See footnote 2.

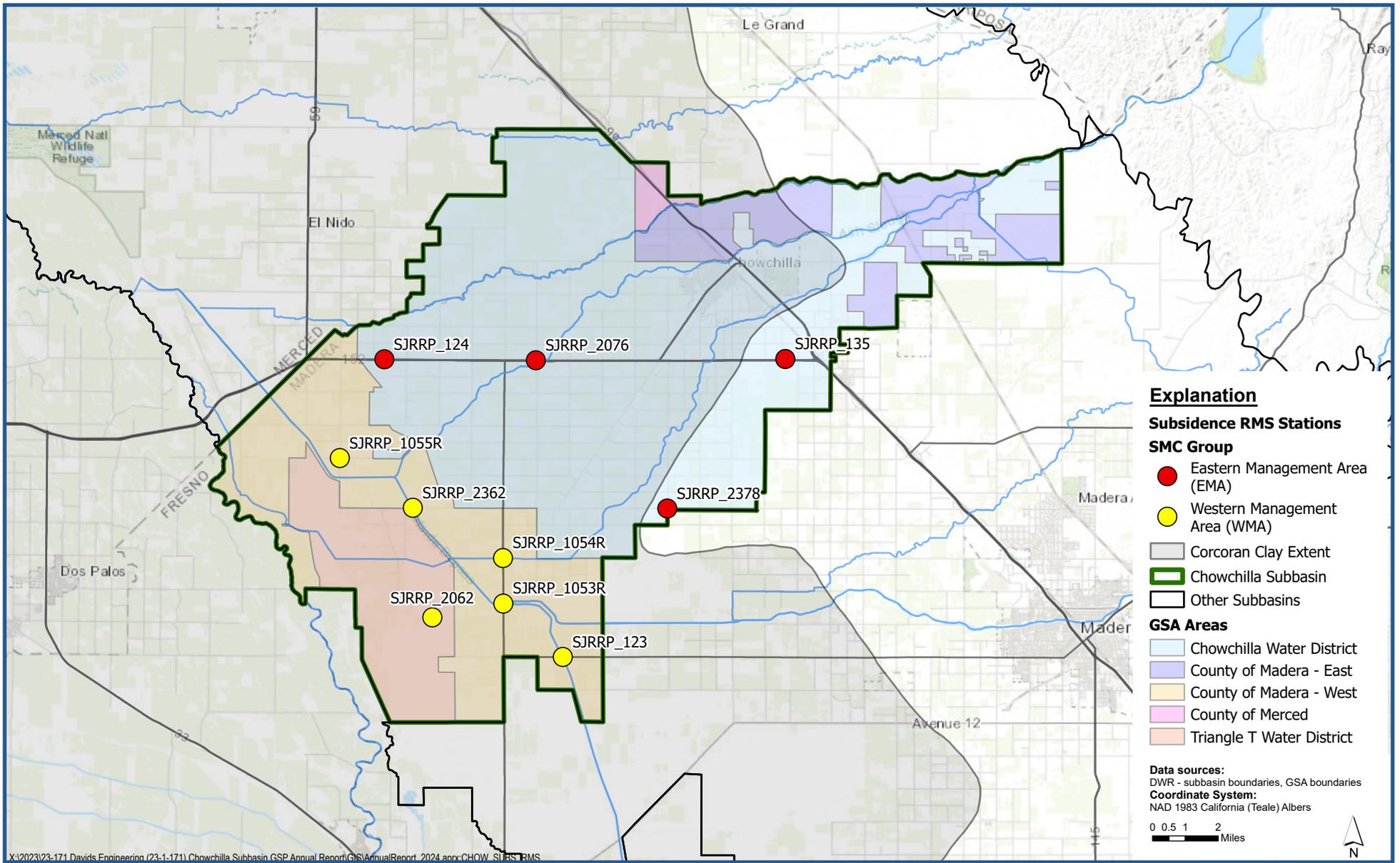
## **APPENDIX 3.L. LAND SUBSIDENCE INTERIM MILESTONE DEVELOPMENT**

Prepared as part of the  
**Groundwater Sustainability Plan  
Chowchilla Subbasin**

January 2020  
Revised January 2025

**GSP Team:**

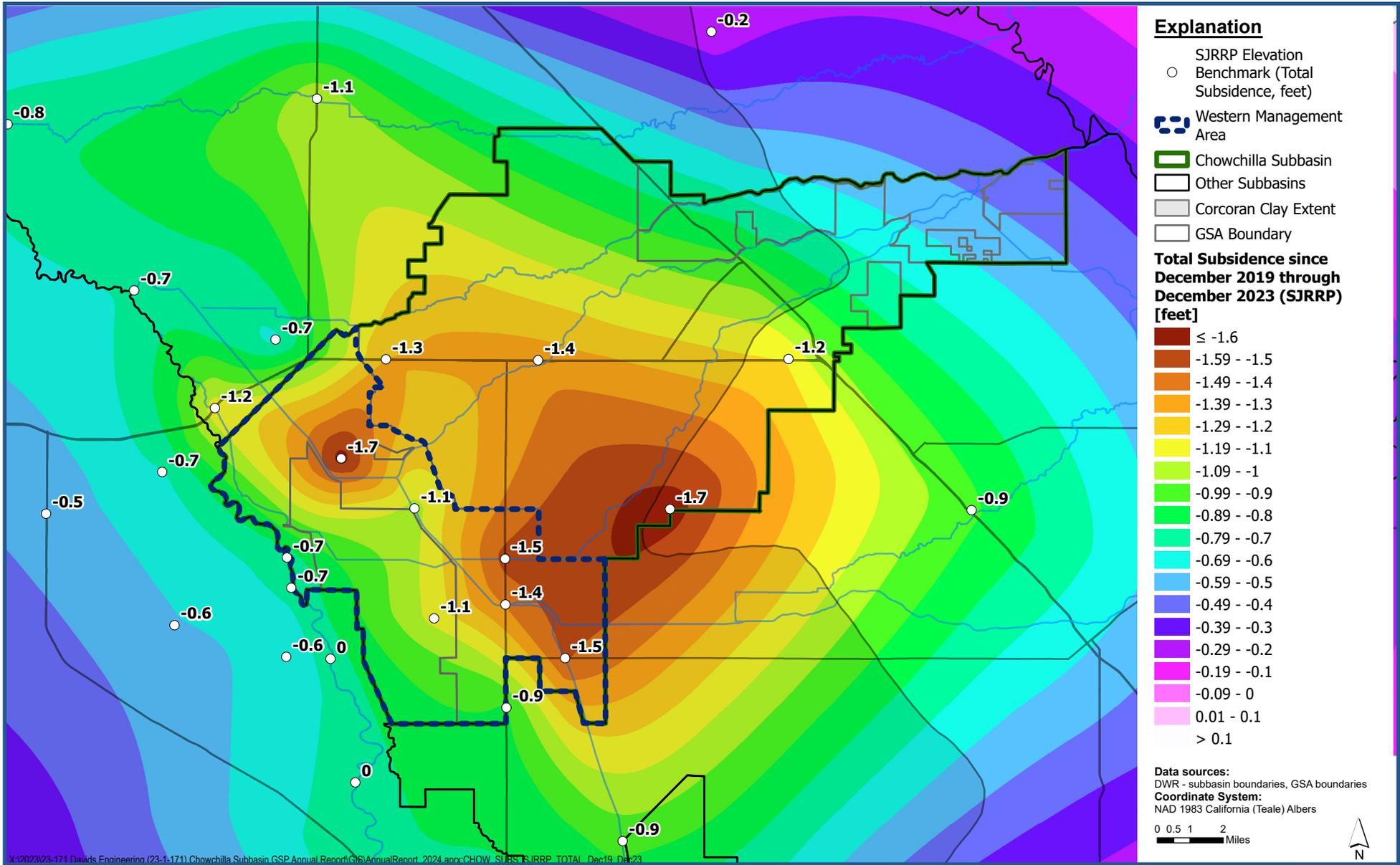
Davids Engineering, Inc (Revised GSP Team)  
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### Subsidence RMS Stations

Chowchilla Subbasin  
Groundwater Sustainability Plan

Figure 3.L-1



**Total Subsidence since December 2019 through December 2023  
(SJRRP Elevation Benchmark)**

*Chowchilla Subbasin  
Groundwater Sustainability Plan*

**Figure 3.L-2**



# **APPENDIX 3.M. CHOWCHILLA SUBBASIN RMS NETWORK EVALUATION WORKPLANS**

Prepared as part of the  
**Groundwater Sustainability Plan  
Chowchilla Subbasin**

January 2020  
Revised January 2025

**GSP Team:**

Davids Engineering, Inc (Revised GSP Team)  
Luhdorff & Scalmanini (Revised GSP Team)  
ERA Economics  
Stillwater Sciences and  
California State University, Sacramento

## TECHNICAL MEMORANDUM

DATE: July 17, 2024

Project No. 23-1-048

TO: Chowchilla Subbasin GSAs

FROM: LSCE and DE

**SUBJECT: Chowchilla Subbasin GSP – Groundwater Level Representative Monitoring Site (RMS) Network Evaluation Workplan**

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### Introduction and Background

The Chowchilla Groundwater Sustainability Agencies (GSAs) (Chowchilla Water District GSA, County of Madera GSA, County of Merced GSA, and Triangle T Water District GSA) developed a Groundwater Level Representative Monitoring Sites (RMS) network as part of the development of a Groundwater Sustainability Plan (GSP) for the Chowchilla Subbasin that was originally submitted in January 2020. During the implementation of the GSP, various issues have arisen that have affected the consistency of groundwater level measurements at a number of these RMS. As part of the first periodic update to the GSP, the groundwater level RMS network will be evaluated and updated to ensure consistent measurements that will satisfy Sustainable Groundwater Management Act (SGMA) monitoring requirements and support GSP activities in the Subbasin.

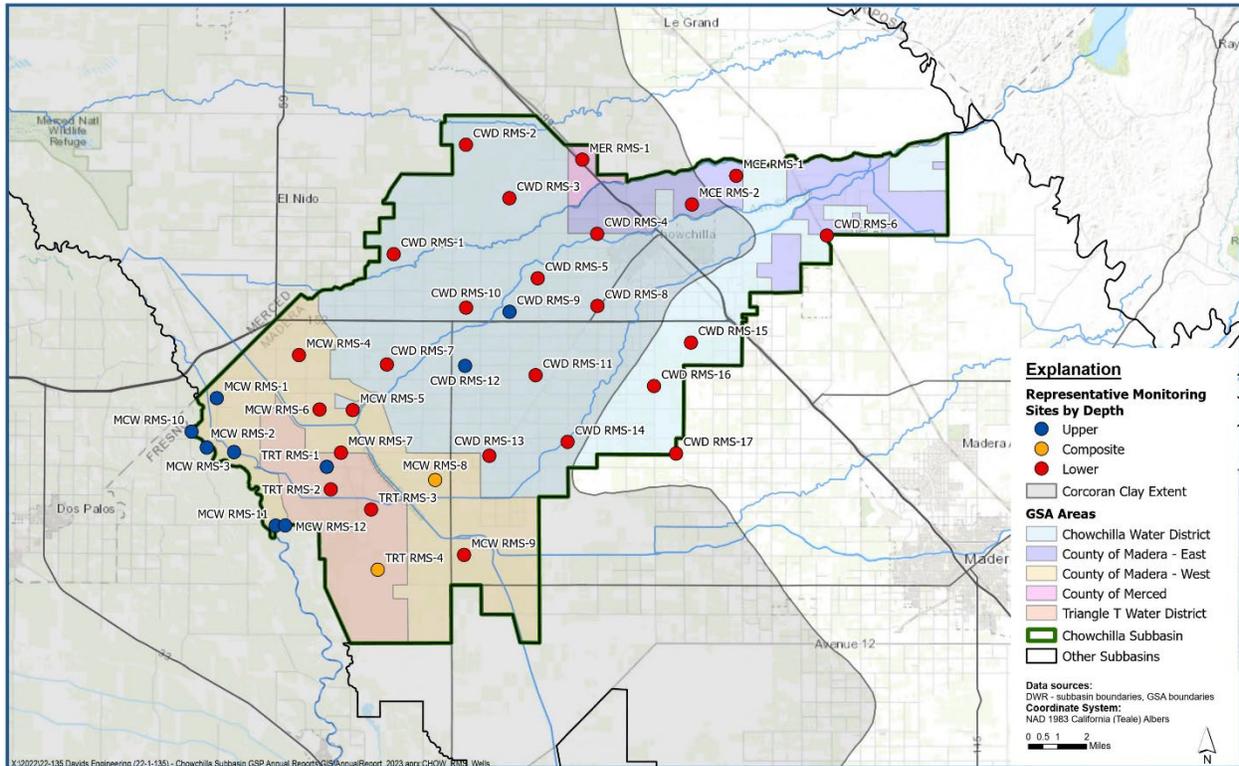
### Groundwater Level RMS Network

The Groundwater Level RMS network in Chowchilla Subbasin (**Figure 1**) currently consists of 36 wells: 9 screened in the Upper Aquifer, 25 screened in the Lower Aquifer, and two screened across both aquifers (composite). The monitoring network was initially developed using existing wells in the GSP Area. The database for existing wells was reviewed with the following criteria in mind:

- CASGEM wells preferred;
- Known construction (screen intervals, depth) preferred;
- Long histories of water level data (including recent data) preferred;
- Relatively good match between observed and modeled water levels preferred;
- Good spatial distribution preferred;
- Representation of both Upper (where present in western portion of Plan Area) and Lower Aquifers preferred.

As required by SGMA, groundwater level RMS are to be measured on a semi-annual basis at a minimum during periods which will capture seasonal highs and lows (i.e., spring and fall). A summary of annual monitoring activities is provided in each year's Annual Report for the Subbasin. A more comprehensive

review of the monitoring network will be conducted as part of this workplan, and a revised monitoring network will be implemented.



**Figure 1. Current Groundwater Level Representative Monitoring Sites (RMS) Network**

### Proposed Scope of Work

The proposed scope of work details the planned updates to groundwater level RMS network as part of the first periodic update to the Chowchilla Subbasin GSP. Refinements to the RMS network are necessary to ensure that the GSP is in compliance with the monitoring requirements set forth under SGMA. This scope of work involves three main tasks including evaluation of the current monitoring network, evaluation of wells for inclusion in the updated monitoring network, and finalization of the update monitoring network. The proposed scope of work is described in more detail below.

#### Task 1. Evaluate Current Monitoring Network

The first task will involve reviewing the monitoring history of each groundwater level RMS well. Wells that do not have consistent, reliable groundwater level measurements will require further evaluation, these include wells with both non-measurements and questionable measurements. Further evaluation will involve a detailed review of the issues encountered during monitoring. If these issues are persistent and preclude the well from satisfying the SGMA monitoring requirements on a regular basis, they will be identified for removal from the RMS network and possible replacement.

#### Task 2. Evaluate New Wells for Inclusion in Monitoring Network

Wells that have been identified for removal from the RMS network and possible replacement will either be replaced with dedicated nested monitoring wells or other existing wells.

#### *Dedicated Nested Monitoring Wells*

A total of 37 dedicated monitoring wells at 15 locations were drilled as part of GSP implementation. These dedicated monitoring wells have been consistently measured upon completion, with the intention of including these wells into the groundwater level RMS network. Where possible, these nested monitoring wells will replace current network RMS that have been identified for removal from the RMS network. In other locations, these wells will provide additional spatial coverage to the monitoring network.

#### *Additional Existing Wells*

In areas where existing RMS have been identified for removal from the RMS network but no dedicated nested monitoring wells exist, other existing wells will be used to fill in gaps in the RMS network. Potential wells for inclusion in the updated monitoring network will be identified through conversations with the GSAs, as well as review of currently monitored wells. At least five years of measurement history and known well construction will be required. After potential wells have been identified, field verification and permission from landowners will be acquired. If these conditions have been satisfied, a well will be included in the updated RMS network.

#### Task 3. Finalize Updates to Monitoring Network

##### *Prepare a Technical Memorandum (TM) Summarizing Monitoring Network Updates*

A TM will be prepared for the Chowchilla Subbasin summarizing the updates to the groundwater level RMS network. This TM will cover the wells identified for removal from the RMS network and possible replacement, the reason for removal/replacement, the new wells selected for inclusion in the RMS network, and a summary of the final updated RMS network. This TM will be included as a detailed appendix to the periodic update of the GSP.

##### *Update the RMS Network Description in the GSP*

As part of the first periodic update, the GSP will be updated to include a description of the new groundwater level RMS network. Wells added to the network will have sustainable management criteria developed consistent with the method described in the approved GSP.

##### *Update the RMS Network in the SGMA Portal*

The groundwater level RMS network will be updated in the SGMA Portal to reflect all changes made to the network as part of this workplan.

#### Schedule

The overall implementation of this Workplan is envisioned as a part of a larger effort for the first periodic update to the Chowchilla Subbasin GSP. Implementation of the Workplan is planned to start in mid-2024 with a target completion of late 2024. A general planned schedule for implementation of the Workplan is outlined in **Table 1**.

<b>Table 1. Summary of Proposed Schedule for Implementation of the Chowchilla Subbasin GSP Groundwater Level Representative Monitoring Site (RMS) Network Evaluation Workplan</b>		
<b>Task No.</b>	<b>Task Description</b>	<b>Task Completion Timeframe</b>
1	Evaluate Current Monitoring Network	Mid 2024
2	Evaluate New Wells for Inclusion in Monitoring Network	Mid 2024 – Late 2024
3	Finalize Updates to Monitoring Network	Late 2024

## TECHNICAL MEMORANDUM

DATE: July 17, 2024

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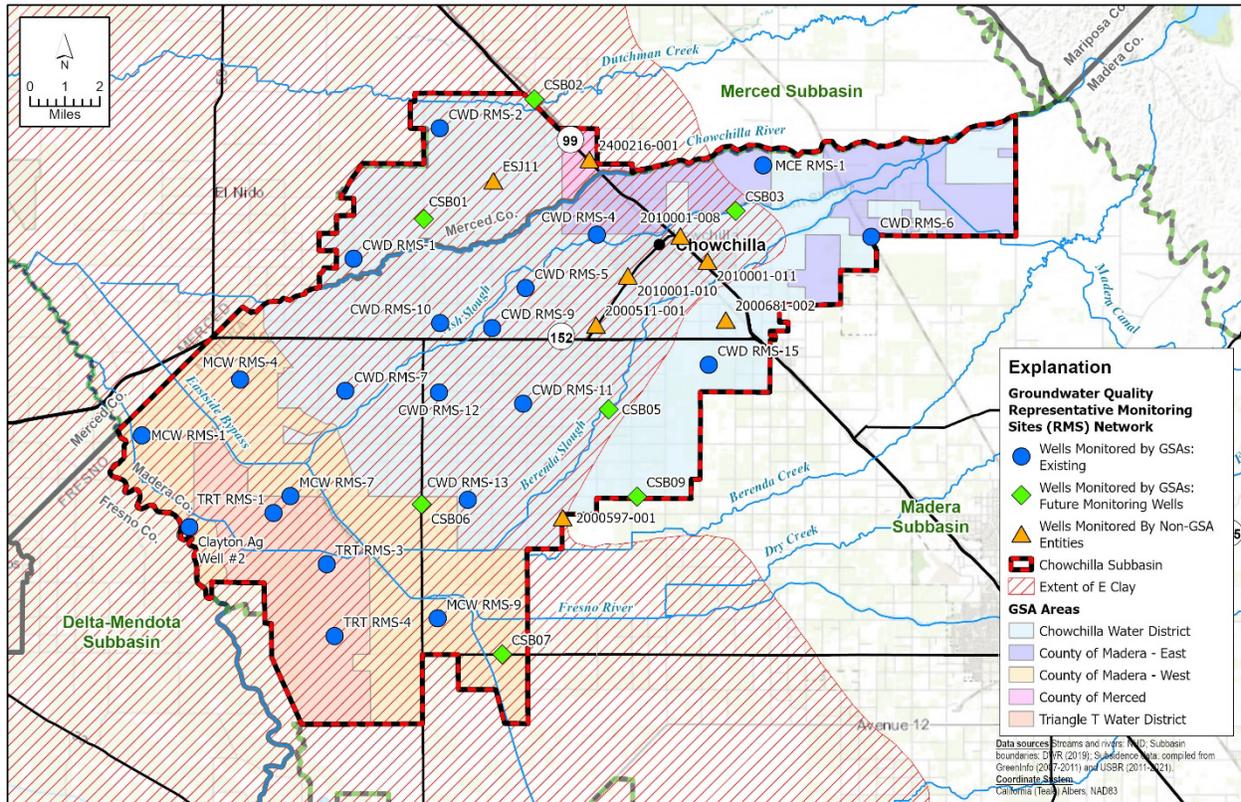
### Introduction and Background

The Chowchilla Groundwater Sustainability Agencies (GSAs) (Chowchilla Water District GSA, County of Madera GSA, County of Merced GSA, and Triangle T Water District GSA) developed a Groundwater Quality Representative Monitoring Sites (RMS) network as part of the development of a Groundwater Sustainability Plan (GSP) for the Chowchilla Subbasin that was originally submitted in January 2020. During the implementation of the GSP, various issues have arisen that have affected the consistency of groundwater quality measurements at a number of these RMS. As part of the first periodic update to the GSP, the groundwater quality RMS network will be evaluated and updated to ensure consistent measurements that will satisfy Sustainable Groundwater Management Act (SGMA) monitoring requirements and support GSP activities in the Subbasin.

### Groundwater Quality RMS Network

The Groundwater Quality RMS network in Chowchilla Subbasin (**Figure 1**) currently consists of 21 existing wells that are also part of the groundwater level RMS network and will also be sampled for groundwater quality by the Chowchilla GSAs, and eight wells that are currently being monitored by other entities for the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) program and Irrigated Lands Regulatory Program (ILRP). An additional 21 wells at seven nested monitoring well locations were identified in the GSP for future inclusion in the RMS network. These wells have been constructed and are currently being monitored.

As required by SGMA, groundwater quality samples are to be collected annually for key constituents and every five years for all other constituents. Wells that are a part of both the groundwater level and groundwater quality RMS networks, as well as the nested monitoring wells, will be monitored by the GSAs. Additional groundwater quality results reported by monitoring entities to DDW (in accordance with DDW testing requirements) for indicator public supply wells will be obtained for evaluation as part of the groundwater quality monitoring program, although the sampling of these wells will not necessarily be performed by the GSAs. A comprehensive review of the monitoring network will be conducted as part of this workplan, and a revised monitoring network will be implemented.



**Figure 1. Current Groundwater Quality Representative Monitoring Sites (RMS) Network**

### Proposed Scope of Work

The proposed scope of work details the planned updates to groundwater quality RMS network as part of the first periodic update to the Chowchilla Subbasin GSP. Refinements to the RMS network are necessary to ensure that the GSP is in compliance with the monitoring requirements set forth under SGMA. This scope of work involves three main tasks including evaluation of the current monitoring network, evaluation of wells for inclusion in the updated monitoring network, and finalization of the update monitoring network. The proposed scope of work is described in more detail below.

#### Task 1. Evaluate Current Monitoring Network

The first task will involve reviewing the monitoring history of each groundwater quality RMS well. Wells that do not have consistent, reliable groundwater quality measurements will require further evaluation, involving a detailed review of the issues encountered during monitoring. If these issues are persistent and preclude the well from satisfying the SGMA monitoring requirements on a regular basis, they will be identified for removal from the RMS network and possible replacement.

#### Task 2. Evaluate New Wells for Inclusion in Monitoring Network

Wells that have been identified for removal from the RMS network and possible replacement will either be replaced with dedicated nested monitoring wells or other existing wells.

#### *Dedicated Nested Monitoring Wells*

An additional 10 dedicated monitoring wells at four locations have been drilled as part of GSP implementation. Where possible, these nested monitoring wells will replace current network RMS that

have been identified for removal from the RMS network. In other locations, these wells will provide additional spatial coverage to the monitoring network.

*Additional Existing Wells*

In areas where existing RMS have been identified for removal from the RMS network but no dedicated nested monitoring wells exist, other existing wells will be used to fill in gaps in the RMS network. Potential wells for inclusion in the updated monitoring network will be identified through conversations with the GSAs, as well as review of currently monitored wells. At least five years of measurement history and known well construction will be required. After potential wells have been identified, field verification and permission from landowners will be acquired. If these conditions have been satisfied, a well will be included in the updated RMS network.

Task 3. Finalize Updates to Monitoring Network

*Prepare a Technical Memorandum (TM) Summarizing Monitoring Network Updates*

A TM will be prepared for the Chowchilla Subbasin summarizing the updates to the groundwater quality RMS network. This TM will cover the wells identified for removal from the RMS network and possible replacement, the reason for removal/replacement, the new wells selected for inclusion in the RMS network, and a summary of the final updated RMS network. This TM will be included as a detailed appendix to the periodic update of the GSP.

*Update the RMS Network Description in the GSP*

As part of the first periodic update, the GSP will be updated to include a description of the new groundwater quality RMS network. Wells added to the network will have sustainable management criteria developed consistent with the method described in the approved GSP.

*Update the RMS Network in the SGMA Portal*

The groundwater quality RMS network will be updated in the SGMA Portal to reflect all changes made to the network as part of this workplan.

Schedule

The overall implementation of this Workplan is envisioned as a part of a larger effort for the first periodic update to the Chowchilla Subbasin GSP. Implementation of the Workplan is planned to start in mid-2024 with a target completion of late 2024. A general planned schedule for implementation of the Workplan is outlined in **Table 1**.

Table 1. Summary of Proposed Schedule for Implementation of the Chowchilla Subbasin GSP Groundwater Quality Representative Monitoring Site (RMS) Network Evaluation Workplan		
Task No.	Task Description	Task Completion Timeframe
1	Evaluate Current Monitoring Network	Mid 2024
2	Evaluate New Wells for Inclusion in Monitoring Network	Mid 2024 – Late 2024
3	Finalize Updates to Monitoring Network	Late 2024

# **APPENDIX 3.N. DEMAND MANAGEMENT PROGRAMS AND SUBSIDENCE MITIGATION MEASURES MOU**

Prepared as part of the  
**Groundwater Sustainability Plan  
Chowchilla Subbasin**

January 2020  
Revised January 2025

**GSP Team:**  
Davids Engineering, Inc (Revised GSP Team)  
Luhdorff & Scalmanini (Revised GSP Team)  
ERA Economics  
Stillwater Sciences and  
California State University, Sacramento

## Memorandum of Understanding

### ESTABLISHING DEMAND MANAGEMENT PROGRAMS AND SUBSIDENCE MITIGATION MEASURES FOR THE CHOWCHILLA SUBBASIN OF THE SAN JOAQUIN VALLEY GROUNDWATER BASIN

This Memorandum of Understanding (“MOU”) is entered into on this \_\_\_ day of \_\_\_ 2024 (the “Effective Date”), by and between the Groundwater Sustainability Agencies (“GSAs”) of the CHOWCHILLA WATER DISTRICT GSA (“CWD GSA”), COUNTY OF MADERA GSA – CHOWCHILLA (“Madera County GSA”), COUNTY OF MERCED GSA – CHOWCHILLA (“Merced County GSA”), and TRIANGLE T WATER DISTRICT GSA (“TTWD GSA”), collectively hereinafter referred to as the “Parties,” or individually as the “Party.”

#### **RECITALS**

- A. **WHEREAS**, groundwater and surface water resources within the Chowchilla Subbasin of the San Joaquin Valley Groundwater Basin (DWR Bulletin 118 No. 5-022.05) (“Subbasin”) are vitally important resources, in that they provide the foundation to maintain and fulfill current and future agricultural, domestic, environmental, industrial, and municipal needs, and to maintain the economic viability, prosperity, and sustainable management of the Subbasin; and
- B. **WHEREAS**, in 2014 the California Legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act, California Water Code § 10720-10737.8 (“SGMA”), pursuant to Senate Bill 1168, Senate Bill 1319, and Assembly Bill 1739, which was approved by the Governor on September 16, 2014, and went into effect on January 1, 2015; and
- C. **WHEREAS**, the Subbasin has been designated by the California Department of Water Resources (“DWR”) as a high-priority subbasin in a condition of critical groundwater overdraft and is subject to the requirements of SGMA; and
- D. **WHEREAS**, SGMA requires that all medium and high priority groundwater basins in California be managed by a GSA, or multiple GSAs, and that such management be implemented pursuant to an approved Groundwater Sustainability Plan (“GSP”), or multiple GSPs; and
- E. **WHEREAS**, the Subbasin is being managed by the Parties whose boundaries are as set-forth in **Exhibit A**; and
- F. **WHEREAS**, the Parties have collectively developed one GSP, such that the Subbasin is managed under one GSP; and
- G. **WHEREAS**, on January 29, 2020, the Parties submitted the Initial GSP to DWR; and
- H. **WHEREAS**, on January 28, 2022, DWR completed their evaluation of the Initial GSP and determined the Initial GSP to be incomplete; and
- I. **WHEREAS**, on July 27, 2022, the Parties resubmitted the Revised GSP to DWR; and

- J. **WHEREAS**, on March 2, 2023, DWR completed their evaluation of the Revised GSP and determined the Revised GSP was inadequate, shifting the primary jurisdiction of the Subbasin to the State Water Resources Control Board (“SWRCB”); and
- K. **WHEREAS**, SGMA defines sustainable groundwater management as the management and use of groundwater in a manner that can be maintained during the GSP planning and implementation horizon without causing undesirable results; and
- L. **WHEREAS**, under SGMA the GSAs are responsible for managing the Subbasin under the GSP to achieve and maintain sustainability according to conditions after SGMA was effective that are caused by groundwater management in the Subbasin; and
- M. **WHEREAS**, the Parties agree, and as SGMA allows, a transition to sustainability over the 20-year GSP Implementation Period is in the best overall interest of the Subbasin, although this approach is expected to result in some continued groundwater level declines during the GSP Implementation Period prior to achieving sustainable groundwater conditions in the Subbasin by or before 2040, as described in the Revised GSP; and
- N. **WHEREAS**, the Parties agree that during the GSP Implementation Period it will be necessary to implement projects and management actions to achieve and maintain sustainable groundwater conditions in the Subbasin by or before 2040; and
- O. **WHEREAS**, the Parties acknowledge that successful implementation of GSP projects and management actions to achieve their intended benefits during the 20-year GSP Implementation Period (prior to 2040) is dependent on adherence to the implementation timelines; and
- P. **WHEREAS**, the Parties acknowledge that successful implementation of GSP projects and management actions to achieve their intended benefits during the 20-year GSP Implementation Period (prior to 2040) is dependent, in part, on uncertainties related to hydrologic conditions (e.g., precipitation and snowpack), available water supply, permitting, funding, and other factors during that time period; and
- Q. **WHEREAS**, the Parties acknowledge that implementation of additional projects and management actions may be necessary to offset uncertainties related to implementation and/or benefits of GSP projects and management actions to ensure that sustainable groundwater conditions are achieved in the Subbasin by or before 2040; and
- R. **WHEREAS**, the Parties acknowledge that wet hydrologic conditions and faster implementation of projects and management actions may result in diminished need for additional projects and management actions, and
- S. **WHEREAS**, the Parties acknowledge that dry hydrologic conditions, prolonged drought, delayed implementation of projects and management actions, and other factors may result in an accelerated need for additional projects and management actions; and
- T. **WHEREAS**, the Parties have had several informal consultations with SWRCB staff, during which SWRCB staff indicated that the Parties must prepare demand management programs and subsidence mitigation measures with specific triggers, providing a “backstop” and an

alternative pathway for achieving sustainability should the other GSP projects and management actions either not come to fruition or not yield the intended benefits; and

- U. **WHEREAS**, the Parties recognize that in order for the SWRCB to determine that the Revised GSP has sufficiently addressed the deficiencies identified in DWR's inadequate determination letter and in SWRCB staff's review of the Revised GSP, SWRCB staff are seeking a firm commitment from the Parties for their consideration of management action(s) to address and mitigate overdraft, groundwater level decline, subsidence, and impacts from subsidence during their management of the Subbasin; and
- V. **WHEREAS**, the Parties acknowledge that they cannot control groundwater conditions not caused by groundwater management activities within the Subbasin; and
- W. **WHEREAS**, the Parties acknowledge that SGMA requires sustainable groundwater management; however, SGMA does not make GSAs responsible for injury from overdraft; and
- X. **WHEREAS**, nothing in this MOU is intended to alter or otherwise eliminate the need for the Parties to proceed with implementation of the projects and management actions set-forth in the Revised GSP; and
- Y. **WHEREAS**, the Parties acknowledge that additional projects and management action(s) to address and mitigate overdraft, groundwater level decline, and subsidence will be implemented in coordination with other related programs in the Subbasin and in the region, as applicable; and
- Z. **WHEREAS**, the Parties recognize that chronic lowering of groundwater levels and land subsidence are two sustainability indicators under SGMA and that, while they are related, separate sustainable management criteria have been established for each sustainability indicator, consistent with SGMA, recognizing that the more restrictive sustainable management criteria governs; and
- AA. **WHEREAS**, the Parties recognize that projects and management actions that are expected to benefit groundwater levels and groundwater storage in the Subbasin are also expected to provide benefits to address and mitigate subsidence conditions.
- BB. **NOW, THEREFORE**, in consideration of the mutual promises, covenants, and conditions contained herein and these Recitals, which are hereby incorporated herein by this reference, the Parties agree to develop, review, consider, and undertake demand management and subsidence mitigation measures through development of Demand Management Programs ("Program") for the Subbasin as follows:

## **AGREEMENT**

### **1. PROGRAM MEASURES**

The Program is anticipated to include some subset of the following Program measures for demand reduction and subsidence mitigation:

- **Voluntary Measures:** The Parties will consider and move forward voluntary measures for immediate implementation. Measures may include, but are not limited to:
  - Multi-benefit land repurposing (e.g., recharge basins, renewable energy including solar, habitat, recreational spaces, pollinator habitat, etc.)
  - Incentivized land use changes that provide net groundwater benefit
  - Dry-land farming
  - Fallowing
  - Water conservation (focusing on activities to reduce consumptive use and groundwater extraction)
  - Encouraging use of all available surface water in lieu of groundwater pumping
  - On-farm best management practices (agronomic practices, soil moisture monitoring and management, delayed irrigation and/or regulated deficit irrigation, runoff capture, etc. to reduce groundwater extraction)
  
- **Mandatory Measures:** The Parties commit to refining and preparing to implement mandatory measures between the date this MOU is fully executed and the Program start date. If trigger conditions occur in the Subbasin, or a portion thereof, on or after the Program start date (specified in Section 6), the Parties commit to implementing mandatory measures for demand reduction. Measures are expected to include, but are not limited to:
  - Groundwater allocations, considering:
    - Groundwater consumptive use restrictions, in coordination with Madera County and Merced County (“Counties”)
    - Well extraction restrictions, in coordination with the Counties
    - Penalties and fee structures for unsustainable groundwater extraction
  
- The Parties agree that Program measures are to be adaptively implemented and managed in each GSA:
  - Commensurate with the amount of demand reduction required in that GSA area, recognizing the sustainable yield for the Subbasin, the overdraft for the Subbasin, and other projects and management actions that are being implemented by each GSA.
  - Commensurate with the issue(s) facing the area(s) where the measure(s) are to be implemented, considering, but not confined to:

- Options for regional implementation of certain actions (around a “Focus Area” where undesirable results are occurring), and/or
    - Options for Subbasin-wide implementation of certain actions (equal treatment of the Subbasin as a whole).
  - In consideration of subsidence conditions in the Subbasin or a portion thereof, with the intent of restricting new subsidence and reducing residual subsidence during the GSP Implementation Period.
  - In consideration of and in coordination with other voluntary and mandatory actions that may be taking place in other GSAs within the Subbasin.
- The Parties agree that implementation of Program measures in any given GSA may be superseded or otherwise altered by ongoing demand management efforts under existing demand management programs that serve the same function as the Program measures.
  - The Parties agree that implementation of Program measures in any given GSA is not intended to alter, supersede, or otherwise eliminate the need for other GSP projects and management actions unless that is the choice of any given GSA.
  - The Parties agree that, under SGMA, GSAs do not have the authority to modify or otherwise change groundwater rights. Additionally, the Parties agree that neither SGMA nor this MOU make the GSAs responsible for injury from overdraft (i.e., the GSAs do not extract groundwater), nor do they require or assign any liability to GSAs to provide, ensure, or guarantee any level of water quality or access.

## **2. TRIGGERS**

The Parties commit to implementing mandatory measures for demand reduction if trigger conditions occur in the Subbasin or a portion thereof on or after the Program start date. Trigger conditions will be developed and agreed to among the Parties prior to the Program start date.

It is anticipated that trigger conditions may be defined in reference to, but may not be limited to:

- Groundwater conditions (e.g., groundwater levels or subsidence) that do not meet or exceed the interim milestones specified in the Revised GSP at the interim milestone date.
- Groundwater conditions (e.g., groundwater levels or subsidence) that are approaching undesirable results in the Subbasin or some portion thereof.
- Occurrence of undesirable results in the Subbasin or some portion thereof.

## **3. PROPORTIONATE RESPONSIBILITY**

The Parties agree to cooperate in good faith to determine each Party’s proportionate responsibility for Program activities (including, but not limited to, Program development, design, implementation) undertaken in connection with this MOU.

#### **4. FUNDING AND FINANCING**

The Parties agree to fund the Program on an annual basis, commensurate with the scope of the Program and consistent with the final determination of each Party's proportionate responsibility, as determined in the manner provided for herein. Program funding and financing discussions are anticipated to include, among other considerations, costs for mitigation of subsidence-related impacts to critical infrastructure in the Subbasin.

It is anticipated that the Program funding will come from one, or a combination, of the following sources established by the Parties:

- Reserve fund
- GSA fees and assessment
- Funds generated through implementation of other projects and management actions (e.g., fines and/or penalties)
- County/state/federal funding, as available
- Other sources, as identified

#### **5. BUDGET CYCLE AND REVIEW**

The budget cycle of the Program shall be on a calendar year basis. Not less than once per year, the Parties shall convene a meeting to review Program implementation progress in that year and plan for Program implementation in the subsequent year.

#### **6. TERM**

The Program shall be developed and mandatory measures, as may be required, will be ready for implementation no later than January 1, 2026 (the Program start date) consistent with the triggers developed. Upon implementation, as maybe required, the Program shall continue in perpetuity unless otherwise directed by the Parties.

#### **7. PROGRAM DEVELOPMENT**

The Parties shall, as part of Program development, agree to define the Program's purpose, objectives, scope, roles and responsibilities, requirements, and potential outcomes.

The anticipated goal of the Program is to address and mitigate overdraft, groundwater level decline, and subsidence and related undesirable results during the GSP Implementation Period including costs for mitigation of subsidence-related impacts to critical infrastructure in the Subbasin, as defined in the Revised GSP, by reducing demand for groundwater in the Subbasin.

Items for consideration during Program development include, but are not limited to:

- Definitions
- Program measures, including:
  - Voluntary Measures for immediate implementation (i.e., measures that will move forward at the Program start date)

- Mandatory Measures (i.e., measures that the Parties commit to refining and preparing to implement, such that they are ready to implement no later than the Program start date if trigger conditions occur in the Subbasin)
- Public outreach and engagement process
- Coordination of Program with other related programs in the Subbasin and in the region, as applicable
- Implementation considerations and protocol for phased adaptive implementation of mandatory measures:
  - Identification of area(s) where measures are applicable.
  - Determination of sustainable yield for those areas.
  - Determination of an appropriate transition period from current to sustainable conditions (prior to 2040), considering uncertainties of the basin setting and of the timelines for other projects and management actions.
  - Process and timeline for implementing phased measures.
  - Process and timeline for evaluating and adapting measures to respond to changing conditions (in annual reports and periodic GSP evaluations).
  - Considerations for allocation development and enforcement, as applicable, related to consumed versus extracted groundwater.
  - Monitoring and enforcement process.
  - Funding and financing, including the planned annual Program funding responsibilities of each Party (see Section 4).

## 8. PROGRAM IMPLEMENTATION AND MANAGEMENT

Program management shall be facilitated by either:

- One of the Parties for the whole Subbasin; or
- Each Party, for their respective portion of the Subbasin.

Program management may be facilitated through a third party upon consent of the Party or the Parties as may be applicable given the geographic scope of implementation.

The Parties agree that Program implementation governance may include the following:

- Program Implementation Committee (comprised of at least two representatives from each Party); or
- Advisory Committee (could include beneficial users, community organizers, and/or non-governmental organizations)
- GSA governing entities (e.g., Boards of Directors or Supervisors).

To aid the Parties in Program development and implementation, a DRAFT Program organizational structure is as shown in **Exhibit B** and a DRAFT Program implementation flowchart is as shown in **Exhibit C**. That shown in **Exhibit B and Exhibit C** is only a DRAFT and shall not limit or otherwise constrain Program development and implementation.

While Program management decisions will be the responsibility of the Party or Parties, as may be applicable given the geographic scope of implementation, it is anticipated that Program

management will be coordinated with the management of other programs in the Subbasin and region related to demand reduction, as applicable, including County-administered programs.

## 9. ENVIRONMENTAL REVIEW

The Parties agree to cooperatively complete any environmental review as may be determined necessary for Program implementation. Any costs associated with environmental review shall be per the proportionate share as determined through Program development.

## 10. NOTICES

All notices required or permitted by this MOU shall be made in writing, and may be delivered in person (by hand or by courier) or may be sent by regular, certified, or registered mail or U.S. Postal Service Express Mail, with postage prepaid, or by facsimile transmission, or by electronic transmission (email) and shall be deemed sufficiently given if served in a manner specified herein.

The addresses and addressees noted below are the Party's designated address and addressee for delivery or mailing notices.

To CWD GSA: Chowchilla Water District  
Brandon Tomlinson  
327 South Chowchilla Blvd.  
Chowchilla, CA 93610

To Madera County GSA: County of Madera  
Stephanie Anagnoson  
200 W 4th Street, 4th Floor  
Madera, CA 93637

To Merced County GSA: County of Merced  
Lacey McBride  
2222 M Street  
Merced, CA 95340

To TTWD GSA: Triangle T Water District  
Brad Samuelson  
P.O. Box 2657  
Los Banos, CA 93635

Any Party may, by written notice to the other Party, specify a different address for notice. Any notice sent by registered or certified mail, return receipt requested, shall be deemed given on the date of delivery shown on the receipt card, or if no delivery date is shown, three days after the postmark date. If sent by regular mail, the notice shall be deemed given 48 hours after it is

addressed as required in this section and mailed with postage prepaid. Notices delivered by United States Express Mail or overnight courier that guarantee next day delivery shall be deemed given 24 hours after delivery to the Postal Service or overnight courier. Notices transmitted by facsimile transmission or similar means (including email) shall be deemed delivered upon telephone or similar confirmation of delivery (confirmation report from fax machine is sufficient), provided a copy is also delivered via personal delivery or mail. If notice is received after 4:00 p.m. or on a Saturday, Sunday or legal holiday, it shall be deemed received on the next business day.

**IN WITNESS WHEREOF**, the Parties have caused this MOU to be executed, each signatory hereto represents that he/she has been appropriately authorized to enter into this MOU on behalf of the Party whom he/she signs.

DRAFT

**Chowchilla Water District GSA**

\_\_\_\_\_

\_\_\_\_\_ Date

**County of Madera GSA – Chowchilla**

\_\_\_\_\_

\_\_\_\_\_ Date

**County of Merced GSA – Chowchilla**

\_\_\_\_\_

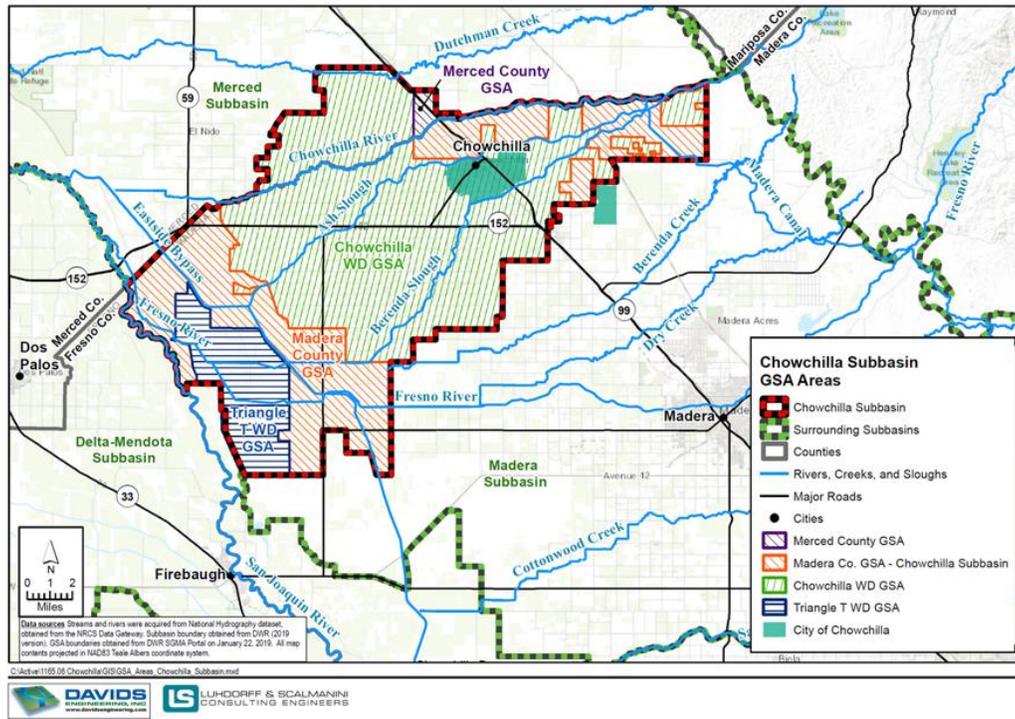
\_\_\_\_\_ Date

**Triangle T Water District GSA**

\_\_\_\_\_

\_\_\_\_\_ Date

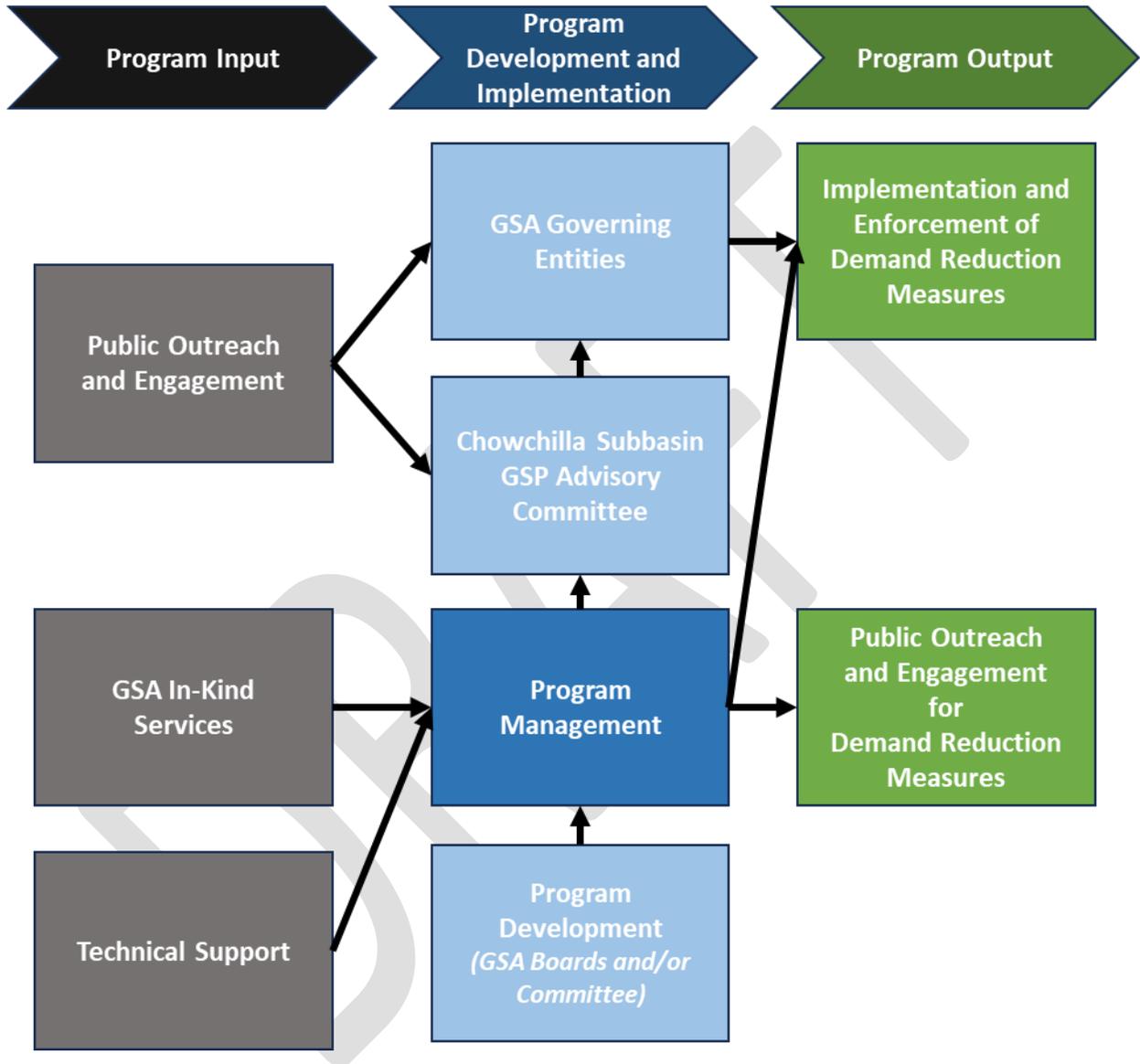
## Exhibit A. Map of Chowchilla Subbasin GSAs.



**Figure ES-1. Chowchilla Subbasin GSAs Map.<sup>1</sup>**

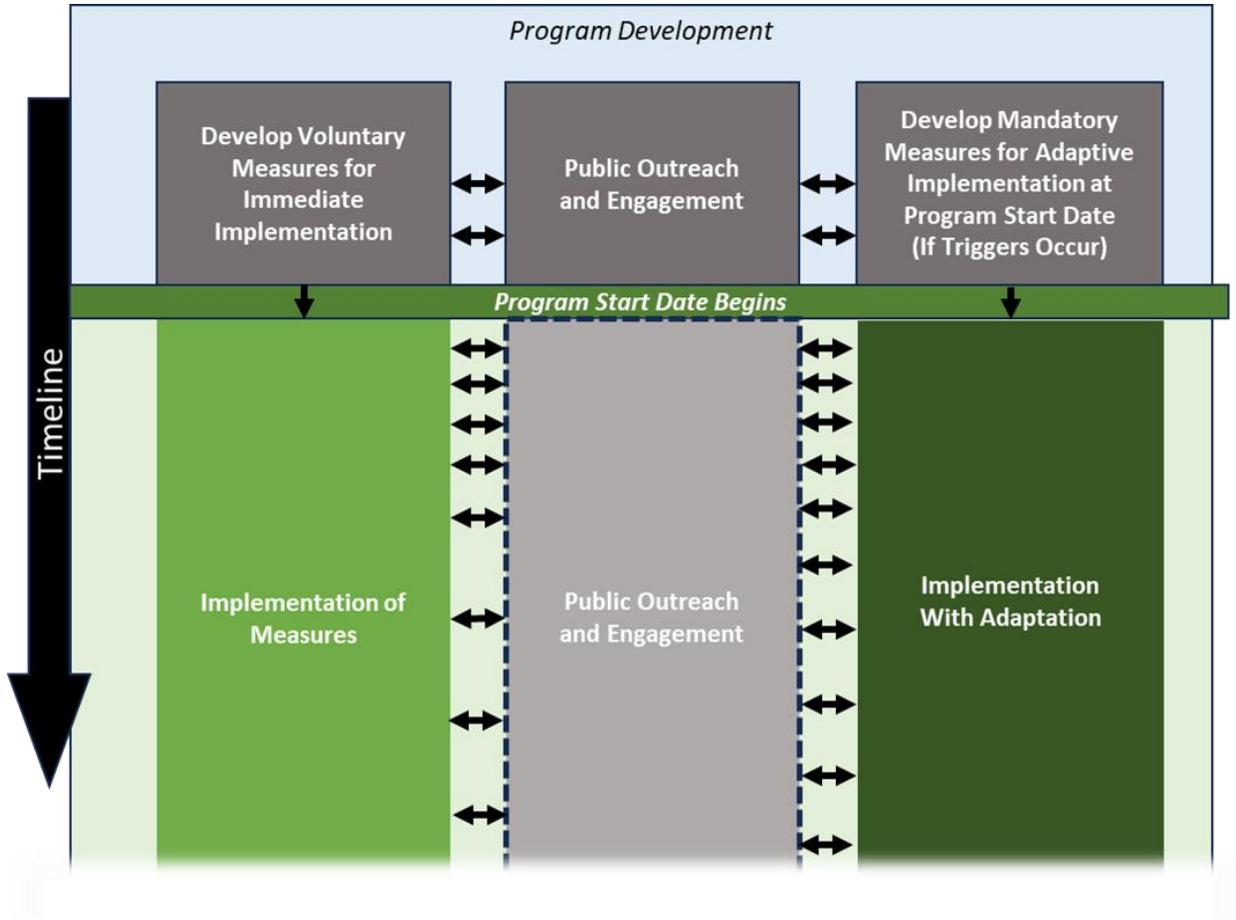
<sup>1</sup>In February 2023, TTWD annexed approximately 3,062 acres formerly located in the Madera County GSA within portions of the Chowchilla, Madera, and Delta-Mendota Subbasins. GSA boundary modifications will be shown in the five-year GSP update and will be reflected in future water budget updates.

**Exhibit B.**  
**Chowchilla Subbasin Demand Management Program**  
**DRAFT Organizational Structure.**



### Exhibit C.

## Chowchilla Subbasin Demand Management Program DRAFT Implementation Flowchart.



Notes:

1. Steps shown herein are intended to demonstrate critical components and is not intended to be indicative of all steps that may be required for Program implementation.
2. Steps shown herein are subject to revision by the Parties.

## **APPENDIX 3.O. CHOWCHILLA MANAGEMENT ZONE MOU**

Prepared as part of the  
**Groundwater Sustainability Plan**  
**Chowchilla Subbasin**

January 2020  
Revised January 2025

**GSP Team:**

Davids Engineering, Inc (Revised GSP Team)  
 Luhdorff & Scalmanini (Revised GSP Team)  
 ERA Economics  
 Stillwater Sciences and  
 California State University, Sacramento

**MEMORANDUM OF UNDERSTANDING BETWEEN CHOWCHILLA MANAGEMENT ZONE AND  
GROUNDWATER SUSTAINABILITY AGENCIES IN THE CHOWCHILLA SUBBASIN**

**RECITALS**

WHEREAS, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopted amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins in 2018 to incorporate a Salt and Nitrate Control Program; and

WHEREAS, the Chowchilla Subbasin (Subbasin) area has been identified as an active (Priority 1) groundwater subbasin and management zone for nitrate management; and

WHEREAS, the Chowchilla Management Zone (CMZ) is a management zone formed to manage the implementation of the Nitrate Control Program in the Subbasin area by providing groundwater testing and free drinking water mitigation services for residents in the management zone whose drinking water supplies are impacted by nitrate contamination issues; and

WHEREAS, the CMZ seeks to identify and provide both interim and long-term drinking water solutions for those in the Subbasin area that are impacted by nitrate contamination; and

WHEREAS, the CMZ is actively implementing a Management Zone Implementation Plan that includes, among other measures, outreach and drinking water mitigation services to residents in the Subbasin that rely on domestic wells for their source of drinking water; and

WHEREAS, the CMZ, as part of its Early Action Plan that has been active since May 2021, has been providing outreach and offering free domestic well testing to measure nitrate levels in such wells and will continue providing replacement water to those whose wells exceed the state's primary maximum contaminant level for nitrate at no cost to the resident; and

WHEREAS, the CMZ has and will continue to seek grants from the State Water Resources Control Board's (SWRCB) Safe and Affordable Funding for Equity and Resilience (SAFER) to provide groundwater testing and free drinking water mitigation services for residents in the Subbasin whose wells are impacted by other contaminants besides nitrate; and

WHEREAS, in the Subbasin, there are four Groundwater Sustainability Agencies (GSAs) formed under and pursuant to the provisions of the Sustainable Groundwater Management Act (SGMA) (California Water Code, § 10720 et seq.) that are required to prepare and implement a Groundwater Sustainability Plan (GSP) for the Subbasin that meets the requirements of SGMA; and

WHEREAS, the four GSAs have cooperatively worked to prepare, adopt, and implement one GSP that collectively covers the entirety of the Subbasin; and

WHEREAS, on or about March 2, 2023, the California Department of Water Resources (DWR) issued an Inadequate Determination for the GSP that covers the entirety of the Subbasin; and

WHEREAS, DWR's Inadequate Determination results in transferring primary jurisdiction for review of the GSP to the SWRCB and creates the need for additional amendments to the GSP; and

WHEREAS, the four GSAs have a shared interest in revising the GSP to satisfy the requirements of SGMA and address concerns raised by the SWRCB regarding GSP implementation and potential impacts to domestic wells related to degraded groundwater quality; and

WHEREAS, the four GSAs, as part of GSP implementation, have agreed to mitigate groundwater quality impacts to domestic wells that are caused by GSP implementation and that result from degradation of groundwater quality above certain levels identified in the GSP as part of their Domestic Well Mitigation Program (DWMP); and

WHEREAS, funding for the DWMP comes from the four GSAs and is not predicated on the receipt of State and/or Federal funds; and

WHEREAS, the CMZ and its contributing members have already prepared a long-term plan for monitoring groundwater quality with regard to nitrate levels throughout the Subbasin area; and

WHEREAS, the four GSAs under SGMA must also monitor groundwater quality with regard to nitrate levels throughout the Subbasin; and

WHEREAS, the CMZ and the four GSAs desire to coordinate their programs related to monitoring groundwater quality with regard to nitrate levels, and providing drinking water mitigation services for residents in the Subbasin whose drinking water supplies are impacted by nitrate contamination issues.

NOW, THEREFORE, the CMZ and the four GSAs agree as follows:

#### **AGREEMENT TERMS**

1. The CMZ and the four GSAs agree to work collaboratively to avoid duplication of efforts in their respective administration of their programs, including but not limited to:
  - a. Compilation and assessment of groundwater data;
  - b. Groundwater monitoring;
  - c. Testing domestic wells for drinking water constituents of concern;
  - d. Development of a review process for siting of new wells to ensure that new wells are not placed in areas with degraded water quality;
  - e. Mitigating dry wells; and,
  - f. Otherwise providing drinking water mitigation services to address water quality impacts.

2. The CMZ and the four GSAs agree that it is in their mutual interest to ensure that all residents in the Subbasin have access to an adequate supply of safe and affordable drinking water.
3. The CMZ agrees, consistent with its Management Zone Implementation Plan once approved by the Central Valley Water Board, to conduct outreach to residents within the Subbasin to offer free domestic well testing for nitrate and will provide drinking water mitigation services to residents if the domestic well exceeds the state's primary maximum contaminant level for nitrate.
4. CMZ agrees that domestic well testing will be coordinated for new wells with both Madera and Merced County.
5. The CMZ agrees that, as part of its Management Zone Implementation Plan outreach efforts, the CMZ will provide residents throughout the Subbasin with information regarding the DWMP that is being implemented by the four GSAs consistent with the GSP, as long as such information is provided to the CMZ for dissemination.
6. The four GSAs agree to identify a contact person for the CMZ for cooperation and collaboration associated with implementation of the domestic well mitigation program.
7. The CMZ agrees to identify a contact person for the four GSAs for cooperation and collaboration associated with implementation of its Management Zone Implementation Plan.
8. The CMZ agrees that if the CMZ, during the normal course of implementing its Management Zone Implementation Plan, encounters a dry well that may be eligible for the domestic well mitigation program, the CMZ will notify the contact person identified by the four GSAs of the dry well and will provide the resident with referral information from the four GSAs of the resident's options for seeking mitigation under the DWMP.
9. The four GSAs agree that if a domestic well is eligible for mitigation under the DWMP, the four GSAs will take all reasonable efforts to install a replacement well that is sealed at a level where the groundwater quality meets primary drinking water standards.
10. The four GSAs agree that if a replacement well is provided through the domestic well mitigation program, the CMZ, through coordination with Madera or Merced County will test groundwater from the well to determine if it exceeds primary drinking water standards. If groundwater from the well exceeds the state's primary maximum contaminant level for nitrate, the identified contact person will work with the CMZ to ensure that drinking water mitigation services are provided to the residents that rely on the well in question.

11. The CMZ and the four GSAs agree that it is their intent to develop a future agreement, or amendments to this agreement, whereby the four GSAs will contribute annually to the CMZ to provide funding to the CMZ to cover costs for well testing and drinking water mitigation services that may be associated with implementation of the GSP.
12. The four GSAs agree to provide the CMZ with groundwater data and information compiled by the GSAs to assist the CMZ in implementation of the Management Zone Implementation Plan, and future plans as appropriate and applicable.
13. The CMZ and the four GSAs agree to work collaboratively in the development of their groundwater monitoring networks to ensure that there are not duplicative monitoring efforts and to share groundwater monitoring results so that each program enhances the other's monitoring program rather than duplicating such programs.