recovery of banked water in other subbasins where out-of-district banking projects are located. Future operations anticipate continued recovery of banked water when necessary in drought years.

5.2.1.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.1.3 Action 3 – Continued In-District Recharge/Banking Operations

Action 3 for the DEID MA consists of continued historical and current operations of existing in-district recharge/banking operations for future groundwater extraction needs.

5.2.1.3.1 Description

DEID has historically accomplished direct water recharge during surplus water years through operations within the White River channel, operating a small 5-acre recharge basin near the DEID headquarters and through the larger Turnipseed Groundwater Banking Project. The Turnipseed Project began in 1993, with the purchase of an 80-acre parcel centrally located in the DEID MA and immediately adjacent to White River. This site was then developed into a recharge basin with water introduced through either the DEID distribution system or from diversions of CVP water that were delivered using the White River. In 2007, DEID began a process of converting the Turnipseed Recharge Project into a water banking project. An initial recovery well was installed in 2009. The Project doubled its size with the purchase of the adjacent 80-acre parcel in mid-2009. An additional four recovery wells were installed, creating a true, operational water banking project within DEID MA. This direct recharge/banking project is in addition to DEID MA's historical in-lieu, conjunctive use project using imported CVP and non-CVP water supplies.

Water records from DEID indicate that from 1993 (project inception) to 2017 DEID imported and recharged nearly 70,000 acre-feet into the Turnipseed Project. During this time period, DEID recovered 17,274 acre-feet from the Turnipseed Project for delivery to DEID MA landowners as imported water.

Action 3 contributes to the past, present, and future sustainability of the DEID MA. The DEID MA will continue its current practice of importing available water supplies from both CVP and non-CVP and optimizing those supplies for use within the DEID MA, including in-district recharge/banking.

5.2.1.3.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the continuing need for the DEID MA to remain sustainable as required by SGMA, this management action will be implemented as an ongoing and historical practice.

5.2.1.3.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

This action was publicly noticed through the project approval process conducted by the DEID Board of Directors beginning in 1993 and at other various times when new project elements were added. No further approvals are required at this time.

5.2.1.3.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The projected effect on this contribution to the water budget from reductions in supplies from a fully restored San Joaquin River and climate change are considered negligible.

5.2.1.3.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Permitting for this action was completed through the project approval process conducted by the DEID board of directors beginning in 1993 and as was required at other various times when new project elements were added. No further permitted is required at this time.

5.2.1.3.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

5.2.1.3.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Stored imported water in the DEID MA is recovered in water years when surface water imports and other available supplies are insufficient to meet crop demands. By continuing operations of in-district water recharge banking, the district expects to increase/stabilize subbasin groundwater levels and groundwater in storage, notwithstanding the effect of anticipated continued groundwater over-pumping that will occur during the SGMA implementation period by others adjacent to the DEID MA as well as projected reductions in Tule Subbasin groundwater levels post-2020 as groundwater levels continue to equilibrate in the Tule Subbasin and adjoining subbasins.

Evaluation of the benefits of this action will occur through continued evaluation of annual CVP water and other water deliveries into the DEID MA and a full accounting of said deliveries, including sources of supply and final use of all water obtained. Benefits from this action will also be evaluated through groundwater measurements.

5.2.1.3.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Basic to the existing and future accomplishments achieved by the action is the contractual right to certain quantities of water that DEID has under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 acre-feet of Class 2 water annually. This CVP contract also provides access to other water supplies that may be available on an annual basis dependent on hydrology. Reliability of continued accomplishments associated with this action are high because of these contractual water rights.

How this action will be accomplished and implemented will be documented as noted above.

5.2.1.3.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID has the contractual right to certain quantities of water under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 acre-feet of Class 2 water annually. This CVP contract also provides access to other water supplies that may be available on an annual basis dependent on hydrology.

5.2.1.3.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: The cost is anticipated to primarily be the additional cost of the water supply. Labor expenses to implement the program are included as a part of Action 1. Cost of the supply is anticipated to be $30 per acre-foot (2019 dollars). As noted above, the average annual deliveries to the Turnipseed Project between 2009 and 2017 was 4,535 acre-feet. Based on these values, full implementation of this action is anticipated to cost $136,050 (4,535 acre-feet x $30/acre-feet) on an average annual basis but can be significantly more in years where significant water banking opportunities exist. For example, in 2019, the DEID MA budgeted $1,500,000 for the cost of water to be banked in-district.

Funding: The total cost of Action 3 is budgeted and funded annually. There are four primary categories of funding currently used and will continue to be used to fund this action. These are:

- Revenue from annual water sales – includes sales to individual water users, other districts, and other sales; 2019 budget total = $16,190,88
- Other operating revenue – includes income from participation in energy projects, pumping charges paid by water users, and use of facilities by others; 2019 budget total = $2,035,819
- Non-operating revenues – Income from investments and rents/leases; 2019 budget total = $803,150.
- Fixed revenues – income from property assessments, standby charges, and voter-approved special benefit and supplemental assessments; 2019 budget total = $7,146,003

Because of the historical methods of funding this action by DEID as noted above, it does not appear that well pumping fees as allowed by SGMA will be necessary to sustain this program.

5.2.1.3.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

DEID adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. DEID MA has already reached long-term sustainability and is a net contributor of water to the Subbasin, which is a function of in-lieu recharge, irrigation return flows and direct water recharge/banking projects both inside and outside of the DEID boundaries. Accordingly, the DEID MA's drought offset measures are primarily centered in exercising its stored water recovery rights of previously deposited imported water in the Tule Subbasin and recovery of banked water in other subbasins where out-of-district banking projects are located. Future operations anticipate continued recovery of stored water deposits when necessary in drought years.

5.2.1.3.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.1.4 Action 4 – Increase In-District Recharge/Banking Operations

Action 4 for the DEID MA consist of efforts to increase in-district recharge/banking operations for future groundwater extraction needs

5.2.1.4.1 Description

DEID has increased in-District Banking operations beyond the two existing 80-acre recharge basins (Phases I & II) in four additional phases.

In April of 2020, construction began on a 320-acre site (Phase III) located one half mile south of the original two phases and directly adjacent to an existing 72-inch mainline. Construction of Phase III was completed in February of 2021. Recent percolation data on Phases I – III, collected during recharge operations in late 2021 and early 2022, supports a percolation rate of 0.55 ft/day, which is equivalent to 220 acre-feet per day when all three phases are in steady state operation.

Following the completion of Phase III, development of an additional 160-acre site (Phase IV) began across the street, sharing the same 72-inch mainline. Construction on Phase IV was completed in June of 2022, increasing the total footprint of in-District recharge facilities to 640 acres.

Phase V, a 156-acre site, is currently in the design phase with groundbreaking scheduled for September 2022. Lastly, the DEID MA acquired an additional 148-acre site for Phase VI of the project, which is currently in the design and environmental phase. With the acquisition of the Phase VI property, the DEID MA is on track to increase the total in-District recharge footprint to 944 acres by the end of 2023.

This action will build upon the historic direct water recharge projects described in Action 3 to enhance the water resources available to the DEID MA. Future direct water recharge projects will increase the amount of water in storage through utilization of unused CVP imported water supplies available to the DEID MA through its long-term CVP water contract with the U.S. Department of the Interior. Other non-CVP supplies will also be used when and if available.

As noted in Action 1, the DEID MA has been historically sustainable and is projected to remain so throughout the 2020-2040 GSP implementation period and beyond. Despite this fact, the DEID MA will continue to explore opportunities to increase importation of water by accessing maximum amounts through its CVP contract as those supplies become available; which will, in turn, be utilized in part for this action item. This will further add to the sustainability of water in the DEID MA.

Action 4 documents current activities that will expand the footprint of the DEID MA's current direct recharge/banking project. This and other future additions to the DEID MA's historic in-lieu, conjunctive use project will significantly increase its importation of water supplies to the DEID MA.

As described in Action 3, the current Turnipseed Groundwater Recharge/Banking Project was constructed in two phases: the original 80 acres in 1993 and the second phase adding another 80 acres in 2007. Phases III – VI came online in February 2021 and July 2022, respectively, which expanded Turnipseed by an additional 480 acres to a total operational footprint of 640 acres. Phases V and VI are expected to come online by the end of 2023. Once Phases V and VI are completed, the total area of the groundwater bank is planned for 944 acres. Other phases are expected to occur throughout the SGMA implementation period and beyond.

Action 4 contributes to the past, present, and future sustainability of water in the DEID MA. The DEID MA will continue its current practice of importing available water supplies from both CVP and non-CVP and optimize those supplies for use within the DEID MA, including in-district groundwater recharge/banking.

5.2.1.4.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Given the continuing need for the DEID MA to remain sustainable as required by SGMA, this management action will be implemented as a continuation and potential expansion of an ongoing and historical practice.

5.2.1.4.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Phases III – VI of the Turnipseed Project are subject to CEQA compliance under the laws of the State of California, which includes public notice requirements. Additional public notice is also provided through posted DEID Board of Directors agendas that are made available to the public. The CEQA has been completed on Phases III – V and is in process for Phase VI process with all public notices made in accordance with state law.

5.2.1.4.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Phases III – VI of the Turnipseed Project have been studied for projected performance, which are summarized as follows:

- Site testing and historical operations supports using an average infiltration rate of 0.55 feet per day.
- Accounting for setbacks and levee footprints reduces the gross acreage of Phases III – VI from 784 to a net recharge area of 643 acres.
- An initial analysis of available surplus CVP supplies (such as Class 1, Class 2, and section 215 water) and past operations of the Turnipseed Project indicates that opportunity to conduct recharge operations will be available for 2.41 months on an average annual basis (72.3 days per year).
- Net amount of recharge has been reduced to 90 percent after assuming a 10 percent loss from evaporation and other losses.

Using these parameters, the anticipated average annual net deposit on the DEID MA is:

0.55 feet/day x 643 acres x 72.3 days = 25,569 ac-ft (23,012 ac-ft net recoverable after 10% losses)

5.2.1.4.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Phase III – VI and other future phases will comply with CEQA.

5.2.1.4.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Phases III – VI came online in February 2021 and July 2022, respectively, which expanded Turnipseed by an additional 480 acres to a total operational footprint of 640 acres. Phases V and VI are expected to come online by the end of 2023. Once Phases V and VI are completed, the total area of the groundwater bank is planned for 944 acres. Other phases are expected to occur throughout the SGMA implementation period and beyond.

5.2.1.4.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Stored imported water in the DEID MA is recovered in water years when surface water imports and other available supplies are insufficient to meet crop demands. By increasing in-district water recharge and banking the district expects to increase/stabilize groundwater levels and groundwater in storage, notwithstanding the effect of anticipated continued groundwater over-pumping that will occur during the SGMA implementation period by others adjacent to the DEID MA as well as projected reductions in Tule Subbasin groundwater levels post-2020 as groundwater levels continue to equilibrate in the Tule Subbasin and adjoining subbasins.

Evaluation of the benefits of this action will occur through continued evaluation of annual CVP water and other water deliveries into the DEID MA and a full accounting of said deliveries, including sources of supply and final use of all water obtained. Benefits from this action will also be evaluated through groundwater measurements.

5.2.1.4.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Basic to the existing and future accomplishments achieved by the action is the contractual right to certain quantities of water that DEID has under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 acre-feet of Class 2 water annually. This CVP contract also provides access to other water supplies that may be available on an annual basis dependent on hydrology. Reliability of continued accomplishments associated with this action are high because of these contractual water rights.

How this action will be accomplished and implemented will be documented as noted above.

5.2.1.4.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID has the contractual right to certain quantities of water under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 acre-feet of Class 2 water annually. This CVP contract also provides access to other

water supplies that may be available on an annual basis dependent on hydrology. The DEID board of directors will evaluate all phases of this action as legally required.

5.2.1.4.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: The cost is anticipated to be (1) the additional cost of the water supply, (2) capital investment in the acquisition of the land for additional phases, (3) project development costs, and (4) ongoing maintenance.

Cost of the supply is anticipated to be $30 per acre-foot (2019 dollars). As noted above, the anticipated average annual deliveries to Turnipseed Project-Phases III - VI will be 25,569 acre-feet. Based on these values, full implementation of this action is anticipated to cost $767,070 (25,569 acre-feet x $30/acre-feet).

Capital investment expenses for Phases III – VI of the Turnipseed Project total $21,372,395.

Project development costs for the Phases III – VI Turnipseed Project are anticipated to be approximately $19,500,000, of which $9,937,035 has already been spent to-date.

Ongoing annual maintenance is anticipated to run approximately $150,000 (2022 dollars).

Funding: Funding of the additional cost of the water supply is minor and is anticipated to be initially absorbed into the existing annual budget for the DEID MA, and potentially funded through annual adjustments in the water rate charged water users in the DEID MA. Funding for Phases III – VI capital investment was provided through 2019-2021 DEID cash. Ongoing annual maintenance will be incorporated into the annual budget for the DEID MA.

In 2020, DEID was awarded a $1.1MM Integrated Regional Water Management Grant available under California's Proposition 1, which was applied toward the development of Phase III.

In 2021, DEID was awarded an additional $2MM WaterSMART grant through the Bureau of Reclamation, which will be applied to the development costs of Phase V.

In 2022, DEID was awarded $2.1MM of State funding available through California's Proposition 68 for SGMA Implementation in Critically Over Drafted Basins. This will be used in tandem with above mentioned federal funds to offset development costs on Phase V.

DEID has applied for $2.7MM under the FY2023 WaterSMART program for Phase VI development. Additionally, DEID, as a member of the Poso Creek Integrated Regional Water Management Group, is in the process of seeking approximately $2MM of funding for Phase VI development through Round 2 of California's Proposition 1 funding available to Regional Water Management Groups. Meanwhile, DEID continues to search for land with the appropriate soil types and proximity to existing infrastructure in preparation for further expansion of the in-District banking project.

5.2.1.4.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

DEID adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. DEID MA has already reached long-term sustainability and is a net depositor of groundwater to the Subbasin, which is a function of in-lieu recharge, irrigation return flows and direct water recharge/banking projects both inside and outside of the DEID boundaries. Accordingly, the DEID MA's drought offset measures are primarily centered in exercising its stored water recovery rights of previously deposited imported water in the Subbasin and recovery of banked water in other subbasins where out-of-district banking projects are located. Future operations anticipate continued recovery of stored water deposits when necessary in drought years.

5.2.1.4.12 Corresponding Attachments *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*

There are no attachments associated with this action.

5.2.1.5 Action 5 – Continued Out-of-District Banking Operations

5.2.1.5.1 Description

As with the DEID MA's in-district water banking projects, the purpose of OOD projects is to bank water in wet years that is surplus to the DEID MA's needs for later recovery in dry years.

The DEID MA has been involved in banking water in OOD projects since 2006. DEID's OOD projects have a total banking capacity of 154,000 acre-feet. A total of 240,833 acre-feet have been banked over the life of the two OOD projects. From 2006 to 2021, approximately 103,494 acre-feet were recovered from OOD projects.

Additional long-term OOD water exchanges have also been entered into for the benefit of the DEID MA. In 2017, 2018, 2019, 2020, and 2021 surplus CVP supplies were banked through long-term exchanges that will provide 36,322 acre-feet of return water. As of 2022, DEID has over 76,456 acre-feet of OOD project water available for recovery in future years. On an average annual basis DEID has deposited 18,002 acre-feet of water in OOD projects (240,833 acre-feet + 65,203 acre-feet = 306,036 acre-feet/17 years).

Action 5 contributes to the past, present, and future sustainability of water in the DEID MA. The DEID MA will continue its current practice of banking surplus CVP water supplies (and potentially non-CVP water) and recovering those supplies for use within the MA in years when imported supplies are inadequate to meet crop demand.

5.2.1.5.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the continuing need for the DEID MA to remain sustainable as required by SGMA, this management action will be implemented as an ongoing and historical practice.

5.2.1.5.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Beginning with the initial OOD project in 2006 and thereafter as other OOD projects were added, public notices were provided as required through CEQA and/or NEPA processes as well as public notices provided as part of Brown Act compliance by the DEID Board of Directors. No further approvals are necessary for continuation of OOD projects.

5.2.1.5.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

As documented in the DEID MA water budget from inception through 2017, OOD projects have yielded an annual average supply of 1,727 acre-feet. With a surplus of stored water available for recovery and available space in OOD banking of over 65,000 acre-feet, water supply from OOD projects is forecast to meet or exceed the historical annual average supply over the SGMA planning and implementation horizon.

5.2.1.5.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

No additional permitting or regulatory approvals are required to implement historical OOD projects.

5.2.1.5.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Implementation of the action is historical and ongoing throughout the SGMA planning and implementation horizon.

5.2.1.5.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Surplus imported water that is banked in OOD banking projects serve the same purpose as surplus imported water that is banked within DEID: to provide additional water supplies to lands within the DEID MA in water years where available imported water supplies are insufficient to meet crop demands. Recovery of banked water from OOD projects offsets a like amount of groundwater that would have otherwise been extracted. By continuing participation in OOD water banking projects, DEID expects to increase/stabilize groundwater levels and groundwater storage, notwithstanding the effect of anticipated continued groundwater over-pumping that will occur during the SGMA implementation period by others adjacent to the DEID MA as well as projected reductions in Tule Subbasin groundwater levels post-2020 as groundwater levels continue to equilibrate in the Tule Subbasin and adjoining subbasins. Continued participation in OOD banking projects will also assist in stabilizing groundwater levels in adjacent basins where these projects exist through the net amount of water left within OOD banking project boundaries ("leave-behind" water that is typically a part of OOD project agreements).

Evaluation of the benefits of this action will occur through continued evaluation of annual CVP water and other water deliveries into the DEID MA and a full accounting of said deliveries, including sources of supply and final use of all water obtained. Benefits from this action will also be evaluated through groundwater measurements.

5.2.1.5.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

How this action will be accomplished and implemented will be documented as noted above.

5.2.1.5.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID has the contractual right to certain quantities of water under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 of Class 2 water annually. This CVP contract also provides access to other water supplies that may be available on an annual basis dependent on hydrology.

5.2.1.5.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: The cost is anticipated to primarily be the additional cost of the water supply dedicated to OOD projects. Cost of the supply is anticipated to be $30 per acre-foot (2019 dollars). The average annual cost of water banked in OOD projects is projected to be $429,000 based on historical annual average "put" amounts (14,298 acre-feet x $30/acre-foot).

Funding: Total cost of Action 5 has been considered a part of the cost of annual water operations which is funded by water rates charged to water users in the DEID MA. Future costs of Action 5 will be funded in the same manner. For example, revenue from annual water sales which includes sales to individual water users, other districts, and other sales was budgeted at $16,190,88 (2019).

5.2.1.5.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. DEID MA has already reached long-term sustainability and is a net contributor of water to the Subbasin, which is a function of in-lieu recharge, irrigation return flows and direct water recharge/banking projects both inside and outside of the DEID boundaries. Accordingly, the DEID MA's drought offset measures is primarily centered in exercising its stored water recovery rights of previously deposited imported water in the Subbasin and recovery of banked water in other subbasins where OOD banking projects are located. Future operations anticipate continued recovery of stored water deposits when necessary in drought years.

5.2.1.5.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.1.6 Action 6 – Increase Out-of-District Groundwater Banking Operations

5.2.1.6.1 Description

This action will build upon the historical OOD water banking projects described in Action 5 to enhance the water resources available to the DEID MA. Future OOD water recharge projects will increase the amount of water in storage through utilization of unused CVP imported water supplies available to the DEID MA through its long-term CVP water contract with the Bureau of Reclamation. Other non-CVP supplies will also be used when and if available.

As noted in Action 1, the DEID MA has been historically sustainable and is projected to remain so throughout the 2020-2040 SGMA-GSP implementation period and beyond. Despite this fact, the DEID MA will continue to explore opportunities to increase importation of water by accessing maximum amounts through its CVP contract as those supplies become available which will, in turn, be utilized in part for this action. This will further enhance the sustainability of the DEID MA.

Action 6 documents the intent to expand the DEID MA's use of OOD banking projects. Potential future additions to the DEID MA's historical use of OOD projects will increase its goal of increasing importation of water supplies to the DEID MA.

As described in Action 5, current OOD projects and long-term exchanges have used to supplement inadequate water supplies in years of drought. Opportunities to expand this capability in the future will be sought out throughout the 20-year SGMA implementation period.

Action 6 has the potential to contribute to the future sustainability of the DEID MA. The DEID MA will continue its current practice of importing available water supplies from both CVP and non-CVP and optimizing those supplies for use within the MA, including OOD banking.

5.2.1.6.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the continuing need for the DEID MA to remain sustainable as required by SGMA, this management action will be implemented as an expansion of an ongoing historical practice.

5.2.1.6.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Any future expansion of OOD banking projects is likely to require compliance with either CEQA, NEPA, or both. Public notice of any specific project will be included as part of CEQA/NEPA compliance actions. Additional public notice will also be provided through posted DEID / DEID GSA Board of Directors agendas that are made available to the public.

5.2.1.6.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Action 6 has not been quantified nor projected to have an impact on the DEID MA's water budget at this time. Any future OOD banking project will be quantified and added to this GSP once identified and implemented.

As noted in the Water Balance for the DEID MA, the District has transferred to others an annual average amount of just over 16,000 acre-feet of CVP water supplies that were excess to its use. Action 6 will use some or all of these excess imported water supplies as its primary source of supply for any future Action 6 projects.

5.2.1.6.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Action 6 projects will likely need to comply with CEQA and/or NEPA regulatory requirements.

5.2.1.6.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

While no specific timeline has been established for future Action 6 projects, it is likely some will occur during the SGMA planning and implementation horizon.

5.2.1.6.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Surplus imported water that is banked in OOD banking projects serves the same purpose as surplus imported water that is banked within DEID: to provide additional water supplies to lands within the DEID MA in water years where available imported water supplies are insufficient to meet crop demands. Recovery of banked water from OOD projects offsets a like amount of water that would have otherwise been extracted. By expanding participation in OOD water banking projects the district expects to increase/stabilize groundwater levels and groundwater storage, notwithstanding the effect of anticipated continued groundwater over-pumping that will occur during the GSP implementation period by others adjacent to the DEID MA as well as projected reductions in Tule Subbasin groundwater levels post-2020 as groundwater levels continue to equilibrate in the Tule Subbasin and adjoining subbasins. Expanded participation in OOD banking projects will also assist in stabilizing groundwater levels in adjacent basins where these projects exist through the net amount of water left within the project boundaries ("leave-behind" water that is typically a part of OOD project agreements).

Evaluation of the benefits of this action will occur through continued evaluation of annual CVP water and other water deliveries into the DEID MA and a full accounting of said deliveries, including sources of supply and final use of all water obtained. Benefits from this action will also be evaluated through groundwater measurements.

5.2.1.6.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

As previously described, DEID has the contractual right to certain quantities of water under its contract with the Bureau of Reclamation and has historically transferred to others an annual average amount of just over 16,000 acre-feet of imported CVP water supplies that were available to it DEID but were in excess to its ability to use. Reliability of expanding OOD water banking projects is high because of these contractual water rights.

5.2.1.6.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID has the contractual right to certain quantities of water under its contract with the Bureau of Reclamation. Contract number I75r-3327D provides the DEID MA with up to 108,800 acre-feet of Class 1 water and up to 74,500 acre-feet of Class 2 water annually. This CVP contract also provides access to other water supplies that may be available on an annual basis dependent on hydrology. Contractual authority allows OOD banking projects to be implemented subject to Bureau of Reclamation standards and authority.

5.2.1.6.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: The cost is anticipated to primarily be the additional cost of the water supply used for new OOD banking projects.

Cost of the supply is anticipated to be $30 per acre-foot (2019 dollars). Total cost is unknown at this time.

Funding: Funding of the additional cost of the water supply is minor and is likely to be initially absorbed into the existing annual budget for the DEID MA, and potentially funded through annual adjustments in the water rate charged water users in the DEID MA.

5.2.1.6.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

DEID adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. DEID MA has already reached long-term sustainability and is a net contributor of water to the Subbasin, which is a function of in-lieu recharge, irrigation return flows and direct water recharge/banking projects both inside and outside of the DEID boundaries. Accordingly, the DEID MA's drought offset measures is primarily centered in exercising its stored water recovery rights of previously deposited imported water in the Subbasin and recovery of banked water in other subbasins where OOD banking projects are located. Future operations anticipate continued recovery of stored water deposits when necessary in drought years.

5.2.1.6.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.1.7 Action 7 – Mitigation Program

5.2.1.7.1 Description

Sustainable management criteria have been developed to be protective of significant and unreasonable impacts to agricultural, municipal, and industrial beneficial uses of groundwater. However, analysis based on the best available data suggest that an estimated 25 shallow domestic wells and potentially other wells may be impacted during the GSP implementation period from 2020-2040 as a result of continued lowering of groundwater levels during this transition period. Wells, land use, property, and infrastructure may also be impacted from land subsidence and changes in groundwater quality during the transition period.

The Tule Subbasin GSAs have agreed to each individually implement a Mitigation Program as needed to offset impacts associated with GSP-allowed activities, subject to minimum requirements.

5.2.1.7.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the continuing need for the DEID MA to remain sustainable as required by SGMA, this management action will be implemented to protect beneficial uses and users of groundwater. In particular, DEID envisions this action to be protective of domestic wells and potentially other wells that may be adversely affected by measurable objectives and minimum thresholds established is this GSP. The number of domestic wells estimated to be impacted in the DEID MA is relatively low, particularly in view of DEID's decision to modify its minimum thresholds in this updated GSP to be even more protective of groundwater levels.

The Mitigation Program will identify the impacts to beneficial uses and users that the program is intended to address. The program—to be more fully described and adopted by DEID to protect domestic well owners no later than December 31, 2022—will establish a claims and investigation procedure. The claim process will be made available to address impacts to (1) domestic and municipal wells, (2) agricultural wells and (3) critical infrastructure. The claim process will include requirements for affected parties to file an application for a claim and provide data to verify the claim. Once a claim of adverse impact has been made, whether it be for well, specific land use, critical infrastructure, or groundwater quality issue(s), the DEID GSA will investigate the claim to determine whether it is associated with groundwater-related actions within that or neighboring GSAs.

For those claims that are shown not to be related to GSP- / GSA-approved or authorized activities, the GSA will, to the extent possible, provide assistance to the affected party to identify programs for addressing their issue.

GSAs may determine whether to provide full or partial mitigation based on a user's compliance with the GSA's GSP, Rules & Regulations, and other laws or regulations. Mitigation will generally be applied only to those claims that are shown to be attributable to GSP- / GSA-approved or authorized activities.

5.2.1.7.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

While formal adoption of the Mitigation Program itself is likely not required to comply with either CEQA or NEPA, specific projects undertaken under this action may require environmental review and/or notice to the public on a project-by-project basis. Necessary environmental review and public notice will be undertaken and the time of project planning and implementation.

5.2.1.7.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Action 7 has not been quantified nor projected to have an impact on the DEID MA's water budget at this time.

5.2.1.7.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Action 7 projects may need to obtain a County Well Permit and potentially review by the GSA to evaluate the sustainability of the action. Project may also need to comply with additional CEQA and/or NEPA regulatory requirements.

5.2.1.7.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

All the Tule GSAs will formulate and implement the Mitigation Program for domestic and municipal use impacts by December 31, 2022, and all other impacts by June 30, 2023. Each GSA will seek to develop a

funding mechanism for the Program, which is dependent on the specific GSA needs for specific expected impacted wells, critical infrastructure, and land uses within each GSA. During program development, the GSAs will refer landowners and others to these local programs as well as other resources and funding programs from the County, State, or non-profit organizations.

5.2.1.7.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The Mitigation Program is anticipated to maintain beneficial uses and uses of groundwater for domestic and municipal wells, agricultural wells, and critical infrastructure. Each claim filed to the DEID GSA will be documented and tracked in Annual Reporting including outcomes of mitigation implemented.

5.2.1.7.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Mitigation Program will be implemented in accordance with the requirements outlined in the Mitigation Program Framework described in the Coordination Agreement (**Appendix A-7**).

Once the need for mitigation is confirmed, suitable mitigation to alleviate groundwater level impacts impact may be any of the following:

- deepening a well,
- constructing a new well,
- modifying pumping equipment,
- providing temporary or permanent replacement water,
- coordinating consolidation of the domestic well owner with existing water systems; or
- with the consent of the affected user, providing other acceptable means of mitigation.

For land use impacts, this could be any of the following:

- repair to canals, turnouts, stream channels, water delivery pipelines, and basins,
- repair to damaged wells,
- addressing flood control impacts,
- repair to other damaged infrastructure including highways, roads, bridges, utilities, and buildings; or
- with the consent of the affected user, providing other acceptable means of mitigation.

For groundwater quality impacts (due to groundwater management/actions), this could be any of the following:

- adjusting groundwater pumping locations, rates, or schedules,
- modifying project operations,
- providing temporary or permanent replacement water,
- coordinating consolidation with existing water systems, or
- with the consent of the affected user, providing other acceptable means of mitigation.

Various factors may reflect the proper mitigation methods for the specific issue. For example, age, location, financial impact to the beneficial user as a result of mitigation, and the beneficial user may reflect which mitigation measures are optimal. It will be the responsibility of the DEID GSA to implement the Mitigation Program within its four management areas.

5.2.1.7.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The DEID has legal authority under SGMA and under other law to investigate claims and assess fees in order to implement the Mitigation Program.

5.2.1.7.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: The cost is anticipated to primarily be a function of the number and type of wells or other infrastructure adversely affected in the DEID MA. A preliminary analysis indicates that approximately 6 agricultural wells, 10 domestic wells, 0 M&I well and 8 unknown wells may be impacted based on transitional pumping during the GSP implementation period. It is estimated that agricultural, domestic and Municipal & Industrial (M&I) well replacements will cost approximately $100,000; $500,000; and $1,000,000; respectively per well type (2022 dollars). The basis for the agricultural well replacement cost is for replacing a similar production capacity as the impacted well. The age, condition and remaining useful life of the impacted wells will be taken into consideration when determining whether to provide full or partial mitigation.

The total estimated cost for implementation of the entire program during the SGMA planning and implementation horizon for agricultural, domestic and M&I well mitigation is estimated at $3,000,000; $1,000,000; and $0; respectively. In addition, there are eight wells of unknown type that may be impacted by lowered water levels during GSP implementation. It is anticipated that these could be potentially old and abandoned wells. DEID is in the process of conducting field surveys to determine the type and

condition of the unknown wells. These wells are not included in the preliminary estimate of well replacement cost.

The preliminary total well mitigation cost is estimated at approximately $4,800,000 as provided in **Table 5-1: Cost Analysis for Potentially Impacted Wells**. As reflected in the Table, the number of wells potentially impacted within the DEID MA has been significantly reduced to the change in minimum thresholds.

Table 5-1: Cost Analysis for Potentially Impacted Wells

Aquifer Impacts Evaluation (All Wells)			
	Proposed MT	Safe Yield Scenario	Original MT
Upper Aquifer			
Ag	$3,000,000	$2,500,000	$5,000,000
Domestic	$1,000,000	$700,000	$2,800,000
M&I	$0	$0	$1,000,000
Unknown	$800,000	$700,000	$2,000,000
Sub-Total	*$4,800,000*	*$3,900,000*	*$10,800,000*
Lower Aquifer			
Ag	$0	$0	$2,500,000
Domestic	$0	$0	$1,000,000
Unknown	$0	$0	$1,600,000
Sub-Total	*$0*	*$0*	*$5,100,000*
TOTAL	**$4,800,000**	**$3,900,000**	**$15,900,000**

Funding: Funding is anticipated to be available for each GSA's Mitigation Program through implementation of assessments, fees, charges, and penalties by the GSA. In addition, the DEID GSA will explore grant funding. The State has many existing grant programs for community water systems and well construction funding. County, state, and federal assistance may be needed to successfully implement the respective Mitigation Programs. The GSAs will also work with local nongovernmental organizations that may be able to provide assistance or seek grant monies to help fund the program. GSAs may act individually or collectively to address and fund mitigation measures.

5.2.1.7.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

DEID adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. DEID MA has already reached long-term sustainability and is a net contributor of water to the Subbasin, which is a function of in-lieu recharge, irrigation return flows and direct water recharge/banking projects both inside and outside of the DEID boundaries.

5.2.1.7.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

The Mitigation Program Framework is attached to the revised July 2022 Coordination Agreement (**Appendix A-7**).

5.2.2 Western Management Area *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

The County of Tulare is a participant in the DEID GSA by actions of an executed MOU between the two agencies (see **Appendix E**). Under SGMA, the County is the default GSA for any "white area" lands (lands that are not within any other legal entity that has jurisdiction to implement and enforce elements of a GSP). White area lands within the DEID GSA have been designated as the "Western Management Area (WMA). The WMA contains an area covering approximately 7,555 acres that are immediately adjacent to the western boundary of the DEID MA. Almost of all the lands within the WMA are actively farmed. The WMA relies exclusively on pumped groundwater as the source of water supply, without any readily available access to surface water.

The purpose of the projects and management actions described in this section of the GSP for the WMA is to outline the process and procedures by which the agricultural activities within the WMA can proceed in a manner consistent with the sustainability goal for the Tule Subbasin. SGMA requires the GSP to address the manner in which the WMA can adapt to operating within the limitations of a sustainable water supply plus any additional supplies that it can procure for the benefit of both current and future water users within its service area. The following projects and management actions indicate the approach to meet sustainability recognizing that, in some cases, details associated with specific projects will be generated as those projects are pursued and developed.

Projects and management actions for the WMA are associated with the following general categories of actions:

- Current -groundwater supply optimization
- Development of additional sources of groundwater supplies
- Existing and future managed aquifer recharge
- Development of future surface water supplies

Successful implementation of the projects and management actions for the WMA will provide for its ultimate sustainability.

The following project and management actions have been identified for the WMA:

Action 1 Transitional pumping

Action 2 Purchases of supplemental imported water supplies

Action 3 Groundwater projects to enhance groundwater allocations

Action 4 Development of tradable groundwater credits

Action 5 Coordinated groundwater projects with DEID

Action 6 New water conveyance projects

Action 7 Demand reduction programs

Action 8 Mitigation of identified adverse impacts

5.2.2.1 Action 1 – Transitional Pumping

5.2.2.1.1 Description

As noted in **Section 2: Basin Setting** in this GSP, the amount of sustainable yield available for the Tule Subbasin is limited, currently calculated to be 0.14 acre-feet per acre, (subject to further revision). Lands in the Tule Subbasin also have available a calculated amount of annual rainfall that accrues to Subbasin aquifers (referred to a "precipitation credits" or "precipitation accruals"). The calculated precipitation credit for the WMA is 0.65 acre-feet per acre, based on the average precipitation received between 1993 and 2016 (data provided by Cal-Poly Irrigation Training and Research Center, subject to further evaluation and updating). When combined, the amount of groundwater that can be sustainably consumed by WMA landowners is currently calculated to be 0.79 acre-feet per acre (subject to further evaluation and revision).

Transitional pumping is proposed as a mechanism to provide an orderly transition from current pumping levels to sustainable levels. The premise of this management action is to provide a reasonable transitional time frame that reduces the economic impact that would otherwise be felt in an "overnight" reduction in water supplies, predicted to be a 64-75 percent reduction in cropped acreage, dependent on the crop being farmed.

This project proposes a transitional pumping schedule for the first 15 years of the GSP implementation period.

Annual transitional pumping credits would be limited in the first 5 years (2020-2024) to the difference between existing crop consumptive use and available groundwater credits consisting of sustainable yield plus precipitation credits.[1] Following the initial 5-year period, the transitional pumping portion of total groundwater credits during the 2025-2034 time period would be reduced each year by an equal 10 percent amount. Beginning in 2035, groundwater credits would be limited to the sustainable yield plus precipitation accruals to groundwater and any supplemental groundwater credits developed from other projects.

[1] Quantification of existing crop consumptive use is currently being verified utilizing the Data and Monitoring protocols described in Section 3.3.1.1 of the Tule Subbasin Coordination Agreement (see **Appendix A**). These same protocols will be used in quantifying future crop consumptive use during the GSP implementation period.

Transitional pumping credits to individual landowners will be made annually with any unused amounts available to be carried over from year to year within the 5-year period the credit was received (2020-2024; 2025-2029; 2030-2034). Individual landowners may also carry over up to one-half of the total transitional pumping credits issued in one 5-year period to the next 5-year period, with all unused transitional pumping credits terminating on December 31, 2034. Transitional pumping credits are not transferable between landowners but may be made available by landowners to their lessees for use on the property assigned such credits.

The maximum annual transitional pumping total is subject to minor adjustments for permanent crops that were not yet mature before 2020. Beginning in 2025 and reviewed annually thereafter, each component of consumable groundwater credits[2] (transitional pumping, sustainable yield, and precipitation accruals to groundwater) will be subject to adjustment in order to meet sustainability measurable objectives and/or mitigation needs.

5.2.2.1.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The primary circumstances to be considered from Action 1 are the potential impacts to DEID MA landowners, potential impacts the FKC, and creation of a funding mechanism for WMA landowners to implement other projects and management actions identified in this GSP.

Impacts to the DEID MA: An analysis of potential impacts to the DEID MA has been evaluated through a study done by Thomas Harder & Co. using the groundwater model developed for the subbasin. A technical memorandum was issued on August 9, 2019, which documented the findings of the analysis which modeled the impacts of pumping from the WMA on the DEID MA. The model compared current groundwater elevations that were in the calibrated model with modeled groundwater elevations if the WMA did not pump any groundwater between 1986 and 2017. The results indicated a loss of up to 35 feet in groundwater elevations in DEID due to historical WMA pumping.

The above-referenced study is not the definitive analysis of the impacts of WMA pumping to the DEID MA, but it is indicative of an anticipated impact. Further study and analysis will be modeled to determine the impacts with actual groundwater elevations used to confirm those impacts.

Impacts to the Friant-Kern Canal: The Tule Subbasin Setting prepared by Thomas Harder & Co. documents the effects of historical groundwater over-pumping that has occurred in the Tule Subbasin (see **Appendix A-2**). Paramount in those impacts has been the documented subsidence that has occurred in the vicinity

[2] "consumable groundwater credits" is the term used to describe the amount of groundwater that will be allocated to landowners annually by the GSA that is the sum of transitional pumping, sustainable yield, and precipitation accruals and will be measured through satellite imagery

of the federally owned FKC. Between 1959 and 2017, FKC subsidence in the vicinity of Deer Creek (which is in the Tule Subbasin) has been documented by the Friant Water Authority at 9 feet (see **Appendix A-2, Figure 2-24**).

The Friant Water Authority, acting in its capacity as the non-federal operating entity of the FKC, advised all GSAs in the Tule Subbasin, including the DEID GSA, that FKC subsidence should be addressed in each GSA's GSP noting that, "[w]hile SGMA may permit for a period of up to 20 years to bring a basin into balance, we firmly believe that the continuation of subsidence at the rates historically experienced, particularly if unmitigated, is unacceptable and look forward to identifying feasible solutions that allow your agency to meet its sustainability goal while avoiding or mitigating undesirable subsidence impacts on the Friant-Kern Canal" (*see* **Appendix I: Letter from Friant Water Authority Dated May 28, 2019**).

Thomas Harder and Co. conducted an analysis of the relative cause of future predicted subsidence along the FKC within the Tule Subbasin (see **Appendix J**: **Technical Report from Thomas Harder and Associates: Analysis of the Relative Cause of Future Subsidence Along the Friant-Kern Canal within the Tule Subbasin**). The results of that and potentially other studies may lead to the development of new mitigation fees to address FKC subsidence impacts from transitional pumping that occurs within the Tule Subbasin, including the WMA. It is anticipated that any mitigation fees would be imposed in proportion to the corresponding share of responsibility and could be used to assist in correcting subsidence impacts on the FKC, thereby allowing capacity correction measures to be constructed that would restore the carrying capacity of the FKC lost to further subsidence to the extent caused from continued over-pumping (transitional pumping). This would restore the ability of Friant contractors in the Tule Subbasin and others further south to receive their contractual imported water (which may be subject to other FKC capacity limitations) which will assist the Subbasin in avoiding the undesirable results of subsidence, reduced groundwater storage amounts, and lowering groundwater levels.

Facilitating implementation of projects and management actions in the WMA – Facilitating landowners within the WMA to implement identified projects and management actions will assist the WMA in minimizing the use of transitional pumping and assist the Tule Subbasin in achieving its sustainability goals. Without such projects, transitional pumping may become the default project with little consideration given to alternatives.

5.2.2.1.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notices will be provided as required by law for all actions associated with transitional pumping, including notice requirements under CEQA.

5.2.2.1.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

The maximum amount of water that could be used under Action 1 remains subject to final technical determination.

5.2.2.1.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.1.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Implementation of the action will occur between 2020-2034. The action will result in groundwater extractions being limited to sustainable levels from 2035 onward.

5.2.2.1.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Action 1 will provide an orderly transition from current pumping levels to sustainable levels as required by SGMA over a 15-year time period. It is designed to avoid the economic impact that would otherwise be felt in an "overnight" reduction in water supplies. While implementation of Action 1 will delay reaching sustainability before 2035, through responsible mitigation of impacts, the benefits of this action can be realized while meeting the goal of sustainability by 2040.

Evaluation of the benefits of this action will occur through continued evaluation of annual groundwater pumping and the effectiveness of mitigation of impacts from transitional pumping, as reflected in annual reports and 5-year updates submitted to DWR under SGMA. Groundwater measurements will also be used to evaluate this action.

5.2.2.1.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

How this action will be accomplished and implemented will be documented as noted above.

5.2.2.1.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

The County of Tulare has jurisdictional and enforcement authority for the WMA. The County of Tulare has an MOU with the DEID GSA that provides for the implementation of this action within the WMA under the management of the DEID GSA (see **Appendix E**).

5.2.2.1.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: The cost of Action 1 is the mitigation of real and anticipated impacts of transitional pumping to the DEID MA, the FKC, and costs associated with various projects and management actions identified for the WMA in this GSP. These costs will continue to be monitored and analyzed by the DEID GSA, the FWA and the WMA landowners as projects are proposed.

Funding: It is anticipated that the cost of Action 1 will be funded by individual landowners that choose to use transitional pumping through transitional pumping pricing that will be initially set and periodically reevaluated by the DEID GSA Board of Directors.

The pricing of transitional pumping water is anticipated to have three separate components of cost[3] which will be charged only on groundwater used that is in excess of the Tule Subbasin sustainable yield, precipitation credits, and any supplemental groundwater added through other projects and management actions of WMA landowners.

These three cost components are:

1. Mitigation of impacts on landowners in the DEID MA - The WMA landowners using transitional pumping will be assessed a per acre-foot transitional pumping mitigation fee. The DEID MA will

[3] The final transitional pumping price will be established by the DEID GSA board of directors following public input.

accept DEID MA mitigation fees collected as payment in full for all potential and real impacts from transitional pumping for the period from 2020-2024. Re-evaluation of necessary mitigation fees and actions will be accomplished every 5 years with any revision to the then current mitigation fee implemented at the beginning of each 5-year period.

2. Mitigation of impacts on the FKC – As noted above, an analysis of the likely sources causing subsidence on the FKC has been conducted which may to lead to an assessment on WMA lands employing transitional pumping to fund FKC subsidence mitigation caused by pumping on those lands. The transitional pumping price paid by WMA landowners will include a per acre-foot FKC mitigation fee that may be subject to retroactive and future adjustments based on an assignment of a proportional share of responsibility of FKC subsidence that is the result of continued over-pumping through the WMA transitional pumping project.

3. WMA project and management actions funding – The WMA proposes several projects and management actions as described in this GSP. WMA landowners will be encouraged to implement those projects and management actions through the assessment of a fee that will be placed on all transitional pumping water. This fee may be used to fund various projects and management actions within the WMA.

5.2.2.1.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Transitional pumping will be capped to a maximum each year while being implemented. No offset for drought is included.

5.2.2.1.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.2 Action 2 – Purchases of Supplemental Imported Water Supplies

5.2.2.2.1 Description

WMA landowners propose to pursue purchases of supplemental imported water that may be available from DEID and other Friant Division or Cross Valley contractors as well as other water acquisitions. These purchases may be either spot market or long-term purchase agreements and could include CVP Section 215 water, Recirculation Water, Unreleased Restoration Flows, or other imported water supplies. Purchases of supplemental imported water would be arms-length transactions and the purchase price would be at market rates or other mutually agreeable terms.

This action anticipates projects that would result in imported water supplies being acquired by WMA landowners. Acquired imported water supplies will be additive to transitional pumping credits as will sustainable yield credits, precipitation credits and other supplemental groundwater credits created from projects and management actions. The DEID GSA will monitor and keep an accounting of all purchased imported water supplies (as well as all other water acquisitions) by individual landowner.

5.2.2.2.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

The level of competition for available surface water supplies is expected to be high post-2020. The ability of finding surface water for importation into the WMA could be affected by this competition.

5.2.2.2.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notices will be provided as required by law, including notice requirements under CEQA and NEPA.

5.2.2.2.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Quantification of this action to the water budget would be speculative at this time. Greater certainty as to the expected water budget benefits will become better understood over time. Any water purchased and delivered to the WMA would assist in reaching sustainability by replacing an equal amount of groundwater pumping that would occur under Action 1. Actual quantities will be dependent on annual hydrology, availability of surplus water, price, and conveyance.

5.2.2.2.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.2.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This action is proposed as an ongoing measure that will be implemented throughout the GSP implementation period and potentially beyond if long-term purchases can be found.

5.2.2.2.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Importation of imported water will assist the WMA with maintaining agricultural production while reaching sustainability by reducing groundwater over-pumping that may occur through transitional pumping. Any supplemental imported water purchases will be additive to available transitional pumping credits and other consumable groundwater credits which would have additional economic benefits for the WMA.

Evaluation of the benefits of this action will occur through annual documentation of imported water delivered to the WMA, as reflected in annual reports and 5-year updates provided to DWR per SGMA. Benefits from this action will also be evaluated through groundwater measurements.

5.2.2.2.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.2.2.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

WMA landowners have the authority to enter into contracts and agreements for purchasing surplus imported water from CVP contractors. CVP contractors have authority to enter into contracts with the WMA under the terms of their CVP contract, subject to compliance with applicable CEQA and NEPA requirements and approval by the appropriate federal contracting officer.

5.2.2.2.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Implementation of this action will be primarily dependent on the cost of water and cost of conveyance.

Funding: It is anticipated that the cost of this action will be included in either the operating budget of the WMA or by individual landowners in the WMA.

5.2.2.2.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Given that this action is dependent on the availability of supplemental imported water, drought offset measures are inherent in this action: the availability of supplemental surface water during times of drought is unlikely at best.

5.2.2.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.3 Action 3 – Groundwater Projects to Enhance Available Groundwater

5.2.2.3.1 Description

Action 3 is the future development and implementation of water recharge projects in the WMA for the benefit of the WMA landowners. This action is designed to develop additional water supplies to meet

some or all of the needs within the WMA not met through consumable groundwater credits including transitional pumping amounts. Projects will be in areas suitable for recharge and would supplement existing groundwater aquifers from which wells in the WMA are extracting.

This action anticipates implementation of certain projects that would result in supplemental groundwater for use by WMA landowners. Supplemental groundwater resulting from WMA landowner projects may occur at any time during the SGMA implementation period and beyond and any supplemental water created will be additive to other consumable groundwater credits. Supplemental groundwater credits created through Action 3 can be carried over from year to year. This would have additional benefits for the WMA and subbasin sustainability.

5.2.2.3.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Any proposed recharge project would require a hydrogeologic analysis and approval by the DEID GSA board of directors for confirmation that recharge water would directly contribute to the aquifer(s) being pumped.

5.2.2.3.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notice process as required by CEQA and those of the Brown Act will be met.

5.2.2.3.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Quantification of the benefits of this action to the water budget would be speculative at this time. Greater certainty of benefits will be evaluated over time. Any water purchased and delivered to recharge projects in the WMA would assist in reaching sustainability by supplementing available groundwater and other water supplies and could reduce the amount of water that is over-pumped through Action 1.

5.2.2.4.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.4.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Given the desire of WMA landowners to bring additional water into their portfolio of available water supplies, it is anticipated that the planning process for this action will begin in 2020 with an analysis of lands suitable as groundwater recharge sites. Any project area identified as suitable will then be considered for further planning, design, and possible construction by the project proponents with mutual agreement of feasibility and anticipated benefits by the DEID GSA. Any projects that are ultimately chosen for construction are anticipated to occur from 2022 to 2040.

5.2.2.4.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Importation of water for groundwater recharge purposes will assist the WMA with maintaining agricultural production while reaching sustainability by adding to groundwater aquifers. Any supplemental water created will be additive to other consumable groundwater credits. Supplemental groundwater credits created through Action 3 can be carried over from year to year, which would have additional benefits for the WMA and subbasin sustainability.

Evaluation of the benefits of this action will occur through annual documentation of surface water delivered to recharge projects benefitting the WMA, as described in annual reporting and 5-year updates to DWR. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.2.4.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.2.4.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Subject to applicable law, WMA landowners as landowners/operators have the authority to enter into contracts for planning, development, construction and operation of groundwater recharge projects and may be subject to compliance with CEQA and/or NEPA.

5.2.2.4.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: Cost of implementation of this action will be primarily dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility.

Funding: It is anticipated that the cost of this action will be funded either individually or as a collective of landowners in the WMA.

5.2.2.4.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

To the extent that supplemental water is created through implementation of this action, additional water supplies that could be accessed during times of drought would offset some or all the negative impacts anticipated from drought.

5.2.2.4.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.4 Action 4 – Development of Tradable Groundwater Credits

5.2.2.4.1 Description

Intra-WMA groundwater credits program - Because of its historical dependence on groundwater and to the extent it remains so to an appreciable degree during SGMA implementation, the DEID GSA anticipates implementing a program establishing and providing for transfer of groundwater credits within the WMA. Net groundwater credits available for trading will consist of the calculated sustainable yield and precipitation accruals to groundwater less any crop consumptive use either recorded or anticipated from the acreage from which the groundwater credit is originating. Credits may also be created through WMA projects and management actions which develop supplemental water and would be allocated as determined by project proponents and administered by the DEID GSA under this action.

Transitional pumping credits are non-transferable or tradable.

An accounting program will be developed by the DEID GSA and used to track groundwater credits, and movement of those credits between WMA landowners. The program establishing tradable groundwater credits is limited to trades to and from lands within the WMA and shall not extend beyond the limits of this geographical area.

Inter-WMA groundwater acquisition credits program - On behalf of the WMA, the DEID GSA will monitor the potential of meeting WMA water needs through participation in a groundwater credits acquisition program within the Tule Subbasin. Should such a program become available within the Tule Subbasin and a determination is first made by the DEID GSA that participation in the program will have no unmitigated negative impact to others within the DEID GSA, WMA landowners will be given the option of participating in an inter-WMA groundwater credits acquisition program.

5.2.2.4.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The intra-WMA credits program will be implemented once an accounting program described above can be activated. Expansion to an inter-WMA program could occur if available within the Tule Subbasin and without unmitigated negative impact to others within the DEID GSA.

5.2.2.4.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notices will be provided as required by law, including notice requirements under CEQA.

5.2.2.4.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Intra-WMA groundwater credits program – Given that the trading of groundwater credits will be initially (and potentially permanently) limited to only lands within the WMA, there will be no impact to the water budget for this management area. There will be no net change of the amount of consumed groundwater.

Inter-WMA groundwater credits program – Expansion of a groundwater credits trading program to one that includes moving credits across WMA boundaries could result in an increase in local groundwater consumed beyond what would otherwise be consumed without the program. This may require further analysis to ensure no undesirable results occur in any other management area in the DEID GSA and potential mitigation of impacts from increased groundwater consumption.

5.2.2.4.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.4.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

This action is proposed as an ongoing measure that will be implemented throughout the GSP implementation period and potentially beyond.

5.2.2.4.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Benefits to individual landowners that obtain water credits will occur as the amount of acreage that can be irrigated sustainably is maintained. Additional benefits may accrue to landowners obtaining water credits as they will be additive to available transitional pumping credits and other consumable groundwater credits. Groundwater credits that are eligible to be carried over from year to year would have additional economic benefits.

Evaluation of the benefits of this action will occur through annual documentation of water credits and their disposition/retirement. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.2.4.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.2.4.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Under its MOU with the County of Tulare (**Appendix E**), the DEID GSA has the authority to implement this action on behalf of the landowners in the WMA.

5.2.2.4.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: The cost of this action will be the expense of development and implementation of a tradable groundwater credits accounting program plus staff time to operate and maintain the accounting program. The cost of an intra-WMA groundwater credits accounting program is expected to be minimal and is subject to reimbursement by participating WMA landowners.

Funding: Funding of this action will be paid by the WMA landowners wishing to participate in this tradeable groundwater credits project. The initial costs of the accounting programs will be funded through direct contributions by participating landowners on a per acre, pro-rata basis. Annual operation and maintenance costs will be assessed in the same manner. Participation in this action is voluntary, but once a landowner commits to participate, a mandatory payment to fund this action will be required.

5.2.2.4.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

To the extent that groundwater credits move from one landowner to another through intra-WMA trading, this would offset some or all the negative impacts anticipated from drought that would otherwise be experienced by the WMA landowner receiving the credits. The same would be true if an inter-WMA program were to be found feasible and acceptable. Neither program adds to the available net amount of groundwater in the DEID GSA or Tule Subbasin; it only shifts use from landowner/location to another.

5.2.2.4.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.5 Action 5 – Coordinated Groundwater Projects with DEID MA

5.2.2.5.1 Description

Action 5 consists of three potential opportunities to work conjunctively with the DEID MA. These opportunities are:

- Construction of groundwater recharge facilities within DEID MA – WMA landowners may pursue the construction of recharge basins within the DEID service area that can take surface water deliveries associated with Action 2 for recharge within DEID MA with resulting benefits accruing to WMA landowners. Water recharged under this action would then be converted to groundwater credits that could be transferred and pumped in the WMA area or potentially exchanged for imported water that would be delivered to the WMA area in current and/or future conveyance systems. This project would include a "leave-behind" amount[4] of recharged water to ensure there are no unacceptable impacts to other DEID MA water users. Additionally, joint venture projects with DEID MA may be an option, subject to mutual agreement by WMA landowners and DEID MA.

[4] Leave-behind amounts may vary but will generally be determined with reference to the specific program or programs and reflect the respective contributions of the DEID GSA and the other parties to the program or programs.

- In-lieu deliveries within DEID MA – In years where the DEID service area is seeking additional water supplies, the WMA landowners may be able to affect a "transfer-in" of acquired imported water supplies that could be transferred to the DEID MA for delivery to DEID MA water users. This delivery would offset a like amount of groundwater that would have otherwise been pumped by DEID MA water users. This amount of groundwater offset by the imported water delivery, subject to a "leave-behind" amount to ensure there are no unacceptable impacts to other DEID water users, could then be converted into groundwater credits and pumped in the WMA. Alternatively, this imported water that is transferred in could be directly delivered to WMA lands through any current and/or future interconnections with DEID's distribution system.
- Water Delivered via DEID recharge facilities – There may be opportunities for imported water acquired by WMA landowners to be introduced into DEID-owned groundwater recharge basins. Any water recharged would be subject to a "leave-behind" amount to insure there are no unacceptable impacts to other DEID water users with the balance available as groundwater credits that could be pumped in the WMA.

This action anticipates implementation of certain projects that would result in supplemental groundwater for use by WMA landowners. Supplemental groundwater credits resulting from Action 5 may occur at any time during the SGMA implementation period and beyond, would be additive to other groundwater credits that are otherwise available, and may be carried over from year to year.

5.2.2.5.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Construction of groundwater recharge facilities within DEID – Proposed recharge sites would require a hydrogeological analysis for site acceptability. Any proposed recharge project would also require a hydrogeologic analysis for confirmation that recharge water would directly contribute to the aquifer(s) being pumped with an acceptable rate of transmissivity to the targeted aquifer(s).

In-lieu deliveries within DEID – In-lieu deliveries utilizing the existing DEID distribution system would be subject to capacity and other potential delivery constraints. In-lieu deliveries may also be limited by the lack of conveyance facilities to reach some of the lands in the WMA and would remain constrained until needed facilities were constructed. Transmissivity of groundwater from the DEID MA to the WMA would also need to be confirmed as having an acceptable rate.

Water Delivered via DEID recharge facilities – This could occur only when excess capacity—in the recharge basins and conveyance to those basins—is available and would be done under a separate agreement with DEID. Any proposal would also require a hydrogeologic analysis for confirmation that recharge water would directly contribute to the aquifer(s) being pumped with an acceptable rate of transmissivity to the targeted aquifer(s).

5.2.2.5.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notice process as required by CEQA will be met.

5.2.2.5.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Quantification of this action to the water budget would be speculative at this time. Greater certainty about potential benefits will be available over time. Any water purchased under Action 5 and delivered to recharge projects in the DEID MA for benefit of the WMA would assist in reaching sustainability by supplementing existing water supplies and could reduce the amount of water that is over-pumped through Action 1. There could also be positive interim impacts to the DEID MA from water banked within the DEID MA as well as long-term positive impacts from any "leave-behind" water.

5.2.2.5.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.5.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Given the desire of WMA landowners to bring additional water into their portfolio of available water supplies, it is anticipated that the planning process for this action could begin in 2020 with initial identification of potential recharge sites. Based on those results, negotiations between DEID and the WMA landowners (either individually or collectively) could proceed immediately with opportunities to implement a project at the next available hydrologic opportunity.

5.2.2.5.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Coordinated groundwater recharge projects could assist the WMA with maintaining agricultural production while reaching sustainability by adding water to groundwater aquifers. Any supplemental groundwater credits created will be additive to available transitional pumping amounts and other consumable groundwater credits and can be carried over from year to year which would have additional economic benefits for the WMA.

Evaluation of the benefits of this action will occur through annual documentation of surface water delivered to recharge projects in the WMA. Benefits from this action will also be evaluated through groundwater measurements.

5.2.2.5.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.2.5.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Both DEID and the WMA can enter into contracts for planning, development, construction and operation of groundwater recharge projects subject to compliance with CEQA.

5.2.2.5.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Cost of implementation of this action will be dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility.

Funding: It is anticipated that the cost of this action will be funded either individually or as a collective of landowners in the WMA.

5.2.2.5.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

To the extent that supplemental water is created through implementation of this action, additional water that could be accessed during times of drought would offset some or all the negative impacts anticipated from drought. Additional water could accrue to the DEID MA if it were to use new groundwater banking projects for its own benefit. This would add drought resiliency benefits to the DEID MA.

5.2.2.5.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.6 Action 6 – New Water Conveyance Projects

5.2.2.6.1 Description

Action 6 consists of four potential conveyance opportunities that includes utilizing the DEID existing water distribution system, local stream courses, and new conveyance infrastructure. The projects being considered are:

- Interconnection with DEID's distribution system – DEID and WMA landowners may pursue and cooperatively assess opportunities to utilize DEID's existing distribution system for delivery of any imported water supplies WMA landowners may have available to them that originate from the FKC. These deliveries would be accomplished through new interconnections to existing DEID pipelines. As the DEID MA develops its water banking facilities, DEID's distribution system will likely be unable to convey water to the WMA under this project.
- Use of White River – WMA landowners may pursue the use of White River to deliver water to WMA lands for irrigation and groundwater recharge. DEID and WMA may develop an allocation system to address any groundwater credits that would be appropriately allocated to the WMA from seepage losses associated with WMA-introduced flows in White River.
- Use of Deer Creek – The WMA may also pursue the use of Deer Creek to deliver water to lands in the WMA for irrigation and groundwater recharge.
- Construction of new conveyance facilities – The WMA may assess the feasibility of a water distribution system for areas targeted for continuance of significant farming operations. Based on the finding of this feasibility assessment, pursuit of the design, development and construction of new conveyance facilities may follow.

This action anticipates projects that would result in importation of water supplies being acquired by WMA landowners. New water supplies acquired through Action 6 will be additive to transitional pumping and other consumable groundwater credits as will other supplemental groundwater credits created from projects and management actions.

5.2.2.6.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Interconnection with DEID's distribution system – Interconnections to WMA lands would be subject to negotiated wheeling agreements with DEID, the cost of the interconnection, and capacity limitations or maintenance needs in the DEID distribution system. It is recognized that any such interconnection and the resulting flow of water could not adversely impact the delivery of water to any existing DEID water user.

Use of White River – Flows introduced in White River by WMA landowners would be subject to associated evaporation losses and a potential "leave-behind" amount. WMA landowners have acknowledged that White River is an integral part of DEID's existing groundwater banking project that conveys surface water to the project and as such, use of White River by WMA landowners must not adversely impact the delivery of water to DEID's groundwater banking projects.

Use of Deer Creek – Investigations into available capacity and related issues will need to be explored by the WMA landowners wishing to use Deer Creek.

5.2.2.6.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notice process as required by CEQA will be met.

5.2.2.6.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Quantification of this action to the water budget would be speculative at this time. Water to convey must first be acquired in amounts to justify costs associated with new conveyance facilities. Assuming supplemental water could be acquired, new conveyance proposed under this action would assist in reaching sustainability by supplementing existing groundwater supplies and could reduce the amount of water that is over-pumped through Action 1.

5.2.2.6.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.6.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Given the desire of WMA landowners to bring additional water into their portfolio of available water supplies, it is anticipated WMA landowners will consider the feasibility of the identified conveyance opportunities within the first 5-year period of SGMA implementation. Based on the feasibility of individual conveyance projects, construction could begin as soon as 2025.

5.2.2.6.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

The completion of new conveyance opportunities will assist the WMA with reaching sustainability by importing supplemental water supplies to the WMA, which would, in turn, enhance water supplies available in the WMA and potentially reduce the net amount of groundwater over-pumping as a result of transitional pumping. Any supplemental water imported will be additive to available transitional pumping and other consumable groundwater credits as will other supplemental groundwater credits created from projects and management actions which would have additional economic benefits for the WMA.

Evaluation of the benefits of this action will occur through annual documentation of water delivered to the WMA through new conveyance projects. Benefits from this action will also be evaluated through groundwater measurements.

5.2.2.6.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Accomplishments associated with this action will be documented as noted above.

5.2.2.6.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Both DEID and the WMA have the authority to enter into contracts for studying the feasibility of a conveyance project and the planning, development, construction and operation of new conveyance facilities, subject to compliance with CEQA as required by law.

5.2.2.6.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: Cost of implementation of this action will be dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility.

Funding: It is anticipated that the cost of this action will be funded either individually or as a collective of landowners in the WMA.

5.2.2.6.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Not applicable.

5.2.2.6.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.7 Action 7 – Demand Reduction Programs

5.2.2.7.1 Description

Action 7 consists of four potential demand reduction programs that would reduce the amount of groundwater required in the WMA that would assist the WMA in reaching long-term groundwater sustainability. The programs being considered are:

- Land retirement within the WMA – The WMA landowners may pursue a program of voluntary land retirement where revenues generated by the WMA would be used to buy land currently farmed within the WMA with the intention of curtailing groundwater pumping on the acquired lands. Individual WMA landowners may also pursue land retirement within their own landholdings independently.
- Crop change within the WMA – The WMA landowners may pursue a program of underwriting changes in cropping where revenues generated by the WMA would be used to contractually limit what can be grown with the intention of reducing water demands below current levels of water used within the WMA. Individual WMA landowners may also pursue crop changes within their own landholdings independently.
- Conservation within the WMA – The WMA landowners may pursue a program of water conservation where revenues generated by the WMA would be used to improve the application of water on lands currently farmed and in distribution systems delivering water with the intention of reducing non-recoverable water losses. Individual WMA landowners may also pursue water conservation improvements within their own landholdings independently.
- Wildlife habitat conversion – The WMA landowners may pursue a program of underwriting the conversion of currently farmed land to wildlife habitat where revenues generated by the WMA and revenues developed in conjunction with federal and state agencies and other non-governmental organizations would be used to purchase conservation easements within the WMA with the intention of curtailing its water use. Individual WMA landowners may also pursue wildlife habitat conversion within their own landholdings independently.

5.2.2.7.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Land retirement within the WMA – This program will be subject to evaluation of feasibility including the cost of land acquisition, identifying willing sellers, and development of a revenue source. Ongoing expenses of weed abatement and other cultural costs would also require evaluation and an ongoing revenue stream.

Crop change within the WMA – This program will be subject to evaluation of feasibility including the cost of subsidizing crop changes from a higher value to one with a lower value, identifying willing participants, and development of a revenue source.

Conservation within the WMA – An inventory of existing irrigation systems with an evaluation of each for recommended irrigation efficiency improvement practices would be required, along with a funding source for recommended improvements.

Wildlife habitat conversion – WMA landowners will need to investigate potential federal, state, and non-governmental organizations for potential programs that would be applicable to the goals of this program.

Each one of these four potential demand reduction programs will require evaluation by individual WMA landowners to determine whether independent pursuit of any of these programs are feasible.

5.2.2.7.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

One or more of these programs may be identifiable as a "project" under CEQA and/or NEPA and would therefore require public notice processes be followed.

5.2.2.7.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Quantification of water savings associated with each of the programs identified under this action would be accomplished as each is assessed for feasibility. If implemented, all would result in reductions to groundwater consumed resulting in the WMA achieving groundwater sustainability.

5.2.2.7.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Appropriate environmental compliance under CEQA and/or NEPA will occur as and when required.

5.2.2.7.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The programs identified under this action would be assessed for feasibility within the first 5-year period of SGMA implementation. Based on the feasibility of each program, implementation could begin as soon as 2025 and could extend beyond 2040.

Independent implementation of any of these programs could occur following adoption of the GSP.

5.2.2.7.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The implementation of demand reduction programs will assist the WMA with reaching sustainability by reducing groundwater consumption to sustainable levels.

Evaluation of the benefits of this action will occur through annual documentation of demand reduction programs and reports documenting the groundwater saved by each program. Benefits from this action will also be evaluated through groundwater measurements.

5.2.2.7.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.2.7.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

Both DEID and WMA landowners can enter into contracts for studying the feasibility of a demand reduction programs and implementing any programs found feasible.

5.2.2.7.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Cost of implementation of this action will be dependent on the cost of implementing each program which will be identified as part of feasibility studies and evaluations associated with each program. Cost to be evaluated include land acquisition, project planning, project development, crop evaluations, conservation measures and program implementation. There may ongoing annual maintenance expenses associated with some of the programs offered in this action.

Funding: It is anticipated that the cost of this action will be included in either the operating budget of the WMA, by individual landowners in the WMA, or through funding from federal, state, or non-governmental organizations grants or other sources.

5.2.2.7.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Not applicable.

5.2.2.7.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.2.8 Action 8 – Mitigation of Identified Adverse Impacts

Mitigation of identified adverse impacts is previously described in **Section 5.2.1.7.** As the WMA is within the DEID GSA boundary, this Mitigation Program will apply to WMA lands.

5.2.3 Richgrove Community Services District Management Area *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

By actions of an executed memorandum of understanding, the RCSD and its service area, which covers the unincorporated community of Richgrove, is a participant in the DEID GSA (see **Appendix D**). The Richgrove community is served by a water system permitted, owned, and operated by the RCSD. The community water system relies exclusively on pumped groundwater as the source of supply, without any rights to surface water.

The purpose of the projects and management actions described in this section of the GSP for the Richgrove Community Services District Management Area (RCSD MA) is to outline the general process and procedures by which development within the RCSD can proceed in a manner consistent with the sustainability goal for the Tule Subbasin. While historical growth within the Richgrove community has been relatively modest, SGMA requires the RCSD MA to address the manner in which they are going to ensure a reliable water supply for both current and future water users within its jurisdiction. This requirement extends to parties and entities desiring to develop within the RCSD MA where demands projected exceed the sustainable yield. The following projects and management actions indicate the approach to meet sustainability recognizing that, in some cases, details associated with specific projects will be generated as future requests for water service and related services are received.

Projects and management actions for the RCSD MA are associated with the following general categories of actions:

- Current Groundwater Supply Optimization
- Development of Additional Groundwater Supplies
- Existing and Future Managed Aquifer Recharge

Successful implementation of the projects and management actions for the RCSD MA will provide for its sustainability.

The following project and management actions have been identified for the RCSD MA:

Action 1 Water conservation programs

Action 2 2020-2025 interim water supply supplement program

Action 3 2025-2040 groundwater recharge projects for future groundwater extraction needs

Action 4 Mitigation of identified adverse impacts

5.2.3.1 Action 1 – Water Conservation Programs

5.2.3.1.1 Description

Optimization of current groundwater supplies used within the RCSD MA will be maintained through current water conservation programs and future work to generate supplemental water conservation elements that will be incorporated into RCSD's adopted water ordinances. These provisions are/shall be constructed such that each dwelling unit, commercial development or industrial enterprise be required to use plumbing fixtures meeting defined levels of conservation potential. These levels are to be achieved by incorporation of conservation principals into the design and selection of plumbing fixtures. Current and future applicants for water service are required to satisfy the specific provisions of the adopted ordinances as a condition of initial and continued service. Demonstrating compliance with a mandated level of water conservation efficiency using fixtures and devices associated with any proposed development will be required.

Conservation provisions of any adopted water ordinances will be revisited on a defined frequency and maintained with respect to the incorporation of Best Available Technology. Conservation elements will be a permanent part of water supply procedures used in RCSD.

Included within Action 1 is the completion of a project to implement full metering of RCSD water service connections and an associated volumetric rate structure. This will allow for the conservation procedures associated with a water meter rate structure to be employed, along with specific conservation enforcement. Meters are installed on all service connections and are subject to technical review for accuracy, operation and replacement. Further, an appropriate volumetric rate structure is currently being evaluated. Rate structure implementation will be a function of successful passage of a Proposition 218 fee or assessment.

5.2.3.1.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Given the need for the RCSD MA to attain and maintain sustainability as required by SGMA, this management action will be implemented as an ongoing practice with additional conservation and project elements added in the future.

5.2.3.1.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the RCSD.

5.2.3.1.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Current water conservation actions are already in place within RCSD. The differential between groundwater pumped and treated wastewater returned to the Tule Subbasin has resulted in a maximum use of 351 acre-feet. When applying the sustainable yield and precipitation accruals on the 308 acres[5] within the RCSD MA, the net maximum current amount of over-pumping of 351 acre-feet is more than the calculated water availability of 243 acre-feet by 108 acre-feet. Each new conservation and project element added will be assessed for water budget impact when proposed by the RCSD.

5.2.3.1.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

All requirements and standards of the SWRCB, Division of Drinking Water will be met.

5.2.3.1.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Implementation of the action is historical and ongoing throughout the GSP implementation period and beyond.

[5] 308 acres x 0.79 acre-feet/acre = 243 acre-feet.

5.2.3.1.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Continued reduction of over-pumping of groundwater in the Tule Subbasin as a result of current and future water conservation measures implemented within RCSD.

Evaluation of the benefits of this action will occur through continued evaluation of annual RCSD groundwater pumping and associated wastewater discharges by RCSD facilities that are returned to groundwater aquifers within the DEID GSA.

Benefits from this action will also be evaluated through groundwater level measurements.

5.2.3.1.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Accomplishments associated with this action will be documented as noted above.

5.2.3.2.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

RCSD has jurisdictional and enforcement rights under Section 61000 et seq of the California Community Services District Law.

5.2.3.2.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: Implementation of current water conservation elements are a part of the current operating budget of the RCSD MA. Future water conservation elements added to existing RCSD water conservation ordinances and policies will be assessed for projected costs and anticipated benefits before implemented.

The current costs associated with water conservation elements implemented within RCSD is unknown at this time.

Funding: The total current cost of Action 1 is budgeted and funded annually and will continue to be funded in this manner in the future. Any additional water conservation elements added in the future will require both initial and ongoing costs to be funded before implementation.

There are four primary categories of funding currently used and will continue to be used to fund this action. These are:

- Revenue from residential water and sewer fees – 2019 budget total = $258,888.
- Revenue from commercial water and sewer fees – 2019 budget total = $ 80,892
- Revenue from late fees charged to customers - 2019 budget total = $5,600.
- Revenue from property taxes and leases – 2019 budget total = $163,139.

5.2.3.2.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

RCSD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.3.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.3.2 Action 2 – 2020-2025 Interim Water Supply Supplement Program

5.2.3.2.1 Description

The RCSD MA proposes to focus on an interim water supply supplement program for the period from 2020-2025 that will provide for a water balance budget where groundwater extractions beyond its historical maximum use are equal to the sum of available water supply inputs. This interim program provides for the purchase of imported water from DEID which will be managed by DEID and based on payment of market-based surface water acquisition prices. As an example, the historical water production and recycled water discharge history has been provided for the RCSD MA for the period from 2016-2018. The differential between groundwater extracted and returns of treated wastewater as groundwater recharge and/or irrigation return flows has resulted in a maximum differential of 351 acre-feet during this period.

A water supply purchase trigger would be based on an exceedance of historical maximum usage. For any prior year in which the annual usage exceeds 351 acre-feet, RCSD MA would be required to purchase supplemental imported supply from DEID. Exceedance above the historical maximum usage would be

allowed to continue, up to a maximum of 41 acre-feet per year. The supplemental imported water purchases would be negotiated, arranged and managed by DEID. The price for the purchase of the supplemental supply shall be established by DEID based on the cost of water supply purchases made by DEID on behalf of RCSD MA.

It is envisioned that this program will be an interim program, having an anticipated 5-year life, with water supply payments from RCSD MA continuing into the future, but with future supply quantities generated through other projects (see Action 3).

The trigger for RCSD MA to purchase supplemental water will involve several response steps. Included will be a reporting procedure by the RCSD MA where it shall provide a monthly total of metered quantities of pumped groundwater, measured quantities of wastewater generated, and the disposition of said wastewater. An exceedance, verified by investigation, will result in a mandatory response by the RCSD MA to participate in purchase of such supplemental quantities of imported water to maintain balance within the DEID GSA boundaries.

5.2.3.2.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Given the need for the RCSD MA to attain and maintain sustainability as required by SGMA, this management action will be implemented immediately.

5.2.3.2.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the RCSD.

5.2.3.2.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Supplemental water required by RCSD MA under Action 2 will provide for the correction of annual groundwater over-pumping that occurs within the RCSD MA through purchase of imported water from DEID. Imported water purchased by RCSD MA and made available by DEID will be added to the DEID GSA water budget through either direct or in-lieu groundwater recharge programs currently in place within DEID.

5.2.3.2.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Potential 218 notices.

5.2.3.2.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This action is proposed as an interim measure that will be implemented between 2020-2025.

5.2.3.2.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Correction of annual groundwater over-pumping beyond the historical maximum that has occurred within the RCSD MA.

Evaluation of the benefits of this action will occur through continued evaluation of annual groundwater pumping and wastewater discharges that are returned to the Tule Subbasin's aquifers. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.3.2.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Accomplishments associated with this action will be documented as noted above.

5.2.3.2.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

RCSD has jurisdictional and enforcement rights under Section 61000 et seq of the California Community Services District Law.

5.2.3.2.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Cost: Implementation of this action will be included in the annual operating budget of the RCSD MA. The annual cost will be determined annually based on the cost of imported supply purchases made by DEID on behalf of RCSD MA.

Funding: Anticipated funding for Action 2 is expected to come from: (1) direct assessments from new water users requesting water service, which will be a condition of service being provided, and (2) revenue from water sales to existing RCSD customers, funded through annual water rates set by the RCSD Board of Directors.

5.2.3.2.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

RCSD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.3.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (c) *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.3.3 Action 3 – Future Development and Implementation of Groundwater Recharge Projects

5.2.3.3.1 Description

Action 3 is the future development and implementation of groundwater recharge projects that will bring the RCSD MA into a sustainable long-term balance condition. It is the long-term goal to develop additional water supplies to meet the needs within the RCSD MA. The nature of these projects will be to provide groundwater recharge to offset RCSD MA groundwater extractions in excess of its sustainable yield and precipitation accruals.

There are three phases anticipated for Action 3: (1) project planning, (2) project construction, and (3) operation, maintenance, and repair of constructed facilities. All three phases will be accomplished in conjunction with DEID.

Planning efforts will begin shortly following approval of the GSP and will be focused on a determination of the proper location of recharge facilities to ensure that they have a direct impact on groundwater extractions within the RCSD MA and to address the capability to deliver purchased imported water supplies to the selected recharge locations. The planning phase will also include identifying potential funding sources to assist the RCSD MA in addressing planning and capital costs associated with project development and implementation. Potential funding sources include the Integrated Regional Water Management Planning, as well as specific funding programs of the State of California designed to address drinking water needs of economically disadvantaged communities. With respect to the latter, the RCSD service area is classified as a severely disadvantaged community relative to economic development criteria. In addition to those external funding efforts, an evaluation of the development of local impact fees will be necessary, both with respect to funding project capital expenses and expenses associated with ongoing project costs, specifically those related to surface water acquisition.

The need for future groundwater recharge projects for the RCSD MA is anticipated to be primarily for the benefit of parties requesting the capability to develop within the RCSD MA. RCSD will remain responsible for the determination of specific criteria that result in proposing the implementing Action 3 projects including negotiations and other interactions with parties requesting service within RCSD MA. Anticipated potential requesting parties are school districts, which would involve increased demand related to changes in average daily attendance on existing school campuses.

On behalf of the RCSD MA, the DEID GSA will monitor the potential of meeting future RCSD MA community water needs through participation in a groundwater credits acquisition program within the Tule Subbasin. Should such a program become available within the Tule Subbasin and a determination is made by the DEID GSA that participation in the program will have of no negative impact to others within the DEID GSA, the RCSD Board of Directors will be given the option of participating in an inter-RCSD MA groundwater credits acquisition program.

5.2.3.3.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the need for the RCSD MA to attain and maintain sustainability as required by SGMA, the planning phase of this action will be implemented immediately, with any identified projects found to be feasible anticipated to be constructed and operated during the period from 2025-2040 and beyond.

5.2.3.3.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the RCSD.

5.2.3.3.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

The water supply impacts associated with future projects that are a result of Action 3 implementation will be identified as part of the feasibility analysis done for each project. As stated above, the intent of any Action 3 projects is to achieve a water balance within the RCSD that demonstrates its long-term sustainability.

With respect to potential participation in a Tule Subbasin groundwater credits acquisition program, said participation could result in an increase in groundwater extractions beyond what would otherwise be extracted without the program. This may require further analysis with respect to any potential undesirable results in any other management area in the DEID GSA and potential mitigation of impacts from increased groundwater extraction.

5.2.3.3.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

All requirements associated with CEQA compliance will be met.

5.2.3.3.6 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

This action is proposed as a long-term measure with planning anticipated to commence immediately. Any projects that ultimately chosen for construction are anticipated to occur from 2025-2040.

5.2.3.3.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Long-term correction of any annual groundwater over-pumping beyond the historical maximum that has occurred within the RCSD MA.

Evaluation of the benefits of this action will occur through continued evaluation of annual groundwater pumping and wastewater discharges that are returned to the Tule Subbasin's aquifers. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.3.3.8 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Accomplishments associated with this action will be documented as noted above.

5.2.3.3.9 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

RCSD has jurisdictional and enforcement rights under Section 61000 et seq of the California Community Services District Law.

Accomplishments associated with this action will be documented as noted above.

5.2.3.3.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Individual project cost of planning, construction, and ongoing operation, maintenance, and repair will be identified in the planning phase of this action.

Funding: Anticipated funding for Action 3 project planning and construction will likely come from funding sources associated with integrated regional water management planning programs or state funds associated with drinking water needs within economically disadvantaged communities' programs. Funding for ongoing operation, maintenance, and repair costs associated with any given project are likely to be funded through development agreements negotiated between interested parties proposing new developments within the RCSD MA and the RCSD.

5.2.3.3.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

RCSD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.3.3.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.3.4 Action 4 – Mitigation of Identified Adverse Impacts

Mitigation of identified adverse impacts is previously described in **Section 5.2.1.7.** As the RCSD MA is within the DEID GSA boundary, this Mitigation Program will apply to RCSD for identified and confirmed adverse impacts to the community water system.

5.2.4 Earlimart Public Utility District Management Area *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

By actions of an executed memorandum of understanding, the EPUD and its service area, which covers the unincorporated community of Earlimart, is a participant in the DEID GSA (see **Appendix C**). The Earlimart community is served by a water system permitted, owned, and operated by the EPUD. The community water system relies exclusively on pumped groundwater as the source of supply, without any rights to surface water.

The purpose of the projects and management actions described in this section of the GSP for the Earlimart Public Utility District Management Area (EPUD MA) is to outline the general process and procedures by which development within the EPUD can proceed in a manner consistent with the sustainability goal for the Tule Subbasin. While historical growth within the Earlimart community has been relatively modest, SGMA requires the EPUD MA to address the manner in which they are going to ensure a reliable water supply for both current and future water users within its jurisdiction. This requirement extends to parties and entities desiring to develop within the EPUD MA where demands projected exceed the sustainable yield. The following projects and management actions indicate the approach to meet sustainability recognizing that, in some cases, details associated with specific projects will be generated as future requests for water service and related services are received.

Projects and management actions for the EPUD MA are associated with the following general categories of actions:

- Current groundwater supply optimization
- Development of additional groundwater supplies
- Existing and future managed aquifer recharge

Successful implementation of the projects and management actions for the EPUD MA will provide for its sustainability.

The following project and management actions have been identified for the EPUD MA:

Action 1 Water conservation programs

Action 2 2020-2025 interim water supply supplement program

Action 3 2025-2040 groundwater recharge projects for future groundwater extraction needs

Action 4 Mitigation of identified adverse impacts

5.2.4.1 Action 1 – Water Conservation Programs

5.2.4.1.1 Description

Optimization of current groundwater supplies used within the EPUD MA will be maintained through current water conservation programs and future work to generate supplemental water conservation elements that will be incorporated into EPUD's adopted water ordinances. These provisions are/shall be constructed such that each dwelling unit, commercial development or industrial enterprise be required to use plumbing fixtures meeting defined levels of conservation potential. These levels are to be achieved by incorporation of conservation principals into the design and selection of plumbing fixtures. Current and future applicants for water service are required to satisfy the specific provisions of the adopted ordinances as a condition of initial and continued service. Demonstrating compliance with a mandated level of conservation efficiency using fixtures and devices associated with any proposed development will be required.

Conservation provisions of any adopted water ordinances will be revisited on a defined frequency and maintained with respect to the incorporation of Best Available Technology. Conservation elements will be a permanent part of water supply process used in EPUD.

Included within the Action 1 is the complete metering of EPUD water service connections. This will allow for the conservation procedures associated with a water meter rate structure to be employed, along with specific conservation enforcement. Timing of full implementation of systems metering will be functions of both funding of the capital cost element and successful passage of a Proposition 218 fee or assessment that will allow implementation of the meter-related rate structure.

5.2.4.1.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Given the need for the EPUD MA to attain and maintain sustainability as required by SGMA, this management action will be implemented as an ongoing practice with additional elements added in the future.

5.2.4.1.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the EPUD.

5.2.4.1.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Current water conservation actions are already in place within EPUD. The differential between groundwater pumped and treated wastewater returned to the Subbasin has resulted in a maximum use of 845 acre-feet. When applying the sustainable yield and precipitation accruals on the 989 acres[6] within the EPUD MA, the net maximum current amount of over-pumping is more than the calculated water availability of 781 acre-feet by 208 acre-feet. Each new conservation and project element added will be assessed for water budget impact when proposed by the EPUD.

5.2.4.1.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

All requirements and standards of the SWRCB, Division of Drinking Water will be met.

5.2.4.1.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

5.2.4.1.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Anticipated benefits include continued reduction of over-pumping of groundwater in the Subbasin as a result of current and future water conservation measures implemented within EPUD.

[6] 989 acres x 0.79 acre-feet/acres = acre-feet 781 acre-feet.

Evaluation of the benefits of this action will occur through continued evaluation of annual EPUD groundwater pumping and associated wastewater discharges by EPUD facilities that are returned to groundwater aquifers within the DEID GSA.

Benefits from this action will also be evaluated through groundwater level measurements.

5.2.4.1.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.4.2.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

EPUD has jurisdictional and enforcement rights under Section 16461 of the California Public Utility District Act.

5.2.4.2.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Implementation of current water conservation elements are a part of the current operating budget of the EPUD. Future water conservation elements added to existing EPUD water conservation ordinances and policies will be assessed for projected costs and anticipated benefits before implemented.

The current costs associated with water conservation elements implemented within EPUD is unknown at this time.

Funding: The total current cost of Action 1 is budgeted and funded annually and will continue to be funded in this manner in the future. Any additional water conservation elements added in the future will require both initial and ongoing costs to be funded before implementation.

There are four primary categories of funding currently used and will continue to be used to fund this action:

- Revenue from water and sewer fees – 2018 budget total = $749,045.
- Revenue from property taxes – 2018 budget total = $12,044.

- Revenue from other sales and services – 2018 budget total = $144,971.
- Unrestricted cash on hand – 2018 budget total = $893,992

5.2.4.2.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

EPUD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.4.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.4.2 Action 2 – 2020-2025 Interim Water Supply Supplement Program

5.2.4.2.1 Description

The EPUD MA proposes to focus on an interim water supply supplement program for the period from 2020-2025 that will provide for a water balance where groundwater extractions beyond its historical maximum use are equal to the sum of available water supply inputs. This interim program provides for the purchase of imported water from DEID which will be managed by DEID and based on payment of market-based surface water acquisition prices. As an example, the historical water production and recycled water discharge history has been provided for the EPUD MA for the period from 2009-2017. The differential between groundwater extracted and returns of treated wastewater as groundwater recharge and/or in-lieu recharge has resulted in a maximum differential of 845 acre-feet during this period.

A water supply purchase trigger would be based on an exceedance of historical maximum usage. For any prior year in which the annual usage exceeds the maximum historical usage of 845 acre-feet, EPUD MA would be required to purchase supplemental imported supply from DEID. Exceedance above the historical maximum usage would be allowed to continue to exist, up to a maximum of 100 acre-feet per year. The supplemental imported water purchases would be negotiated, arranged and managed by DEID. The price for the purchase of the supplemental supply shall be established by DEID based on the cost of water supply purchases made by DEID on behalf of EPUD MA.

It is envisioned that this program will be an interim program, having an anticipated 5-year life, with water supply payments from EPUD MA continuing into the future, but with future supply quantities generated through other projects (see Action 3).

The trigger for EPUD MA to purchase supplemental water will involve several response steps. Included will be a reporting procedure by the EPUD MA where it shall provide a monthly total of metered quantities

of pumped groundwater, measured quantities of wastewater generated, and the disposition of said wastewater. An exceedance, verified by investigation, will result in a mandatory response by the EPUD MA to participate in purchase of supplemental quantities of imported water to maintain balance within the DEID GSA boundaries.

5.2.4.2.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the need for the EPUD MA to attain and maintain sustainability as required by SGMA, this management action will be implemented immediately.

5.2.4.2.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the EPUD.

5.2.4.2.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

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

Any supplemental water required by EPUD MA under Action 2 will provide for the correction of annual groundwater over-pumping that occurs within the EPUD MA through purchase of imported water from DEID. Imported water purchased by EPUD MA and made available by DEID will be added to the DEID GSA water budget through either direct or in-lieu groundwater recharge programs currently in place within DEID.

5.2.4.2.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

Potential Proposition 218 notices.

5.2.4.2.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This action is proposed as an interim measure that will be implemented from 2020-2025.

5.2.4.2.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Correction of any annual groundwater over-pumping beyond the historical maximum that has occurred within the EPUD MA.

Evaluation of the benefits of this action will occur through continued evaluation of annual groundwater pumping and wastewater discharges that are returned to the Tule Subbasin's aquifers. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.4.2.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.4.2.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

EPUD has jurisdictional and enforcement rights under Section 16461 of the California Public Utility District Act.

5.2.4.2.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Implementation of this action will be included in the annual operating budget of the EPUD MA. The annual cost will be determined based on the cost of imported supply purchases made by DEID on behalf of EPUD MA.

Funding: Anticipated funding for Action 2 is expected to come from: (1) direct assessments from new water users requesting water service, which will be a condition of service being provided, and (2) revenue from water sales to existing EPUD customers, funded through annual water rates set by the EPUD Board of Directors.

5.2.4.2.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

EPUD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.4.2.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.4.3 Action 3 – 2025-2040 Groundwater Recharge Projects

5.2.4.3.1 Description

Action 3 is the future development and implementation of groundwater recharge projects that will bring the EPUD MA into a sustainable long-term balance condition. It is the long-term goal to develop additional water supplies to meet the needs within the EPUD MA. The nature of these projects will be to provide groundwater recharge to offset EPUD MA groundwater extractions in excess of its sustainable yield and precipitation accruals.

There are three phases anticipated for Action 3: (1) project planning, (2) project construction, and (3) operation, maintenance and repair of constructed facilities. All three phases will be accomplished in conjunction with DEID.

Planning efforts will begin shortly following approval of the GSP and will be focused on a determination of the proper location of recharge facilities to ensure that they have a direct impact on groundwater extractions within the EPUD MA and to address the capability to deliver purchased imported water supplies to the selected recharge locations. The planning phase will also include identifying potential funding sources to assist the EPUD MA in addressing planning and capital costs associated with project development and implementation. Potential funding sources are within the Integrated Regional Water Management Planning structure coordination, as well as specific funding programs of the State of California designed to address drinking water needs of economically disadvantaged communities. With respect to the latter, the EPUD service area is classified as a severely disadvantaged community relative to economic development criteria. In addition to those external funding efforts, an evaluation of the development of local impact fees will be a necessity, both with respect to funding project capital expenses and expenses associated with ongoing project costs, specifically those related to surface water acquisition.

The need for future groundwater recharge projects for the EPUD MA is anticipated to be primarily for the benefit of parties requesting the capability to develop within the EPUD MA. EPUD will remain responsible for the determination of specifics that result in proposing implementing Action 3 projects including negotiations and other interactions with parties requesting service within EPUD MA. Included within these potential requesting parties are school districts, as a number of projects are currently known to be in the planning phases which involve increased demand both related to changes in average daily attendance on existing school campuses, as well as a planned high school campus within the EPUD.

On behalf of the EPUD MA, the DEID GSA will monitor the potential of meeting future EPUD MA community water needs through participation in a groundwater credits acquisition program within the Tule Subbasin. Should such a program become available within the Tule Subbasin and a determination is made by the DEID GSA that participation in the program will have of no negative impact to others within the DEID GSA, the EPUD Board of Directors will be given the option of participating in an inter-EPUD MA groundwater credits acquisition program.

5.2.4.3.2 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

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

Given the need for the EPUD MA to attain and maintain sustainability as required by SGMA, the planning phase of this action will be implemented immediately, with any identified projects found to be feasible anticipated to be constructed and operated during the period from 2025-2040 and beyond.

5.2.4.3.3 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public notices will be provided as required by law, potential Proposition 218 notices, and standard communication practices of the EPUD.

5.2.4.3.4 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The water supply impacts associated with future projects that are a result of Action 3 implementation will be identified as part of the feasibility analysis done for each project proposed. As stated above, the intent of any Action 3 projects is to achieve a water balance within the EPUD that demonstrates its long-term sustainability.

With respect to potential participation in a Tule Subbasin groundwater credits acquisition program, said participation could result in an increase in groundwater extractions beyond what would otherwise be extracted without the program. This may require further analysis with respect to any potential undesirable results in any other management area in the DEID GSA and potential mitigation of impacts from increased groundwater extraction.

5.2.4.3.5 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(3)** *A summary of the permitting and regulatory process required for each project and management action.*

All requirements associated with CEQA compliance will be met.

5.2.4.3.6 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

This action is proposed as a long-term measure with planning anticipated to commence immediately. Any projects that ultimately chosen for construction are anticipated to occur from 2025-2040.

5.2.4.3.7 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

Long-term correction of any annual groundwater over-pumping beyond the historical maximum that has occurred within the EPUD MA.

Evaluation of the benefits of this action will occur through continued evaluation of annual groundwater pumping and wastewater discharges that are returned to the Tule Subbasin's aquifers. Benefits from this action will also be evaluated through groundwater level measurements.

5.2.4.3.8 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

Accomplishments associated with this action will be documented as noted above.

5.2.4.3.9 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

EPUD has jurisdictional and enforcement rights under Section 16461 of the California Public Utility District Act.

5.2.4.3.10 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Cost: Individual project cost of planning, construction, and ongoing operation, maintenance, and repair will be identified in the planning phase of this action.

Funding: Anticipated funding for Action 3 project planning and construction will likely come from funding sources associated with integrated regional water management planning programs or state funds associated with drinking water needs within economically disadvantaged communities' programs. Funding for ongoing operation, maintenance, and repair costs associated with any given project are likely

to be funded through development agreements negotiated between interested parties proposing new developments within the EPUD MA and the EPUD.

5.2.4.3.11 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(9)** *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

EPUD adjusts expenses and revenues annually to reach a balanced budget. Drought years are managed accordingly, both with respect to maximizing water supplies and fiscal responsibility. This is anticipated to be continued in the future.

5.2.4.3.12 Corresponding Attachments *[Reg. § 354.44(c)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (c)** *Projects and management actions shall be supported by best available information and best available science.*

There are no attachments associated with this action.

5.2.4.4 Action 4 – Mitigation of Identified Adverse Impacts

Mitigation of identified adverse impacts is previously described in **Section 5.2.1.7.** As the EPUD MA is within the DEID GSA boundary, this Mitigation Program will apply to EPUD for identified and confirmed adverse impacts to the water system.

Section 6. Plan Implementation

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6.1 Estimated Cost of Implementation – By Management Area

[23 CCR § 354.6]

23 Cal. Code Regs. § 354.6 Agency information. *When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information:*

(e) *An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs.*

GSP implementation will be conducted under the authority of the DEID GSA and in accordance with the adopted GSP. The cost of implementing the Updated GSP will vary by management area. An estimation of the cost of implementation for each project and management action was provided in **Section 5** and is summarized below:

6.1.1 DEID Management Area

Action 1 - Continued importation and optimization of surface water supplies to meet consumptive use requirements and minimize groundwater pumping: Implementation of this action is an ongoing cost for the DEID, which includes the cost of the water supply as well as the operation and maintenance of the distribution system that includes DEID's dedicated pipelines pumping plants, and regulating reservoirs.. Implementation of this action is anticipated to cost approximately $26,000,000 per year.

Action 2 - Actions to increase imported water quantities above historical operations: The cost is anticipated to primarily be the additional cost of the water supply. Labor expenses to implement the program is negligible. The average annual cost of this action is $72,000.

Action 3 - Continued operations of existing in-district groundwater recharge/banking operations for future groundwater extraction needs: The cost is anticipated to primarily be the additional cost of the water supply. Labor expenses to implement the program are included as a part of Action 1. Implementation of this action is anticipated to cost $136,050 per year.

Action 4 - Actions to increase in-district groundwater recharge/banking operations: The cost is anticipated to be (1) the additional cost of the water supply, (2) capital investment in the acquisition of the land for additional phases, (3) project development costs, and (4) ongoing maintenance. The anticipated average annual cost of the water supply is $767,057. Capital investments costs for the Turnipseed Project-Phases III - VI total $21,372,395. Project development costs for the Turnipseed-Phases III - VI are anticipated to be approximately $19,500,000, of which $,937,035 has already been spent. Ongoing annual maintenance is anticipated to run approximately $150,000 (2022 dollars).

Action 5 - Continued operations of existing out-of-district groundwater banking operations for future augmentation of surface water supplies: The cost is anticipated to primarily be the additional cost of the water supply dedicated to OOD projects. The average annual cost of water banked in OOD projects is projected to be $429,000.

Action 6 - Actions to increase out-of-district groundwater banking operations: The cost is anticipated to primarily be the additional cost of the water supply used for new OOD banking projects. Total cost is unknown at this time.

Action 7 - Implementation of mitigation plan for impacted wells: The cost is preliminary and estimated based on analysis of the number of agricultural (7), domestic (17) and M&I (1) wells potentially impacted. Implementation of this action is anticipated to cost approximately $4,800,000 over the 20-year GSP implementation horizon. This cost estimate is for the entire DEID GSA and is not specific to the DEID MA. As such, mitigation program costs have not been developed for each Management Area at this time.

6.1.2 Western Management Area

Action 1 - Transitional pumping: Mitigation of impacts to the DEID MA as a result of implementation of the GSP projects and management actions including transitional pumping will be evaluated over the planning and implementation horizon. It is expected that the WMA and its pumpers will participate in the mitigation plan being developed to satisfy the requirements of the Monitoring Program Framework as described in **Section 5.** Potential FKC subsidence mitigation associated with impacts caused by WMA pumping is yet to be determined.

Action 2 - Purchases of supplemental surface water supplies: Implementation of this action will be primarily dependent on the cost of water and cost of conveyance, both of which are unknown at this time. A group of landowners in the WMA have begun the process of organizing a new water district, known as the Rio Blanco Water District, to manage water resources in the area and potentially facilitate the purchase of supplemental surface water supplies.

Action 3 - Groundwater projects to enhance groundwater allocations: Cost of implementation of this action will be primarily dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility. All costs associated with this action will be identified through a feasibility study for each proposed project.

Action 4 - Development of tradable groundwater credits: The cost of this action will be the expense of development and implementation of a tradable groundwater credits accounting program plus staff time to operate and maintain the accounting program. Initial accounting program costs are expected to be minimal. The annual operation and maintenance cost of the program is also anticipated to be minimal.

Action 5 - Conjunctive groundwater projects with DEID: Cost of implementation of this action will be dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility. All costs associated with this action will be identified through a feasibility study for each proposed project.

Action 6 - New surface water conveyance projects: Cost of implementation of this action will be dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility. All costs associated with this action will be identified through a feasibility study for each proposed project.

Action 7 - Demand reduction programs: Cost of implementation of this action will be dependent on the cost of implementing each program, which will be identified as part of feasibility studies and evaluations associated with each program. Cost to be evaluated include land acquisition, project planning, project

development, crop evaluations, conservation measures, and program implementation. There may ongoing annual maintenance expenses associated with some of the programs offered in this action.

6.1.3 Earlimart PUD Management Area

Action 1 - Water conservation programs: Implementation of current water conservation elements are a part of the current operating budget of the EPUD. Future water conservation elements added to existing EPUD water conservation ordinances and policies will be assessed for projected costs and anticipated benefits before implemented. The current costs associated with water conservation elements implemented within EPUD is unknown at this time.

Action 2 - 2020-2025 interim water supply supplement program: Implementation of this action will be included in the annual operating budget of the EPUD MA. The annual cost will be determined based on the cost of water supply purchases made by DEID on behalf of EPUD MA.

Action 3 - 2025-2040 groundwater recharge projects for future groundwater extraction needs: Individual project cost of planning, construction, and ongoing operation, maintenance, and repair will be identified in the planning phase of this action.

6.1.4 RCSD Management Area

Action 1 - Water conservation programs: Implementation of current water conservation elements are a part of the current operating budget of the RCSD MA. Future water conservation elements added to existing EPUD water conservation ordinances and policies will be assessed for projected costs and anticipated benefits before implemented. The current costs associated with water conservation elements implemented within RCSD is unknown at this time.

Action 2 - 2020-2025 interim water supply supplement program: Implementation of this action will be included in the annual operating budget of the RCSD MA. The annual cost will be determined based on the cost of water supply purchases made by DEID on behalf of RCSD MA.

Action 3 - 2025-2040 groundwater recharge projects for future groundwater extraction needs: Individual project costs for planning, construction, and ongoing operation, maintenance, and repair will be identified in the planning phase of this action. Treated wastewater from the RCSD Wastewater Treatment Facility is currently encumbered in a contract for irrigation of a nearby field. Upon the expiration of this contract, this treated wastewater will become available for continued aquifer recharge.

6.2 Estimated Cost of Implementation – General Expenses *[23 CCR § 354.6]*

23 Cal. Code Regs. § 354.6 Agency information. *When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information:*

(e) *An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs.*

There will be other GSP implementation costs in addition to specific costs associated with individual project and management actions. The additional costs of GSP implementation are outlined in the following nine categories:

- General and administrative costs
- Groundwater network monitoring and maintenance
- Subbasin groundwater model input and maintenance
- Subbasin coordination activities
- Crop consumptive use data acquisition (LandSAT)
- Sustainability monitoring and enforcement activities
- Public outreach
- Annual reports
- 5-year GSP assessment reports

The above categories of GSP implementation are estimated to cost $300,000 per year and are expected to be funded on an equal, per-acre basis across all acreage in the DEID GSA or by other available fee mechanism. This is expected to be achieved through either a Proposition 218 election, Proposition 26 fee assessment, or from existing agency budgets. Pursuit of an appropriate funding program will begin once the GSP is adopted. Rate payer input will be sought through public meetings and hearings on GSA/GSP funding.

6.3 Schedule of Implementation

A schedule of implementing each project and management action within each of the four management areas in the DEID GSA was provided in **Section 5** and is summarized below:

6.3.1 DEID Management Area

Action 1 - Continued importation and optimization of surface water supplies to meet consumptive use requirements and minimize groundwater pumping: Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

Action 2 - Actions to increase imported water quantities above historic operations: Implementation of the action will be throughout the SGMA implementation period and beyond.

Action 3 - Continued operations of existing in-district groundwater recharge/banking operations for future groundwater extraction needs: Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

Action 4 - Actions to increase in-district groundwater recharge/banking operations: Phases 1, 2 and 3 of the DEID in-district water recharge facilities are currently on-line and fully operational. Phases 4 and 5 are anticipated to be on-line in fall 2022. Other phases are expected to occur throughout the SGMA implementation period and beyond.

Action 5 - Continued operations of existing out-of-district groundwater banking operations for future augmentation of surface water supplies: Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

Action 6 - Actions to increase out-of-district groundwater banking operations: While no specific timeline has been established for future Action 6 projects, it is likely some will occur during the 2020-2040 GSP implementation period and beyond.

6.3.2 Western Management Area

Action 1 – Transitional pumping: Implementation of the action will occur between 2020-2034. The action will result in groundwater extractions being limited to sustainable levels from 2035 onward.

Action 2 – Purchases of supplemental surface water supplies: Implementation of this action will be primarily dependent on the cost of supplemental water supplies and cost of conveyance, both of which are unknown at this time. A group of landowners in the WMA have begun the process of organizing a new water district, known as the Rio Blanco Water District, to manage water resources in the area and potentially facilitate the purchase of supplemental surface water supplies.

Action 3 – Groundwater projects to enhance groundwater allocations: Cost of implementation of this action will be primarily dependent on the cost of land acquisition, project planning, project development and construction. In addition, the cost of annual operations including water purchases and conveyance expenses will also need to be considered when determining project feasibility. All costs associated with this action will be identified through a feasibility study for each proposed project.

Action 4 – Development of tradable groundwater credits: This action is proposed as an ongoing measure that will be implemented throughout 2020-2040 and potentially beyond.

Action 5 – Conjunctive groundwater projects with DEID: Given the desire of WMA landowners to bring new water into their portfolio of available water supplies, it is anticipated that the planning process for this action is intended to begin in 2022 with preparation of a potential recharge site and transmissivity analysis. Depending on the outcome of the analysis, negotiations between DEID and the WMA could proceed immediately to plan, permit, and design a project.

Action 6 – New surface water conveyance projects: Given the desire of WMA landowners to bring new water into their portfolio of available water supplies, it is anticipated WMA landowners will consider the feasibility of the identified conveyance opportunities within the first 5-year period of SGMA implementation. Based on the feasibility of individual conveyance projects, construction could begin as soon as 2025.

Action 7 – Demand reduction programs: The programs identified under this action would be assessed for feasibility within the first 5-year period of GSP implementation. Based on the feasibility of each program, implementation could begin as soon as 2025 and would extend beyond 2040.

6.3.3 Earlimart PUD Management Area

Action 1 - Water conservation programs: Implementation of the action is historical and ongoing throughout the GSP implementation period and beyond.

Action 2 - 2020-2025 interim water supply supplement program: This action is proposed as an interim measure that will be implemented between 2020-2025.

Action 3 - 2025-2040 groundwater recharge projects for future groundwater extraction needs: This Action is proposed as a long-term measure with planning anticipated to commence immediately. Any projects that ultimately chosen for construction are anticipated to occur between 2025-2040.

6.3.4 Richgrove CSD Management Area

Action 1 - Water conservation programs: Implementation of the action is historical and ongoing throughout the SGMA implementation period and beyond.

Action 2 - 2020-2025 interim water supply supplement program: This action is proposed as an interim measure that will be implemented between 2020-2025.

Action 3 - 2025-2040 groundwater recharge projects for future groundwater extraction needs: This action is proposed as a long-term measure with planning anticipated to commence immediately. Any projects that ultimately chosen for construction are anticipated to occur between 2025-2040. Treated wastewater from the RCSD Wastewater Treatment Facility is currently encumbered in a contract for irrigation of a nearby field. Upon the expiration of this contract, this treated wastewater will become available for continued aquifer recharge.

In some instances, the schedule for implementation will be adjusted once feasibility of individual projects and management actions are known. Adjustments may also become advisable due to public input, available funding, additional groundwater data that becomes available through network monitoring, or updated groundwater flow model assessments. Any necessary adjustments will be disclosed in the annual updates or 5-year assessment report as applicable.

6.4 Sources of Funding *[23 CCR § 354.6]*

> **23 Cal. Code Regs. § 354.6 Agency information.** *When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information:*
>
> **(e)** *An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs.*

The DEID GSA has identified the following potential funding sources for GSP implementation:

6.4.1 DEID General Fund

The general costs of implementing the GSP as outlined in **Section 6.2** above for the DEID MA will be funded through the DEID general fund. The amount and length of time that this is the primary funding source for all GSP implementation expenses is anticipated to be limited to 3 to 6 months and will be subject to reimbursement from other identified funding sources. This is exclusive of funding for the DEID MA projects and management actions identified in **Section 5.**

6.4.2 DEID GSA Land-Based Assessment Fees

As noted above, general expenses of the GSP are anticipated to be funded through a per-acre land-based assessment across all acreage in the DEID GSA or other available fee mechanism. This is expected to be achieved through either a Proposition 218 election or a Proposition 26 fee assessment.

6.4.3 Mitigation fees for transitional pumping impacts to DEID MA

Fees associated with mitigation of impacts from the implementation of transitional pumping projects is expected from both the Western MA and other GSAs. The Subbasin groundwater flow model will be used in identifying areas of impact to the DEID MA along with actual groundwater levels and groundwater storage measurements. A Mitigation Plan Framework (**Appendix A-7**) has been developed by the Tule Subbasin GSAs that will be used as the basis for resolving claims that result from the implementation of projects and management actions including transitional pumping.

6.4.4 Federal, state or non-governmental agency funding

Opportunities to gain funding from grant programs to supplement GSP implementation and project construction funding will be sought. Funding for ongoing GSP implementation, specific projects identified in **Section 5** of this GSP, and the development of upland habitat and other wildlife enhancements projects is anticipated. Expertise in identifying grant opportunities and then completing applications will be a part of finding agency and Nongovernmental organizations funding.

The importance and relative impact to the overall DEID GSA annual budget will vary as implementation occurs based on funding availability, necessary refinements to the GSP, and adjustments in project implementation.

6.4.5 Monitoring and Reporting

The GSA will direct the monitoring programs outlined in **Section 4** to track Subbasin conditions related to the four applicable sustainability indicators. Data from the monitoring programs will be evaluated to ensure progress is being made towards sustainability or identify whether undesirable results are occurring. Data will be maintained in the DMS. Data from the monitoring program will be used by the DEID GSA to guide decisions on projects and management actions and prepare annual reports to DWR. This data will also be used to inform stakeholders and entities.

SGMA regulations require that the reports comply with DWR submittal requirements with all transmittals signed by an authorized GSA representative. All reports and data submissions will be available to the public.

The following sections describe the minimum reporting requirements required by SGMA:

6.5 Annual Reports *[23 CCR § 354.2]*

23 Cal. Code Regs. § 356.2 Annual Reports. (e) *Each Agency shall submit an annual report to the Department by April 1 of each year following the adoption of the Plan.*

(a) *General information, including an executive summary and a location map depicting the basin covered by the report.*

(b) *A detailed description and graphical representation of the following conditions of the basin managed in the Plan:*

(1) *Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:*

(A) *Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.*

(B) *Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.*

(2) *Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.*

(3) *Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.*

(4) *Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.*

(5) *Change in groundwater in storage shall include the following:*

(A) *Change in groundwater in storage maps for each principal aquifer in the basin.*

(B) *A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.*

(c) *A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.*

Annual reports will be submitted to the DWR starting on April 1, 2020. The purpose of annual reports is to provide monitoring and total groundwater use data to DWR, compare monitoring data to the sustainable management criteria, and to adaptively manage actions and projects implemented to achieve sustainability. Annual reports will be available to Subbasin stakeholders.

6.6 Five-year GSP Assessment *[23 CCR § 354.4]*

23 Cal. Code Regs. § 356.4 Periodic Evaluation by Agency. *Each Agency shall evaluate its Plan at least every five years and whenever the Plan is amended, and provide a written assessment to the Department. The assessment shall describe whether the Plan implementation, including implementation of projects and management actions, are meeting the sustainability goal in the basin, and shall include the following:*

(a) *A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives, interim milestones and minimum thresholds.*

(b) *A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.*

(c) *Elements of the Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, shall be reconsidered and revisions proposed, if necessary.*

(d) *An evaluation of the basin setting in light of significant new information or changes in water use, and an explanation of any significant changes. If the Agency's evaluation shows that the basin is experiencing overdraft conditions, the Agency shall include an assessment of measures to mitigate that overdraft.*

(e) *A description of the monitoring network within the basin, including whether data gaps exist, or any areas within the basin are represented by data that does not satisfy the requirements of Sections 352.4 and 354.34(c). The description shall include the following:*

(1) *An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of Section 354.38.*

(2) *If the Agency identifies data gaps, the Plan shall describe a program for the acquisition of additional data sources, including an estimate of the timing of that acquisition, and for incorporation of newly obtained information into the Plan.*

(3) *The Plan shall prioritize the installation of new data collection facilities and analysis of new data based on the needs of the basin.*

(f) *A description of significant new information that has been made available since Plan adoption or amendment, or the last five-year assessment. The description shall also include whether new information warrants changes to any aspect of the Plan, including the evaluation of the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results.*

(g) *A description of relevant actions taken by the Agency, including a summary of regulations or ordinances related to the Plan.*

(h) *Information describing any enforcement or legal actions taken by the Agency in furtherance of the sustainability goal for the basin.*

(i) *A description of completed or proposed Plan amendments.*

(j) *Where appropriate, a summary of coordination that occurred between multiple Agencies in a single basin, Agencies in hydrologically connected basins, and land use agencies.*

(k) *Other information the Agency deems appropriate, along with any information required by the Department to conduct a periodic review as required by Water Code Section 10733..*

As required by SGMA, 5-year GSP assessment reports will be provided to DWR starting in 2025. Each 5-year assessment will report on the status of the GSA's GSP in achieving the sustainability goal in the Subbasin. The assessment will include a description of significant new information that has become

available since the GSP adoption or amendment and whether the new information warrants any changes to the GSP.

The DEID GSA will provide both annual reports and 5-year assessments as required by SGMA.

Section 7. References and Technical Studies *[23 CCR § 354.4(b)]*

23 Cal. Code Regs. § 354.4 General Information. *Each Plan shall include the following general information:*

(b) *A list of references and technical studies relied upon by the Agency in developing the Plan. Each Agency shall provide to the Department electronic copies of reports and other documents and materials cited as references that are not generally available to the public.*

The following documents and resources are referenced throughout this GSP, or were otherwise relied upon by the Agency in the development of this GSP:

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Appendix A Tule Subbasin Coordination Agreement

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EASTERN TULE GSA

TRI-COUNTY WATER AUTHORITY GSA

PIXLEY IRRIGATION DISTRICT GSA

LOWER TULE RIVER IRRIGATION DISTRICT GSA

DELANO-EARLIMART IRRIGATION DISTRICT GSA

ALPAUGH GSA

TULARE COUNTY GSA

TULE SUBBASIN COORDINATION AGREEMENT

7/13/2022

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Attachments:

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LIST OF ACRONYMS AND DEFINITIONS

"GSA" - Groundwater Sustainability Agency

"GSP" - Groundwater Sustainability Plan

"Coordination Agreement"

"DWR" - California Department of Water Resources

"Tule Subbasin" or "Tule Basin" - Bulletin 118 Groundwater Basin Number 5-22.13

"Tule Subbasin TAC" - Tule Subbasin Technical Advisory Committee

ACOE - United States Army Corps of Engineers

Alpaugh GSA – Alpaugh Irrigation District Groundwater Sustainability Agency

AWWA – American Water Works Association

BMP – Best Management Practices

CASGEM – California Statewide Groundwater Elevation Monitoring

DCTRA – Deer Creek Tule River Authority

DEID GSA – Delano-Earlimart Irrigation District Groundwater Sustainability Agency

ET - Evapotranspiration

ETGSA – Eastern Tule Groundwater Sustainability Agency

GIS – Geographic Information System

LTGSA – Lower Tule River Irrigation District Groundwater Sustainability Agency

LTRID – Lower Tule River Irrigation District

PIXID GSA – Pixley Irrigation District Groundwater Sustainability Agency

RWQCB – Regional Water Quality Control Board

QA/QC – Quality Assurance/Quality Control

SGMA – Sustainable Groundwater Management Act

TCWA GSA – Tri-County Water Authority Groundwater Sustainability Agency

TRA – Tule River Association

USBR – United State Bureau of Reclamation

USGS – United States Geological Survey

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I. INTRODUCTION

1.1 General (§357.4(a))

Pursuant to 23 Cal. Code Regs. §357.4(a), the GSAs hereby enter into this Coordination Agreement. The Tule Subbasin identified by DWR as No. 5-22-13 of the Tulare Lake Hydrologic Region, **Figure 1-1**, is currently composed of seven GSAs. Each GSA within the Tule Subbasin has previously submitted notice to the Department of its intent to implement and develop its own GSP pursuant to 23 CCR §353.6. As a result, a Coordination Agreement is necessary as multiple GSAs within the Tule Subbasin are developing and implementing independent GSPs. The purpose of this Coordination Agreement is to fulfill all statutory and regulatory requirements related to Intra-basin coordination agreements pursuant to the Sustainable Groundwater Management Act ("SGMA").

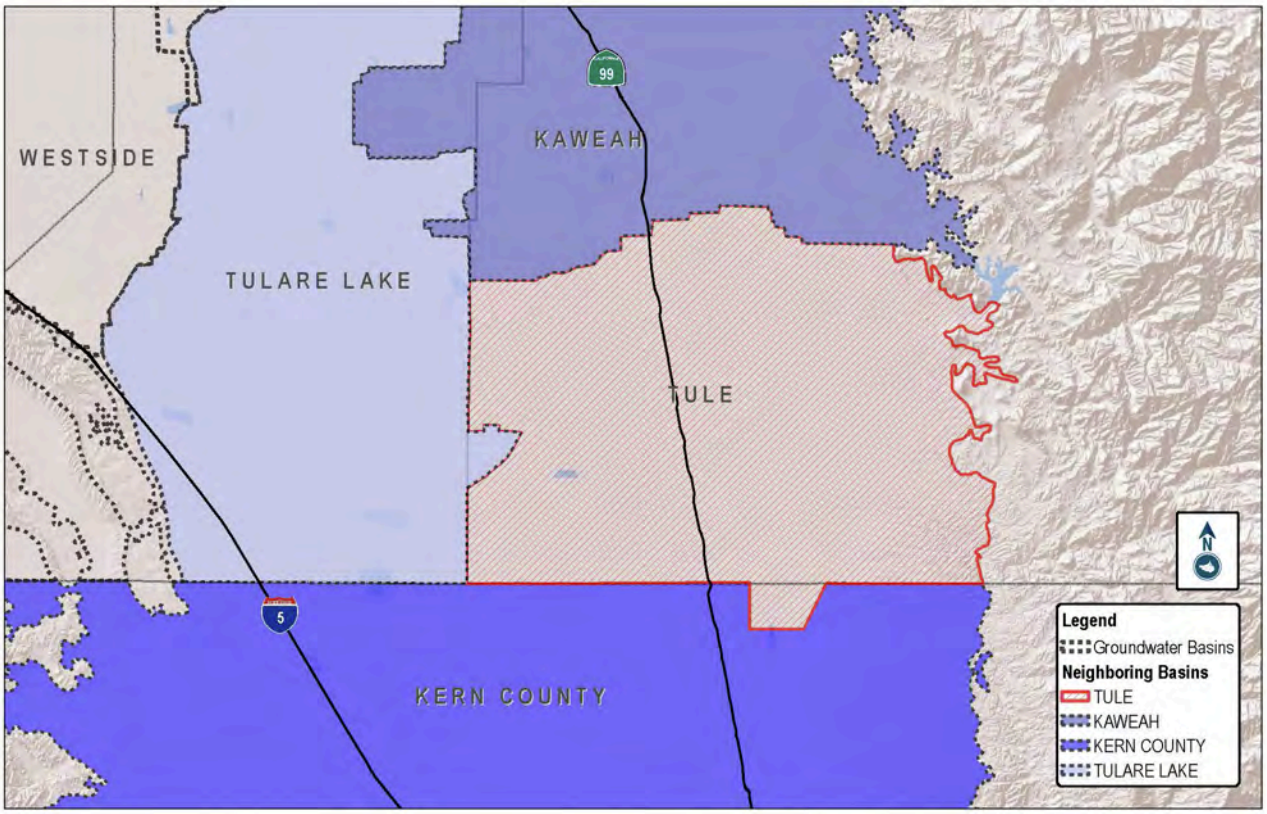

FIGURE 1-1: TULE SUBBASIN

1.2 Parties

The Parties to this Coordination Agreement are the seven (7) exclusive GSAs within the Tule Subbasin identified as follows:

1. Eastern Tule Groundwater Sustainability Agency ("ETGSA"),
2. Tri-County Water Authority Groundwater Sustainability Agency ("TCWA GSA"),
3. Pixley Irrigation District Groundwater Sustainability Agency ("PIXID GSA"),

4. Lower Tule River Irrigation District Groundwater Sustainability Agency ("LTGSA"),
5. Delano-Earlimart Irrigation District Groundwater Sustainability Agency ("DEID GSA"), and
6. Alpaugh Groundwater Sustainability Agency ("Alpaugh GSA")
7. Tulare County Groundwater Sustainability Agency ("Tulare County GSA")

It should be noted the Tulare County GSA has entered into MOUs concerning coverage of territories under adjacent GSPs and although there are seven GSAs there will be six GSPs covering the Tule Subbasin. Hereinafter the foregoing is collectively referred to as "Parties" or "Tule Subbasin GSAs" or individually as "Party", **Figure 1-2**. Collectively, the Parties' jurisdictional areas cover the Tulare Lake Hydrologic Region San Joaquin Valley Groundwater Basin, Tule Subbasin, a groundwater subbasin recognized by DWR as described in Groundwater Bulletin 118 and also identified as Groundwater Basin Number 5-22.13.

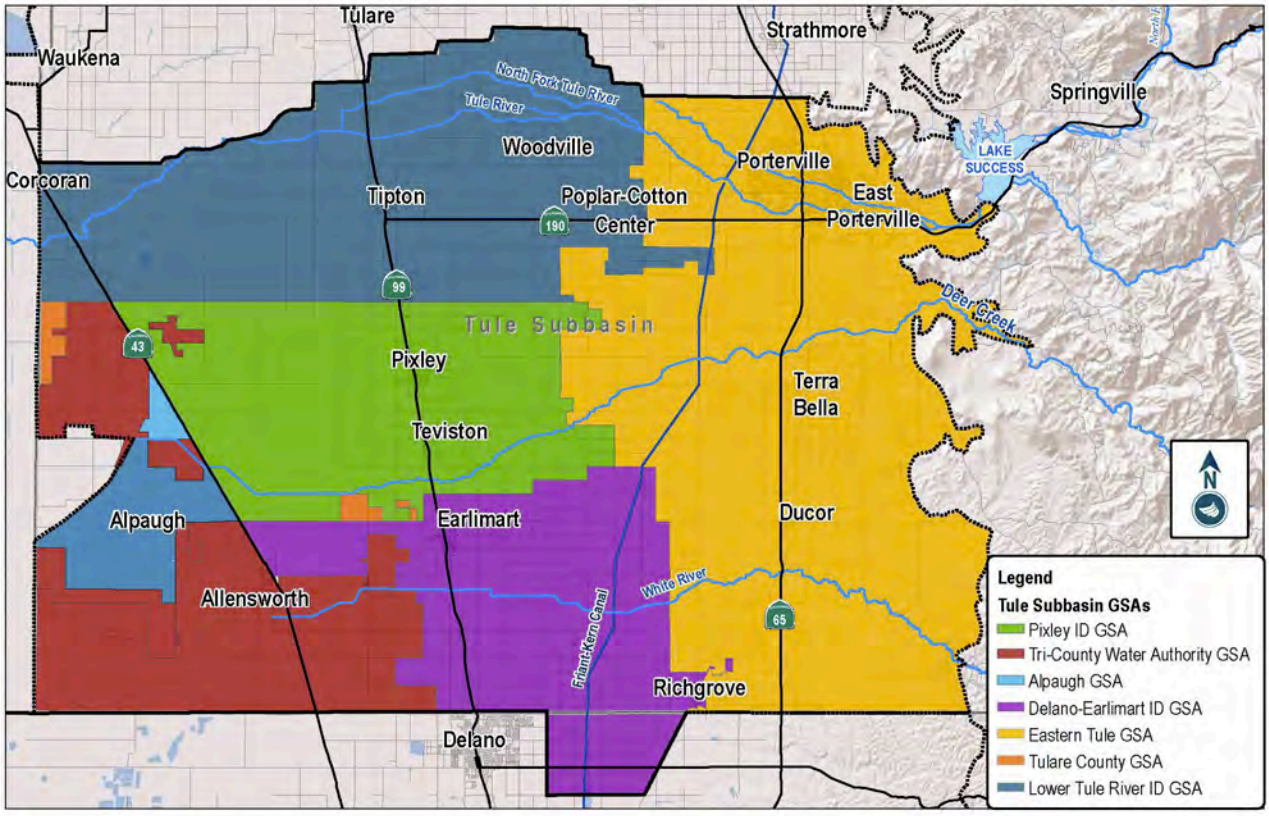

FIGURE 1-2: TULE SUBBASIN GROUNDWATER SUSTAINABILITY AGENCIES

1.3 Plan Manager (§§357.4(b)(1), 351(z))

Pursuant to 23 Cal. Code Regs. §357.4(b) and §351(z), the Plan Manager or point of contact with DWR, who is responsible for reviewing this Agreement and the GSPs prepared by each respective GSA and delegated the authority under this Agreement to submit information on behalf of the GSAs within the Tule Subbasin to DWR, shall be the selected chairperson of the Tule

Subbasin Technical Advisory Committee (TAC), which consists of representatives from each Party. Currently, the Chairperson of the Tule Subbasin TAC is:

David De Groot, Principal Engineer
324 S. Sante Fe, Suite A
Visalia, CA 93292
559-802-3052
davidd@4-creeks.com

The Parties agree that no GSP shall be submitted by the Plan Manager without the prior authority to do so being granted by the respective GSA that prepared that GSP.

1.4 Process for submitting all Plans, Plan amendments, supporting information, monitoring data, annual reports and periodic evaluations. (§357.4(d).)

Pursuant to 23 Cal. Code Regs. §357.4(d), this section describes the process for submitting GSPs, plan amendments, supporting information, monitoring data, and other pertinent information, along with annual reports and periodic evaluations to DWR. Each GSA shall provide to the Chairperson of the Tule Subbasin TAC the approved GSP, any subsequent GSP amendments and supporting information for submittal to the DWR. All GSAs within the Tule Subbasin shall endeavor to complete all GSP requirements in a timely manner.

The Plan Manager shall be responsible for submitting all required information to DWR in compliance with SGMA and 23 Cal. Code Regs. §353.4. No information shall be submitted by the Plan Manager without the prior written authorization of each responsible GSA.

1.4.1 Groundwater Sustainability Plans, Plan Amendments, and Supporting Information (§355.2, §355.10)

The Parties agree that each GSA shall prepare and submit its respective GSP and supporting information to the Tule Subbasin TAC so each GSP can be reviewed by the other GSAs in the Subbasin prior to the GSPs being submitted to the DWR. The Parties shall notify the other GSAs of future amendments and updates to their respective GSPs. The Parties agree that they endeavor to provide each other with as much notice of such amendments and updates as practically possible, but that the baseline, minimum noticing requirements will be what the SGMA Regulations require for public notice. Any plan amendments shall also be circulated to the other GSAs for review and submitted to the Plan Manager for submittal to DWR.

1.4.2 Monitoring Data (§354.40)

Basin-wide monitoring data will be collected in accordance with the Tule Subbasin Monitoring Plan, provided in this Coordination Agreement as **Attachment 1**, and reported to the Tule Subbasin TAC as part of the annual reports described below in compliance with 23 Cal. Code Regs. § 354.40.

If an individual GSA has identified monitoring features for use in collecting data specific to its GSA, and the features are not included in the Subbasin Monitoring Plan of this Coordination

Agreement, then the GSA can incorporate the features and data into its GSP upon confirmation that the monitoring features meet the minimum criteria specified in the Monitoring Plan.

1.4.3 Annual Reports (§356.2)

Pursuant to 23 Cal. Code Regs. § 356.2, annual reports are required to be submitted to DWR by April 1 of each year following the adoption by the GSA of the GSP. Each GSA shall submit annually to the Plan Manager a report to meet these requirements, who will in turn submit the reports to DWR on behalf of the Tule Subbasin. The Tule Subbasin TAC may develop a standardized template for these reports and use by each respective GSA. The annual report shall be separated between a subbasin-wide section and individual GSA specific sections that will be prepared by each respective GSA, but reviewed by the Tule Subbasin TAC prior to submission to DWR for review. The report shall contain the information described below.

- General information summarizing the contents of the report and a map depicting the subbasin.
- Groundwater elevation data from monitoring wells
    - Groundwater elevation contour maps
    - Hydrographs of groundwater elevations and water year type
- Groundwater extraction from preceding water year
- Surface water supply used or available for use for groundwater recharge or in-lieu use
- Total water use
- Changes in groundwater storage
    - Change in groundwater storage maps
    - Graph depicting water year type, groundwater use, annual change in groundwater storage, and cumulative change in groundwater in storage for the basin

In addition, each GSA shall provide a description of the progress towards implementing its respective GSP. The description shall include progress with respect to interim milestones, implementation of projects, and any management actions implemented since the prior annual report.

1.4.4 Periodic Evaluations (§356.4)

Pursuant to 23 Cal. Code Regs. §356.4, periodic evaluations by each GSA are required at least every five years and whenever a GSP is amended. These evaluations shall be provided to DWR.

Each individual GSA shall prepare the required periodic evaluation, in consultation with the Tule Subbasin TAC where subbasin-wide information is required. The evaluations shall be delivered to the Plan Manager for submission to DWR and subject to review by the other subbasin GSAs.

The periodic evaluations shall include all the requirements found in Section 356.4 of SGMA Regulations, including but not limited to the following:

- Groundwater conditions relative to measurable objectives, interim milestones, and minimum thresholds
- Description of project or management action implementations
- GSP elements that are being requested for reconsideration or proposed revision, if any
- Evaluation of the basin setting in light of new information or changes in water use
- Description of the monitoring network as described in **Attachment 1** including:
    - Assessment of monitoring network function
    - Identification of data gaps and program resolving such gaps
    - Plans to install new data collection facilities
    - Adjustments to Monitoring Network
- Description of significant information that has been made available since GSP adoption, amendment, or prior periodic evaluation and if changes to GSP elements are needed
- Description of actions taken by GSA related to GSP
- Enforcement activities, if any, by the GSA
- GSP amendments that have been completed or proposed
- Summary of coordination between GSAs
- Other relevant information

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II. BASIN SETTING (§§354.12-354.20)

Pursuant to 23 Cal. Code Regs. §354.12-354.20, the basin setting components are attached hereto and incorporated by reference as **Attachment 2** and summarized below.

2.1 Physical Setting

The Tule Subbasin is located in the southern portion of the San Joaquin Valley Groundwater Basin in the Central Valley of California. The lateral boundaries of the Tule Subbasin include both natural and political boundaries. The eastern boundary of the Tule Subbasin is defined by the surface contact between crystalline rocks of the Sierra Nevada and surficial alluvial sediments that make up the groundwater basin. The northern boundary is defined by the Lower Tule River Irrigation District (LTRID) and Porterville Irrigation District boundaries. The western boundary is defined by the Tulare County/Kings County boundary, except for a portion of the Tulare Lake Basin Water Storage District that extends east across the county boundary and is excluded from the subbasin. The southern boundary is defined by the Tulare County/Kern County boundary except for the portion of the Delano-Earlimart Irrigation District (DEID) that extends south of the county boundary and is included in the subbasin.

The area of the Tule Subbasin is defined by the latest version of DWR Bulletin 118 and is approximately 744 square miles (475,895 acres). The subbasin has been divided into seven individual GSAs: ETGSA, LTGSA, PIXID GSA, DEID GSA, Alpaugh GSA, TCWA GSA, and the Tulare County GSA. Communities within the subbasin include Allensworth, Alpaugh, Porterville, Tipton, Pixley, Earlimart, Richgrove, Ducor and Terra Bella. Neighboring DWR Bulletin 118 subbasins include the Kern County Subbasin to the south, the Tulare Lake Subbasin to the west, and the Kaweah Subbasin to the north.

2.2 Hydrogeologic Conceptual Model §354.14

The hydrogeologic conceptual model of the Tule Subbasin, as described in **Attachment 2**, has been developed in accordance with the requirements of California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2, Article 5, Subarticle 2 (§354.14) and in consideration of DWR Best Management Practices (BMPs) for the preparation of hydrogeologic conceptual models. The hydrogeologic conceptual model forms the basis for the numerical groundwater flow model of the subbasin.

2.3 Groundwater Conditions §354.16.

Two primary aquifers have been identified within the Tule Subbasin: an upper unconfined to semi-confined aquifer and a lower semi-confined to confined aquifer. The upper and lower aquifers are separated by the Corcoran Clay confining unit in the western portion of the subbasin. Groundwater within the southeastern portion of the subbasin is also produced from the Santa Margarita Formation, which is located stratigraphically below the lower aquifer.

In general, groundwater in the Tule Subbasin flows from areas of natural recharge along major streams at the base of the Sierra Nevada Mountains on the eastern boundary towards a groundwater pumping depression in the western-central portion of the subbasin. Groundwater

level changes observed in wells completed in the upper aquifer show a persistent downward trend between approximately 1987 and 2017, despite a relatively wet hydrologic period between 1991 and 1999 and other intervening wet years (2005 and 2011). Groundwater level trends in wells perforated exclusively in the lower aquifer vary depending on location in the subbasin. In the northwestern part of the subbasin, lower aquifer groundwater levels have shown a persistent downward trend from 1987 to 2017. In the southern part of the subbasin, groundwater levels were relatively stable between 1987 and 2007, but began declining after 2007.

Changes in groundwater storage within the Tule Subbasin have been estimated through analysis of the water budget. Comparison of the groundwater inflow elements of the water budget with the outflow elements shows a cumulative change in groundwater storage over the 31-year period between 1986/87 and 2016/17 of approximately -4,948,000 acre-ft. The average annual change in storage resulting from the groundwater budget is approximately -160,000 acre-ft/yr.

Seawater intrusion cannot occur in the Tule Subbasin due to its location with respect to the Pacific Ocean.

Groundwater quality in the Tule Subbasin is generally very good and does not prevent the beneficial use of the water in most places. The primary exception is perched and upper aquifer groundwater in the southwest portion of the subbasin, where the beneficial use designation has been removed by the State Water Resources Control Board. The primary groundwater quality issues that could affect the beneficial uses of groundwater in the future are nitrate and pesticides. Point sources of contamination have been identified in some parts of the subbasin, but they are highly localized problems.

Land surface subsidence resulting from lowering the groundwater level from groundwater production has been well documented in the Tule Subbasin. Since 1987, the highest rates of land subsidence have occurred in the northwestern portion of the subbasin and in the vicinity of the Friant-Kern Canal near Terra Bella.

Groundwater dependent ecosystems require shallow groundwater or groundwater that discharges at the land surface. Throughout the Tule Subbasin, the depth to groundwater is well below the level required to support riparian vegetation (vegetation that draws water directly from groundwater) or near surface ecosystems, except some areas along the Tule River, east of Porterville.

2.4 Water Budget §354.18.

A detailed surface water and groundwater budget has been developed for the Tule Subbasin for the 31-year period from 1986/87 to 2016/17. The surface water budget includes the following inflow and outflow terms:

Surface Water Inflow

- Precipitation
- Stream inflow
- Imported water

- Discharge to the land surface from wells

Surface Water Outflow

- Infiltration of precipitation
- Evapotranspiration of precipitation from native vegetation and crops
- Stream infiltration
- Canal losses
- Recharge in basins
- Deep percolation of applied water
- Crop consumptive use

The groundwater budget describes the sources and estimates the volumes of groundwater inflow and outflow within the Tule Subbasin. The groundwater budget includes the following inflow and outflow terms:

Groundwater Inflow

- Areal recharge from precipitation
- Recharge in stream/river channels
- Managed recharge in basins
- Canal losses
- Deep percolation of applied water
- Release of water from compression of aquitards
- Subsurface inflow

Groundwater Outflow

- Groundwater pumping
- Evapotranspiration
- Subsurface outflow

A fundamental premise of the groundwater budget is the following relationship:

Inflow – Outflow = +/- ΔS

The difference between the sum of groundwater inflow terms and the sum of groundwater outflow terms is the change in groundwater storage (ΔS). The cumulative change in groundwater storage over the 31-year period between 1986/87 and 2016/17 in the Tule Subbasin was approximately -4,948,000 acre-ft. The average annual change in storage resulting from the groundwater budget is approximately -160,000 acre-ft/yr.

In the Tule Subbasin, sources of groundwater recharge (i.e. inflow) that are associated with pre-existing surface water rights and imported water deliveries are not used to estimate the Sustainable Yield of the subbasin.

III. COORDINATED DATA AND METHODOLOGIES (§357.4(b)(3).)

3.1 General

This section of the Coordination Agreement describes the types of data to be collected and the data collection and analysis methodologies to be utilized to satisfy requirements for the preparation of GSPs and annual reports.

Pursuant to Water Code Section 10727.6, GSAs intending to develop and implement multiple GSPs are required to coordinate with other agencies preparing a GSP within the basin to ensure that the various GSPs utilize the same data and methodologies for the following assumptions in developing the GSP:

a) Groundwater elevation data;
b) Groundwater extraction data;
c) Surface water supply;
d) Total water use;
e) Change in groundwater storage;
f) Water budget; and
g) Sustainable yield.

3.2 Groundwater Elevation (§357.4(b)(3)(A))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(A), the following describes how the GSAs have used the same data and methodologies for groundwater elevation, which is supported by the quality, frequency and spatial data in the monitoring network and monitoring objectives. Groundwater elevation data to be relied on for the purpose of determining minimum thresholds, estimating change in groundwater storage as required for annual reports, and measuring progress towards achieving sustainability will be collected from the minimum monitoring well network identified in the Tule Subbasin Monitoring Plan (see **Attachment 1**).

The Tule Subbasin shall use the following data and methods to measure or estimate groundwater elevations:

3.2.1 Data and Monitoring Protocols

Groundwater elevation data to be relied on for the purpose of determining minimum thresholds, estimating change in groundwater storage as required for annual reports, and measuring progress towards achieving sustainability will be collected from the minimum monitoring well network. Groundwater elevation monitoring protocols and measurement frequencies are described in detail in the Tule Subbasin Monitoring Plan (**Attachment 1**).

The monitoring well network for collection of groundwater elevation data may consist of a combination of existing wells and new dedicated monitoring wells. In order to be included in the well network for collecting groundwater elevation data, each monitoring well must meet the following minimum criteria:

3.2.1.1 *Existing Wells*

Preference will be given where feasible to existing wells that are not actively pumped as they provide the most representative static groundwater level data. Monitoring of groundwater levels in existing wells that are actively pumped must be conducted in accordance with the monitoring procedures specified in the Tule Subbasin Monitoring Plan (**Attachment 1**).

The location (i.e. X-Y Coordinates) of existing wells to be included in the monitoring well network must be surveyed to the nearest 1 foot (NAD83) by a California licensed land surveyor. The elevation of the reference point (i.e. the Z Coordinate) shall be surveyed to an accuracy of 0.1 foot relative to mean sea level (NAVD88) by a California licensed land surveyor.

The construction of each existing well must be documented and confirmed to the satisfaction of the Tule Subbasin TAC's technical consultant. Construction information shall include:

- The total well depth,
- The perforation interval(s),
- The casing diameter,
- Depth intervals of all seals,
- Pump setting (if applicable).

If these data are not known or cannot be confirmed, the well must be investigated in the field to be considered for inclusion in the monitoring well network. Any field investigation must be conducted with the consent of the landowner and/or well owner. All field verification of the wells will be collected utilizing professional staff that are trained and experienced in the use of the equipment used to measure well depth and inspect wells, and who meet the minimum qualifications and training requirements required by the Tule Subbasin TAC technical consultant. Field verification of the wells identified in the Tule Subbasin Monitoring Plan will be conducted by a technical consultant of the Tule Subbasin TAC. A GSA may hire and use its own technical consultant, who meets minimum qualifications and training requirements required by the Tule Subbasin TAC consultant, to collect data from wells within its GSA's boundaries, that a GSA may choose to monitor in addition to the wells identified in the Tule Subbasin Monitoring Plan. Each GSA shall be provided notice of when the Tule Subbasin TAC consultant will be conducting field verification or measurements and a GSA may have its consultant quality control check the Tule Subbasin TAC's consultant's work. Furthermore, nothing in this Agreement prevents multiple GSAs from using the same consultant to conduct field verification.

Field verification will consist of obtaining a downhole video log of the full length of blank and perforated well casing. If the well is equipped with a pump, the pump shall be removed prior to obtaining the downhole video log. The video camera equipment shall be equipped with side-scan capability in order to view the condition and depth of well perforations. Existing wells for which adequate documentation is not available, as determined by the Tule Subbasin TAC's technical consultant, will not be included in the groundwater level monitoring network. Further, wells for which the owner does not provide access, does not voluntarily remove the pump for investigating the well, or does not otherwise provide consent to investigate the well will not be included in the groundwater level monitoring network.

An established and acceptable sounding access tube or port shall be available for the purpose of measuring groundwater levels. Sounding tubes that are separate and outside the main well casing (i.e. enter the well casing from the outside at depth) will be preferred. Sounding tubes located within the main well casing are acceptable if they extend past the pump intake depth. The sounding tube shall be free and clear and allow for collection of representative groundwater level measurements without the risk of damaging the sounder.

Only wells perforated exclusively in either the upper aquifer (as defined in **Attachment 1**) or lower aquifer (as defined in **Attachment 1**) will be included in the monitoring well network. Wells constructed with perforations across multiple aquifers in a single casing string (i.e. "composite wells") will not be included in the monitoring network for measuring groundwater elevations unless authorized by the Tule Subbasin TAC.

Groundwater elevation data has historically been obtained via monitoring programs conducted under other local State and Federal programs such as the Regional Water Quality Control Board (RWQCB) General Order for Dairies, California Statewide Groundwater Elevation Monitoring (CASGEM) program, Bureau of Reclamation, and others. Existing wells that have been monitored as part of these programs will be considered for the Tule Subbasin monitoring network as long as they meet the criteria specified in this section.

3.2.1.2 *New Wells*

New monitoring wells will either be constructed in the upper aquifer, lower aquifer, or Santa Margarita Formation aquifer (as defined in **Attachment 1**). New wells shall not be constructed as composite wells. The exact depth and perforation intervals of these wells will be determined from site-specific data collected during the drilling of the boreholes for the wells.

New monitoring wells will be constructed with minimum 4-inch diameter casing in order to allow for collection of groundwater samples.

Each new monitoring well will be constructed with a steel above-ground riser equipped with a protective locking cap for keeping the wellhead secure. The above-ground riser will be surrounded by cement-filled steel bollards for further protection.

A dedicated reference point shall be established and marked on the top of the monitoring well casing. All groundwater level measurements shall be obtained relative to the reference point. The elevation of the reference point shall be surveyed to an accuracy of 0.1 foot relative to mean sea level (NAVD88) by a California licensed land surveyor.

3.2.2 Quality Assurance/Quality Control

All groundwater elevation data will be collected utilizing professional staff that are trained and experienced in the use of the monitoring equipment and who meet the minimum qualifications and training requirements required by the Tule Subbasin TAC technical consultant. All data collection required for the Tule Subbasin Monitoring Plan ("Baseline Monitoring") will be performed either by the Tule Subbasin TAC technical consultant or a consultant hired direct by

the GSA. If the GSA utilizes the Tule Subbasin TAC technical consultant, each GSA shall be notified in advance of when such data collection will occur within that respective GSA's boundaries and each GSA may hire its own consultant for quality control and peer review the work of the Tule Subbasin TAC technical consultant. If the GSA hires and uses its own consultant, who meets the same minimum qualifications and training requirements required by the Tule Subbasin TAC consultant, to collect data for monitoring features within its GSA's boundaries, all data shall be submitted per the data management requirements and schedule. Furthermore, nothing in this Agreement prevents multiple GSAs from using the same consultant to collect such data. General and basin-wide data will be collected by and/or provided to the Tule Subbasin TAC's consultant in accordance with the protocols specified in the Tule Subbasin Monitoring Plan (**Attachment 1**). The goal of the GSAs is to maintain the integrity of the data by following the above described procedures for collection of Baseline Monitoring data and additional data within each GSA that will provide additional information for the benefit of the Subbasin.

By December 1 following a water year, all groundwater elevation data produced by the GSAs shall be submitted to the Tule Subbasin TAC's technical consultant for input into the Tule Subbasin Water Management Database (**Attachment 1**). All groundwater elevation data shall be subject to Quality Assurance/Quality Control (QA/QC) checks by the Tule Subbasin TAC's technical consultant. QA/QC may include (but not necessarily be limited to):

- Verification of reference point survey data
- Verification of groundwater level measurement methodology
- Review of calculations to convert groundwater depth to groundwater elevation
- Comparison of data with previous measurements to identify outliers

Data from wells that have not been included in the Tule Subbasin Monitoring Plan or do not follow the above-described procedures, shall not be relied on for making basin management decisions and shall not be used in the analyses necessary for completion of GSPs or annual reports. No wells will be added or removed from the groundwater elevation network without the prior approval of the Tule Subbasin TAC. All monitoring wells to be added to the monitoring network shall meet the criteria specified in this section. Upon such time as wells are added or removed from the monitoring network, the Tule Subbasin Monitoring Plan (**Attachment 1**) will be revised to reflect the changes.

Individual GSAs may include additional monitoring features, not specifically identified in the Tule Subbasin Monitoring Plan, for collecting data to include in their respective GSPs and annual reports. Tule Subbasin GSAs may collect more GSA-specific data utilizing the same methodologies and may supply applicable information to the Tule Subbasin TAC's technical consultant for the benefit of basin-wide information. The technical consultant will compile the groundwater elevation data into a relational database to be maintained by the consultant in accordance with **Attachment 1**.

3.3 Groundwater Extraction (§357.4(b)(3)(B))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(B), this section outlines the approved methodologies for measuring or estimating groundwater extraction in the Tule Subbasin. The

GSAs shall use either satellite remote sensing technology or metered wells to estimate groundwater extraction as described below:

3.3.1 Data and Monitoring Protocols

3.3.1.1 *Groundwater Extraction Estimated from Satellite Data*

In this method, groundwater extraction is estimated as a function of the total agricultural water demand, surface water deliveries, and precipitation. This method is specific to agricultural groundwater extraction (as opposed to municipal groundwater extraction). The total agricultural water demand (i.e. applied water demand) is estimated as follows:

$$W_d = \frac{A_i \, x \, ET}{I_{eff}}$$

Where:

W_d = Total Agricultural Water Demand (acre-ft)
A_i = Irrigated Area (acres)
ET = Evapotranspiration (acre-ft/acre)
I_{eff} = Irrigation Efficiency (unitless)

Crop evapotranspiration (ET) is estimated using remote sensing data from LandSAT satellites. The satellite data is entered into a model, which is used to estimate the ET rate and ET spatial distribution of an area in any given time period. When appropriately calibrated to land-based ET and/or climate stations and validated with crop surveys, the satellite-based model provides an estimate of crop ET (i.e. consumptive use). The satellite-based model is representative, verifiable, and can be accomplished uniformly across the Tule Subbasin by an independent third party. The Tule Subbasin TAC will provide this data for all GSAs.

Irrigation efficiency (I_{eff}) is estimated for any given area based on the irrigation method for that area (e.g. drip irrigation, flood irrigation, micro sprinkler, etc.). Irrigation methods are tied to crop types based on either DWR land use maps or field surveys. The following irrigation efficiencies will be applied to the different irrigation methods based on California Energy Commission (2006):

- Border Strip Irrigation – 77.5 percent
- Micro Sprinkler – 87.5 percent
- Surface Drip Irrigation – 87.5 percent
- Furrow Irrigation – 67.5 percent

Agricultural groundwater extraction is estimated as the total applied water demand (W_d) minus surface water deliveries and effective precipitation. Effective precipitation is the portion of precipitation that becomes evapotranspiration.

3.3.1.2 *Groundwater Extraction Measured Using Flow Meters*

For this method, groundwater extraction is measured using a totalizing flowmeter. The GSAs agree that for metering to be effective, any well in a GSA that chooses this method and pumps over 70 gallons per minute, or an annual total of two (2) acre-ft per year, shall be metered. The GSAs also agree that as a Subbasin-wide standard, meters installed shall be calibrated, certified, and periodically tested following the guidance of American Water Works Association (AWWA) Standard M6 – Water Meters, Selection, Installation, Testing and Maintenance (AWWA, 2012) and the AWWA standards referenced therein for the types of inline meters employed (AWWA C700 series standards). Copies of all meter calibration and testing reports shall be submitted to the Tule Subbasin TAC's technical consultant for review and documentation.

3.3.2 Quality Assurance/Quality Control

By January 1 following a water year, all groundwater extraction data produced by the GSAs shall be submitted to the Tule Subbasin TAC's technical consultant for input into Tule Subbasin Water Management Database (see Section 4.3).

All groundwater extraction data will be subject to QA/QC checks and verification by the Tule Subbasin TAC's technical consultant. QA/QC could include (but not necessarily be limited to):

- Field inspection and verification of inline flow meters.
- Review of flow meter calibration and testing reports.
- Review of groundwater extraction estimates using satellite data.

3.4 Surface Water Supply (§357.4(3)(b)(B))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(B), the GSAs agree the total surface water supply to the Tule Subbasin will be the sum of supplies from stream inflow, imported water, and delivered recycled water. Surface water supplies will be compiled annually by the Tule Subbasin TAC consultant from the following sources:

- Tule River inflow to the Subbasin – Tule River Association (TRA) Annual Reports
- Tule River flow from ETGSA to LTGSA – TRA Annual Reports
- Deer Creek inflow to the Subbasin – United States Geological Survey (USGS) Stream Gage at Fountain Springs
- Deer Creek flow from ETGSA to PID GSA – Trenton Weir as provided by Pixley Irrigation District
- Deer Creek flow to downstream license holders in the Tule Subbasin – measured by TCWA GSA
- White River inflow to the Subbasin – Estimated by the Tule Subbasin TAC consultant based on flows measured in Deer Creek
- White River flow from ETGSA to DEID GSA – Estimated by the Tule Subbasin TAC consultant based on an analysis of infiltration or data from White River at Road 208 (from DEID or California Data Exchange Center), as available.

The Tule Subbasin shall use the following data and methods to measure or estimate surface water supply:

3.4.1 Data and Monitoring Protocols

3.4.1.1 *Stream Inflow*

3.4.1.1.1 *Tule River*

Streamflow in the Tule River is recorded as releases from the Lake Success Reservoir and reported in the TRA annual reports. Diversions from the Tule River between Lake Success and Oettle Bridge are documented in TRA annual reports and described in Section 2.6.1.1 of the Monitoring Plan.

Native Tule River water flow in the Tule River channel from the ETGSA to the LTGSA will be recorded as the flow at Rockford Station minus assumed channel losses between the Rockford Station stream gage and Oettle Bridge, as reported in TRA annual reports.

Tule River gaged flow into the LTGSA is assumed to be the sum of gaged surface water measured Below Oettle Bridge, Woods Central Ditch Diversion, Poplar Irrigation Company flow reaching LTGSA, and Porter Slough at 192, as reported in TRA annual reports. Diversions of native Tule River water in the LTGSA will be recorded using the following ratio:

$$\frac{TR_{Gaged}}{TR_{Gaged} + FK_{LTRID}} \; x \; LTRID \; deliveries = TR_{delivered}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK_{LTRID}	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
LTRID deliveries	=	Total water deliveries to farmers in the LTRID (acre-ft).
$TR_{delivered}$	=	Assumed portion of LTRID delivered water that is native Tule River water (acre-ft).

Any residual stream flows left in the Tule River after diversions and channel loss are measured at the Turnbull Weir, located at the west end of the LTGSA and the Tule Subbasin. This stream outflow from the Subbasin will be the same as reported in TRA annual reports. Exports of Tule River water to the Friant-Kern Canal will be the same as reported in TRA annual reports.

3.4.1.1.2 *Deer Creek*

Streamflow in Deer Creek is measured by the USGS at their gaging station at Fountain Springs. Stream inflow from Deer Creek into the Tule Subbasin is recorded as the flow at the USGS Fountain Springs stream gage. It is noted that although the Fountain Springs gage is located

approximately five miles upstream of the Tule Subbasin boundary, the creek flows over granitic bedrock between the gage and the alluvial basin boundary and losses along this reach are assumed to be limited to evapotranspiration. Evapotranspiration losses between the Fountain Springs gage and the Trenton Weir are assumed to be 30 acre-ft/month when the gaged flow at Fountain Springs is greater than 30 acre-ft/month. When the gaged flow at Fountain Springs is less than 30 acre-ft/month the evapotranspiration is assumed to be equal to the gaged flow.

Deer Creek stream flow from the ETGSA to the PID GSA will be recorded as the flow at Trenton Weir as reported in the Pixley Irrigation District annual water use summaries. J.G. Boswell Company and Angiola Water District hold licenses on Deer Creek and those flows will be reported by TCWA GSA.

3.4.1.1.3 *White River*

Stream inflow into the Tule Subbasin (and ETGSA) from the White River has historically been measured at the USGS stream gage near Ducor. The measured data from this station is only available from 1971 to 2005. For years with no stream flow data, it is assumed that the magnitude of flow in the White River is proportional to the magnitude of flow in Deer Creek. A linear regression analysis of monthly White River streamflow plotted against monthly Deer Creek streamflow for the period 1971 to 2005 results in a correlation coefficient of 0.91. Accordingly, monthly stream flow in the White River will be reported using the following equation from the linear regression:

$$SF_{WR} = 0.3523(SF_{DC}) - 1.1215$$

Where:

SF_{WR} = Stream flow in the White River (Acre-ft).
SF_{DC} = Stream flow in Deer Creek (Acre-ft).

This method will be used to record stream inflow from the White River until a stream gage is established in the river near the eastern subbasin boundary.

White River stream flow from the ETGSA to the DEID GSA will be estimated as the White River inflow into the Subbasin minus evapotranspiration loss and minus an assumed infiltration rate between the eastern subbasin boundary and the DEID GSA boundary. Evapotranspiration losses between the Subbasin boundary and the DEID GSA are estimated to be 14 acre-ft/month when the flow at the boundary is greater than 14 acre-ft/month and equal to the flow in the river when the flow is less than 14 acre-ft/month. Channel loss within the ETGSA is estimated as the total flow minus ET up to 1,190 acre-ft/month. If flows exceed 1,190 acre-ft/month, the balance, up to 9,000 acre-ft/month, is assumed to infiltrate within the DEID GSA. If measured flow at the USGS stream gage near Ducor or interpolated flows, based on the linear regression described above, exceed 9,000 acre-ft in any given month, the volume over 9,000 acre-ft is assumed to infiltrate within the TCWA GSA.

3.4.1.2 *Imported Water*

Imported water delivered to the various agencies within the seven GSAs of the Tule Subbasin will be reported on an annual basis by the agencies receiving deliveries.

3.4.1.3 *Recycled Water*

Recycled water consists of treated wastewater generated at the City of Porterville's Wastewater Treatment Facility and other treatment facilities within the Subbasin. Most of the water from subbasin facilities is delivered to crops in the area. In the case of the City of Porterville, the balance is allowed to infiltrate into the subsurface in recharge ponds located in the old Deer Creek channel. The volume of recycled water delivered to crops shall be measured using an in-line calibrated flow meter. Monthly water deliveries will be provided on an annual basis by the City of Porterville, community services districts, and public utility districts within the Subbasin.

3.4.2 Quality Assurance/Quality Control

The Tule Subbasin GSAs assume that the QA/QC procedures in place by the various entities acting as sources of data, including the TRA, USGS, United States Bureau of Reclamation (USBR), United States Army Corps of Engineers (ACOE), Angiola Water District, City of Porterville, and any other entity upon which the GSAs rely for monitoring surface water flowing in and out of the Subbasin, are satisfactory and will not cause any undue compromise of the data relied upon to calculate total surface water supply.

Surface water supply data will be obtained from the various sources of data by the Tule Subbasin TAC's technical consultant and entered into the Tule Subbasin Water Management Database (see Section 4.3). Surface water supply data will be made available to each GSA by February 1 following the end of a water year.

3.5 Total Water Use (§357.4(b)(3)(B))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(B), the GSAs agree the total water use, as defined herein, is based on 23 Cal. Code Regs. §356.2(b)(4), which provides: "Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements." Total water use is the total water demand, including consumptive use.

The Tule Subbasin shall use the following data and methods outlined in **Attachment 1** to measure or estimate total water use, briefly described below:

3.5.1 Data and Monitoring Protocols

3.5.1.1 *Agricultural Water Use*

3.5.1.1.1 *Agricultural Water Demand*

Agricultural water demand will be the sum of groundwater extractions (see Section 3.3) and surface water deliveries from stream sources, imported water, and recycled water (Sections 3.4.1.1, 3.4.1.2 and 3.4.1.3).

3.5.1.1.2 *Agricultural Consumptive Use*

Crop consumptive use will be estimated using the method described in Section 3.3.1.1.

3.5.1.2 *Municipal and Industrial Water Use*

3.5.1.2.1 *M&I Water Demand*

Municipal water demand will be the sum of metered groundwater production from the following communities:

ETGSA

1. City of Porterville
2. Community of East Porterville
3. Terra Bella Irrigation District
4. Ducor Community Services District

LTGSA

1. Tipton Public Utility District
2. Woodville Community Services District
3. Poplar Community Services District

PIXID GSA

1. Pixley Public Utility District
2. Teviston Community Services District

DEID GSA

1. Earlimart Public Utility District
2. Richgrove Community Services District

Alpaugh GSA

1. Alpaugh Community Services District

TCWA GSA

1. Allensworth Community Services District

Tulare County GSA
(None)

3.5.1.2.2 *M&I Consumptive Use*

Consumptive use of landscaping associated with applied municipal groundwater pumping will be estimated based on an assumed percentage of delivered water that is applied to landscaping and an assumed deep percolation factor. It is assumed 47 percent of municipal water use is applied to landscaping. It is assumed that 75 percent of applied water to landscaping is consumptively used by the plants.

The total municipal consumptive use for any one of the communities in the Subbasin is the sum of landscape consumptive use and evaporation of surface water in that community's wastewater treatment facility discharge basins.

3.5.2 Quality Assurance/ Quality Control

By January 1 following a water year, the total water use from each GSA shall be submitted to the Tule Subbasin TAC's technical consultant for review and input into the Tule Subbasin Water Management Database (see Section 4.3).

Total water use will be calculated by individuals from each GSA who meet the minimum qualifications and training requirements. Total water use will be checked by the Tule Subbasin TAC's technical consultant to ensure consistency with the methods described in this Coordination Agreement and to verify that the consumptive use estimates are consistent with satellite data.

3.6 Change in Groundwater Storage (§357.4(b)(3)(B))

The Tule Subbasin shall use the following data and methods to measure or estimate change in annual groundwater storage:

3.6.1 Data and Monitoring Protocols

3.6.1.1 *GIS-Based Method for Estimating Storage Change*

For any given GSA, the change in groundwater storage can be estimated using the following equation:

$V_w = S_y A \, \Delta h$

Where:

V_w	=	the volume of groundwater storage change (acre-ft).
S_y	=	specific yield of aquifer sediments (unitless).
A	=	the surface area of the aquifer within the Tule Subbasin/GSA (acres).
Δh	=	the change in hydraulic head (i.e. groundwater level) (feet).

The change in storage estimate is specific to the shallow aquifer as the groundwater level in the deep aquifer will not likely drop below the top of the aquifer. The calculations will be made using a Geographic Information System (GIS) map of the Tule Subbasin/GSA that will be discretized into 300-foot by 300-foot grids to allow for spatial representation of aquifer specific yield and groundwater level change.

The areal and vertical distribution of specific yield for the shallow aquifer will be based on the values obtained from the calibrated groundwater flow model of the Tule Subbasin.

For the areal distribution of change in hydraulic head within the Tule Subbasin/GSA, groundwater contours for the spring of the previous year will be digitized and overlain on the grid map of the Tule Subbasin/GSA in GIS. Groundwater levels will then be assigned to each grid. A contour map with groundwater elevation contours from spring of the next year will also be digitized and overlain on the grid map. Change in hydraulic head (groundwater level) at each grid will be calculated as the difference in groundwater level between the two years.

The complete GIS files of specific yield and groundwater levels will be exported into a spreadsheet program for the final analysis of groundwater storage change. The change in groundwater storage will be calculated for each grid cell by multiplying the change in groundwater level by the specific yield and then by the area of the cell.

The data from the analysis can be used to develop change in storage maps for incorporation into the annual reports.

3.6.1.2 *Groundwater Flow Model Method for Estimating Storage Change*

The calibrated groundwater flow model of the Tule Subbasin, which was originally prepared for the Tule Subbasin TAC in 2018, can be used to estimate the change in groundwater storage across the subbasin and within each GSA boundary. The calibrated groundwater surface from one year can be exported and subtracted from the exported calibrated groundwater surface from a subsequent year. The difference in groundwater levels is multiplied by the specific yield distribution of the shallow aquifer in the model to obtain an estimate of the change in groundwater storage across the subbasin.

In order to develop updated change in storage values for the annual reports, the model will be updated on a regular basis. The update will include incorporation of the previous year's groundwater extractions, recharge values, and groundwater levels. The model calibration will be validated with the measured data and adjusted as needed. Once the updated model is validated, it can be used to estimate changes in groundwater storage both across the Subbasin and within each GSA. The GSAs acknowledge that the more measured data that is available for incorporation into the model, the better the model results will be. The GSAs further acknowledge that they have used the best available information up to this point, but that they will continue to evaluate and gather additional information through the Monitoring Plan.

The model output will be used to develop maps showing the changes in groundwater storage, for incorporation into annual reports.

3.6.2 Quality Control and Assurance

All change in groundwater storage estimates will be conducted by professionals trained and experienced in the use of the groundwater flow model and hydrological calculations. All work shall be conducted under the direct supervision of a California registered Professional Civil Engineer, Professional Geologist, or Certified Hydrogeologist.

3.7 Water Budget (§357.4(b)(3)(B))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(B), the GSAs agree to use the following data and methods to measure or estimate a water budget, for both the Subbasin and individual GSAs:

3.7.1 Data and Monitoring Protocols

The water budget methodologies described herein have been developed based on the best available data and procedures at the time of publication. The methodologies shall be reviewed and updated periodically as new monitoring features, data, and technical advances are available.

3.7.2 Surface Water Budget

Surface water budgets describe all of the sources and volumes of surface water inflow and outflow to/from the subbasin. Inflow terms for the surface water budget of the Tule Subbasin will include:

1. Precipitation.
2. Stream inflow.
3. Imported water.
4. Discharge to the land surface from wells.

Surface water outflow terms will include:

1. Infiltration of precipitation.
2. Evapotranspiration of precipitation from native vegetation and crops.
3. Stream infiltration.
4. Infiltration in canals.
5. Recharge in basins.
6. Deep percolation.
7. Consumptive use.
8. Stream outflow.

3.7.2.1 Surface Water Inflow

3.7.2.1.1 *Precipitation*

The annual volume of water entering the Tule Subbasin as precipitation will be estimated based on the long-term average annual isohyetal map as included in **Attachment 2** and annual precipitation data reported for the Porterville precipitation station. As annual precipitation values are not available throughout the entire Tule Subbasin, it will be assumed that the relative

precipitation distribution for each year is the same as that shown on the isohyetal map. The magnitude of annual precipitation within each isohyetal zone will be varied from year to year based on the ratio of annual precipitation at the Porterville Station to annual average precipitation at the Porterville isohyetal zone multiplied by the isohyetal zone average annual precipitation.

$$\frac{Precip_{Porterville}}{Precip_{Ave\ Porterville}}\ x\ Isohyet_{Ave\ Precip} = Precip_{Isohyet}$$

Where:

$Precip_{Porterville}$	=	Precipitation at the Porterville Station in any given year (ft/yr).
$Precip_{Ave\ Porterville}$	=	Long-Term Average Precipitation at the Porterville Station (ft/yr).
$Isohyet_{Ave\ Precip}$	=	Average precipitation within the Isohyet zone overlying the Subbasin/GSA (ft/yr).
$Precip_{Isohyet}$	=	Adjusted annual precipitation within the isohyet zone overlying the Subbasin/GSA (ft/yr).

The adjusted annual precipitation for the year of interest will be multiplied by the area of the isohyet zone to estimate the precipitation falling on the area (in acre-ft).

3.7.2.1.2 *Stream Inflow*

Surface water inflow to the Tule Subbasin occurs primarily via three native streams: the Tule River, Deer Creek, and the White River. As the ETGSA borders the eastern Tule Subbasin boundary, stream inflow into the Tule Subbasin is equal to the stream inflow into the ETGSA.

Tule River

Streamflow in the Tule River is documented in TRA annual reports. Stream inflow to the Tule Subbasin (and ETGSA) is recorded as releases from the Richard L. Schafer Dam (formerly Lake Success Dam) and will be the same as reported in the TRA annual reports. Accounting of diversions from the Tule River is described in Section 3.4.1.1.1 of this Coordination Agreement.

Deer Creek

Accounting of streamflow in Deer Creek is described in Section 3.4.1.1.2 of this Coordination Agreement.

White River

Accounting of streamflow in the White River is described in Section 3.4.1.1.3 of this Coordination Agreement.

3.7.2.1.3 *Imported Water*

Imported water delivered to the various agencies within the six GSAs of the Tule Subbasin will be provided on an annual basis by the agencies receiving deliveries.

3.7.2.1.4 *Discharge to Crops from Wells*

Water applied to crops from wells is assumed to be the total applied water minus surface water deliveries from imported water and diverted stream flow. Total crop demand will be estimated based on the methodologies identified in Section 3.3.1. Diverted streamflow and imported water deliveries are described in Sections 3.4.1.1 and 3.4.1.2, respectively.

3.7.2.1.5 *Municipal Deliveries from Wells*

Accounting of groundwater pumping for municipal supply will be provided on a monthly basis by the various cities/communities in the Tule Subbasin. These cities/communities include:

1. City of Porterville
2. Tipton Public Utility District
3. Pixley Public Utility District
4. Teviston Community Services District
5. Earlimart Community Services District
6. Terra Bella Irrigation District
7. Richgrove Community Services District
8. Poplar Community Services District
9. Woodville Community Services District
10. Allensworth Community Services District
11. Alpaugh Community Services District
12. Ducor Community Services District

It is assumed that municipal pumping will be metered. In the event that metered pumping data is not available, municipal supply will be estimated based on the population of the community served and an assumption of per capita water demand from the most recent Urban Water Master Plan applicable to the area.

It is noted that there are some households in the rural portions of the Tule Subbasin that rely on private wells to meet their domestic water supply needs. However, given the low population density of these areas, the volume of pumping from private domestic wells is considered negligible compared to the other pumping sources.

3.7.2.2 Surface Water Outflow

3.7.2.2.1 *Areal Recharge from Precipitation*

Historical estimates of areal recharge from precipitation falling on the valley floor in the Tule Subbasin, as used in TH&Co (2017a)[1] were based on Williamson et al., (1989).[2] The equation for estimating areal recharge, using the Williamson Method, is:

$$PPT_{rech} = (0.64)PPT - 6.2$$

Where:

PPT_{rech}	=	Groundwater Recharge from Precipitation (ft/yr)
PPT	=	Annual Precipitation (ft/yr)

Total precipitation in any given GSA (i.e. PPT) will be estimated on an annual basis using the portion of the isohyetal map overlapping the GSA (see **Attachment 2**; Figure 2-27) and adjusted based on the recorded annual precipitation at the Porterville station, as described in Section 3.7.1.1.1.1. Precipitation recharge for each GSA will then be recorded on an annual basis using the above equation.

3.7.2.2.2 *Streambed Infiltration (Channel Loss)*

Tule River

Total channel loss (i.e. streambed infiltration plus evapotranspiration) in the Tule River between Lake Success and Oettle Bridge will be the same as reported in TRA annual reports and shall be allocated pursuant to the allocation method in the TRA Water Rights Schedule. Tule River infiltration for the water budget will be estimated as follows:

$TR_{CL} - ET = TR_{NatInf}$

Where:

TR_{CL}	=	Tule River channel losses between Lake Success and Oettle Bridge as reported in TRA annual reports (acre-ft).
ET	=	Evapotranspiration (acre-ft).
TR_{NatInf}	=	Infiltration losses between Lake Success and Oettle Bridge attributed to native Tule River water (acre-ft).

[1] TH&Co, 2017a; Hydrogeological Conceptual Model and Water Budget of the Tule Subbasin. Dated August 1, 2017.

[2] Williamson, A.K., Prudic, D.E., and Swain, L.A., 1989. Ground-Water Flow in the Central Valley, California. USGS Professional Paper 1401-D.

Evapotranspiration between Lake Success and Oettle Bridge will be equal to 35 acre-ft/month when the flow in the channel is greater than 35 acre-ft/month and equal to the flow when less than 35 acre-ft/month.

Reporting of total streambed infiltration of surface water flow in the Tule River channel between Oettle Bridge and Turnbull Weir will be obtained from LTRID annual water use summaries and adjusted to account for ET in the stream channel. Evapotranspiration in the Tule River channel between Oettle Bridge and Turnbull Weir is assumed to be equal to 55 acre-ft/month if the flow in the channel is greater than 55 acre-ft/month and equal to the flow when less than 55 acre-ft/month.

Given the fact that LTRID periodically releases imported water from the Friant-Kern Canal to the Tule River upstream of Oettle Bridge, it will be necessary to account for the portion of channel infiltration attributed to native Tule River flow versus the channel infiltration attributed to imported water as the native river flow infiltration is part of the Sustainable Yield of the subbasin but the imported water recharge is not. Imported water deliveries to the Tule River channel are reported in the TRA annual reports. The estimated native Tule River water infiltration in the channel between Oettle Bridge and Turnbull Weir will be computed as follows:

$$\frac{FK}{TR_{BOB} + FK} \; x \; TR_{Tot\ Inf} - ET = TR_{Native\ Inf\ Loss}$$

Where:

FK	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
TR_{BOB}	=	Gaged flow Below Oettle Bridge from TRA annual reports (acre-ft).
$TR_{Tot\ Inf}$	=	Infiltration losses from both native Tule River water and imported water (acre-ft).
ET	=	Evapotranspiration (acre-ft).
$TR_{Native\ Inf\ Loss}$	=	Infiltration losses between Oettle Bridge and Turnbull Weir attributed to native Tule River water (acre-ft).

Deer Creek

Deer Creek is a losing stream such that infiltration of surface water within the stream channel recharges the groundwater system beneath it. Streambed infiltration (channel loss) is estimated for the stream reaches between the Fountain Springs gaging station and Trenton Weir and between Trenton Weir and Homeland Canal. The difference in streamflow between Fountain Springs station and Trenton Weir is assumed to be total channel loss along this section. Combined streambed infiltration in the Deer Creek channel between Trenton Weir and Homeland Canal and canal losses within the rest of the Pixley Irrigation District were estimated based on Pixley Irrigation District monthly water use summaries. Measured channel loss includes infiltration as well as evapotranspiration. Therefore, infiltration is equal to channel loss minus evapotranspiration.

It is noted that there are two sources of water in the Deer Creek channel: 1) native flow and 2) imported water from the Friant-Kern Canal. It is further noted that imported water is introduced into the Deer Creek channel upstream of Trenton Weir. Thus, until a stream gage is established upstream of the Friant-Kern Canal/Deer Creek intersection, the separate accounting of losses associated with imported water and native Deer Creek surface flow will be approximated. Imported water discharged to the Deer Creek channel from the Friant-Kern Canal is monitored by the USBR and reported in the Pixley Irrigation District monthly water use summaries.

Deer Creek channel loss (i.e. streambed infiltration and evapotranspiration) from Fountain Springs to Trenton Weir was estimated based on the difference in measured flows between the two stations. The surface flow between these two stations is assumed to be, for this water budget, native Deer Creek water. Deer Creek channel infiltration will be estimated as follows:

$$DC_{FS} - DC_{TW} - ET = DC_{Inf\ Loss}$$

Where:

$\underline{DK_{FS}}$	=	Gaged flow at Fountain Springs (acre-ft).
$\underline{DK_{TW}}$	=	Gaged flow at Trenton Weir (acre-ft).
ET	=	Evapotranspiration (acre-ft).
$DC_{Inf\ Loss}$	=	Infiltration losses attributed to native Deer Creek water (acre-ft).

Flow in the Deer Creek channel from Trenton Weir to Homeland Canal is a combination of native Tule River water and imported water purchased by the Pixley Irrigation District for distribution in their service area. For this water balance, it is assumed that all of the water that flows through Trenton Weir is either delivered to farmers or becomes channel or canal loss (i.e. there are no data available to document surface flow from the Deer Creek channel to Homeland Canal although it is known that this occurs during periods of above normal precipitation). The infiltration of native Deer Creek water in the Deer Creek channel downstream of Trenton Weir is estimated for each month based on Pixley Irrigation District annual water use summaries in the following way:

1. Subtract the imported water deliveries to Deer Creek from the total flow measured at Trenton Weir to estimate the volume entering Pixley Irrigation District that is attributed to native Deer Creek flow.
2. Pixley Irrigation District sales and deliveries to basins are subtracted from the total flow through Trenton Weir to determine the volume of water presumably lost as infiltration in the Deer Creek channel and canals.
3. The total loss in No. 2 is multiplied by the ratio of Deer Creek channel length to the total channel/canal length within the Pixley irrigation District (0.21) to estimate losses in the channel and multiplied by the ratio of canal length to the total channel/canal length to estimate losses in the canals (0.79).
4. The total loss attributed to the Deer Creek channel, as estimated from No. 3, is multiplied by the ratio of native Deer Creek flow at Trenton Weir to the total water available to estimate the volume of native Deer Creek water infiltration estimated to occur in the Deer Creek channel.

5. The total loss attributed to canals, as estimated from No. 3, is multiplied by the ratio of native Deer Creek flow at Trenton Weir to the total water available to estimate the volume of native Deer Creek water loss estimated to occur in the canals.

Infiltration losses in the Deer Creek channel are included in the Sustainable Yield of the overall Tule Subbasin.

White River

All of the surface water flow measured or interpolated at the White River stream gage, after accounting for ET losses, is assumed to become streambed infiltration, as described in Section 3.4.1.1.3.

3.7.2.2.3 *Canal Losses*

Canal Losses from Tule River Diversions

Canal losses from Tule River diversions occur within the numerous unlined canals connected to the Tule River within the City of Porterville, Vandalia Water District, Porterville Irrigation District and LTRID. With the exception of LTRID, canal losses are accounted for in the portion of the water budget that addresses deep percolation of applied water (see Section 3.7.1.1.2.5).

Canal losses associated with deliveries of native Tule River water in the LTRID GSA are estimated based on LTRID annual water use summaries. Canal losses will be reported as total LTRID GSA losses minus channel losses attributed to native Tule River water ($TR_{\text{Native Inf Loss}}$). The equation is as follows:

$$\frac{TR_{Gaged}}{TR_{Gaged} + FK} \; x \; LTRID_{Total\ Losses} \; - \; TR_{Native\ Inf\ Loss} \; = TR_{Native\ Can\ Loss}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK	=	Imported water delivered to the LTRID from the Friant Kern Canal.
$LTRID_{\text{Total Losses}}$	=	Total losses reported in LTRID annual water use summaries.
$TR_{\text{Native Inf Loss}}$	=	Native Tule River channel infiltration losses.
$TR_{\text{Native Can Loss}}$	=	Canal losses attributed to native Tule River water.

Canal losses from diverted native Tule River water are not included in the Sustainable Yield of the overall Tule Subbasin.

Canal Losses from Deer Creek Diversions

It is assumed that canal losses from delivery of native Deer Creek water to riparian landowners and farmers occur only within the PID GSA. The methodology to estimate canal losses within the PID GSA is described above.

Canal losses from diverted Deer Creek water are not included in the Sustainable Yield of the overall Tule Subbasin.

Canal Losses from Imported Water Deliveries

With the exception of canal losses within the Angiola Water District and Porterville Irrigation District, it is assumed that imported water that infiltrates into the subsurface in the Tule River channel, Deer Creek channel and unlined canals is grouped together. Within the Angiola Water District and Porterville Irrigation District, canal losses are accounted for in the portion of the water budget that addresses deep percolation of applied water (see Section 3.7.1.1.2.5). For the Tule River, canal losses are estimated as follows:

$$LTRID_{Total\ Losses} - TR_{Native\ Inf\ Loss} = LTRID_{Imp\ Can\ Loss}$$

Where:

$LTRID_{Total\ Losses}$	=	Total losses reported in LTRID annual water use summaries (acre-ft).
$TR_{Native\ Inf\ Loss}$	=	Native Tule River channel infiltration losses (acre-ft).
$LTRID_{Imp\ Can\ Loss}$	=	Canal losses attributed to imported water in the LTRID (acre-ft).

For Deer Creek, canal losses are estimated as follows:

$$Pixley_{Total\ Losses} - DC_{Native\ Inf\ Loss} = Pixley_{Imp\ Can\ Loss}$$

Where:

$Pixley_{Total\ Losses}$	=	Total losses reported in Pixley Irrigation District annual water use summaries (acre-ft).
$DC_{Native\ Inf\ Loss}$	=	Native Deer Creek channel infiltration losses (acre-ft).
$Pixley_{Imp\ Can\ Loss}$	=	Canal losses attributed to imported water in the Pixley Irrigation District (acre-ft).

Canal losses resulting from delivery of imported water are not included in the Sustainable Yield of the overall Tule Subbasin.

3.7.2.2.4 *Managed Recharge in Basins*

Managed Recharge of Tule River Diversions

Native Tule River water is diverted to basins for recharge by Pioneer Water Company, Campbell and Moreland Ditch Company, Vandalia Water District, Porterville Irrigation District, and LTRID.

All of the water diverted by Campbell and Moreland Ditch Company and Vandalia Water District (ETGSA) is native Tule River flow and is assumed to be delivered to basins. The native Tule River water diverted by these agencies is reported in TRA annual reports. Native Tule River water diverted to basins by Pioneer Water Company and Porterville Irrigation District will be provided by those agencies.

Monthly total water deliveries to basins in the LTGSA are reported in LTRID annual water use summary reports. The total deliveries include both native Tule River water and imported water from the Friant-Kern Canal. The basin recharge attributable to native Tule River water downstream of Oettle Bridge will be reported as follows:

$$\frac{TR_{Gaged}}{TR_{Gaged} + FK} \; x \; LTRID_{Total\ Basin\ Rech} = TR_{Basin\ Rech}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
$LTRID_{Total\ Basin\ Rech}$	=	Total LTRID basin recharge from annual water use summaries (acre-ft).
$TR_{Basin\ Rech}$	=	Basin recharge in LTRID attributed to native Tule River water (acre-ft).

Managed recharge of diverted native Tule River water is not included in the Sustainable Yield of the overall Tule Subbasin.

Managed Recharge of Deer Creek Diversions

Artificial recharge (i.e. recharge in basins) of diverted Deer Creek streamflow is accomplished via multiple recharge facilities. Native Deer Creek water is diverted to basins for recharge by Pixley Irrigation District and DCTRA. It is acknowledged that the Pixley Irrigation District diversions are limited to the rights of the riparians within the District. The amount of the water right is subject to discussion. Basin recharge attributed to native Deer Creek water is estimated using the following equation:

$$\frac{DC_{Gaged}}{DC_{Gaged} + FK} \; x \; Pixley_{Total\ Basin\ Rech} = DC_{Basin\ Rech}$$

Where:

DC_{Gaged}	=	Gaged flow through Trenton Weir (acre-ft).
FK	=	Imported water delivered to the Pixley Irrigation District from the Friant-Kern Canal (acre-ft).
$Pixley_{Total\ Basin\ Rech}$	=	Total Pixley Irrigation District basin recharge from annual water use summaries (acre-ft).
$DC_{Basin\ Rech}$	=	Basin recharge in Pixley Irrigation District attributed to native Deer Creek water (acre-ft).

Managed recharge of diverted Deer Creek water is not included in the Sustainable Yield of the overall Tule Subbasin.

Managed Recharge of Imported Water

Managed recharge of imported water is accomplished via multiple recharge facilities within the Porterville Irrigation District, LTRID, Pixley Irrigation District, Tea Pot Dome Water District and DEID. Managed recharge attributed to imported water in the LTRID is estimated as follows:

$$\frac{FK}{TR_{Gaged} + FK} \; x \; LTRID_{Total\ Basin\ Rech} = LTRID_{Imp\ Basin\ Rech}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
$LTRID_{Total\ Basin\ Rech}$	=	Total LTRID basin recharge from annual water use summaries (acre-ft).
$LTRID_{Imp\ Basin\ Rech}$	=	Basin recharge in LTRID attributed to imported water (acre-ft).

Managed recharge of imported water in the Pixley Irrigation District is estimated as follows:

$$\frac{FK}{DC_{Gaged} + FK} \; x \; Pixley_{Total\ Basin\ Rech} = Pixley_{Imp\ Basin\ Rech}$$

Where:

DC_{Gaged}	=	Gaged flow through Trenton Weir (acre-ft).
FK	=	Imported water delivered to the Pixley Irrigation District from the Friant Kern Canal (acre-ft).
$Pixley_{Total\ Basin\ Rech}$	=	Total Pixley Irrigation District basin recharge from annual water use summaries (acre-ft).
$Pixley_{Imp\ Basin\ Rech}$	=	Basin recharge in Pixley Irrigation District attributed to imported water (acre-ft).

Imported water delivered to recharge in basins for DEID, Porterville Irrigation District and Tea Pot Dome Water District will be provided by each district.

Managed recharge of imported water is not included in the Sustainable Yield of the overall Tule Subbasin.

Recharge of Recycled Water in Basins

Most of the recycled water generated by the City of Porterville is used for agricultural irrigation. From time to time, some of the recycled water is delivered to basins in the Old Deer Creek Channel where it infiltrates into the subsurface to become groundwater recharge. Basin recharge of recycled water will be based on data provided by the City of Porterville. Managed recharge of recycled water in basins is not included in the Sustainable Yield of the overall Tule Subbasin.

3.7.2.2.5 *Deep Percolation of Applied Water*

Deep Percolation of Applied Tule River Diversions

Deep percolation of applied Tule River water for irrigating agriculture will be applied to the various land uses in the Tule Subbasin according to the irrigation method (e.g. drip irrigation, flood irrigation, micro sprinkler, etc.) for each land use type reported in DWR on-line land use maps. Irrigation efficiencies will be applied to the different irrigation methods based on tables reported in California Energy Commission (2006)[3].

Tule River water is diverted for agricultural irrigation by the Pioneer Water Company, Porter Slough Headgate, Porter Slough Ditch Company, Campbell and Moreland Ditch Company, Vandalia Water District, Hubbs and Miner Ditch Company, Poplar Irrigation Co., Woods Central Ditch Company, Porter Slough Below 192, and Below Oettle Bridge. Application of the appropriate deep percolation rate will depend on the crop types receiving native Tule River water and the associated irrigation methods. In the LTGSA, estimation of the volume of applied water attributed to native Tule River water is based on the following:

[3] California Energy Commission, 2006. PIER Project Report: Estimating Irrigation Water Use for California Agriculture: 1950s to Present. May 2006.

$$\frac{TR_{Gaged}}{TR_{Gaged} + FK} \; x \; LTRID_{Total\ Deliveries} = TR_{App\ Water}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
$LTRID_{Total\ Deliveries}$	=	Total LTRID deliveries (i.e. "Sales") from annual water use summaries (acre-ft).
$TR_{App\ Water}$	=	Volume of applied native Tule River water in the LTRID (acre-ft).

Deep percolation is calculated as the applied water ($TR_{App\ Water}$) multiplied by the appropriate percent deep percolation depending on the crop type receiving the water and the associated irrigation method.

Deep percolation of applied native Tule River water is not included in the Sustainable Yield of the overall Tule Subbasin.

Deep Percolation of Applied Deer Creek Diversions

The portion of native Deer Creek water delivered for agricultural use within the PIXID GSA is estimated using the following equation:

$$\frac{DC_{Gaged}}{DC_{Gaged} + FK} \; x \; Pixley_{Total\ Deliveries} = DC_{App\ Water}$$

Where:

DC_{Gaged}	=	Gaged flow through Trenton Weir (acre-ft).
FK	=	Imported water delivered to the Pixley Irrigation District from the Friant Kern Canal (acre-ft).
$Pixley_{Total\ Deliveries}$	=	Total Pixley Irrigation District deliveries (i.e. "Sales") from annual water use summaries (acre-ft).
$DC_{App\ Water}$	=	Applied water in Pixley Irrigation District from native Deer Creek River water (acre-ft).

Deep percolation is estimated as the applied water ($DC_{App\ Water}$) multiplied by the appropriate percent deep percolation depending on the crop type receiving the water.

Deep percolation of applied native Deer Creek water is not included in the Sustainable Yield of the overall Tule Subbasin.

Deep Percolation of Applied Imported Water

Deep percolation of imported water delivered and applied to crops within the LTGSA is based on the following equation:

$$\frac{FK}{TR_{Gaged} + FK} \; x \; LTRID_{Total\ Deliveries} x \; DP_{Factor} = DP_{LTRID\ FK}$$

Where:

TR_{Gaged}	=	Sum of gaged flow at Below Oettle Bridge, Woods Central Diversion, Poplar Irrigation Company flow reaching LTRID, and Porter Slough at 192 (acre-ft).
FK	=	Imported water delivered to the LTRID from the Friant Kern Canal (acre-ft).
$LTRID_{Total\ Deliveries}$	=	Total LTRID deliveries (i.e. "Sales") from annual water use summaries (acre-ft).
DP_{Factor}	=	Deep percolation factor that varies from 0.06 to 0.33 depending on the type of crop receiving the imported water (see Section 3.7.1.1.2.3.4) (unitless).
$DP_{LTRID\ FK}$	=	Deep percolation of imported water applied to crops in the LTRID (acre-ft).

Deep percolation of imported water delivered and applied to crops within the PIXID GSA is based on the following equation:

$$\frac{FK}{DC_{Gaged} + FK} \; x \; Pixley\ ID_{Total\ Deliveries} x \; DP_{Factor} = DP_{Pixley\ ID\ FK}$$

Where:

DC_{Gaged}	=	Deer Creek at Trenton Weir (acre-ft).
FK	=	Imported water delivered to the Pixley ID from the Friant Kern Canal (acre-ft).
Pixley $ID_{Total\ Deliveries}$	=	Total Pixley ID deliveries (i.e. "Sales") from annual water use summaries (acre-ft).
DP_{Factor}	=	Deep percolation factor that varies from 0.06 to 0.33 depending on the type of crop receiving the imported water (see Section 3.7.1.1.2.3.4) (unitless).
$DP_{Pixley\ ID\ FK}$	=	Deep percolation of imported water applied to crops in Pixley Irrigation District (acre-ft).

Deep percolation of imported water delivered and applied to crops in DEID, Porterville Irrigation District, Saucelito Irrigation District, Tea Pot Dome Water District, Alpaugh Irrigation District, Angiola Water District, and Atwell Island Water District shall be estimated as the

delivered water, minus water delivered to basins, multiplied by the appropriate percent deep percolation factor.

Deep percolation of applied imported water is not included in the Sustainable Yield of the overall Tule Subbasin.

Deep Percolation of Applied Recycled Water

Deep percolation of recycled water applied to crops will be estimated using the deep percolation factors described earlier in this section. Deep percolation of applied recycled water is not included in the Sustainable Yield of the overall Tule Subbasin.

Deep Percolation of Applied Native Groundwater for Agricultural Irrigation

The balance of agricultural irrigation demand not met by imported water or stream diversions is assumed to be met by groundwater pumping. Groundwater extraction will be calculated based on the methods described in Section 3.3. Deep percolation of applied water from groundwater pumping will be based on the types of crops on which the water is applied and will be calculated using the deep percolation factors discussed earlier in this section. Deep percolation of applied water from agricultural groundwater pumping is included in the Sustainable Yield of the overall Tule Subbasin.

Deep Percolation of Applied Native Groundwater for Municipal Irrigation

Deep percolation of applied water for landscape irrigation was estimated for the urbanized portions of the Tule Subbasin. All municipal water demand is met from groundwater pumping. For the City of Porterville, landscape irrigation was estimated to be 47 percent of the total water delivered to each home based on an analysis of the total groundwater production and influent flows to the wastewater treatment plant (City of Porterville draft Urban Water Management Plan 2010 Update, 2014). Of the water used for irrigation, 25 percent is assumed to become deep percolation and groundwater recharge. Deep percolation of applied water from municipal groundwater pumping is included in the Sustainable Yield of the overall Tule Subbasin.

For the other smaller communities in the Tule Subbasin, wastewater discharge is assumed to be through individual septic systems. For water discharged to septic systems, it is assumed that 100 percent of the discharge becomes deep percolation and groundwater recharge. As with the City of Porterville, 47 percent of total water use was assumed to be for landscape irrigation and 25 percent of the landscape irrigation is assumed to become deep percolation.

3.7.2.2.6 *Evapotranspiration*

Evapotranspiration of Precipitation from Crops and Native Vegetation

Evapotranspiration (ET) is the loss of water to the atmosphere from free-water evaporation, soil-moisture evaporation, and transpiration by plants. Evapotranspiration of precipitation is assumed to be the difference between total precipitation (Section 3.7.1.1.1.1) and areal recharge

from precipitation (Section 3.7.1.1.2.1). This value includes evapotranspiration of precipitation from crops as well as native vegetation.

Evapotranspiration of Surface Water Within the Tule River Channel

Evapotranspiration of surface water within the Tule River channel is a function of the ET rate and wetted channel surface area. The ET rate was based on published data for riparian vegetation in an intermittent stream and applied to channel segments with similar average width based on aerial photographs (Google Earth). The ET rate was applied to the surface area of each reach to obtain an estimate of ET. The sum of reach by reach ET estimates between Lake Success and the western Tule Subbasin boundary represents the total Tule River ET.

Evapotranspiration of Surface Water Within the Deer Creek Channel

Evapotranspiration within the Deer Creek channel was estimated using the same methodology as described for the Tule River Channel.

Evapotranspiration of Surface Water Within the White River Channel

Evapotranspiration in the White River channel was estimated using the same methodology as described for the Tule River Channel.

Evapotranspiration of Recycled Water in Basins

Evapotranspiration of recycled water delivered to basins will be provided by the City of Porterville.

Agricultural Consumptive Use

Crop consumptive use may be estimated using one of the methods described in Section 3.3.1.

Municipal Consumptive Use

Consumptive use of landscaping associated with applied municipal groundwater pumping will be estimated based on the methods described in Section 3.5.1.2.2.

3.7.2.2.7 *Surface Water Flow Out of the Subbasin*

Tule River

Any residual stream flow in the Tule River that reaches the Turnbull Weir, located at the west (downstream) end of the Tule Subbasin, is assumed to flow out of the subbasin. Outflow through the Turnbull Weir is documented in the TRA annual reports. Exports of Tule River water to the Friant-Kern Canal will be the same as reported in TRA annual reports.

Deer Creek

During periods of above-normal precipitation, residual stream flow left in the Deer Creek after diversions has historically flowed into Homeland Canal, located at the west end of the Tule Subbasin. The data for this outflow is currently unavailable. As this data becomes available, it will be incorporated into the surface water budget.

3.7.3 Groundwater Budget

The groundwater budget describes the sources and estimates the volumes of groundwater inflow and outflow within the Tule Subbasin. The difference between the sum of inflow terms and the sum of outflow terms is the change in groundwater storage (ΔS). A fundamental premise of the groundwater budget is the following relationship:

Inflow – Outflow = +/- ΔS

Sources of recharge (inflow terms) in the groundwater budget include:

1. Areal recharge from precipitation.
2. Recharge within stream and river channels.
3. Managed recharge in basins.
4. Canal infiltration.
5. Deep percolation of applied municipal and agricultural irrigation.
6. Release of water from compression of aquitards.
7. Subsurface inflow.
8. Mountain-Front Recharge.

It is noted that many of the groundwater inflow terms are surface water outflow terms. The groundwater budget includes the following sources of discharge (outflow terms):

1. Municipal groundwater pumping.
2. Agricultural groundwater pumping.
3. Groundwater pumping for export out of the subbasin.
4. Evapotranspiration.
5. Subsurface outflow.

3.7.3.1 *Sources of Recharge*

3.7.3.1.1 *Areal Recharge*

Groundwater recharge from precipitation falling on the valley floor in the Tule Subbasin will be estimated for each GSA as described in Section 3.7.1.1.2.1. Areal recharge of the groundwater system from precipitation is included in the Sustainable Yield of the overall Tule Subbasin.

3.7.3.1.2 *Tule River*

Groundwater recharge of native Tule River water occurs as streambed infiltration, infiltration of water in unlined canals, recharge in basins, and deep percolation of applied water.

The methods for estimating the volumes of Tule River water that become groundwater recharge are described in Section 3.7.1.1.2.

3.7.3.1.3 *Deer Creek*

Groundwater recharge of native Deer Creek water occurs as streambed infiltration, canal loss, recharge in basins, and deep percolation of applied water. The methods for estimating the volumes of Deer Creek water that become groundwater recharge are described in Section 3.7.1.1.2.

3.7.3.1.4 *White River*

Groundwater recharge of White River water occurs as streambed infiltration as described in Section 3.7.1.1.2.

3.7.3.1.5 *Imported Water Deliveries*

Groundwater recharge of imported water occurs as canal loss, recharge in basins, and deep percolation of applied water as described in Section 3.7.1.1.2.

3.7.3.1.6 *Recycled Water*

Groundwater recharge of recycled water occurs as artificial recharge and deep percolation of applied water as described in Section 3.7.1.1.2.

3.7.3.1.7 *Deep Percolation of Applied Water from Groundwater Pumping*

A portion of irrigated agriculture and municipal applied water from groundwater pumping becomes deep percolation and groundwater recharge as described in Sections 3.7.1.1.2.8.1 and 3.7.1.1.2.8.2.

3.7.3.1.8 *Release of Water from Compression of Aquitards*

As land subsidence due to groundwater withdrawal is considered an undesirable result, the ultimate goal of the Tule Subbasin TAC is to reduce it to de minimis levels. In the meantime, in order to produce a representative water balance, the volume of water released to the aquifer as a result of subsidence can be estimated using the methods described in Section 3.8.

3.7.3.1.9 *Subsurface Inflow*

The subsurface inflow and outflow along the southern, western and northern boundaries of the Tule Subbasin as well as the internal boundaries between each GSA will be evaluated as needed using either of the following methodologies:

Flow Net Analysis

A flow net analysis is applied to groundwater elevation contours developed for both the shallow and deep aquifers. The groundwater elevation contours will be based on measured groundwater levels at designated monitoring wells with perforations specific to each aquifer. After developing the groundwater contours, flow lines that are perpendicular to the groundwater elevation contours will be equally spaced along the boundary of the Subbasin or GSA.

For the shallow aquifer, which is conceptualized as being unconfined, subsurface inflow/outflow will be estimated using the Dupuit Equation, which is expressed as:

$$Q = 0.5K\left(\frac{(h_1 - h_2)^2}{L}\right)$$

Where:

Q	=	Subsurface flow, (acre-ft)
K	=	Hydraulic Conductivity, (ft/day)
h_1	=	Initial Hydraulic head, (ft amsl)
h_2	=	Ending Hydraulic head, (ft amsl)
L	=	Flow Length (ft)

For the deep aquifer, which is conceptualized as being semi-confined/confined, subsurface inflow/outflow will be estimated using the Darcy Equation, which is expressed as:

$$Q = KA\left(\frac{dh}{dl}\right)$$

Where:

Q	=	Subsurface flow, (acre-ft)
K	=	Hydraulic Conductivity, (ft/day)
A	=	Aquifer Cross-Sectional Area, (ft^2)
$\frac{dh}{dl}$	=	Hydraulic gradient

As the groundwater flow lines into and out of the subbasin/GSA may not occur at right angles to the subbasin/GSA boundary, it will be necessary to correct the subsurface flow by the angle (degrees) of the flow line relative to the basin boundary. This will be conducted by multiplying the subsurface inflow value by the sine of the angle of flow relative to the boundary.

Groundwater Flow Model

TH&Co has prepared a calibrated groundwater flow model of the Tule Subbasin. The model is capable of calculating the subsurface inflow and outflow to/from the subbasin boundaries and/or each GSA boundary. In order to develop updated subsurface inflow/outflow values for the water budget, the model will be updated annually with groundwater extractions, recharge values, and groundwater levels. The model calibration will be validated with the measured data and adjusted periodically. Once the updated model is validated, it can be used to estimate the subsurface inflow/outflow at each subbasin boundary and each GSA boundary.

3.7.3.1.10 *Mountain-Front Recharge*

Mountain-front recharge represents the infiltration of precipitation into the fractures in the bedrock east of the Tule Subbasin, which eventually flows into the alluvial aquifer system in the subsurface where the fractured rock aquifer system is in hydrologic communication with the alluvial aquifer system. Estimates of mountain-block recharge will be developed using the calibrated groundwater flow model.

3.7.3.2 *Sources of Discharge*

3.7.3.2.1 *Municipal Groundwater Pumping*

Groundwater pumping data for municipal supply is metered and will be provided by the individual cities within the Tule Subbasin, as described in Section 3.7.1.1.1.5

3.7.3.2.2 *Agricultural Groundwater Pumping*

Agricultural groundwater production will be estimated as described in Section 3.3.

3.7.3.2.3 *Groundwater Pumping for Export Out of the Tule Subbasin*

The volume of groundwater that is pumped and exported out of the subbasin on a quarterly basis will be provided by Angiola Water District and the Boswell/Creighton Ranch.

3.7.3.2.4 *Subsurface Outflow*

The subsurface outflow at the Tule Subbasin boundaries and/or GSA boundaries will be estimated using one of the methods described in Section 3.7.1.2.1.9.

3.7.4 Quality Assurance and Control

The water budget will be completed and updated by each GSA using professionals working under the direct supervision of a California Registered Professional Civil Engineer, Professional Geologist, or Certified Hydrogeologist. All GSA water budgets will be subject to review by the Tule Subbasin TAC's technical consultant.

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IV. Sustainable Management Criteria (§357.4(b)(3)(C))

Pursuant to 23 Cal. Code Regs. §357.4(b)(3)(C), the coordination agreement shall describe how the GSAs have used the same data and methodologies for estimating sustainable yield for the basin. The description shall be supported by a description of undesirable results for the basin, and an explanation of how the minimum thresholds and measurable objectives defined by each Plan relate to those undesirable results, based on information described in the basin setting.

4.1 Introduction (Reg. § 354.22)

Pursuant to 23 Cal. Code Regs. §354.22, this Chapter describes criteria that constitute sustainable groundwater criteria for the Tule Subbasin[4], including its sustainability goal and the characterization and definition of undesirable results for each applicable sustainability indicator.

4.2 Sustainability Goal (§ 354.24)

Pursuant to 23 Cal. Code Regs. §354.24, the Sustainability Goal of the Tule Subbasin is defined as the absence of undesirable results, accomplished by 2040 and achieved through a collaborative, Subbasin-wide program of sustainable groundwater management by the various Tule Subbasin GSAs.

Achievement of this goal will be accomplished through the coordinated effort of the Tule Subbasin GSAs in cooperation with their many stakeholders. It is further the goal of the Tule Subbasin GSAs that coordinated implementation of their respective GSPs will achieve sustainability in a manner that facilitates the highest degree of collective economic, societal, environmental, cultural, and communal welfare and provides all beneficial uses and users the ability to manage the groundwater resource at least cost. Moreover, this coordinated implementation is anticipated to ensure that the sustainability goal, once achieved, is also maintained through the remainder of the 50-year planning and implementation horizon, and well thereafter.

In achieving the Sustainability Goal, these GSPs are intended to balance average annual inflows and outflows of water by 2040 so that long term negative change in storage does not occur after 2040, with the ultimate goal being avoidance of undesirable results caused by groundwater conditions throughout the Subbasin. The stabilization of change in storage should also drive stable groundwater elevations, which, in turn, works to inhibit water quality degradation and arrest land subsidence.

4.2.1 Sustainable Yield

Chapter 2.3.2.6 of the *Tule Subbasin Setting* estimates the projected Sustainable Yield for the Tule Subbasin to be approximately 130,000 acre-ft/yr (see ***Table 2-4,*** *Tule Subbasin Setting*).

The term "Sustainable Yield" for the purposes of SGMA and GSPs developed under SGMA is defined by Water Code §10721(w) as: "*the maximum quantity of water, calculated over*

[4] The Tule Subbasin is designated by the California Department of Water Resources as Basin No. 5-22.13 and is also abbreviated herein as the "Subbasin".

a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result."

Within the Tule Subbasin, the Sustainable Yield includes the natural channel losses in the natural streams, precipitation, subsurface inflow and subsurface outflow, mountain front subsurface inflow, and return flow of applied water not subject to recapture (by virtue of a Water Right). The components not included in the estimate of the Tule Subbasin's Sustainable Yield are described below from the Tule Subbasin Setting:

"It is noted that sources of groundwater recharge in the subbasin that are associated with pre-existing water rights and/or imported water deliveries are not included in the Sustainable Yield estimate. These recharge sources include:

Diverted Tule River water canal losses, recharge in basins, and deep percolation of applied water, Diverted Deer Creek water canal losses, recharge in basins, and deep percolation of applied water, Imported water canal losses, recharge in basins, and deep percolation of applied water, and Recycled water deep percolation of applied water and recharge in basins." (Tule Subbasin Setting)

The sources of groundwater recharge that are not included in the Subbasin Sustainable Yield calculations are intended to be accounted for by each GSA.

As noted above, for purposes of establishing the water budget pursuant to 23 Cal. Code Regs. §354.18, the GSAs in the Tule Subbasin have agreed that the Sustainable Yield for the Subbasin shall be divided amongst the GSAs for purposes of development of their GSPs as described in the attached water budget (**Attachment 2**). The basin-wide portion of the Sustainable Yield identified in the water budget was divided amongst each GSA by multiplying that GSA's proportionate areal coverage of the Tule Subbasin times the total Subbasin Sustainable Yield.

The water budget, as divided amongst the GSAs, is not an allocation or final determination of any water rights (including without limitation any claimed appropriative or prescriptive rights). This understanding is consistent with §10720.5(b) of SGMA, which provides that nothing in SGMA or in a plan adopted under SGMA determines or alters surface or groundwater rights under common law or any provision of law that determines or grants water rights. Rather, for practical reasons and in keeping with SGMA limitations with respect to determining water rights and the statutory deadlines for GSP submittal, the use of the proportional acreage basis for dividing up the water budget—among the Tule Subbasin GSAs—was used because it represents the most readily-available and implementable manner of accounting for the water budget for GSA-specific GSP preparation purposes at this time.

The GSAs will be collecting additional data during the GSP implementation period and will consider refining or changing the method of dividing Sustainable Yield for water budget purposes in future GSP updates. The division of Sustainable Yield among the GSAs under this Coordination Agreement does not constitute any determination that groundwater extractions within a GSA in excess of a budgeted amount would cause an undesirable result or that extractions less than a budgeted amount would not cause an undesirable result. The water budget division also does not require any GSA to implement particular projects or management actions.

4.3 Undesirable Results (Reg. § 354.26)

Pursuant to 23 Cal. Code Regs. §357.26, the GSAs agree on the following processes and criteria to define undesirable results applicable to the Subbasin. Undesirable Results are caused by groundwater conditions occurring throughout the basin that, for any sustainability indicator, are considered significant and unreasonable. These conditions, or sustainability indicators, include:

- Chronic lowering of groundwater levels indicating a depletion of supply if continued over the planning and implementation horizon;
- Reduction of groundwater storage;
- Seawater intrusion;
- Degraded water quality, including the migration of contaminant plumes that impair water supplies;
- Land subsidence that substantially interferes with surface land uses; and
- Depletions of interconnected surface water that have adverse impacts on beneficial uses.

The process to identify the conditions that constitute significant and unreasonable conditions in the Tule Subbasin was informed through:

- Research and documentation of the hydrogeological conceptual model of the subbasin (see Attachment 1);
- Development of a calibrated numerical groundwater flow model of the subbasin for use in estimating sustainable yield and analyzing the effects of projects and management actions on future groundwater levels and land subsidence (see Attachment 3);
- Analysis of potential future groundwater levels, land subsidence, and groundwater quality throughout the subbasin for use in assessing significant and unreasonable groundwater conditions and identifying sustainable management criteria (see Attachments 4, 5, and 6).

Based on analysis of the hydrogeological conceptual model, four sustainability indicators were identified with potential to cause significant and unreasonable effects within the Tule Subbasin. These indicators are:

- Chronic lowering of groundwater levels indicating a depletion of supply if continued over the planning and implementation horizon;
- Reduction of groundwater storage;
- Degraded water quality, including the migration of contaminant plumes that impair groundwater supplies; and
- Land subsidence that substantially impacts critical infrastructure.

The definitions of undesirable results for each of these sustainability indicators are provided in the following subsections along with the criteria used to define them.

Based on groundwater level and land subsidence projections from the Tule Subbasin groundwater flow model and analysis of potential impacts of the additional groundwater level decline and land subsidence projected for the transition period from 2020 to 2040 (see Attachments 4 and 6),

each GSA developed Sustainable Management Criteria for each of the sustainability indicators to avoid undesirable results in consideration of the beneficial uses of groundwater and the beneficial users of these supplies and facilities:

- Municipal and Domestic Supply
- Agricultural Supply
- Industrial Supply
- Critical Infrastructure, including the Friant-Kern Canal (FKC)

The Sustainable Management Criteria identified to avoid undesirable results were vetted through a public process that included multiple stakeholder workshops, meetings, and document review. While the sustainable management criteria are protective of undesirable results for most beneficial uses and users, during the transition period between 2020 and 2040, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

Each individual GSA may further refine the Sustainable Management Criteria in its GSP based on GSA-specific information and considerations as long as it includes the above-described beneficial uses/users and undesirable results and provides explanations in support of its minimum thresholds and other criteria in a manner meeting SGMA requirements.

4.3.1 Chronic Lowering of Groundwater Levels

4.3.1.1 *Causes of Groundwater Conditions That Could Lead to Undesirable Results (§354.26(b)(1))*

Groundwater levels in the Tule Subbasin have shown a general chronic lowering since approximately 1987. Without management actions to arrest this trend, the groundwater resource in the subbasin is not sustainable, which is an undesirable result. The primary cause of groundwater conditions that have led to chronic lowering of groundwater levels is groundwater production in excess of natural and artificial recharge over a multi-year period that includes both wetter than average and drier than average conditions. This condition has been exacerbated during natural drought-cycles when access to imported water supplies is restricted and groundwater production increases. Restricted access to imported surface water can occur due to a variety of factors, including but not limited to, increased requirements in the Delta, which may increase the likelihood imported supplies from Millerton Lake will be delivered outside the Tule Subbasin. Climate change may also affect the availability and rate upon which natural and artificial recharge is available.

4.3.1.2 *Criteria to Define Undesirable Results (§354.26(b)(2))*

The GSA's have determined that continued chronic lowering of groundwater levels below those needed to accommodate continued pumping during the transitional period of temporary overdraft is an undesirable result, as that condition is considered unsustainable. Further, lack of access to water supplies for all beneficial uses and users due to lowered groundwater levels is considered significant and unreasonable and, therefore, an undesirable result.

These significant and unreasonable conditions in the subbasin were informed through:

- Development of a detailed hydrogeologic conceptual model of the subbasin (see

Attachment 1)
- Development of a calibrated numerical groundwater flow model of the subbasin (see Attachment 3)
- Analysis of potential future groundwater levels using the model and incorporating each GSA's planned projects and management actions, and
- Comparison of model-forecasted groundwater levels with the best available information on well depths in the subbasin (see Attachment 4).

Each GSA has followed a public process through stakeholder workshops, Technical Advisory Committee meetings, and meetings of individual GSA Board of Directors to communicate potential undesirable results and receive feedback from the various beneficial uses and users of groundwater within its jurisdictional area. Based on the best available data collected to date and groundwater model analysis, each GSA identified groundwater level conditions designed to reasonably protect access to groundwater for the majority of beneficial users. For those uses such as shallow domestic well owners where impacts to groundwater access may occur, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

Aside from mitigation provisions for impacted beneficial uses, the quantitative definition of undesirable results for chronic lowering of groundwater levels indicating continued overdraft conditions is the lowering of the groundwater elevation below the minimum threshold at an RMS in any given GSA for the area and beneficial uses and users associated with that RMS. This condition would indicate that more aggressive management actions were needed by the GSA to mitigate the overdraft.

4.3.1.3 *Potential Effects on Beneficial Uses and Users (§354.26(b)(3))*

Using the above-described criteria, the GSAs evaluated potential undesirable results to agricultural, domestic, industrial, and municipal beneficial uses. Overall, based on forecasting of future groundwater levels using a calibrated numerical groundwater flow model of the Tule Subbasin and the best available data, the projects and management actions to be implemented by each GSA are predicted to decelerate and arrest chronic lowering of groundwater levels by 2040. Potential impacts to wells associated with groundwater level declines in the transition period between 2020 and 2040 were evaluated through an analysis of well depths in the Tule Subbasin (see Attachment 4). Potential effects of lowered groundwater levels on the various beneficial uses of groundwater in the Tule Subbasin, in the context of the groundwater modeling and analysis of well depths, are as follows:

Agricultural

Potential effects to agricultural beneficial uses and users from lowered groundwater levels include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4).

Domestic

Some domestic uses and users of groundwater may be impacted by continued lowering of groundwater levels during the transition period from January 2020 to December 2040. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4). Lowering groundwater levels below the total depth of shallow

domestic wells could lead to added costs to haul in water supplies, tie into other available supplies, consolidation with existing water service providers, or requiring other form of mitigation

Industrial

Potential effects to industrial beneficial uses and users from lowered groundwater levels include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4).

Municipal

Potential effects of lowered groundwater levels on municipal beneficial uses and users of groundwater include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4). All of the potentially impacted wells are in the City of Porterville. The City of Porterville has indicated that these potential effects can be mitigated through management actions by distributing pumping in such a way as to avoid the impacts.

To address potential effects on agricultural, domestic and industrial beneficial uses and ensure access to water until the Subbasin reaches a sustainable groundwater level condition, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.3.2 Reduction of Groundwater Storage

4.3.2.1 *Causes of Groundwater Conditions That Could Lead to Undesirable Results (§354.26(b)(1))*

The primary cause of groundwater conditions that have led to the reduction in groundwater in storage observed in the Subbasin since 1987 is groundwater production in excess of natural and artificial recharge over a multi-year period that includes both wetter than average and drier than average conditions. This condition, if allowed to continue indefinitely into the future, will not allow for the support of the beneficial uses and users of the Subbasin and is considered an undesirable result.

4.3.2.2 *Criteria to Define Undesirable Results (§354.26(b)(2))*

The GSA's have determined that continued chronic depletion of groundwater in storage below that which is needed to accommodate continued pumping during the transitional period of temporary overdraft is an undesirable result, as that condition is considered unsustainable. Further, lack of access to water supplies for all beneficial uses and users due to depletion of groundwater in storage is considered significant and unreasonable and, therefore, an undesirable result.

These significant and unreasonable conditions in the subbasin were informed through:

- Development of a detailed hydrogeologic conceptual model of the subbasin (see Attachment 1)
- Development of a calibrated numerical groundwater flow model of the subbasin (see Attachment 3)
- Analysis of potential future groundwater levels using the model and incorporating

each GSA's planned projects and management actions, and

- Comparison of model-forecasted groundwater levels with the best available information on well depths in the subbasin (see Attachment 4).

The groundwater level conditions established to protect access to groundwater for the majority of beneficial users form the basis for the conditions used to define an unreasonable depletion of groundwater in storage. Thus, the maximum theoretical amount of groundwater that can be removed from storage in the transition period from 2020 to 2040, including implementation of the proposed projects and management actions, is the volume of groundwater that would be removed if Upper Aquifer groundwater levels were lowered to the minimum thresholds across the Subbasin. For those uses such as shallow domestic well owners where depletion of groundwater in storage causes impacts, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

Each GSA has followed a public process through stakeholder workshops, Technical Advisory Committee meetings, and meetings of individual GSA Board of Directors to communicate potential undesirable results and receive feedback from the various beneficial uses and users of groundwater within its jurisdictional area.

4.3.2.3 *Potential Effects on Beneficial Uses and Users (§354.26(b)(3))*

Using the above-described criteria, the GSAs evaluated potential undesirable results to agricultural, domestic, industrial, and municipal beneficial uses. Overall, based on forecasting of future groundwater levels using a calibrated numerical groundwater flow model of the Tule Subbasin and the best available data, the projects and management actions to be implemented by each GSA are predicted to decelerate and arrest chronic depletion of groundwater in storage by 2040. Potential impacts to wells associated with groundwater storage declines in the transition period between 2020 and 2040 were evaluated through an analysis of well depths in the Tule Subbasin (see Attachment 4). Potential effects of lowered groundwater storage on the various beneficial uses of groundwater in the Tule Subbasin, in the context of the groundwater modeling and analysis of well depths, are as follows:

Agricultural

Potential effects to agricultural beneficial uses and users from lowered groundwater levels include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4). In extreme circumstances, agricultural well owners may be forced to share use of wells or facilities with other lands or landowners.

Domestic

Some domestic uses and users of groundwater may be impacted by continued lowering of groundwater levels during the transition period from January 2020 to December 2040. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4). Lowering groundwater levels below the total depth of shallow domestic wells could lead to added costs to haul in water supplies, tie into other available supplies, consolidation with existing water service providers, or requiring other form of mitigation

Industrial

Potential effects to industrial beneficial uses and users from lowered groundwater levels include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4).

Municipal

Potential effects of lowered groundwater levels on municipal beneficial uses and users of groundwater include financial impacts to lower pumps, repair/replace wells, and increased pumping costs. Analysis of well depths that could be affected by lowering groundwater levels to the minimum thresholds has been completed (see Attachment 4). All of the potentially impacted wells are in the City of Porterville. The City of Porterville has indicated that these potential effects can be mitigated through management actions by distributing pumping in such a way as to avoid the impacts.

To address potential effects on agricultural, domestic and industrial beneficial uses and ensure access to water until the Subbasin reaches a sustainable groundwater level condition, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7..

4.3.3 Degraded Water Quality

4.3.3.1 *Causes of Groundwater Conditions That Could Lead to Undesirable Results (§354.26(b)(1))*

Pursuant to 23 Cal. Code Regs. §354.26(b)(1), degraded water quality can occur for a variety of reasons, some reasons that are not a result of GSP implementation. An undesirable result would be the significant and unreasonable degradation of groundwater quality due to groundwater pumping and recharge projects such that the quality of groundwater is no longer generally suitable for agricultural and/or domestic use. For the purposes of SGMA, degraded water quality causation will include those changes to groundwater quality resulting from the implementation of a GSP. These significant and unreasonable conditions in the subbasin were informed through the evaluation outlined in Attachment 5.

Projects and management actions will be implemented by each GSA in order to decelerate and arrest the degradation of groundwater quality caused by irrigation and septic return flows or lowering of groundwater elevations within the Tule Subbasin by 2040.

4.3.3.2 *to Define Undesirable Results (§354.26(b)(2))*

Pursuant to 23 Cal. Code Regs. §354.26(b)(2), the criteria for an undesirable result for the degradation of groundwater quality is defined as the exceedance of a minimum threshold at a groundwater quality RMS in any given GSA resulting from the implementation of a GSP. This condition would indicate that more aggressive management actions were needed to mitigate the overdraft.

Measurement Methodology: Utilize Data collected by others (Public Water Systems, Irrigated Lands Regulatory Program, other Regulated Dischargers) at the RMS well sites identified in

Attachment 1. Groundwater degradation will be evaluated relative to established Maximum Contaminate Levels (MCL) or the agricultural constituents of concern (COC) by applicable regulatory agencies. The metrics for degraded water quality shall be measured for compliance—MCL or the agricultural water quality objective (WQO)—depending on the dominant beneficial use or user of groundwater determined at each RMS well (see **Attachment 1**). These metrics will address the following constituents where applicable to the beneficial use or user:

- Arsenic
- Nitrate
- Hexavalent Chromium
- Dibromochloropropane (DBCP)
- 1,2,3-Trichloropropane (TCP)
- Tetrachloroethylene (PCE)
- Sodium
- Chloride
- Perchlorate
- Total Dissolved Solids (TDS)

4.3.3.3 *Potential Effects on Beneficial Uses and Users (§354.26(b)(3))*

Pursuant to 23 Cal. Code Regs. §354.26(b)(3), the following beneficial uses and users of groundwater may be impacted by the Minimum Thresholds:

- Municipal, Small Community, Underserved Communities, and Domestic Well Sites
- Agricultural Supply

Generally, the avoidance of an undesirable result for degraded groundwater quality is to protect the those using the groundwater, which varies depending on the beneficial use of the groundwater. Degraded groundwater quality may impact crop growth or impact drinking water systems, both of which would cause additional expense of treatment to obtain suitable water. To address impacts to beneficial uses and users as a result of minimum threshold exceedances for degraded water quality at RMS wells, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.3.4 Land Subsidence

4.3.4.1 *Causes of Groundwater Conditions That Could Lead to Undesirable Results (§354.26(b)(1))*

Land subsidence in the Tule Subbasin is caused by prolonged pumping induced groundwater level declines in portions of the Subbasin with substantial thicknesses of fine-grained deposits beneath the water table. The chronic lowering of groundwater levels throughout the Subbasin since 1987 has contributed to historical land subsidence that has caused reduced flow capacity in the Friant-Kern Canal (FKC). Continued lowering of groundwater levels during the transition period from 2020 to 2040 has the potential to result in additional land subsidence in various parts of the Subbasin resulting

in impacts to gravity-driven conveyance facilities, changes in flood control conditions, and damage to roads and other surface infrastructure.

4.3.4.2 *Criteria to Define Undesirable Results (§354.26(b)(2))*

Land subsidence that occurs during the transition period from 2020 to 2040 will be considered significant and unreasonable if damage and/or loss of functionality of a structure or a facility occurs to the extent that the structure or facility cannot reasonably operate without either repair or replacement, as determined by the GSA where the structure and facility are located or where beneficial use is impacted due to the damage and/or loss of functionality of the structure or facility. Any land subsidence occurring after 2040 that is not attributable to recoverable compaction is considered an undesirable result. It is acknowledged that residual land subsidence resulting from historical groundwater conditions may occur after 2040. Additional studies and data are needed to assess the rate and extent of residual land subsidence that could occur after 2040 and the potential for this subsidence to cause undesirable results.

The criteria to define undesirable results for land subsidence was developed based on:

- Development of a detailed hydrogeologic conceptual model of the subbasin that included an assessment of the conditions causing land subsidence along the FKC (see Attachment 1)
- Development of a calibrated numerical groundwater flow model of the subbasin that included a land subsidence package for estimating potential future land subsidence (see Attachment 3)
- Analysis of potential future land subsidence using the model and incorporating each GSA's planned projects and management actions (Attachment 3),
- Comparison of the forecasted rate and extent of land subsidence through the transition period from 2020 to 2040 with surface land uses and critical infrastructure throughout the Subbasin (see Attachment 6), and
- Coordination with Friant Water Authority staff and consultants.

Each GSA has followed a public process through stakeholder workshops, Technical Advisory Committee meetings, and meetings of individual GSA Board of Directors to communicate potential undesirable results and receive feedback from the various beneficial uses and users of groundwater within its jurisdictional area.

Groundwater flow model analysis forecast as much as three feet of additional land subsidence at some locations of the FKC during the transition period from 2020 to 2040 (see Attachment 6). Through coordination with the Friant Water Authority staff and consultants, this value became the basis for engineering design modifications to restore canal flow capacity to its original condition. Land subsidence along the canal exceeding three feet was determined to be an undesirable result because it would be beyond what the engineering design could accommodate to restore the flow capacity to its original condition and what the parties to the FWA/ETGSA/Pixley GSA settlement agreement agreed to mitigate.

In other areas of the Tule Subbasin, apart from the FKC, the rate and extent of land subsidence forecast by the groundwater flow model for the 2020 to 2040 transition period was the basis for establishing undesirable results (see Attachment 6). In most areas of the Tule Subbasin, the GSAs determined that the forecasted land subsidence during the transition period, which was of a

similar magnitude to what had been historically measured, was not anticipated to result in undesirable results to land uses or critical infrastructure because no undesirable results had previously been reported as a result of historical land subsidence in those areas. Nonetheless, for unforeseen impacts due to land subsidence during this period, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

Aside from mitigation provisions for impacted land uses, the quantitative definition of undesirable results for land subsidence is ongoing land subsidence below the minimum threshold at any given RMS Site that cannot be attributable to recoverable land subsidence, as described in Attachment 6.

Additional land subsidence beyond that forecast for the transition period was considered an undesirable result as long as it was not attributable to recoverable land subsidence from seasonal changes in groundwater levels.

4.3.4.3 *Potential Effects on Beneficial Uses and Users (§354.26(b)(3))*

In the Tule Subbasin, the most common structures impacted by land subsidence from groundwater withdrawal are surface water conveyance canals where the elevation of a segment of the canal drops faster than other segments, resulting in sags that restrict the ability to deliver water downstream of the impacted area. As an example, land subsidence in the vicinity of the FKC is being monitored and managed under Eastern Tule Groundwater Sustainability Agency's Land Subsidence Monitoring and Management Plans.

Potentially impacted land uses in the Tule Subbasin have been divided into high priority land uses and low priority land uses.

High priority land uses are those that are potentially impacted by regional land subsidence regardless of if there is differential land subsidence. These high priority land uses include:

- Gravity-Driven Water Conveyance
  - Canals
  - Turnouts
  - Stream Channels
  - Water Delivery Pipelines
  - Basins
- Wells
- Flood Control Infrastructure

Low priority land uses are not typically impacted by regional land subsidence but are susceptible to differential land subsidence if it occurs. Based on the available information, these land uses have not been impacted by the regional land subsidence that has historically occurred in the Tule Subbasin. Similarly, the additional land subsidence that is projected to occur in the transition period from 2020 to 2040, and upon which the Minimum Thresholds were established, is not anticipated to result in significant and unreasonable impacts to these land uses as greater subsidence has occurred in these areas historically than projected during the period between 2020 and 2040 (see Attachment 6). The low priority land uses include:

- Highways and Bridges
- Railroads
- Other Pipelines
- Wastewater Collection
- Utilities
- Buildings

Damage to infrastructure and other land uses in the Tule Subbasin from land subsidence could result in financial impacts to beneficial users of groundwater associated with fixing the damaged infrastructure and providing alternative means to meet the services provided by such infrastructure until they are fixed.

To address potential impacts due to land subsidence, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7. The ETGSA and Pixley GSA have entered into a settlement agreement with the FWA to mitigate the cost to repair sections of the FKC within ETGSA associated with land subsidence that occurs during the transition period from 2020 to 2040.

Projects and management actions will be implemented by each GSA to reduce land subsidence rates within the Tule Subbasin during the transition period from 2020 to 2040, and minimize land subsidence after 2040. This will include measures necessary to minimize land subsidence significantly and unreasonably affecting the functionality or a structure or facility, such as the FKC.

4.3.5 Depletion of Interconnected Surface Waters (Regs. §354.26 (d) & §354.28 (e))

No interconnected surface waters have been identified in any Tule Subbasin GSAs as described more thoroughly in relevant portions of the Basin Setting. Thus, no criteria need be established.

4.3.6 Seawater Intrusion (Regs. §354.26 (d) & §354.28 (e))

Seawater intrusion is defined as "the advancement of seawater into a groundwater supply that results in degradation of water quality in the basin and includes seawater from any source." (23 Cal. Code Regs. §351(af).) As described more thoroughly in the basin setting, there is no potential for the advancement of seawater into any portion of the Tule Subbasin. Thus, no criteria need be established.

4.4 Minimum Thresholds (Reg. § 354.28)

A Minimum Threshold is "…the quantitative value that represents the groundwater conditions at a representative monitoring site that, when exceeded individually or in combination with Minimum

Thresholds at other monitoring sites, may cause an undesirable result(s) in the basin…"[5] In consideration of input received through public stakeholders workshops, public Technical Advisory Committee meetings, and individual GSA Board meetings and Stakeholder meetings, each GSA in the Tule Subbasin has established Minimum Thresholds at their representative monitoring sites in consideration of the groundwater beneficial uses and users in their GSA. Minimum Thresholds for groundwater levels and land subsidence were informed, in part, from analysis of forecasted future groundwater levels and land subsidence using the calibrated numerical groundwater flow model of the Tule Subbasin (see Attachment 3). The MTs were then adjusted based on the beneficial uses and users across each of the GSAs.

4.4.1 Groundwater Level Minimum Thresholds

4.4.1.1 *Criteria Used to Establish Minimum Thresholds (§354.28(b)(1))*

Based on the best available data collected to date and groundwater model analysis (see Section 4.3.1.2), each GSA established groundwater level minimum thresholds designed to reasonably protect access to groundwater for the majority of beneficial users. For those uses such as shallow domestic well owners where impacts to groundwater access may occur, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.4.1.2 *Relationship to Other Sustainability Indicators (§354.28(b)(2))*

Lowering of groundwater levels is directly related to the sustainability indicators for changes in groundwater in storage and land subsidence. By maintaining groundwater levels above the Minimum Thresholds, undesirable results associated with reduction of groundwater in storage and land subsidence should be minimized.

4.4.1.3 *Relationship to Adjacent Basins (§354.28(b)(3))*

The Minimum Thresholds described in each GSA's GSP have been informed through an analysis of potential future groundwater levels in the Subbasin using a numerical groundwater flow model that incorporates future planned projects and management actions of each of the GSAs. Implementation of the projects and management actions are predicted to stabilize groundwater levels at the Tule Subbasin boundaries and areas immediately adjacent to the Subbasin, as long as the neighboring basins are successful in implementing their respective projects and management actions.

4.4.1.4 *Potential Effects (§354.28(b)(4))*

Maintaining groundwater levels above the Minimum Thresholds for the chronic lowering of groundwater levels is not anticipated to produce undesirable results for the majority of beneficial uses and users of groundwater. Potential effects on beneficial uses from groundwater level declines are described in Section 4.3.1.3. For those uses such as shallow domestic well owners where impacts to groundwater access may occur, each GSA will adopt a Mitigation Program or Programs consistent

[5] DWR, 2017. Best Management Practices for the Sustainable Management of Groundwater – Sustainable Management Criteria. Draft document dated November 2017.

with the Framework attached hereto as Attachment 7.

4.4.1.5 *Relationship with Federal, State, and Local Standards (§354.28(b)(5))*

There are no Federal, State or local standards specific to addressing the chronic lowering of groundwater levels in the Tule Subbasin.

4.4.1.6 *Measurement of Groundwater Levels Relative to Minimum Thresholds (§354.28(b)(6))*

Groundwater levels will be measured at the representative monitoring sites and according to the monitoring schedule described in **Attachment 1**. The status of groundwater levels relative to the Minimum Thresholds will be reported in Annual Reports and Five-Year Reports.

4.4.2 Reduction of Groundwater in Storage Minimum Thresholds

4.4.2.1 *Criteria Used to Establish Minimum Thresholds (§354.28(b)(1))*

The Minimum Threshold for reduction of groundwater in storage is a single value for the entire Tule Subbasin based on the Upper Aquifer Minimum Threshold for groundwater levels. It represents the volume of groundwater that would hypothetically be removed if groundwater levels were lowered to the minimum thresholds across the Subbasin. As lowering the groundwater levels below the Minimum Thresholds is considered indicative of an unsustainable condition and, therefore, an undesirable result, the associated reduction in groundwater in storage is also considered an undesirable result.

4.4.2.2 *Relationship to Other Sustainability Indicators (§354.28(b)(2))*

Reduction of groundwater in storage is directly related to the sustainability indicators for groundwater levels and land subsidence. By maintaining groundwater storage above the Minimum Threshold, undesirable results associated with lowered groundwater levels and land subsidence should be minimized if not eliminated.

4.4.2.3 *Relationship to Adjacent Basins (§354.28(b)(3))*

The Minimum Thresholds described in each GSA's GSP have been informed through an analysis of potential future groundwater levels in the Subbasin using a numerical groundwater flow model that incorporates future planned projects and management actions of each of the GSAs. Implementation of the projects and management actions are predicted to stabilize groundwater levels at the Tule Subbasin boundaries and areas immediately adjacent to the Subbasin, which will stabilize groundwater storage levels, as long as the neighboring basins are successful in implementing their respective projects and management actions.

4.4.2.4 *Potential Effects (§354.28(b)(4))*

Stabilizing groundwater storage levels above the Minimum Threshold is not anticipated to produce undesirable results for the majority of beneficial uses and users of groundwater. Potential effects on beneficial uses from depletion of groundwater in storage is described in Section 4.3.2.3. For

those uses such as shallow domestic well owners where impacts to groundwater access may occur, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.4.2.5 *Relationship with Federal, State, and Local Standards (§354.28(b)(5))*

There are no Federal, State or local standards specific to addressing the reduction of groundwater in storage in the Tule Subbasin.

4.4.2.6 *Measurement of Groundwater Levels Relative to Minimum Thresholds (§354.28(b)(6))*

Changes in the volume of groundwater in storage will be assessed on an annual basis using the groundwater levels measured at the representative monitoring sites in accordance with the monitoring schedule described in **Attachment 1**.

4.4.3 Groundwater Quality Minimum Thresholds

4.4.3.1 *Criteria Used to Establish Minimum Thresholds (§354.28(b)(1))*

The criteria to establish the minimum thresholds for groundwater quality will be the established Maximum Contaminate Levels (MCL) or the water quality objective (WQO) depending on the dominant beneficial use of groundwater determined at each RMS well (see **Attachment 1**). These metrics will address the following constituents of concern as applicable to the beneficial use or user:

Constituent	Units	Minimum Threshold	
		Drinking Water Limits (MCL/SMCL)	Agricultural WQOs
Arsenic	ppb	10	N/A
Nitrate as N	ppm	10	N/A
Hexavalent Chromium	ppb	10	N/A
Dibromochloropropane (DBCP)	ppb	0.2	N/A
1,2,3-Trichloropropane (TCP)	ppt	5	N/A
Tetrachloroethene (PCE)	ppb	5	N/A
Chloride	ppm	500	106
Sodium	ppm	N/A	69
Total Dissovled Solids	ppm	1,000	450
Perchlorate	ppb	6	N/A

The methodology used to distinguish between the applicability of either MCLs or Ag WQO for setting minimum thresholds at RMS wells is summarized below (detailed in Attachment 5):

- At each RMS well, determine the dominant beneficial use for that monitoring well based on the classification of wells within one mile of the RMS well.
    - If the majority of the beneficial use (greater than 50% the wells within a determined area) is agricultural and there are no public water systems (including schools) the minimum threshold would be a host of agricultural water quality constituents.
    - If an RMS well is located within an urban area, within one mile of a public water system, which includes schools, or the dominant beneficial use (greater than 50% of the wells within the determined area) is drinking water, then the minimum threshold would be set at the MCL for drinking water.
    - In cases where both of the above criteria are found to be true, the minimum thresholds would be established for both drinking water MCLs and Ag WQO's and minimum thresholds would be set at the most stringent of the two when considering common constituents.
    - If drinking water MCLs or Ag WQOs were historically exceeded at an RMS well or found not be a result of implementation of a GSP, the GSA will coordinate with the responsible regulatory agency to prevent GSA SGMA activities from further degrading groundwater quality.

4.4.3.2 *Relationship to Other Sustainability Indicators (§354.28(b)(2))*

Groundwater quality is directly related to the sustainability indicator for change in groundwater storage and lowering of groundwater levels.

4.4.3.3 *Relationship to Adjacent Basins (§354.28(b)(3))*

The Minimum Thresholds for groundwater quality are based upon MCL and WQO established by the State for the beneficial uses and user within the Central Valley of California. Implementation of the projects and management actions within the GSA that may impact degraded groundwater quality will be consistent with the requirements established by the State and therefore would not adversely impact adjacent basins.

4.4.3.4 *Potential Effects (§354.28(b)(4))*

The Minimum Thresholds for the degrading of groundwater quality is not anticipated to produce undesirable results for agricultural, municipal, and industrial beneficial uses. If beneficial uses and users of groundwater have their groundwater quality impacted by GSA actions, each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.4.3.5 *Relationship with Federal, State, and Local Standards (§354.28(b)(5))*

The minimum thresholds established are based on the Federal, State and Local Standards for groundwater quality maximum contaminant level (MCL) for drinking water or Agricultural Water

Quality Objective (WQO) based on the beneficial use or user of the groundwater. Each groundwater quality RMS has been designated as representative of drinking water beneficial use, agricultural beneficial use, or both using the criteria defined in Section 4.4.3.1.

4.4.3.6 *Measurement of Groundwater Quality Relative to Minimum Thresholds (§354.28(b)(6))*

Groundwater quality will be measured at the representative monitoring sites and according to the monitoring schedule described in **Attachment 1**. The status of groundwater quality relative to the Minimum Thresholds will be reported in Annual Reports and Five-Year Reports.

4.4.4 Land Subsidence Minimum Thresholds

4.4.4.1 *Criteria Used to Establish Minimum Thresholds (§354.28(b)(1))*

Minimum Thresholds for land subsidence were established throughout the Tule Subbasin based on the best available data collected to date and groundwater model analysis, as described in Section 4.3.4.2.

Groundwater flow model analysis forecast as much as three feet of additional land subsidence at some locations of the FKC during the transition period from 2020 to 2040 (see Attachment 3; Figure 44). Through coordination with the Friant Water Authority staff and consultants, this value became the basis for engineering design modifications to restore canal flow capacity to its original condition. Land subsidence along the canal exceeding three feet was determined to be an undesirable result because it would be beyond what the engineering design could accommodate to restore the flow capacity to its original condition and what the parties to the FWA/ETGSA/Pixley GSA settlement agreement agreed to mitigate. Accordingly, the minimum threshold for land subsidence along the FKC was established at three feet of additional land subsidence after January 2020.

In other areas of the Tule Subbasin, apart from the FKC, the rate and extent of land subsidence forecast by the groundwater flow model for the 2020 to 2040 transition period was the basis for establishing minimum thresholds (see Attachment 6). In most areas of the Tule Subbasin, the GSAs determined that the forecasted land subsidence during the transition period, which was of a similar magnitude to what had been historically measured, was not anticipated to result in undesirable results to land uses or critical infrastructure because no undesirable results had previously been reported as a result of historical land subsidence in those areas. Thus, the maximum amount of land subsidence forecast during the transition period from 2020 to 2040 using the calibrated groundwater flow model is the basis for the land subsidence minimum thresholds throughout the Subbasin.

4.4.4.2 *Relationship to Other Sustainability Indicators (§354.28(b)(2))*

Land subsidence is directly related to the sustainability indicators for lowered groundwater levels and reductions in groundwater in storage. By maintaining groundwater levels above the Minimum Thresholds, undesirable results associated with land subsidence should be minimized.

4.4.4.3 *Relationship to Adjacent Basins (§354.28(b)(3))*

The Minimum Thresholds described in each GSA's GSP have been informed through an analysis of potential future land subsidence in the Subbasin using a numerical groundwater flow model that incorporates future planned projects and management actions of each of the GSAs. Implementation of the projects and management actions, including the mitigation program by participating GSAs, are predicted to stabilize groundwater levels at the Tule Subbasin boundaries and areas immediately adjacent to the Subbasin, as long as the neighboring basins are successful in implementing their respective projects and management actions. Stabilizing groundwater levels will have the effect of minimizing land subsidence.

4.4.4.4 *Potential Effects (§354.28(b)(4))*

Regional land subsidence could result in impacts to gravity-driven water conveyance and other infrastructure. Land uses vulnerable to regional land subsidence are considered high priority and include:

- Gravity-Driven Water Conveyance
  - Canals
  - Turnouts
  - Stream Channels
  - Water Delivery Pipelines
  - Basins
- Wells
- Flood Control

The Tule Subbasin GSAs have developed a mitigation framework for each GSA to utilize to address claims of impact that can be attributed to land subsidence (see Attachment 7). The ETGSA and Pixley GSA have entered into a settlement agreement with the FWA to mitigate the cost to repair sections of the FKC within ETGSA associated with land subsidence that occurs during the transition period from 2020 to 2040 (see ETGSA and Pixley GSA GSPs).

Differential land subsidence and associated damage to infrastructure has not been reported in the Tule Subbasin and is not anticipated to result in adverse impacts to infrastructure or land uses. These land uses are considered low priority, as it relates to land subsidence impacts, and include:

- Highways and Bridges
- Railroads
- Other Pipelines
- Wastewater Collection
- Utilities
- Buildings

Claims of impact related to land subsidence for these categories are more likely to come from public utilities, municipalities, or state agencies whereas each GSA will adopt a Mitigation Program or Programs consistent with the Framework attached hereto as Attachment 7.

4.4.4.5 *Relationship with Federal, State, and Local Standards (§354.28(b)(5))*

There are no Federal, State or local standards specific to addressing land subsidence in the Tule Subbasin.

4.4.4.6 *Measurement of Land Subsidence Relative to Minimum Thresholds (§354.28(b)(6))*

Land elevations will be measured at the representative monitoring sites and according to the monitoring schedule described in **Attachment 1**. Additional monitoring, above and beyond that specified in Attachment 1, will be implemented for the ETGSA Land Subsidence Management Area along the FKC. The status of land subsidence relative to the Minimum Thresholds will be reported in Annual Reports and Five-Year Reports.

4.5 Measurable Objectives (Reg. § 354.30)

Measurable Objectives, including interim milestones in increments of five years, will be quantified at each RMS for each applicable sustainability indicator, defined as the numeric value in 2040, to achieve the sustainability goal in 20-year of plan implementation. Each measurable objective and interim milestones will be defined and described separately by each GSA in the GSP.

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V. MONITORING PROTOCOLS, NETWORKS, AND IDENTIFICATION OF DATA GAPS (§§352.2, 354.32.)

5.1 Monitoring Network and Representative Monitoring (§§354.34-354.36)

The minimum monitoring network to be used to collect data in the Tule Subbasin is described in the Tule Subbasin Monitoring Plan (see **Attachment 1**). The types of data to be collected as part of the plan include:

□ Surface water flow □ Surface water quality □ Groundwater levels □ Groundwater quality □ Land surface elevation from Global Positioning System (GPS) stations □ Land surface elevation changes from satellite data □ Land subsidence data from extensometers

The monitoring plan ensures that the data collected within the Subbasin is of sufficient quality, frequency and distribution to provide meaningful results for evaluating changing conditions within the Subbasin and informing the decision-making process.

The minimum monitoring network identified in the Tule Subbasin Monitoring Plan is both flexible and iterative, allowing for the addition or subtraction of monitoring features, as necessary, and to accommodate changes in monitoring frequency and alternative methodologies, as appropriate. Any changes to the minimum monitoring network or monitoring protocols identified in **Attachment 1** shall be approved by the Tule Subbasin TAC.

Individual GSAs may include additional monitoring features, not specifically identified in the Tule Subbasin Monitoring Plan, for collecting data to include in their respective GSPs and Annual Reports. Any monitoring features utilized for the collection of data to be included in GSPs and Annual Reports that are not identified in the Tule Subbasin Monitoring Plan must meet the minimum design and construction requirements specified in Section 3 of this Coordination Agreement and the Tule Subbasin Monitoring Plan. Any monitoring features not in the Tule Subbasin Monitoring Plan that are to be used by a GSA to collect data for incorporation into GSPs or Annual Reports will be shared with the Tule Subbasin TAC.

5.1.1 Procedures for Collecting the Data

The Tule Subbasin Monitoring Plan (**Attachment 1**) includes detailed procedures for the collection of surface water flow data, groundwater elevation data, and land surface elevation data. Groundwater quality data will be coordinated with and through the Irrigated Lands Regulatory Program and the existing coalitions. The data collection procedures will ensure that the data collected have the level of accuracy and precision necessary for evaluating conditions relative to minimum thresholds, estimating change in groundwater storage as required for Annual Reports, and measuring progress toward achieving sustainability. The data collection processes and procedures shall apply to monitoring features specifically identified in the Tule Subbasin Monitoring Plan as well as any additional monitoring features utilized for the collection of data by individual GSAs.

5.1.2 Entities Responsible for Data Collection

All data collection work, as specified in the Tule Subbasin Monitoring Plan (**Attachment 1**)

will be performed by each GSA through individuals working under the direct supervision of a California Registered Professional Civil Engineer, Professional Geologist, or Certified Hydrogeologist and who meet the minimum qualifications and training requirements required by the Tule Subbasin TAC's technical consultant. The collection of groundwater quality data will be coordinated with and through the Irrigated Lands Regulatory Program and the existing coalitions. All data will be collected in accordance with the protocols specified in **Attachment 1**.

Nothing in this Agreement prevents multiple GSAs from using the same consultant. It is understood by and among the Parties that there will be individual GSA-specific data that can be collected either through the Tule Subbasin TAC's technical consultant or through the consultant/staff hired by that GSA. The goal is that the data collection be done following the same processes and procedures throughout the Tule Subbasin. If a GSA prefers to use the technical consultant hired by the Tule Subbasin TAC for the purposes of collecting information beyond what is required for Tule Subbasin Monitoring Plan, then that GSA shall pay for the consultant's fees and costs separately and above what the Tule Subbasin GSAs agree to cost share. In the event that a GSA hires its own consultant for site or GSA-specific data collection, such data shall be shared through the data sharing provisions of this Agreement.

All data collected by the GSAs shall be submitted to the Tule Subbasin TAC's technical consultant in accordance with the schedule described in Section 4.1.3 for QA/QC and entry into the Tule Subbasin Water Management Database (see Section 4.3).

5.1.3 How and When Data are Distributed to the GSAs

The complete Tule Subbasin Water Management Database will be available to authorized representatives as set forth by the GSAs of the Tule Subbasin GSAs at any time upon request.

The schedule to distribute data to the individual GSAs for preparation of Annual Reports has been prepared to enable the Tule Subbasin TAC to submit the compiled Annual Reports by the SGMA reporting deadline of April 1 following a water year. As per Groundwater Sustainability Plan Regulations Section 356.2, Annual Reports will include data and analyses for the preceding water year (October 1 through September 30). The distribution of data to the GSAs for the preparation of Annual Reports will be in accordance with the following schedule:

- The Tule Subbasin TAC's technical consultant will update the database between October 1 and January 30 following a subject water year.
- Individual GSAs will be required to submit groundwater extractions (i.e. pumpage) to the technical consultant by January 1 following a subject water year.
- Following Quality Assurance/Quality Control checks by the technical consultant, the previous water year's data will be submitted to each GSA by February 1 so the

GSAs can prepare their respective Annual Reports. The data will be formatted for easy incorporation into Annual Reports and distributed electronically. Annual reports will be submitted to the Tule Subbasin TAC for compilation by March 1 following the preceding water year. All Annual Reports will be submitted to the California Department of Water Resources by April 1 following the preceding water year.

5.2 Assessment and Improvement of Monitoring Network and Identification of Data Gaps (§354.38.)

The Tule Subbasin TAC will periodically evaluate the monitoring network in **Attachment 1** to determine if there are data gaps that could affect the ability of the Subbasin to meet its sustainability goals. Current data gaps are identified in **Attachment 1**. Every five years, the Tule Subbasin TAC will provide an evaluation of data gaps in the five-year assessment, including steps to be taken to address data gaps before the next five-year assessment.

5.3 Data Management System (DMS) (§357.4(e))

Efficient data management will be a critical to ensure that each GSA can access the data needed to prepare their respective Annual Reports in a timely manner and to ensure that the Tule Subbasin TAC can meet deadlines for submittal of the coordinated reports. The Monitoring Plan, **Attachment 1**, describes the Tule Subbasin Water Management Database, the procedures for updating and maintaining the database, and protocols for database security, file access and reporting. Data to be managed will include:

A. Historical data used as a basis for preliminary estimates of the Water Budget and Sustainable Yield of the Tule Subbasin.
B. Data to be collected in accordance with the Tule Subbasin Monitoring Plan (**Attachment 1**).

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VI. IMPLEMENTATION OF GSPS (§357.4(c))

Pursuant to 23 Cal. Code Regs. §357.24(c), the coordination agreement shall explain how the GSPs when implemented together satisfy the requirements of SGMA and are in substantial compliance with its regulations. SGMA requires the development and implementation of GSPs by GSAs to achieve sustainable groundwater management by 2040.

Throughout this Coordination Agreement, the Tule Subbasin GSAs have agreed upon various data and methodologies critical to understanding the hydrogeology of the Subbasin, and addressing and understanding what remedies are available to avoid undesirable results.

The GSAs within the Tule Subbasin will work together to implement their respective GSPs within the Tule Subbasin. The Tule Subbasin TAC, the technical advisory committee composed of representatives from each GSA, has developed Subbasin-wide data and methodologies for each of the following items, and made them available to each GSA to adopt and utilize in the development of its respective GSP:

- Groundwater elevation data.
- Groundwater extraction data.
- Surface water supply.
- Total water use.
- Change in groundwater storage.
- Water budget.
- Sustainable yield.

The GSAs understand there is local, site-specific data particular to each GSA which each GSA may utilize in the development of its respective GSP in addition to the Subbasin-wide data. If an individual GSA has identified monitoring features for use in collecting data specific to its jurisdictional area and the features are not included in Section 3 or **Attachment 1** of this Coordination Agreement, then the GSA can incorporate the features and data into its GSP upon confirming that those particular monitoring features meet the minimum criteria specified in Section 3 and that the data has been collected in accordance with this Coordination Agreement.

Each GSA shall submit its respective GSP, and any updates thereto, to the Tule Subbasin TAC so that the other Tule Subbasin GSAs may review and comment prior to documents being submitted to DWR. Each GSA shall comply with 23 Cal. Code Regs. §354.10, regarding comments received on the GSP, and such GSP shall be made available on the GSA's website.

Each GSA acknowledges and agrees that it is responsible to ensure that its GSP complies with the statutory requirements of SGMA. The GSAs further acknowledge the obligation for each GSA to coordinate the implementation of their respective GSPs in order to, collectively, achieve the Sustainability Goal for the Subbasin, as required by SGMA.

Additionally, to better implement and refine the projects and management actions adopted in their respective GSPs, the GSAs are committed to work together on developing and maintaining a data management system and are implementing quality control and quality assurance measures to collect reliable GSA-specific and Subbasin-wide data to ensure Subbasin-wide Sustainability Goal is

achieved.

The Tule Subbasin GSAs are committed to implementing their respective projects and management actions set forth in their respective GSPs for the purpose of reaching sustainability for the Subbasin by 2040. The GSAs are also committed to further refine and update their projects, management actions and GSPs in accordance with SGMA as more and better data becomes available.

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VII. TULE SUBBASIN ORGANIZATIONAL STRUCTURE

7.1 Tule Subbasin Technical Advisory Committee

The Tule Subbasin TAC was previously formed under a Memorandum of Agreement executed by all Tule Subbasin GSAs. The Parties agree to the continued existence of the Tule Subbasin TAC pursuant to the terms below. The Tule Subbasin TAC is an advisory committee only and has no authority or power to bind any individual GSA to any recommendation or action item taken by its members.

Nothing in this Agreement is intended to affect the statutory powers granted under SGMA, or any other applicable law, to the Tule Subbasin GSAs. Each Tule Subbasin GSA shall be solely responsible for the adoption and enforcement of any ordinances, bylaws, or other legally enforceable actions taken within their respective GSA boundaries to implement SGMA, including, but not limited to, the preparation of the GSP applicable within their GSA boundaries. Each GSA agrees that as required by this Coordination Agreement, they shall utilize the same data and methodologies contained in this Coordination Agreement. The Parties understand there will be basin-wide data, in addition to certain local site-specific data collected and/or utilized by each GSA.

7.1.1 Members and Voting

A Tule Subbasin TAC shall be formed with one (1) representative appointed from each GSA, as well as one (1) alternate from each GSA. The Subbasin TAC shall make technical recommendations regarding the Coordination Agreement and other Tule Subbasin related SGMA compliance issues to each GSA. The Tule Subbasin TAC shall meet as necessary. Each GSA shall be entitled to one (1) vote. Recommendations to each GSA shall only be made upon consensus of the Tule Subbasin TAC. Should consensus not be reached, the votes shall be reported to each GSA Board for further direction. A quorum shall exist when five of the seven GSAs have representatives in attendance. The chairperson and secretary will not hold any separate voting rights on the Tule Subbasin TAC.

7.1.2 Consultants

The Parties agree that the Tule Subbasin TAC should obtain the services of consultants to facilitate the collection of data and the submission of information to the Tule Subbasin GSAs. Prior to hiring consultants, or approving scopes of work, the TAC shall obtain approval from the Tule Subbasin GSAs.

7.1.3 Legal Services

The Tule Subbasin TAC shall not retain independent legal services, unless agreed upon by all Parties hereto. Each Party shall be responsible for any legal fees incurred by its own counsel in the course of performing any legal work related to Subbasin matters.

7.1.4 Chairman and Secretary

A Chairman and Secretary shall be appointed to serve the Tule Subbasin TAC. The Chairperson shall be responsible for managing all Tule Subbasin TAC meetings, preparing agenda

materials, managing consultants hired by the Tule Subbasin TAC, and coordinating the delivery of information between GSAs and Tule Subbasin TAC consultants. The Secretary shall be responsible for distributing Tule Subbasin TAC agenda materials to all Tule Subbasin GSAs and to all interested parties that request to be notified of Tule Subbasin TAC meetings, as well as ensuring compliance with all applicable legal requirements, including, but not limited to, the Ralph M. Brown Act. The Secretary shall also be responsible for record keeping of the Tule Subbasin TAC group, maintaining minutes of Tule Subbasin TAC meetings, maintaining copies of all executed agreements, maintaining copies of documents produced by consultants, and providing such information to individual Tule Subbasin GSAs upon request. The appointed Chairperson or Secretary may meet with Tule Subbasin GSAs or GSA member agency employees as necessary.

7.1.5 Meetings

All meetings shall be subject to the Ralph M. Brown Act. The Chairman and Secretary shall be responsible for ensuring compliance. Interested parties shall be provided an opportunity to comment on Coordination Agreement issues. Parties acknowledge the Tule Subbasin TAC duties may include public outreach.

7.1.6 Cost Sharing and Governance

Parties shall share on an equitable basis the costs related to the preparation of the data required for the Coordination Agreement to be drafted. Costs shall be allocated between GSAs based on the number of acres within a GSA.

Each Party to this Agreement shall be responsible for their respective share of costs based on their proportionate acreage within the Tule Subbasin. Through a separate agreement, the Tule Subbasin GSAs have appointed a fiscal agent and that fiscal agent shall have authority to enter into any contract necessary to assist with the preparation of the Coordination Agreement, subject to the direction and authorization of the Tule Subbasin TAC. The fiscal agent shall be responsible for invoicing the respective GSAs and for providing an accounting of all funds received and spent on behalf of the GSAs. The fiscal agent shall attend all Tule Subbasin TAC meetings but has no separate voting rights on the Tule Subbasin TAC.

The Tule Subbasin TAC shall annually prepare a schedule, scope of work, and budget of items required for the Coordination Agreement, which shall identify the estimated expenses and the estimated portions each respective Tule Subbasin GSA will be expected to be responsible for payment. This information shall be submitted to the GSAs for review and approval. The Tule Subbasin TAC may request funds under the approved budget from the GSAs as needed to reimburse the GSA's fiscal agent and may also request budget amendments.

The Parties agree that if grant funds become available for the Coordination Agreement components, then the Parties shall utilize grant funds to pay for those costs. The Parties agree to coordinate specific grant application requests by separate agreement. The Parties agree that grant funds shall be utilized based on the grant application budget and that if any grant funds are available for distribution to the GSAs, then the remaining grant funds shall be distributed based on GSA acreage within the Tule Subbasin.

7.1.7 Procedures for Timely Exchange of Information (§357.4(b)(2))

7.1.7.1 *Exchange of Information*

Pursuant to 23 Cal. Code Regs. §357.4(b)(2), the GSAs acknowledge and recognize that for this Coordination Agreement to be effective in the enhancement of the goals of basin-wide groundwater sustainability and compliance with the SGMA and the basin level coordinating and reporting regulations, the GSAs will have an affirmative obligation to exchange certain minimally necessary information among and between the other GSA Parties. Likewise, the GSA Parties acknowledge and recognize that individual GSA Parties, in providing certain information, and in particular certain raw data, may contend that limitations apply in the sharing and other dissemination of certain types of said information, which may subject the individual GSA Party to certain duties regarding non-disclosure and privacy restrictions and protections.

7.1.7.2 *Procedure Governing the Exchange of Information*

The GSAs may exchange information through collaboration and/or informal requests made at the Tule Subbasin TAC. To the extent it is necessary to make a written request for information to another GSA, each GSA shall designate a representative to respond to information requests and provide the name and contact information of the designee to the Tule Subbasin TAC. Requests may be communicated in writing and transmitted in person or by mail, facsimile machine or other electronic means to the appropriate representative as named in this Agreement.

Nothing in this Agreement shall be construed to prohibit any Party from voluntarily exchanging information with any other Party by any other mechanism separate from the Tule Subbasin TAC.

7.1.8 Procedures for Resolving Disputes Dispute Resolution (§§357.4(b)(2), 357.4(h))

The Parties agree that all disputes under this Coordination Agreement that concern the applicability and requirements of SGMA by or between GSAs within the Tule Subbasin, shall be handled under the terms of this Agreement. Any GSA may choose to initiate a dispute resolution process by serving written notice to the remaining GSAs of the following: (1) identification of the conflict; (2) description of how the conflict may negatively impact the sustainability of the Tule Subbasin; and (3) a proposal for one or more resolutions. The Parties agree to designate representatives to meet and confer with each other within thirty (30) days of the date such notice is given and said representatives shall then meet within a reasonable time to address all issues identified in the notice. Should the representatives be unable to reach a resolution within ninety (90) days of the written notice, the Parties shall enter into informal mediation in front of a mutually agreeable mediator. After attempting to settle or resolve a dispute or disagreement through informal resolution and mediation, as described above, nothing within this Agreement shall prevent the Parties from pursuing legal action. The resolution of any dispute or claim related to a water right alleged by a Party is outside the scope contemplated in this Section 7.1.8 and the Coordination Agreement.

7.2 Amendments to this Coordination Agreement

This Coordination Agreement shall become effective on the dates executed by all Parties and shall remain in effect until revised or replaced by a subsequent agreement. This Agreement may be amended upon the mutual written agreement of all the Parties. Pursuant to 23 Cal. Code Regs. §357.4(i), this Coordination Agreement shall be reviewed as part of the five-year assessment, revised if necessary, and executed by all parties.

7.3 Construction

This Agreement is for the sole benefit of the Parties and shall not be construed as granting rights to or imposing obligations on any person other than the Parties.

7.4 Good Faith

Each Party shall use its best efforts and work in good faith for the expeditious completion of the purposes and goals of this Agreement and the satisfactory performance of its terms.

7.5 Execution

This Agreement may be executed in counterparts and the signed counterparts shall constitute a single instrument. The signatories to this Agreement represent that they have the authority to sign this agreement and to bind the Party for whom they are signing.

7.6 Third Party Beneficiaries

This Agreement shall not create any right of interest in any non-Party or in any member of the public as a third-party beneficiary.

7.7 Notices

All notices, requests, demands or other communications required or permitted under this Agreement shall be in writing unless provided otherwise in this Agreement, and shall be deemed to have been duly given and received on: (i) the date of service if personally served or served by electronic mail or facsimile transmission on the Party to whom notice is to be given at the address(es) below; (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other similar overnight courier service; or (iii) on the third day after mailing if mailed to the Party to whom notice is to be given by first class mail, registered certified as follows:

Alpaugh Groundwater Sustainability Agency
Attn: Bruce Howarth
P.O. Box 129 Alpaugh, CA 93201

Delano-Earlimart Irrigation District Groundwater Sustainability Agency
Attn: Eric Quinley
14181 Avenue 24 Delano, CA 93215

Eastern Tule Groundwater Sustainability Agency
Attn: Rogelio Caudillo
881 W. Morton Avenue, Suite D Porterville, CA 93257

Lower Tule River Irrigation District GSA
Attn: Eric Limas
357 E. Olive Avenue Tipton, CA 93272

Pixley Irrigation District GSA
Attn: Eric Limas
357 E. Olive Avenue Tipton, CA 93272

Tri-County Water Authority GSA
Attn: Deanna Jackson
944 Whitley Avenue Suite E Corcoran, CA 93212

County of Tulare
c/o Denise England
County Administration Building
2800 W. Burrel Avenue Visalia, California 93291

7.8 No Waiver; No Admission

Nothing in this Coordination Agreement is intended to modify the water rights of any Party or of any Person (as that term is defined under Section 19 of the Water Code). Nothing in this Coordination Agreement shall be construed as an admission by any Party regarding any subject matter of this Coordination Agreement, including without limitation any water right or priority of any water right that is claimed by a Party or any Person. Nor shall this Coordination Agreement in any way be construed to represent an admission by a Party with respect to the subject or sufficiency of another Party's claim to any water or water right or priority or defenses thereto, or to establish a standard for the purposes of the determining the respective liability of any Party or Person, except to the extent otherwise specified by law. Nothing in this Coordination Agreement shall be construed as a waiver by any Party of its election to at any time assert a legal claim or argument as to water, water right or any subject matter of this Coordination Agreement or defenses thereto. The Parties hereby agree that this Coordination Agreement, to the fullest extent permitted by law, preserves the water rights of each of the Parties as they may exist as of the effective date of this Coordination Agreement or at any time thereafter. Any dispute or claim arising out of or in any way related to a water right alleged by a Party shall be separately resolved before the appropriate judicial, administrative or enforcement body with proper jurisdiction and is specifically excluded from the dispute resolution procedures set forth under this Coordination Agreement, including without limitation under Section 7.1.8.

7.9 It is understood and agreed that this Coordination Agreement supersedes that certain "Memorandum of Understanding to Develop and Implement a Coordination Agreement" and all oral agreements and negotiations between the Parties relating to the subject matter hereof.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement to be effective as of the date noted below.

Alpaugh Groundwater Sustainability Agency — Date: 07/25/22

Delano Earlimart Irrigation District GSA — Date: 7/21/22

Eastern Tule Groundwater Sustainability Agency — Date: 7-18-22

Lower Tule River Irrigation District GSA — Date: 7/19/2022

Pixley Irrigation District GSA — Date: 7/21/2022

Tri-County Water Authority GSA — Date: July 21, 2022

Tulare County GSA — Date: 7/19/2022

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Appendix A Tule Subbasin Coordination Agreement

A-1 Tule Subbasin Monitoring Plan

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TULE SUBBASIN COORDINATION AGREEMENT ATTACHMENT 1

Tule Subbasin Monitoring Plan

July 2022

Prepared for

Tule Subbasin Technical Advisory Committee

Prepared by

Thomas Harder, PG, CHG
Principal Hydrogeologist

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Acronyms

GSP	Groundwater Sustainability Plan
SGMA	Sustainable Groundwater Management Act, California's framework for the recovery and ongoing management of groundwater basins. SGMA empowers local agencies to form Groundwater Sustainability Agencies (GSAs) to manage basins sustainably and requires those GSAs to adopt Groundwater Sustainability Plans (GSPs) for crucial groundwater basins in California.
DWR	Department of Water Resources
GSA	Groundwater Sustainability Agency
TAC	Technical Advisory Committee
TSMP	Tule Subbasin Monitoring Plan
DO	Dissolved Oxygen
EC	Electrical Conductivity
TDS	Total Dissolved Solids
QAPP	Quality Assurance Project Plan
USGS	United States Geological Society
USBR	United States Bureau of Reclamation
GPS	Global Positioning System
NGS	National Geodetic Survey

TRA	Tule River Association
ACOE	Army Core of Engineers
ILRP	Irrigated Lands Regulatory Program
DMS	Data Management System, an application with a database back-end that will track and manage the data of the end users as well as provide administrative
SQL	structured query language
End User/User	Person who will use the product, but not a member of staff, administration, or development team.
UI	User Interface, the part of the application that end users and staff interact with.

1.0 Background

This monitoring plan has been prepared to describe the monitoring features and monitoring methodologies to be used to collect the data to be included in Tule Subbasin Groundwater Sustainability Plans (GSPs) and annual reports, as required by the Sustainable Groundwater Management Act (SGMA). This plan is for the Tule Subbasin (see Figure A1-1), as described in California Department of Water Resources (DWR) Bulletin 118.[1] The Tule Subbasin is subdivided into six Groundwater Sustainability Agencies (GSAs), each with their own GSP.

As required by Section 10727.2 of the Water Code, each GSP must include:

> (d) Components relating to the following, as applicable to the basin:
>
> > (1) The monitoring and management of groundwater levels within the basin.
> >
> > (2) The monitoring and management of groundwater quality, groundwater quality degradation, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin.
> >
> > (3) Mitigation of overdraft.
> >
> > (4) How recharge areas identified in the plan substantially contribute to the replenishment of the basin.
> >
> > (5) A description of surface water supply used or available for use for groundwater recharge or in-lieu use.
>
> (e) A summary of the type of monitoring sites, type of measurements, and the frequency of monitoring for each location monitoring groundwater levels, groundwater quality, subsidence, streamflow, precipitation, evaporation, and tidal influence. The plan shall include a summary of monitoring information such as well depth, screened intervals, and aquifer zones monitored, and a summary of the type of well relied on for the information, including public, irrigation, domestic, industrial, and monitoring wells.
>
> (f) Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence, for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect

[1] DWR, 2016. Final 2016 Bulletin 118 Groundwater Basin Boundaries shapefile. http://www.water.ca.gov/groundwater/sgma/basin_boundaries.cfm

groundwater levels or quality or are caused by groundwater extraction in the basin. The monitoring protocols shall be designed to generate information that promotes efficient and effective groundwater management.

The Tule Subbasin Technical Advisory Committee (TAC) has determined that a single monitoring plan that includes the entire Tule Subbasin is necessary in order to identify the types of data to be collected throughout the subbasin, the minimum number of monitoring features from which to collect data, and the monitoring protocols to be followed by each GSA, in order to ensure that the same methodologies are followed as required by California Water Code Section 10727.6 of SGMA. This Tule Subbasin Monitoring Plan (TSMP) serves that purpose.

1.1 Plan Objectives 354.34 (b)

The TSMP has been prepared to meet the following subbasin-wide objectives:

- To ensure that the data collected within the basin are in sufficient quantities, areal distribution, frequency and accuracy to provide meaningful results for demonstrating progress toward achieving measurable objectives of each GSA and the sustainability goal of the subbasin as a whole.
- To monitor impacts to the beneficial uses and users of groundwater.
- To monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.
- Enable the quantification of annual changes in water budget components.
- To identify data gaps and monitoring features to address the data gaps.
- To provide a standard methodology for the collection of surface water, groundwater, and land surface subsidence data within the Tule Subbasin.
- To provide for a central, secure monitoring database available to the GSAs for their use in preparing their respective groundwater sustainability plans and annual reports.

The TSMP is both flexible and iterative, allowing for the addition or subtraction of monitoring features, as necessary, and to accommodate changes in monitoring frequency and alternative methodologies, as appropriate.

1.2 Area Encompassed by the Monitoring Plan

The area addressed by this plan is the Tule Subbasin, as defined by the latest version of DWR Bulletin 118 as shown on Figure A1-1. The Tule Subbasin area is 744 square miles (475,895 acres). The Tule Subbasin has been subdivided into the following six GSAs (see Figure A1-1):

- Eastern Tule GSA

- Lower Tule River Irrigation District GSA
- Pixley Irrigation District GSA
- Delano-Earlimart GSA
- Tri-County Water Authority GSA
- Alpaugh GSA

1.3 Monitoring Plan Organization

The monitoring plan addresses the following types of data:

- Surface Water Data
- Groundwater Data
- Land Elevation and Subsidence Data

Each data type will be addressed in its own section that includes a description of the monitoring features for collecting data, the data collection protocols, and the monitoring frequency.

The final section of the monitoring plan describes the data management program that includes a description of the database management platform, criteria for data QA/QC, file storage, security and access, database maintenance and documentation.

2.0 Monitoring Networks 354.34

This monitoring plan presents the minimum groundwater monitoring network to be relied on by the Tule Subbasin GSAs to prepare their annual reports. Data to be collected from the monitoring network will include surface water flow, surface water quality, groundwater levels, groundwater quality and land elevation data. Groundwater levels and quality data will be collected from a network of monitoring wells spaced throughout the Tule Subbasin. The monitoring well network includes existing monitoring wells, existing domestic and agricultural wells, and new wells to be added. As some of the existing wells require further investigation prior to formal inclusion in the monitoring network, and the exact locations of new monitoring wells are yet to be determined, it will be necessary to modify the monitoring network over time to add/remove monitoring features and adjust locations.

2.1 Chronic Lowering of Groundwater Levels 354.34 (c) (1)

As there are significant differences in hydraulic head and aquifer characteristics with depth in the Tule Subbasin, monitoring wells have been identified to enable the collection of data from each of the significant subsurface hydrogeologic units in the area. These units include (in order from shallowest to deepest):

- The Upper Aquifer
- The Lower Aquifer
- The Santa Margarita Formation

The depths of each of these units follow the hydrogeological conceptual model of the Tule Subbasin outlined in the hydrogeological conceptual model and incorporated into the Tule Subbasin Groundwater Flow Model.[2] The Upper Aquifer is generally located above the Corcoran Clay in the western part of the subbasin and above other confining beds in the eastern part of the subbasin. The Upper Aquifer is generally unconfined to semi-confined. The Upper Aquifer varies in depth from approximately 400 ft below ground surface (ft bgs) in the western portion of the basin to less than 100 ft bgs in the northeastern portion. The Lower Aquifer is below the Corcoran Clay and extends to depths ranging from approximately 2,200 ft bgs in the western portion of the

[2] TH&Co, 2017a. Hydrogeological Conceptual Model and Water Budget for the Tule Subbasin. Prepared for the Tule Subbasin MOU Group. Dated August 1, 2017.

TH&Co, 2019. Groundwater Flow Model for the Tule Subbasin. Prepare for the Tule Subbasin MOU Group. In Progress.

Tule Subbasin to 400 ft bgs near State Route 99. The Santa Margarita Formation occurs at depths ranging from 700 to 2,000 ft bgs in the southeastern portion of the Tule Subbasin.

Monitoring wells are identified with perforations exclusively in the Upper Aquifer, Lower Aquifer, or Santa Margarita Formation. Individual wells perforated across multiple aquifer layers (i.e. "composite wells") will not be allowed in the monitoring plan unless no other wells are available for monitoring in the area. Over time, wells in the monitoring network that are perforated across multiple aquifers will be replaced with nested or cluster wells with perforations specific to the Upper or Lower aquifers.

2.1.1 Monitoring Features

2.1.1.1 Upper Aquifer Monitoring Wells

Upper aquifer monitoring wells are shown on Figure A1-2. A total of 78 monitoring wells have been identified for monitoring the Upper Aquifer. Of these wells, 27 have been designated as RMS wells (see Table A1-A). The Upper Aquifer monitoring wells are further described below.

Existing Upper Aquifer Monitoring Wells with Historical Records

Of the 82 wells identified for monitoring the Upper Aquifer, 36 have historical groundwater level records and meet the minimum criteria specified in Section 3.2.1.1 of the Coordination Agreement. Groundwater level hydrographs for these wells are provided in Appendix A.

Existing Upper Aquifer Monitoring Wells – No Historical Records (to be Investigated)

There are numerous existing wells with documented total depth and perforation interval(s) within the Upper Aquifer that could be incorporated into the monitoring network but require further investigation. These wells have no historical groundwater level records and owner permission for access the wells has not been pursued. However, if access is approved by the owner and the wells are demonstrated to meet the minimum criteria for monitoring wells, they may be incorporated into the monitoring plan. Many of these existing Upper Aquifer wells, to be confirmed through further investigation, have been identified for consideration in the monitoring plan (see Figure A1-2; Table A1-1). In addition, 48 wells that are part of the water quality monitoring network are included in the groundwater level monitoring network. These wells have been selected to help fill aerial coverage data gaps for monitoring Upper Aquifer groundwater levels.

Potential existing Upper Aquifer wells for which access has been denied or, upon investigation, do not otherwise meet the minimum criteria specified in Section 3.2.1.1 of the Coordination Agreement, will be removed and replaced with an alternate existing well with documented total depth and perforation interval located in the same area. If no other wells exist in the area, a new Upper Aquifer monitoring well may be constructed in the area.

Proposed New Upper Aquifer Monitoring Wells

New monitoring wells will be drilled in areas where there are no existing wells for monitoring in order to fill the data gaps. General areas for future monitoring wells are identified on Figure A1-2.

The depths and perforation intervals of the new Upper Aquifer monitoring wells will vary depending on location within the subbasin. In general, Upper Aquifer monitoring wells will be perforated from approximately 10 ft below the then current static groundwater level to the bottom of the Upper Aquifer, as defined by the Tule Subbasin conceptual model[3] (see Figure A1-2). New Upper Aquifer wells constructed on the west side of the subbasin will be the deepest and new Upper Aquifer wells constructed on the east side of the subbasin will be shallowest. It is noted that the depths presented herein are for planning purposes. The final well construction details will be refined in the field during drilling once site-specific data have been obtained and reviewed. As such, the final well depths and perforation intervals may be adjusted for site specific conditions.

A conceptual well design drawing for new Upper Aquifer monitoring wells is shown on Figure A1-3. In general, new monitoring wells shall be constructed of 5-inch diameter Schedule 80 PVC blank and slotted casing. A filter pack for the new wells will be placed in the annular borehole space opposite the perforations from the total borehole depth to at least 10 feet above the top of perforations. The upper portion of the annular space shall be backfilled with a seal consisting of bentonite or other approved sealing material. The surface completion for each new monitoring well will include a steel above-ground riser equipped with a protective locking cap for keeping the wellhead secure. The above-ground riser will be surrounded by cement-filled steel bollards for further protection.

At some locations, the well will be completed as a nested well with two 5-inch diameter casings within the same borehole. One casing will be constructed in the Upper Aquifer and the other casing will be constructed in the Lower Aquifer (see Figure A1-4). A bentonite seal will be placed in the annular space between the two perforation intervals to ensure that the data collected from each casing will be specific to the aquifer in which it is perforated.

A dedicated reference point shall be established and marked on the top of each monitoring well casing. All groundwater level measurements shall be obtained relative to the reference point. The elevation of the reference point shall be surveyed to an accuracy of 0.1 foot relative to mean sea

[3] TH&Co, 2017a. Hydrogeological Conceptual Model and Water Budget for the Tule Subbasin. Prepared for the Tule Subbasin MOU Group. Dated August 1, 2017.

level (NAVD88) by a California licensed land surveyor. The location of each well will be surveyed to an accuracy of 1 foot.

2.1.1.2 Lower Aquifer Monitoring Wells

Lower Aquifer monitoring wells are shown on Figure A1-2. A total of 66 monitoring wells have been identified for monitoring the Lower Aquifer. For the purpose of this TSMP, an additional 15 composite wells and 4 Santa Margarita Aquifer wells are included with the Lower Aquifer wells. Of the Lower Aquifer, composite, and Santa Margarita Aquifer wells, 29 have been designated as RMS wells (see Table A1-2). These wells are further described below.

Existing Lower Aquifer Monitoring Wells with Historical Records

Of the 66 existing wells identified for monitoring the Lower Aquifer, nine are existing wells with historical groundwater level records and meet the minimum criteria specified in Section 3.2.1.1 of the Coordination Agreement. Groundwater level hydrographs for these wells are provided in Appendix B.

Existing Lower Aquifer Monitoring Wells – No Historical Records (to be Investigated)

There are numerous existing wells with documented total depth and perforation interval(s) within the Lower Aquifer that could be incorporated into the monitoring network but require further investigation. These wells have no historical groundwater level records and owner permission to access the wells has not been pursued. However, if access is approved by the owner and the wells are demonstrated to meet the minimum criteria for monitoring wells, they may be incorporated into the monitoring plan. Many of these existing Lower Aquifer wells, to be confirmed through further investigation, have been identified for consideration in the monitoring plan (see Figure A1-2; Table A1-2). In addition, 20 wells that are part of the water quality monitoring network are included in the groundwater level monitoring network. These wells have been selected to help fill aerial coverage data gaps for monitoring Lower Aquifer groundwater levels.

Potential existing Lower Aquifer wells for which access is denied or, upon investigation, do not otherwise meet the minimum criteria specified in Section 3.2.1.1 of the Coordination Agreement, will be removed and replaced with an alternate existing well with documented total depth and perforation interval located in the same area. If no other wells exist in the area, a new Lower Aquifer well will be constructed in the area.

Proposed New Lower Aquifer Monitoring Wells

New monitoring wells are planned to be constructed in the Lower Aquifer (see Figure A1-2). New Lower Aquifer monitoring wells will be drilled in areas where there are no existing wells for

monitoring in order to fill data gaps. General areas for future monitoring wells are identified on Figure A1-2.

The depths and perforation intervals of the new Lower Aquifer monitoring wells will vary depending on location within the subbasin. In general, Lower Aquifer monitoring wells will be perforated below the Corcoran Clay, where it has been mapped, or at depths where the aquifer is assumed to be confined, as defined by the Tule Subbasin conceptual model.[4] New Lower Aquifer monitoring wells will be constructed with total depths ranging from 400 to 1,000 ft bgs, with the deepest wells in the western part of the subbasin and shallowest wells on the east side of the subbasin. It is noted that the depths presented herein are for planning purposes. The final well construction details will be refined in the field during drilling once site-specific data have been obtained and reviewed. As such, the final well depths and perforation intervals may be adjusted for site specific conditions.

A conceptual well design drawing for new Lower Aquifer monitoring wells is shown on Figure A1-5. In general, new monitoring wells shall be constructed of 4-inch diameter PVC blank and slotted casing. A dedicated reference point shall be established and marked on the top of each monitoring well casing. All groundwater level measurements shall be obtained relative to the reference point. The elevation of the reference point shall be surveyed to an accuracy of 0.1 foot relative to mean sea level (NAVD88) by a California licensed land surveyor. The location of each well will be surveyed to an accuracy of 1 foot.

2.1.2 Monitoring Procedure

Groundwater level measurements shall be collected from each well using either a steel tape, a calibrated well sounder, or a pressure transducer. Where possible, groundwater level measurements shall be collected with a steel tape or an electrical groundwater level sounder calibrated to the nearest 0.01 ft. For pre-existing wells with limited access, a calibrated steel tape and chalk may be used. All equipment must be in good working condition. No damaged or refurbished electrical sounding tape shall be used. All new monitoring wells shall be equipped with calibrated pressure transducers.

Groundwater level measurements must be representative of static (i.e. non-pumping) groundwater level conditions. To ensure measurement of static groundwater levels in active pumping wells, the field technician collecting the data must verify that the pump has been off for at least 24 hours prior to collecting the data.

[4] TH&Co, 2017a. Hydrogeological Conceptual Model and Water Budget for the Tule Subbasin. Prepared for the Tule Subbasin MOU Group. Dated August 1, 2017.

2.1.2.1 Manual Groundwater Level Measurements

The following monitoring procedure shall be used to obtain manual groundwater level measurements in the field:

- Upon arrival at each site, the field technician shall note the well name, time of day, and date on the standard groundwater level data form (see Appendix C).
- All monitoring equipment shall be cleaned prior to lowering it into the well(s) using the following decontamination procedure:
    - Wash equipment with an Alconox solution which is followed by a deionized water rinse.
    - Triple rinse equipment with deionized water.
    - Place equipment on clean surface such as teflon or polyethylene sheet to air dry.
- To measure the depth to groundwater with a steel tape or an electrical sounder or meter, slowly lower the steel tape or water level electrical tape into the designated sounding port for production wells and into the main well for monitoring wells. Steel tapes and electrical tapes are lowered to the water surface, as determined by the audio signal, meter, or technician. Depths to groundwater are measured relative to the dedicated reference point at the top of the casing or sounding tube. Depth to groundwater shall be immediately recorded on the standard groundwater level data form (see Appendix C). Depths to groundwater shall be compared to previous measurements in the field and re-measured if significantly different.
- For wells with limited access (such as agricultural wells or domestic wells equipped with a pump), a steel tape and chalk may be used. For this method, chalk is applied to a 1- to 3-foot section of the steel tape prior to lowering in the well. The steel tape is lowered to a depth at least 1-ft below the static groundwater level and a whole number on the calibrated tape is matched to the reference point at the surface. Both the foot mark held at the reference point and the groundwater level observed on the chalk shall be recorded on the standard field forms (see Appendix D). The difference between the two is the depth to groundwater.
- When finished sounding the groundwater level, all downhole equipment shall be removed, and where existing, the well cap shall be replaced, and the riser locked.
- Prior to leaving the monitoring well site, the field representative shall note any physical changes in the concrete well pad and riser pipe, such as erosion, cracks or damage. All changes shall be recorded on the standard field forms provided in Appendices C, D, and E.

2.1.2.2 Automatic Groundwater Level Measurements Using Transducers

Transducers shall be installed in all new monitoring wells and existing monitoring wells identified as representative monitoring sites. Transducers shall be installed below the groundwater level with enough submergence to accommodate anticipated groundwater level fluctuations.

2.1.3 Frequency of Measurement

Groundwater level measurements from existing domestic and irrigation wells shown on Figure A1-2 will be collected semi-annually in the Spring (February/March) and in the Fall (October/November). To the extent possible, groundwater level monitoring events will be coordinated between GSAs so that measurements are taken at the time of greatest recovery and maximum depth.

Groundwater level measurements from all new monitoring wells and wells designated as representative monitoring sites will be collected using pressure transducers permanently installed in the wells and set to collect one measurement per day. Pressure transducers will be downloaded on a semi-annual basis. During each download session, the field technician will also obtain a manual groundwater level measurement in order to verify transducer readings and ensure that the instruments are working properly.

2.2 Reduction in Groundwater Storage § 354.34 (c) (2)

Changes in groundwater storage within the Tule Subbasin will be estimated using either of the methods identified in Section 3.6 of the Tule Subbasin Coordination Agreement. Groundwater level data to be relied on for the change in groundwater storage estimates will be collected as described in Section 2.1 of this TSMP.

2.3 Seawater Intrusion § 354.34 (c) (3)

Seawater intrusion cannot occur in the Tule Subbasin due to its location with respect to the Pacific Ocean. The Tule Subbasin is approximately 110 miles inland of the Pacific Ocean and is separated from the ocean by approximately 90 miles of sedimentary rocks that make up the Coast Ranges. These sedimentary rocks effectively separate the Pacific Ocean hydraulically from the aquifer system in the San Joaquin Valley. Further, the Coast Ranges are dissected by multiple northwest trending faults, the largest of which is the San Andreas Fault. These faults form groundwater flow barriers, which further act to separate the San Joaquin Valley aquifers from the Pacific Ocean. Accordingly, groundwater pumping in the Tule Subbasin cannot induce seawater intrusion. As such, monitoring for seawater intrusion is not necessary and is not included in this monitoring plan.

2.4 Degraded Water Quality § 354.34 (c) (4)

Groundwater samples shall be collected and analyzed annually, during summer months, from the wells shown on Figure A1-6 consistent with the Tule Basin Water Quality Coalition Groundwater Quality Trend Monitoring Program Workplan.[5] The groundwater sampling protocols described herein will ensure that:

- Groundwater quality data are collected from the correct location
- Groundwater quality data are accurate and reproducible
- Groundwater quality data represent conditions that inform appropriate basin management decisions
- All salient information is recorded to normalize, if necessary, and compare data
- Data are handled in a way that ensures data integrity

2.4.1 Groundwater Quality Constituents to be Analyzed

Annual water quality monitoring of the wells shown on Figure A1-6 will include laboratory analysis for nitrate as N only (see Table A1-3). Prior to collecting the samples in the field, the field technician will collect measurements of temperature, pH, dissolved oxygen (DO) and electrical conductivity (EC) from the well discharge, as described in Section 2.4.2 herein.

Every five years, samples from the wells shown on Figure A1-6 will be analyzed for an expanded list of analytes. In addition to nitrate, samples will be analyzed for total dissolved solids (TDS) and major cations and anions (see Table A1-3). Prior to collecting the samples in the field, the field technician shall collect measurements of temperature, pH, DO and EC from the well discharge, as described in Section 2.4.2 herein.

2.4.2 Groundwater Quality Samples from Existing Domestic Water Supply or Irrigation Wells

Domestic water supply and irrigation wells shall be sampled after purging the well for a period of time adequate to remove at least three well volumes removed prior to sampling (see Appendix E). If the well is currently pumping, this step is not necessary.

During pumping and prior to sample collection, the field technician shall obtain measurements of temperature, pH, DO and EC from water collected from the sample port. Meters for measuring pH, DO and EC shall be field calibrated in accordance with manufacturer's specifications at the beginning of each sampling day. Samples will be collected when: (1) a minimum of four sets of

[5] Tule Basin Water Quality Coalition, 2017. Groundwater Trend Monitoring Workplan. January 6, 2017.

parameter readings have been obtained; and (2) the temperature, pH, and EC reach relatively constant values.

All samples shall be collected from the discharge point nearest the well head and placed in laboratory-prepared sample containers. The technician collecting the sample shall wear new latex or neoprene gloves while collecting the sample. Sample containers shall be labeled before or immediately after sampling with self-adhesive tags having the following information written in waterproof ink:

- Project number
- Sample I.D. number
- Sample location
- Date and time sample was collected
- Initials of sample collector

2.4.3 Groundwater Quality Samples from Monitoring Wells

All groundwater samples from monitoring wells will be collected consistent with procedures described in the United States Environmental Protection Agency's (USEPA's) Low-flow (Minimal Drawdown) Groundwater Sampling Procedures.[6] Low-flow purging can be conducted using either portable or dedicated (leave in well) pump systems. A submersible pump, diaphragm pump, or positive displacement pump, which may contain a bladder, may be used for evacuating (purging) the monitoring well casing and collecting the samples. The pump-intake should be set in the middle or slightly above the middle of the screened interval in the well. Other equipment necessary for collecting groundwater samples using the low-flow sampling method include:

- A water level measurement device, or water level sounder
- In-line flow through cell to monitor water quality parameters
- Field forms for documenting water quality parameters measured at each monitoring well
- Chain of custody forms
- Laboratory prepared sample containers from a State-certified laboratory with the appropriate labels for the analytes being measured
- Gloves
- Cleaning supplies for decontaminating
- Tubing for the pump

[6] Puls, R.W., and Barcelona, M.J., 1996. Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures. EPA document 540/S-95-504.

All samples shall be collected from a discharge port at the wellhead and placed in laboratory-prepared sample containers. For dissolved trace metal analyses, samples will be collected in unpreserved bottles, then filtered through a 0.45-micron filter and acidified prior to analysis. The technician collecting the sample shall wear new latex or neoprene gloves while collecting the sample. Sample containers shall be labeled before or immediately after sampling with self-adhesive tags having the following information written in waterproof ink:

- Project number
- Sample I.D. number
- Sample location
- Date and time sample was collected
- Initials of sample collector

2.4.4 Well Sampling Records

Data collected during groundwater sampling will be recorded on the standard forms provided in Appendix F. Information and data to be recorded shall include:

- Sample I.D.
- Duplicate I.D., if applicable
- Date and time sampled
- Name of sample collector
- Well designation (State well numbering system for water supply wells)
- Owner's name, or other common designation
- Well diameter
- Depth to water on day sampled
- Casing volume on day sampled
- Method of purging (bailing, pumping, etc.)
- Extraordinary circumstances (if any)
- Field measurements temperature (0º C), pH, specific electrical conductivity (at 25ºC µs/cm), and dissolved oxygen (mg/l)
- Number and type of sample container(s)
- Times corresponding to water quality measurements
- Pumping rate at time of sampling

In addition to the standard forms for collecting data, the field technician shall keep a daily field record for each day of fieldwork. Following review by the project manager, the original records shall be kept in the project file.

2.4.5 Handling, Storage and Transportation of Samples

Upon collection and labeling, all samples shall be placed immediately into a clean chest/cooler with ice in order to keep samples cool. Exposure to dust, direct sunlight, high temperature, adverse weather conditions, and possible contamination shall be avoided.

All samples will be transported to a State-certified analytical laboratory within 24 hours of collection. Samples shall be transported under chain-of-custody procedures, which document the transfer of custody of samples from the field to the laboratory. Each sample sent to the laboratory for analysis shall be recorded on a Chain-of-Custody Record, which includes instructions to the laboratory for analytical services.

Information contained on the triplicate Chain-of-Custody Record shall include:

- Project number
- Signature of sampler(s)
- Date and time sampled
- Sample I.D.
- Number of sample containers
- Sample matrix (water)
- Analyses required
- Remarks, including preservatives, special conditions, or specific quality control measures
- Turnaround time and person to receive laboratory report
- Method of shipment to the laboratory
- Release signature of sampler(s), and signatures of all people assuming custody
- Condition of samples when received by laboratory

Blank spaces on the Chain-of-Custody Record will be crossed out between the last sample listed and the signatures at the bottom of the sheet.

The field sampler shall sign the Chain-of-Custody Record and record the time and date at the time of transfer to the laboratory or to an intermediate person. A set of signatures is required for each relinquished/reserved transfer, including intermediate transfers. The original imprint of the Chain-of-Custody Record will accompany the sample containers. A duplicate copy shall be placed in the project file.

If the samples are to be shipped to the laboratory, the original Chain-of-Custody will be sealed inside a plastic bag within the ice chest, and the chest shall be sealed with custody tape which has been signed and dated by the last person listed on the Chain-of-Custody. U. S. Department of Transportation shipping requirements shall be followed and the sample shipping receipt retained in the project file as part of the permanent chain-of-custody document. The shipping company

(e.g. Federal Express, UPS, DHL) will not sign the chain-of-custody forms as a receiver, instead the laboratory shall sign as a receiver when the samples are received.

2.4.6 Quality Control Samples

Quality control samples shall consist of duplicates and blanks. At least one duplicate sample shall be collected during each day of sampling. The duplicate sample shall be collected from the same well as the original and immediately after the original sample. At least one blank sample shall be included with each batch of samples delivered to the laboratory. Blank samples shall consist of laboratory prepared deionized water that is containerized at the laboratory and delivered with the sample containers. Duplicate and blank samples will be analyzed by the laboratory, as specified in the project Quality Assurance Project Plan (QAPP)[7] or by the project manager (see Appendix E).

2.4.7 Frequency of Measurement

Groundwater quality samples will be collected from the wells shown on Figure A1-6 on an annual basis, during the summer, and analyzed as described in Section 2.4.1 herein.

2.5 Land Subsidence 354.34 (c) (5)

Land surface subsidence has been observed in multiple areas within the Tule Subbasin. Based on United States Geological Survey (USGS) measurements and analysis of land subsidence that occurred in the area in the 1950s and 1960s,[8] it has been determined that the land subsidence is associated with lowered groundwater levels due to groundwater pumping in areas where the subsurface contains a significant amount of clay and silt. Recent land subsidence in the Tule Subbasin has resulted in lowered flow capacity in the Friant-Kern Canal. Subsidence has also been observed from satellite data in the western portion of the subbasin.

2.5.1 Monitoring Features

Monitoring of changes in land surface elevation related to groundwater withdrawal will be conducted through global positioning surveys, data collected from extensometers, and satellite data.

[7] Tule Basin Water Quality Coalition, 2017. Groundwater Trend Monitoring Workplan. January 6, 2017.
[8] Lofgren, B.E., and Klausing, R.L., 1969. Land Subsidence Due to Ground-Water Withdrawal, Tulare-Wasco Area of California. USGS Professional Paper 437-B.

2.5.1.1 Global Positioning Surveys

A total of 60 benchmark stations have been established to monitor changes in land elevation across the subbasin using GPS measurements (see Figure A1-7). Each survey station is a benchmark labeled with the station identification. An additional 34 benchmark stations established by the Friant Water Authority (FWA) are included in the monitoring network. In addition to the existing benchmark network, additional benchmarks may be established in the subbasin in the future.

Land surface elevations from the Porterville GPS Station (Station P056), located at the Porterville Airport (see Figure A1-7), are also included in this plan. The data is available through the University NAVSTAR Consortium (UNAVCO) website.

2.5.1.2 Extensometers

The USGS collects data on aquifer system compaction, which causes land subsidence, from one existing extensometer near Porterville (22S/27E-30D2; see Figure A1-7). This station is located adjacent to the Friant-Kern Canal approximately one mile north of the Deer Creek crossing. Data from this extensometer can be accessed via the USGS website.

In addition to the existing extensometer, additional extensometers may be established at strategic locations of the subbasin in the future.

2.5.1.3 Satellite Data (InSAR)

Changes in land surface elevation over time can be observed on a regional scale using satellite data. The data is generated using interferometric synthetic aperture radar (InSAR). InSAR data is available and will be obtained from the CDWR on a quarterly basis.

2.5.2 Monitoring Procedure

2.5.2.1 Global Positioning Surveys

The GPS network will be established and monitored in accordance with National Geodetic Survey (NGS) Guidelines for Establishing GPS-Derived Ellipsoid Heights (National Oceanographic and Atmospheric Administration and Guidelines for Establishing GPS-Derived Orthometric Heights.[9] All GPS-derived elevations will be constrained to an established NGS benchmark located on Lake

[9] NOAA, 1997.

Success Dam (KT 200). All land surface elevation readings will be to an accuracy of 0.1 feet relative to NAVD88.

Land surface elevations from the Porterville GPS Station will be downloaded from the UNAVCO website as needed.

2.5.2.2 Extensometers

The USGS extensometer is equipped with a continuous monitoring device to record aquifer system compaction. Aquifer system compaction data will be downloaded from the USGS website for analysis as data updates are available.

2.5.2.3 Satellite Data (InSAR)

InSAR data will be obtained from the Jet Propulsion Laboratory, USGS, or European Space Agency for processing. The data will be analyzed and interpreted by an outside professional (Neva Ridge Technologies, Inc. or approved equal) in order to develop maps showing regional land surface changes.

2.5.3 Frequency of Measurement

2.5.3.1 Global Positioning Surveys

GPS surveys of the stations shown on Figure A1-7 will be conducted on an annual basis correlated to groundwater quality sampling events. GPS surveys of stations located within the Friant-Kern Canal Monitoring Zone will be conducted on a quarterly basis.

2.5.3.2 Extensometers

Aquifer system compaction is measured on a continuous basis at the USGS extensometer. Aquifer system compaction data will be downloaded from the USGS website for analysis as data updates are available.

2.5.3.3 Satellite Data (InSAR)

InSAR data will be obtained and analyzed on a quarterly basis.

2.6 Depletions of Interconnected Surface Water 354.34 (c) (6)

Surface water flow in the Tule River and Deer Creek ultimately flow into the historical Tulare Lake but only during periods of prolonged above-normal precipitation. Surface water flow in the White River does not reach the Tulare Lake bed. Surface water flow in the Tule River, including flow beyond the Tule Subbasin, is monitored and managed by the Tule River Association (TRA).

Surface water flow in the Deer Creek and White River are monitored by the USGS and USBR. The monitoring features, monitoring procedures, and monitoring frequency for surface water in the Tule Subbasin follows the features, procedures, and frequency already in place by these organizations.

2.6.1 Monitoring Features

A primary source of water to the Tule Subbasin is surface water runoff originating in the Sierra Nevada Mountains. The primary rivers/streams contributing surface water to the subbasin include the Tule River, Deer Creek, and White River (see Figure A1-8). Each of these rivers/streams contain existing surface water monitoring stations for the collection of both stream flow and surface water quality. The following summarizes the key monitoring features and locations in the subbasin.

2.6.1.1 Tule River

Stream flow in the portion of the Tule River that is within the Tule Subbasin is determined by controlled releases from Lake Success, measured by the Army Corps of Engineers (ACOE). Stream flow entering Lake Success is measured and distributed to various water rights holders as allocated at Success Dam in accordance with the Tule River Water Diversion Schedule and Storage Agreement.[10] The accounting of surface water flow, storage, streambed losses, and diversions is documented for each water year in the TRA annual reports from 1962 through 2017.

Tule River Stream Flow – Main Channel

Stream flow in the Tule River is measured by the ACOE below Success Dam, at Rockford Station downstream of Porterville, and at Turnbull Weir by the TRA (see Figure A1-8). In addition, releases of imported Central Valley Project water into the Tule River and Porter Slough from the Friant-Kern Canal are conducted at two locations, which are measured via weir structures managed by the USBR. Details regarding the location and construction of each stream flow gage are provided in Table A1-4.

[10] TRA, 1966. Tule River Diversion Schedule and Storage Agreement. Dated February 1, 1966; revised June 16, 1966.

Tule River Diversions - Structures and Headgates

Between Lake Success Dam and the Turnbull Weir, water is diverted from the Tule River to various water right holders. Diversion locations are shown on Figure A1-8 and described as follows:

Pioneer Water Company:

The headgate is a portion of the Success Reservoir outlet works and consists of a 42-inch gated conduit. The gaging station is a standard 5-foot concrete Parshall flume located 100 feet downstream of the reservoir outlet works at a point approximately 2,100 feet south and 1,400 feet east of the northwest corner of Section 35, Township 21 South, Range 28 East, M.D.B.&M., being in the southeast quarter of the northeast quarter of said Section 35.

Porter Slough at Headgate

The Porter Slough Headgate diverts water from the main channel of the Tule River to the Porter Slough, an ancestral branch of the Tule River that extends from the headgate to the LTRID No. 4 Canal (see Figure A1-8). The headgate is located in the southeast quarter of the northeast quarter of Section 4, Township 22 South, Range 28 East, M.D.B.&M. Five bays of flashboards control the diversions from the Tule River in Porter Slough.

Flows at the headgate of Porter Slough are computed by the addition of 5 cubic-feet per second to the daily mean flows measured at the Porter Slough at Porterville (B Lane) gaging station.

Porter Slough at Porterville

The gaging station is a rated section of the natural channel situated approximately 2,900 feet west and 1,100 feet north of the southeast corner of Section 32, Township 21 South, Range 28 East, M.D.B.&M. and 1.4 miles below the Porter Slough headgate in the Boydston Weir.

Porter Slough Ditch Company

The headgate is located in the Porter Slough check structure at Putnam Street being approximately 2,500 feet west and 1,500 feet north of the Southeast corner of Section 26, Township 21 South, Range 27 East, M.D.B.&M., being in the northwest quarter of the southeast quarter of said Section 26. The gaging station is a rated section 150 feet below the headgate.

Porter Slough Below Avenue 192

Porter Slough terminates with discharge through a concrete check structure into the No. 4 Canal of LTRID located near the center of Section 11, Township 21 South, Range 26 East, M.D.B.&M., one-half mile easterly of Tulare County Road 192. A daily weir measurement is used for recording the flow of Porter Slough Below 192.

Downstream of Avenue 192, the Porter Slough discharges into a series of unlined canals that deliver water to farmers in the LTRID.

Campbell and Moreland Ditch Company:

The headgate is located near the South end of Boydston Weir at a point approximately 600 feet west and 1,700 feet south of the northeast corner of Section 4, Township 22 South, Range 28 East, M.D.B.&M., being in the southeast quarter of the northeast quarter of said Section 4. The gaging station is a rated concrete lined canal section 2,600 feet below the headgate.

Vandalia Ditch Company:

The headgate is located in the south end of Vandalia Weir at a point approximately 1,160 feet west and 170 feet north of the southeast corner of Section 32, Township 21 South, Range 28 East, M.D.B.&M., being in the southeast quarter of the southeast quarter of said Section 32. The gaging station is a rated section 1,000 feet below the headgate.

Hubbs & Miner Ditch Company:

The canal diverts along the North levee of the Tule River at a point approximately 2,600 feet west and 2,100 feet north of the southeast corner of Section 35, Township 21 South, Range 27 East, M.D.B.&M., being in the northwest quarter of the southeast quarter of said Section 35. The gaging station is a rated section 3,100 feet below the canal diversion and 85 feet downstream of the River bypass headgate structure.

Poplar Irrigation Company:

The canal diverts along the south levee of the Tule River at a point approximately 740 feet west and 1,000 feet north of the southeast corner of Section 36, Township 21 South, Range 27 East, M.D.B.&M., being in the southeast quarter of the southeast quarter of said Section 36. The gaging station is a rated section 3,400 feet below the canal diversion and 325 feet downstream of the River bypass headgate structure.

Woods-Central Ditch Company:

The headgate structure is located in the South bank of the Tule River at a point approximately 2,300 feet west and 2,200 feet north of the southeast corner of Section 30,

Township 21 South, Range 27 East, M.D.B.&M., being in the northwest quarter of the southeast quarter of said Section 30. The gaging station is a rated section 150 feet below the River diversion.

2.6.1.2 Deer Creek

Deer Creek is a natural drainage that originates in the Sierra Nevada Mountains, flowing in a westerly direction north of Terra Bella and between Pixley and Earlimart (see Figure A1-8). The Deer Creek channel extends to the Homeland Canal, although surface water flow rarely reaches that location.

Deer Creek Stream Flow

Stream flow in Deer Creek is measured at the United States Geological Survey (USGS) gage at Fountain Springs (five miles east of, and outside of, the Tule Subbasin boundary), Trenton Weir, and at the point where Deer Creek outlets to the Homeland Canal (see Figure A1-8). Details regarding the location and construction of each stream flow gage are provided in Table A-4 and summarized below.

Friant-Kern Canal Discharges into Deer Creek

Friant-Kern Canal water is also discharged into Deer Creek approximately five miles upstream of Trenton Weir and measured by the USBR (see Figure A1-8).

2.6.1.3 White River

The White River drains out of the Sierra Nevada Mountains east of the community of Richgrove in the southern portion of the Tule Subbasin (see Figure A1-8). The White River channel extends as far as State Highway 99 but does not reach the historical Tulare Lake bed. Streamflow in this river is currently monitored manually at Road 208 by the Tule Basin Water Quality Coalition and the Delano-Earlimart Irrigation District.

2.6.2 Monitoring Procedure

2.6.2.1 Surface Water Flow Measurements

With the exception of the White River Turnbull Weir at Road 208, Porter Slough at 192, and Deer Creek outlet to Homeland Canal, all gaging stations and diversion structures on the Tule River and Deer Creek are equipped with water stage recorders that collect water stage readings automatically every 15 minutes. The gage on the Tule River Below Success Dam is operated and managed by the ACOE. The Trenton Weir on Deer Creek is operated and managed by the ACOE. All other gages (with the exceptions noted) report data electronically in real time to the TRA/LTRID.

Stream flow at the Turnbull Weir is measured manually when flow passes the gage. Manual measurements involve recording the reading on the staff gage in the river and conducting current meter measurements for verifying the rating curve and table. Current meter measurements will be collected within the rated section of the natural channel under laminar flow conditions. The required frequency of manual measurements at the Turnbull Weir is addressed in Section 2.6.3. Staff gage and current meter readings are recorded immediately after completion of the measurement and any significant shifts are verified immediately by re-measurement. All readings are recorded on standard forms that include the time the measurement began, the time the measurement was completed, the staff gage height in feet to the nearest hundredth, and any other pertinent data with respect to channel conditions, growth, etc.

For water stage recorders, should the flow double within any 24-hour period, the bi-hourly gage heights shall be converted to second-foot flows and the mean daily flow computed from the second-foot quantities rather than utilizing the normal procedure of obtaining a mean daily gage height and the gage height to a second-foot flow. In the final review of gage sheets, shifts shall be prorated through the period during which the change occurred as determined from the current meter measurements, unless the Hydrographer determines a specific reason for the shift to occur at a definite time.

2.6.2.2 Surface Water Quality Measurements

Surface water quality samples have historically been collected and analyzed from the Tule River, Deer Creek and White River by the Tule Basin Water Quality Coalition surface water quality program. Surface water quality monitoring stations are shown on Figure A1-8.

Surface Water Quality Monitoring Locations – Tule River

Porter Slough at Road 192

Surface water quality samples are collected from Porter Slough upstream of the discharge into the LTRID canal (see Figure A1-8). This surface water monitoring site is located approximately eight miles northwest of Porterville, California.

Tule River at Road 144

Surface water quality samples are collected from the North Fork of the Tule River at Road 144, approximately 3.5 miles northwest of Woodville, California.

Tule River at Road 92

Surface water quality samples are collected from the Tule River at Road 92, approximately four miles northwest of Tipton, California.