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# MODESTO SUBBASIN GROUNDWATER SUSTAINABILITY PLAN (GSP)

## *CHAPTER 8 PROJECTS AND MANAGEMENT ACTIONS*

## *CHAPTER 9 PLAN IMPLEMENTATION*

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STANISLAUS AND TUOLUMNE  
RIVERS GROUNDWATER BASIN  
ASSOCIATION GSA

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***DRAFT, SUBJECT TO REVISION***

Modesto Subbasin GSP  
STRGBA GSA

15 November 2021

## TABLE OF CONTENTS

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Table of Contents.....	ii
8. Projects and Management Actions.....	8-6
8.1 Projects Overview .....	8-7
8.2 Projects Developed for Near-Term Implementation (Groups 1 and 2) ..	8-10
8.2.1 Urban and Municipal Projects.....	8-12
8.2.1.1 Growth Realization of Surface Water Treatment Plant Phase II (Project 1)	8-12
8.2.1.2 Advanced Metering Infrastructure Project (AMI) (Project 2) .....	8-15
8.2.1.3 Storm Drain Cross Connection Removal Project (Project 3).....	8-17
8.2.1.4 Surface Water Pump Station and Storage Tank (Project 4).....	8-20
8.2.2 In-Lieu & Direct Recharge Projects .....	8-24
8.2.2.1 Modesto Irrigation District In-Lieu and Direct Recharge Project (Project 5)	8-24
8.2.2.1 Oakdale Irrigation District In-lieu and Direct Recharge Project (Project 6)	8-28
8.2.3 Flood Mitigation Projects .....	8-32
8.2.3.1 Tuolumne River Flood Mitigation and Direct Recharge Project (Project 7)	8-32
8.2.3.2 Dry Creek Flood Mitigation and Direct Recharge Project (Project 8) .....	8-36
8.3 Other Projects to be Implemented as Needed (Group 3).....	8-40
8.3.1.1 Stanislaus River Flood Mitigation and Direct Recharge Project (Project 9)	8-40
8.3.1.2 Retention Basin Standards Specifications Update (Project 10) .....	8-42
8.3.1.3 Recharge Ponds Constructed by Non-District East Landowners (Project 11)	8-44
8.3.1.4 OID Irrigation and Recharge to Benefit City of Oakdale (Project 12) .....	8-45
8.3.1.5 MID FloodMAR Projects (Project 13) .....	8-46
8.4 Management Actions.....	8-48
8.4.1 Demand Management Strategies .....	8-51
8.4.1.1 Voluntary Conservation and/or Land Fallowing (Management Action 1) ..	8-51
8.4.1.2 Conservation Practices (Management Action 2) .....	8-54
8.4.2 Water Accounting Framework.....	8-57

**DRAFT, SUBJECT TO REVISION**

8.4.2.1	Groundwater Extraction and Surface Water Accounting Reporting or Monitoring Program (Management Action 3) .....	8-58
8.4.2.2	Groundwater Allocation Program (Management Action 4) .....	8-60
8.4.2.3	Groundwater Extraction Fee (Management Action 5) .....	8-63
8.4.2.4	Groundwater Pumping Credit Market and Trading Program (Management Action 6) .....	8-66
8.5	Plan for Achieving Sustainability .....	8-69
8.5.1	Integrated Modeling Scenarios .....	8-69
8.5.2	Representative Hydrographs Scenarios 1-2 .....	8-74
9.	Implementation Plan .....	8-82
9.1	Plan Implementation .....	8-82
9.1.1	Implementation Schedule .....	8-82
9.2	Implementation Costs Budgets and Funding Sources .....	8-84
9.2.1	GSP Implementation and Funding .....	8-85
9.2.2	Projects and Management Actions .....	8-87
9.3	Annual Reports .....	8-90
9.3.1	General Information .....	8-90
9.3.2	Basin Conditions .....	8-90
9.3.3	Plan Implementation Progress .....	8-90
9.4	Five-Year Evaluation Report .....	8-91
9.4.1	Sustainability Evaluation .....	8-91
9.4.2	Plan Implementation Progress .....	8-91
9.4.3	Reconsideration of GSP Elements .....	8-91
9.4.4	Monitoring Network Description .....	8-92
9.4.5	New Information .....	8-92
9.4.6	Regulations or Ordinances .....	8-92
9.4.7	Legal or Enforcement Actions .....	8-92
9.4.8	Plan Amendments .....	8-92
9.4.9	Coordination .....	8-92

## List of Tables

---

Table 8-1: List of Projects .....	8-9
Table 8-2: List of Projects Developed for Implementation in the Modesto Subbasin.....	8-11
Table 8-3: Storm Drain Cross Connection Removal Project Components, Status, and Expected Recharge Benefit .....	8-17
Table 8-4: Stanislaus River Flood Mitigation and Direct Recharge Project: Summary (23 CCR §354.44(b)).....	8-41
Table 8-5: Retention Basin Standards Specifications Update: Summary (23 CCR §354.44(b))	8-43
Table 8-6: Recharge Ponds Constructed by Non-District East Landowners: Summary (23 CCR §354.44(b)).....	8-44
Table 8-7: OID Irrigation and Recharge to Benefit City of Oakdale Summary (23 CCR §354.44(b)).....	8-45
Table 8-8: MID FloodMAR Projects Summary (23 CCR §354.44(b)) .....	8-47
Table 8-9: List of Management Actions .....	8-50
Table 8-10: Projects Analyzed Using C2VSim™ Model .....	8-69
Table 8-11: Scenario 1 Project Summary .....	8-70
Table 8-12: Scenario 2 Project Summary .....	8-71
Table 8-13: Scenarios 1-2 Groundwater Budgets .....	8-73
Table 9-1: Modesto Subbasin GSA and GSP Implementation Budgets .....	8-84
Table 9-2: Financing Options for Proposed Projects, Management Actions, and Adaptive Management Strategies.....	8-87



## List of Figures

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Figure 8-1: Scenario 1-2 Cumulative Change in Storage.....	8-72
Figure 8-2: Scenario 2 Groundwater Budget .....	8-73
Figure 8-3: Modesto Subbasin Representative Wells.....	8-74
Figure 8-4: SMC1 Example Hydrographs .....	8-75
Figure 8-5: SMC1 Hydrograph C2VSimTM 01 .....	8-75
Figure 8-6: SMC1 Hydrograph C2VSimTM 07 .....	8-76
Figure 8-7: SMC1 Hydrograph C2VSimTM 11 .....	8-76
Figure 8-8: SMC1 Hydrograph C2VSimTM 19 .....	8-77
Figure 8-9: SMC1 Hydrograph C2VSimTM 24 .....	8-77
Figure 8-10: SMC1 Hydrograph C2VSimTM 34 .....	8-78
Figure 8-11: SMC1 Hydrograph C2VSimTM 45 .....	8-78
Figure 8-12: SMC1 Hydrograph C2VSimTM 48 .....	8-79
Figure 8-13: SMC1 Hydrograph C2VSimTM52 .....	8-79
Figure 8-14: SMC1 Hydrograph C2VSimTM 54 .....	8-80
Figure 8-15: SMC1 Hydrograph C2VSimTM 64 .....	8-80
Figure 8-16: SMC1 Hydrograph C2VSimTM 65 .....	8-81
Figure 9-1: Implementation Estimated Schedule <sup>1</sup> .....	8-83

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## 8. PROJECTS AND MANAGEMENT ACTIONS

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To achieve the sustainability goals for the Modesto Subbasin by 2042, and to avoid undesirable results over the remainder of a 50-year planning horizon, as required by SGMA regulations, multiple Projects and Management Actions (PMAs) have been identified and considered by the Modesto Subbasin Groundwater Sustainability Agency (GSA) in this Groundwater Sustainability Plan (GSP).

A description of PMAs that will contribute to the achievement of sustainability goals in the Modesto Subbasin is provided herein. PMAs are described in accordance with §354.42 and §354.44 of the SGMA regulations. An evaluation of the benefits and/or impacts of various planned projects on groundwater levels and storage volumes is also provided.

“Projects” generally refer to physically constructed (structural) features whereas “Management Actions” generally refer to non-structural programs or policies designed to incentivize reductions in groundwater pumping or optimize management of the Subbasin. The PMAs discussed in this chapter are intended to help the GSA progress toward meeting the sustainability goals and Measurable Objectives (MOs), as well as avoid Minimum Thresholds (MTs) and undesirable results identified for the Subbasin in **Chapter 6: Sustainable Management Criteria (SMCs)**. The subsequent **Chapter 9: Plan Implementation** describes the plan for implementing the PMAs detailed in this chapter.

Recognizing the data gaps identified in the GSP and uncertainties in the basin setting (per §354.44(d)), PMA development and implementation in the Modesto Subbasin applies an adaptive management approach informed by continued monitoring of groundwater conditions. The adaptive approach includes two categories:

- 1 **PMAs developed for implementation at this time** that would help to achieve and maintain groundwater sustainability while supporting other local goals. These PMAs include:
  - PMAs that are in place and will continue to be implemented by specific participating agencies, that will support groundwater management and GSP implementation.
  - PMAs that are currently planned and will be implemented by specific participating agencies, that will contribute to attainment of the Subbasin sustainability goal and will support GSP implementation
- 2 **Other PMAs to be implemented as needed** to gather and evaluate monitoring and investigation data as well as achieve and maintain long-term sustainable groundwater management across the Modesto Subbasin. These potential PMAs will be managed adaptively via further evaluation and initiation during GSP implementation if the GSA finds that established Interim Milestones (IMs) or MOs cannot be achieved and/or if MTs are being approached.

A range of PMAs is presented to allow the GSA flexibility in their response to changing groundwater conditions. However, it is anticipated that not all PMAs will need to be implemented, or that some PMAs will be implemented by one GSA but not the other. Adaptive implementation of PMAs will be informed by ongoing monitoring of groundwater conditions using the monitoring network and methods described in the GSP. Any adverse groundwater conditions or challenges in maintaining groundwater sustainability will be

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addressed by scaling and implementing PMAs in a targeted and proportional manner, consistent with conditions observed in the Subbasin.

PMAs will be periodically assessed during the GSP implementation period. As planning is at very early stages of development, complete information on construction requirements, operations, costs, permitting requirements, and other details are not uniformly available for all the PMAs. Potential timing and funding of PMAs are described under each PMA where known. Other implementation and funding efforts will be determined and reported if/when the PMA is evaluated and selected for implementation. This information will be reported in annual reports and five-year updates to the GSP when known. For more detailed information, refer to **Chapter 9: Plan Implementation**.

## **8.1 PROJECTS OVERVIEW**

This section describes the Projects that are in place, planned, or may be considered for implementation in the Modesto Subbasin. In accordance with 23 CCR §354.44, Projects were developed to help achieve and maintain the Subbasin sustainability goal by 2042 and avoid undesirable results over the GSP planning and implementation horizon. Broadly, Projects provide tools that can be used to achieve and maintain groundwater sustainability.

Projects were developed, where possible, to be aligned with State grant program preferences and the Governor's Water Action Plan, by providing multiple benefits, embracing innovation and new technologies, and benefitting disadvantaged communities (DACs) and environmental water users. This Plan prioritizes Projects that contain multi-benefit approaches that address multiple needs and stress the utilization of natural infrastructure, including the Subbasin itself for storage and the natural waterways and floodplains as recharge areas. Additionally, the Plan emphasizes coordination among users, GSA member agencies, and neighboring basins to improve the region's groundwater condition and achieve sustainability.

Projects were identified in the Modesto Subbasin through a several-month process involving the STRGBA GSA Technical Advisory Committee. Project information was provided by the GSA and compiled into a draft list. The initial set of projects was reviewed further, and a final list of 13 possible projects was identified for inclusion in the GSP, representing a variety of project types including direct and in-lieu recharge, water recycling, and advancements to metering infrastructure. Projects are classified into three groups based on project status: Group 1, Group 2, and Group 3, as defined below.

- Group 1 – Projects that are in place and will continue to be implemented by specific participating agencies within the Modesto Subbasin to support groundwater management and GSP implementation.
- Group 2 – Projects that are, generally, readily implementable but may still be in the planning stages of development and may be pursued by specific participating agencies within the Modesto Subbasin which will contribute to attainment of Sustainable Management Criteria (SMC) and will support GSP implementation.

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- Group 3 – Projects which have been identified for consideration in the Modesto Subbasin in the future subject to feasibility. These projects would provide benefits in contributing to the attainment of the sustainability goal and Sustainable Management Criteria (SMCs) and would otherwise support GSP implementation.

Group 1 and Group 2 Projects are summarized in **Section 8.2: Projects Developed for Implementation**. These Projects were analyzed as part of scenarios using the C2VSim™ model to estimate their benefit to the groundwater system over the projected planning period. The results of the model scenarios are discussed in **Section 8.5: Plan for Achieving Sustainability**.

Group 3 Projects are summarized in **Section 8.3: Conceptual Projects to be Implemented as Needed**. Group 3 Projects are currently not evaluated in detail, and are described at a more general level, reflecting their conceptual nature and planning status at this time. Additional feasibility studies and details for these Projects will be developed in the future, as needed.

The proposed Projects identified in this chapter will be either directly funded and implemented by the GSA or will be subject of grant funding requests through state and federal funding opportunities. Project proponents are listed in Table 8-1.

Each individual Project proponent will manage the permitting and other specific implementation oversight for its own Projects. Inclusion of Projects in this GSP does not forego any obligations regarding individual project implementation under local, state, or federal regulatory programs. While the GSA does have an obligation to oversee progress towards groundwater sustainability, they are not the primary regulator of land use, water quality, or environmental project compliance. It is the responsibility of the implementing agencies of planned Projects to ensure that they are collaborating with outside trustee and responsible regulatory agencies to ensure their Projects are in compliance with all applicable laws and permitting requirements.

The GSA will collaborate with project proponents and project partners to track progress and support project implementation. The implementation of PMAs will be enhanced by the development of clear policy and guidance by the GSA that lays out applicable sustainable management criteria (as described in **Chapter 6: Sustainable Management Criteria**) as well as PMA-specific monitoring and reporting frameworks to facilitate adaptive management toward Subbasin protection and sustainability. The GSP implementation will include guidelines and protocols to coordinate implementation of Projects in such a way that the Subbasin sustainability is achieved in a coordinated environment in the GSA, with the Project proponents and sponsors, and other stakeholders.

Table 8-1 shows the Projects with their respective groups. This represents an initial list of Projects that will be further refined as additional Projects are identified during GSP implementation, with updates included in Annual Reports and the GSP updates, as appropriate. A description of each Project in more detail is provided in **Sections 8.2** [Projects Developed for Near-Term Implementation (Groups 1 and 2)] and **Section 8.3** [Other Projects to be Implemented as Needed].

Table 8-1: List of Projects

Number	Proponent(s)	Project Name	Primary Mechanism(s) <sup>1</sup>	Partner(s)	Group	Included in Modeling Scenario
<b>Urban Projects</b>						
1	City of Modesto	Growth Realization of Surface Water Treatment Plant Phase II	In-lieu Groundwater Recharge	N/A	1	Baseline
2	City of Modesto	Advanced Metering Infrastructure Project (AMI)	Conservation	N/A	1	×
3	City of Modesto	Storm Drain Cross Connection Removal Project	Stormwater Capture	N/A	2	×
4	City of Waterford	Project 3: Waterford/Hickman Surface Water Pump Station and Storage Tank	In-lieu Groundwater Recharge	City of Modesto, MID	2	×
<b>In-Lieu &amp; Direct Recharge Projects</b>						
5	Non-District East Areas	Modesto Irrigation District In-lieu and Direct Recharge Project	Direct or In-lieu Groundwater Recharge	Modesto ID	2	×
6	Non-District East Areas	Oakdale Irrigation District In-lieu and Direct Recharge Project	Direct or In-lieu Groundwater Recharge	OID	2	×
<b>Flood Mitigation Projects</b>						
7	Non-District East Areas	Tuolumne River Flood Mitigation and Direct Recharge Project	Direct Groundwater Recharge	Modesto ID	2	×
8	Non-District East Areas	Dry Creek Flood Mitigation and Direct Recharge Project	Direct Groundwater Recharge	Stanislaus County	2	×
<b>Potential Future Projects</b>						

Number	Proponent(s)	Project Name	Primary Mechanism(s) <sup>1</sup>	Partner(s)	Group	Included in Modeling Scenario
9	Non-District East Areas	Stanislaus River Flood Mitigation and Direct Recharge Project	Direct Groundwater Recharge	Stanislaus County	3	
10	City of Modesto	Detention Basin Standards Specifications Update	Groundwater Recharge	N/A	3	
11	Non-District East Areas	Recharge Ponds	Groundwater Recharge	N/A	3	
12	OID	OID Irrigation and Recharge to Benefit City of Oakdale	Direct or In-lieu Groundwater Recharge	N/A	3	
13	MID	MID FloodMAR Projects	Direct Groundwater Recharge	N/A	3	

These projects are considered as potential projects to support the GSP implementation. They are currently considered as alternative options and are not directly analyzed in this Chapter.

## 8.2 PROJECTS DEVELOPED FOR NEAR-TERM IMPLEMENTATION (GROUPS 1 AND 2)

This section describes the Projects that were developed for near-term implementation in the Modesto Subbasin, organized by proponent. This includes all Group 1 and 2 Projects identified in Table 8-1. These Projects are either:

- Currently in place and will continue to be implemented by specific participating agencies, or are
- Currently planned and will be implemented or started by specific participating agencies in the next five years.

The Projects developed for near-term implementation were modeled in the C2VSim<sup>TM</sup> to estimate their potential benefit to the groundwater system over the projected future water budget period. Applicable assumptions used to model each Project are described in each Project description. The results of these model scenarios are discussed in **Section 8.5: Plan for Achieving Sustainability**.

Table 8-2 lists all Group 1 and Group 2 PMAs described in the subsections that follow. Each Project description is organized to address the applicable regulatory requirements:

- **Project Description:** 23 CCR §354.44(b)
- **Public Noticing:** 23 CCR §354.44(b)(1)(B)
- **Permitting and Regulatory Process:** 23 CCR §354.44(b)(3)
- **Expected Benefits:** 23 CCR §354.44(b)(4), §354.44(b)(5)
- **Implementation Criteria, Status, and Plan:** 23 CCR §354.44(b)(1)(A); §354.44(b)(4); §354.44(b)(6)
- **Water Source and Reliability:** 23 CCR §354.44(b)(6)
- **Legal Authority:** 23 CCR §354.44(b)(7)
- **Estimated Costs and Funding Plan:** 23 CCR §354.44(b)(8)
- **Management of Groundwater Extractions and Recharge:** 23 CCR §354.44(b)(9)

*Summary of Criteria for Project Implementation (23 CCR §354.44(b)(1)(A))*

As described above, the Group 1 and Group 2 PMAs described in this section are either currently in place or are planned to be implemented prior to 2042. Those PMAs that are currently in place will continue to be implemented over this same period.

*Table 8-2: List of Projects Developed for Implementation in the Modesto Subbasin.*

Location (Proponent)	Project Name	Primary Mechanism(s) <sup>1</sup>
City of Modesto	Project 2: Advanced Metering Infrastructure Project (AMI)	Water Conservation
	Project 3: Storm Drain Cross Connection Removal Project	Stormwater Capture
City of Waterford	Project 4: Waterford/Hickman Surface Water Pump Station and Storage Tank	Water Conservation
Non-District East Areas	Project 5: Modesto Irrigation District In-lieu and Direct Recharge Project	In-lieu and Direct Recharge Project
	Project 6: Oakdale Irrigation District In-lieu and Direct Recharge Project	In-lieu and Direct Recharge Project
	Project 7: Tuolumne River Flood Mitigation and Direct Recharge Project	Flood control and Direct Recharge Project
	Project 8: Dry Creek Flood Mitigation and Direct Recharge Project	Flood control and Direct Recharge Project

<sup>1</sup>The primary mechanism of the Project as conceptualized, although during implementation Projects may be used for multiple functions to support groundwater sustainability and multiple other benefits.

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## **8.2.1 Urban and Municipal Projects**

PMAs developed for implementation by urban and municipal proponents in the Modesto Subbasin are summarized in the sections below.

### **8.2.1.1 Growth Realization of Surface Water Treatment Plant Phase II (Project 1)**

#### **8.2.1.1.1 *Project Description***

This project continues the water purchase agreement between Modesto Irrigation District (MID) and the City of Modesto to meet urban demands. It utilizes the expansion from Phase II of the Modesto Regional Water Treatment Plant (MRWTP).

The Modesto Irrigation District operates the MRWTP to treat surface water for use within the City and has been expanding its capacity to meet growing and future water demands from its customers. The Initial Phase (first phase) of the MRWTP Project included the construction of a 30 million-gallon per day (mgd) surface water treatment plant, two 5-million-gallon (MG) terminal storage tanks and associated pumping facility. The pump station delivered water into the MID transmission system for distribution into either the Del Este or City water distribution systems through several MID turnouts. The City now owns the Del Este water system. Figure 1-1 shows the existing transmission mains and turnouts constructed as part of the Phase One MRWTP Project

The Expansion Phase of the MRWTP project (second phase) included the construction of a new parallel treatment process consisting of low-pressure membranes, ozone disinfection system, a dissolved air flotation thickener and a new Supervisory Control and Data Acquisition (SCADA) system. The total capacity available at the MRWTP with the completion of the MRWTP Phase Two Expansion project is 60 MGD with a maximum annual supply of up to 67,200 AFY.

#### **8.2.1.1.2 *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.



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#### **8.2.1.1.3      *Permitting and Regulatory Process***

This project includes the continued transfer of water purchased between MID and the City of Modesto, and therefore, permitting, and regulatory requirements have already been completed. Future permitting and regulatory processes, if needed to continue project activities, will be managed through MID and the City of Modesto.

#### **8.2.1.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Utilization of purchased water for urban water demands is expected to offset groundwater pumping demands, with in-lieu groundwater recharge benefits to the Subbasin. The sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and possibly land subsidence. All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

Water supplied through this project directly benefits areas within the City of Modesto's contiguous water service areas within the Modesto Subbasin, most of which is classified as a DAC. By supplementing and diversifying their drinking water supply, this Project will provide an alternate drinking water source and operational flexibility to remove or blend production wells with treated surface water to comply with safe drinking water regulations and meeting Maximum Contaminant Levels (MCLs). The additional surface water supply will also reduce groundwater pumping and increase groundwater levels near the communities which can reduce pumping costs and potentially mitigate some groundwater quality concerns. Additionally, benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs in the Modesto Subbasin.

##### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the benefits from the Growth Realization of Surface Water Treatment Plan Phase II Project was estimated by simulating this Project in the C2VSim<sup>TM</sup> model. General information and assumptions used to simulate this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

This project is estimated to provide an additional 10 mgd (11,200 AFY) starting in 2016 and continuing at 10 mgd through 2020, and then gradually increasing to an additional 30 mgd (33,600 AFY) by 2050.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling will be done with the C2VSim<sup>TM</sup> model used for GSP development.

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#### **8.2.1.1.5 Implementation Criteria, Status, and Strategy**

##### ***Implementation Strategy and Timeline***

This Project would be implemented by the City of Modesto and MID and is expected to provide 10 mgd initially and eventually increase to 30 mgd. This PMA includes the expansion of current water transfers between MID and the City of Modesto and has therefore already started. Updates to the status and continuation of this agreement and Project will be provided in GSP annual Reports and Five-Year GSP updates.

##### ***Implementation Assumptions for Modeling***

Impacts to the Subbasin from the Growth Realization of Surface Water Treatment Plan Phase II Project were already captured in the Projected Conditions Baseline and thus no additional changes were needed to simulate this project in the PMA scenarios. Baseline conditions include both the expansion of the City of Modesto's footprint and the resulting increase of surface water available for urban use.

#### **8.2.1.1.6 Water Source and Reliability**

This Project would use water from MID to supplement water for the City of Modesto for urban demands. This project is estimated to provide an additional 10 mgd (11,200 AFY) starting in 2016 and continuing at 10 mgd through 2020, and then gradually increasing to an additional 30 mgd (33,600 AFY) by 2050. These assumptions are included in the model development. The exact volume will be reported in Annual Reports and GSP Five-Year Update Reports when known.

#### **8.2.1.1.7 Legal Authority**

The GSA, Districts, and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. MID has the authority to construct and continue to operate its water treatment plant and to continue to transfer water to the City of Modesto.

#### **8.2.1.1.8 Estimated Costs and Funding Plan**

The Growth Realization of Surface Water Treatment Plant Phase II Project is a continuation of water transfers from MID to the City of Modesto. Because an agreement and water transfers have already commenced, the estimated costs of this project are low and include agreement/coordination costs and operational costs. Infrastructure for this project has already been constructed and therefore is not needed. The estimated operations and management cost for this project is \$4.1M annually which will increase to \$8.3M in FY 2024 when payment towards principal begins. The City of Modesto has been utilizing the Water Fund as a funding sources to cover project costs as part of project development and continuation. Other funding sources may be identified in the future including grants (e.g., Prop 1, Prop 68m, NRCs), fees, local cost share, loans, and other assessments.

#### **8.2.1.1.9 Management of Groundwater Extractions and Recharge**

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are targeted to maintain the balance of groundwater extractions and recharge to help ensure that lowering of groundwater levels or

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depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

In-lieu recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies during wetter years, helping to offset potential increases in groundwater pumping during drought when surface water supplies are limited.

#### **8.2.1.2 Advanced Metering Infrastructure Project (AMI) (Project 2)**

The City of Modesto is in the initial stages of on installing AMI smart meters to support water reduction goals. Smart meters will assist the City of Modesto in notifying residents of leaking pipes and helping to overall reduce domestic water consumption through improved and direct consumer data.

##### **8.2.1.2.1 *Project Description***

The City of Modesto is planning on upgrading 75,000 meters to AMI smart meters to support water reduction goals. Smart meters will assist the City in providing analytical tools to manage water usage better such as identifying potential leaks sooner and providing customers more usable and user friendly data to manage their water usage.

##### **8.2.1.2.2 *Public Noticing***

Public and/or inter-agency noticing will be facilitated through GSA and/or district board meetings, GSA and/or district website(s), GSA and/or district newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.

##### **8.2.1.2.3 *Permitting and Regulatory Process***

Required permitting and regulatory review will be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, Regional Water Boards, USFWS, NMFS, LAFCO, County of Stanislaus, and CARB.

##### **8.2.1.2.4 *Expected Benefits***

###### ***Benefits to Sustainability Indicators***

The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water.

###### ***Benefits to Disadvantaged Communities***

This Project would apply to and benefit all water customers served by the City of Modesto, most of which are considered a DAC or SDAC.

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### ***Volumetric Benefits to the Subbasin Groundwater System***

This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. However, the Project is expected to reduce water use in the City of Modesto to meet future water use mandates and conservation goals.

Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project is evaluated as part of a scenario and the C2VSim<sup>TM</sup> is used to assess the benefits and impacts on the subbasin sustainability.

#### ***8.2.1.2.5 Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

This Project would install AMI smart meters to support water reduction goals, helping the City to obtain the analytical tools to manage water usage better. The planning phase is scheduled for 2022 through 2023 with implementation occurring from 2024 through 2026.

##### ***Implementation Assumptions for Modeling***

The Advanced Metering Infrastructure Project has been modeled in the C2VSim<sup>TM</sup> model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

The following general information and assumptions were used to simulate implementation of the Project:

- Modeled as part of scenario of ongoing conservation efforts within the City of Modesto. Simulated change includes the reduction of urban water demand from 228 gallons per person per day (GPCD) (2015 City of Modesto UWMP) to 175 GPCD (2020 City of Modesto UWMP).

#### ***8.2.1.2.6 Water Source and Reliability***

This Project would not directly use a water source but would help to manage and enhance use of existing water City of Modesto supplies.

#### ***8.2.1.2.7 Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects.

#### ***8.2.1.2.8 Estimated Costs and Funding Plan***

The anticipated costs of this Project are estimated to be \$20 million. Any updates or changes to the estimated costs will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. The project proponent will identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

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#### **8.2.1.2.9      *Management of Groundwater Extractions and Recharge***

This Project would not directly use a water source (e.g., no groundwater extraction or recharge is involved) but would help to manage and enhance use of existing water City of Modesto water supplies.

#### **8.2.1.3 Storm Drain Cross Connection Removal Project (Project 3)**

##### **8.2.1.3.1      *Project Description***

This multi-benefit and multi-component project captures, treats, and infiltrates stormwater within the City of Modesto. The projects use low impact development (LID) techniques including bio-retention planters, infiltration trenches, and underground retention basins under city parks to recharge the groundwater aquifer. Other benefits include reduced stormwater flows to the City of Modesto's wastewater treatment plant, reduced number of sanitary sewer overflows, reduction of localized flooding in heavily traveled and localized streets, and improved water quality for Dry Creek and Lower Tuolumne River (both of which are 303d water bodies). Each project component is located within the City of Modesto jurisdiction in areas with no positive storm drainage systems. The project components are a cost effective and LID alternative to constructing detention basins in undeveloped portions of the city and constructing miles of storm drains. This project also includes the removal of failed dry wells and storm to sanitary sewer cross connections. The Project components, status, and expected recharge benefits are included.

*Table 8-3: Storm Drain Cross Connection Removal Project Components, Status, and Expected Recharge Benefit*

<b>Component</b>	<b>Status</b>	<b>Expected Recharge Benefit</b>
Garrison Park	Completed	12 AFY
Roosevelt Park	Completed	29 AFY
JM Pike Park	Design in Progress	53 AFY
Catherine Everett Park	Planning/Construction (2026 completion)	29 AFY
Other	Planning	125 AFY
Removal of failed dry wells and storm to sanitary sewer cross connection	In Progress	N/A

##### **8.2.1.3.2      *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is

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considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

#### **8.2.1.3.3      *Permitting and Regulatory Process***

Required permitting and regulatory review is being initiated through consultation with applicable governing agencies. Governing agencies that may be consulted for this Project include, but are not limited to: DWR, SWRCB, the California Department of Fish and Wildlife (CDFW), the Central Valley Flood Protection Board (Flood Board), Regional Water Boards, the United States Bureau of Reclamation (Reclamation or USBR), the United States Army Corps of Engineers (USACE), the United States Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), Local Agency Formation Commissions (LAFCo), the County of Stanislaus and/or Tuolumne, and the California Air Resources Board (CARB).

#### **8.2.1.3.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Stormwater flows going to sewer will be disconnected and rerouted to provide direct groundwater recharge to the Subbasin. Sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, and interconnected surface water. All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

The City of Modesto storm drain cross connection removal project is expected to provide direct recharge in and around the City of Modesto. Most communities in the Modesto Subbasin are classified as DACs, SDACs, or EDAs (according to 2018 census data, evaluated by place, tract, and block group). Depending on which specific parcels receive surface water deliveries, this Project may directly benefit specific DACs in this area. In addition, maintenance or improvement of groundwater levels will help to protect beneficial groundwater use by rural domestic wells from potential adverse impacts related to chronic groundwater level decline. Benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs.

##### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the City of Modesto storm drain cross connection removal project was estimated by simulating this Project in the C2VSim™ model. General information and assumptions used to simulate

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this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

On average across all years, the City of Modesto storm drain cross connection removal project is expected to provide approximately 248 AFY of recharge benefit to the Modesto Subbasin, once completed.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling may be done with the C2VSim<sup>TM</sup> model used for GSP development.

#### **8.2.1.3.5      *Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

This project consists of several different components of a larger program which has relied on the success of previous grant funds. For the components included in this project, work is already in progress. The JM Pike Park component is expected to be completed in 2023. Overall, the final storm to sewer cross connection removals for the program are estimated to be completed in 2061.

##### ***Implementation Assumptions for Modeling***

The Storm Drian Cross Connection Removal Project has been modeled in the C2VSim<sup>TM</sup> model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

The following general information and assumptions were used to simulate implementation of the project:

- Volume of water: 41 AFY were provided during the first 10 years of simulation, 70 AFY during the following 5 years of simulation, and 248 AFY for the rest of the simulation, distributed evenly between the months of October and April. The annual average during the 50-year simulation period would be of 189 AFY.
- The total volume would be provided as direct recharge over the aquifer.

#### **8.2.1.3.6      *Water Source and Reliability***

This Project would use flows that became available from disconnecting storm drain flows going to sewer and redirecting them to recharge groundwater. Stormwater flows are more dependent on precipitation events. It is anticipated that annual contributions from this project will collect approximately 12 AF from Garrison Park, 29 AF from Roosevelt Park, 53 AF from JM Pike Park, 29 AF from Catherine Everett, and an additional 125 AF from other areas. The precise reliability of available water would be identified if/when the project is evaluated and selected for implementation. This information will be reported in GSP annual reports and five-year updates when known.

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#### **8.2.1.3.7      *Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, Regional Water Boards, USFWS, NMFS, LAFCO, Stanislaus County, and CARB.

#### **8.2.1.3.8      *Estimated Costs and Funding Plan***

Potential costs of this Project include construction or improvements to new or existing recharge basin and alteration of current stormwater and sewer system connections. The current cost estimate for this project is \$40 million for all project components. It is anticipated that the City of Modesto would identify funding sources to cover project costs as part of project development. These may include grants (e.g. Prop 1, Prop 68, NRCS), fees, local cost share, loans and other assessments.

#### **8.2.1.3.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are expected to maintain the balance of groundwater extractions and recharge to ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

### **8.2.1.4 Surface Water Pump Station and Storage Tank (Project 4)**

#### **8.2.1.4.1      *Project Description***

The Waterford/Hickman Surface Water Pump Station and Storage Tank (Project) entails connecting the City of Waterford (Waterford) and Hickman to Modesto Irrigation District's (MID) surface water supply. The Project includes several components, described in order of the flow of the surface water. Surface water will be diverted from MID's distribution network at a pipeline turn-out located at the corner of Tim Bell and Vineyard Road, northeast of the Waterford. The surface water will be piped into a one-million-gallon storage tank that will be constructed at this intersection. A pump station at this location and transmission line will also be constructed that transports the water to Yosemite Boulevard in Waterford.

As part of a separate project, the Waterford and Hickman systems are in the process of being connected and should be completed by the end of 2023. Once the two water systems are connected and the surface water conveyance, storage, and pump station are complete, then Hickman, located in the Subbasin, can utilize surface water from MID through existing transmission lines.

#### **8.2.1.4.2      *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing



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will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the STRGBA GSA board meetings and/or MID board meetings, the Modesto Subbasin and/or MID website(s), the MID newsletter, inter-basin coordination meetings, other public meetings hosted by the STRGBA and/or MID, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

#### **8.2.1.4.3      *Permitting and Regulatory Process***

Required permitting and regulatory review would be initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but are not limited to: DWR, SWRCB, CDFW, Flood Board, Regional Water Boards, USFWS, NMFS, LAFCO, Counties of Stanislaus and/or Tuolumne, and CARB. Specific permitting and regulatory processes that may potentially affect the construction of project-related infrastructure include, but are not limited to:

- USACE Section 404 Permits (potential exemption under Section 404(f)(1)(C) of Clean Water Act)
- Regional Water Quality Control Board Section 401 Water Quality Certification (not required if exempt from USACE Section 404)
- SWRCB Construction General Permit and Storm Water Pollution Prevention Plan (SWPPP)
- State Historic Preservation Office (SHPO) and National Historic Preservation Act (NHPA) Section 106 Coordination
- CEQA Environmental Review Process
- California Endangered Species Act (CESA) Consultation
- Endangered Species Act (ESA) Compliance
- National Environmental Policy Act (NEPA) Compliance (expected to require either an Environmental Impact Report and Negative Declaration or Mitigated Negative Declaration)

#### **8.2.1.4.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Utilization of surface water for urban water demands in Hickman is expected to offset groundwater pumping demands, with in-lieu groundwater recharge benefits to the Subbasin. The sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and possibly land subsidence. All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

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### ***Benefits to Disadvantaged Communities***

The Waterford/Hickman Surface Water Pump Station and Storage Tank Project directly benefits Waterford and Hickman, both classified as a DACs, by supplementing and diversifying their drinking water supply. This Project will provide an alternate drinking water source in case of infrastructure or contamination concerns with the communities' groundwater production wells. The additional surface water supply will also reduce groundwater pumping and increase groundwater levels near the communities which can reduce pumping costs and potentially mitigate some groundwater quality concerns. Additionally, benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs in the Modesto Subbasin.

### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the Waterford/Hickman Surface Water Pump Station and Storage Tank was estimated by simulating this Project in the C2VSim™ model. General information and assumptions used to simulate this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

It is assumed that MID will provide 900 AF/year to Waterford and Hickman, except for critical years which will provide a partial allotment (approximately 750 AF/year in critical years).

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling will be done with the C2VSim™ model used for GSP development.

#### ***8.2.1.4.5 Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

The Waterford/Hickman Surface Water Pump Station and Storage Tank will be implemented by the City of Waterford. Waterford will oversee the Project financing and funding, permitting, and construction. The Project will require an agreement between MID and the City of Modesto to purchase treated surface water. Negotiations are underway but have not been concluded. Once negotiations are finalized and financing is secured, then design and subsequent construction will begin. This PMA is currently in the early conceptual stage. Thus, the start and completion dates for this PMA have yet to be determined and will be provided in GSP annual reports and five-year updates when known. Once the Project construction is complete, it is expected that MID would provide 900 AF/year to Waterford and Hickman in all water years except critical years which will provide a partial allocation.

##### ***Implementation Assumptions for Modeling***

The Waterford/Hickman Surface Water Pump Station and Storage Tank has been modeled in the C2VSim™ model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

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The following general information and assumptions were used to simulate implementation of the Project:

- Estimated volume of surface water deliveries: Proportional to the MID irrigation water allotment based on water year type, not to exceed 900 AFY. The surface water deliveries are distributed throughout the months proportional to monthly urban demands.
- Area receiving surface water deliveries: Surface water is delivered to the jurisdictional extent of the Hickman and Waterford communities, consistent with the extent in the historical C2VSim™ model. Surface water is distributed between Waterford and Hickman proportional to simulated demands of each community.
- Water source: It is assumed that all surface water is diverted from MID's distribution system, with no adjustment to modeled MID diversions, spillage, and seepage.
- Groundwater pumping: It is assumed that groundwater production is reduced by the volume of surface water deliveries which is distributed evenly among all wells in Waterford and Hickman.

#### **8.2.1.4.6      *Water Source and Reliability***

The Waterford/Hickman Surface Water Pump Station and Storage Tank will use water diverted from MID's surface water distribution network. MID has existing water rights on the Tuolumne River and existing storage and conveyance facilities that afford secure surface water supplies. Surface water is expected to be available for this Project in all hydrologic years, proportional to MID irrigation allotment, while still meeting the demand of existing MID customers.

#### **8.2.1.4.7      *Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. MID and the City of Modesto have the authority to sell surface water to the City of Waterford.

#### **8.2.1.4.8      *Estimated Costs and Funding Plan***

Costs of this Project include right of way purchase, environmental permitting, design, construction, and project management costs. The estimate cost is approximately \$8.5 million. However, this Project is currently in the early conceptual stage and a more refined cost can be reported in GSP annual reports and five-year updates when known. It is anticipated that Waterford would identify grant funding sources to cover project costs as part of project development.

#### **8.2.1.4.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are expected to maintain the balance of groundwater extractions and recharge to ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

In particular, in-lieu recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies, helping to offset any potential increases in groundwater pumping during drought when surface water supplies are limited.

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## **8.2.2 In-Lieu & Direct Recharge Projects**

### **8.2.2.1 Modesto Irrigation District In-Lieu and Direct Recharge Project (Project 5)**

#### **8.2.2.1.1 *Project Description***

The Modesto Irrigation District In-lieu and Direct Recharge Project (Project) is intended to be a cooperative long-term project between Modesto Irrigation District (MID) and the non-district east landowners. It is designed to ensure groundwater sustainability in non-district east areas by being:

- Implemented with no impacts to MID's existing agricultural and urban customers
- Operated in tandem with the Oakdale Irrigation District In-lieu and Direct Recharge Project

Currently developed agriculture in the non-district east areas of the Modesto subbasin is estimated to be approximately 36,000 acres, of which approximately 30,000 acres is deciduous fruits and nuts (permanent crops). With limited exception, the entire non-district east area is solely reliant on groundwater from the Modesto subbasin. The Project involves the delivery of approximately 60,000 AF of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season. Historically (1972-2020), Wet and Above Normal WYs have occurred approximately 47% of the time on the Tuolumne River. Under the current Final Environmental Impact Statement for the relicensing of Don Pedro Reservoir, there is estimated to be approximately 1,500,000 AF of surface water in Wet WYs and 620,000 AF of surface water in Above Normal WYs in the Tuolumne River above and beyond that necessary to meeting existing customer demands (all Tuolumne River Partners) and the recommended instream flow obligations. As a result, 60,000 AF of Tuolumne River surface water to applicable non-district east areas amounts to approximately 4% and 10% of available surface water supply respectively, for Wet and Above Normal WYs. Project operation in tandem with the Oakdale Irrigation District In-lieu and Direct Recharge Project is intended to ensure surface water delivery to applicable non-district east areas in most WYs.

#### **8.2.2.1.2 *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

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#### **8.2.2.1.3      *Permitting and Regulatory Process***

Required permitting and regulatory review would be initiated through consultation with applicable governing agencies. Surface water would be diverted for this Project by MID through existing pre- and post-1914 water rights. Governing agencies that may be consulted for this Project include but are not limited to: the State Water Resources Control Board (SWRCB), the County(ies) of Stanislaus and/or Tuolumne, and DWR.

If necessary for field flooding, the project proponent will obtain land grading permits from the County(ies). Recharge projects may also require an environmental review process under CEQA.

#### **8.2.2.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Surface water deliveries during the non-irrigation season are expected to provide direct groundwater recharge to the Subbasin. For fields that are irrigated using groundwater, surface water deliveries during the irrigation season are expected to offset groundwater demand and provide in-lieu groundwater recharge benefits. In both cases, the sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and land subsidence (depending on where recharge occurs). All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

The MID in-lieu and direct recharge project is expected to provide direct or in-lieu recharge for use in the non-district east area. Most communities in the Modesto Subbasin, particularly in the non-district east area, are classified as DACs, SDACs, or EDAs (according to 2018 census data, evaluated by place, tract, and block group). Depending on which specific parcels receive surface water deliveries, this Project may directly benefit specific DACs in this area. In addition, maintenance or improvement of groundwater levels will help to protect beneficial groundwater use by rural domestic wells from potential adverse impacts related to chronic groundwater level decline. Benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs.

##### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the MID in-lieu and direct recharge project was estimated by simulating this Project in the C2VSim<sup>TM</sup> model. General information and assumptions used to simulate this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

On average across all years, the MID in-lieu and direct recharge project is expected to provide an average annual benefit 28,800 AFY of recharge benefit to the Modesto Subbasin. These benefits would accrue in years with wet or above normal hydrologic conditions when sufficient water is expected to be available

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for on-farm recharge (approximately 50 percent of years historically). In those years, approximately 60,000 AFY of groundwater recharge is expected to occur.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling may be done with the C2VSim<sup>TM</sup> model used for GSP development.

#### **8.2.2.1.5      *Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

Project involves the delivery of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through existing and newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season.

It is anticipated that most of the surface water made available will be used to meet agricultural demand during the irrigation season throughout the Non-District East area. This in-lieu use is intended to reduce the pumping needed in this area of the subbasin in wet and above normal years. It is expected that fields with non-permanent crops, permeable soils, and existing flood irrigation infrastructure will be most suitable for project participation.

This Project is currently in the early conceptual stage. Thus, the start and completion dates for this Project have yet to be determined and will be provided in GSP Annual Reports and Five-Year Assessment Reports when known.

##### ***Implementation Assumptions for Modeling***

The MID In-lieu and Direct Recharge Project has been modeled in the C2VSim<sup>TM</sup> model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

The following general information and assumptions were used to simulate implementation of the project:

- Volume of water: 60,000 AFY were provided during Wet and Above Normal years, distributed in the months following the demand distribution. During the 50-year simulation period, the average annual water supply from this project would be 28,800 AFY.
- One third of the total volume would be provided as direct recharge over the aquifer. The other two thirds would be delivered as in-lieu recharge.
- The location of the in-lieu and direct recharge would be within the Non-District East area, located near existing MID conveyance facilities and those parcels with low/medium infrastructure requirements.

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#### **8.2.2.1.6      *Water Source and Reliability***

The Project involves the delivery of approximately 60,000 AF of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season. Historically (1969-2018), Wet and Above Normal WYs have occurred approximately 48% of the time on the Tuolumne River. Under the current Final Environmental Impact Statement for the relicensing of Don Pedro Reservoir, there is estimated to be approximately 1,500,000 AF of surface water in Wet WYs and 620,000 AF of surface water in Above Normal WYs in the Tuolumne River above and beyond that necessary to meeting existing customer demands (all Tuolumne River Partners) and the recommended instream flow obligations. As a result, 60,000 AF of Tuolumne River surface water to applicable non-district east areas amounts to approximately 4% and 10% of available surface water supply respectively, for Wet and Above Normal WYs.

#### **8.2.2.1.7      *Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. MID and OID have the authority to contract with and provide deliveries to non-districted east landowners area, and individual irrigators have the authority to apply surface water to their fields for on-farm recharge.

#### **8.2.2.1.8      *Estimated Costs and Funding Plan***

Potential costs of this Project may include project coordination and administration, financial, or other incentives to encourage on-farm recharge, field preparation to enhance flooding, and other potential on-field monitoring equipment. Costs per site may vary depending on changes in project implementation and incentives. Slightly higher costs per site would likely be incurred in the first year an irrigator participates, as more coordination and site preparation may be required. The total costs of the Project will vary over time, depending on the number of sites receiving water, the extent to which irrigators require coordination and support, and any applicable Project incentives.

This Project is currently in the early conceptual stage. Thus, the anticipated costs have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. However, high-level initial estimates are on the order of \$####,### per year for years that are hydrologically wet or above normal. It is anticipated that the GSA would identify funding sources to cover project costs as part of project development. These may include grants (e.g. Prop 1, Prop 68, NRCS, others), fees, and loans.

#### **8.2.2.1.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are targeted to maintain the balance of groundwater extractions and recharge to help ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

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In-lieu recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies during wetter years, helping to offset potential increases in groundwater pumping during drought when surface water supplies are limited.

#### **8.2.2.1 Oakdale Irrigation District In-lieu and Direct Recharge Project (Project 6)**

##### **8.2.2.1.1 *Project Description***

The Oakdale Irrigation District In-lieu and Direct Recharge Project (Project) is intended to be a cooperative long-term project between Oakdale Irrigation District (OID) and the non-district east landowners, is designed to be implemented with no impacts to OID's existing agricultural customers and is designed to be operated in tandem with the Modesto Irrigation District In-lieu and Direct Recharge Project to ensure groundwater sustainability in the non-district east areas. Currently developed agriculture in the non-district east areas of the Modesto subbasin is estimated to be approximately 36,000 acres, of which approximately 30,000 acres is deciduous fruits and nuts (permanent crops). With limited exception, the entire non-district east area is solely reliant on groundwater from the Modesto subbasin. The Project involves the delivery of approximately 20,000 AF of surface water from the Stanislaus River in all water years (WYs) except Wet and Above Normal WYs, through a limited number of new points of diversions off OID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season. Historically (2010-2019), OID has had system inflows (diversions) ranging from approximately 165,000 AF to approximately 246,000 AF, with an overall average of approximately 208,000 AF. Given OID's existing surface water rights off the Stanislaus (300,000 AF) and their overall average system inflows, the surface water contemplated for this Project amounts to approximately 22% of the total available surface water supply above and beyond that necessary to meet their existing customer demands (on an average basis). As a result, there remains opportunity for OID to meet a portion of the non-district east area needs while retaining some volume of water for "high-value" out-of-basin water transfers as they have historically done. Project operation in tandem with the Modesto Irrigation District In-lieu and Direct Recharge Project is intended to ensure surface water delivery to applicable non-district east areas in most WYs.

##### **8.2.2.1.2 *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted



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by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

#### **8.2.2.1.3      *Permitting and Regulatory Process***

Required permitting and regulatory review would be initiated through consultation with applicable governing agencies. Surface water would be diverted for this Project by OID through existing pre- and post-1914 water rights. Governing agencies that may be consulted for this Project include, but are not limited to: the State Water Resources Control Board (SWRCB), the County(ies) of Stanislaus and/or Tuolumne, and DWR.

If necessary for field flooding, the project proponent will obtain land grading permits from the County(ies). Recharge projects may also require an environmental review process under CEQA.

#### **8.2.2.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Surface water deliveries during the non-irrigation season are expected to provide direct groundwater recharge to the Subbasin. For fields that are irrigated using groundwater, surface water deliveries during the irrigation season are expected to offset groundwater demand and provide in-lieu groundwater recharge benefits. In both cases, the sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and land subsidence (depending on where recharge occurs). All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

The Oakdale Irrigation District in-lieu and direct recharge project is expected to provide direct or in-lieu recharge for non-district east landowners area. The majority of communities in the Modesto Subbasin, including the non-district east area, are classified as DACs, SDACs, or EDAs (according to 2018 census data, evaluated by place, tract, and block group). Depending on which specific parcels receive surface water deliveries, this Project may directly benefit specific DACs in this area. In addition, maintenance or improvement of groundwater levels will help to protect beneficial groundwater use by rural domestic wells from potential adverse impacts related to chronic groundwater level decline. Benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs.

##### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the Oakdale Irrigation District in-lieu and direct recharge project was estimated by simulating this Project in the C2VSim™ model. General information and assumptions used to simulate

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this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

On average across all years, the Oakdale Irrigation District in-lieu and direct recharge project is expected to provide approximately 14,400 AFY of recharge benefit to the Modesto Subbasin. These benefits would accrue in all hydrologic conditions except for critically dry years (approximately 72 percent of years historically). In those years, approximately 20,000 AFY of groundwater recharge is expected to occur.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling may be done with the C2VSim<sup>TM</sup> model used for GSP development.

#### **8.2.2.1.5      *Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

Project involves the delivery of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off OID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season. It is expected that most of the Project water will be used for in-lieu recharge on parcels that have previously purchased surface water from OID, but it is anticipated that other Non-District East growers will participate as conveyance infrastructure is implemented.

This Project is currently in the early conceptual stage. Thus, the start and completion dates for this Project have yet to be determined and will be provided in GSP Annual Reports and Five-Year Assessment Reports when known.

##### ***Implementation Assumptions for Modeling***

The OID In-lieu and Direct Recharge Project has been modeled in the C2VSim<sup>TM</sup> model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

The following general information and assumptions were used to simulate implementation of the project:

- Volume of water: Up to 20,000 AFY of water was made available in all years except critically dry conditions. Surface water deliveries were made within the irrigation season, distributed based on agricultural demand. The annual average water supply during the 50-year simulation period would be of 14,400 AFY.
- The location of the in-lieu and direct recharge would be within the Non-District East area, located near existing OID conveyance facilities and those parcels with low/med infrastructure requirements.

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#### **8.2.2.1.6      *Water Source and Reliability***

The Project involves the delivery of approximately 20,000 AF of surface water from the Stanislaus River in all water years (WYs) except Wet and Above Normal WYs, through a limited number of new points of diversions off OID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for in-lieu and direct recharge during the growing season. Historically (2010-2019), OID has had system inflows (diversions) ranging from approximately 165,000 AF to approximately 246,000 AF, with an overall average of approximately 208,000 AF. Given OID's existing surface water rights off the Stanislaus (300,000 AF) and their overall average system inflows, the surface water contemplated for this Project amounts to approximately 22% of the total available surface water supply above and beyond that necessary to meet their existing customer demands (on an average basis). As a result, there remains opportunity for OID to meet a portion of the non-district east area needs while retaining some volume of water for "high-value" out-of-basin water transfers as they have historically done. Project operation in tandem with the Modesto Irrigation District In-lieu and Direct Recharge Project is intended to ensure surface water delivery to applicable non-district east areas in most WYs.

#### **8.2.2.1.7      *Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. OID has the authority to contract with and provide deliveries to non-districted east landowners area, and individual irrigators have the authority to apply surface water to their fields for on-farm recharge.

#### **8.2.2.1.8      *Estimated Costs and Funding Plan***

Potential costs of this Project may include project coordination and administration, financial, or other incentives to encourage on-farm recharge, field preparation to enhance flooding, and other potential on-field monitoring equipment. Costs per site may vary depending on changes in project implementation and incentives. Slightly higher costs per site would likely be incurred in the first year an irrigator participates, as more coordination and site preparation may be required. The total costs of the Project will vary over time, depending on the number of sites receiving water, the extent to which irrigators require coordination and support, and any applicable Project incentives.

This Project is currently in the early conceptual stage. Thus, the anticipated costs have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. However, high-level initial estimates are on the order of \$##### per year for years that are hydrologically wet or above normal. It is anticipated that OID would identify funding sources to cover project costs as part of project development. These may include grants (e.g. Prop 1, Prop 68, NRCS, others), fees, and loans.

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#### **8.2.2.1.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are targeted to maintain the balance of groundwater extractions and recharge to help ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

In-lieu recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies during wetter years, helping to offset potential increases in groundwater pumping during drought when surface water supplies are limited.

### **8.2.3      Flood Mitigation Projects**

#### **8.2.3.1 Tuolumne River Flood Mitigation and Direct Recharge Project (Project 7)**

##### **8.2.3.1.1      *Project Description***

The Tuolumne River Flood Mitigation and Direct Recharge Project (Project) is intended to be a cooperative long-term project between Modesto Irrigation District (MID) and the non-district east landowners and is designed to be implemented with no impacts to MID's existing agricultural and urban customers. Currently developed agriculture in the non-district east areas of the Modesto subbasin is estimated to be approximately 36,000 acres, of which approximately 30,000 acres is deciduous fruits and nuts (permanent crops). With limited exception, the entire non-district east area is solely reliant on groundwater from the Modesto subbasin. The Project is different than the Modesto Irrigation District In-lieu and Direct Recharge Project, namely from a timing perspective, and involves the delivery of approximately 20,000 AF of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for storage and direct recharge during the non-growing season. Historically (1972-2020), Wet and Above Normal WYs have occurred approximately 47% of the time on the Tuolumne River. In addition to measurable benefits to groundwater resources within the Modesto subbasin, this Project is intended to mitigate flood releases from Don Pedro Reservoir during the winter months whereby reducing impacts on the lower Tuolumne River (City of Modesto and growers near the confluence of the lower Tuolumne River and the San Joaquin River), the San Joaquin River and the Delta. Under the current Final Environmental Impact Statement for the relicensing of Don Pedro Reservoir, there is estimated to be approximately 1,500,000 AF of surface water in Wet WYs and 620,000 AF of surface water in Above Normal WYs in the Tuolumne River above and beyond that necessary to meeting existing customer demands (all Tuolumne River Partners) and the recommended instream flow obligations. As a result, 20,000 AF of Tuolumne River surface water to applicable non-district east areas during the non-growing season amounts to approximately 1% and 3% of available surface water supply respectively, for Wet and Above Normal WYs. New licenses for diversions/water rights may be required for this project.

##### **8.2.3.1.2      *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process

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of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.

Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

#### **8.2.3.1.3      *Permitting and Regulatory Process***

Required permitting and regulatory review would be initiated through consultation with applicable governing agencies. Surface water would be diverted for this Project by MID through existing pre- and post-1914 water rights. Governing agencies that may be consulted for this Project include but are not limited to: the State Water Resources Control Board (SWRCB), the County(ies) of Stanislaus and/or Tuolumne, and DWR.

If necessary for field flooding, the project proponent will obtain land grading permits from the County(ies). Recharge projects may also require an environmental review process under CEQA.

#### **8.2.3.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Surface water deliveries during the non-irrigation season are expected to provide direct groundwater recharge to the Subbasin. For fields that are irrigated using groundwater, surface water deliveries during the irrigation season are expected to offset groundwater demand and provide groundwater recharge benefits. In both cases, the sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and land subsidence (depending on where recharge occurs). All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

The Tuolumne River flood mitigation and direct recharge project is expected to provide direct recharge for non-district east landowners area. Most communities in the Modesto Subbasin, particularly the non-district east area, are classified as DACs, SDACs, or EDAs (according to 2018 census data, evaluated by place, tract, and block group). Depending on which specific parcels receive surface water deliveries, this Project may directly benefit specific DACs in this area. In addition, maintenance or improvement of groundwater levels will help to protect beneficial groundwater use by rural domestic wells from potential adverse impacts related to chronic groundwater level decline. Benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs.

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### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the Tuolumne River flood mitigation and direct recharge project was estimated by simulating this Project in the C2VSim™ model. General information and assumptions used to simulate this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

On average across all years, the Tuolumne River flood mitigation and direct recharge project is expected to provide approximately 9,600 AFY of recharge benefit to the Modesto Subbasin. These benefits would accrue in years with wet or above normal hydrologic conditions when sufficient water is expected to be available for on-farm recharge (approximately 50 percent of years historically). In those years, approximately 20,000 AFY of groundwater recharge is expected to occur.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling may be done with the C2VSim™ model used for GSP development.

#### ***8.2.3.1.5 Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

Project involves the delivery of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for direct recharge during the growing season. It is expected that fields with non-permanent crops, permeable soils, and existing flood irrigation infrastructure will be most suitable for project participation.

This Project is currently in the early conceptual stage. Thus, the start and completion dates for this Project have yet to be determined and will be provided in GSP Annual Reports and Five-Year Assessment Reports when known.

However, once project implementation begins, it is expected that MID would deliver surface water during wet and above normal hydrologic years (approximately 50 percent of years historically) when sufficient water is available for field flooding and on-farm recharge. MID would deliver surface water to participating fields, and irrigators would use that water to flood their fields for recharge. Subsequent analysis of projected water availability, actual annual application rates, and extent of participating lands will be necessary as project development continues and implementation begins.

##### ***Implementation Assumptions for Modeling***

The Tuolumne River Flood Mitigation Direct Recharge Project has been modeled in the C2VSim™ model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

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The following general information and assumptions were used to simulate implementation of the project:

- Volume of water: 20,000 AFY were provided during Wet and Above Normal years, distributed between the months of January and February for direct recharge. The annual average during the 50-year simulation period would be of 9,600 AFY.

#### **8.2.3.1.6      *Water Source and Reliability***

The Project involves the delivery of approximately 20,000 AF of surface water from the Tuolumne River in Wet and Above Normal water years (WYs) through a limited number of new points of diversions off MID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for and direct recharge during the non-growing season. Historically (1972-2020), Wet and Above Normal WYs have occurred approximately 47% of the time on the Tuolumne River. In addition to measurable benefits to groundwater resources within the Modesto subbasin, this Project is intended to mitigate flood releases from Don Pedro Reservoir during the winter months whereby reducing impacts on the lower Tuolumne River (City of Modesto and growers near the confluence of the lower Tuolumne River and the San Joaquin River), the San Joaquin River and the Delta. Under the current Final Environmental Impact Statement for the relicensing of Don Pedro Reservoir, there is estimated to be approximately 1,500,000 AF of surface water in Wet WYs and 620,000 AF of surface water in Above Normal WYs in the Tuolumne River above and beyond that necessary to meeting existing customer demands (all Tuolumne River Partners) and the recommended instream flow obligations. As a result, 20,000 AF of Tuolumne River surface water to applicable non-district east areas during the non-growing season amounts to approximately 1% and 3% of available surface water supply respectively, for Wet and Above Normal WYs. New licenses for diversions/water rights may be required for this project.

#### **8.2.3.1.7      *Legal Authority***

The GSA, Districts, and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. MID has the authority to contract with and provide deliveries to non-districted east landowners area, and individual irrigators have the authority to apply surface water to their fields for on-farm recharge.

#### **8.2.3.1.8      *Estimated Costs and Funding Plan***

Potential costs of this Project may include project coordination and administration, financial, or other incentives to encourage on-farm recharge, field preparation to enhance flooding, and other potential on-field monitoring equipment. Costs per site may vary depending on changes in project implementation and incentives. Slightly higher costs per site would likely be incurred in the first year an irrigator participates, as more coordination and site preparation may be required. The total costs of the Project will vary over time, depending on the number of sites receiving water, the extent to which irrigators require coordination and support, and any applicable Project incentives.

This Project is currently in the early conceptual stage. Thus, the anticipated costs have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. However, high-level initial estimates are on the order of \$##### per year for years that are hydrologically

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wet or above normal. It is anticipated that the GSA and/or non-district east landowners would identify funding sources to cover project costs as part of project development. These may include grants (e.g. Prop 1, Prop 68, NRCS, others), fees, and loans.

#### **8.2.3.1.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are targeted to maintain the balance of groundwater extractions and recharge to help ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

Recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies during wetter years, helping to offset potential increases in groundwater pumping during drought when surface water supplies are limited.

#### **8.2.3.2 Dry Creek Flood Mitigation and Direct Recharge Project (Project 8)**

##### **8.2.3.2.1      *Project Description***

The Dry Creek Flood Mitigation and Direct Recharge Project (Project) is intended to be a cooperative long-term Project implemented by the non-district east landowners and is designed to be constructed and managed in a way to prevent negative impacts to downstream users. Currently developed agriculture in the non-district east areas of the Modesto subbasin is estimated to be approximately 36,000 acres, of which approximately 30,000 acres is deciduous fruits and nuts (permanent crops). With limited exception, the entire non-district east area is solely reliant on groundwater from the Modesto subbasin. The Project involves the delivery of approximately 5,400 AF of surface water from Dry Creek through a limited number of new and/or existing points of diversions off Dry Creek and subsequent conveyance through new and/or existing private irrigation conveyance infrastructure for direct recharge during the non-growing season. The volume of water associated with this Project was derived from previous work done on behalf of Stanislaus County and is representative of only a fraction of modeled results for a 2-year storm event in the lower reaches of Dry Creek. As a result, both the frequency and volume of water available are conservative estimates. In addition to measurable benefits to groundwater resources within the Modesto subbasin, this Project is intended to mitigate flood flows in Dry Creek whereby reducing impacts on the lower Tuolumne River (City of Modesto and growers near the confluence of the lower Tuolumne River and the San Joaquin River), the San Joaquin River and the Delta. New licenses for diversions/water rights may be required for this project.

##### **8.2.3.2.2      *Public Noticing***

The public and other agencies will be notified of the planned or ongoing implementation of PMA activities through the outreach and communication channels identified in the GSP, during the preparation process of the PEIR (if applicable), and during updates presented at regularly scheduled GSA meetings. Noticing will occur as potential activities are being considered for implementation, and as ongoing and planned activities are implemented. Noticing will inform the public and other agencies that the proponent is considering or will be implementing the PMA and will provide a description of the actions that will be taken.



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Public and/or inter-agency noticing may be facilitated through the GSA's board meetings and/or City and Agency meetings, associated website(s), inter-basin coordination meetings, other public meetings hosted by the GSA, GSP annual reports and five-year updates, public scoping meetings, and/or environmental/regulatory permitting notification processes.

#### **8.2.3.2.3      *Permitting and Regulatory Process***

Required permitting and regulatory review would be initiated through consultation with applicable governing agencies. Governing agencies that may be consulted for this Project include but are not limited to: the State Water Resources Control Board (SWRCB), the County(ies) of Stanislaus and/or Tuolumne, and DWR.

If necessary for field flooding, the project proponent will obtain land grading permits from the County(ies). Recharge projects may also require an environmental review process under CEQA.

#### **8.2.3.2.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Surface water deliveries during the non-irrigation season are expected to provide direct groundwater recharge to the Subbasin. For fields that are irrigated using groundwater, surface water deliveries during the irrigation season are expected to offset groundwater demand and provide groundwater recharge benefits. In both cases, the sustainability indicators expected to benefit from this Project are groundwater levels, groundwater storage, interconnected surface water, and land subsidence (depending on where recharge occurs). All benefits to sustainability indicators in the Modesto Subbasin will be evaluated through groundwater monitoring at nearby monitoring sites, identified in the GSP.

##### ***Benefits to Disadvantaged Communities***

The Dry Creek flood mitigation and direct recharge project is expected to provide direct recharge for non-district east landowners area. Most communities in the Modesto Subbasin, including the non-district east area, are classified as DACs, SDACs, or EDAs (according to 2018 census data, evaluated by place, tract, and block group). Depending on which specific parcels receive surface water deliveries, this Project may directly benefit specific DACs in this area. In addition, maintenance or improvement of groundwater levels will help to protect beneficial groundwater use by rural domestic wells from potential adverse impacts related to chronic groundwater level decline. Benefits to groundwater conditions in the Modesto Subbasin are also expected to broadly benefit all DACs, SDACs, and EDAs.

##### ***Volumetric Benefits to the Subbasin Groundwater System***

The expected yield of the Dry Creek flood mitigation and direct recharge project was estimated by simulating this Project in the C2VSim<sup>TM</sup> model. General information and assumptions used to simulate this Project are summarized in the Implementation section below. Additional information is provided in **Section 8.5: Plan for Achieving Sustainability**.

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On average across all years, Dry Creek flood mitigation and direct recharge project is expected to provide approximately 5,400 AFY of recharge benefit to the Modesto Subbasin.

Evaluation of benefits will be based on analysis of without-project and with-project measurements supported by modeling. Measured parameters will include surface water deliveries, groundwater levels, and other parameters to be determined. Modeling may be done with the C2VSim<sup>TM</sup> model used for GSP development.

#### **8.2.3.2.5      *Implementation Criteria, Status, and Strategy***

##### ***Implementation Strategy and Timeline***

The Project involves the delivery of approximately 5,400 AF of surface water from Dry Creek through a limited number of new and/or existing points of diversions off Dry Creek and subsequent conveyance through new and/or existing private irrigation conveyance infrastructure for direct recharge during the non-growing season. At the initiation of this Project and on an ongoing basis, the GSA plans to identify fields that are most suitable for groundwater recharge. It is expected that fields with non-permanent crops, permeable soils, and existing flood irrigation infrastructure will be most suitable for project participation.

This Project is currently in the early conceptual stage. Thus, the start and completion dates for this Project have yet to be determined and will be provided in GSP Annual Reports and Five-Year Assessment Reports when known.

However, once project implementation begins, it is expected that surface water would be delivered during wet and above normal hydrologic years (approximately 50 percent of years historically) when sufficient water is available for field flooding and on-farm recharge. Subsequent analysis of projected water availability, actual annual application rates, and extent of participating lands will be necessary as project development continues and implementation begins.

##### ***Implementation Assumptions for Modeling***

The Dry Creek Flood Mitigation Direct Recharge Project has been modeled in the C2VSim<sup>TM</sup> model. Additional information about project-related modeling is described in **Section 8.5: Plan for Achieving Sustainability**.

The following general information and assumptions were used to simulate implementation of the project:

- Volume of water: 5,400 AFY were provided during all years, distributed evenly in the months of January and February. The annual average during the 50-year simulation period would be of 5,400 AFY.
- The total volume would be provided as direct recharge over the aquifer.

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#### **8.2.3.2.6      *Water Source and Reliability***

The Project involves the delivery of approximately 5,400 AF of surface water from Dry Creek through a limited number of new and/or existing points of diversions off Dry Creek and subsequent conveyance through new and/or existing private irrigation conveyance infrastructure for direct recharge during the non-growing season. The volume of water associated with this Project was derived from previous work done on behalf of Stanislaus County and is representative of only a fraction of modelled results for a 2-year storm event in the lower reaches of Dry Creek. As a result, both the frequency and volume of water available are conservative estimates. In addition to measurable benefits to groundwater resources within the Modesto subbasin, this Project is intended to mitigate flood flows in Dry Creek whereby reducing impacts on the lower Tuolumne River (City of Modesto and growers near the confluence of the lower Tuolumne River and the San Joaquin River), the San Joaquin River and the Delta. New licenses for diversions/water rights may be required for this project.

#### **8.2.3.2.7      *Legal Authority***

The GSA and individual project proponents have the authority to plan and implement projects through consultation with applicable governing agencies. Individual irrigators have the authority to apply surface water to their fields for on-farm recharge.

#### **8.2.3.2.8      *Estimated Costs and Funding Plan***

Potential costs of this Project may include: project coordination and administration, financial, or other incentives to encourage on-farm recharge, field preparation to enhance flooding, and other potential on-field monitoring equipment. Costs per site may vary depending on changes in project implementation and incentives. Slightly higher costs per site would likely be incurred in the first year an irrigator participates, as more coordination and site preparation may be required. The total costs of the Project will vary over time, depending on the number of sites receiving water, the extent to which irrigators require coordination and support, and any applicable Project incentives.

This Project is currently in the early conceptual stage. Thus, the anticipated costs have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. However, high-level initial estimates are on the order of \$###,### per year for years that are hydrologically wet or above normal. It is anticipated that GSA would identify funding sources to cover project costs as part of project development. These may include grants (e.g. Prop 1, Prop 68, NRCS, others), fees, and loans.

#### **8.2.3.2.9      *Management of Groundwater Extractions and Recharge***

Per 23 CCR § 354.44(b)(9), all PMAs developed for implementation are targeted to maintain the balance of groundwater extractions and recharge to help ensure that lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels and storage in other years.

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In particular, recharge benefits of this Project are expected to increase the use and recharge of available surface water supplies during wetter years, helping to offset potential increases in groundwater pumping during drought when surface water supplies are limited.

### **8.3 OTHER PROJECTS TO BE IMPLEMENTED AS NEEDED (GROUP 3)**

This section describes potential Project(s) that would be implemented if determined to be necessary, pending future conditions in the Modesto Subbasin (Group 3 Projects, Table 8-1). Only one project, the Stanislaus River Flood Mitigation and Direct Recharge Project, was categorized as a Group 3 Project. While this Project would contribute to attainment of the sustainability goal and support GSP implementation, it is in the early conceptual or planning stage at this time, with no specific implementation timeline established at this time.

To the extent that future monitoring indicates the occurrence of undesirable results in the Subbasin, additional Projects will be implemented to address these changing conditions. As additional project development occurs for the project described below or for other projects identified in the future, updates will be documented and reported in subsequent GSP Annual Reports and Five-Year Assessment Reports.

#### **Summary of Criteria for Project Implementation (23 CCR §354.44(b)(1)(A))**

As described above, the Project described in this section is still in the early conceptual or planning stage. This potential Project could be implemented, as needed, to achieve and maintain long-term sustainable groundwater management across the Modesto Subbasin. This Project would be evaluated for implementation if, based on data gathered during GSP implementation, the GSA finds that established IMs and MOs cannot be maintained and/or if MTs are being approached. This adaptive approach will be informed by continued monitoring of groundwater conditions, using the monitoring network and methods described in the GSP. This initial list will likely be supplemented with additional projects as they are identified and reported through Annual Reports and Five-Year Assessment Reports of the GSP.

#### **8.3.1.1 Stanislaus River Flood Mitigation and Direct Recharge Project (Project 9)**

The Stanislaus River Flood Mitigation and Direct Recharge Project (Project) is intended to be a cooperative long-term project between Oakdale Irrigation District (OID) and the non-district east landowners and is designed to be implemented with no impacts to OID's existing agricultural customers. Currently developed agriculture in the non-district east areas of the Modesto subbasin is estimated to be approximately 36,000 acres, of which approximately 30,000 acres is deciduous fruits and nuts (permanent crops). With limited exception, the entire non-district east area is solely reliant on groundwater from the Modesto subbasin. The Project is different than the Oakdale Irrigation District In-lieu and Direct Recharge Project, namely from a timing perspective, and involves the delivery of approximately 5,000 AF of surface water from the Stanislaus River in Wet water years (WYs) through a limited number of new points of diversions off OID's existing irrigation conveyance infrastructure and subsequent conveyance through newly constructed private irrigation conveyance infrastructure for direct recharge during the non-growing season. Storage in New Melones is approximately 2.5 times what the watershed yields on an annual basis and as a result, the magnitude and frequency (5,000 AF and wet WYs) of this Project has been limited.

Nonetheless, this Project is intended to mitigate flood releases from New Melones Reservoir during the winter months whereby reducing impacts on the lower Stanislaus River (growers along the lower Stanislaus River), the San Joaquin River and the Delta. This project would require a license for diversion, as well as potential agreements with UBSR, OID regarding storage facilities, and water rights.

A summary of the Project is provided in **Table 8-4**.

*Table 8-4: Stanislaus River Flood Mitigation and Direct Recharge Project: Summary (23 CCR §354.44(b))*

Item in GSP Regulations	Description
Implementation Strategy and Criteria  (§354.44(b)(1)(A); §354.44(b)(6))	Although similar to the OID In-lieu and Direct Recharge Project, this project is different because of the timing perspective and the delivery of approximately 5,000 AF of surface water from the Stanislaus River in Wet water years (WYs). This Project is intended to mitigate flood releases from New Melones Reservoir during the winter months whereby reducing impacts on the lower Stanislaus River, the San Joaquin River and the Delta. This is currently in the conceptual stage and is a project the GSA may decide to pursue in the future if additional strategies are needed to reach sustainability.
Timeline and Implementation Status  (§354.44(b)(4))	This Project is currently in the early conceptual stage and will be implemented at the discretion of the GSA. Thus, the start and completion dates for this Project have yet to be determined and if the GSA determines it should be implemented, an updated timeline will be provided in GSP Annual Reports and Five-Year Assessment Reports. Benefits are expected to accrue in wet and above normal hydrologic years when flood water is available for use, potentially beginning the first year of project implementation.
Notice to public and other agencies  (§354.44(b)(1)(B))	Public and/or inter-agency noticing will be facilitated through GSA and/or district board meetings, GSA and/or district website(s), GSA and/or district newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.
Water source & reliability  (§354.44(b)(6))	This Project would use available flood water from the Stanislaus River.  This Project is currently in the early conceptual stage. The precise reliability of available water would be identified if/when the Project is evaluated and selected for implementation. This information will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.
Legal authority, permitting processes,	The GSA, Districts, and individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will

Item in GSP Regulations	Description
and regulatory control  (§354.44(b)(3); §354.44(b)(7))	be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, RWQCBs, USFWS, NMFS, LAFCo, County(ies) of Stanislaus and/or Tuolumne, and CARB.
Benefits and benefit evaluation methodology  (§354.44(b)(5))	<p>The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water.</p> <p>This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.</p> <p>Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project may be evaluated as part of a scenario and the C2VSim<sup>TM</sup> would be used to assess the benefits and impacts on the subbasin sustainability.</p>
Costs  (§354.44(b)(8))	This Project is currently in the early conceptual stage. Thus, the anticipated costs of this Project have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. The project proponent would identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

### 8.3.1.2 Retention Basin Standards Specifications Update (Project 10)

This Project would aim to change standards for future storm drains so that the drains would not discharge straight to rivers, creeks, or canals but rather to retention basins. This would increase the sustainability footprint of the City of Modesto through future growth. Currently, approximately 16.37 Square miles out of 45 Square miles (36 percent) of the City of Modesto area drain to surface water, with approximately 64 percent draining and contributing to local recharge. If the City of Modesto adopts new storm drain standards, 100 percent of runoff from newly developed areas would reach a retention system with an approximate runoff coefficient of 0.7, and an average rainfall of 12.14 inches per year.

A summary of the Project is provided in **Table 8-5**.

*Table 8-5: Retention Basin Standards Specifications Update: Summary (23 CCR §354.44(b))*

Item in GSP Regulations	Description
Implementation Strategy and Criteria (§354.44(b)(1)(A); §354.44(b)(6))	This Project would aim to change standards for future storm drains so that the drains would not discharge straight to rivers, creeks, or canals but rather to retention basins. This is currently in the conceptual stage and is a project the GSA may decide to pursue in the future if additional strategies are needed to reach sustainability.
Timeline and Implementation Status (§354.44(b)(4))	This Project is currently in the early conceptual stage and will be implemented at the discretion of the GSA. Thus, the start and completion dates for this Project have yet to be determined and if the GSA determines it should be implemented, an update will be provided in GSP Annual Reports and Five-Year Assessment Reports. Benefits are expected to accrue in all years and potentially beginning the first year of project implementation.
Notice to public and other agencies (§354.44(b)(1)(B))	Public and/or inter-agency noticing will be facilitated through GSA and/or district board meetings, GSA and/or district website(s), GSA and/or district newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.
Water source & reliability (§354.44(b)(6))	This Project would use urban storm runoff flows from the City of Modesto. This Project is currently in the early conceptual stage. The precise reliability of available water would be identified if/when the Project is evaluated and selected for implementation. This information will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.
Legal authority, permitting processes, and regulatory control (§354.44(b)(3); §354.44(b)(7))	The GSA and individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, RWQCBs, USFWS, NMFS, LAFCo, County of Stanislaus, and CARB.
Benefits and benefit evaluation methodology (§354.44(b)(5))	The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water. This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project may be evaluated as part of a scenario and the C2VSim <sup>TM</sup> would be used to assess the benefits and impacts on the subbasin sustainability.
Costs (§354.44(b)(8))	This Project is currently in the early conceptual stage. Thus, the anticipated costs of this Project have yet to be determined and will be reported in GSP

Item in GSP Regulations	Description
	Annual Reports and Five-Year Assessment Reports when known. The project proponent would identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

### 8.3.1.3 Recharge Ponds Constructed by Non-District East Landowners (Project 11)

This project would aim to capture some wintertime runoff from the Dry Creek Watershed by constructing detention basins. These basins would be constructed by Non-District East Landowners.

A summary of the Project is provided in **Table 8-6**.

*Table 8-6: Recharge Ponds Constructed by Non-District East Landowners: Summary (23 CCR §354.44(b))*

Item in GSP Regulations	Description
Implementation Strategy and Criteria (§354.44(b)(1)(A); §354.44(b)(6))	This project would aim to capture some wintertime runoff from the Dry Creek Watershed by constructing detention basins. These basins would be constructed by Non-District East Landowners.
Timeline and Implementation Status (§354.44(b)(4))	This Project is currently in the early conceptual stage and will be implemented at the discretion of the GSA and Non-District East Landowners. Thus, the start and completion dates for this Project have yet to be determined and if the GSA and/or Non-District East Landowners determines it should be implemented, an updated timeline will be provided in GSP Annual Reports and Five-Year Assessment Reports. Benefits are expected to accrue during winter periods when water is available for use, potentially beginning the first year of project implementation.
Notice to public and other agencies (§354.44(b)(1)(B))	Public and/or inter-agency noticing will be facilitated through GSA board meetings, GSA website(s), GSA newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.
Water source & reliability (§354.44(b)(6))	This Project would use water from the Dry Creek Watershed. This Project is currently in the early conceptual stage. The precise reliability of available water would be identified if/when the Project is evaluated and selected for implementation. This information will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.
Legal authority, permitting processes,	The GSA individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will be



Item in GSP Regulations	Description
and regulatory control (\$354.44(b)(3); \$354.44(b)(7))	project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, RWQCBs, USFWS, NMFS, LAFCo, County(ies) of Stanislaus and/or Tuolumne, and CARB.
Benefits and benefit evaluation methodology (\$354.44(b)(5))	The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water. This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project may be evaluated as part of a scenario and the C2VSim <sup>TM</sup> would be used to assess the benefits and impacts on the subbasin sustainability.
Costs (\$354.44(b)(8))	This Project is currently in the early conceptual stage. Thus, the anticipated costs of this Project have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. The project proponent would identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

#### 8.3.1.4 OID Irrigation and Recharge to Benefit City of Oakdale (Project 12)

This project would utilize water transfers from OID to the City of Oakdale to irrigate city parks. There is currently a pilot project assessing the feasibility of this project. If results from the pilot project finds this project is feasibly, this project may be initiated by OID and the City of Oakdale. [Please provide a more detailed project description; locations, volumes, timing, anything that is currently know]

A summary of the Project is provided in **Table 8-7**.

*Table 8-7: OID Irrigation and Recharge to Benefit City of Oakdale Summary (23 CCR §354.44(b))*

Item in GSP Regulations	Description
Implementation Strategy and Criteria (\$354.44(b)(1)(A); \$354.44(b)(6))	This Project would aim to... [Will provide more description after more information is provided]  This is currently in the conceptual stage and is a project the GSA may decide to pursue in the future if additional strategies are needed to reach sustainability.
Timeline and Implementation Status (\$354.44(b)(4))	This Project is currently in the early conceptual stage and will be implemented at the discretion of OID and the City of Oakdale. Thus, the start and completion dates for this Project have yet to be determined and if the project proponents determine it should be implemented, an updated timeline

Item in GSP Regulations	Description
	will be provided in GSP Annual Reports and Five-Year Assessment Reports. Benefits are expected to accrue in wet and above normal hydrologic years when flood water is available for use, potentially beginning the first year of project implementation.
Notice to public and other agencies (§354.44(b)(1)(B))	Public and/or inter-agency noticing will be facilitated through GSA and/or district board meetings, GSA and/or district website(s), GSA and/or district newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.
Water source & reliability (§354.44(b)(6))	This Project is currently in the early conceptual stage. The precise reliability of available water would be identified if/when the Project is evaluated and selected for implementation, however, water would be provided by OID who has an existing water right. This information will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.
Legal authority, permitting processes, and regulatory control (§354.44(b)(3); §354.44(b)(7))	The GSA, Districts, and individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board, RWQCBs, USFWS, NMFS, LAFCo, County(ies) of Stanislaus and/or Tuolumne, and CARB.
Benefits and benefit evaluation methodology (§354.44(b)(5))	The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water. This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project may be evaluated as part of a scenario and the C2VSim <sup>TM</sup> would be used to assess the benefits and impacts on the subbasin sustainability.
Costs (§354.44(b)(8))	This Project is currently in the early conceptual stage. Thus, the anticipated costs of this Project have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. The project proponent would identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

#### 8.3.1.5 MID FloodMAR Projects (Project 13)

This project would support the development of flood managed aquifer recharge (FloodMAR) activities in locations in the Modesto Irrigation District boundaries where storm flows are available, or where existing

surface water facilities can be utilized to direct and control surface water for various beneficial uses. Components of this Project would be developed privately or as coordinated efforts. Necessary infrastructure would be installed to connect existing delivery systems to FloodMAR activities. This is a conceptual project and has not benefited from a feasibility analysis or any subsequent design.

A summary of the Project is provided in **Table 8-8**.

*Table 8-8: MID FloodMAR Projects Summary (23 CCR §354.44(b))*

Item in GSP Regulations	Description
Implementation Strategy and Criteria (§354.44(b)(1)(A); §354.44(b)(6))	<p>This Project would support the development of flood managed aquifer recharge (FloodMAR) activities in locations in the Modesto Irrigation District where storm flows are available, or where existing surface water facilities can be utilized to direct and control surface water for various beneficial uses.</p> <p>The Project may be implemented and would be monitored and quantified with respect to groundwater conditions, as needed, if sustainable levels are not reached following implementation of other PMAs.</p> <p>This is currently in the conceptual stage and is a project the GSA may decide to pursue in the future if additional strategies are needed to reach sustainability.</p>
Timeline and Implementation Status (§354.44(b)(4))	<p>This Project is currently in the early conceptual stage and will be implemented at the discretion of the GSA and/or other participating entities. Thus, the start and completion dates for this Project have yet to be determined and if the project proponents determine it should be implemented, an updated timeline will be provided in GSP Annual Reports and Five-Year Assessment Reports. Benefits are expected to accrue in wet and above normal hydrologic years when flood water is available for use, potentially beginning the first year of project implementation.</p>
Notice to public and other agencies (§354.44(b)(1)(B))	<p>Public and/or inter-agency noticing will be facilitated through GSA and/or district board meetings, GSA and/or district website(s), GSA and/or district newsletters, inter-basin coordination meetings, GSP Annual Reports and Five-Year Assessment Reports, public scoping meetings, and environmental/regulatory permitting notification processes.</p>
Water source & reliability (§354.44(b)(6))	<p>This Project is currently in the early conceptual stage. The precise reliability of storm flows or other excess flows would be identified if/when the Project is evaluated and selected for implementation. This information will be reported in GSP Annual Reports and Five-Year Assessment Reports when known.</p>
Legal authority, permitting processes, and regulatory control	<p>The GSA, Districts, and individual project proponents have the authority to plan and implement projects. Required permitting and regulatory review will be project-specific and initiated through consultation with applicable governing agencies. Governing agencies for which consultation will be initiated may include, but is not limited to: DWR, SWRCB, CDFW, Flood Board,</p>

Item in GSP Regulations	Description
(§354.44(b)(3); §354.44(b)(7))	RWQCBs, USFWS, NMFS, LAFCo, County(ies) of Stanislaus and/or Tuolumne, and CARB.
Benefits and benefit evaluation methodology (§354.44(b)(5))	The sustainability indicators expected to benefit are groundwater levels, groundwater storage, and depletion of interconnected surface water. This Project is currently in the early conceptual stage. Thus, the expected yield of this Project has yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. Evaluation of benefits will be based on analysis of without-project and with-project effects on the SGMA sustainability indicators. Each project may be evaluated as part of a scenario and the C2VSim <sup>TM</sup> would be used to assess the benefits and impacts on the subbasin sustainability.
Costs (§354.44(b)(8))	This Project is currently in the early conceptual stage. Thus, the anticipated costs of this Project have yet to be determined and will be reported in GSP Annual Reports and Five-Year Assessment Reports when known. The project proponent would identify funding sources to cover project costs as part of project development. These may include grants, fees, loans, and other assessments.

## 8.4 MANAGEMENT ACTIONS

This Section identifies and describes proposed Management Actions that may be undertaken by the Modesto Subbasin GSA as an element of GSP implementation. Management Actions generally refer to non-structural programs or policies designed to incentivize reductions in groundwater pumping, optimize management of the Subbasin, or implement GSA management authorities. **Table 8-9** shows a list of the six Management Actions organized into two categories: demand reduction strategies (**Section 8.4.1**) and pumping management framework (**Section 8.4.2**). Demand reduction strategies are a broad and strategic set of actions intended to reduce water demand, some of which may be incentivized by State programs or policies, or by a pumping management framework. The pumping management framework provides a suite of administrative procedures, programs, and policies that describe how the GSA will manage and monitor groundwater extractions. Implementation activities such as monitoring, annual reporting, and GSP updates are discussed in further detail in **Chapter 9**.

As described in **Chapter 5**, the Subbasin has experienced overdraft conditions. Per § 354.44(b)(2), the GSP must describe Projects or Management Actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft. Several Projects identified in earlier sections of this chapter would increase the available water in the Subbasin through increased recharge or use of alternate supplies and are expected to reduce the groundwater deficit sufficiently to achieve the Subbasin's sustainability goal. Additional Group 3 projects could be implemented to further decrease this deficit if necessary. Management Actions are additional strategies the GSA could implement to assist in achieving the

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sustainability goal if needed. A modeling analysis to assess the effectiveness of the current Group 1 and Group 2 projects is provided in **Section 8.5**. Although the C2VSim-TM model used in this analysis is currently the best available tool for this analysis, its ability to accurately predict future groundwater levels is limited and the estimate is therefore approximate and subject to future refinement. In addition, the extent and effectiveness of the Group 3 projects that will be implemented in the future, and of the water conservation management actions described in **Sections 8.4.1** and **8.4.2** is not yet known.

This section describes potential Management Actions that could be implemented in the Subbasin. While the tools described in this section will be available for implementation basin wide, implementation will be determined based upon need within each GSA separately. PMAs implemented in one GSA represent that GSA's contributions to subbasin sustainability. As such, it is anticipated that responsibility for implementing Management Actions will correspond with the relative GSA contribution to overdraft and impacts associated with other sustainability criteria within that GSA.

A range of Management Actions is presented to allow the GSA flexibility in their response to changing groundwater conditions and as data gaps and uncertainties are addressed during GSP implementation. However, it is anticipated that not all Management Actions will need to be implemented, or that individual Management Actions may be implemented by one GSA but not by the other. In addition, implementation of Management Actions will be based on adaptive management strategies informed by ongoing monitoring of groundwater conditions using the monitoring network and methods described in the GSP. Monitoring data will be used to assess the need for PMAs in the Subbasin as a whole, in the GSA, and at specific locations. This will occur incrementally as monitoring data become available, the effectiveness of prior PMAs is established, and knowledge of the Subbasin improves over time. The advent or threat of undesirable results and the performance or failure of the Subbasin to meet Interim Milestones or Measurable Objectives will serve as triggers for scaling and implementing both Projects and Management Actions in a targeted and proportional manner, consistent with conditions observed in the Subbasin.

Most of the Management Actions described in this section are presented as frameworks and will be fully developed into implementation plans during the first years of GSP implementation as indicated in the subsequent sections. These potential MAs will be implemented by the GSA as needed to achieve and maintain long-term sustainable groundwater management across the Modesto Subbasin. They would be evaluated and selected for implementation if, based on data gathered during GSP implementation, the GSA finds that established IMs and MOs cannot be maintained and/or if MTs are being approached. This adaptive approach will be informed by continued monitoring of groundwater conditions, using the monitoring network and methods described in the GSP.

**Table 8-9** lists the Management Actions described in the subsections that follow. Each Management Action description is organized to address the applicable regulatory requirements:

- **Management Action Description:** 23 CCR §354.44(b)
- **Public Notice:** 23 CCR §354.44(b)(1)(B)
- **Permitting and Regulatory Process:** 23 CCR §354.44(b)(3)
- **Expected Benefits:** 23 CCR §354.44(b)(4), §354.44(b)(5)
- **Implementation Criteria, Status, and Plan:** 23 CCR §354.44(b)(1)(A); §354.44(b)(4); §354.44(b)(6)

- **Water Source and Reliability:** 23 CCR §354.44(b)(6)
- **Legal Authority:** 23 CCR §354.44(b)(7)
- **Estimated Costs and Funding Plan:** 23 CCR §354.44(b)(8)
- **Management of Groundwater Extractions and Recharge:** 23 CCR §354.44(b)(9)

Summary of Criteria for Project Implementation (23 CCR §354.44(b)(1)(A))

Most of the Management Actions described in this section are presented as frameworks and will be fully developed into implementation plans during the first years of GSP implementation as indicated in the subsequent sections. These potential MAs will be implemented by the GSA as needed to achieve and maintain long-term sustainable groundwater management across the Modesto Subbasin. They would be evaluated and selected for implementation if, based on data gathered during GSP implementation, the GSA finds that established IMs and MOs cannot be maintained and/or if MTs are being approached. This adaptive approach will be informed by continued monitoring of groundwater conditions, using the monitoring network and methods described in the GSP.

*Table 8-9: List of Management Actions*

Category	Number	Proponent <sup>2</sup>	Management Action	Primary Mechanism(s) <sup>1</sup>	Partner(s)
<b>Demand Reduction Strategies</b>	1	Modesto Subbasin GSAs	Voluntary Conservation and/or Land Fallowing	Conservation/Land Fallowing	N/A
	2	Modesto Subbasin GSAs	Conservation Practices	Conservation	N/A
<b>Water Accounting framework</b>	3	Modesto Subbasin GSAs	Groundwater Extraction and Surface Water Reporting Program	Pumping Reduction	N/A
	4	Modesto Subbasin GSAs	Groundwater Allocation and Pumping Management Program	Pumping Reduction	N/A
	5	Modesto Subbasin GSAs	Groundwater Extraction Fee	Pumping Reduction	N/A
	6	Modesto Subbasin GSAs	Groundwater Pumping Credit Market and Trading Program	Pumping Reduction	N/A

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<sup>1</sup>The primary mechanism of the Management Action as conceptualized. Management Actions may support groundwater sustainability through multiple mechanisms during implementation.

<sup>2</sup> It is anticipated that Management Actions will be implemented by each GSA as needed to mitigate overdraft within their jurisdictional areas and assure that the SMC adopted in **Chapter 6** are met.

### **8.4.1 Demand Management Strategies**

In case Projects are insufficient to manage the Subbasin in a sustainable condition, strategies may need to be developed to manage the agricultural and urban water demands in the Subbasin. These strategies could be implemented in the form of voluntary conservation and/or land fallowing (see **Section 8.4.1.1**) or other urban and agricultural conservation practices (see **Section 8.4.1.2**). While conservation practices are expected to be implemented throughout GSP implementation, specific strategies are in preliminary stages of discussion and possible consideration. Should the Modesto Subbasin GSAs decide to pursue a program in the future, the program would be implemented as necessary in a targeted and proportional manner consistent with conditions observed in the Subbasin. Similarly, the Conservation Practices Management Action is expected to be implemented adaptively.

#### **8.4.1.1 Voluntary Conservation and/or Land Fallowing (Management Action 1)**

##### **8.4.1.1.1 *Management Action Description***

Voluntary Conservation and/or Land Fallowing covers several strategies that can be designed to achieve both temporary and permanent water demand reduction. Should the Modesto Subbasin GSAs decide to pursue such strategies, this Management Action would assess options and develop a program to incentivize voluntary conservation and/or fallowing strategies in close coordination and collaboration with the landowners. Examples of this strategy could include repurposing of lands growing lower value crops. These lands could be dry farmed, fallowed in rotation, or used for recreation, habitat restoration, groundwater recharge, or solar power generation. This Management Action would also try to prioritize those lands that are more favorable for groundwater recharge projects.

Temporary or permanent land fallowing could also be combined with recharge projects through the application of surplus surface water supplies to the fallowed lands.

##### **8.4.1.1.2 *Public Noticing***

A successful Voluntary Conservation and/or Land Fallowing program will require a comprehensive and strategic outreach effort, including multiple public workshops and meetings, potential website and/or email announcements, along with other public notices for the workshops. The outreach will be targeted to both potential participants of the program (landowners) as well as other stakeholders who may be impacted by changes to land and water use.

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#### **8.4.1.1.3      *Permitting and Regulatory Process***

Preparation of a CEQA evaluation for a fallowing program will identify potential environmental impacts and identify feasible alternatives or feasible mitigation measures. Establishment of a voluntary land fallowing program is expressly authorized under SGMA (CWC, §10726.2(c)). The fallowing program, including program standards, will be developed and undergo CEQA review as necessary.

#### **8.4.1.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Sustainability indicators that could benefit from Voluntary Conservation and/or Land Fallowing include:

- Chronic lowering of groundwater levels – By reducing groundwater demand, this Management Action would reduce pumping and pumping-related contributions to chronic lowering of groundwater levels.
- Reduction of groundwater storage – Reduced pumping throughout the Subbasin contributes to a smaller rate of reduction in groundwater storage.
- Degraded water quality – Fallowing of crop lands can reduce agricultural water use and associated nutrient loading, thereby improving groundwater quality.
- Land subsidence – Depending on the location of land fallowing or conservation, reduced pumping stress on local aquifer(s) will reduce the potential for subsidence.
- Depletion of interconnected surface water – This Management Action does not address this sustainability indicator.

##### ***Benefits to Disadvantaged Communities***

Benefits to disadvantaged communities overlap with the benefits described above for sustainability indicators. Land repurposing can also provide other ancillary benefits to local communities, such as recreation.

##### ***Volumetric Benefits to Subbasin Groundwater System***

The volumetric benefit to the groundwater system would depend on the extent to which a Voluntary Conservation and/or Land Fallowing program is adopted and would be further studied when the program is implemented by the GSAs.

#### **8.4.1.1.5      *Implementation Criteria, Status, and Plan***

Temporary fallowing is a quick way to reduce demand with no capital costs or infrastructure needed. Because it is inexpensive, it can be implemented earlier and quicker while other long-term solutions like land repurposing are investigated. The Modesto Subbasin GSAs may explore options for encouraging



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voluntary and temporary fallowing during GSP implementation while developing a more structured program and exploring funding opportunities.

The Voluntary Conservation and/or Land Fallowing program is in preliminary stages of discussion and consideration. Should the Modesto Subbasin GSAs decide to pursue a program in the future, the program would be implemented as necessary in a targeted and proportional manner consistent with conditions observed in the Subbasin. To maximize recharge potential, the preservation lands that are more favorable for recharge projects could be prioritized while developing this management action. The implementation timeline has yet to be determined but would be provided in GSP annual reports and five-year updates when known. Any future changes in implementation would be communicated with the public and other agencies, and would be documented in GSP annual reports and five-year updates.

#### **8.4.1.1.6      *Water Source and Reliability***

This program does not rely on the supplies from outside the Subbasin because it is a planning effort that will result in conservation. It will support overall supply reliability by reducing overdraft in the Subbasin and moving the Subbasin towards sustainability.

#### **8.4.1.1.7      *Legal Authority***

It is the established policy of the State of California “to facilitate the voluntary transfer of water and water rights where consistent with the public welfare” (CWC, §109(a)). “The Legislature hereby finds and declares that voluntary water transfers between water users can result in a more efficient use of water, benefitting both the buyer and the seller” (CWC, §475).

In addition, each of the members of the GSA has independent legal authority to implement water transfer programs in their respective jurisdictions under existing law. Under SGMA, the GSA has authority to “authorize temporary and permanent transfers of groundwater extraction allocations within the [GSA’s] boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the [GSP]” CWC, §10726.4(a)(3). The GSA also has authority to “provide for a program of voluntary fallowing of agricultural lands or validate an existing program” (CWC, §10726.2(c)).

This Management Action carries forward the policy of the state and satisfies SGMA requirements by establishing a voluntary program that encourages water within the Subbasin to be transferred to beneficial uses of water in a manner designed to achieve the sustainability goals and to protect against undesirable results.

#### **8.4.1.1.8      *Estimated Costs and Funding Plan***

The Voluntary Conservation and/or Land Fallowing program is in preliminary stages of discussion and possible consideration. Therefore, no costs have been estimated for its development and implementation. Such costs would be developed should the Modesto Subbasin GSAs decide to pursue a program in the future. Separately, multiple funding programs exist as a potential source of revenue for individual landowners looking at options for land repurposing, including (EDF, 2021):

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- Mitigation or Conservation Banks
  - Conservation Easements
  - Solar Rentals
  - Grazing Leases
  - Converting to Low Water Intensity Crops
  - Federal and State Grant Funding Programs

#### **8.4.1.1.9      *Management of Groundwater Extractions and Recharge***

This Management Action encourages the conservation of water; this will be applicable during both drought and non-drought conditions.

#### **8.4.1.2 Conservation Practices (Management Action 2)**

##### **8.4.1.2.1      *Management Action Description***

This Management Action would create a program to support the use of conservation practices in both urban and agricultural sectors.

Urban water suppliers are already obligated to consider demand reduction and conservation efforts during dry periods. These demand management actions are described in their respective Urban Water Management Plans (UWMPs). These include:

- City of Modesto Urban Water Management Plan
  - <https://www.modestogov.com/860/Urban-Water-Management-Plan>
- Modesto Irrigation District Urban Water Management Plan
  - [https://wuedata.water.ca.gov/public/uwmp\\_attachments/2173444449/R%20-%20418%20-%20City%20of%20Modesto\\_MID%20-%20Final%202020%20UWMP%20-%202006-23-21.pdf](https://wuedata.water.ca.gov/public/uwmp_attachments/2173444449/R%20-%20418%20-%20City%20of%20Modesto_MID%20-%20Final%202020%20UWMP%20-%202006-23-21.pdf)
- City of Riverbank Urban Water Management Plan
  - <https://www.riverbank.org/610/Urban-Water-Management-Plan-WSCP>
- City of Oakdale Urban Water Management Plan
  - <https://cadwr.app.box.com/s/hg3k8bc9vuka689jkh1x4f9i1n58ey9a/file/521558561581>
- City of Waterford Urban Water Management Plan

In addition, SB 606 and AB 1668, both signed into law in May 2018, are laws that introduce conservation mandates that will cap indoor residential use and set a target for efficient outdoor landscape irrigation based on local climate and size of landscaped areas. Urban water suppliers will be required to report on progress to meeting urban water use objectives beginning in 2023 and comply with them beginning in 2028.

In addition to meeting urban water use objectives, this management action could include changing standards for storm drainage so that storm flows do not discharge straight to a river, creek, or canal. This would help increase the sustainability footprint of the City of Modesto as it grows. Currently

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approximately 36% of the City of Modesto area drains to a surface water, while approximately 64% is captured for local recharge. If the City of Modesto adopts new Storm Drain Standards, 100% of runoff from newly developed areas would reach a retention system and contribute to recharge.

In addition to urban conservation, agricultural water suppliers serving more than 25,000 irrigated acres must adopt an Agricultural Water Management Plan (AWMP) that include reports on the implementation status of specific Efficient Water Management Practices required by the Water Conservation Act of 2009 (SB X7-7). Agencies that have developed AWMPs include:

- Modesto Irrigation District Agricultural Water Management Plan
  - <https://www.mid.org/water/awmp/default.html>
- Oakdale Irrigation District Agricultural Water Management Plan
  - [https://wuedata.water.ca.gov/public/awmp\\_attachments/3350354850/OID%202020%20AWMP%20FINAL%2010323.pdf](https://wuedata.water.ca.gov/public/awmp_attachments/3350354850/OID%202020%20AWMP%20FINAL%2010323.pdf)

The Modesto Subbasin GSAs may choose to evaluate the existing UWMPs and AWMPs in the Subbasin and either expand upon minimum requirements to increase the impact of such programs or implement similar conservation practice programs in other areas of the Subbasin that may not be covered under an UWMP or AWMP.

Notably, conservation practices must be considered in the greater context of the Subbasin water budget, especially at the nexus between on-farm water use and groundwater sustainability. In areas where groundwater is the primary or sole water supply, conservation practices that reduce water demand may also reduce groundwater consumption, but conservation practices may also have unintended consequences that impede water conservation and sustainable groundwater management. Some of these consequences directly result from irrigation efficiency improvements: applying less water to an area and reducing the gap between irrigation and consumptive use also reduces deep percolation and seepage to the groundwater system. Other consequences may stem from behavioral responses and changes in irrigation resulting from these technologies and policies. If less water can be used to produce the same amount of a crop product, growers may be inclined to use the same amount of water and produce more (Lankford, et al., 2020). Additional considerations on the promises, pitfalls, and paradoxes of irrigation efficiency in water management planning are described by Lankford et al. (2020).

Further details on any expansion of the Conservation Practices program are preliminary as of the time of publishing and would need to be developed and refined further during GSP implementation.

#### **8.4.1.2.2      *Public Noticing***

The Modesto Subbasin GSAs anticipates that public outreach and education on the potential structure of the Conservation Practices program, as well as feasible monitoring and enforcement mechanisms, would be necessary to enable a successful program. Outreach may include public notices, meetings, potential website presence and email announcements. Initial program implementation will focus on voluntary compliance while the GSA considers the necessary elements to begin enforcing the program by 2027 (five years after adopting and submitting the GSP).

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#### **8.4.1.2.3      *Permitting and Regulatory Process***

Development of a Conservation Practices program is not a project as defined by the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) and would therefore not trigger either.

#### **8.4.1.2.4      *Expected Benefits***

##### **Benefits to Sustainability Indicators**

Sustainability indicators benefitting from Conservation Practices include:

- Chronic lowering of groundwater levels – By reducing groundwater demand, this Management Action would reduce pumping and pumping-related contributions to chronic lowering of groundwater levels.
- Reduction of groundwater storage – Reduced pumping throughout the Subbasin contributes to a smaller rate of reduction in groundwater storage.
- Degraded water quality – This Management Action does not address this sustainability indicator.
- Land subsidence – Depending on the location of Conservation Practices, reduced pumping stress on local aquifer(s) will reduce the potential for subsidence.
- Depletion of interconnected surface water – This Management Action does not address this sustainability indicator.

##### **Benefits to Disadvantaged Communities**

Benefits to disadvantaged communities overlap with the benefits described above for sustainability indicators. Depending on how they're structured, urban conservation programs may also provide a financial benefit to individual users who reduce their water consumption, either via a lower water bill or reduced demand on a domestic well.

##### **Volumetric Benefits to Subbasin Groundwater System**

The volumetric benefit to the groundwater system will depend on the extent to which a Conservation Practices program is implemented and will be further studied when the program is developed by the GSA.

#### **8.4.1.2.5      *Implementation Criteria, Status, and Plan***

The Conservation Practices Management Action is expected to commence shortly after the adoption of the GSP and continue in an ongoing fashion throughout the implementation period of the GSP. The implementation timeline has yet to be determined but would be provided in GSP annual reports and five-year updates when known. Any future changes in implementation would be communicated with the public and other agencies and would be documented in GSP annual reports and five-year updates.

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#### **8.4.1.2.6      *Water Source and Reliability***

This Management Action does not rely on the supplies from outside the Subbasin because it is a planning effort that will result in conservation benefits. It will support overall supply reliability by reducing groundwater demand in the Subbasin and moving the Subbasin towards sustainability.

#### **8.4.1.2.7      *Legal Authority***

The Modesto Subbasin GSAs have the authority to develop a Conservation Practices program and may perform implementation and enforcement of practices via implementation of fees for noncompliance or through metering or other methods to quantify groundwater use. Mechanisms for enforcement would be outlined in the Conservation Practices program once developed and are expected to be enforced by the Modesto Subbasin GSAs and/or member agencies.

#### **8.4.1.2.8      *Estimated Costs and Funding Plan***

Costs for UWMP and AWMP report preparation and submittals are ongoing for urban and agricultural water suppliers, respectively. Any future costs related to additional programming or program enforcement are not yet developed.

#### **8.4.1.2.9      *Management of Groundwater Extractions and Recharge***

This Management Action encourages the conservation of water; this will be applicable during both wet and dry conditions.

### **8.4.2      *Water Accounting Framework***

The Water Accounting Framework consists of four-tiered Management Actions that will be implemented in a prioritized order as determined by the Modesto Subbasin GSA to meet the Subbasin's sustainability goal. Not all Management Actions may be needed – Subbasin conditions will be evaluated against the sustainability management criteria when considering whether an additional tiered Management Action is needed. The tiered order of potential Water Accounting Framework Management Actions implementation is:

1. Groundwater Extraction and Surface Water Accounting Reporting or Monitoring Program (Management Action 3) – see **Section 8.4.2.1**
2. Groundwater Allocation Program (Management Action 4) – see **Section 8.4.2.2**
3. Groundwater Extraction Fee (Management Action 5) – see **Section 8.4.2.3**
4. Groundwater Pumping Credit Market and Trading Program (Management Action 6) – see **Section 8.4.2.4**

The process of providing annual reports to DWR and of GSA self-reporting will allow them to update the Plan and adjust the implementation course as needed based on changing conditions.

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### **8.4.2.1 Groundwater Extraction and Surface Water Accounting Reporting or Monitoring Program (Management Action 3)**

#### **8.4.2.1.1 Management Action Description**

As required in SGMA regulations, groundwater extraction has been calculated by the GSA for this GSP using the groundwater model (Appendix X). Currently, the GSA intends to continue with its current data collection and groundwater extraction monitoring techniques. This management action is provided as an alternative to allow the GSA flexibility and additional options in the event more or alternative forms of data are needed in the future.

There are several ways that this management action could be implemented by the GSA. For this plan, two potential components have been developed and include a voluntary program and a comprehensive program. However, these two potential components are provided only as options. If this management action is initiated, the GSA will further develop options before implementing.

- Voluntary program - This program is intended to provide an annual reporting of groundwater use by agricultural and private well owners and surface water transfers for in-lieu use. The Data Management System will be set up with appropriate input data forms for voluntary reporting of groundwater use as well as other relevant information, such as irrigated acreage, crop type, and sources of water.
- Comprehensive program - This program is a more robust and elaborate strategy for reporting groundwater extraction that is intended to cover all groundwater users and surface water transfers for in-lieu use. Implementation of this program can be using satellite imagery to estimate the evapotranspiration of crops by parcel. Additionally, this strategy can take the form of requiring the installation of meters at all agricultural wells.

The Groundwater Extraction Reporting Program would exclude *de minimis* extractors but may also include surface water accounting in the Subbasin due to the amount of surface water transferred from MID and OID to the non-districted east area used for in-lieu and direct recharge.

#### **8.4.2.1.2 Public Noticing**

Successful implementation of either component of this program would require the support and coordination of member agencies, well owners throughout the Subbasin, and other stakeholders.

The voluntary program would be noticed via public outreach and education about the logistics of participating in the program as well as the purpose and importance of doing so. Outreach may include public notices, meetings, potential website presence and email announcements.

The comprehensive program would involve more of a robust planning process. The Modesto Subbasin GSA anticipates that public outreach and education on the potential structure of this program would be necessary, including public notices, meetings, potential website presence and email announcements.

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#### **8.4.2.1.3      *Permitting and Regulatory Process***

The Groundwater Extraction Reporting Program is not expected to require any permitting or regulatory involvement.

#### **8.4.2.1.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Direct measurement of groundwater extractions may not have direct impacts on sustainability indicators, but would improve future water budget and sustainable yield refinement. The accurate and widespread collection of extraction data will provide the Modesto Subbasin GSA with critical information to assist in management of the Subbasin, development of additional Management Actions, and monitoring the success of the GSP against the sustainable management criteria.

##### ***Benefits to Disadvantaged Communities***

The Groundwater Extraction Reporting Program would exclude *de minimis* extractors.

##### ***Volumetric Benefits to Subbasin Groundwater System***

Measurement of groundwater extractions provides a vast improvement to the refinement of water budgets and basin storage calculations.

#### **8.4.2.1.5      *Implementation Criteria, Status, and Plan***

The Modesto Subbasin GSA will develop annual reports to evaluate progress toward meeting the sustainability goal. If monitoring efforts demonstrate that the Projects and Management Actions being implemented are not effective in achieving stated targets, the GSA will convene a working group to evaluate the implementation of additional supply-side and demand-side actions, such as the implementation of tiered approaches in the Pumping Management Framework.

#### **8.4.2.1.6      *Water Source and Reliability***

This program does not rely on supplies from outside the Subbasin because it is a planning effort that will support overall supply reliability by providing additional information for better management of the Subbasin and moving the Subbasin towards sustainability.

#### **8.4.2.1.7      *Legal Authority***

SGMA provides GSAs with the authority to regulate the pumping of groundwater in order to stabilize the region's water supply and recharge aquifers. As such, the GSA has the authority to: "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate, . . . or otherwise establishing groundwater extraction allocations" (CWC, §10726.4(a)).

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#### **8.4.2.1.8      *Estimated Costs and Funding Plan***

The estimated costs for the Groundwater Extraction Reporting Program would vary depending on the components that are implemented:

- The costs for the voluntary component are minimal and include:
  - One-time costs for initial public outreach and setup of tools and procedures to receive and compile voluntary submitted data
  - Ongoing annual administrative costs to review and compile the voluntarily submitted data as well as continued outreach
- The costs for implementing the more comprehensive program would be larger as they may include:
  - One-time costs to develop a remote sensing system or a more comprehensive program to track and monitor well meters, in addition to public outreach
  - Ongoing annual costs to administer the program, whether via purchase and analysis of the latest remote sensing data or to track and collect data from well meters

The Groundwater Extraction Reporting Program is in preliminary stages of discussion and possible consideration. Therefore, no costs have been estimated for its development and implementation. Such costs will be developed should the Modesto Subbasin GSA decide to pursue a program in the future.

#### **8.4.2.1.9      *Management of Groundwater Extractions and Recharge***

This program would directly develop and expand the reporting of groundwater extractions, including during both dry and wet periods, to support better management of the Subbasin.

#### **8.4.2.2 Groundwater Allocation Program (Management Action 4)**

##### **8.4.2.2.1      *Management Action Description***

This strategy entails development of a Groundwater Allocation Program for the Subbasin that would result in groundwater sustainability for the Subbasin as a whole.

Outlined here is a framework for how the Modesto Subbasin GSA might develop and implement pumping allocations in the Subbasin based on the magnitude of projected overdraft estimated by Subbasin modeling.

There are four key steps to developing pumping allocations:

1. Determine the Sustainable Yield of the Basin (see **Chapter 6** of this GSP)
2. Allocate sustainable yield of native groundwater to users based on:
  - a. Historical use
  - b. Land uses and irrigated areas
3. Determine how new/additional supplies would be allocated
4. Develop a timeline for reducing pumping to achieve allocations over time



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The Groundwater Allocation Program is only conceptual at this time. There are numerous ways to structure and implement an allocation program which will need to be further evaluated, developed, and refined by the Modesto Subbasin GSA prior to implementation.

#### **8.4.2.2.2      *Public Noticing***

Development of a Groundwater Allocation Program would require substantial public input to understand the potential impacts of groundwater allocations and baseline needs that should be accounted for. The Modesto Subbasin GSA anticipates that public outreach would include multiple public workshops and meetings, potential website and/or email announcements, along with other public notices for the workshops. The Groundwater Allocation Program would be circulated for public comment before finalized, though final approval of the plan would be made by the Modesto Subbasin GSA in partnership with their respective member agencies.

#### **8.4.2.2.3      *Permitting and Regulatory Process***

Development of a Groundwater Allocation Program would not require any permitting, but would require consideration of existing water rights and applicable permits and regulations associated with groundwater pumping in the Subbasin.

#### **8.4.2.2.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Sustainability indicators benefitting from the Groundwater Allocation Program include:

- Chronic lowering of groundwater levels – By reducing groundwater demand, this Management Action would reduce pumping and pumping-related contributions to chronic lowering of groundwater levels.
- Reduction of groundwater storage – Reduced pumping throughout the Subbasin contributes to a smaller rate of reduction in groundwater storage.
- Degraded water quality – This Management Action does not address this sustainability indicator.
- Land subsidence – Reduced groundwater pumping would reduce the risk of subsidence associated with lowering of groundwater levels.
- Depletion of interconnected surface water – Reduced pumping would reduce the potential for negative impacts to surface water flows associated with lowering groundwater levels.

##### ***Benefits to Disadvantaged Communities***

Benefits to disadvantaged communities overlap with the benefits described above for sustainability indicators.

##### **Volumetric Benefits to Subbasin Groundwater System**

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The volumetric benefit to the groundwater system will depend on the structure of the allocation framework and will be further studied if and when the program is developed by the GSA.

#### **8.4.2.2.5      *Implementation Criteria, Status, and Plan***

The Modesto Subbasin GSA will develop annual reports to evaluate progress toward meeting the sustainability goal. If monitoring efforts demonstrate that the Projects and Management Actions being implemented are not effective in achieving stated targets, the GSA will convene a working group to evaluate the implementation of additional supply-side and demand-side actions, such as the implementation of tiered approaches in the Water Accounting Framework.

#### **8.4.2.2.6      *Water Source and Reliability***

This program does not rely on the supplies from outside the Subbasin because it is a planning effort that will result in conservation. It will support overall supply reliability by reducing overdraft in the Subbasin and moving the Subbasin towards sustainability.

#### **8.4.2.2.7      *Legal Authority***

Under SGMA, GSAs have authority to establish groundwater extraction allocations. Specifically, SGMA authorizes GSAs to control groundwater by regulating, limiting, or suspending extractions from individual wells or extractions in the aggregate.<sup>1</sup> SGMA and GSPs adopted under SGMA cannot alter water rights.

#### **8.4.2.2.8      *Estimated Costs and Funding Plan***

Development and initiation of an allocation program is expected to include upfront costs to conduct the analysis, set up the tracking system, and conduct outreach. Costs to implement the plan would depend on the level of enforcement required to achieve allocation targets and the level of outreach required annually to remind users of their allocation for a given year. The Groundwater Allocation Program would also include an annual cost that covers ongoing enforcement and implementation. Because the Groundwater Allocation Program is in preliminary stages of discussion and possible consideration, no costs have been estimated. Such costs will be developed should the Modesto Subbasin GSA decide to pursue a program in the future.

#### **8.4.2.2.9      *Management of Groundwater Extractions and Recharge***

The Groundwater Allocation Program would include provisions for the recovery of groundwater levels and groundwater storage during non-drought periods.

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<sup>1</sup> California Water Code § 10726.4(a)(2)

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### **8.4.2.3 Groundwater Extraction Fee (Management Action 5)**

#### **8.4.2.3.1      *Management Action Description***

This strategy entails setting up a Groundwater Extraction Fee structure for each groundwater user. The fee structure could work in conjunction with the groundwater allocation and reporting programs, such that groundwater use above a certain allocation can be subject to a fee. This strategy could be implemented within the GSA as needed to achieve the sustainability goals.

Revenue from these fees could then be used to pay for a variety of activities, such as the construction of water infrastructure, protection of groundwater, proper construction and destruction of wells to prevent contamination, groundwater recharge and recovery projects, purchase of imported water or other supplies to replenish the groundwater basin, and/or purchasing and permanent fallowing of marginally-productive agricultural lands dependent on groundwater.

#### **8.4.2.3.2      *Public Noticing***

Development of a Groundwater Extraction Fee would require substantial public input to understand the potential impacts and needs that should be accounted for. The Modesto Subbasin GSAs anticipates that public outreach would include multiple public workshops and meetings, potential website and/or email announcements, along with other public notices for the workshops. The Groundwater Extraction Fee framework would be circulated for public comment before being finalized, though final approval of the plan would be made by the Modesto Subbasin GSAs in partnership with its member agencies.

Additional noticing for the public would be conducted consistent with permitting requirements in the case of the enactment of fees. GSA outreach may include public notices, meetings, website or social media presence, and email announcements. Prior to implementing any fee or assessment program, the GSA would complete a rate assessment study or other analysis if required by the regulatory requirements.

Per Water Code §10730, prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting, at which oral or written presentations may be made as part of the meeting. Notice of the time and place of the meeting shall include a general explanation of the matter to be considered and a statement that the data required by this section is available. The notice shall be provided by publication pursuant to §6066 of the Government Code, by posting notice on the Internet Web site of the groundwater sustainability agency, and by mail to any interested party who files a written request with the agency for mailed notice of the meeting on new or increased fees. A written request for mailed notices shall be valid for one year from the date that the request is made and may be renewed by making a written request on or before April 1 of each year. At least 20 days prior to the meeting, the groundwater sustainability agency shall make available to the public data upon which the proposed fee is based. Any action by a groundwater sustainability agency to impose or increase a fee shall be taken only by ordinance or resolution.

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#### **8.4.2.3.3      *Permitting and Regulatory Process***

Fees imposed pursuant to Water Code §10730 shall be adopted in accordance with subdivisions (a) and (b) of §6 [property-related fees] of Article XIII D of the California Constitution [Prop.218]. Post-GSP adoption, fees are required to comply with the requirements for Proposition 218, except for the voter approval requirement.

A fee or charge shall not be extended, imposed, or increased by any agency unless it meets all of the following requirements:

- Revenues derived from the fee or charge shall not exceed the funds required to provide the property related service.
- Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
- The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.
- No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question. Fees or charges based on potential or future use of a service are not permitted. Standby charges, whether characterized as charges or assessments, shall be classified as assessments and shall not be imposed without compliance with Section 4 (Water Code §10730).
- No fee or charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.

Procedural requirements include the following:

- The parcels upon which a fee or charge is proposed for imposition shall be identified. The amount of the fee or charge proposed to be imposed upon each parcel shall be calculated. The agency shall provide written notice by mail of the proposed fee or charge to the record owner of each identified parcel upon which the fee or charge is proposed for imposition, the amount of the fee or charge proposed to be imposed upon each, the basis upon which the amount of the proposed fee or charge was calculated, the reason for the fee or charge, together with the date, time, and location of a public hearing on the proposed fee or charge.
- The agency shall conduct a public hearing upon the proposed fee or charge not less than 45 days after mailing the notice of the proposed fee or charge to the record owners of each identified parcel upon which the fee or charge is proposed for imposition. At the public hearing, the agency shall consider all protests against the proposed fee or charge. If written protests against the proposed fee or charge are presented by a majority of owners of the identified parcels, the agency shall not impose the fee or charge.

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#### **8.4.2.3.4 Expected Benefits**

##### ***Benefits to Sustainability Indicators***

Collection of groundwater extraction fees incentivizes the use of supplemental or alternative water supplies where fees can also fund activities/projects that increase groundwater supplies, such as groundwater recharge, thus reducing declines in groundwater elevations and groundwater storage. Other sustainability indicators benefitting from the Groundwater Extraction Fee program include:

- Degraded water quality – Funded activities and projects can also reduce degradation of groundwater quality (such as proper construction/destruction of wells to prevent contamination).
- Land subsidence – Reduced groundwater pumping would reduce the risk of subsidence associated with lowering of groundwater levels.
- Depletion of interconnected surface water – Reduced pumping would reduce the potential for negative impacts to surface water flows associated with lowering groundwater levels.

##### ***Benefits to Disadvantaged Communities***

Per CWC, §10730(a), the groundwater fee programs shall exclude *de minimis* extractors.

##### ***Volumetric Benefits to Subbasin Groundwater System***

The volumetric benefit to the groundwater system would depend on the framework of the fee implemented and would be further studied as the Groundwater Extraction Fee framework is developed by the GSA.

#### **8.4.2.3.5 Implementation Criteria, Status, and Plan**

The Modesto Subbasin GSA will develop annual reports to evaluate progress toward meeting the sustainability goal. If monitoring efforts demonstrate that the Projects and Management Actions being implemented are not effective in achieving stated targets, the GSA will convene a working group to evaluate the implementation of additional supply-side and demand-side actions, such as the implementation of tiered approaches in the Water Accounting Framework.

#### **8.4.2.3.6 Water Source and Reliability**

The Groundwater Extraction Fee program will apply in both drought and non-drought periods.

#### **8.4.2.3.7 Legal Authority**

The GSA possess the legal authority to implement special taxes, assessments, and user fees within the project proponent service area or area of project benefit. Fees imposed include fixed fees and fees charged on a volumetric basis, including, but not limited to, fees that increase based on the quantity of

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groundwater produced annually, the year in which the production of groundwater commenced from a groundwater extraction facility, and impacts to the basin.

#### **8.4.2.3.8      *Estimated Costs and Funding Plan***

While there are certain administrative costs anticipated with the development and implementation of a Groundwater Extraction Fee, the Groundwater Extraction Fee itself is a potential mechanism to fund the costs of groundwater management. This includes, but is not limited to, the following:

- Administration, operation, and maintenance, including a prudent reserve
- Acquisition of lands or other property, facilities, and services
- Supply, production, treatment, or distribution of water
- Other activities necessary or convenient to implement the plan

#### **8.4.2.3.9      *Management of Groundwater Extractions and Recharge***

This program, in conjunction with the Groundwater Extraction Reporting Program (Management Action 3), would directly develop and expand the reporting of groundwater extractions, including during both drought and non-drought periods, to support better management of the Subbasin.

### **8.4.2.4 Groundwater Pumping Credit Market and Trading Program (Management Action 6)**

#### **8.4.2.4.1      *Management Action Description***

Groundwater credit markets and trading programs can be used to exchange and trade the allocation of groundwater use by each landowner within the GSA. This strategy is contingent upon implementation of the groundwater reporting and allocation programs (Management Actions 1 and 2), so that the credit and trading market can monitor the exchange of groundwater allocations among the landowners and/or the GSA. Should the Modesto Subbasin GSAs decide to pursue a program in the future, the Modesto Subbasin GSAs would seek guidance from agencies with experience in water markets to identify options for communications and outreach with stakeholders, program design, and mechanisms to ensure that non-participating stakeholders are not adversely impacted by the program.

#### **8.4.2.4.2      *Public Noticing***

Development and implementation of a Groundwater Pumping Credit Market and Trading Program would require substantial public input to understand the potential impacts and nuances of implementing such a program. The Modesto Subbasin GSA anticipates that public outreach would include multiple public workshops and meetings, potential website and/or email announcements, along with other public notices for the workshops. The program plan would be circulated for public comment before finalized, though final approval of the plan would be made by the Modesto Subbasin GSA in partnership with its member agencies.

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#### **8.4.2.4.3      *Permitting and Regulatory Process***

Permitting and other regulatory compliance issues will be identified and addressed when the program is being further explored and developed, consistent with SGMA §10726.4 (a) (3 & 4).

#### **8.4.2.4.4      *Expected Benefits***

##### ***Benefits to Sustainability Indicators***

Sustainability indicators benefitting from the Groundwater Pumping Credit Market and Trading Program include:

- Chronic lowering of groundwater levels – By reducing groundwater demand, this Management Action would reduce pumping and pumping-related contributions to chronic lowering of groundwater levels.
- Reduction of groundwater storage – Reduced pumping throughout the Subbasin contributes to a smaller rate of reduction in groundwater storage.
- Degraded water quality – This Management Action does not address this sustainability indicator.
- Land subsidence – Reduced groundwater pumping would reduce the risk of subsidence associated with lowering of groundwater levels.
- Depletion of interconnected surface water – Reduced pumping would reduce the potential for negative impacts to surface water flows associated with lowering groundwater levels.

##### ***Benefits to Disadvantaged Communities***

Benefits to disadvantaged communities overlap with the benefits described above for sustainability indicators.

##### ***Volumetric Benefits to Subbasin Groundwater System***

The volumetric benefit to the groundwater system will depend on the framework of the credit market and trading program implemented and will be further studied when the program is developed by the GSA.

#### **8.4.2.4.5      *Implementation Criteria, Status, and Plan***

The Modesto Subbasin GSAs will develop annual reports to evaluate progress toward meeting the sustainability goal. If monitoring efforts demonstrate that the Projects and Management Actions being implemented are not effective in achieving stated targets, the GSA will convene a working group to evaluate the implementation of additional supply-side and demand-side actions, such as the implementation of tiered approaches in the Pumping Management Framework.

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#### **8.4.2.4.6      *Water Source and Reliability***

The Subbasin area will be the source of groundwater and will be limited by the hydrology of the region.

#### **8.4.2.4.7      *Legal Authority***

SGMA §10726.4 (a) (3 & 4) provide legal authority for groundwater transfer and accounting programs.

#### **8.4.2.4.8      *Estimated Costs and Funding Plan***

The Groundwater Pumping Credit Market and Trading Program is in preliminary stages of discussion and possible consideration. Therefore, no costs have been estimated for its development and implementation. Such costs will be developed should the Modesto Subbasin GSA decide to pursue a program in the future. Costs will likely include additional staffing required to administer the program and will be borne by the participants.

#### **8.4.2.4.9      *Management of Groundwater Extractions and Recharge***

The implementation of a Groundwater Pumping Credit Market and Trading Program will include provisions for the recovery of groundwater levels and groundwater storage during non-drought periods.



## 8.5 PLAN FOR ACHIEVING SUSTAINABILITY

### 8.5.1 Integrated Modeling Scenarios

To evaluate the effects of PMAs in meeting the sustainability goals of the Modesto Subbasin, Group 1 and 2 Projects have been analyzed using the C2VSimTM model. C2VSimTM is a fully integrated surface and groundwater flow model capable of analyzing the effects of the PMAs on the land surface, stream, and groundwater systems of the Modesto Subbasin. The C2VSimTM model is used to develop the GSP's water budget estimates for historical, current, and projected conditions, as well as Subbasin groundwater levels, streamflow, and interconnected surface water bodies under historical, baseline, and various project conditions. It is understood that the projections of future groundwater conditions using the C2VSimTM model are based on the current understanding of the Subbasin, which can be further refined as more information becomes available. The 50-year projection of groundwater conditions using C2VSimTM is based on assumptions that has uncertainties in hydrologic and climatic conditions, agricultural crop mix and patterns, irrigation practices, population growth patterns and urban development trends, and land use plans, and environmental regulations. However, the C2VSimTM is currently the best available analysis tool to assist in evaluation of project benefits and impacts, not in an absolute sense, but in a relative scale.

The analysis below evaluates the proposed projects relative to the C2VSimTM Projected Conditions Baseline. The results of this analysis are then compared to MTs to estimate the approximate amount of additional net demand reduction that will be needed to meet the sustainability goal of the Subbasin. The Projected Conditions Baseline applies the projected water supply and demand conditions under the 50-year hydrologic period of WYs 1969-2018. A total of seven (7) Group 1 and 2 Projects were grouped into two (2) scenarios based on their use-sector and project type. **Table 8-10** shows a matrix of the simulated projects and their respective scenarios. Each of these projects are described in detail in **Section 8.2**, with modeling assumptions outlined in sub-section 5 for each project.

*Table 8-10: Projects Analyzed Using C2VSimTM Model*

Urban and Municipal Projects		Scenario 1	Scenario 2
1	Growth Realization of Surface Water Treatment Plant Phase II	Baseline	Baseline
2	Municipal Conservations Projects	X	X
3	Storm Drain Cross Connection Removal Project	X	X
4	Surface Water Supply Project	X	X
In-lieu Supply or Recharge Projects			
5	MID to Out-of-District Lands In-lieu and Direct Recharge Project		X
6	OID to Out-of-District Lands In-lieu and Direct Recharge Project		X
Flood Mitigation Projects			
7	Tuolumne River Flood Mitigation Direct Recharge Project		X
8	Dry Creek Flood Mitigation Direct Recharge Project		X

### **Scenario 1: Urban and Municipal Surface Water Supply**

Scenario 1 includes the three urban and municipal projects as proposed by their respective agencies. These projects, shown in **Table 8-11** total an average net-recharge of 13,700 AFY over the 50-year simulation period. Impacts to the subbasin were simulated by reducing the urban demand in the City of Modesto, providing surface water supplies to the City of Waterford, and incorporating additional recharge facilities throughout the City of Modesto. **Table 8-11** below summarizes the individual and cumulative impacts of each project within this scenario.

*Table 8-11: Scenario 1 Project Summary*

	Project	Direct Recharge	In-Lieu Recharge	Demand Reduction
Urban and Municipal Projects	Municipal Conservation Projects <sup>1</sup>			12,800
	Storm Drain Cross Connection Removal Project	200		
	City of Waterford Surface Water Supply Project <sup>1</sup>		700	
	All Urban and Municipal Projects	200	700	12,800
All Scenario 1 Projects		200	700	12,800
<b>Notes:</b> All Units are in acre-feet <sup>1</sup> The City of Modesto Conservation Projects and the City of Waterford Surface Water Supply Project include beneficiaries in both the Turlock and Modesto Subbasin. The volumes in this table represent an estimated fraction of the effective contribution to the Modesto Subbasin				

Scenario 1 projects are expected to reduce net groundwater pumping in the subbasin by 13,700 AFY. The net benefit to groundwater storage is to reduce the projected average annual groundwater storage deficit from 11,000 AFY under the Baseline conditions to 9,500 AFY with these projects, resulting in a net savings of 1,500 AFY of groundwater in storage. Details are shown in **Table 8-13** and **Figure 8-1**.

Principally, Scenario 1 projects were implemented to mitigate lowering groundwater levels, depletions of interconnected surface water systems, and potential subsidence near the urban centers within the Modesto Subbasin. **Section 8.5.2** presents the simulated groundwater conditions under both the projected conditions baseline and each of the PMA scenarios.

Scenario 1 is anticipated to be implemented in conjunction with multiple other agriculturally based projects to further improve and protect aquifer conditions. See the descriptions of the following scenario for information on the cumulative impacts to the system.

### **Scenario 2: In-Lieu Supply Recharge and Flood Mitigation Projects**

Scenario 2 builds on the benefits of Scenario 1 to incorporate the agriculturally based in-lieu and direct recharge projects. The addition of the projects to this scenario increases the net simulated contribution to the groundwater system from an average of 13,700 AF to 71,900 AFY. The four proposed projects include

1. The MID to Out-of-District Lands In-lieu and Direct Recharge Project, providing up to 60,000 AF of in-lieu recharge in Wet and Above Normal years, or an average annual contribution of 28,800 over the 50-year simulation period.

2. The OID to Out-of-District Lands In-lieu and Direct Recharge Project, providing 28,000 AFY of in-lieu recharge in all non-critically dry years, providing an average of 14,400 across the planning horizon.
3. The Tuolumne River Flood Mitigation Direct Recharge Project, providing 20,000 AFY of direct recharge in Wet and Above Normal years (9,600 AFY in the 50-year simulation average),
4. The Dry Creek Flood Mitigation Direct Recharge Project, providing 5,400 AFY of direct recharge in all year types.

**Table 8-11** below summarizes the individual and cumulative impacts of each project within this scenario.

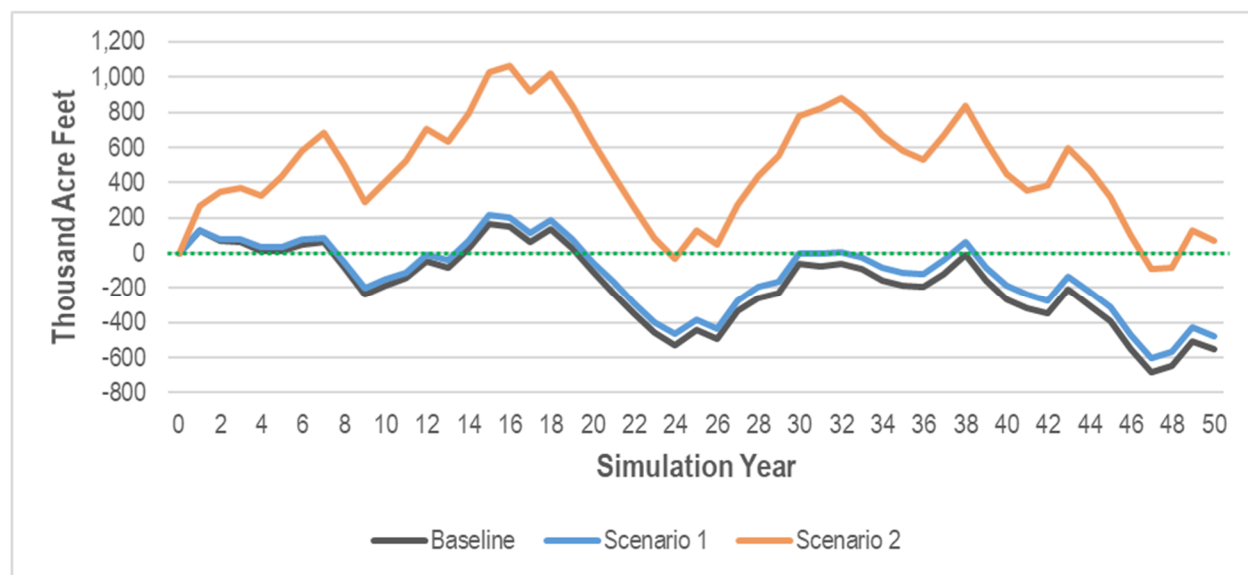
*Table 8-12: Scenario 2 Project Summary*

	Project	Direct Recharge	In-Lieu Recharge	Demand Reduction
Urban and Municipal Projects	Municipal Conservation Projects <sup>1</sup>			12,800
	Storm Drain Cross Connection Removal Project	200		
	City of Waterford Surface Water Supply Project <sup>1</sup>		700	
	All Urban and Municipal Projects	200	700	12,800
In-lieu Supply and Direct Recharge Projects	MID to Out-of-District Lands In-lieu and Direct Recharge Project	9,600	19,200	
	OID to Out-of-District Lands In-lieu and Direct Recharge Project	1,400	13,000	
	All In-lieu Supply or Recharge Projects	11,000	32,200	0
Flood Mitigation Projects	Tuolumne River Flood Mitigation Direct Recharge Project	9,600		
	Dry Creek Flood Mitigation Direct Recharge Project	5,400		
	All In-lieu Supply or Recharge Projects	15,000	0	0
<b>All Scenario 2 Projects</b>		<b>26,200</b>	<b>32,900</b>	<b>12,800</b>
<b>Notes:</b> All Units are in acre-feet <sup>1</sup> The City of Modesto Conservation Projects and the City of Waterford Surface Water Supply Project include beneficiaries in both the Turlock and Modesto Subbasin. The volumes in this table represent an estimated fraction of the effective contribution to the Modesto Subbasin				

Scenario 2 projects are expected to reduce groundwater pumping in the subbasin by 44,400 AFY. The net benefit to groundwater storage projected is to reduce the average annual groundwater storage deficit from 11,000 AFY under the Baseline conditions to an average annual positive change in storage of 1,400 AFY with these projects, resulting in a net savings of 12,400 AFY of groundwater in storage. Details are shown in **Table 8-13** and **Figure 8-1**.

Analysis of conditions under Scenario 2 show that under project buildout, sustainability goals as defined by the Minimum Thresholds (MTs) outlined in **Chapter 6, Sustainable Management Criteria**, can be met without demand management. **Section 8.5.2** below shows how Scenarios 1 and 2 effect groundwater levels at representative monitoring locations throughout the subbasin relative to the simulated minimum thresholds.

While simulated conditions meet sustainability metrics in the long-term, the Modesto Subbasin acknowledges that these scenarios assume immediate implementation of the projects and management actions listed above. In the near-term, sustainability of the Modesto Subbasin relies on the Non-District East area to actively pursue the development of these projects and understands that interim management actions, including the potential for demand reduction, may be necessary to meet SMCs.



*Figure 8-1: Scenario 1-2 Cumulative Change in Storage*

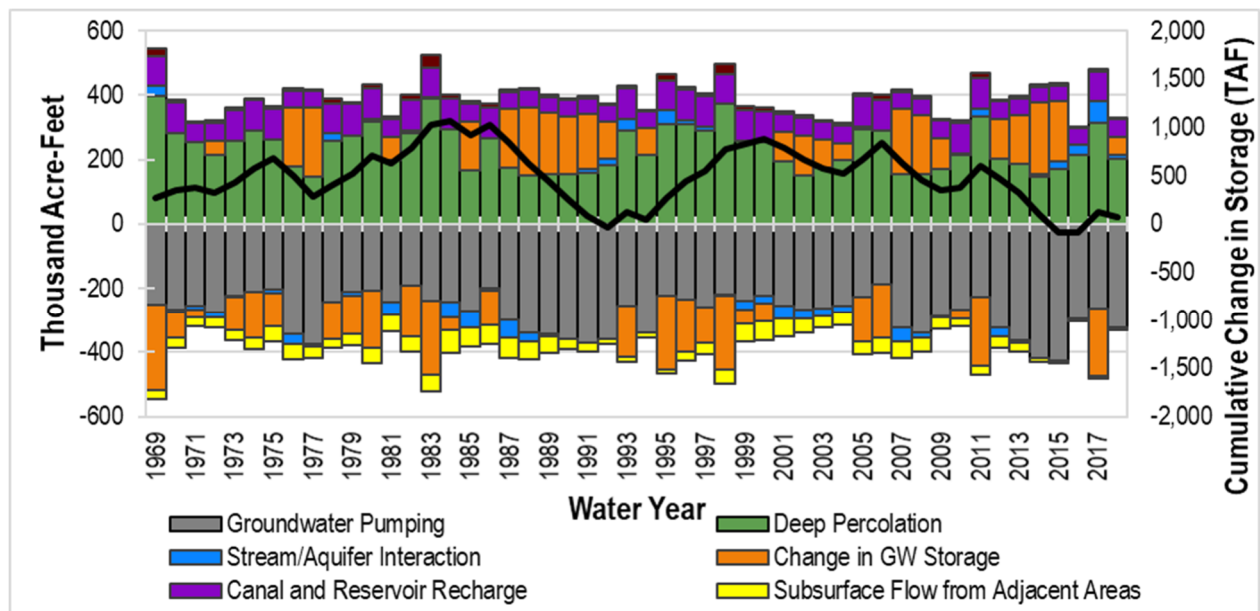


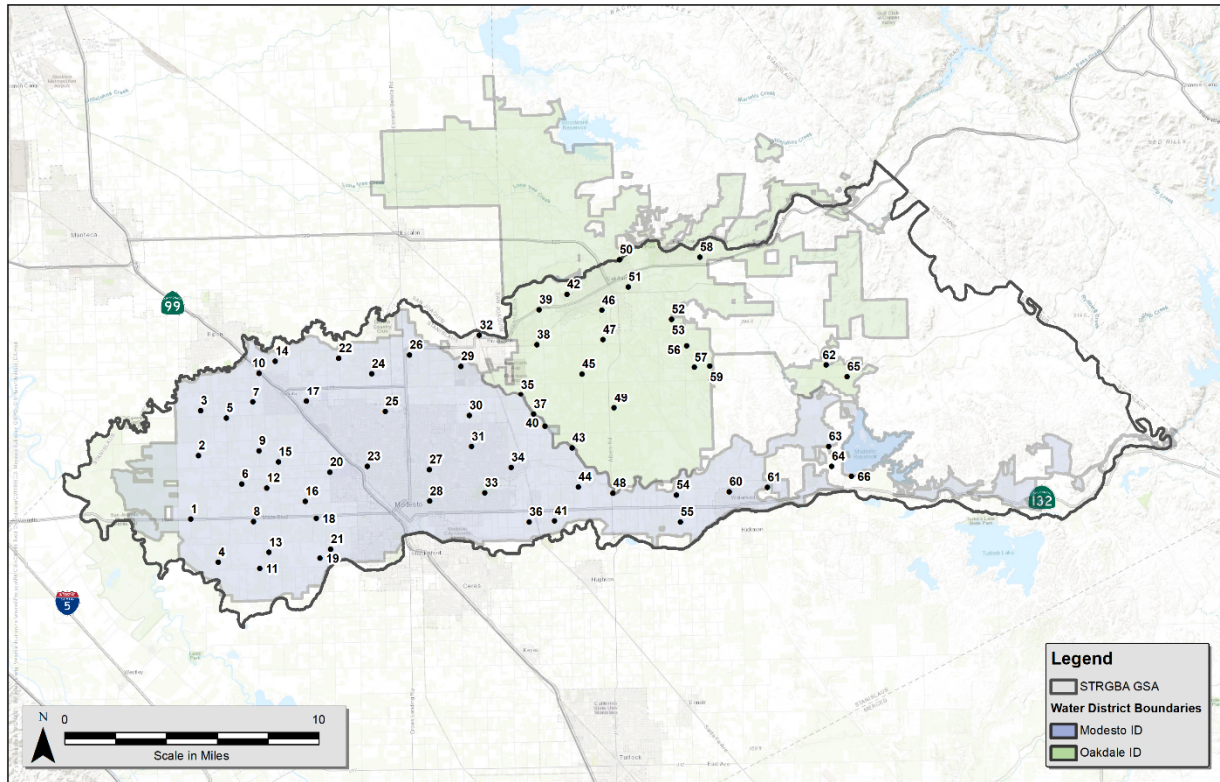
Figure 8-2: Scenario 2 Groundwater Budget

Table 8-13: Scenarios 1-2 Groundwater Budgets

	Baseline	Scenario 1 Urban & Municipal	Scenario 2 In-lieu and Direct Recharge Projects
Deep Percolation	234,900	230,100	235,800
Canal, Res., & Direct Recharge	47,300	47,500	73,500
Net Stream Seepage	24,300	18,800	-4,100
Inflow from Foothills	9,300	9,300	9,300
Net Subsurface Flow	-5,900	-7,600	-36,500
Groundwater Pumping	321,000	307,600	276,600
Groundwater Storage Deficit	11,000	9,500	-1,400

### 8.5.2 Representative Hydrographs Scenarios 1-2

**Figure 8-3** shows the location of the representative monitoring wells that were used in the development and calibration of the Modesto Subbasin in C2VSimTM. As representative wells of simulated conditions, these wells were used to evaluate the performance of the PMAs in each of the different scenarios.



*Figure 8-3: Modesto Subbasin Representative Wells*

**Chapter 6: Sustainable Management Criteria** describes thresholds for representative monitoring network wells that protect the Subbasin from experiencing Undesirable Results from the chronic lowering of groundwater levels (SMC1), and depletions of interconnected surface water systems (SMC6). **Chapter 6** defines Undesirable Results such that at no more than 33% of the representative monitoring wells shall exceed the 2015-low for a period longer than 3 years. Under Scenario 2, SGMA compliance was predicted to be met throughout the simulation period. As shown in the figures below, simulated groundwater levels occasionally drop below the MT, but do not exceed the combination of drought-time spatial and temporal limitations.

Note, the twelve wells listed below (**Figure 8-5** through **Figure 8-14**) are not inclusive of all monitoring locations, rather this subset was included as they are considered representative of RMS throughout the Subbasin. Locations of these example representative hydrographs are shown in **Figure 8-4** below.



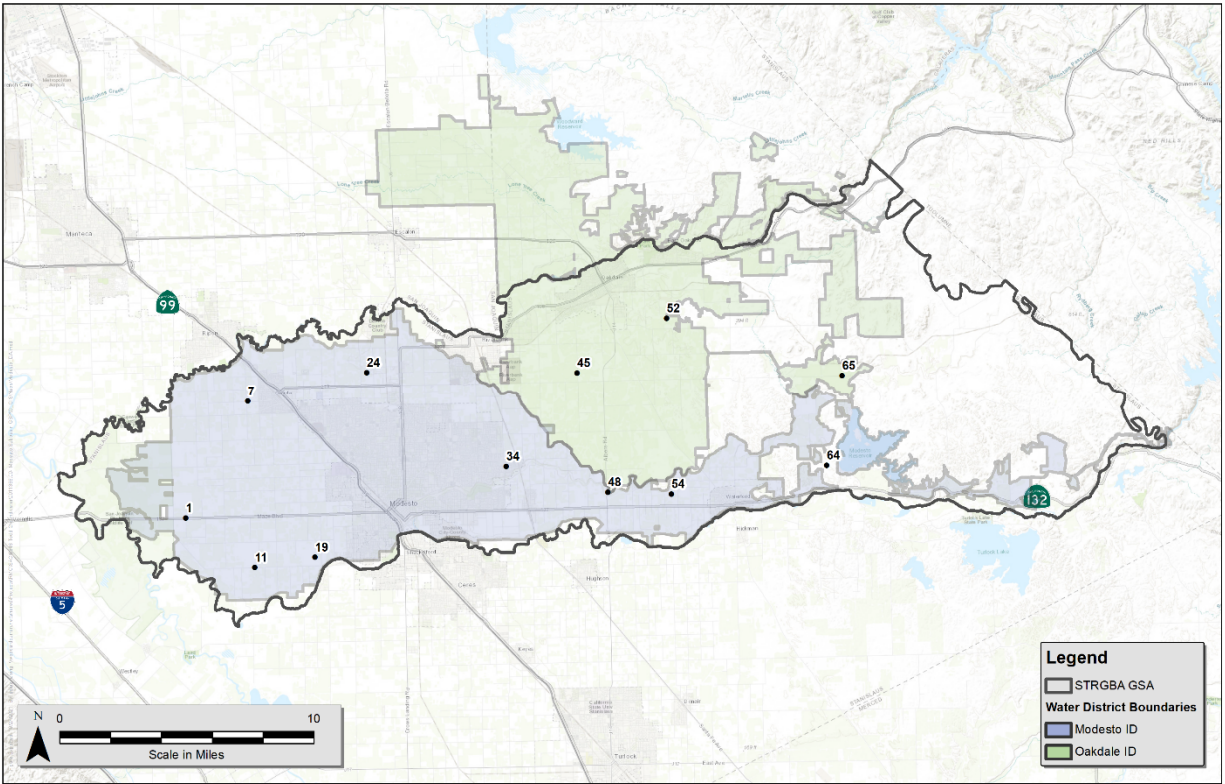


Figure 8-4: SMC1 Example Hydrographs

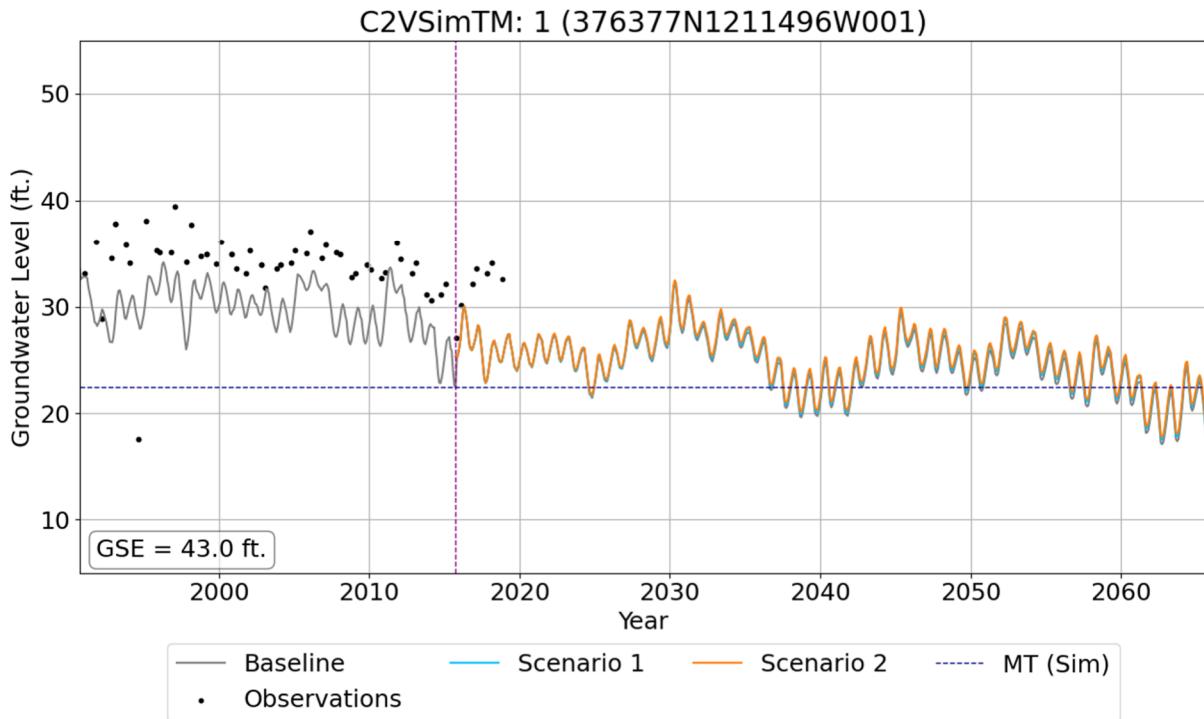


Figure 8-5: SMC1 Hydrograph C2VSimTM 01

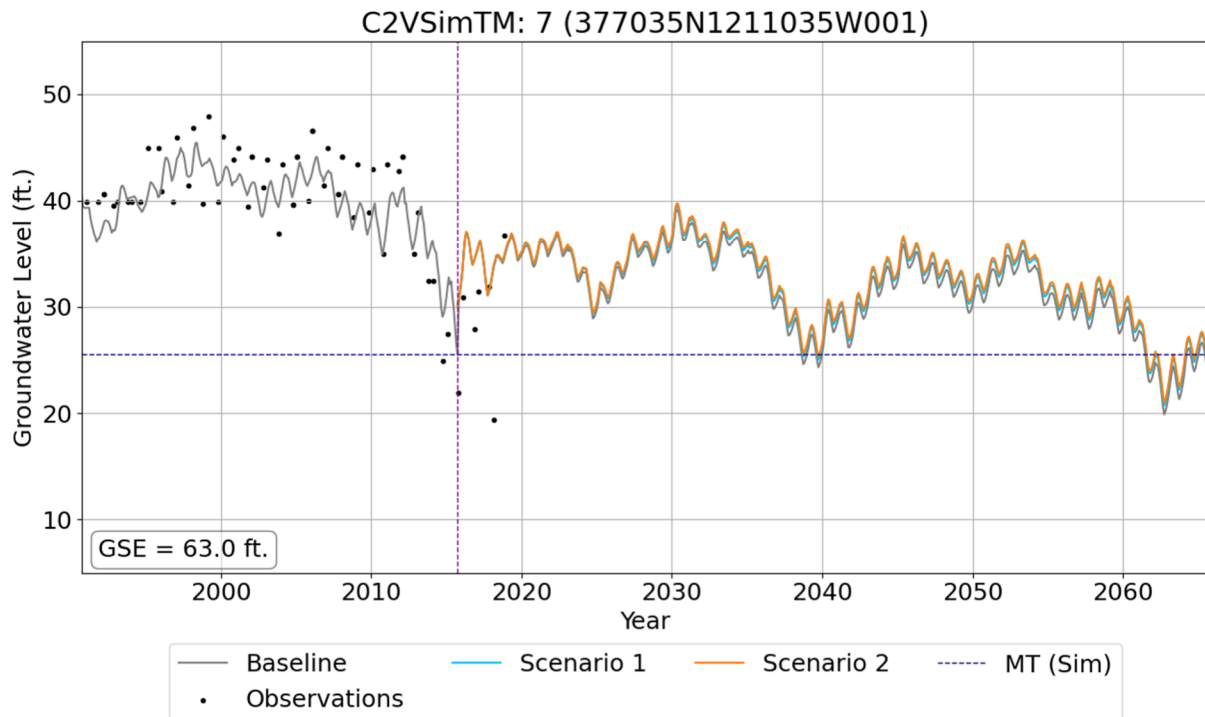


Figure 8-6: SMC1 Hydrograph C2VSimTM 07

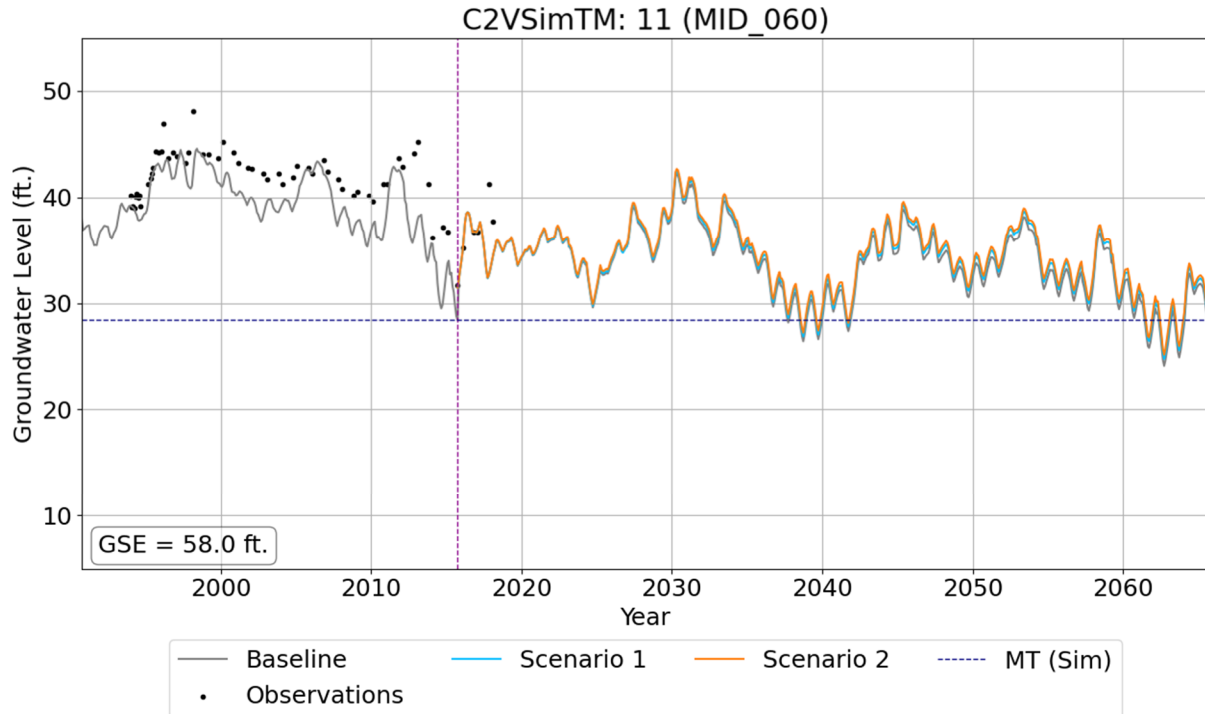


Figure 8-7: SMC1 Hydrograph C2VSimTM 11



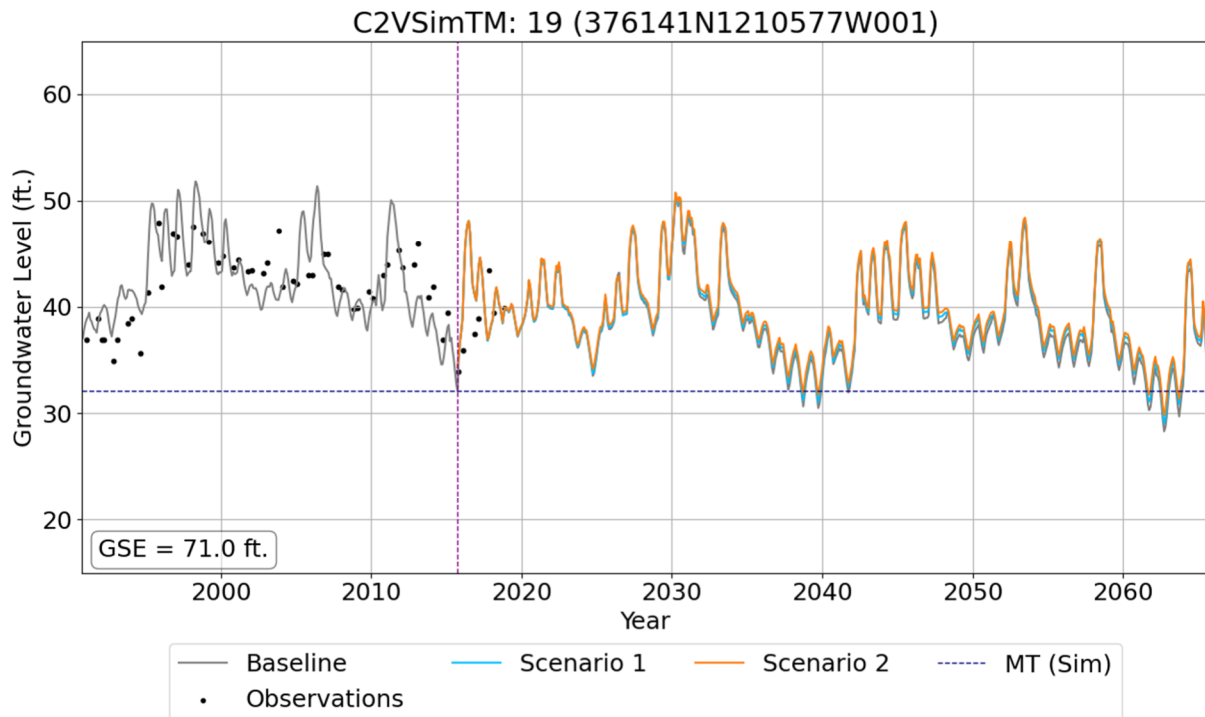


Figure 8-8: SMC1 Hydrograph C2VSimTM 19

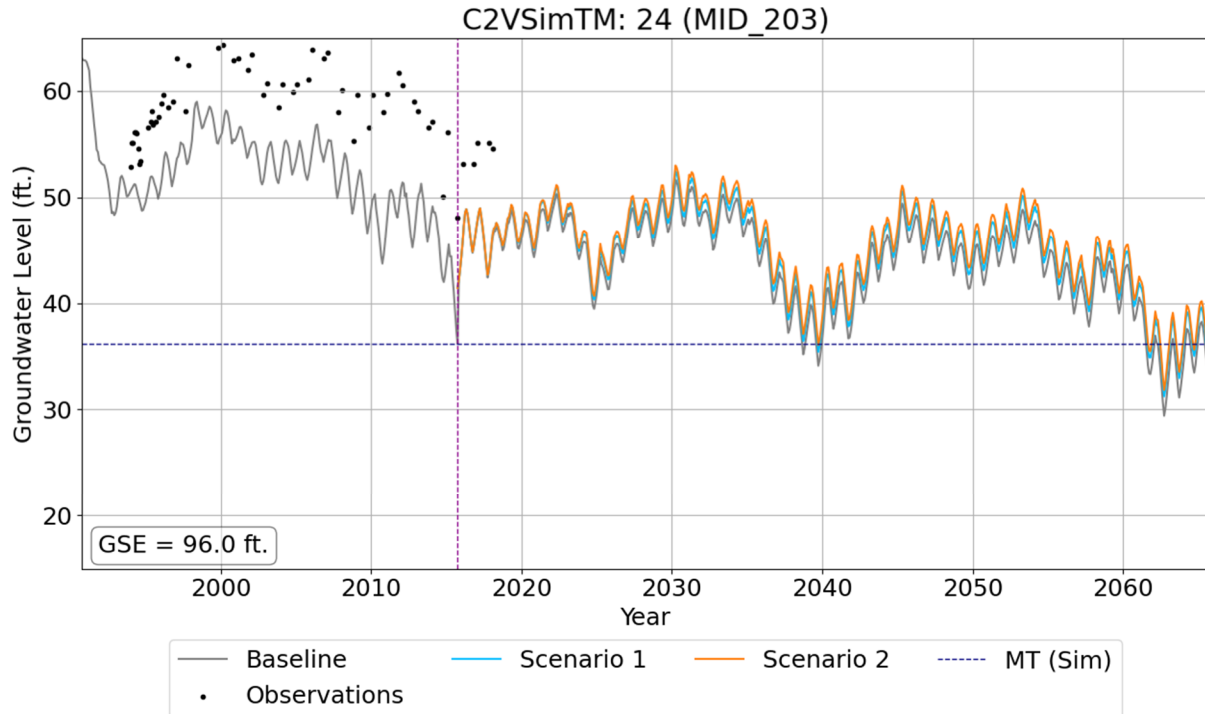


Figure 8-9: SMC1 Hydrograph C2VSimTM 24

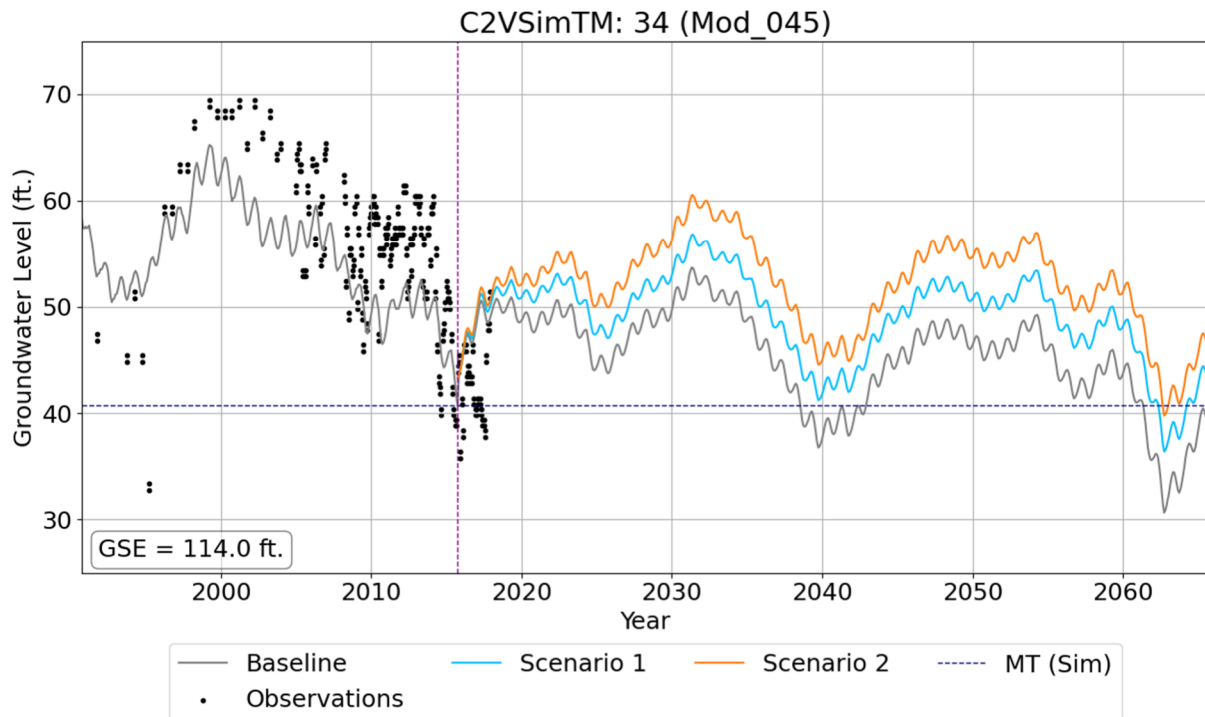


Figure 8-10: SMC1 Hydrograph C2VSimTM 34

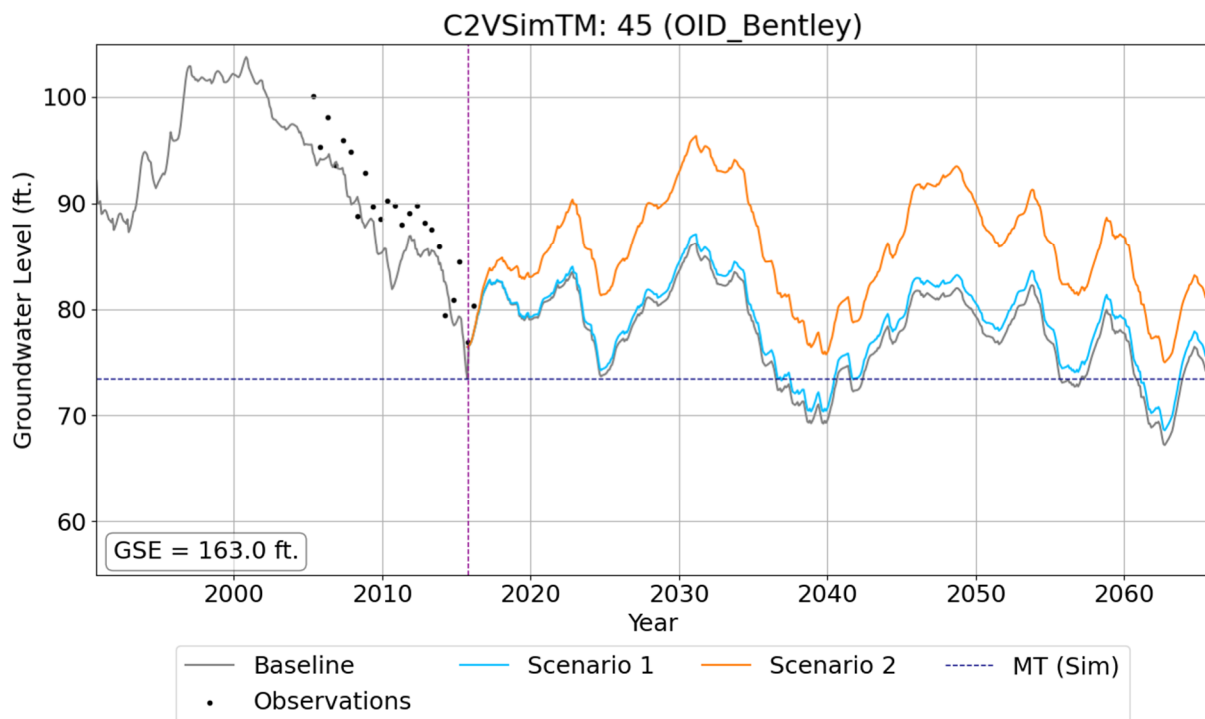


Figure 8-11: SMC1 Hydrograph C2VSimTM 45

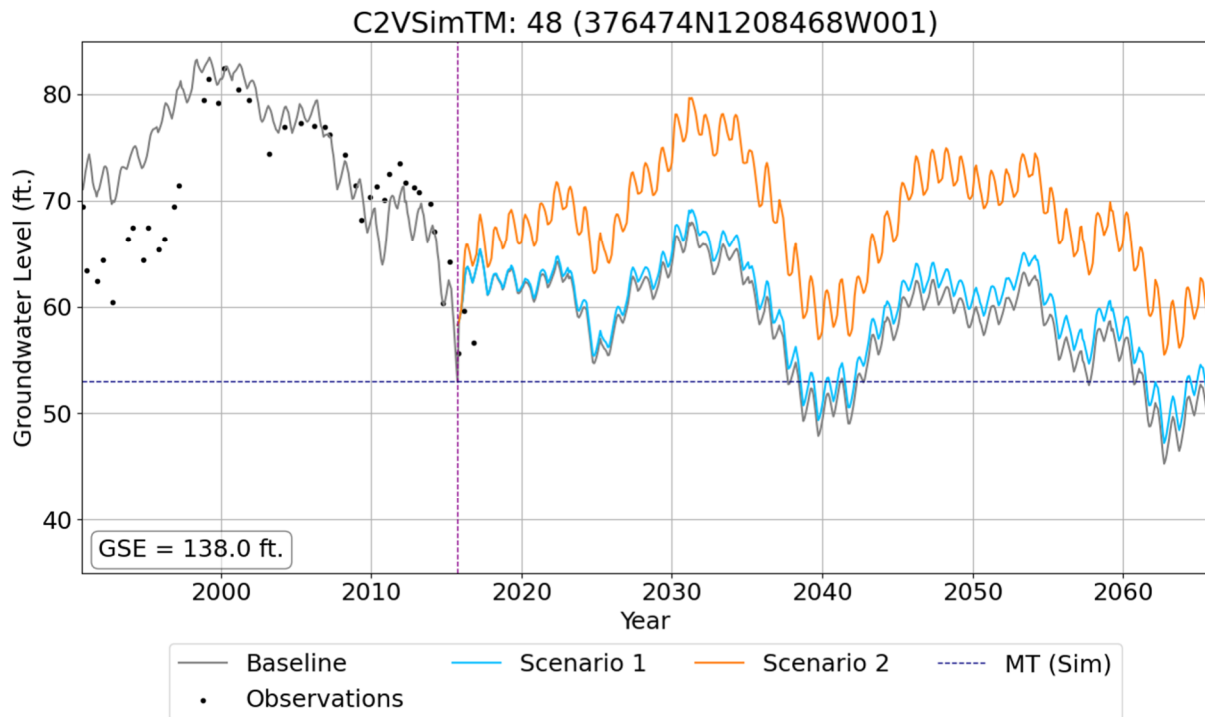


Figure 8-12: SMC1 Hydrograph C2VSimTM 48

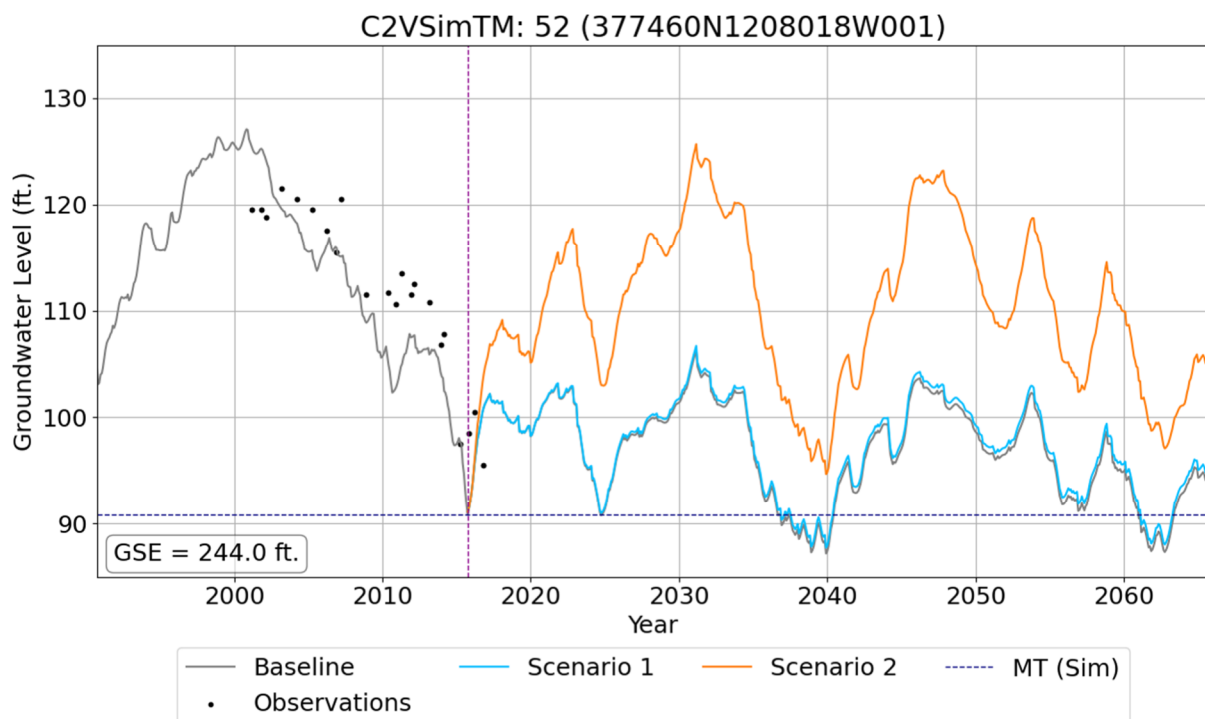


Figure 8-13: SMC1 Hydrograph C2VSimTM52

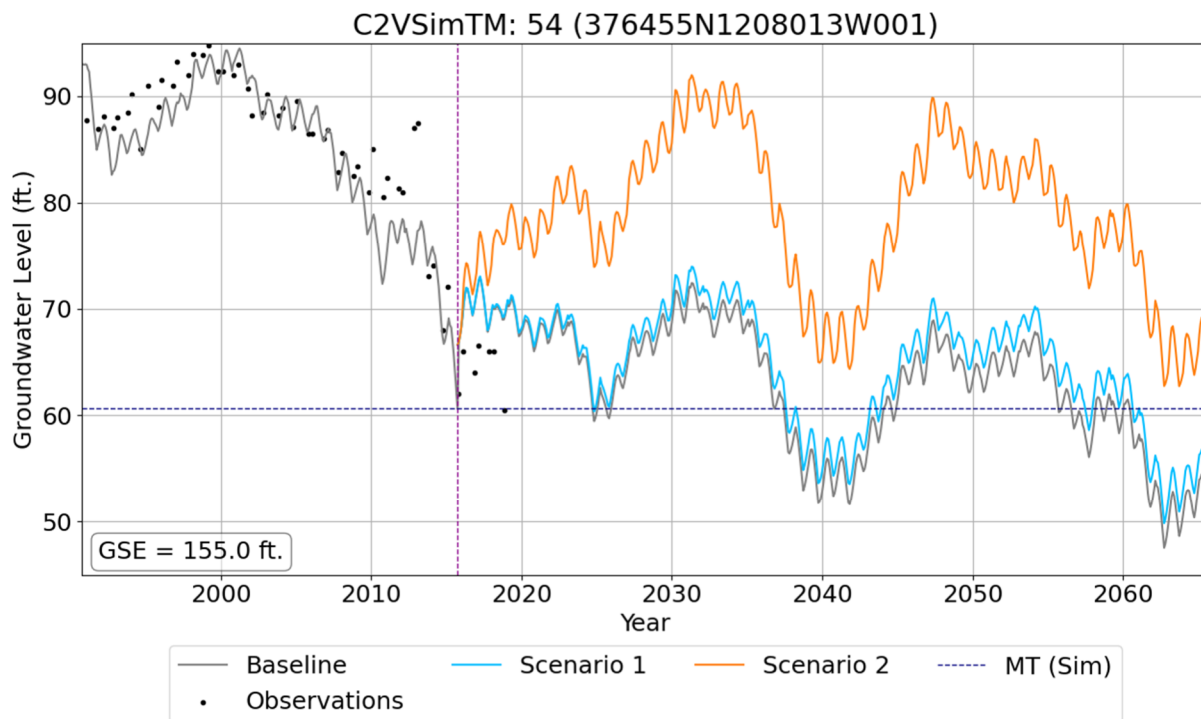


Figure 8-14: SMC1 Hydrograph C2VSimTM 54

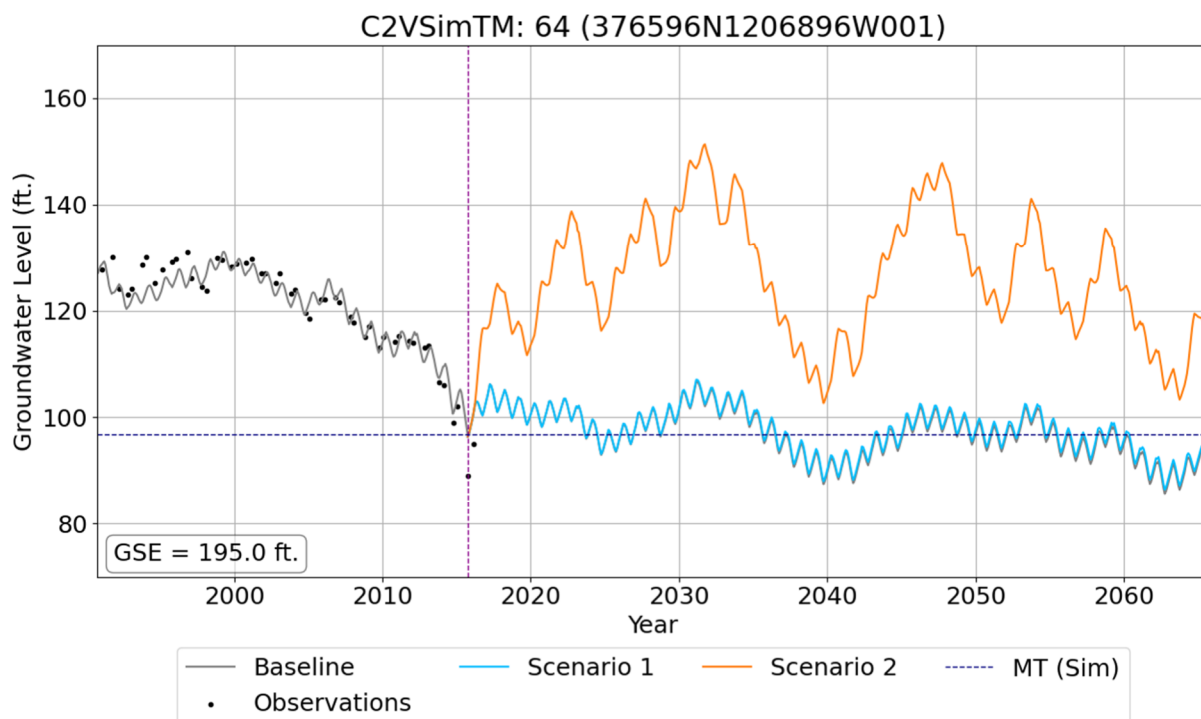


Figure 8-15: SMC1 Hydrograph C2VSimTM 64

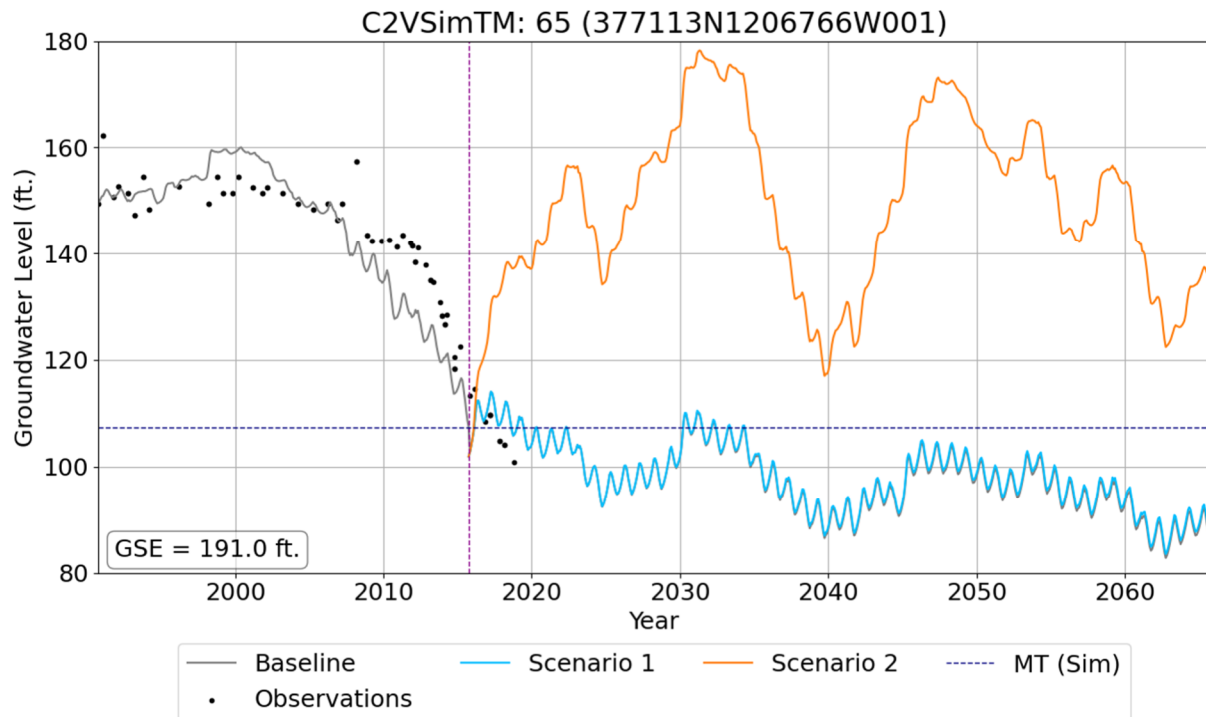


Figure 8-16: SMC1 Hydrograph C2VSimTM 65

## 9. IMPLEMENTATION PLAN

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### 9.1 PLAN IMPLEMENTATION

Implementation of this GSP includes implementation of the projects and management actions included in **Chapter 8**, as well as the following:

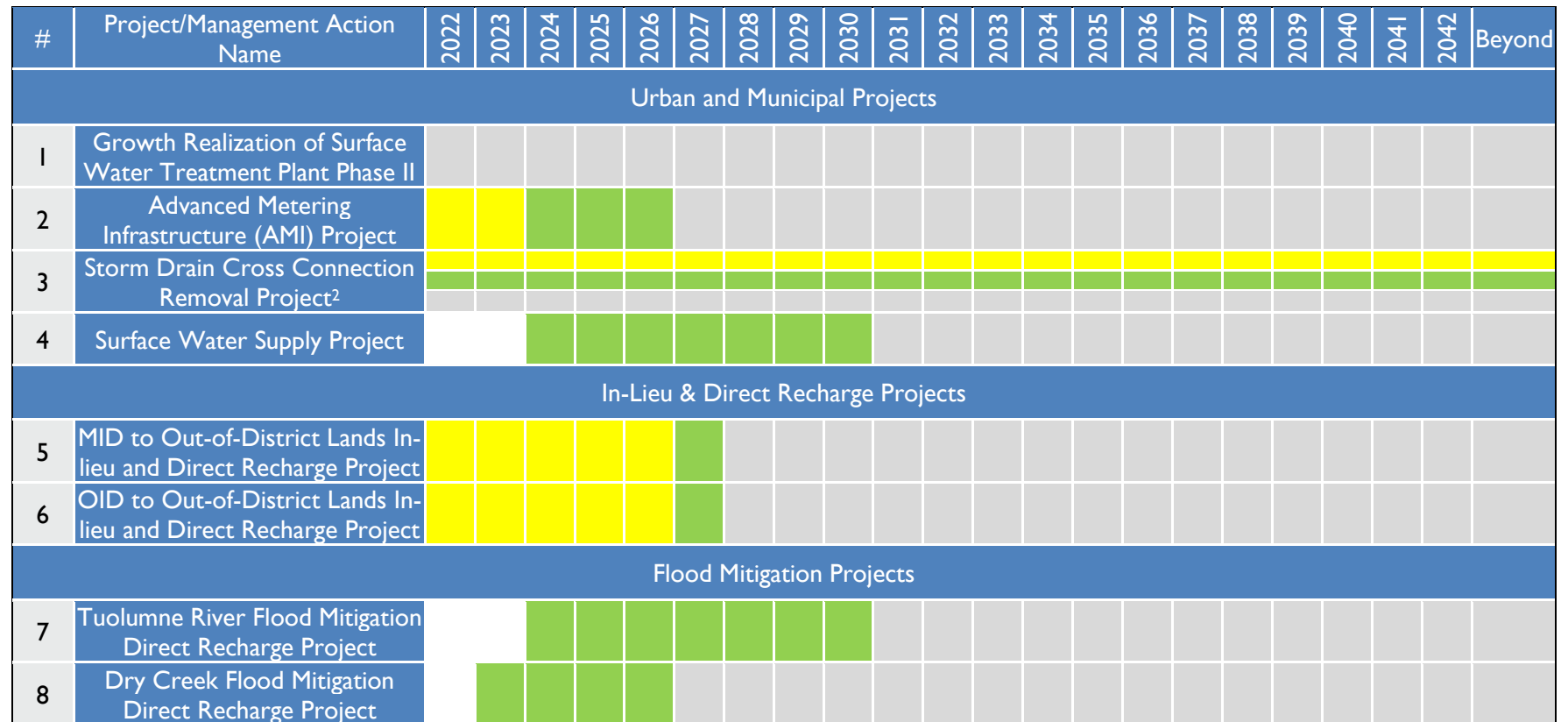
- Modesto Subbasin GSA administration and management
- Implementing the monitoring program
- Implementation of Projects and Management Actions
- Developing annual reports
- Developing required five-year GSP updates

This chapter also describes the contents of both the annual and five-year reports that must be provided to the California Department of Water Resources (DWR) as required by Sustainable Groundwater Management Act (SGMA) regulations.

#### 9.1.1 Implementation Schedule

Figure 9-1 illustrates the GSP's implementation schedule. Included in the chart are activities necessary for ongoing GSP monitoring and updates, as well as tentative schedules for projects and management actions. Additional details about the activities included in the schedule are provided in these activities' respective sections of this GSP. Adaptive management would only be implemented if triggering events are reached, as described in **Chapter 8**, and are shown as ongoing in the schedule.

Figure 9-1: Implementation Estimated Schedule<sup>1</sup>



Project development and design period
  Project Construction
  Project operation

<sup>1</sup> Potential future projects (Projects 9 through 13) are not included because they will be implemented by the GSA as needed and do not have a planned schedule at this time.

<sup>2</sup> This project has multiple phases and components that will be developed over time and therefore portions are in development/design, construction, or are completed simultaneously.

## 9.2 IMPLEMENTATION COSTS BUDGETS AND FUNDING SOURCES

The operation of the Modesto Subbasin GSA and GSP implementation will incur costs, which will require funding by the GSA. The five primary activities that will incur costs are listed here. Table 9-1 summarizes these activities and their estimated costs. These estimates will be refined during GSP implementation as more information becomes available.

- Implementing the GSP
- Implementing GSP-related projects and management actions
- Operations of the GSA
- Developing annual reports
- Developing five-year evaluation reports

*Table 9-1: Modesto Subbasin GSA and GSP Implementation Budgets*

Activity	Estimated Budget <sup>a</sup>
<b>GSP Implementation and GSA Management</b>	
Administration and Legal Support for the GSA	\$36,500
Stakeholder and Board Engagement	\$2,000
Outreach	\$5,000
GSP Implementation Program Management	\$25,000
Monitoring Program, including Data Management	\$14,500
Annual Reporting	\$100,000
Five-Year GSP Updates	\$100,000
<b>Projects and Management Actions</b>	
Project 1: Growth Realization of Surface Water Treatment Plant Phase II	\$#####
Project 2: Advanced Metering Infrastructure Project (AMI)	\$20,000,000
Project 3: Storm Drain Cross Connection Removal Project	\$40,000,000
Project 4: Waterford/Hickman Surface Water Pump Station and Storage Tank	\$8,500,000
Project 5: Modesto Irrigation District In-lieu and Direct Recharge Project	\$#####
Project 6: Oakdale Irrigation District In-lieu and Direct Recharge Project	\$#####



Activity	Estimated Budget <sup>a</sup>
Project 7: Tuolumne River Flood Mitigation and Direct Recharge Project	#####
Project 8: Dry Creek Flood Mitigation and Direct Recharge Project	#####
Project 9: Stanislaus River Flood Mitigation and Direct Recharge Project	To be developed if implementation is needed
Project 10: Detention Basin Standards Specifications Update	To be developed if implementation is needed
Project 11: Recharge Ponds	To be developed if implementation is needed
Project 12: OID Irrigation and Recharge to Benefit City of Oakdale	To be developed if implementation is needed
Project 13: Modesto Irrigation District FloodMAR Projects	To be developed if implementation is needed
Management Action 1: Voluntary Conservation and/or Land Fallowing	To be developed if implementation is needed
Management Action 2: Conservation Practices	To be developed if implementation is needed
Management Action 3: Groundwater Extraction and Surface Water Accounting Reporting Program	To be developed if implementation is needed
Management Action 4: Groundwater Allocation Program	To be developed if implementation is needed
Management Action 5: Groundwater Extraction Fee	To be developed if implementation is needed
Management Action 6: Groundwater Pumping Credit Market and Trading Program	To be developed if implementation is needed
<sup>a</sup> Estimates are rounded and based on full implementation years (FY 2023 through FY 2042). Different costs may be incurred in FY 2022 as GSP implementation begins.	

### 9.2.1 GSP Implementation and Funding

Costs associated with GSP implementation and operation of the GSA include the following:

- **Modesto Subbasin GSA administration and legal support:** Overall program management, and coordination activities, and legal services
- **Stakeholder/Board engagement:** Quarterly Bi-monthly Stakeholder Advisory Committee (SAC) meetings, bi-monthly GSA Board meetings, bi-monthly calls with the GSA and/or ad-hoc committees, and semi-annual public workshops
- **Outreach:** Email communications, newsletters, and website management

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Modesto Subbasin GSP  
STRGBGSA

- **GSP implementation program management:** Program management and oversight of project and management action implementation, including coordination among GSA Board, staff and stakeholders, coordination of GSA implementation technical activities, oversight and management of the GSA consultants and subconsultants, budget tracking, schedule management, and quality assurance/quality control of project implementation activities
- **Monitoring:** Data collection, filling data gaps, improvements and/or enhancements to DMS

Implementation of this GSP is projected to run between \$200,000 and \$300,000 per year, and projects and management actions an additional \$##### to \$##### per year. Development of this GSP was funded through a Proposition 1 Sustainable Groundwater Planning Grant. Operation of the GSA is fully funded through volunteer contributions from GSA member agencies. Although ongoing operation of the GSA is anticipated to include contributions from its member agencies, which are ultimately funded through customer fees or other public funds, additional funding would be required to implement the GSP. Of the implementation activities in the GSP, only project implementation is likely to be eligible for grant or loan funding; funding through grants or loans have varying levels of certainty. As such, the GSA will develop a financing plan that will include one or more of the following financing approaches:

- **Pumping Fees:** Pumping fees would implement a charge for pumping that would be used to fund GSP implementation activities. In the absence of other sources of funding (i.e., grants, loans, or combined with assessments) fees could range between \$10 and \$100 per AF per year. To meet the funding needs of the GSP, fees would be lower when pumping is higher, such as current pumping levels, and higher when pumping is lower, such as when sustainable pumping levels are achieved. Although this funding approach would meet the financial needs of the GSP and GSA, it may discourage pumping reductions due to cost. The financing plan developed by the GSA would evaluate how to balance the need for funding with encouraging pumpers to commit to compliance with desired groundwater pumping reduction goals.
- **Assessments:** Assessments would charge a fee based on land areas. There are two methods for implementing an assessment based on acreage. The first option would assess a fee for all acres in the Subbasin outside of those in federal lands, which would cost approximately \$5 to \$10 per acre per year. This option would not distinguish between land use types. The second option would be to assess a fee only on irrigated acres. Based on current irrigated acreage, the assessment would be \$10 to \$50 per acre per year. Similar to the pumping fee approach, assessment based on irrigated acreage could affect agricultural operations and contribute to land use conversions, which could affect the assessment amount or ability to fully fund GSP implementation.
- **Combination of fees and assessments:** This approach would combine pumping fees and assessments to moderate the effects of either approach on the economy in the

Basin. This approach would likely include an assessment that would apply to all acres in the Basin, rather than just to irrigated acreage. It would be coupled with a pumping fee to account for those properties that use more water than others.

During development of a financing plan, the GSA would also determine whether to apply fees across the Subbasin as a whole or just within certain Management Areas. Prior to implementing any fee or assessment program, the GSA would complete a rate assessment study and other analysis consistent with the requirements of Proposition 218.

The GSA will pursue grants and loans to help pay for project costs to the extent possible. If grants or loans are secured for project implementation, potential pumping fees and assessments may be adjusted to align with operating costs of the GSA and ongoing GSP implementation activities. A potential hurdle to the utilization of state grant funding is that delays in payment by the state can cause hardships for disadvantaged communities. Therefore, it would be appropriate to expedite payments associated with grant funding by DWR.

### 9.2.2 Projects and Management Actions

Costs for the Projects and Management Actions are described in **Chapter 8: Projects and Management Actions** of this GSP. Financing of the projects and management actions would vary depending on the activity. Potential financing for projects and management actions are provided in Table 9-2, though other financing may be pursued as opportunities arise or as appropriate.

*Table 9-2: Financing Options for Proposed Projects, Management Actions, and Adaptive Management Strategies*

Project/Activity	Responsible Entity	Potential Financing Options
<b>Projects</b>		
Project 1: Growth Realization of Surface Water Treatment Plant Phase II	City of Modesto/MID	<ul style="list-style-type: none"> <li>• City of Modesto Operating Costs</li> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 2: Advanced Metering Infrastructure Project (AMI)	City of Modesto	<ul style="list-style-type: none"> <li>• City of Modesto Operating Costs</li> <li>• Grants</li> <li>• Loans</li> </ul>
Project 3: Storm Drain Cross Connection Removal Project	City of Modesto	<ul style="list-style-type: none"> <li>• City of Modesto Operating Costs</li> </ul>

Project/Activity	Responsible Entity	Potential Financing Options
		<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> </ul>
Project 4: Waterford/Hickman Surface Water Pump Station and Storage Tank	City of Waterford	<ul style="list-style-type: none"> <li>• City of Waterford Operating Costs</li> </ul>
Project 5: Modesto Irrigation District In-lieu and Direct Recharge Project	Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 6: Oakdale Irrigation District In-lieu and Direct Recharge Project	Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 7: Tuolumne River Flood Mitigation and Direct Recharge Project	Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 8: Dry Creek Flood Mitigation and Direct Recharge Project	Stanislaus County/Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 9: Stanislaus River Flood Mitigation and Direct Recharge Project	Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 10: Retention Basin Standards Specifications Update	City of Modesto	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 11: Recharge Ponds	Non-District East Areas	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>

Project/Activity	Responsible Entity	Potential Financing Options
Project 12: OID Irrigation and Recharge to Benefit City of Oakdale	OID/City of Oakdale	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Project 13: Modesto Irrigation District FloodMAR Projects	MID	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
<b>Management Actions</b>		
Management Action 1: Voluntary Conservation and/or Land Fallowing	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Management Action 2: Conservation Practices	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Management Action 3: Groundwater Extraction and Surface Water Accounting Reporting Program	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Management Action 4: Groundwater Allocation Program	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Management Action 5: Groundwater Extraction Fee	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>
Management Action 6: Groundwater Pumping Credit Market and Trading Program	GSA	<ul style="list-style-type: none"> <li>• Grants</li> <li>• Loans</li> <li>• GSA's Operating Funds</li> <li>• GSA's Member Agencies</li> </ul>

## **9.3 ANNUAL REPORTS**

Annual reports must be submitted by April 1 of each year following GSP adoption per California Code of Regulations. Annual reports must include three key sections as follows

- General Information
- Basin Conditions
- Plan Implementation Progress

An outline of what information will be provided in each of these sections in the annual report is included below. Annual reporting would be completed in a manner and format consistent with Section 356.2 of the SGMA regulations. As annual reporting continues, it is possible that this outline will change to reflect Subbasin conditions, priorities of the GSA, and applicable requirements.

### **9.3.1 General Information**

General information will include an executive summary that highlights the key content of the annual report. As part of the executive summary, this section will include a description of the sustainability goals, provide a description of GSP projects and their progress as well as an annually updated implementation schedule and map of the Subbasin. Key components as required by SGMA regulations include:

- Executive Summary
- Map of the Basin

### **9.3.2 Basin Conditions**

Basin conditions will describe the current groundwater conditions and monitoring results. This section will include an evaluation of how conditions have changed in the Subbasin over the previous year and compare groundwater data for the year to historical groundwater data. Pumping data, effects of project implementation (e.g., recharge data, conservation, if applicable), surface water flows, total water use, and groundwater storage will be included. Key components as required by SGMA regulations include:

- Groundwater elevation data from the monitoring network
- Hydrographs of elevation data
- Groundwater extraction data
- Surface water supply data
- Total water use data
- Change in groundwater storage, including maps

### **9.3.3 Plan Implementation Progress**

Progress toward successful plan implementation would be included in the annual report. This section of the annual report would describe the progress made toward achieving interim

milestones as well as implementation of projects and management actions. Key components as required by SGMA regulations include:

- Plan implementation progress
- Sustainability progress

## **9.4 FIVE-YEAR EVALUATION REPORT**

SGMA requires evaluation GSPs regarding their progress toward meeting approved sustainability goals at least every five years. SGMA also requires developing a written assessment and submitting this assessment to DWR. An evaluation must also be made whenever the GSP is amended. A description of the information that will be included in the five-year report is provided below and would be prepared in a manner consistent with Section 356.4 of the SGMA regulations.

### **9.4.1 Sustainability Evaluation**

This section will contain a description of current groundwater conditions for each applicable sustainability indicator and will include a discussion of overall Subbasin sustainability. Progress toward achieving interim milestones and measurable objectives will be included, along with an evaluation of groundwater elevations (i.e., those being used as direct or proxy measures for the sustainability indicators) in relation to minimum thresholds. If any of the adaptive management triggers are found to be met during this evaluation, a plan for implementing adaptive management described in the GSP would be included.

### **9.4.2 Plan Implementation Progress**

This section will describe the status of project and management action implementation, and report on whether any adaptive management action triggers had been activated since the previous five-year report. An updated project implementation schedules will be included, along with any new projects that were developed to support the goals of the GSP and a description of any projects that are no longer included in the GSP. The benefits of projects that have been implemented will be included, and updates on projects and management actions that are underway at the time of the five-year report will be reported.

### **9.4.3 Reconsideration of GSP Elements**

Part of the five-year report will include a reconsideration of GSP elements. As additional monitoring data are collected during GSP implementation, land uses and community characteristics change over time, and GSP projects and management actions are implemented, it may become necessary to revise the GSP. This section of the five-year report will reconsider the Basin setting, management areas, undesirable results, minimum thresholds, and measurable objectives. If appropriate, the five-year report will recommend revisions to the GSP. Revisions would be informed by the outcomes of the monitoring network, and changes in the Basin, including changes to groundwater uses or supplies and outcomes of project implementation.

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Modesto Subbasin GSP  
STRGBGSA

#### **9.4.4 Monitoring Network Description**

A description of the monitoring network will be provided in the five-year report. Data gaps, or areas of the Subbasin that are not monitored in a manner commensurate with the requirements of Sections 352.4 and 354.34(c) of the SGMA regulations will be identified. An assessment of the monitoring network's function will also be provided, along with an analysis of data collected to date. If data gaps are identified, the GSP will be revised to include a program for addressing these data gaps, along with an implemented schedule for addressing gaps and how the GSA will incorporate updated data into the GSP.

#### **9.4.5 New Information**

New information that becomes available after the last five-year evaluation or GSP amendment would be described and evaluated. If the new information would warrant a change to the GSP, this would also be included.

#### **9.4.6 Regulations or Ordinances**

The five-year report will include a summary of the regulations or ordinances related to the GSP that have been implemented by DWR since the previous report, and address how these may require updates to the GSP.

#### **9.4.7 Legal or Enforcement Actions**

Enforcement or legal actions taken by the GSA or its member agencies in relation to the GSP will be summarized in this section along with how such actions support sustainability in the Subbasin.

#### **9.4.8 Plan Amendments**

A description of amendments to the GSP will be provided in the five-year report, including adopted amendments, recommended amendments for future updates, and amendments that are underway during development of the five-year report.

#### **9.4.9 Coordination**

The Modesto Subbasin GSAs will continue to work collaboratively to ensure implementation of the GSP to reach sustainability in the Subbasin by 2042. The GSA will also coordinate with neighboring Subbasins including Eastern San Joaquin, Turlock, Delta-Mendota, and Tracy as needed, or any other land use agencies or entities for project implementation. This section of the five-year report will describe coordination activities between these entities, such as meetings, joint projects, or data collection efforts.