Engagement Plan is omitted from the overall GSP Table of Contents "Appendices Attached to Corresponding Section," which would make it much easier to find for members of the general public reviewing the GSP to see what efforts have been made or plan to be made. Additionally, ETGSA worked with CWC and Self-Help Enterprises (SHE) on a series of public outreach meetings in the spring of 2019, including review and co-development of materials and Spanish translations. During the public comment period for the draft GSP, CWC was given the opportunity to develop community workshop formats and materials which we felt would be the most conducive to facilitating community understanding of and engagement in the process with the collaboration of the EGGSA. Such collaborative engagement was productive and it is recommended that it should continue through the implementation of the GSP.

- **There has been some room for improvement throughout the process.**
    - **In early 2018, the draft GSP and policy points began to be developed through an ad-hoc committee, which was not open to the public**. On January 4, 2018, the ETGSA board decided that they were going to create a closed ad-hoc committee to start drafting the GSP and policies. This ad-hoc committee had been a controversial subject of discussion for several months in late 2017 at meetings of both the Executive and Stakeholder Committees. Following a closed-session regarding pending litigation at a meeting of the ETGSA board of directors on February 28, 2018, the decision was made to halt the ad-hoc committee and go back to the respective Stakeholder and Executive committees to propose a different manner to develop the GSP which is subject to open public meetings. It is unclear whether some of these closed meetings may have occurred prior to February 28, 2018.
    - **The ETGSA first released the draft GSP on September 16th, 2019, and then re-released a revised draft, without public notice, on October 2nd, 2019.** This complicated review of the draft GSP, as many reviewers (CWC included) invested significant time and effort into reviewing the first draft before realizing that a revised draft had been released without being noticed.
    - **As noted in the community comments, not all landowners received timely notification about the formation of the ETGSA or the release of the draft GSP.** Notices which were sent out via the postal service have not always been received, especially in rural areas. Similarly, internet access is limited in many rural areas and reliance on the internet, e-mail, and social media for outreach and communication may exclude some residents from effective notification and engagement.
    - **Water boards were contacted, but contact with residents was really only made explicitly through coordination with CWC on workshops.** While we are appreciative of these collaborative workshops, the GSA could have additionally made more effort to outreach to all potentially impacted stakeholder groups. We would also like to note that for the meeting at Porterville College on November 13, 2019, materials were not provided not sufficient time for effective outreach or to review all materials in advance of the meeting. Both outreach efforts and materials could have been improved with more time.

- Official meetings of the board of directors and advisory committees meetings are not bilingual, thus limiting the ability of many members of the public to engage effectively.

- To improve outreach and communication specifically for DACs and domestic well communities, please consider the following suggestions:
  - **Utilize existing community venues for community meetings, workshops and events to provide information.** For example, consider conducting short presentations during water board and school district board meetings. Venues should be carefully selected in order to meet the needs of the targeted audience.
  - **Identify community social media (Facebook, Instagram, etc.) groups, pages and websites and post information.** Continue to develop media advisories, press releases and work with local media outlets, such as local radio stations, television stations, and local newspapers to captivate a broader audience that are not being reached via the electronic-based outreach currently used.
  - **Identify, and work with key community leaders /trusted messengers to distribute information and encourage community participation.**
  - **Continue to provide bilingual (English and Spanish) information and materials on the website, via email and consider inserting short notices (notices must include key messages, visuals and information that is relevant to the average water user) in water bills and/or community newsletters.** The Dymally-Alatorre Bilingual Services Act requires that public agencies serving over 10% of non-English speaking constituents provide appropriate translation services[16]. At a minimum, this information should be provided during plan updates, and prior to critical decisions. In particular, the draft GSP released during the formal comment period should include materials highlighting key summaries of the GSP. Critical decision points can also include the adoption of groundwater fees, or the approval of new groundwater projects or management actions.
  - **Partner with other educational programs to leverage resources and explore opportunities to educate different generational groups.**
  - **Consider hiring a bilingual Stakeholder and Outreach Communication specialist as part of the ETGSA staff**

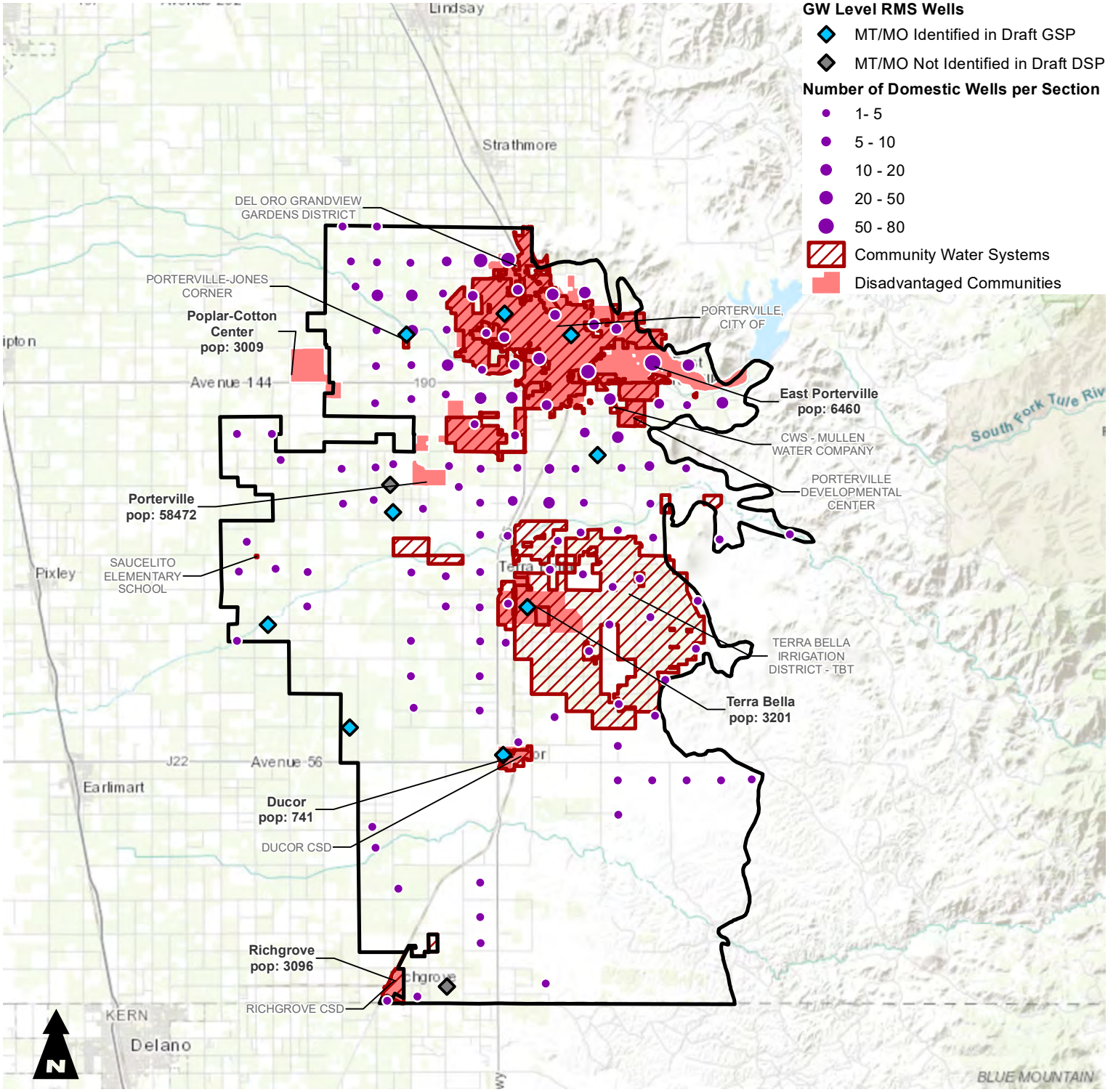
Attachments to this Comment Letter

1. CWC Figure 1— Representative Monitoring Network for GW Levels Relative to Domestic Wells, DACs, and Community Water Systems
2. CWC Figure 2A - Estimated Water Level Decline at Measurable Objectives and Domestic Wells
3. CWC Figure 2B - Estimated Water Level Decline at Minimum Thresholds and Domestic Wells
4. CWC Figure 3 - Water Level Minimum Thresholds and Domestic Wells
5. CWC Figure 4 - Representative Monitoring Network for GW Quality Relative to Domestic Wells, DACs, and Community Water Systems

[16] California Government Code Section 7290.

Figure 1 - Representative Monitoring Network for GW Levels Relative to Domestic Wells, DACs, and Community Water Systems

Eastern Tule GSA



Notes

1. All locations are approximate.
2. Two wells are marked as RMS in the Tule Subbasin Monitoring Plan but are not identied in the draft GSP with MO/MT values.

References

1. Domestic Well Densities: Research to develop the CWC Vulnerability Tool draft as of August 6, 2019. The dataset excludes private wells located in areas served by community water systems, based on the Water Boundary Tool (WBT).
2. Disadvantaged community data: downloaded on August 6, 2019 from the DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/.
3. Community Water System data: downloaded on August 6, 2019 from Tracking California: https://trackingcalifornia.org/water/map-viewer.
4. Representative Monitoring Site wells for groundwater level are are located based on Figure 2-34, Table 1A-1, and Table 1A-3 in the draft Tule Subbasin Monitoring Plan, dated August 2019. The MOs and MTs are from Table 5-2 and Table 5-3 in the draft Eastern Tule GSA GSP - Public Review Draft dated September 2019.

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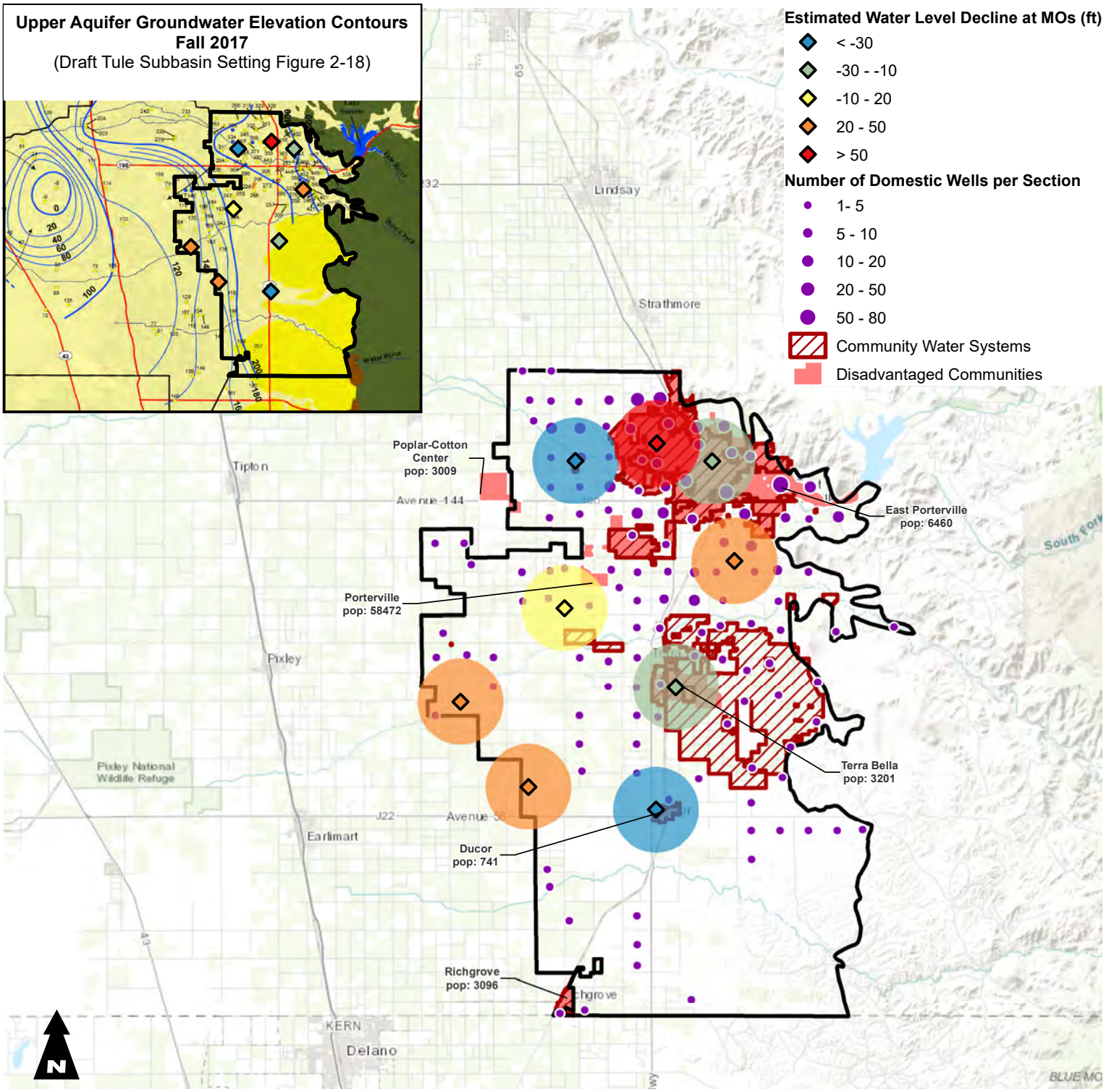
Figure 2A - Estimated Water Level Decline at Measurable Objectives and Domestic Wells
Eastern Tule GSA



Notes
1. All locations are approximate.

References
1. Domestic Well Densities: Research to develop the CWC Vulnerability Tool draft as of August 6, 2019. The dataset excludes private wells located in areas served by community water systems, based on the Water Boundary Tool (WBT).
2. Disadvantaged community data (place): downloaded on August 6, 2019 from the DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/.
3. Community Water System data: downloaded on August 6, 2019 from Tracking California: https://trackingcalifornia.org/water/map-viewer.
4. Groundwater level representative monitoring wells are the wells assigned with MTs and MOs according to the draf Eastern Tule GSA GSP - Public Review Draft dated September 2019. The MO values are from Table 5-2 in the draft GSPs. The Fall 2017 groundwater elevation contours are from Figure 2-17 of the draft Tule Subbasin Setting.

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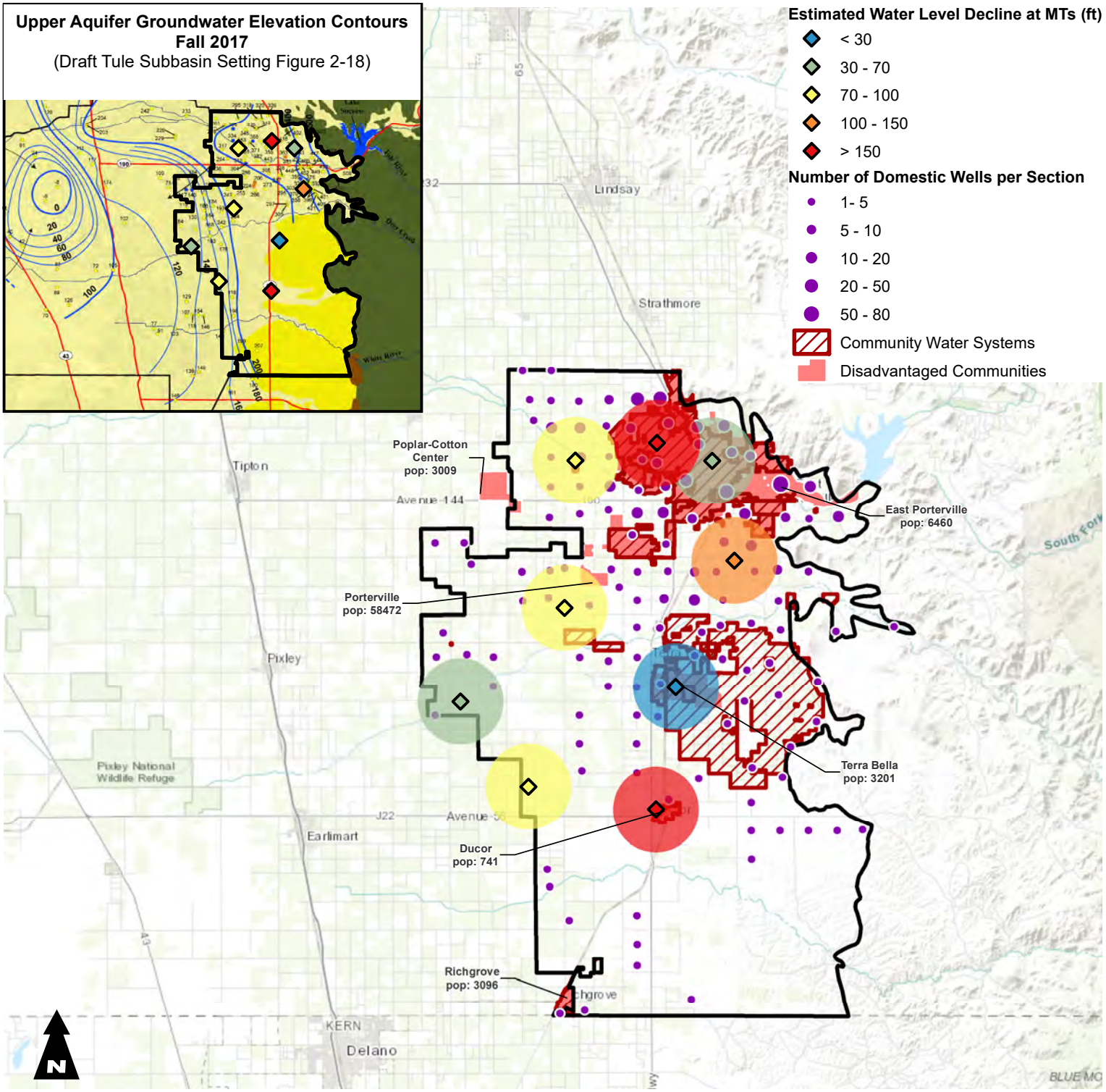
Figure 2B - Estimated Water Level Decline at Minimum Thresholds and Domestic Wells
Eastern Tule GSA



Notes
1. All locations are approximate.

References
1. Domestic Well Densities: Research to develop the CWC Vulnerability Tool draft as of August 6, 2019. The dataset excludes private wells located in areas served by community water systems, based on the Water Boundary Tool (WBT).
2. Disadvantaged community data (place): downloaded on August 6, 2019 from the DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/.
3. Community Water System data: downloaded on August 6, 2019 from Tracking California: https://trackingcalifornia.org/water/map-viewer.
4. Groundwater level representative monitoring wells are the wells assigned with MTs and MOs according to the draf Eastern Tule GSA GSP - Public Review Draft dated September 2019. The MT values are from Table 5-3 in the draft GSPs. The Fall 2017 groundwater elevation contours are from Figure 2-17 of the draft Tule Subbasin Setting.

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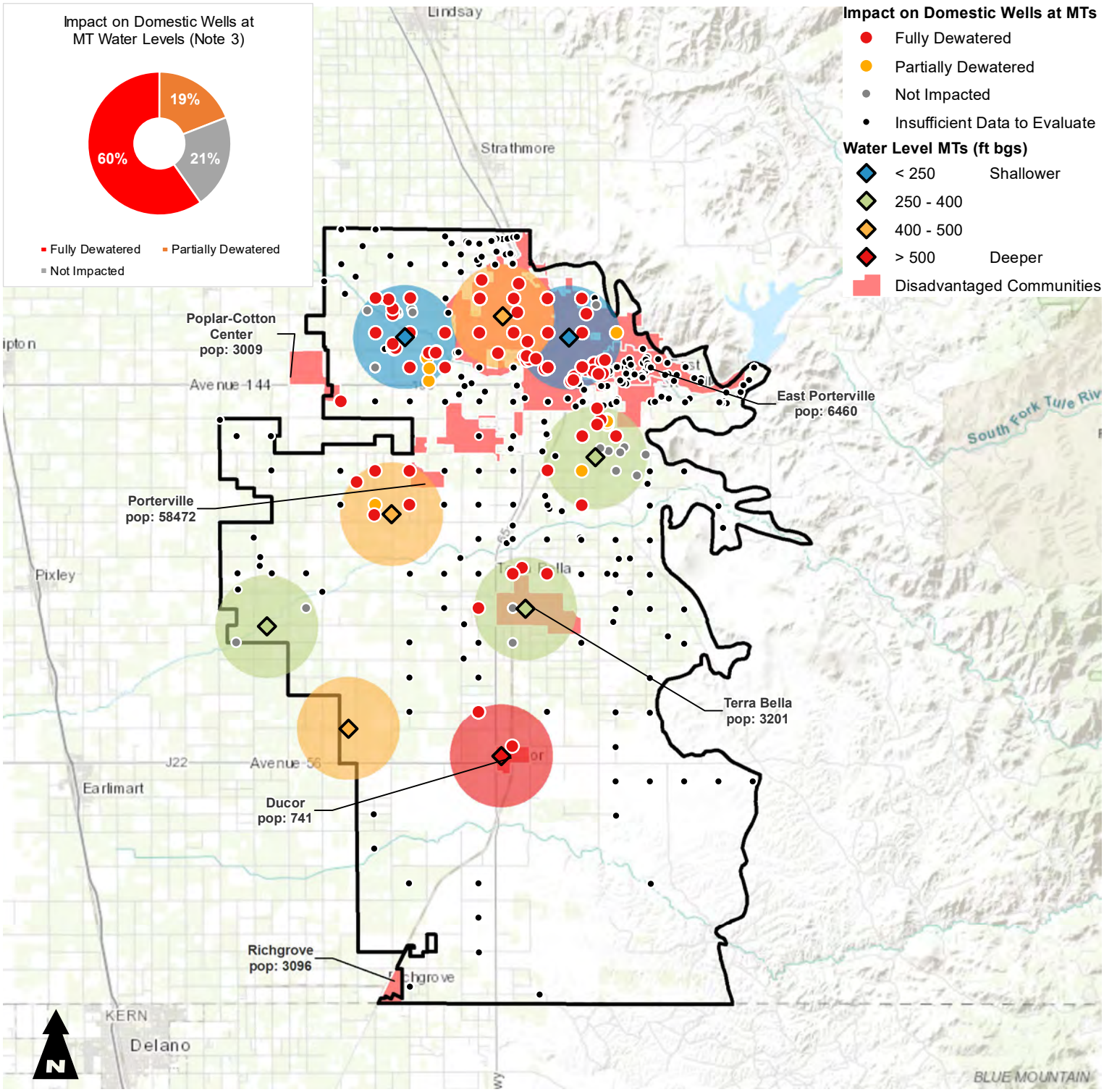
Figure 3 - Water Level Minimum Thresholds and Domestic Wells
Eastern Tule GSA



Notes
1. All locations are approximate.
2. For this assessment, the proposed MTs in ft above sea level were converted to depth below ground surface values, based on the ground surface elevation of RMS wells.
3. Where available, bottom of screen interval of a domestic well was used for this assessment, and bottom of well depth was used for the remaining domestic wells. A well is identified as fully dewatered if the MT is below the bottom of the well screen interval; a well is identified as partially dewatered if the MT is below the midpoint of well screen interval. Wells with insufficient data and/or wells outside of the 1.5-mile radius were not evaluated.

References
1. Domestic Well data: Research to develop the CWC Vulnerability Tool draft as of May 16, 2019.
2. Disadvantaged community data: downloaded on August 6, 2019 from the DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/. Last updated in 2016.
3. MT values are from Table 5-3 in draft Eastern Tule GSA GSP - Public Review Draft dated September 2019.

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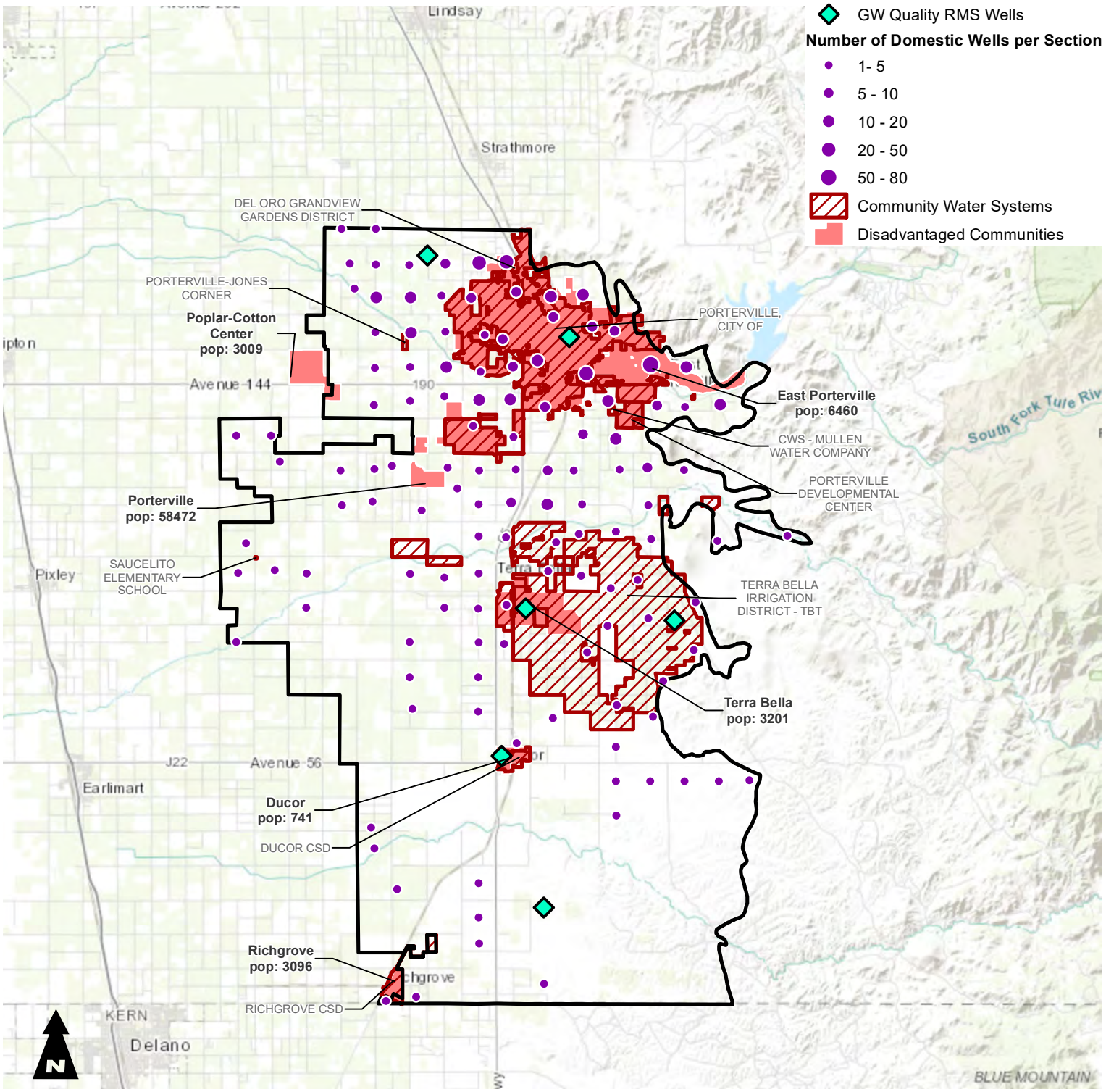
Figure 4 - Representative Monitoring Network for GW Quality Relative to Domestic Wells, DACs, and Community Water Systems

Eastern Tule GSA



Notes

1. All locations are approximate.

References

1. Domestic Well Densities: Research to develop the CWC Vulnerability Tool draft as of August 6, 2019. The dataset excludes private wells located in areas served by community water systems, based on the Water Boundary Tool (WBT).
2. Disadvantaged community data: downloaded on August 6, 2019 from the DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/.
3. Community Water System data: downloaded on August 6, 2019 from Tracking California: https://trackingcalifornia.org/water/map-viewer.
4. Representative Monitoring Site wells for groundwater quality are from Table 5-8 in draftEastern Tule GSA GSP, - Public Review Draft dated September 2019.
RMS wells in Figure 5-1 from the draft GSP are not used due to information discrepeancy with Table 5-8. Two RMS wells are identified in Table 5-8 but could not be located ude to missing well information in the draft GSP.

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Delano-Earlimart Irrigation District Groundwater Sustainability Agency

14181 Avenue 24 ◆ Delano, Ca 93215

December 16, 2019

Eastern Tule Groundwater Sustainability Agency
881 W. Morton Avenue, Suite D,
Porterville, CA 93257

RE: Comments on the Eastern Tule GSA draft Groundwater Sustainability Plan

The Delano-Earlimart Irrigation District Groundwater Sustainability Agency (DEID GSA) respectfully submits the following comments on the Groundwater Sustainability Plan (GSP) that has been released for public comments by the Eastern Tule Groundwater Sustainability Agency (ETGSA). The DEID GSA appreciates the collaborative relationship forged with the ETGSA through the GSP development process and looks forward to the continuation that relationship as we jointly enter the GSP implementation phase of the Sustainable Groundwater Management Act (SGMA). We invite the ETGSA to continued constructive dialogue regarding these comments.

1. **Section 1: Introduction to the ETGSA Groundwater Sustainability Plan**
   a. The Executive Summary should be clearer about the Project and Management Actions that will be undertaken to meet the Sustainability Goal. The Executive Summary is vague as to how the ETGSA intends to reach sustainability in its portion of the Subbasin. The GSP states that the initial management actions and projects are primarily focused on the implementation of "an accounting system to track and monitor groundwater data to help inform and develop policies to adaptively manage to reduce groundwater overdraft." (GSP, p.1-2.) However, SGMA focuses on mitigation of overdraft, not simply tracking and adaptive management. (Wat. Code, § 10727.2(d)(3).) It is unclear whether the reduction in overdraft contemplated in the GSP will meet the required DWR GSP review regulatory standards without more explanation of how the projects and management actions will ensure sustainability by 2040.

   b. Sustainability goal to achieve "no long-term change in groundwater storage" needs to be rephrased. The GSP states that the GSA's long-term sustainability goal for the subbasin is to achieve "no long-term change in groundwater storage." (GSP, p.1-2.) However, SGMA requires mitigation of overdraft and the avoidance of long-term reduction of groundwater storage. (Wat. Code, §§ 10727.2(d)(3), 10721(x)(2).) The GSA should consider revising the language to state "no long-term decrease in groundwater storage" instead, as an increase in groundwater storage may be a favorable outcome under SGMA. Also, the baseline year against which such decrease would be measured should be expressly referenced. In addition, the GSP regulations provide that groundwater elevation, not groundwater storage, can serve as the representative minimum threshold for multiple sustainability indicators. (GSP Regulations, § 354.28(d).) Thus, the GSA may wish to revise the GSP accordingly.

   c. Measurement of overdraft within ETGSA area needs to be further explained. The GSP states that, on average, the "annual overdraft within the Tule Subbasin is 82,400 acre-feet per year." (GSP, p. 1-2.) The narrative should clearly distinguish between the sources of this annual overdraft. It is also not entirely clear how the 82,400 acre-feet of overdraft is proposed to be offset during both the 20-year period to reach sustainability and the 50-year SGMA planning and implementation horizon.

2. **Section 2: Agency Information**
   a. Reference to Memorandum of Understanding needs to be replaced with reference to Coordination Agreement. The GSP states that the ETGSA has "coordinated the development and intended implementation of its Groundwater Sustainability Plan with the other six (6) GSAs overlying the Tule Subbasin via Memorandum of Understanding" and that the MOU is attached as Appendix B. (GSP, p. 2-4.) However, Appendix B is a resolution by the GSA of an intent to negotiate an MOU with the other GSAs. (GSP, Appendix 2-B.) The MOU is under Appendix 2-F. Notwithstanding the location of these appendices, references to the GSP should add a reference to the final Coordination Agreement, which supersedes and replaces the MOU. Because that Coordination Agreement has not been finalized, ETGSA may wish to delay its GSP approval until that agreement is completed to ensure its GSP is consistent with that agreement.

3. **Section 3: Description of Plan Area**
   a. Use of management areas need to be expanded. We recognize the varying nature of lands within the ETGSA, particularly with differing imported water assets. We believe that areas covered by a district or private water company with imported water supplies should be identified as separate management areas as provided by SGMA. This would help in analyzing to what degree each area within the ETGSA is currently sustainable and would assist in understanding the water balance for each area. While there are some management areas identified in the GSP in Section 3.6, they are limited to individual municipal water agencies and the Kern-Tulare Water District. This is inadequate for understanding the water surplus or deficits for specific areas within the ETGSA, particularly those that are solely dependent on groundwater.

      We further note that Section 3.6 contains language that notes a separate "Friant-Kern Canal Subsidence Management Area" but Figure 3.6 which identifies management areas within the ETGSA does not include any reference to this Management Area. We believe there is a critical need to have the important issue of subsidence along the Friant-Kern Canal within the ETGSA identified and treated as a separate management area. We recommend that the Friant-Kern Canal Subsidence Management Area be identified on Figure 3.6.

   b. Types of water sources are not property identified. The GSP, in several sections, does not adequately distinguish between different types of water sources (e.g., native groundwater, imported water return flows, etc.) (e.g., GSP, pp. 3-31, 3-43, 7-14 and others). Please clarify whether the reference to 192,000 acre-feet of "extracted groundwater" is native groundwater yield, or something different. (GSP, p. 3-15.)

   c. Reference to riparian water rights needs further clarification. The GSP states that "local surface water supplies are distributed by way of appropriative and riparian water rights." (GSP, p. 3-15.) Further clarification is needed as to how and where water under a riparian water right is distributed. Please note that water under a riparian water right may not be distributed or diverted outside of the land to which the right attaches without a proper permit. (Wat. Code, §§ 101, 1201.)

   d. City of Porterville's UWMP may not be consistent with mandatory statewide water conservation requirements. The GSP includes information from the City of Porterville's UWMP stating that it includes "a water use target of 179 gallons per capita per day [gpcd] by 2020 and an interim 2015 target of 187 gpcd." (GSP, p.3-26.) Pursuant to SB 606 and AB 1668, which became effective January 1, 2019, indoor urban water use is supposed to be reduced to 55 gpcd by end of 2024, and to 52.5 gpcd beginning in 2025 unless a different standard is recommended by the

Department of Water Resources. (Wat. Code, §§ 10608.20(b)(2)(A), 10609.4(a)(1).) Please note that, regardless of the city's UWMP, anytime a city is acting as the lead agency under CEQA for new development or other project that requires a water supply assessment, even if the city is not a water provider and has another entity prepare the assessment, the city must evaluate the water availability based on the entire record, including relevant GSPs, to determine whether there is enough water to serve the proposed project. (Wat. Code, § 10911(b), (c).)

e. It appears that the City of Porterville boundaries overlaps other districts with imported water supplies. This may be inflating the water budget for the City. Water assets of each local agency should be separated out and included in its own management area.

f. Landowner recharge and banking using groundwater recharge credits needs additional clarification. The GSP states that Porterville and Saucelito Irrigation Districts have adopted policies allowing landowners to use "groundwater recharge credits" for recharge or banking purposes and that the policies include a leave-behind provision whereby "a percentage of the surface water" used for recharge or banking is credited to the irrigation district's accounts. (GSP, p. 3-31.) Further clarification is needed as to the location of the recharge and banking activities, the legal authority pursuant to which the "groundwater recharge credits" are authorized, particularly for water native to the basin/watershed, water rights permits allowing capture of flood waters (e.g., Saucelito policy, p. 1) and the reliability, enforcement mechanism and amounts of water benefiting the Subbasin under these activities.

g. Further information is needed as to anticipated "new alternative" sources of water. The GSP states that the GSA anticipates meeting some water demands in its jurisdiction through "new alternative sources." (GSP, p. 3-49.) Further elaboration on what those anticipated new sources are would be helpful.

h. Table 3-2 (page 3-13) identifies active public water systems within the ETGSA and include the Richgrove CSD and the Rodriguez labor camp. Both are within the DEID GSA. A check should be made to ensure the water budget values for these two public water systems are not included within the ETGSA water budget.

i. the narrative included in the Groundwater Dependent Communities section (page 3-20) notes that "Continued lowering of groundwater could result in well failure and the loss of a community's primary source of water." An analysis of the expected well failures within the ETGSA, including those specifically within groundwater dependent communities, would assist in understanding the impacts of the transitional pumping project identified in Section 7 of the GSP.

4. Section 4: Basin Setting

a. Sustainable yield calculation for the GSA area is not consistent. The base calculation of the sustainable yield for the GSA area must be stated and must be consistent with the method and water quantities specified in the Coordination Agreement; as currently stated in the GSP, it is not. (GSP, p. 4-26.) In particular, use of a historical sustainable yield figure of 257,725 AFY does not appear to be consistent with the approximately 129,000 AFY sustainable yield figured referenced in the Coordination Agreement. (GSP, p. 4-26.) Further, any water amounts that are inconsistent with the Coordination Agreement must be separated out and explained.

b. Extensive referencing to the Thomas Harder report should be clarified. Throughout Section 4, the GSP refers the reader to certain sections of the TH&Co. report, without any further analysis or explanation. To the extent possible, a brief analysis needs to be provided for clarity and to narratively explain how the Harder report meets the respective GSP regulatory requirements.

At section 4.4.2.5, the explanation of water year does not correspond with the regulation, which seeks an analysis of how the water budget was quantified in different water year types (e.g., critically dry, above normal, etc.)

c. Monitoring for purposes of addressing land subsidence needs more details. The GSP states that a "monitoring area has been created to specially address land subsidence in areas with existing or future planned critical infrastructure that are at risk of significant impairment" and that "future projects and management actions within this Monitoring Area will focus on physically mitigating future subsidence." (GSP, pp. 4-31, 4-32.) Further details as to the locations to monitor need to be provided. In addition, no management action is proposed (or even outlined) in the GSP as a follow-up to these statements, particularly as needed to protect critical infrastructure such as the Friant Kern Canal from further damage.

d. Section 4.4.2.4 -Overdraft should be updated to reflect the most recent values of that portion of the Tule Subbasin overdraft that is attributable to ETGSA. Further, separating the overdraft into specific areas within the ETGSA that contribute to the overdraft, particularly those areas that are solely dependent on groundwater, would be helpful in understanding the nature of and possible mitigation necessary to correct the overdraft attributable to the ETGSA.

e. Section 4.5.3-Monitoring notes anticipated continued subsidence due to "legacy impacts" but does not reference nor quantify subsidence impacts expected from transitional pumping. Anticipated subsidence impacts on the Friant-Kern Canal from transitional pumping should be noted in this and other pertinent sections of the GSP along with quantification of this impacts as projected by the Tule Subbasin groundwater flow model.

5. Section 5: Sustainable Management Criteria

a. Limiting undesirable results to those associated with groundwater pumping is inconsistent with SGMA. The GSP states that the "sustainability goal of the Tule Subbasin is defined in the Coordination Agreement pursuant to Section 4.2, as the absence of significant and unreasonable undesirable results associated with groundwater pumping." (GSP, p. 5-4.) SGMA requires the absence of undesirable results (not just "significant and unreasonable" undesirable results) and defines undesirable results are those "caused by groundwater conditions occurring throughout the basin," without limiting them to groundwater pumping. (Wat. Code, § 10721(x); Cal. Code Regs., tit. 23, § 354.24.) Specifying a narrower definition risks having the GSP's sustainability goal deemed insufficient to meet SGMA requirements.

b. Undesirable results are not limited to a "significant and unreasonable portion" of the basin. The GSP states: "Undesirable Results are caused by groundwater conditions occurring throughout a significant and unreasonable portion of the basin that, for any sustainability indicator, are considered significant and unreasonable." (GSP, p. 5-5.) The underscored portion of the preceding sentence should be deleted as inconsistent with SGMA. The SGMA GSP regulations do not require that a "significant and unreasonable portion" of the Subbasin be adversely affected before an Undesirable Result can occur. (Cal. Code Regs., tit. 23, § 354.26(a) referencing groundwater conditions "occurring throughout the basin".)

c. Measurable Objectives (MOs) in the GSP are not quantified as required under SGMA. The MOs described in the GSP lack the quantification and specificity required under SGMA (Cal. Code Regs., tit. 23, §§ 354.26(b)(2), 354.28, and 354.30.) For example, Table 5-4 and Table 5-5 for reduction of groundwater storage are blank. (GSP, pp. 5-17, 5-19). Such undetermined thresholds fall short of SGMA 's requirements for defining MOs.

d. Minimum Thresholds are not narratively explained. The minimum thresholds are not sufficiently explained for the reader or DWR to determine how they were derived. For example, Table 5-3 sets minimum thresholds in terms of groundwater elevations at a number of wells. The "4-Step" explanation seems to indicate that these thresholds relate to groundwater elevations occurring during the 2007-2016 drought. However, there is no explanation of how selecting such thresholds leads to avoidance of the applicable undesirable results in the ETGSA area.

e. Extensive referencing is made to the Coordination Agreement. Throughout Section 5, the GSP refers the reader to certain sections of the Coordination Agreement, without any further analysis or explanation. To the extent possible, a brief narrative analysis or explanation needs to be provided for clarity of how the specified objectives, thresholds and milestones will avoid undesirable results in the ETGSA area.

f. Legacy related land subsidence needs further clarification. The GSP states that the "land subsidence evaluation includes legacy related subsidence." (GSP, p. 5-30.) Further clarification would be helpful in understanding how legacy subsidence was evaluated, how it relates to undesirable results, and their avoidance, and otherwise meeting SGMA requirements related to avoiding or mitigating land subsidence.

6. Sections 6 & 7: Monitoring Networks; Project & Management Actions

a. PMA's and minimum thresholds. Stating that projects and management actions "will be evaluated" (GSP, p. 6-2) if minimum thresholds are exceeded does not satisfy SGMA's requirements to avoid undesirable results. One of the primary purposes of SGMA is to entirely avoid undesirable results; it is insufficient to wait to react until after an undesirable result has been attained.

b. Contained with Section 7.2.1-Groundwater Accounting Action is table 7-1 titled "Proposed Reduction in Groundwater Use Over Time". This table introduces what has been commonly referred to as "transitional pumping" at various ETGSA public meetings. Given its projected impact on Friant-Kern Canal subsidence, the continuation of groundwater overdraft for another 15 years and lowering of groundwater elevations and reductions in groundwater storage, transitional pumping should be its own project stated within Section 7. Additional details should be provided including but not limited to quantification of projected over-pumping by year, allocation methodology within the ETGSA, priority of use as compared to other groundwater and imported water supplies, fees associated with the use of transitional pumping, and enforcement actions necessary to regulate the use of transitional pumping. Because of importance of avoiding the undesirable result of continued subsidence within the Subbasin as it specifically relates to the Friant-Kern Canal, the restated project should specifically address anticipated subsidence impacts that this project will have on the Friant-Kern Canal, and how those impacts will be mitigated. Subsidence data contained within the basin setting, the monitoring plan, and other outside reports prepared by the Subbasin hydrogeologist should be used to develop specific subsidence management areas and required projects and management actions necessary to mitigate the undesirable results associated with transitional pumping and the resultant subsidence on the Friant-Kern Canal.

Additionally, the assertion as to applicability of CEQA/NEPA requirements to proposed transitional pumping needs revisiting. The "groundwater accounting action" contains two actions: accounting and transitional pumping. (GSP, pp. 7-1.) It would be more appropriate to separate the two as they have different regulatory requirements. In addition, the assertion that post-GSP approval allocation and transitional pumping are not subject to CEQA/NEPA could be

susceptible to legal challenge. An argument can be made that CEQA/NEPA may be triggered by the GSP affirmatively allocating groundwater or allowing transitional pumping (GSP, p. 7-4). This also requires revising the timeline accordingly. (GSP, p. 7-5.)

c. Voluntary projects need additional detail. Section 7.3 includes a completely voluntary component to be undertaken by individual landowners and describes the implementation timeline as varying from "a few weeks to several years." (GSP, pp. 7-8, 7-12.) The sources, availability, reliability and quantity of the surface water supplies needed for implementing this management action are not sufficiently specified. (GSP, p. 7-12.) This general lack of detail, analysis as to how these projects and others will implemented makes evaluation and comment impossible.

7. Appendix C

a. The ETGSA GSP includes a separate GSP for the Kern-Tulare Water District Management Area. It does not appear that there has been any effort given to coordinate the Kern-Tulare GSP with the ETGSA GSP. Consideration should be given to incorporating Kern-Tulare GSP fully into the ETGSA GSP to avoid the confusion of having two sperate GSPs for a single GSA. Alternatively, consideration should be given to making the Kern-Tulare Water District its own GSA.

Please contact the undersigned should you have any questions.

Sincerely,

Eric Quinley, General Manager
Delano-Earlimart Irrigation District GSA

Ducor
Community Services District

To: Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave
Porterville, CA 93257

From: Ducor Community Services District Board
6128 Road 248
Ducor,CA 93218

Re: Comments on the Eastern Tule Groundwater Sustainability Plan
DRAFT

Dear Eastern Tule Groundwater Sustainability Agency (ET GSA),

On behalf of the Ducor Community Services District (CSD), we are writing to voice our concerns and submit our comments in response to the Draft Groundwater Sustainability Plan that was released on September 16, 2019, and then re-released without any public notice on October 2, 2019. The comments and recommendations presented are intended to support ET GSA in revising the Draft GSP to better reflect the needs of Ducor CSD.

Ducor CSD is a public water utility that provides drinking water to residents and businesses in and around the unincorporated disadvantaged community of Ducor, California. The Ducor CSD provides drinking water service to 535 residents, utilizing 162 service connections. Our district is 100% reliant on groundwater for our drinking water needs. During the 2012 to 2016 drought, municipal groundwater users in the Tule Subbasin were some of the hardest hit in the entire state. During the drought, there were approximately 1700 incidents of groundwater supply shortages in Tulare County. Furthermore, our community has faced issues with drinking water contaminants, including nitrate in 2009, and secondary contaminants including manganese. The following sections will discuss our concerns and recommendations with specific issues of the draft ET GSP.

Minimum Thresholds for Groundwater Levels

We are concerned that the proposed groundwater minimum thresholds (MTs) and measurable objectives (MOs) in the Draft GSP will negatively impact our ability to maintain consistent drinking water availability in the long-term and we request the ET GSA to revise the GSP to reflect and address these concerns.

The Draft GSP lacks a thorough assessment of impacts to Ducor CSD and to other drinking water beneficial users within the GSA, nor does the Draft GSP take into consideration AB 685, The

Human Right to Water. The Sustainable Groundwater Management Act (SGMA) requires GSAs to consider how the MTs may affect the interests of beneficial users and property interests (23 CCR §354.28). Based on the Draft GSP MOs, groundwater levels for the representative monitoring well in Ducor could increase by 42 feet above current conditions, but at the MTs they would be allowed to drop 157 feet below current conditions. Despite this great reduction in groundwater levels, there is no analysis in the Draft GSP explaining the impact of these MOs and MTs on public and private drinking water wells. In addition to the potential dewatering of public and private wells, this significant drop in groundwater levels could lead to additional pumping costs associated with the increased lift at the potential lower water levels. Ducor is a low-income community and these additional costs would cause a significant burden on our community which must be considered in the GSP. In order to fully consider the impacts of our beneficial use of groundwater, we request the following:

- **Include an analysis of the potential impact the identified MOs and MTs could have on drinking water wells in the Ducor area, quantifying both the potential dewatering of wells as well as the associated costs.**
- **Based on results from the impact analysis, revise MO/MTs to be protective of private and public drinking water wells in the Ducor area.**

Groundwater Quality

The water quality sustainability criteria, monitoring network, and analysis presented in the Draft GSP does not clearly illustrate how the MOs/MTs will adequately ensure that the water quality undesirable result of impact on the long-term viability of the groundwater resource will be avoided, particularly for Ducor CSD or other communities and domestic well users. The proposed MTs and MOs that allow contaminants to further degrade appears to be inconsistent with state water quality laws and policies. Further degradation of groundwater quality can significantly impact Ducor CSD's ability to maintain a long-term, sustainable source of clean water, as well as affecting home and other property values. Further contamination of groundwater near or around Ducor CSD could require our district to have to utilize increased treatment systems or potentially require us to take a well offline. These potential outcomes could lead to unaffordable water rates that make providing safe drinking water even more challenging.

The Draft GSP is not clear about what method was used to develop the water quality sustainable management criteria and what the ET GSA intends to use to define water quality sustainability. The Draft GSP should clearly and transparently describe what the water quality sustainability goals are and how the GSA plans to reach them. Based on these concerns, we request that:

- **The GSP be revised to clearly articulate the groundwater quality sustainability criteria.**

- **The GSP include an analysis of how the proposed sustainable management criteria for groundwater quality might impact Ducor's ability to maintain safe drinking water over the long term.**

Future Groundwater Allocation

As noted above, Ducor is dependent on groundwater for all its domestic water needs. It has been communicated unofficially to representatives of Ducor CSD that they will likely be allocated a quantity of groundwater pumping which would meet current use, but the specific details of this allocation criteria, including how it would be calculated, are not elaborated in the Draft GSP. Currently, Ducor CSD has a new well which was recently constructed in 2018, but which at this time is not being used to its full design capacity. Additionally, the community has numerous vacant lots which are not currently being served. It is our belief that any allocation to Ducor CSD should, at minimum, account for the full design capacity of our existing wells and provide capacity for all current and potential service connections in the community, as well as accounting for the 1.3% projected annual growth rate of the community as detailed in the Hamlet and Legacy Plan for the community of Ducor, which can be found on the Tulare County website[1]. Without accurate information about future domestic water availability, Ducor will be unable to plan for future growth. SGMA requires a reduction in groundwater usage over the twenty-year period during which the GSA must reach its sustainability goals, but the Draft GSP does not identify how this reduction will be apportioned between beneficial users. Accordingly, we are concerned by the lack of specifics regarding the future allocation of groundwater use in the ET GSA, with the remainder being used for agriculture. Additionally, California law identifies water for domestic use as the highest priority amongst beneficial users. Since groundwater for drinking water is such a vital need for the small communities within the GSA, as well as their local economies, the GSP should be revised to reflect the need for an adequate groundwater allocation for future community growth. In light of the above, we request that:

- **The draft GSP be revised to guarantee adequate groundwater for planned growth.**

Mitigation Plan for Unexpected Impacts of GSA Projects and Management Actions.

The Ducor CSD board is concerned about any potential effect projects and management actions will have on both public and private wells. Although other GSAs around the state have produced draft GSPs which contain plans to mitigate short term negative effects of actions taken by GSAs, ET's GSP lacks a plan for addressing impacts to drinking water access. Without any clear actions regarding establishing a groundwater allocation or addressing reductions in groundwater pumping, drinking water users could face significant impacts, particularly if the

[1] Tulare County Resource Management Agency:

region faces another drought. If ET GSA defines its sustainability goal and related sustainability criteria in a way that allows for the dewatering of drinking water wells, it must provide a robust drinking water protection program to prevent impacts to drinking water users and mitigate the drinking water impacts that occur. A drinking water well mitigation program could include a combination of different strategies including: replacing impacted wells with new, deeper wells, connecting domestic well users to a nearby public water system, or providing interim bottled water. Examples of existing drinking water mitigation plans can be found in past groundwater adjudications, the Kern Water Bank Authority's mitigation strategy, and several others. The inclusion of this drinking water well mitigation program allows the Draft GSP to be better aligned with the goals of AB 685, The Human Right to Water, which states that "every human being has the right to safe, clean, and accessible water adequate for human consumption, cooking, and sanitary purposes." As the Department of Water Resources reviews the draft GSPs, it will be required to ensure plans are upholding this statutory requirement. Based on the concerns listed above, we request that:

- **The draft GSP be revised to include an analysis of potential projects and management actions the GSA may have on Ducor, as well as the neighboring communities.**

Financial Impact of Fee Assessments

The Census-Designated Place (CDP) of Ducor qualifies as a Severely Disadvantaged Community, with a Median Household Income (MHI) of $30,083 according to the US Census Bureau's American Community Survey data from 2013-2017. The State Water Resource Control Board sets a threshold of 1.5% of MHI for domestic water supply, which would equate to $37.60 per month for the community of Ducor, as the maximum affordable water rate. Current water rates for Ducor CSD are approximately $65 per month for an average household. It is not clear from the Draft GSP how fees will be assessed on stakeholders within the GSA. As is, Ducor CSD already faces significant financial capacity challenges, and we are deeply concerned that any fees or assessments levied on the district by ETGSA will place an undue and disproportionate financial burden on the ability of Ducor CSD to provide reliable access to safe drinking water at an affordable rate. This concern is apart from water allocation concerns, which could potentially require Ducor CSD to purchase pumping rights to meet capacity requirements now or in the future. Given these concerns, we request that:

- **The draft GSP include specific proposals on assessment of fees, with special considerations of the financial challenges faced by small water systems serving disadvantaged communities.**

Thank you for reviewing this letter and for the consideration of our comments on the Draft GSP. The ET GSA's adoption of our recommendations will go far towards improving the Draft GSP and bringing it into compliance with SGMA legislation and requirements. Ducor CSD looks forward to working with the ET GSA to ensure that the GSA is protective of drinking water

needs and to ensure the sustainable management of our shared groundwater resources. Please do not hesitate to contact us with any questions or concerns, or if you would like to meet to further discuss these important sets of issues.

Sincerely,

Jim Parsons, President
Ted Daniel, Director
Sue Avila, Director
Nick Galusha, Director
Ruth Martinez, Director

ELMCO 200, LLC
20191 AVENUE 128 | PORTERVILLE, CA | 93257 | PHARMAN@FCFARMING.COM

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

December 13, 2019

Re: Comments on the Draft Groundwater Sustainability Plan for the Eastern Tule Groundwater Sustainability Agency

Dear Mr. Caudillo:

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA) and a member of the Eastern Tule White Area Growers, Inc. (ETWAG).

The members of ETWAG formed our organization to give a voice to the many landowners within the ETGSA that farm outside the boundaries of any water or irrigation district. ETWAG current represents 66 landowners that farm nearly 24,000 acres within the "white area" of the ETGSA. ETWAG has submitted comments to the ETGSA regarding the GSA's draft Groundwater Sustainability Plan (GSP). We support ETWAG's comments, and we incorporate by reference and attach hereto that comment letter and its enclosed memorandum into this letter.

Elmco 200, LLC further attaches and incorporates in these comments a February 6, 2019 letter to the ETGSA and its constituent agencies that was drafted and submitted by another group of landowner entities.

We will also note that significant portions of the GSP were not available for review prior to the comment deadline – specifically, portions related to an area of potential subsidence concern or a potential subsidence management area. Without these crucial details about the structure of the GSA's management areas, we cannot adequately comment on those issues and reserve the right to do so when such materials become available.

Further, we wish to reiterate and build upon Comment 4-2 from the memo accompanying the comment letter submitted on behalf of ETWAG by its legal counsel. Although the GSP clearly states on page 4-3 that the bottom of the subbasin "is defined by the interface between the Santa Margarita Formation and the relatively impermeable granitic bedrock," it also states that "In the southern region of the ETGSA, the lower aquifer system is separated from the underlying Santa Margarita Formation and the Olcese Formation by a thick layer of marine deposits." (GSP Page 4-6.) The GSP admits that the Pliocene Marine Deposits that separate the underlying Olcese Sands and the Santa Margarita Formation from the overlying upper and lower alluvial aquifers are an aquitard. (GSP Page 4-5.)

While admitting that there is a barrier to hydrological conductivity between the alluvial aquifers and the Santa Margarita Formation, below the GSP makes no attempt to address that by, for example, creating a separate management area with distinct Sustainable Management Criteria for the separate aquifer in underlying marine sedimentary deposits. Simply put, Minimum Thresholds and Measurable Objectives designed to protect the overlying Upper and Lower Alluvial Aquifers have no applicability or scientific nexus to the sustainable management of the Santa Margarita aquifer. The Confined aquifers within the Santa Margarita and Olcese Sands formations must be considered a separate subbasin or at least a separate management area, and must be managed separately from the overlying alluvial aquifers.

As landowners, we appreciate the GSA's work on our behalf. We look forward to continued collaboration as the GSA implements the adopted GSP.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Very Truly Yours,

Peter Harman, COO
Elmco 200, LLC

Enclosures:

A – ETWAG Comment Letter

B – Bondy Groundwater Consulting Memo

C – February 6, 2019 Landowner Letter to ETGSA

ENCLOSURE A

Joseph D. Hughes 661-328-5217 jhughes@kleinlaw.com

4550 California Ave., Second Floor, Bakersfield, CA 93309
p. 661-395-1000 f. 661-326-0418 **www.kleinlaw.com**

December 12, 2019

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave.
Porterville, CA 93257

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

We are counsel for Eastern Tule White Area Growers, Inc. (ETWAG), and submit this comment letter on behalf of ETWAG. ETWAG appreciates the opportunity that Eastern Tule Groundwater Sustainability Agency (GSA) has provided for stakeholders to comment on the GSA's draft Groundwater Sustainability Plan (GSP). We understand and appreciate the efforts undertaken by the GSA and your consultants to reach this point. Our hope in submitting these comments is that the GSA will appropriately modify the draft GSP to address our concerns and those of our members.

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the draft GSP. In addition to those comments, we add the following.

A primary concern of our members is the apparent conclusion that the GSA will allocate groundwater according to gross acreage owned by landowners within the GSA. This is consistent with the GSA discussions in which we have been allowed to participate. Indeed, the draft Coordination Agreement dated September 16, 2019, uses the gross acreage method after dismissing historical use. Put simply, we disagree with your approach in both substance and process.

A gross acreage methodology ignores accepted legal principles and equitable considerations governing the allocation of native yield. We fear that the GSA is sacrificing fairness and the law for the sake of convenience. Historical use of groundwater and investment based on that productive use of the resource must be considered in the allocation methodology. ETWAG has previously provided the GSA with our position on this issue, which has not changed.

ETWAG also disagrees with the process by which the GSA is handling this critical issue of water rights. The draft Coordination Agreement notes that historic use of groundwater might be considered in the future. If the GSA recognizes now that historic use should be an element in the allocation of native yield, then the process should include that element. The GSA should not rush the process simply because the GSA wants the issue settled now. Further discussion and

stakeholder involvement on this issue could avoid unnecessary legal challenges. We urge the GSA to allow for more stakeholder engagement and, if necessary, dispute resolution before reaching its conclusion as to how native yield should be allocated.

We are encouraged that the draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits. Such a market system should be as flexible as possible to facilitate the needs of farmers with lands in different areas of the sub-basin. We ask that the GSA fully engage stakeholders who will be participating in a market as the GSA develops this groundwater management tool.

The GSA and its stakeholders have reached a significant milestone in completing a draft GSP and, in short order, submitting a final GSP to the Department of Water Resources. But as the GSA is aware and notes throughout the draft GSP, there is much work to be done in the implementation of the GSP. We urge the GSA to continue with active engagement of the stakeholders. The GSP is a planning document. Implementation will require collaboration, among other things, and ETWAG anticipates working closely with the GSA in that process.

Please feel free to contact us if you have any questions or wish to discuss any of our comments as you finalize the GSP.

Very truly yours,

Joseph D. Hughes

JDH:sbh

Enclosure

ENCLOSURE B

MEMORANDUM

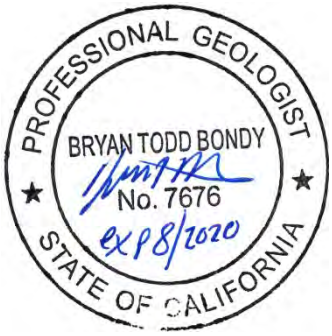
To: Eastern Tule White Area Growers, Inc.

From: Bryan Bondy, P.G., CHG / Bondy Groundwater Consulting, Inc.

CC: Project File

Date: December 13, 2019

Re: Evaluation of Eastern Tule Subbasin Draft Groundwater Sustainability Plan



Introduction

Eastern Tule White Area Growers, Inc. (ETWAG) retained Bondy Groundwater Consulting, Inc. (BGC) to review the September 2019 Draft Groundwater Sustainability Plan (GSP) for the Eastern Tule Subbasin prepared by the Eastern Tule Groundwater Sustainability Agency (ETGSA). This memorandum presents the results of BGC's evaluation, which are organized by GSP section.

Please note that the GSP review was focused on technical aspects of the GSP and it is understood that my firm's familiarity with the Tule Subbasin and time available for review were both limited. Furthermore, it is important to note that much of the GSP is based on groundwater modeling that is not yet documented in a publically available report; therefore, much of technical basis for the GSP cannot be reviewed at this time. Based on the foregoing, this review should not be considered exhaustive. Lack of comments on any particular section, issue, or topic should not be considered agreement with the associated content.

Overarching Comment

Much of the technical foundation of the GSP is provided by the groundwater flow model and simulations of future conditions made using the model. The groundwater flow model and the specifics of the modeling runs used to develop the projected future water budget, sustainable yield, sustainable management criteria (measureable objectives, interim milestones, and minimum thresholds) are not documented in a publically available report. Therefore, much of technical basis for the GSP cannot be reviewed at this time, which is obviously problematic for stakeholders who desire a review of the technical basis for the key aspects of the GSP.

Section 1 – Introduction

Comment 1-1: Executive Summary: The executive summary could do a better job of providing a more informative summary of the plan, including key groundwater conditions in the basin, undesirable results, and what actions will be taken to address undesirable results. Suggest providing more information.

Comment 1-2: Executive Summary: Statement that "…overdraft conditions have caused issues for those reliant on groundwater pumping…" is vague. What are the issues and are they considered significant and unreasonable?

Comment 1-3: Executive Summary: Description of the sustainability goal differs from that provided in Section 5.2.

Section 2 – Agency Information

Section not reviewed.

Section 3 – Description of Plan Area

Comment 3-1: Section 3.6 - Management Areas within ETGSA: The purposes of the six management areas listed in this section are vague. More information is need to understand how and why management might differ in the various management areas.

Comment 3-2: Figure 3-6 - Management Areas within the ETGSA: The "Friant-Kern Canal Subsidence Management Area" listed in Section 3.6 is not depicted on Figure 3-6, map of management areas within ETGSA.

Section 4 – Basin Setting

Comment 4-1: GSP Section 4.2.2 and Tule Subbasin Setting Section 2.1.3 Lateral Basin Boundaries: These sections state that 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." These sections should be revised to note that the southernmost portion of the eastern boundary near White River is the contact between the older sedimentary rocks and alluvial sediments.

Comment 4-2: GSP Section 4.2.3 and Tule Subbasin Setting Section 2.1.4 Bottom of Basin: These sections define the basin bottom as the contact between the Santa Margarita Formation (GSP) or Tertiary deposits (Tule Subbasin Setting) and granitic bedrock. The definitions differ between Section 4.2.3 and the Tule Subbasin Setting and should be reconciled. More importantly, the basin bottom definitions are inconsistent with the lateral basin boundary and SGMA.

The basin bottom definitions are inconsistent with the lateral basin boundary because neither the Santa Margarita Formation (GSP) or Tertiary deposits are included in the lateral basin boundary where they outcrop in the southeastern portion of the basin (See Figure 2-4 of the Tule Subbasin Setting). In other words, how can these units be included in the basin vertically, but not laterally?

SGMA defines "Basin" as a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Chapter 3 (commencing with Section 10722). DWR's Bulletin 118 defines the basin as the Pliocene to Holocene continental deposits, including flood-basin deposits, younger alluvium, older alluvium, Tulare Formation, and undifferentiated continental deposits (Attachment A). The 2016 basin boundary modification was jurisdiction in nature and, therefore, did not modify the 2004 DWR description of the basin bottom.

Based on the foregoing, it appears the bottom of the GSP should define the basin bottom as the base of the oldest unit described by DWR (2004), i.e. the Tulare Formation. This is important because the basin bottom defines which hydrostratigraphic units are subject to regulation by the GSAs.

Comment 4-3: Tule Subbasin Setting Section – Figure 2-4: Cross Sections C-C', D-D', and E-E' depicted on Figure 2-4 are not provided in the document. In particular, including Cross Section C-C would presumably help illustrate the points made in early comments about the basin boundary.

Comment 4-4: GSP Section 4.2.6 and Tule Subbasin Setting Section 2.1.7.1 – Principal Aquifers and Aquitards: These sections identify the Pliocene Marine Deposits, Santa Margarita Formation, and Olcese Formation as principal aquifers within the basin. As pursuant to earlier comments, these units should not be listed as principal aquifers because they are not part of the basin.

Comment 4-5: GSP Section 4.2.6.2 and Tule Subbasin Setting Section 2.1.7.2 –Aquifer Physical Properties: The Tule Subbasin Setting should describe and show (on Tule Subbasin Setting Figures 2-10 through 2-13) the spatial distribution of textural data used to estimate hydraulic conductivity and storage properties. Any significant gaps should be identified and discussed, particularly in key areas, such as for the lower aquifer in subsidence areas, both in this section and Tule Subbasin Setting Section 2.1.8 – Uncertainty in the Hydrogeologic Conceptual Model.

Comment 4-6: GSP Section 4.3.6 and Tule Subbasin Setting Section 2.2.6 – Interconnected Surface Water Systems: Both sections conclude that there are no interconnected surface water systems in the basin. While this appears to be a potentially reasonable conclusion, the GSP does not provide the necessary technical justification for eliminating this sustainability indicator. DWR will be looking for such justification during its review of the GSP. This justification should be included in the GSP to prevent DWR from finding the GSP inadequate and so that further consideration of this sustainability indicator will not be required.

The discussion and analysis of percolating groundwater and subterranean streams included in GSP Section 4.3.6 is a separate issue from whether there are interconnected surface water systems within the basin. That discussion does not provide the justification needed for concluding there are no interconnected surface water systems in the basin. Instead, the technical justification should demonstrate that surface water is not hydraulically connected by a continuous saturated zone to the underlying aquifer and that the overlying surface water is not completely depleted at any location and time throughout the year, since 2015 and going forward. Specifically, the analysis should address the easternmost reaches of Tule River, Deer Creek, and White River where shallow groundwater depths are indicated in January 2015 (Tule Subbasin Setting Figure 2-26).

Comment 4-7: GSP Section 4.3.7 and Tule Subbasin Setting Section 2.2.7 – Groundwater Dependent Ecosystems: The GSP is not clear regrading whether groundwater dependent ecosystems are present in the basin, as required by the GSP Emergency Regulations. While groundwater dependent ecosystems do not appear to be a principal issue for the basin, the current level of characterization may be noted as a plan deficiency by DWR.

Comment 4-8: GSP Section 4.4.1 and Tule Subbasin Setting Section 2.3.1 – Surface Water Budget: The GSP and Tule Subbasin Setting state that the difference between estimated surface water inflows and outflows is 0.2 percent. This implies a greater level of accuracy for the surface water flows than actually exists. It is commonly known that there is considerable error in measuring/estimate inflow and outflow terms, ranging from a minimum of approximately 5%

for metered flows to 30+% for unmetered (estimated) flows. The uncertainty in the water balance terms should be estimated, reported in the GSP, and considered in a modeling sensitivity analysis to determine the impact on model calibration and sustainable yield estimation.

Comment 4-9: GSP Section 4.4.2.6 and Tule Subbasin Setting Section 2.3.2.6 – Sustainable Yield: The process for determining the sustainable yield is not documented sufficiently to critically evaluate. Specifically, the sustainable yield was developed using a groundwater flow model and simulations that are not documented in the draft GSP or other publically available report.

Groundwater inflow and outflow is a major consideration for determining the sustainable yield. Under historical conditions, the net inflow to the subbasin was estimated to be 53,000 acre-feet per year (118,000 acre-feet of inflow and 65,000 acre-feet of outflow). Under simulated future conditions, the net inflow to the subbasin from the model results is negative (-)34,000 acre-feet per year (54,000 acre-feet of inflow and 88,000 acre-feet of outflow). In other words, the model is predicting a 87,000 acre-feet per year decrease in net inflow to the basin under future conditions. Based on the information presented in the GSP, it appears that the reason for this is that the modeling does not consider groundwater level increases in neighboring subbasins that should be expected to occur as a result of SGMA implementation. In short, the modeling appears to significantly underestimate future net groundwater inflow to the subbasin. This is a material consideration given the magnitude of the difference between estimated historical versus simulated future net groundwater inflows. Given that the swing in net groundwater inflow is more than half of the sustainable yield, further evaluation of this aspect is certainly warranted.

The other consideration for groundwater outflow is the source of water. The Tule Subbasin Setting treats all groundwater inflows and outflows as native water for the purpose of estimating sustainable yield. In reality, groundwater flowing into or out of the subbasin is likely a mixture of native and non-native water, particularly for the upper aquifer. Likewise, recharge of imported water may displace native water out of the subbasin. It may be appropriate to treat groundwater inflows the same as native water when estimating the sustainable yield because that water was not imported into the basin by specific entities in the subbasin like imported surface water supplies are. However, more thought should be given to the treatment of groundwater outflows. In essence, the approach used in the Tule Subbasin Setting assumes that all groundwater flowing out of the basin is derived from native sources. Certainly some groundwater outflow is derived from recharge of imported sources and should probably not be included in the calculation of sustainable yield just like groundwater recharge and return flows

derived from imported sources of are excluded from the calculation. Consistent treatment of imported water is needed for an equitable assessment of the sustainable yield.

Lastly, the sustainable yield does not appear to be optimized and may be lower than it needs to be to prevent undesirable results. This is suggested by model simulated groundwater levels presented in the Tule Subbasin Setting appendices that show continuously rising groundwater levels after approximately 2030 in some areas of the subbasins (most notably many of the representative monitoring wells in ETGSA) versus other areas where groundwater levels are predicted to stabilize. This is likely the result of simulating a uniform application of sustainable yield across the subbasin. In other words, some areas could probably stand to pump more than allowed by a uniform distribution of sustainable yield without causing undesirable results. Differential pumping reductions could be considered to increase the overall yield of the subbasin. Financial incentives and/or projects to transfer water within the subbasin could be considered to address any inequities created by imposing differential pumping reductions.

Comment 4-10: GSP Section 4.5 - Management Areas: These sections describe five management areas, whereas six are described in Section 3.6 of the plan. The number of management areas needs to be clarified throughout the GSP.

The "Friant-Kern Canal Subsidence Management Area" is not discussed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4, but is listed in GSP Section 3.6. The GSP should clarify whether "Friant-Kern Canal Subsidence Management Area" is truly a management area, or simply a monitoring area as described in the Tule Subbasin Setting, page 45.

The purposes of the management areas listed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4 are vague. More information is need to understand how and why management might differ in the various management areas.

Section 5 – Sustainable Management Criteria

Comment 5-1: The process for establishing measureable objectives and minimum thresholds for groundwater levels, groundwater storage, and land subsidence appears arbitrary and may not necessarily be designed to prevent undesirable results. As I understand the process, the groundwater flow model was run with future hydrology assumptions and assumed projects and management actions. The predicted groundwater levels (adjusted in some cases) and predicted land subsidence were then selected at 2025, 2030, and 2035 as the interim milestones and 2040 as the measureable objectives. The minimum threshold was then selected by subtracting measured groundwater level declines and subsidence during the recent 10-year

drought (2007-2016) from the measureable objective. In the case of the Friant-Kern Canal area, the deduction was limited to 3 feet, without explanation or justification. The process described in the GSP is backwards from what SGMA requires, which is to establish minimum thresholds based on metrics that prevent undesirable results and the establish measureable objectives and interim milestones that provide operational flexibility (essentially a safety factor so that the minimum thresholds are not exceeded).

In short, there is no nexus presented between the minimum thresholds and preventing undesirable results. For groundwater levels and storage, minimum thresholds in the upper aquifer may be unnecessarily high in many cases for preventing the undesirable result, which the coordinate agreements states is "a new productive well cannot be constructed". In the lower aquifer, the minimum threshold levels are below the top of screen in some wells, which potentially indicates conversion of the lower aquifer from confined to unconfined conditions that could have significant impacts on well performance and lifespan. For subsidence, the minimum thresholds are not linked in any way to the coordination agreement definition of undesirable results, which is "loss of a functionality of a structure or a facility to the point that, due to subsidence, the structure or facility cannot reasonably operate without either significant repair or replacement." The section does not provide any information to assess whether the subsidence minimum thresholds will prevent undesirable results or whether they are overly restrictive.

Perhaps there is more to the sustainable management criteria analysis that is not being described in this GSP section; nonetheless, the current sustainable management criteria discussion does not appear to meet the requirements of the GSP Emergency Regulations.

Comment 5-2: Tables 5-4 and 5-5 (IM, MO, and MTs for groundwater storage) are blank.

Section 6 – Monitoring Network

Section not reviewed.

Section 7 – Projects and Management Actions

Comment 7-1: Many good project concepts are presented in this section, most of which appear to lack specific plans of funding, which is to be expected at this stage. However, two concerns are noted. First, the GSP assumes that most of the projects will be developed and implemented by member agencies. This may create a significant challenge given that much of the GSA is comprised of white areas that do not have a district to lead the develop and implementation of

project(s). Perhaps the County would fill this role, but the GSP does not address this potentially significant issue. The other concern is the lack of projects specifically targeted to address key undesirable results, such as subsidence along the Friant-Kern Canal.

Because it is anticipated that competition for funding from GSA fees and competitive grants will be high, allocating limited available funds will likely be one of the most significant challenges faced by ETGSA and its partner GSAs within the subbasin and a will likely be a source of conflict. It is recommended that the ETGSA begin working internally and with the other subbasin GSAs to develop a process for screening and ranking projects for funding. This process should start immediately in anticipation of future rounds of Prop 1 funding for GSP implementation. The screening and ranking process should be heavily weighted toward projects that have the greatest impact on preventing undesirable results at the lowest cost. Projects that provided water supply benefits, but do not contribute significantly to preventing undesirable results should rank lower. Projects that screen high should be moved as quickly as possible into feasibility evaluation and design to maximize the potential for funding when grant opportunities present themselves.

Section 8 – Notices and Communications

Section not reviewed.

Section 9 – References and Technical Studies

Comment 9-1: Documentation of the groundwater model development, calibration, sensitivity analysis, and predictive simulations for the GSP should be provided.

Limitations

This memorandum was prepared by Bondy Groundwater Consulting, Inc. (BGC) for Eastern Tule White Area Growers, Inc. BGC has employed accepted geologic and hydrogeologic procedures and its opinions are made in accordance with generally accepted principles and practices of these professions. The analyses, conclusions, and recommendations contained in this memorandum reflect BGC's best judgment in light of the information readily available to BGC at the time of preparation, experience with similar projects, and project scope, schedule, and budget. All locations depicted and/or described in the memorandum are approximate and are provided as general information only. Interpretations, location descriptions, location depictions, conclusions, and other information presented in this memorandum should not be relied upon to site or design wells or any other infrastructure without field confirmation of assumptions and estimates made in this memorandum. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this memorandum.

Closing

Please contact me if you have any questions regarding this memorandum. The opportunity to assist Eastern Tule White Area Growers, Inc. is greatly appreciated.

BONDY
Groundwater Consulting, Inc.

Attachment A

San Joaquin Valley Groundwater Basin
Tule Subbasin

- Groundwater Basin Number: 5-22.13
- County: Tulare
- Surface Area: 467,000 acres (733 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Tule Groundwater Subbasin is generally bounded on the west by the Tulare County line, excluding those portions of the Tulare Lake Subbasin Water Storage District and Sections 29 and 30 of Township 23 South, Range 23 East, that area west of the Homeland Canal. This boundary is shared with the Tulare Lake Groundwater Subbasin. The northern boundary of the subbasin follows the northern boundaries of Lower Tule Irrigation District and Porterville Irrigation District and is shared with the Kaweah Groundwater Subbasin. The eastern boundary is at the edge of the alluvium and crystalline bedrock of the Sierra Nevada foothills, and the southern boundary is the Tulare-Kern County line and is shared with the Kern County Groundwater Basin

West-flowing Tule River, Deer Creek and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Annual average precipitation is seven to 11 inches, increasing eastward.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. It is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The sediments that comprise the subbasin's aquifer are continental deposits of Tertiary and Quaternary age (Pliocene to Holocene). These deposits include flood-basin deposits, younger alluvium, older alluvium, the Tulare Formation, and continental deposits undifferentiated.

The flood-basin deposits consist of relatively impermeable silt and clay interbedded with some moderately to poorly permeable sand layers that interfinger with the younger alluvium. These deposits are probably not important as a source of water to wells but may yield sufficient supplies for domestic and stock use. The younger alluvium is a complex of interstratified and discontinuous beds of unsorted to fairly well sorted clay, silt, sand, and gravel, comprising the materials beneath the alluvial fans in the valley and stream channels. Where saturated the younger alluvium is very permeable, but this unit is largely unsaturated and probably not important as a source of water to wells. The older alluvium consists of poorly sorted deposits of clay, silt, sand, and gravel. This unit is moderately to highly permeable and is a major source of water to wells. The Tulare Formation consists of poorly sorted deposits of clay, silt, sand, and gravel derived predominately from the Coast Ranges. It contains the Corcoran Clay Member, the major confining bed in the subbasin. The formation is moderately to highly permeable and yields moderate to large quantities of water to wells. The continental deposits undifferentiated consist of poorly sorted lenticular deposits of clay, silt, sand, and gravel derived from the Sierra Nevada. The unit is moderately to highly permeable and is a major source of ground water in the subbasin.

The estimated average specific yield for this subbasin is 9.5 percent. This estimation is based on DWR San Joaquin District internal data and Davis (1959).

Land subsidence of 12 to 16 feet due to deep compaction of fine-grained units has occurred in the subbasin (Ireland 1984).

Restrictive Structures

Groundwater flow is generally westward (DWR 2000). Groundwater elevation contours diverge from the path of the Tule and White Rivers in the north and south portions of the subbasin, respectively, suggesting that these drainages act as losing streams throughout most of their extent. Based on current and historical groundwater elevation maps, horizontal groundwater barriers do not appear to exist in the subbasin.

Recharge Areas

Groundwater recharge is primarily from stream recharge and from deep percolation of applied irrigation water (Hilton and others 1963; DWR 1995).

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased about four feet from 1970 through 2000. The period from 1970 to 1978 showed a general decline, bottoming out at 13 feet below 1970 levels in 1978. There is a steep increase in water levels in the ten-year period from 1978 to 1988, topping out at 20 feet above 1970 water levels in 1988. There is a very sharp decrease in water levels of 34 feet from 1988 to

1995, with the lowest level reached in 1993 at 16 feet below 1970 water levels. From 1995 to 2000, water levels generally increase, eventually reaching four feet above 1970 water levels in 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 14,600,000 af to a depth of 300 feet and 94,100,000 af to the base of fresh groundwater. These same calculations give an estimate of 9,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 33,000,000 af to a depth of $\leq$ 1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

The natural recharge into the subbasin is estimated at 34,400 af. Artificial recharge and subsurface inflow are not determined. There is about 201,000 af of applied water recharge into the subbasin. Annual urban extraction and annual agricultural extraction are estimated to be 19,300 af and 641,000 af, respectively. Other extractions and subsurface outflow are not determined.

Groundwater Quality

Characterization. The water in the northern portion of this subbasin has a calcium bicarbonate type (Croft and Gordon 1968), while the southern portion of the subbasin is better characterized by a water chemistry of a sodium bicarbonate type (Hilton and others 1963). TDS values typically range from 200 to 600 mg/L. TDS values of shallow groundwater in drainage problem areas are as high as 30,000 mg/L (Fujii and Swain 1995). The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 65 wells ranging from 20 to 490 mg/L, with an average value of 256 mg/L

Impairments. There is shallow, saline groundwater in the western portion of the subbasin (Vink 2001). The eastern side of the subbasin has localized nitrate pollution.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	73	0
Radiological	71	3
Nitrates	71	6
Pesticides	73	1
VOCs and SVOCs	71	5
Inorganics – Secondary	73	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)
Municipal/Irrigation	Range: 50 – 3,000
	Total depths (ft)
Domestic	
Municipal/Irrigation	Range: 200 - 1,400

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency	
DWR (incl. Cooperators)	Groundwater levels	459	Semi-annually
Department of Health Services (and cooperators)	Title 22 Water quality	150	Varies

Basin Management

Groundwater management:	None
Water agencies	
Public	Alpaugh I.D., Angiloa W.D., Atwell Island W.D., Delano-Earlimart I.D., Ducor I.D., Kern-Tulare W.D., Lower Tule River I.D., Pixley I.D., Porterville I.D., Rag Gulch W.D., Saucelito I.D., Teapot Dome W.D., Terra Bella I.D., Vandalia I.D.
Private	California Water Service.

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Errata

Changes made to the basin description will be noted here.

ENCLOSURE C

February 6, 2019

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Re: Sustainable Yield Allocation and Related Policy Development in the Tule Subbasin

The undersigned growers collectively farm land in many of the subbasins in the San Joaquin Valley and throughout the state, and have been participating in the GSP development in each respective subbasin. We also have holdings in the Tule Subbasin. The Tule Subbasin GSAs

deserve commendation for their efforts to date in developing GSPs for the subbasin and for working to address difficult issues including allocations and rampdown of pumping. We appreciate proposals in the subbasin to implement gradual reductions of overdraft (i.e. "transitional pumping") where feasible and the institution of water markets as methods to mitigate SGMA's impacts.

The Tule Subbasin is further along in its development of the aforementioned concepts than most other basins/GSAs. Consequently, it is likely to serve as a model for other basins. As such, it is critical that the policy decisions of the Tule GSAs regarding allocation of groundwater rights adhere to applicable legal principles, making it more likely to withstand legal challenge. We recognize that applicable law does not prescribe an exact formula as to how an allocation method must be designed, but we are concerned that the "gross-acre" sustainable yield allocation method (i.e. each acre in the basin receives an equal share of sustainable yield regardless of historical water use or other factors) is inconsistent with the principles set forth in that established law. The "gross acre" approach that has been proposed by the Eastern Tule GSA, and seemingly supported by GSAs throughout the Tule Subbasin, is highly susceptible to legal challenge. Our group feels it is in the best interest of all landowners, large and small, to adhere closely to applicable groundwater law, including existing case law, during the allocation determination process in a best effort to avoid the long and costly process of an adjudication.

Accordingly, we believe that underlying water rights, which are expressly not displaced by SGMA, must inform any method chosen. In a long-overdrafted basin, groundwater rights can be grouped into three categories: developed (foreign and salvaged water), appropriative/ prescriptive, and overlying. Based on review of existing case law, including adjudications in other basins in California, historical use of groundwater should be a significant consideration when developing allocations. Reliance on surface water in lieu of groundwater use may also establish a legal and equitable basis to claim a share of the native groundwater supply. And while we believe there are reasons to afford an allocation to landowners with dormant or unexercised overlying rights (i.e. landowners with little or no groundwater use in recent years), there is a legal case for "subordination" of the priority of such rights, which should be factored into this determination[i]. Lastly, we believe it is important to consider principles of equity to effectuate a fair and reasonable outcome for those who have invested above and beyond the price of land: time and money into enterprise reliant on groundwater.

Because we feel that it is in the best interest of all landowners to avoid an adjudication, we have utilized resources at our own expense to inform the accompanying paper and attachments that summarizes legal principles with which an allocation method should comport. The paper also provides an illustration of an allocation approach that we believe would be consistent with those same legal principles. The approach described in the paper is not intended to be "final," but instead provides a starting point for renewed discussions. We request that you review the paper

and proposal, and urge you to consider further deliberation to find an allocation method that will sustain legal scrutiny.

We, the undersigned recognize the mammoth tasks bestowed upon GSAs. We hope to ease some of the burden of these tasks and are openly offering our employees, consultants and legal counsel time to assist in these efforts at our expense in hopes of avoiding an onerous adjudication.

Thank you,

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[i] It is important to define and distinguish dormant or undeveloped lands from irrigated lands that have had a recent reduction in groundwater use attendant to crop transition or replanting, as those should not be considered dormant. Further, subsequent fallowing for SGMA impact mitigation should not result in subordination or a loss of allocation.

February 6, 2019

Analysis of Allocation Methods

1. Purpose

The Tule Subbasin GSAs should be commended for their efforts to address the difficult subject of groundwater allocations and for its endorsement of transfer markets to foster flexibility and transition in the use of groundwater. The Tule Subbasin GSAs should also be commended for pursuing a transitional pumping system that allows groundwater users to slowly reduce their pumping to sustainable yield over a period of many years, rather than an abrupt curtailment of pumping.

While applicable law does not prescribe an exact formula as to how an allocation model must be designed, the allocation approach proposed by Tule Subbasin GSAs based on gross acres for agricultural Sustainable Yield Allocations (i.e., each acre in the basin receives an equal share of sustainable yield regardless of historical water use or other factors) is potentially legally assailable as both inconsistent with common law water rights and inequitable. SGMA expressly provides that the act does not disturb water rights and that allocations made by a GSA shall not be deemed a determination of water rights. (*See* Water Code Water Code §§ 10720.5, 10726.4(a)(2), 10726.8(b).) If an allocation scheme is objected to by stakeholders, a comprehensive groundwater basin adjudication may ensue (*see* Water Code §§ 830 et seq.). In that case, groundwater rights will be determined by the courts and the GSA allocation scheme will need to comport with the determination. Therefore, it is prudent to seek to structure the allocation scheme consistent with the common law as best as possible in the hopes of dissuading stakeholders from initiating an adjudication, and if an adjudication nonetheless occurs, persuading the court to adopt the scheme as its determination of groundwater rights within the adjudication.

The exact application of common law to groundwater rights in the Tule Basin is not entirely clear, but certain legal principles are applicable, which are discussed below. Relevant factors may include prescriptive pumping by appropriators, "self-help" pumping by overlying landowners, and various equitable considerations that inform allocations among overlying (correlative) rights holders. Historical use of groundwater should be considered. However, various other considerations may also apply, including historical use of imported surface water and landownership. Following this discussion, we outline a conceptual allocation approach that we believe is consistent with common law groundwater principles. This approach is not intended to be "final," but instead provides an alternative for renewed and continued discussions. Our primary objective is to support the development of an allocation methodology that is consistent with SGMA and groundwater law generally.

2. Applicable Legal Principles

a. Overlying (or "Correlative") Rights

Overlying landowners have the right to extract and use groundwater for reasonable and beneficial uses on land owned by them overlying the basin. (*City of Barstow v. Mojave* Water Agency (2000) 23 Cal.4th 1224,1240 ("*Mojave*"); *California Water Service Co. v. Edward Sidebotham & Son* (1964) 224 Cal.App.2d 715, 725.) Overlying rights are a form of "correlative right." Therefore, when groundwater supplies are limited, overlying rights may be curtailed to an amount that is reasonable considering the basin's safe yield and competing demands by other users. One court explained that "the apportionment [of correlative rights] should be measured in the 'manner best calculated to a reasonable result,' and the court may adopt any standard of measurement 'that is reasonable on the facts to secure equality.'" (*Prather v. Hoberg* (1944) 24 Cal.2d 549, 560 [citation omitted]).

Factors that may be applied in allocating limited groundwater supplies among overlying rights holders may include "the amount of water available, the extent of ownership in the basin, the nature of the projected use - if for agriculture, the area sought to be irrigated, the character of the soil, the practicability of irrigation, i.e., the expense thereof, the comparative profit of the different crops which could be made of the water on the land - all these and many other considerations must enter into the solution of the problem." (*Tehachapi-Cummings County Water District v. Armstrong* (1975) 49 Cal.App.3d 992, 1001-1002 ("*Tehachapi-Cummings*").) The gross acreage approach applies a "coarse" standard that does not individually consider these factors.

It also bears noting that all uses of groundwater produced by a landowner for use on overlying land is afforded overlying rights status, whether the use is for agriculture, industry, or otherwise. The ETGSA staff proposal lumps overlying industrial users together with municipal purveyors (appropriators), which is inconsistent with common law treatment of overlying industrial users.

b. Appropriative Rights

Appropriative groundwater rights allow for the appropriation of groundwater for use on non-overlying properties. (*City of Santa Maria v. Adam* (2013) 211 Cal.App.4th 266, 279 ("*Santa Maria*").) In supplying water to the public, public water purveyors act as appropriators even if they provide water service to customers overlying the same basin from which they draw their water supply. (*Town of Antioch v. Williams Irr. Dist.* (1922) 188 Cal. 451, 456; *Santa Maria*, 211 Cal.App.4th at 279.)

Absent a perfection of prescriptive rights (discussed below), overlying rights enjoy seniority over appropriative rights. (*Mojave,* 23 Cal.4th at 1240-1241.) Thus, appropriators, as a group, may only lawfully appropriate groundwater supplies that are surplus to the cumulative demands of the overlying owners receiving groundwater from the same source. (*Id.*; *accord Los Angeles v. San Fernando* (1975) 14 Cal.3d 199, 282-286 ("*San Fernando*").)

c. Safe Yield/Sustainable Yield

Safe yield is the maximum quantity of water which can be withdrawn annually from a groundwater supply under a given set of conditions without causing "undesirable results" arising from the gradual lowering of groundwater levels resulting in eventual depletion of the supply. (*San Fernando*,14 Cal.3d at 278; *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908,

929 ("*Pasadena*").) The judicial use of the term, "safe yield," has been complimented by SGMA's use of the term "sustainable yield," which is defined similarly to the definition of safe yield in the case law. (Water Code § 10721(w).) SGMA incorporates the term, "undesirable results," from case law and defines sustainable yield in relation to avoiding six undesirable results specified in the law. (Water Code § 10721(x)).

d. Prescription

When a basin's safe yield is exceeded, groundwater overdraft begins. (*Pasadena*, 33 Cal.2d at 936-937.) The overdraft establishes adversity for purposes of the appropriators perfecting prescriptive groundwater rights. (*San Fernando*, 14 Cal.3d at 284.) If the overdraft is notorious and continues for a period of at least five years, without objection by the overlying landowners, appropriators can prescribe rights from the overlying landowners. (*Id.*)

Under Civil Code section 1007, neither private parties nor public entities can obtain prescriptive rights against public utilities, municipalities or other public entities. Accordingly, private pumpers can only obtain prescriptive rights against other private pumpers. Although public pumpers cannot lose water rights by prescription, their acquisition of prescriptive groundwater rights is limited by "self-help," which is defined as groundwater pumping by the overlying owners during the prescriptive period. (*San Fernando*, 14 Cal.3d. at 293, f.n. 101; *City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 298 ["Landowners may limit prescriptive rights by showing that although they had not sought an injunction during the prescriptive period they exercised self-help by continuing to pump during that time"]; *Hi-Desert County Water Dist. v. Blue Skies Country Club, Inc.* (1994) 23 Cal.App.4th 1723, 1736 ("*High Desert*".)

The prescriptive period may be any period during which overdraft occurred and which the appropriator can demonstrate continuous, open, and notorious pumping (hereafter, the "Prescriptive Pumping Period." However, in basins for which a groundwater sustainability plan must be developed under SGMA, the Prescriptive Pumping Period cannot extend beyond January 1, 2015, which SGMA established as a cut-off date for establishing or defending against claims of prescription. (Water Code § 10720.5(a).)

e. Subordination

In the case *In re Water of Long Valley Stream System* (1979) 25 Cal.3d 339, 355, 357-359 ("*Long Valley*"), the California Supreme Court approved the State Water Resources Control Board's "subordination" of the dormant riparian rights in the surface water context. Accordingly, the priority of dormant overlying rights was subordinated in priority to existing overlying *and appropriative* users. To date, although overlying rights to groundwater are analogous to riparian rights to surface water, the courts have not applied the same principle to subordinate dormant overlying rights (*Wright v. Goleta Water District* 174 Cal.App.3d 74, 87-89 (1985)). However, as part of the recent groundwater basin adjudication reform law, the legislature explicitly permits the court to apply the principles set forth in *Long Valley* within a comprehensive groundwater basin adjudication (Code Civ. Proc. § 830(b)(7)). Moreover, the California Supreme Court explained in its *Mojave* opinion that the subordination principle applied in *Long Valley* may need

to be applied in the future to subordinate dormant overlying rights "to harmonize groundwater shortages with a fair allocation of future use." (*Mojave*, 23 Cal.4th at 1249, n 13).[1]

f. Developed Water (Foreign and Salvaged Water)

Water imported from outside the watershed (foreign water) or water that is captured, which would have been otherwise lost to the subbasin, and which is recharged into the groundwater basin (salvaged water) should be granted to the party responsible for introducing that "developed" water into the basin. (*San Fernando*, 14 Cal.3d at 261; *Santa Maria,* 211 Cal.App.4th at 305.)

g. Equity

Provided that a court does not ignore water rights priorities, in water cases, a court is acting in equity and has broad authority to effectuate a fair and reasonable outcome. *Mojave*, 23 Cal.4th at 1249-50; *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.* (1935) 3 Cal.2d 489, 574. Thus, in setting allocations in future groundwater adjudications, courts will likely seek to achieve equitable outcomes.

Equitable considerations are relevant to an assessment of the gross acreage approach to allocations. The gross acreage approach effectively denies certain allocation to those that have invested in property development/plantings and groundwater infrastructure (i.e., investment-backed reliance and expectations) so that the allocation can be granted to dormant overlying rights holders with no such reliance. In many circumstances, the land is dormant because it is not optimal for planting (e.g., topography, poorly producing wells, soil type) and as a result the dormant rights landowner is likely to simply sell the allocation back to those in need (i.e., the overlying users that received less allocation in order to allow allocation to the dormants). It may therefore be argued that the approach results in an inequitable financial windfall to dormant landowners at the expense of active overlying users.

3. Division of Native Safe Yield (Sustainable Yield Allocations)

As stated above, GSP allocations should be constructed to reflect applicable legal and equitable considerations. In doing so, the first step should be to identify and segregate any yield attributable to developed water from the total safe yield. As noted above, the developed water must be allocated to the parties responsible for introducing the developed water into the basin. (*San Fernando*, 14 Cal.3d at 261; *Santa Maria,* 211 Cal.App.4th at 305.) The remaining safe yield is the "native safe yield."

The native safe yield (NSY) should then be divided among basin stakeholders (i.e., "Sustainable Yield Allocations"). The stakeholders include appropriators/prescriptors (e.g., municipal water

[1] Dormant overlying rights are groundwater rights appurtenant to overlying property that have not been exercised in recent years. Dormant or undeveloped lands that have had a recent reduction in groundwater use attendant to crop transition or replanting should not be considered dormant. Further, subsequent fallowing for SGMA impact mitigation should not result in subordination or a loss of allocation.

purveyors and any exporters of groundwater from the basin) and landowners. Among the landowners, there are:

- landowners that may advance a claim based on self-help pumping,
- landowners with existing/historical reliance on groundwater,
- landowners with existing/historical reliance on surface water, and
- landowners with dormant lands that are not presently irrigated.

A landowner may, of course, be simultaneously situated in several of these categories (e.g., a self-help pumper and reliant on groundwater and surface water). However, for purposes of application of pertinent legal and equitable principles to the allocation methodology, it is helpful to compartmentalize landowners into each of these categories even if an individual landowner is situated in, and receives allocation from, multiple categories.

a. Allocations Pursuant to Prescriptive and Self-Help Pumping

In a basin like the Tule subbasin, where overdraft has persisted for many years, appropriators would likely be awarded prescriptive rights. (*San Fernando*, 14 Cal.3d at 283-284.) However, the doctrine of prescription should only apply to the portion of production within the basin made by appropriators (i.e., the total amount of prescriptive pumping).[2] Of this amount, a portion has been protected from prescription due to "self-help" pumping by landowners. (*City of Santa Maria,* 211 Cal.App.4th at 298.) Arguably, the portion of the safe yield subject to potential prescription, but protected from prescription by self-help pumping, should be allocated to the landowners engaged in pumping during the Prescriptive Pumping Period whose pumping is responsible for the self-help.

Each appropriative/prescriptive pumper should be allocated a Sustainable Yield Allocation resulting from the prescriptor's pumping during the Prescriptive Pumping Period reduced by the self-help pumping by overlying landowners during the prescriptive period. Caselaw has not set forth a precise formula for dividing groundwater rights between prescriptive and self-help pumping. The *San Fernando* opinion also raised certain factually-dependent criticism of "mechanically" allocating prescriptive rights proportionally to the amounts used during the Prescriptive Pumping Period. (14 Cal.3d. at 265-266.) However, the following principles likely apply:

- Prescriptive rights can be no greater that the amount of continuous appropriative pumping during the prescriptive period.
- The prescriptive right must be reduced in some quantity reflecting the protection of overlying rights through self-help pumping by overlying landowners during the prescriptive period.
- Where the amount of appropriative pumping is *less* than the amount of the native safe-yield, arguably the following would apply:
    - An allocation in the amount of the appropriative/prescriptive pumping should be divided equally between appropriative/prescriptive pumping, as a group, and overlying self-help pumping, as a group, with each group receiving half of the

[2] In a basin like Tule, in which the vast majority of pumping is for agriculture, and a minor portion is used for appropriative uses (e.g., municipal water service), the allocations made to prescriptors will also be only a minor portion of the native safe yield. The remainder of the native safe yield will need to be allocated to landowners pursuant to principles applicable to overlying rights.

combined allocation. Within each of the two groups (appropriative/prescriptive pumpers and overlying/self-help pumpers), the award should be divided proportional to each pumper's production during the prescriptive period in comparison to the total pumping by the group during the prescriptive period.

- The residual amount of native safe-yield (i.e., after deducting the portion allocated pursuant to prescriptive/self-help pumping) should be allocated pursuant to the overlying (correlative) rights doctrine, as discussed in the next section.

- Where the amount of appropriative/prescriptive pumping is *greater* than the amount of the native safe-yield (not the circumstance in the Tule subbasin or other San Joaquin subbasins), the division of allocation should be determined largely, if not exclusively, on the basis of proportional appropriative/prescriptive pumping and overlying/self-help pumping.

The attached spreadsheet illustrates allocations based on prescription, self-help, and correlative rights as presented in various scenarios. This illustration is independent from any particular equitable principles that may (likely will) apply.

We note that the Sustainable Yield Allocations granted to the appropriator/prescriptors in our conceptual approach is similar to the municipal and industrial pool proposed in the ETGSA staff recommendation with two significant departures: (1) it uses common law principles to establish the Sustainable Yield Allocation to appropriator/prescriptors; and (2) industrial pumpers of groundwater for use on overlying lands would be treated as overlying landowners

b. Allocations Pursuant to Existing/Historical Use (Groundwater and Surface Water)

The portion of the safe yield not allocated pursuant to the prescription doctrine, should be allocated pursuant to the laws applicable to the division of available groundwater among overlying landowners. Unfortunately, there is ambiguity in this area of the law. One appellate court held that as between overlying landowners, overlying rights are not predicated on past use and the doctrine of prescription does not apply to afford prescriptive rights to be developed between and among overlying owners because the nature of overlying rights is correlative, and thus under the court's reasoning, pumping by any one overlying landowner is not superior nor adverse to another overlying landowner's groundwater rights regardless of overdraft conditions. (*Tehachapi-Cummings,* 49 Cal.App.3d at 1001-1002.) Rather, the court held that a series of considerations must be made, as noted above.

However, historical use of water—both groundwater and surface water—should be relevant to the allocation of groundwater supplies for the following reasons:

- Between existing overlying users and dormant lands, there is a case for subordination of the overlying groundwater pursuant to Code of Civil Procedure section 830(b)(7) and the case law discussed above; and
- Equitable arguments for protecting uses that are supported by investment-backed reliance and expectations.[3]

[3] *See also e.g.,* Restatement (Second) of Torts § 850A (listing "the protection of existing values" as one of the criteria to be applied in evaluating the reasonableness of allocations of water among claimants of riparian

Historical/existing overlying uses supported by groundwater possess a strong equitable claim to Sustainable Yield Allocation. Additionally, historical/existing water use on overlying lands supported by surface water possess a claim to the Sustainable Yield Allocation as well. The basis of such claim may be legal in relation to "cessation of use" (*see* Water Code § 1005.1) and/or equitable, citing their "voluntary" avoidance of groundwater use based on their use of surface water and the economic investments made to enable the beneficial use of surface water. Our proposed allocation approach suggests splitting the Sustainable Yield Allocations in an equitable manner between groundwater and surface water users.

c. The Dormant Lands Set-Aside Pool

With respect to lands that are not presently irrigated (or using groundwater for industrial or other overlying purposes), the doctrines of prescription and subordination may be employed to substantially constrain, if not fully eliminate, future rights to pump groundwater absent a future transfer of right to such lands. (Code of Civ. Proc. § 830(b)(7); *San Fernando*, 14 Cal.3d at 283-284; *Mojave*, 23 Cal.4th at 1249, n 13.) However, section 830(b)(7) of the Code of Civil Procedure provides that a court hearing a comprehensive basin adjudication *may* consider applying the principles established in *Long Valley* (i.e., subordination); it does not provide that the court *must* do so. This fact, together with the inherent notion of overlying rights as correlative in nature and not dependent on historical use, plus general equitable principles, afford reason to provide some amount of access to the basin's native safe yield to dormant landowners.

Our conceptual allocation proposal outline below suggests use of a dormant lands set-aside pool pursuant to which owners of dormant lands could apply for a conditional grant of Sustainable Yield Allocation from the set aside pool, which if granted must be used beneficially and continuously on the overlying property for a minimum period of years (e.g., 10) before the Sustainable Yield Allocation were deemed vested and transferable. These provisions would ensure that Sustainable Yield Allocations from the dormant set-aside pool are only used by those intending actual overlying use of their dormant land for a substantial period. Other appropriate terms, including a period for submission of applications, a maximum allocation grant per acre, etc. might also be considered.

4. Proposed Allocation Approach

In consideration of applicable the legal and equitable principles discussed above, we propose the following conceptual allocation approach as a basis of further discussion.

- Groundwater attributable to foreign and salvaged water would be granted to the party responsible for bringing the water into the basin. The remaining native safe yield would then be allocated between urban/municipal users and landowners as described below. *Basis: The parties responsible for developed water in the basin are entitled to the augmented recoverable yield.*

[correlative] rights, which are analogous to overlying groundwater rights); *Williams v. Rankin* (1966) 245 Cal.App.2d 803 (awarding a greater proportion of a stream among competing riparians based on the extent of irrigation, installation of irrigation infrastructure, and actual use of water).

- Determine how much was pumped by appropriators/prescriptors (principally urban users) continuously without interruption over a five-year Prescriptive Pumping Period. *Basis: Assuming there is a strong case for prescriptive rights in the subbasin, the portion of the native safe yield subject to prescriptive/self-help pumping should be defined and segregated from the remainder of the native safe-yield.*
    - Suggest that the 5-year Prescriptive Pumping Period might be 2010 through 2014 to reflect (i) the SGMA provision that provides that January 1, 2015 is the cut-off date for establishing or defending against prescription (Water Code § 10720.5(a).) and (ii) the groundwater pumping that occurred under severe drought conditions during those years. Earlier five-year Prescriptive Pumping Periods should be considered if stakeholders desire.
    - Prescriptive pumping amount would be the average pumping during the Prescriptive Pumping Period. Note, the law is not clear whether average or lowest annual prescriptive pumping would be used; rather the law refers to "continuous" prescriptive pumping throughout the five year Prescriptive Pumping Period.
- As a group, the appropriative/prescriptive pumpers would receive a Sustainable Yield Allocation that is equal to half of the amount of the combined continuous prescriptive pumping during the Prescriptive Pumping Period. Each appropriator would receive an individual Sustainable Yield Allocation (a portion of the group award) proportional to the amount of their continuous prescriptive pumping during the Prescriptive Pumping Period compared to the combined appropriative/prescriptive pumping during the Prescriptive Pumping Period.
- As a group, the overlying landowner/self-help pumpers would receive a Sustainable Yield Allocation that is equal to half of the amount of the combined continuous prescriptive pumping during the Prescriptive Pumping Period. Each overlying landowner/self-help pumper would receive an individual Sustainable Yield Allocation (a portion of the group award) proportional to the amount of their continuous overlying/self-help pumping during the Prescriptive Pumping Period compared to the combined overlying/self-help pumping during the Prescriptive Pumping Period..
- The remainder of the native safe yield after deducting the amount allocated to prescriptors and self-help pumpers would be "Landowner NSY" to be divided among landowners per below.
- Landowner NSY would be allocated as follows:
    - __% of Landowner NSY would be allocated to existing/historical users,[4] groundwater users and surface water users (as of [designated date]). *Basis: The vast majority of the Landowner NSY should be allocated among existing overlying users to reflect both the potential legal claims of subordination and the equitable considerations noted above concerning avoiding a windfall to dormant landowners at the expense of those that have made investment-backed reliance and expectations upon the groundwater supply.*
    - __% of Landowner NSY would be set aside in a pool for dormant users (allocated based on application for allocation and actual beneficial use for a designated period [e.g., 10 years continuous]). *Basis: A small portion of the Landowner NSY*

[4] We use the term "existing/historical users" to reflect that both existing and historical use may be relevant. For example, existing use of water on overlying lands may be an initial requirement to qualify for allocation under this category, with the quantity of allocation determined by average use during a designated base period.

should be set aside for use by presently dormant landowners that desire to initiate some irrigation of their property in the future without having to purchase allocation from others. Although these users face potential subordination claims, an equitable compromise should afford them some opportunity. The provisions requiring an application for grant of allocation and minimum continual use ensure that the allocations from the dormant set-aside pool are only used by those intending actual irrigation.

- Of the __% of Landowner NSY allocated to existing/historical users (i.e., the amount of the Landowner NSY after deducting the amount allocated to the dormant set-aside pool), __% would be allocated to groundwater users (divided proportionally based on the average use of groundwater during a base period from [beginning year – end year]) and __% would be allocated to surface water users (divided proportionally based on the average use of surface water during a base period from [beginning year – end year]). *Basis: A share of this amount should be allocated to existing/historical groundwater producers that have relied on the groundwater supply. Additionally, landowners using surface water may advance cessation of use and equitable claims based upon use of surface water in lieu of groundwater. Accordingly, landowners using surface water should be awarded a share of the Landowner NSY as well.*

- Transitional pumping (all allowed pumping in excess of the cumulative native safe yield) will be allocated to historical groundwater producers (consistent with the previous paragraph) in proportion to their average groundwater production during a base period from [beginning year – end year] pursuant to an option and payment system. The payments would raise revenue to fund projects to mitigate undesirable results. If transitional pumping allocations are not acquired by exercise of option/payment by historical groundwater producers by [end date], the remainder would be made available to all landowners on a first-come, first-served basis.
- Transitional pumping volumes would be ramped down to native safe yield over 20 years in the following five-year increments:
  - 2020-2024: 100%
  - 2025-2029: 75%
  - 2030-2034: 50%
  - 2035-2039: 25%
  - 2040- 0%

The conceptual approach outlined above is solely intended to stimulate discussion toward an allocation approach that reflects applicable legal and equitable principles. We recognize that there is ample ambiguity in the law and different stakeholders will have different views of what is equitable. Therefore, an appropriate and acceptable approach for allocations in the Tule Subbasin GSAs will require negotiation and compromise. As such, the approach would surely evolve to include additional provisions. Our goal is simply to illustrate that the gross acreage approach does not comport with relevant legal and equitable principles and that there are reasonable alternative approaches. We respectfully urge the Tule Subbasin GSAs to open a broader discussion that addresses the considerations discussed above.

Klein · DeNatale · Goldner
ATTORNEYS AT LAW

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December 16, 2019

VIA E-MAIL AND U.S. MAIL

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave.
Porterville, CA 93257
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

We are counsel for Eastern Tule White Area Growers, Inc. (ETWAG), and submit this comment letter on behalf of ETWAG. ETWAG appreciates the opportunity that Eastern Tule Groundwater Sustainability Agency (GSA) has provided for stakeholders to comment on the GSA's draft Groundwater Sustainability Plan (GSP). We understand and appreciate the efforts undertaken by the GSA and your consultants to reach this point. Our hope in submitting these comments is that the GSA will appropriately modify the draft GSP to address our concerns and those of our members.

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the draft GSP. In addition to those comments, we add the following.

A primary concern of our members is the apparent conclusion that the GSA will allocate groundwater according to gross acreage owned by landowners within the GSA. This is consistent with the GSA discussions in which we have been allowed to participate. Indeed, the draft Coordination Agreement dated September 16, 2019, uses the gross acreage method after dismissing historical use. Put simply, we disagree with your approach in both substance and process.

A gross acreage methodology ignores accepted legal principles and equitable considerations governing the allocation of native yield. We fear that the GSA is sacrificing fairness and the law for the sake of convenience. Historical use of groundwater and investment based on that productive use of the resource must be considered in the allocation methodology. ETWAG has previously provided the GSA with our position on this issue, which has not changed.

ETWAG also disagrees with the process by which the GSA is handling this critical issue of water rights. The draft Coordination Agreement notes that historic use of groundwater might be considered in the future. If the GSA recognizes now that historic use should be an element in the allocation of native yield, then the process should include that element. The GSA should not rush the process simply because the GSA wants the issue settled now. Further discussion and stakeholder involvement on this issue could avoid unnecessary legal challenges. We urge the GSA to allow for more stakeholder engagement and, if necessary, dispute resolution before reaching its conclusion as to how native yield should be allocated.

We are encouraged that the draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits. Such a market system should be as flexible as possible to facilitate the needs of farmers with lands in different areas of the sub-basin. We ask that the GSA fully engage stakeholders who will be participating in a market as the GSA develops this groundwater management tool.

The GSA and its stakeholders have reached a significant milestone in completing a draft GSP and, in short order, submitting a final GSP to the Department of Water Resources. But as the GSA is aware and notes throughout the draft GSP, there is much work to be done in the implementation of the GSP. We urge the GSA to continue with active engagement of the stakeholders. The GSP is a planning document. Implementation will require collaboration, among other things, and ETWAG anticipates working closely with the GSA in that process.

Please feel free to contact us if you have any questions or wish to discuss any of our comments as you finalize the GSP.

Very truly yours,

Joseph D. Hughes

JDH:sbh

Enclosure

MEMORANDUM

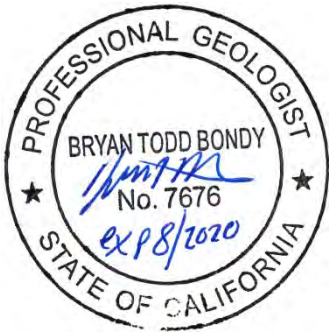
To: Eastern Tule White Area Growers, Inc.

From: Bryan Bondy, P.G., CHG / Bondy Groundwater Consulting, Inc.

CC: Project File

Date: December 13, 2019

Re: Evaluation of Eastern Tule Subbasin Draft Groundwater Sustainability Plan



Introduction

Eastern Tule White Area Growers, Inc. (ETWAG) retained Bondy Groundwater Consulting, Inc. (BGC) to review the September 2019 Draft Groundwater Sustainability Plan (GSP) for the Eastern Tule Subbasin prepared by the Eastern Tule Groundwater Sustainability Agency (ETGSA). This memorandum presents the results of BGC's evaluation, which are organized by GSP section.

Please note that the GSP review was focused on technical aspects of the GSP and it is understood that my firm's familiarity with the Tule Subbasin and time available for review were both limited. Furthermore, it is important to note that much of the GSP is based on groundwater modeling that is not yet documented in a publically available report; therefore, much of technical basis for the GSP cannot be reviewed at this time. Based on the foregoing, this review should not be considered exhaustive. Lack of comments on any particular section, issue, or topic should not be considered agreement with the associated content.

Overarching Comment

Much of the technical foundation of the GSP is provided by the groundwater flow model and simulations of future conditions made using the model. The groundwater flow model and the specifics of the modeling runs used to develop the projected future water budget, sustainable yield, sustainable management criteria (measureable objectives, interim milestones, and minimum thresholds) are not documented in a publically available report. Therefore, much of technical basis for the GSP cannot be reviewed at this time, which is obviously problematic for stakeholders who desire a review of the technical basis for the key aspects of the GSP.

Section 1 – Introduction

Comment 1-1: Executive Summary: The executive summary could do a better job of providing a more informative summary of the plan, including key groundwater conditions in the basin, undesirable results, and what actions will be taken to address undesirable results. Suggest providing more information.

Comment 1-2: Executive Summary: Statement that "…overdraft conditions have caused issues for those reliant on groundwater pumping…" is vague. What are the issues and are they considered significant and unreasonable?

Comment 1-3: Executive Summary: Description of the sustainability goal differs from that provided in Section 5.2.

Section 2 – Agency Information

Section not reviewed.

Section 3 – Description of Plan Area

Comment 3-1: Section 3.6 - Management Areas within ETGSA: The purposes of the six management areas listed in this section are vague. More information is need to understand how and why management might differ in the various management areas.

Comment 3-2: Figure 3-6 - Management Areas within the ETGSA: The "Friant-Kern Canal Subsidence Management Area" listed in Section 3.6 is not depicted on Figure 3-6, map of management areas within ETGSA.

Section 4 – Basin Setting

Comment 4-1: GSP Section 4.2.2 and Tule Subbasin Setting Section 2.1.3 Lateral Basin Boundaries: These sections state that 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." These sections should be revised to note that the southernmost portion of the eastern boundary near White River is the contact between the older sedimentary rocks and alluvial sediments.

Comment 4-2: GSP Section 4.2.3 and Tule Subbasin Setting Section 2.1.4 Bottom of Basin: These sections define the basin bottom as the contact between the Santa Margarita Formation (GSP) or Tertiary deposits (Tule Subbasin Setting) and granitic bedrock. The definitions differ between Section 4.2.3 and the Tule Subbasin Setting and should be reconciled. More importantly, the basin bottom definitions are inconsistent with the lateral basin boundary and SGMA.

The basin bottom definitions are inconsistent with the lateral basin boundary because neither the Santa Margarita Formation (GSP) or Tertiary deposits are included in the lateral basin boundary where they outcrop in the southeastern portion of the basin (See Figure 2-4 of the Tule Subbasin Setting). In other words, how can these units be included in the basin vertically, but not laterally?

SGMA defines "Basin" as a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Chapter 3 (commencing with Section 10722). DWR's Bulletin 118 defines the basin as the Pliocene to Holocene continental deposits, including flood-basin deposits, younger alluvium, older alluvium, Tulare Formation, and undifferentiated continental deposits (Attachment A). The 2016 basin boundary modification was jurisdiction in nature and, therefore, did not modify the 2004 DWR description of the basin bottom.

Based on the foregoing, it appears the bottom of the GSP should define the basin bottom as the base of the oldest unit described by DWR (2004), i.e. the Tulare Formation. This is important because the basin bottom defines which hydrostratigraphic units are subject to regulation by the GSAs.

Comment 4-3: Tule Subbasin Setting Section – Figure 2-4: Cross Sections C-C', D-D', and E-E' depicted on Figure 2-4 are not provided in the document. In particular, including Cross Section C-C would presumably help illustrate the points made in early comments about the basin boundary.

Comment 4-4: GSP Section 4.2.6 and Tule Subbasin Setting Section 2.1.7.1 – Principal Aquifers and Aquitards: These sections identify the Pliocene Marine Deposits, Santa Margarita Formation, and Olcese Formation as principal aquifers within the basin. As pursuant to earlier comments, these units should not be listed as principal aquifers because they are not part of the basin.

Comment 4-5: GSP Section 4.2.6.2 and Tule Subbasin Setting Section 2.1.7.2 –Aquifer Physical Properties: The Tule Subbasin Setting should describe and show (on Tule Subbasin Setting Figures 2-10 through 2-13) the spatial distribution of textural data used to estimate hydraulic conductivity and storage properties. Any significant gaps should be identified and discussed, particularly in key areas, such as for the lower aquifer in subsidence areas, both in this section and Tule Subbasin Setting Section 2.1.8 – Uncertainty in the Hydrogeologic Conceptual Model.

Comment 4-6: GSP Section 4.3.6 and Tule Subbasin Setting Section 2.2.6 – Interconnected Surface Water Systems: Both sections conclude that there are no interconnected surface water systems in the basin. While this appears to be a potentially reasonable conclusion, the GSP does not provide the necessary technical justification for eliminating this sustainability indicator. DWR will be looking for such justification during its review of the GSP. This justification should be included in the GSP to prevent DWR from finding the GSP inadequate and so that further consideration of this sustainability indicator will not be required.

The discussion and analysis of percolating groundwater and subterranean streams included in GSP Section 4.3.6 is a separate issue from whether there are interconnected surface water systems within the basin. That discussion does not provide the justification needed for concluding there are no interconnected surface water systems in the basin. Instead, the technical justification should demonstrate that surface water is not hydraulically connected by a continuous saturated zone to the underlying aquifer and that the overlying surface water is not completely depleted at any location and time throughout the year, since 2015 and going forward. Specifically, the analysis should address the easternmost reaches of Tule River, Deer Creek, and White River where shallow groundwater depths are indicated in January 2015 (Tule Subbasin Setting Figure 2-26).

Comment 4-7: GSP Section 4.3.7 and Tule Subbasin Setting Section 2.2.7 – Groundwater Dependent Ecosystems: The GSP is not clear regrading whether groundwater dependent ecosystems are present in the basin, as required by the GSP Emergency Regulations. While groundwater dependent ecosystems do not appear to be a principal issue for the basin, the current level of characterization may be noted as a plan deficiency by DWR.

Comment 4-8: GSP Section 4.4.1 and Tule Subbasin Setting Section 2.3.1 – Surface Water Budget: The GSP and Tule Subbasin Setting state that the difference between estimated surface water inflows and outflows is 0.2 percent. This implies a greater level of accuracy for the surface water flows than actually exists. It is commonly known that there is considerable error in measuring/estimate inflow and outflow terms, ranging from a minimum of approximately 5%

for metered flows to 30+% for unmetered (estimated) flows. The uncertainty in the water balance terms should be estimated, reported in the GSP, and considered in a modeling sensitivity analysis to determine the impact on model calibration and sustainable yield estimation.

Comment 4-9: GSP Section 4.4.2.6 and Tule Subbasin Setting Section 2.3.2.6 – Sustainable Yield: The process for determining the sustainable yield is not documented sufficiently to critically evaluate. Specifically, the sustainable yield was developed using a groundwater flow model and simulations that are not documented in the draft GSP or other publically available report.

Groundwater inflow and outflow is a major consideration for determining the sustainable yield. Under historical conditions, the net inflow to the subbasin was estimated to be 53,000 acre-feet per year (118,000 acre-feet of inflow and 65,000 acre-feet of outflow). Under simulated future conditions, the net inflow to the subbasin from the model results is negative (-)34,000 acre-feet per year (54,000 acre-feet of inflow and 88,000 acre-feet of outflow). In other words, the model is predicting a 87,000 acre-feet per year decrease in net inflow to the basin under future conditions. Based on the information presented in the GSP, it appears that the reason for this is that the modeling does not consider groundwater level increases in neighboring subbasins that should be expected to occur as a result of SGMA implementation. In short, the modeling appears to significantly underestimate future net groundwater inflow to the subbasin. This is a material consideration given the magnitude of the difference between estimated historical versus simulated future net groundwater inflows. Given that the swing in net groundwater inflow is more than half of the sustainable yield, further evaluation of this aspect is certainly warranted.

The other consideration for groundwater outflow is the source of water. The Tule Subbasin Setting treats all groundwater inflows and outflows as native water for the purpose of estimating sustainable yield. In reality, groundwater flowing into or out of the subbasin is likely a mixture of native and non-native water, particularly for the upper aquifer. Likewise, recharge of imported water may displace native water out of the subbasin. It may be appropriate to treat groundwater inflows the same as native water when estimating the sustainable yield because that water was not imported into the basin by specific entities in the subbasin like imported surface water supplies are. However, more thought should be given to the treatment of groundwater outflows. In essence, the approach used in the Tule Subbasin Setting assumes that all groundwater flowing out of the basin is derived from native sources. Certainly some groundwater outflow is derived from recharge of imported sources and should probably not be included in the calculation of sustainable yield just like groundwater recharge and return flows

derived from imported sources of are excluded from the calculation. Consistent treatment of imported water is needed for an equitable assessment of the sustainable yield.

Lastly, the sustainable yield does not appear to be optimized and may be lower than it needs to be to prevent undesirable results. This is suggested by model simulated groundwater levels presented in the Tule Subbasin Setting appendices that show continuously rising groundwater levels after approximately 2030 in some areas of the subbasins (most notably many of the representative monitoring wells in ETGSA) versus other areas where groundwater levels are predicted to stabilize. This is likely the result of simulating a uniform application of sustainable yield across the subbasin. In other words, some areas could probably stand to pump more than allowed by a uniform distribution of sustainable yield without causing undesirable results. Differential pumping reductions could be considered to increase the overall yield of the subbasin. Financial incentives and/or projects to transfer water within the subbasin could be considered to address any inequities created by imposing differential pumping reductions.

Comment 4-10: GSP Section 4.5 - Management Areas: These sections describe five management areas, whereas six are described in Section 3.6 of the plan. The number of management areas needs to be clarified throughout the GSP.

The "Friant-Kern Canal Subsidence Management Area" is not discussed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4, but is listed in GSP Section 3.6. The GSP should clarify whether "Friant-Kern Canal Subsidence Management Area" is truly a management area, or simply a monitoring area as described in the Tule Subbasin Setting, page 45.

The purposes of the management areas listed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4 are vague. More information is need to understand how and why management might differ in the various management areas.

Section 5 – Sustainable Management Criteria

Comment 5-1: The process for establishing measureable objectives and minimum thresholds for groundwater levels, groundwater storage, and land subsidence appears arbitrary and may not necessarily be designed to prevent undesirable results. As I understand the process, the groundwater flow model was run with future hydrology assumptions and assumed projects and management actions. The predicted groundwater levels (adjusted in some cases) and predicted land subsidence were then selected at 2025, 2030, and 2035 as the interim milestones and 2040 as the measureable objectives. The minimum threshold was then selected by subtracting measured groundwater level declines and subsidence during the recent 10-year

drought (2007-2016) from the measureable objective. In the case of the Friant-Kern Canal area, the deduction was limited to 3 feet, without explanation or justification. The process described in the GSP is backwards from what SGMA requires, which is to establish minimum thresholds based on metrics that prevent undesirable results and the establish measureable objectives and interim milestones that provide operational flexibility (essentially a safety factor so that the minimum thresholds are not exceeded).

In short, there is no nexus presented between the minimum thresholds and preventing undesirable results. For groundwater levels and storage, minimum thresholds in the upper aquifer may be unnecessarily high in many cases for preventing the undesirable result, which the coordinate agreements states is "a new productive well cannot be constructed". In the lower aquifer, the minimum threshold levels are below the top of screen in some wells, which potentially indicates conversion of the lower aquifer from confined to unconfined conditions that could have significant impacts on well performance and lifespan. For subsidence, the minimum thresholds are not linked in any way to the coordination agreement definition of undesirable results, which is "loss of a functionality of a structure or a facility to the point that, due to subsidence, the structure or facility cannot reasonably operate without either significant repair or replacement." The section does not provide any information to assess whether the subsidence minimum thresholds will prevent undesirable results or whether they are overly restrictive.

Perhaps there is more to the sustainable management criteria analysis that is not being described in this GSP section; nonetheless, the current sustainable management criteria discussion does not appear to meet the requirements of the GSP Emergency Regulations.

Comment 5-2: Tables 5-4 and 5-5 (IM, MO, and MTs for groundwater storage) are blank.

Section 6 – Monitoring Network

Section not reviewed.

Section 7 – Projects and Management Actions

Comment 7-1: Many good project concepts are presented in this section, most of which appear to lack specific plans of funding, which is to be expected at this stage. However, two concerns are noted. First, the GSP assumes that most of the projects will be developed and implemented by member agencies. This may create a significant challenge given that much of the GSA is comprised of white areas that do not have a district to lead the develop and implementation of

project(s). Perhaps the County would fill this role, but the GSP does not address this potentially significant issue. The other concern is the lack of projects specifically targeted to address key undesirable results, such as subsidence along the Friant-Kern Canal.

Because it is anticipated that competition for funding from GSA fees and competitive grants will be high, allocating limited available funds will likely be one of the most significant challenges faced by ETGSA and its partner GSAs within the subbasin and a will likely be a source of conflict. It is recommended that the ETGSA begin working internally and with the other subbasin GSAs to develop a process for screening and ranking projects for funding. This process should start immediately in anticipation of future rounds of Prop 1 funding for GSP implementation. The screening and ranking process should be heavily weighted toward projects that have the greatest impact on preventing undesirable results at the lowest cost. Projects that provided water supply benefits, but do not contribute significantly to preventing undesirable results should rank lower. Projects that screen high should be moved as quickly as possible into feasibility evaluation and design to maximize the potential for funding when grant opportunities present themselves.

Section 8 – Notices and Communications

Section not reviewed.

Section 9 – References and Technical Studies

Comment 9-1: Documentation of the groundwater model development, calibration, sensitivity analysis, and predictive simulations for the GSP should be provided.

Limitations

This memorandum was prepared by Bondy Groundwater Consulting, Inc. (BGC) for Eastern Tule White Area Growers, Inc. BGC has employed accepted geologic and hydrogeologic procedures and its opinions are made in accordance with generally accepted principles and practices of these professions. The analyses, conclusions, and recommendations contained in this memorandum reflect BGC's best judgment in light of the information readily available to BGC at the time of preparation, experience with similar projects, and project scope, schedule, and budget. All locations depicted and/or described in the memorandum are approximate and are provided as general information only. Interpretations, location descriptions, location depictions, conclusions, and other information presented in this memorandum should not be relied upon to site or design wells or any other infrastructure without field confirmation of assumptions and estimates made in this memorandum. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this memorandum.

Closing

Please contact me if you have any questions regarding this memorandum. The opportunity to assist Eastern Tule White Area Growers, Inc. is greatly appreciated.

BONDY
Groundwater Consulting, Inc.

Attachment A

San Joaquin Valley Groundwater Basin
Tule Subbasin

- Groundwater Basin Number: 5-22.13
- County: Tulare
- Surface Area: 467,000 acres (733 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Tule Groundwater Subbasin is generally bounded on the west by the Tulare County line, excluding those portions of the Tulare Lake Subbasin Water Storage District and Sections 29 and 30 of Township 23 South, Range 23 East, that area west of the Homeland Canal. This boundary is shared with the Tulare Lake Groundwater Subbasin. The northern boundary of the subbasin follows the northern boundaries of Lower Tule Irrigation District and Porterville Irrigation District and is shared with the Kaweah Groundwater Subbasin. The eastern boundary is at the edge of the alluvium and crystalline bedrock of the Sierra Nevada foothills, and the southern boundary is the Tulare-Kern County line and is shared with the Kern County Groundwater Basin

West-flowing Tule River, Deer Creek and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Annual average precipitation is seven to 11 inches, increasing eastward.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. It is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The sediments that comprise the subbasin's aquifer are continental deposits of Tertiary and Quaternary age (Pliocene to Holocene). These deposits include flood-basin deposits, younger alluvium, older alluvium, the Tulare Formation, and continental deposits undifferentiated.

The flood-basin deposits consist of relatively impermeable silt and clay interbedded with some moderately to poorly permeable sand layers that interfinger with the younger alluvium. These deposits are probably not important as a source of water to wells but may yield sufficient supplies for domestic and stock use. The younger alluvium is a complex of interstratified and discontinuous beds of unsorted to fairly well sorted clay, silt, sand, and gravel, comprising the materials beneath the alluvial fans in the valley and stream channels. Where saturated the younger alluvium is very permeable, but this unit is largely unsaturated and probably not important as a source of water to wells. The older alluvium consists of poorly sorted deposits of clay, silt, sand, and gravel. This unit is moderately to highly permeable and is a major source of water to wells. The Tulare Formation consists of poorly sorted deposits of clay, silt, sand, and gravel derived predominately from the Coast Ranges. It contains the Corcoran Clay Member, the major confining bed in the subbasin. The formation is moderately to highly permeable and yields moderate to large quantities of water to wells. The continental deposits undifferentiated consist of poorly sorted lenticular deposits of clay, silt, sand, and gravel derived from the Sierra Nevada. The unit is moderately to highly permeable and is a major source of ground water in the subbasin.

The estimated average specific yield for this subbasin is 9.5 percent. This estimation is based on DWR San Joaquin District internal data and Davis (1959).

Land subsidence of 12 to 16 feet due to deep compaction of fine-grained units has occurred in the subbasin (Ireland 1984).

Restrictive Structures

Groundwater flow is generally westward (DWR 2000). Groundwater elevation contours diverge from the path of the Tule and White Rivers in the north and south portions of the subbasin, respectively, suggesting that these drainages act as losing streams throughout most of their extent. Based on current and historical groundwater elevation maps, horizontal groundwater barriers do not appear to exist in the subbasin.

Recharge Areas

Groundwater recharge is primarily from stream recharge and from deep percolation of applied irrigation water (Hilton and others 1963; DWR 1995).

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased about four feet from 1970 through 2000. The period from 1970 to 1978 showed a general decline, bottoming out at 13 feet below 1970 levels in 1978. There is a steep increase in water levels in the ten-year period from 1978 to 1988, topping out at 20 feet above 1970 water levels in 1988. There is a very sharp decrease in water levels of 34 feet from 1988 to

1995, with the lowest level reached in 1993 at 16 feet below 1970 water levels. From 1995 to 2000, water levels generally increase, eventually reaching four feet above 1970 water levels in 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 14,600,000 af to a depth of 300 feet and 94,100,000 af to the base of fresh groundwater. These same calculations give an estimate of 9,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 33,000,000 af to a depth of $\leq$ 1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

The natural recharge into the subbasin is estimated at 34,400 af. Artificial recharge and subsurface inflow are not determined. There is about 201,000 af of applied water recharge into the subbasin. Annual urban extraction and annual agricultural extraction are estimated to be 19,300 af and 641,000 af, respectively. Other extractions and subsurface outflow are not determined.

Groundwater Quality

Characterization. The water in the northern portion of this subbasin has a calcium bicarbonate type (Croft and Gordon 1968), while the southern portion of the subbasin is better characterized by a water chemistry of a sodium bicarbonate type (Hilton and others 1963). TDS values typically range from 200 to 600 mg/L. TDS values of shallow groundwater in drainage problem areas are as high as 30,000 mg/L (Fujii and Swain 1995). The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 65 wells ranging from 20 to 490 mg/L, with an average value of 256 mg/L

Impairments. There is shallow, saline groundwater in the western portion of the subbasin (Vink 2001). The eastern side of the subbasin has localized nitrate pollution.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	73	0
Radiological	71	3
Nitrates	71	6
Pesticides	73	1
VOCs and SVOCs	71	5
Inorganics – Secondary	73	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)
Municipal/Irrigation	Range: 50 – 3,000
	Total depths (ft)
Domestic	
Municipal/Irrigation	Range: 200 - 1,400

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency	
DWR (incl. Cooperators)	Groundwater levels	459	Semi-annually
Department of Health Services (and cooperators)	Title 22 Water quality	150	Varies

Basin Management

Groundwater management:	None
Water agencies	
Public	Alpaugh I.D., Angiloa W.D., Atwell Island W.D., Delano-Earlimart I.D., Ducor I.D., Kern-Tulare W.D., Lower Tule River I.D., Pixley I.D., Porterville I.D., Rag Gulch W.D., Saucelito I.D., Teapot Dome W.D., Terra Bella I.D., Vandalia I.D.
Private	California Water Service.

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Fujii, Rodger and Swain, Walter C. 1995. Arial Distribution of Selected Trace Elements, Salinity, and major Ions in Shallow Ground Water, Tulare Basin, Southern San Joaquin Valley. USGS water Resources Investigation Report 95-4048.

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Errata

Changes made to the basin description will be noted here.

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Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

December 13, 2019

Re: Comments on the Draft Groundwater Sustainability Plan for the Eastern Tule Groundwater Sustainability Agency

Dear Mr. Caudillo:

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA) and a member of the Eastern Tule White Area Growers, Inc. (ETWAG).

The members of ETWAG formed our organization to give a voice to the many landowners within the ETGSA that farm outside the boundaries of any water or irrigation district. ETWAG current represents 66 landowners that farm nearly 24,000 acres within the "white area" of the ETGSA. ETWAG has submitted comments to the ETGSA regarding the GSA's draft Groundwater Sustainability Plan (GSP). We support ETWAG's comments, and we incorporate by reference and attach hereto that comment letter and its enclosed memorandum into this letter.

FLS Enterprises, LLC further attaches and incorporates in these comments a February 6, 2019 letter to the ETGSA and its constituent agencies that was drafted and submitted by another group of landowner entities.

We will also note that significant portions of the GSP were not available for review prior to the comment deadline – specifically, portions related to an area of potential subsidence concern or a potential subsidence management area. Without these crucial details about the structure of the GSA's management areas, we cannot adequately comment on those issues and reserve the right to do so when such materials become available.

Further, we wish to reiterate and build upon Comment 4-2 from the memo accompanying the comment letter submitted on behalf of ETWAG by its legal counsel. Although the GSP clearly states on page 4-3 that the bottom of the subbasin "is defined by the interface between the Santa Margarita Formation and the relatively impermeable granitic bedrock," it also states that "In the southern region of the ETGSA, the lower aquifer system is separated from the underlying Santa Margarita Formation and the Olcese Formation by a thick layer of marine deposits." (GSP Page 4-6.) The GSP admits that the Pliocene Marine Deposits that separate the underlying Olcese Sands and the Santa Margarita Formation from the overlying upper and lower alluvial aquifers are an aquitard. (GSP Page 4-5.)

While admitting that there is a barrier to hydrological conductivity between the alluvial aquifers and the Santa Margarita Formation, below the GSP makes no attempt to address that by, for example, creating a separate management area with distinct Sustainable Management Criteria for the separate aquifer in underlying marine sedimentary deposits. Simply put, Minimum Thresholds and Measurable Objectives designed to protect the overlying Upper and Lower Alluvial Aquifers have no applicability or scientific nexus to the sustainable management of the Santa Margarita aquifer. The Confined aquifers within the Santa Margarita and Olcese Sands formations must be considered a separate subbasin or at least a separate management area, and must be managed separately from the overlying alluvial aquifers.

As landowners, we appreciate the GSA's work on our behalf. We look forward to continued collaboration as the GSA implements the adopted GSP.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Very Truly Yours,

Peter Harman, COO
FLS Enterprises, LLC

Enclosures:

A – ETWAG Comment Letter

B – Bondy Groundwater Consulting Memo

C – February 6, 2019 Landowner Letter to ETGSA

ENCLOSURE A

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December 12, 2019

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave.
Porterville, CA 93257

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

We are counsel for Eastern Tule White Area Growers, Inc. (ETWAG), and submit this comment letter on behalf of ETWAG. ETWAG appreciates the opportunity that Eastern Tule Groundwater Sustainability Agency (GSA) has provided for stakeholders to comment on the GSA's draft Groundwater Sustainability Plan (GSP). We understand and appreciate the efforts undertaken by the GSA and your consultants to reach this point. Our hope in submitting these comments is that the GSA will appropriately modify the draft GSP to address our concerns and those of our members.

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the draft GSP. In addition to those comments, we add the following.

A primary concern of our members is the apparent conclusion that the GSA will allocate groundwater according to gross acreage owned by landowners within the GSA. This is consistent with the GSA discussions in which we have been allowed to participate. Indeed, the draft Coordination Agreement dated September 16, 2019, uses the gross acreage method after dismissing historical use. Put simply, we disagree with your approach in both substance and process.

A gross acreage methodology ignores accepted legal principles and equitable considerations governing the allocation of native yield. We fear that the GSA is sacrificing fairness and the law for the sake of convenience. Historical use of groundwater and investment based on that productive use of the resource must be considered in the allocation methodology. ETWAG has previously provided the GSA with our position on this issue, which has not changed.

ETWAG also disagrees with the process by which the GSA is handling this critical issue of water rights. The draft Coordination Agreement notes that historic use of groundwater might be considered in the future. If the GSA recognizes now that historic use should be an element in the allocation of native yield, then the process should include that element. The GSA should not rush the process simply because the GSA wants the issue settled now. Further discussion and

stakeholder involvement on this issue could avoid unnecessary legal challenges. We urge the GSA to allow for more stakeholder engagement and, if necessary, dispute resolution before reaching its conclusion as to how native yield should be allocated.

We are encouraged that the draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits. Such a market system should be as flexible as possible to facilitate the needs of farmers with lands in different areas of the sub-basin. We ask that the GSA fully engage stakeholders who will be participating in a market as the GSA develops this groundwater management tool.

The GSA and its stakeholders have reached a significant milestone in completing a draft GSP and, in short order, submitting a final GSP to the Department of Water Resources. But as the GSA is aware and notes throughout the draft GSP, there is much work to be done in the implementation of the GSP. We urge the GSA to continue with active engagement of the stakeholders. The GSP is a planning document. Implementation will require collaboration, among other things, and ETWAG anticipates working closely with the GSA in that process.

Please feel free to contact us if you have any questions or wish to discuss any of our comments as you finalize the GSP.

Very truly yours,

Joseph D. Hughes

JDH:sbh

Enclosure

ENCLOSURE B

MEMORANDUM

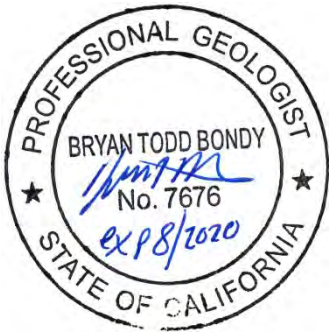
To: Eastern Tule White Area Growers, Inc.

From: Bryan Bondy, P.G., CHG / Bondy Groundwater Consulting, Inc.

CC: Project File

Date: December 13, 2019

Re: Evaluation of Eastern Tule Subbasin Draft Groundwater Sustainability Plan



Introduction

Eastern Tule White Area Growers, Inc. (ETWAG) retained Bondy Groundwater Consulting, Inc. (BGC) to review the September 2019 Draft Groundwater Sustainability Plan (GSP) for the Eastern Tule Subbasin prepared by the Eastern Tule Groundwater Sustainability Agency (ETGSA). This memorandum presents the results of BGC's evaluation, which are organized by GSP section.

Please note that the GSP review was focused on technical aspects of the GSP and it is understood that my firm's familiarity with the Tule Subbasin and time available for review were both limited. Furthermore, it is important to note that much of the GSP is based on groundwater modeling that is not yet documented in a publically available report; therefore, much of technical basis for the GSP cannot be reviewed at this time. Based on the foregoing, this review should not be considered exhaustive. Lack of comments on any particular section, issue, or topic should not be considered agreement with the associated content.

Overarching Comment

Much of the technical foundation of the GSP is provided by the groundwater flow model and simulations of future conditions made using the model. The groundwater flow model and the specifics of the modeling runs used to develop the projected future water budget, sustainable yield, sustainable management criteria (measureable objectives, interim milestones, and minimum thresholds) are not documented in a publically available report. Therefore, much of technical basis for the GSP cannot be reviewed at this time, which is obviously problematic for stakeholders who desire a review of the technical basis for the key aspects of the GSP.

Section 1 – Introduction

Comment 1-1: Executive Summary: The executive summary could do a better job of providing a more informative summary of the plan, including key groundwater conditions in the basin, undesirable results, and what actions will be taken to address undesirable results. Suggest providing more information.

Comment 1-2: Executive Summary: Statement that "…overdraft conditions have caused issues for those reliant on groundwater pumping…" is vague. What are the issues and are they considered significant and unreasonable?

Comment 1-3: Executive Summary: Description of the sustainability goal differs from that provided in Section 5.2.

Section 2 – Agency Information

Section not reviewed.

Section 3 – Description of Plan Area

Comment 3-1: Section 3.6 - Management Areas within ETGSA: The purposes of the six management areas listed in this section are vague. More information is need to understand how and why management might differ in the various management areas.

Comment 3-2: Figure 3-6 - Management Areas within the ETGSA: The "Friant-Kern Canal Subsidence Management Area" listed in Section 3.6 is not depicted on Figure 3-6, map of management areas within ETGSA.

Section 4 – Basin Setting

Comment 4-1: GSP Section 4.2.2 and Tule Subbasin Setting Section 2.1.3 Lateral Basin Boundaries: These sections state that 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." These sections should be revised to note that the southernmost portion of the eastern boundary near White River is the contact between the older sedimentary rocks and alluvial sediments.

Comment 4-2: GSP Section 4.2.3 and Tule Subbasin Setting Section 2.1.4 Bottom of Basin: These sections define the basin bottom as the contact between the Santa Margarita Formation (GSP) or Tertiary deposits (Tule Subbasin Setting) and granitic bedrock. The definitions differ between Section 4.2.3 and the Tule Subbasin Setting and should be reconciled. More importantly, the basin bottom definitions are inconsistent with the lateral basin boundary and SGMA.

The basin bottom definitions are inconsistent with the lateral basin boundary because neither the Santa Margarita Formation (GSP) or Tertiary deposits are included in the lateral basin boundary where they outcrop in the southeastern portion of the basin (See Figure 2-4 of the Tule Subbasin Setting). In other words, how can these units be included in the basin vertically, but not laterally?

SGMA defines "Basin" as a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Chapter 3 (commencing with Section 10722). DWR's Bulletin 118 defines the basin as the Pliocene to Holocene continental deposits, including flood-basin deposits, younger alluvium, older alluvium, Tulare Formation, and undifferentiated continental deposits (Attachment A). The 2016 basin boundary modification was jurisdiction in nature and, therefore, did not modify the 2004 DWR description of the basin bottom.

Based on the foregoing, it appears the bottom of the GSP should define the basin bottom as the base of the oldest unit described by DWR (2004), i.e. the Tulare Formation. This is important because the basin bottom defines which hydrostratigraphic units are subject to regulation by the GSAs.

Comment 4-3: Tule Subbasin Setting Section – Figure 2-4: Cross Sections C-C', D-D', and E-E' depicted on Figure 2-4 are not provided in the document. In particular, including Cross Section C-C would presumably help illustrate the points made in early comments about the basin boundary.

Comment 4-4: GSP Section 4.2.6 and Tule Subbasin Setting Section 2.1.7.1 – Principal Aquifers and Aquitards: These sections identify the Pliocene Marine Deposits, Santa Margarita Formation, and Olcese Formation as principal aquifers within the basin. As pursuant to earlier comments, these units should not be listed as principal aquifers because they are not part of the basin.

Comment 4-5: GSP Section 4.2.6.2 and Tule Subbasin Setting Section 2.1.7.2 –Aquifer Physical Properties: The Tule Subbasin Setting should describe and show (on Tule Subbasin Setting Figures 2-10 through 2-13) the spatial distribution of textural data used to estimate hydraulic conductivity and storage properties. Any significant gaps should be identified and discussed, particularly in key areas, such as for the lower aquifer in subsidence areas, both in this section and Tule Subbasin Setting Section 2.1.8 – Uncertainty in the Hydrogeologic Conceptual Model.

Comment 4-6: GSP Section 4.3.6 and Tule Subbasin Setting Section 2.2.6 – Interconnected Surface Water Systems: Both sections conclude that there are no interconnected surface water systems in the basin. While this appears to be a potentially reasonable conclusion, the GSP does not provide the necessary technical justification for eliminating this sustainability indicator. DWR will be looking for such justification during its review of the GSP. This justification should be included in the GSP to prevent DWR from finding the GSP inadequate and so that further consideration of this sustainability indicator will not be required.

The discussion and analysis of percolating groundwater and subterranean streams included in GSP Section 4.3.6 is a separate issue from whether there are interconnected surface water systems within the basin. That discussion does not provide the justification needed for concluding there are no interconnected surface water systems in the basin. Instead, the technical justification should demonstrate that surface water is not hydraulically connected by a continuous saturated zone to the underlying aquifer and that the overlying surface water is not completely depleted at any location and time throughout the year, since 2015 and going forward. Specifically, the analysis should address the easternmost reaches of Tule River, Deer Creek, and White River where shallow groundwater depths are indicated in January 2015 (Tule Subbasin Setting Figure 2-26).

Comment 4-7: GSP Section 4.3.7 and Tule Subbasin Setting Section 2.2.7 – Groundwater Dependent Ecosystems: The GSP is not clear regrading whether groundwater dependent ecosystems are present in the basin, as required by the GSP Emergency Regulations. While groundwater dependent ecosystems do not appear to be a principal issue for the basin, the current level of characterization may be noted as a plan deficiency by DWR.

Comment 4-8: GSP Section 4.4.1 and Tule Subbasin Setting Section 2.3.1 – Surface Water Budget: The GSP and Tule Subbasin Setting state that the difference between estimated surface water inflows and outflows is 0.2 percent. This implies a greater level of accuracy for the surface water flows than actually exists. It is commonly known that there is considerable error in measuring/estimate inflow and outflow terms, ranging from a minimum of approximately 5%

for metered flows to 30+% for unmetered (estimated) flows. The uncertainty in the water balance terms should be estimated, reported in the GSP, and considered in a modeling sensitivity analysis to determine the impact on model calibration and sustainable yield estimation.

Comment 4-9: GSP Section 4.4.2.6 and Tule Subbasin Setting Section 2.3.2.6 – Sustainable Yield: The process for determining the sustainable yield is not documented sufficiently to critically evaluate. Specifically, the sustainable yield was developed using a groundwater flow model and simulations that are not documented in the draft GSP or other publically available report.

Groundwater inflow and outflow is a major consideration for determining the sustainable yield. Under historical conditions, the net inflow to the subbasin was estimated to be 53,000 acre-feet per year (118,000 acre-feet of inflow and 65,000 acre-feet of outflow). Under simulated future conditions, the net inflow to the subbasin from the model results is negative (-)34,000 acre-feet per year (54,000 acre-feet of inflow and 88,000 acre-feet of outflow). In other words, the model is predicting a 87,000 acre-feet per year decrease in net inflow to the basin under future conditions. Based on the information presented in the GSP, it appears that the reason for this is that the modeling does not consider groundwater level increases in neighboring subbasins that should be expected to occur as a result of SGMA implementation. In short, the modeling appears to significantly underestimate future net groundwater inflow to the subbasin. This is a material consideration given the magnitude of the difference between estimated historical versus simulated future net groundwater inflows. Given that the swing in net groundwater inflow is more than half of the sustainable yield, further evaluation of this aspect is certainly warranted.

The other consideration for groundwater outflow is the source of water. The Tule Subbasin Setting treats all groundwater inflows and outflows as native water for the purpose of estimating sustainable yield. In reality, groundwater flowing into or out of the subbasin is likely a mixture of native and non-native water, particularly for the upper aquifer. Likewise, recharge of imported water may displace native water out of the subbasin. It may be appropriate to treat groundwater inflows the same as native water when estimating the sustainable yield because that water was not imported into the basin by specific entities in the subbasin like imported surface water supplies are. However, more thought should be given to the treatment of groundwater outflows. In essence, the approach used in the Tule Subbasin Setting assumes that all groundwater flowing out of the basin is derived from native sources. Certainly some groundwater outflow is derived from recharge of imported sources and should probably not be included in the calculation of sustainable yield just like groundwater recharge and return flows

derived from imported sources of are excluded from the calculation. Consistent treatment of imported water is needed for an equitable assessment of the sustainable yield.

Lastly, the sustainable yield does not appear to be optimized and may be lower than it needs to be to prevent undesirable results. This is suggested by model simulated groundwater levels presented in the Tule Subbasin Setting appendices that show continuously rising groundwater levels after approximately 2030 in some areas of the subbasins (most notably many of the representative monitoring wells in ETGSA) versus other areas where groundwater levels are predicted to stabilize. This is likely the result of simulating a uniform application of sustainable yield across the subbasin. In other words, some areas could probably stand to pump more than allowed by a uniform distribution of sustainable yield without causing undesirable results. Differential pumping reductions could be considered to increase the overall yield of the subbasin. Financial incentives and/or projects to transfer water within the subbasin could be considered to address any inequities created by imposing differential pumping reductions.

Comment 4-10: GSP Section 4.5 - Management Areas: These sections describe five management areas, whereas six are described in Section 3.6 of the plan. The number of management areas needs to be clarified throughout the GSP.

The "Friant-Kern Canal Subsidence Management Area" is not discussed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4, but is listed in GSP Section 3.6. The GSP should clarify whether "Friant-Kern Canal Subsidence Management Area" is truly a management area, or simply a monitoring area as described in the Tule Subbasin Setting, page 45.

The purposes of the management areas listed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4 are vague. More information is need to understand how and why management might differ in the various management areas.

Section 5 – Sustainable Management Criteria

Comment 5-1: The process for establishing measureable objectives and minimum thresholds for groundwater levels, groundwater storage, and land subsidence appears arbitrary and may not necessarily be designed to prevent undesirable results. As I understand the process, the groundwater flow model was run with future hydrology assumptions and assumed projects and management actions. The predicted groundwater levels (adjusted in some cases) and predicted land subsidence were then selected at 2025, 2030, and 2035 as the interim milestones and 2040 as the measureable objectives. The minimum threshold was then selected by subtracting measured groundwater level declines and subsidence during the recent 10-year

drought (2007-2016) from the measureable objective. In the case of the Friant-Kern Canal area, the deduction was limited to 3 feet, without explanation or justification. The process described in the GSP is backwards from what SGMA requires, which is to establish minimum thresholds based on metrics that prevent undesirable results and the establish measureable objectives and interim milestones that provide operational flexibility (essentially a safety factor so that the minimum thresholds are not exceeded).

In short, there is no nexus presented between the minimum thresholds and preventing undesirable results. For groundwater levels and storage, minimum thresholds in the upper aquifer may be unnecessarily high in many cases for preventing the undesirable result, which the coordinate agreements states is "a new productive well cannot be constructed". In the lower aquifer, the minimum threshold levels are below the top of screen in some wells, which potentially indicates conversion of the lower aquifer from confined to unconfined conditions that could have significant impacts on well performance and lifespan. For subsidence, the minimum thresholds are not linked in any way to the coordination agreement definition of undesirable results, which is "loss of a functionality of a structure or a facility to the point that, due to subsidence, the structure or facility cannot reasonably operate without either significant repair or replacement." The section does not provide any information to assess whether the subsidence minimum thresholds will prevent undesirable results or whether they are overly restrictive.

Perhaps there is more to the sustainable management criteria analysis that is not being described in this GSP section; nonetheless, the current sustainable management criteria discussion does not appear to meet the requirements of the GSP Emergency Regulations.

Comment 5-2: Tables 5-4 and 5-5 (IM, MO, and MTs for groundwater storage) are blank.

Section 6 – Monitoring Network

Section not reviewed.

Section 7 – Projects and Management Actions

Comment 7-1: Many good project concepts are presented in this section, most of which appear to lack specific plans of funding, which is to be expected at this stage. However, two concerns are noted. First, the GSP assumes that most of the projects will be developed and implemented by member agencies. This may create a significant challenge given that much of the GSA is comprised of white areas that do not have a district to lead the develop and implementation of

project(s). Perhaps the County would fill this role, but the GSP does not address this potentially significant issue. The other concern is the lack of projects specifically targeted to address key undesirable results, such as subsidence along the Friant-Kern Canal.

Because it is anticipated that competition for funding from GSA fees and competitive grants will be high, allocating limited available funds will likely be one of the most significant challenges faced by ETGSA and its partner GSAs within the subbasin and a will likely be a source of conflict. It is recommended that the ETGSA begin working internally and with the other subbasin GSAs to develop a process for screening and ranking projects for funding. This process should start immediately in anticipation of future rounds of Prop 1 funding for GSP implementation. The screening and ranking process should be heavily weighted toward projects that have the greatest impact on preventing undesirable results at the lowest cost. Projects that provided water supply benefits, but do not contribute significantly to preventing undesirable results should rank lower. Projects that screen high should be moved as quickly as possible into feasibility evaluation and design to maximize the potential for funding when grant opportunities present themselves.

Section 8 – Notices and Communications

Section not reviewed.

Section 9 – References and Technical Studies

Comment 9-1: Documentation of the groundwater model development, calibration, sensitivity analysis, and predictive simulations for the GSP should be provided.

Limitations

This memorandum was prepared by Bondy Groundwater Consulting, Inc. (BGC) for Eastern Tule White Area Growers, Inc. BGC has employed accepted geologic and hydrogeologic procedures and its opinions are made in accordance with generally accepted principles and practices of these professions. The analyses, conclusions, and recommendations contained in this memorandum reflect BGC's best judgment in light of the information readily available to BGC at the time of preparation, experience with similar projects, and project scope, schedule, and budget. All locations depicted and/or described in the memorandum are approximate and are provided as general information only. Interpretations, location descriptions, location depictions, conclusions, and other information presented in this memorandum should not be relied upon to site or design wells or any other infrastructure without field confirmation of assumptions and estimates made in this memorandum. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this memorandum.

Closing

Please contact me if you have any questions regarding this memorandum. The opportunity to assist Eastern Tule White Area Growers, Inc. is greatly appreciated.

BONDY
Groundwater Consulting, Inc.

Attachment A

San Joaquin Valley Groundwater Basin
Tule Subbasin

- Groundwater Basin Number: 5-22.13
- County: Tulare
- Surface Area: 467,000 acres (733 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Tule Groundwater Subbasin is generally bounded on the west by the Tulare County line, excluding those portions of the Tulare Lake Subbasin Water Storage District and Sections 29 and 30 of Township 23 South, Range 23 East, that area west of the Homeland Canal. This boundary is shared with the Tulare Lake Groundwater Subbasin. The northern boundary of the subbasin follows the northern boundaries of Lower Tule Irrigation District and Porterville Irrigation District and is shared with the Kaweah Groundwater Subbasin. The eastern boundary is at the edge of the alluvium and crystalline bedrock of the Sierra Nevada foothills, and the southern boundary is the Tulare-Kern County line and is shared with the Kern County Groundwater Basin

West-flowing Tule River, Deer Creek and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Annual average precipitation is seven to 11 inches, increasing eastward.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. It is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The sediments that comprise the subbasin's aquifer are continental deposits of Tertiary and Quaternary age (Pliocene to Holocene). These deposits include flood-basin deposits, younger alluvium, older alluvium, the Tulare Formation, and continental deposits undifferentiated.

The flood-basin deposits consist of relatively impermeable silt and clay interbedded with some moderately to poorly permeable sand layers that interfinger with the younger alluvium. These deposits are probably not important as a source of water to wells but may yield sufficient supplies for domestic and stock use. The younger alluvium is a complex of interstratified and discontinuous beds of unsorted to fairly well sorted clay, silt, sand, and gravel, comprising the materials beneath the alluvial fans in the valley and stream channels. Where saturated the younger alluvium is very permeable, but this unit is largely unsaturated and probably not important as a source of water to wells. The older alluvium consists of poorly sorted deposits of clay, silt, sand, and gravel. This unit is moderately to highly permeable and is a major source of water to wells. The Tulare Formation consists of poorly sorted deposits of clay, silt, sand, and gravel derived predominately from the Coast Ranges. It contains the Corcoran Clay Member, the major confining bed in the subbasin. The formation is moderately to highly permeable and yields moderate to large quantities of water to wells. The continental deposits undifferentiated consist of poorly sorted lenticular deposits of clay, silt, sand, and gravel derived from the Sierra Nevada. The unit is moderately to highly permeable and is a major source of ground water in the subbasin.

The estimated average specific yield for this subbasin is 9.5 percent. This estimation is based on DWR San Joaquin District internal data and Davis (1959).

Land subsidence of 12 to 16 feet due to deep compaction of fine-grained units has occurred in the subbasin (Ireland 1984).

Restrictive Structures

Groundwater flow is generally westward (DWR 2000). Groundwater elevation contours diverge from the path of the Tule and White Rivers in the north and south portions of the subbasin, respectively, suggesting that these drainages act as losing streams throughout most of their extent. Based on current and historical groundwater elevation maps, horizontal groundwater barriers do not appear to exist in the subbasin.

Recharge Areas

Groundwater recharge is primarily from stream recharge and from deep percolation of applied irrigation water (Hilton and others 1963; DWR 1995).

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased about four feet from 1970 through 2000. The period from 1970 to 1978 showed a general decline, bottoming out at 13 feet below 1970 levels in 1978. There is a steep increase in water levels in the ten-year period from 1978 to 1988, topping out at 20 feet above 1970 water levels in 1988. There is a very sharp decrease in water levels of 34 feet from 1988 to

1995, with the lowest level reached in 1993 at 16 feet below 1970 water levels. From 1995 to 2000, water levels generally increase, eventually reaching four feet above 1970 water levels in 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 14,600,000 af to a depth of 300 feet and 94,100,000 af to the base of fresh groundwater. These same calculations give an estimate of 9,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 33,000,000 af to a depth of $\leq$ 1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

The natural recharge into the subbasin is estimated at 34,400 af. Artificial recharge and subsurface inflow are not determined. There is about 201,000 af of applied water recharge into the subbasin. Annual urban extraction and annual agricultural extraction are estimated to be 19,300 af and 641,000 af, respectively. Other extractions and subsurface outflow are not determined.

Groundwater Quality

Characterization. The water in the northern portion of this subbasin has a calcium bicarbonate type (Croft and Gordon 1968), while the southern portion of the subbasin is better characterized by a water chemistry of a sodium bicarbonate type (Hilton and others 1963). TDS values typically range from 200 to 600 mg/L. TDS values of shallow groundwater in drainage problem areas are as high as 30,000 mg/L (Fujii and Swain 1995). The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 65 wells ranging from 20 to 490 mg/L, with an average value of 256 mg/L

Impairments. There is shallow, saline groundwater in the western portion of the subbasin (Vink 2001). The eastern side of the subbasin has localized nitrate pollution.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	73	0
Radiological	71	3
Nitrates	71	6
Pesticides	73	1
VOCs and SVOCs	71	5
Inorganics – Secondary	73	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)
Municipal/Irrigation	Range: 50 – 3,000
	Total depths (ft)
Domestic	
Municipal/Irrigation	Range: 200 - 1,400

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency	
DWR (incl. Cooperators)	Groundwater levels	459	Semi-annually
Department of Health Services (and cooperators)	Title 22 Water quality	150	Varies

Basin Management

Groundwater management:	None
Water agencies	
Public	Alpaugh I.D., Angiloa W.D., Atwell Island W.D., Delano-Earlimart I.D., Ducor I.D., Kern-Tulare W.D., Lower Tule River I.D., Pixley I.D., Porterville I.D., Rag Gulch W.D., Saucelito I.D., Teapot Dome W.D., Terra Bella I.D., Vandalia I.D.
Private	California Water Service.

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Errata

Changes made to the basin description will be noted here.

ENCLOSURE C

February 6, 2019

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Re: Sustainable Yield Allocation and Related Policy Development in the Tule Subbasin

The undersigned growers collectively farm land in many of the subbasins in the San Joaquin Valley and throughout the state, and have been participating in the GSP development in each respective subbasin. We also have holdings in the Tule Subbasin. The Tule Subbasin GSAs

deserve commendation for their efforts to date in developing GSPs for the subbasin and for working to address difficult issues including allocations and rampdown of pumping. We appreciate proposals in the subbasin to implement gradual reductions of overdraft (i.e. "transitional pumping") where feasible and the institution of water markets as methods to mitigate SGMA's impacts.

The Tule Subbasin is further along in its development of the aforementioned concepts than most other basins/GSAs. Consequently, it is likely to serve as a model for other basins. As such, it is critical that the policy decisions of the Tule GSAs regarding allocation of groundwater rights adhere to applicable legal principles, making it more likely to withstand legal challenge. We recognize that applicable law does not prescribe an exact formula as to how an allocation method must be designed, but we are concerned that the "gross-acre" sustainable yield allocation method (i.e. each acre in the basin receives an equal share of sustainable yield regardless of historical water use or other factors) is inconsistent with the principles set forth in that established law. The "gross acre" approach that has been proposed by the Eastern Tule GSA, and seemingly supported by GSAs throughout the Tule Subbasin, is highly susceptible to legal challenge. Our group feels it is in the best interest of all landowners, large and small, to adhere closely to applicable groundwater law, including existing case law, during the allocation determination process in a best effort to avoid the long and costly process of an adjudication.

Accordingly, we believe that underlying water rights, which are expressly not displaced by SGMA, must inform any method chosen. In a long-overdrafted basin, groundwater rights can be grouped into three categories: developed (foreign and salvaged water), appropriative/ prescriptive, and overlying. Based on review of existing case law, including adjudications in other basins in California, historical use of groundwater should be a significant consideration when developing allocations. Reliance on surface water in lieu of groundwater use may also establish a legal and equitable basis to claim a share of the native groundwater supply. And while we believe there are reasons to afford an allocation to landowners with dormant or unexercised overlying rights (i.e. landowners with little or no groundwater use in recent years), there is a legal case for "subordination" of the priority of such rights, which should be factored into this determination[i]. Lastly, we believe it is important to consider principles of equity to effectuate a fair and reasonable outcome for those who have invested above and beyond the price of land: time and money into enterprise reliant on groundwater.

Because we feel that it is in the best interest of all landowners to avoid an adjudication, we have utilized resources at our own expense to inform the accompanying paper and attachments that summarizes legal principles with which an allocation method should comport. The paper also provides an illustration of an allocation approach that we believe would be consistent with those same legal principles. The approach described in the paper is not intended to be "final," but instead provides a starting point for renewed discussions. We request that you review the paper

and proposal, and urge you to consider further deliberation to find an allocation method that will sustain legal scrutiny.

We, the undersigned recognize the mammoth tasks bestowed upon GSAs. We hope to ease some of the burden of these tasks and are openly offering our employees, consultants and legal counsel time to assist in these efforts at our expense in hopes of avoiding an onerous adjudication.

Thank you,

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[i] It is important to define and distinguish dormant or undeveloped lands from irrigated lands that have had a recent reduction in groundwater use attendant to crop transition or replanting, as those should not be considered dormant. Further, subsequent fallowing for SGMA impact mitigation should not result in subordination or a loss of allocation.

February 6, 2019

Analysis of Allocation Methods

1. Purpose

The Tule Subbasin GSAs should be commended for their efforts to address the difficult subject of groundwater allocations and for its endorsement of transfer markets to foster flexibility and transition in the use of groundwater. The Tule Subbasin GSAs should also be commended for pursuing a transitional pumping system that allows groundwater users to slowly reduce their pumping to sustainable yield over a period of many years, rather than an abrupt curtailment of pumping.

While applicable law does not prescribe an exact formula as to how an allocation model must be designed, the allocation approach proposed by Tule Subbasin GSAs based on gross acres for agricultural Sustainable Yield Allocations (i.e., each acre in the basin receives an equal share of sustainable yield regardless of historical water use or other factors) is potentially legally assailable as both inconsistent with common law water rights and inequitable. SGMA expressly provides that the act does not disturb water rights and that allocations made by a GSA shall not be deemed a determination of water rights. (*See* Water Code Water Code §§ 10720.5, 10726.4(a)(2), 10726.8(b).) If an allocation scheme is objected to by stakeholders, a comprehensive groundwater basin adjudication may ensue (*see* Water Code §§ 830 et seq.). In that case, groundwater rights will be determined by the courts and the GSA allocation scheme will need to comport with the determination. Therefore, it is prudent to seek to structure the allocation scheme consistent with the common law as best as possible in the hopes of dissuading stakeholders from initiating an adjudication, and if an adjudication nonetheless occurs, persuading the court to adopt the scheme as its determination of groundwater rights within the adjudication.

The exact application of common law to groundwater rights in the Tule Basin is not entirely clear, but certain legal principles are applicable, which are discussed below. Relevant factors may include prescriptive pumping by appropriators, "self-help" pumping by overlying landowners, and various equitable considerations that inform allocations among overlying (correlative) rights holders. Historical use of groundwater should be considered. However, various other considerations may also apply, including historical use of imported surface water and landownership. Following this discussion, we outline a conceptual allocation approach that we believe is consistent with common law groundwater principles. This approach is not intended to be "final," but instead provides an alternative for renewed and continued discussions. Our primary objective is to support the development of an allocation methodology that is consistent with SGMA and groundwater law generally.

2. Applicable Legal Principles

a. Overlying (or "Correlative") Rights

Overlying landowners have the right to extract and use groundwater for reasonable and beneficial uses on land owned by them overlying the basin. (*City of Barstow v. Mojave* Water Agency (2000) 23 Cal.4th 1224,1240 ("*Mojave*"); *California Water Service Co. v. Edward Sidebotham & Son* (1964) 224 Cal.App.2d 715, 725.) Overlying rights are a form of "correlative right." Therefore, when groundwater supplies are limited, overlying rights may be curtailed to an amount that is reasonable considering the basin's safe yield and competing demands by other users. One court explained that "the apportionment [of correlative rights] should be measured in the 'manner best calculated to a reasonable result,' and the court may adopt any standard of measurement 'that is reasonable on the facts to secure equality.'" (*Prather v. Hoberg* (1944) 24 Cal.2d 549, 560 [citation omitted]).

Factors that may be applied in allocating limited groundwater supplies among overlying rights holders may include "the amount of water available, the extent of ownership in the basin, the nature of the projected use - if for agriculture, the area sought to be irrigated, the character of the soil, the practicability of irrigation, i.e., the expense thereof, the comparative profit of the different crops which could be made of the water on the land - all these and many other considerations must enter into the solution of the problem." (*Tehachapi-Cummings County Water District v. Armstrong* (1975) 49 Cal.App.3d 992, 1001-1002 ("*Tehachapi-Cummings*").) The gross acreage approach applies a "coarse" standard that does not individually consider these factors.

It also bears noting that all uses of groundwater produced by a landowner for use on overlying land is afforded overlying rights status, whether the use is for agriculture, industry, or otherwise. The ETGSA staff proposal lumps overlying industrial users together with municipal purveyors (appropriators), which is inconsistent with common law treatment of overlying industrial users.

b. Appropriative Rights

Appropriative groundwater rights allow for the appropriation of groundwater for use on non-overlying properties. (*City of Santa Maria v. Adam* (2013) 211 Cal.App.4th 266, 279 ("*Santa Maria*").) In supplying water to the public, public water purveyors act as appropriators even if they provide water service to customers overlying the same basin from which they draw their water supply. (*Town of Antioch v. Williams Irr. Dist.* (1922) 188 Cal. 451, 456; *Santa Maria*, 211 Cal.App.4th at 279.)

Absent a perfection of prescriptive rights (discussed below), overlying rights enjoy seniority over appropriative rights. (*Mojave,* 23 Cal.4th at 1240-1241.) Thus, appropriators, as a group, may only lawfully appropriate groundwater supplies that are surplus to the cumulative demands of the overlying owners receiving groundwater from the same source. (*Id.*; *accord Los Angeles v. San Fernando* (1975) 14 Cal.3d 199, 282-286 ("*San Fernando*").)

c. Safe Yield/Sustainable Yield

Safe yield is the maximum quantity of water which can be withdrawn annually from a groundwater supply under a given set of conditions without causing "undesirable results" arising from the gradual lowering of groundwater levels resulting in eventual depletion of the supply. (*San Fernando*,14 Cal.3d at 278; *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908,

929 ("*Pasadena*").) The judicial use of the term, "safe yield," has been complimented by SGMA's use of the term "sustainable yield," which is defined similarly to the definition of safe yield in the case law. (Water Code § 10721(w).) SGMA incorporates the term, "undesirable results," from case law and defines sustainable yield in relation to avoiding six undesirable results specified in the law. (Water Code § 10721(x)).

d. Prescription

When a basin's safe yield is exceeded, groundwater overdraft begins. (*Pasadena*, 33 Cal.2d at 936-937.) The overdraft establishes adversity for purposes of the appropriators perfecting prescriptive groundwater rights. (*San Fernando*, 14 Cal.3d at 284.) If the overdraft is notorious and continues for a period of at least five years, without objection by the overlying landowners, appropriators can prescribe rights from the overlying landowners. (*Id.*)

Under Civil Code section 1007, neither private parties nor public entities can obtain prescriptive rights against public utilities, municipalities or other public entities. Accordingly, private pumpers can only obtain prescriptive rights against other private pumpers. Although public pumpers cannot lose water rights by prescription, their acquisition of prescriptive groundwater rights is limited by "self-help," which is defined as groundwater pumping by the overlying owners during the prescriptive period. (*San Fernando*, 14 Cal.3d. at 293, f.n. 101; *City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 298 ["Landowners may limit prescriptive rights by showing that although they had not sought an injunction during the prescriptive period they exercised self-help by continuing to pump during that time"]; *Hi-Desert County Water Dist. v. Blue Skies Country Club, Inc.* (1994) 23 Cal.App.4th 1723, 1736 ("*High Desert*".)

The prescriptive period may be any period during which overdraft occurred and which the appropriator can demonstrate continuous, open, and notorious pumping (hereafter, the "Prescriptive Pumping Period." However, in basins for which a groundwater sustainability plan must be developed under SGMA, the Prescriptive Pumping Period cannot extend beyond January 1, 2015, which SGMA established as a cut-off date for establishing or defending against claims of prescription. (Water Code § 10720.5(a).)

e. Subordination

In the case *In re Water of Long Valley Stream System* (1979) 25 Cal.3d 339, 355, 357-359 ("*Long Valley*"), the California Supreme Court approved the State Water Resources Control Board's "subordination" of the dormant riparian rights in the surface water context. Accordingly, the priority of dormant overlying rights was subordinated in priority to existing overlying *and appropriative* users. To date, although overlying rights to groundwater are analogous to riparian rights to surface water, the courts have not applied the same principle to subordinate dormant overlying rights (*Wright v. Goleta Water District* 174 Cal.App.3d 74, 87-89 (1985)). However, as part of the recent groundwater basin adjudication reform law, the legislature explicitly permits the court to apply the principles set forth in *Long Valley* within a comprehensive groundwater basin adjudication (Code Civ. Proc. § 830(b)(7)). Moreover, the California Supreme Court explained in its *Mojave* opinion that the subordination principle applied in *Long Valley* may need

to be applied in the future to subordinate dormant overlying rights "to harmonize groundwater shortages with a fair allocation of future use." (*Mojave*, 23 Cal.4th at 1249, n 13).[1]

f. Developed Water (Foreign and Salvaged Water)

Water imported from outside the watershed (foreign water) or water that is captured, which would have been otherwise lost to the subbasin, and which is recharged into the groundwater basin (salvaged water) should be granted to the party responsible for introducing that "developed" water into the basin. (*San Fernando*, 14 Cal.3d at 261; *Santa Maria,* 211 Cal.App.4th at 305.)

g. Equity

Provided that a court does not ignore water rights priorities, in water cases, a court is acting in equity and has broad authority to effectuate a fair and reasonable outcome. *Mojave*, 23 Cal.4th at 1249-50; *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.* (1935) 3 Cal.2d 489, 574. Thus, in setting allocations in future groundwater adjudications, courts will likely seek to achieve equitable outcomes.

Equitable considerations are relevant to an assessment of the gross acreage approach to allocations. The gross acreage approach effectively denies certain allocation to those that have invested in property development/plantings and groundwater infrastructure (i.e., investment-backed reliance and expectations) so that the allocation can be granted to dormant overlying rights holders with no such reliance. In many circumstances, the land is dormant because it is not optimal for planting (e.g., topography, poorly producing wells, soil type) and as a result the dormant rights landowner is likely to simply sell the allocation back to those in need (i.e., the overlying users that received less allocation in order to allow allocation to the dormants). It may therefore be argued that the approach results in an inequitable financial windfall to dormant landowners at the expense of active overlying users.

3. Division of Native Safe Yield (Sustainable Yield Allocations)

As stated above, GSP allocations should be constructed to reflect applicable legal and equitable considerations. In doing so, the first step should be to identify and segregate any yield attributable to developed water from the total safe yield. As noted above, the developed water must be allocated to the parties responsible for introducing the developed water into the basin. (*San Fernando*, 14 Cal.3d at 261; *Santa Maria,* 211 Cal.App.4th at 305.) The remaining safe yield is the "native safe yield."

The native safe yield (NSY) should then be divided among basin stakeholders (i.e., "Sustainable Yield Allocations"). The stakeholders include appropriators/prescriptors (e.g., municipal water

[1] Dormant overlying rights are groundwater rights appurtenant to overlying property that have not been exercised in recent years. Dormant or undeveloped lands that have had a recent reduction in groundwater use attendant to crop transition or replanting should not be considered dormant. Further, subsequent fallowing for SGMA impact mitigation should not result in subordination or a loss of allocation.

purveyors and any exporters of groundwater from the basin) and landowners. Among the landowners, there are:

- landowners that may advance a claim based on self-help pumping,
- landowners with existing/historical reliance on groundwater,
- landowners with existing/historical reliance on surface water, and
- landowners with dormant lands that are not presently irrigated.

A landowner may, of course, be simultaneously situated in several of these categories (e.g., a self-help pumper and reliant on groundwater and surface water). However, for purposes of application of pertinent legal and equitable principles to the allocation methodology, it is helpful to compartmentalize landowners into each of these categories even if an individual landowner is situated in, and receives allocation from, multiple categories.

a. Allocations Pursuant to Prescriptive and Self-Help Pumping

In a basin like the Tule subbasin, where overdraft has persisted for many years, appropriators would likely be awarded prescriptive rights. (*San Fernando*, 14 Cal.3d at 283-284.) However, the doctrine of prescription should only apply to the portion of production within the basin made by appropriators (i.e., the total amount of prescriptive pumping).[2] Of this amount, a portion has been protected from prescription due to "self-help" pumping by landowners. (*City of Santa Maria,* 211 Cal.App.4th at 298.) Arguably, the portion of the safe yield subject to potential prescription, but protected from prescription by self-help pumping, should be allocated to the landowners engaged in pumping during the Prescriptive Pumping Period whose pumping is responsible for the self-help.

Each appropriative/prescriptive pumper should be allocated a Sustainable Yield Allocation resulting from the prescriptor's pumping during the Prescriptive Pumping Period reduced by the self-help pumping by overlying landowners during the prescriptive period. Caselaw has not set forth a precise formula for dividing groundwater rights between prescriptive and self-help pumping. The *San Fernando* opinion also raised certain factually-dependent criticism of "mechanically" allocating prescriptive rights proportionally to the amounts used during the Prescriptive Pumping Period. (14 Cal.3d. at 265-266.) However, the following principles likely apply:

- Prescriptive rights can be no greater that the amount of continuous appropriative pumping during the prescriptive period.
- The prescriptive right must be reduced in some quantity reflecting the protection of overlying rights through self-help pumping by overlying landowners during the prescriptive period.
- Where the amount of appropriative pumping is *less* than the amount of the native safe-yield, arguably the following would apply:
    - An allocation in the amount of the appropriative/prescriptive pumping should be divided equally between appropriative/prescriptive pumping, as a group, and overlying self-help pumping, as a group, with each group receiving half of the

[2] In a basin like Tule, in which the vast majority of pumping is for agriculture, and a minor portion is used for appropriative uses (e.g., municipal water service), the allocations made to prescriptors will also be only a minor portion of the native safe yield. The remainder of the native safe yield will need to be allocated to landowners pursuant to principles applicable to overlying rights.

combined allocation. Within each of the two groups (appropriative/prescriptive pumpers and overlying/self-help pumpers), the award should be divided proportional to each pumper's production during the prescriptive period in comparison to the total pumping by the group during the prescriptive period.

- The residual amount of native safe-yield (i.e., after deducting the portion allocated pursuant to prescriptive/self-help pumping) should be allocated pursuant to the overlying (correlative) rights doctrine, as discussed in the next section.

- Where the amount of appropriative/prescriptive pumping is *greater* than the amount of the native safe-yield (not the circumstance in the Tule subbasin or other San Joaquin subbasins), the division of allocation should be determined largely, if not exclusively, on the basis of proportional appropriative/prescriptive pumping and overlying/self-help pumping.

The attached spreadsheet illustrates allocations based on prescription, self-help, and correlative rights as presented in various scenarios. This illustration is independent from any particular equitable principles that may (likely will) apply.

We note that the Sustainable Yield Allocations granted to the appropriator/prescriptors in our conceptual approach is similar to the municipal and industrial pool proposed in the ETGSA staff recommendation with two significant departures: (1) it uses common law principles to establish the Sustainable Yield Allocation to appropriator/prescriptors; and (2) industrial pumpers of groundwater for use on overlying lands would be treated as overlying landowners

b. Allocations Pursuant to Existing/Historical Use (Groundwater and Surface Water)

The portion of the safe yield not allocated pursuant to the prescription doctrine, should be allocated pursuant to the laws applicable to the division of available groundwater among overlying landowners. Unfortunately, there is ambiguity in this area of the law. One appellate court held that as between overlying landowners, overlying rights are not predicated on past use and the doctrine of prescription does not apply to afford prescriptive rights to be developed between and among overlying owners because the nature of overlying rights is correlative, and thus under the court's reasoning, pumping by any one overlying landowner is not superior nor adverse to another overlying landowner's groundwater rights regardless of overdraft conditions. (*Tehachapi-Cummings,* 49 Cal.App.3d at 1001-1002.) Rather, the court held that a series of considerations must be made, as noted above.

However, historical use of water—both groundwater and surface water—should be relevant to the allocation of groundwater supplies for the following reasons:

- Between existing overlying users and dormant lands, there is a case for subordination of the overlying groundwater pursuant to Code of Civil Procedure section 830(b)(7) and the case law discussed above; and
- Equitable arguments for protecting uses that are supported by investment-backed reliance and expectations.[3]

[3] *See also e.g.,* Restatement (Second) of Torts § 850A (listing "the protection of existing values" as one of the criteria to be applied in evaluating the reasonableness of allocations of water among claimants of riparian

Historical/existing overlying uses supported by groundwater possess a strong equitable claim to Sustainable Yield Allocation. Additionally, historical/existing water use on overlying lands supported by surface water possess a claim to the Sustainable Yield Allocation as well. The basis of such claim may be legal in relation to "cessation of use" (*see* Water Code § 1005.1) and/or equitable, citing their "voluntary" avoidance of groundwater use based on their use of surface water and the economic investments made to enable the beneficial use of surface water. Our proposed allocation approach suggests splitting the Sustainable Yield Allocations in an equitable manner between groundwater and surface water users.

c. The Dormant Lands Set-Aside Pool

With respect to lands that are not presently irrigated (or using groundwater for industrial or other overlying purposes), the doctrines of prescription and subordination may be employed to substantially constrain, if not fully eliminate, future rights to pump groundwater absent a future transfer of right to such lands. (Code of Civ. Proc. § 830(b)(7); *San Fernando*, 14 Cal.3d at 283-284; *Mojave*, 23 Cal.4th at 1249, n 13.) However, section 830(b)(7) of the Code of Civil Procedure provides that a court hearing a comprehensive basin adjudication *may* consider applying the principles established in *Long Valley* (i.e., subordination); it does not provide that the court *must* do so. This fact, together with the inherent notion of overlying rights as correlative in nature and not dependent on historical use, plus general equitable principles, afford reason to provide some amount of access to the basin's native safe yield to dormant landowners.

Our conceptual allocation proposal outline below suggests use of a dormant lands set-aside pool pursuant to which owners of dormant lands could apply for a conditional grant of Sustainable Yield Allocation from the set aside pool, which if granted must be used beneficially and continuously on the overlying property for a minimum period of years (e.g., 10) before the Sustainable Yield Allocation were deemed vested and transferable. These provisions would ensure that Sustainable Yield Allocations from the dormant set-aside pool are only used by those intending actual overlying use of their dormant land for a substantial period. Other appropriate terms, including a period for submission of applications, a maximum allocation grant per acre, etc. might also be considered.

4. Proposed Allocation Approach

In consideration of applicable the legal and equitable principles discussed above, we propose the following conceptual allocation approach as a basis of further discussion.

- Groundwater attributable to foreign and salvaged water would be granted to the party responsible for bringing the water into the basin. The remaining native safe yield would then be allocated between urban/municipal users and landowners as described below. *Basis: The parties responsible for developed water in the basin are entitled to the augmented recoverable yield.*

[correlative] rights, which are analogous to overlying groundwater rights); *Williams v. Rankin* (1966) 245 Cal.App.2d 803 (awarding a greater proportion of a stream among competing riparians based on the extent of irrigation, installation of irrigation infrastructure, and actual use of water).

- Determine how much was pumped by appropriators/prescriptors (principally urban users) continuously without interruption over a five-year Prescriptive Pumping Period. *Basis: Assuming there is a strong case for prescriptive rights in the subbasin, the portion of the native safe yield subject to prescriptive/self-help pumping should be defined and segregated from the remainder of the native safe-yield.*
    - Suggest that the 5-year Prescriptive Pumping Period might be 2010 through 2014 to reflect (i) the SGMA provision that provides that January 1, 2015 is the cut-off date for establishing or defending against prescription (Water Code § 10720.5(a).) and (ii) the groundwater pumping that occurred under severe drought conditions during those years. Earlier five-year Prescriptive Pumping Periods should be considered if stakeholders desire.
    - Prescriptive pumping amount would be the average pumping during the Prescriptive Pumping Period. Note, the law is not clear whether average or lowest annual prescriptive pumping would be used; rather the law refers to "continuous" prescriptive pumping throughout the five year Prescriptive Pumping Period.
- As a group, the appropriative/prescriptive pumpers would receive a Sustainable Yield Allocation that is equal to half of the amount of the combined continuous prescriptive pumping during the Prescriptive Pumping Period. Each appropriator would receive an individual Sustainable Yield Allocation (a portion of the group award) proportional to the amount of their continuous prescriptive pumping during the Prescriptive Pumping Period compared to the combined appropriative/prescriptive pumping during the Prescriptive Pumping Period.
- As a group, the overlying landowner/self-help pumpers would receive a Sustainable Yield Allocation that is equal to half of the amount of the combined continuous prescriptive pumping during the Prescriptive Pumping Period. Each overlying landowner/self-help pumper would receive an individual Sustainable Yield Allocation (a portion of the group award) proportional to the amount of their continuous overlying/self-help pumping during the Prescriptive Pumping Period compared to the combined overlying/self-help pumping during the Prescriptive Pumping Period..
- The remainder of the native safe yield after deducting the amount allocated to prescriptors and self-help pumpers would be "Landowner NSY" to be divided among landowners per below.
- Landowner NSY would be allocated as follows:
    - __% of Landowner NSY would be allocated to existing/historical users,[4] groundwater users and surface water users (as of [designated date]). *Basis: The vast majority of the Landowner NSY should be allocated among existing overlying users to reflect both the potential legal claims of subordination and the equitable considerations noted above concerning avoiding a windfall to dormant landowners at the expense of those that have made investment-backed reliance and expectations upon the groundwater supply.*
    - __% of Landowner NSY would be set aside in a pool for dormant users (allocated based on application for allocation and actual beneficial use for a designated period [e.g., 10 years continuous]). *Basis: A small portion of the Landowner NSY*

[4] We use the term "existing/historical users" to reflect that both existing and historical use may be relevant. For example, existing use of water on overlying lands may be an initial requirement to qualify for allocation under this category, with the quantity of allocation determined by average use during a designated base period.

should be set aside for use by presently dormant landowners that desire to initiate some irrigation of their property in the future without having to purchase allocation from others. Although these users face potential subordination claims, an equitable compromise should afford them some opportunity. The provisions requiring an application for grant of allocation and minimum continual use ensure that the allocations from the dormant set-aside pool are only used by those intending actual irrigation.

- Of the __% of Landowner NSY allocated to existing/historical users (i.e., the amount of the Landowner NSY after deducting the amount allocated to the dormant set-aside pool), __% would be allocated to groundwater users (divided proportionally based on the average use of groundwater during a base period from [beginning year – end year]) and __% would be allocated to surface water users (divided proportionally based on the average use of surface water during a base period from [beginning year – end year]). *Basis: A share of this amount should be allocated to existing/historical groundwater producers that have relied on the groundwater supply. Additionally, landowners using surface water may advance cessation of use and equitable claims based upon use of surface water in lieu of groundwater. Accordingly, landowners using surface water should be awarded a share of the Landowner NSY as well.*

- Transitional pumping (all allowed pumping in excess of the cumulative native safe yield) will be allocated to historical groundwater producers (consistent with the previous paragraph) in proportion to their average groundwater production during a base period from [beginning year – end year] pursuant to an option and payment system. The payments would raise revenue to fund projects to mitigate undesirable results. If transitional pumping allocations are not acquired by exercise of option/payment by historical groundwater producers by [end date], the remainder would be made available to all landowners on a first-come, first-served basis.
- Transitional pumping volumes would be ramped down to native safe yield over 20 years in the following five-year increments:
  - 2020-2024: 100%
  - 2025-2029: 75%
  - 2030-2034: 50%
  - 2035-2039: 25%
  - 2040- 0%

The conceptual approach outlined above is solely intended to stimulate discussion toward an allocation approach that reflects applicable legal and equitable principles. We recognize that there is ample ambiguity in the law and different stakeholders will have different views of what is equitable. Therefore, an appropriate and acceptable approach for allocations in the Tule Subbasin GSAs will require negotiation and compromise. As such, the approach would surely evolve to include additional provisions. Our goal is simply to illustrate that the gross acreage approach does not comport with relevant legal and equitable principles and that there are reasonable alternative approaches. We respectfully urge the Tule Subbasin GSAs to open a broader discussion that addresses the considerations discussed above.

Friant
WATER AUTHORITY

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December 16, 2019

Alpaugh GSA
Delano Earlimart Irrigation District GSA
Eastern Tule GSA
Lower Tule River Irrigation District GSA
Pixley Irrigation District GSA
Tri-County Water Authority GSA

Re: **Comments on Tule Subbasin Groundwater Sustainability Plans**

To: The Directors and Staff of the Referenced Groundwater Sustainability Agencies

The Friant Water Authority (FWA), which operates the 152-mile long Friant-Kern Canal (FKC or Canal) on behalf of the United States Department of Interior's Bureau of Reclamation (Reclamation) and which Canal conveys contract water to 34 water agencies and municipalities that in turn serve tens of thousands of residential customers and over 1 million acres of farmland, respectfully submits this comment letter on the Groundwater Sustainability Plans (GSPs) that have been drafted by each of the Groundwater Sustainability Agencies (GSAs) addressed in this letter pursuant to the Sustainable Groundwater Management Act (SGMA).[1]

As a preliminary matter, we commend the various boards, staff members and technical consultants for the efforts that have gone into the preparation of the draft GSPs and for the transparent and collaborative manner in which the GSAs have engaged with stakeholders such as FWA. We are in this together, and your leadership to date, as evidenced by the outreach to our agency, has been exemplary. With the exception of the issues noted below, FWA fully supports the adoption and implementation of the GSPs. To that end, FWA looks forward to continuing our collaboration in order to achieve the "Sustainability Goal" of the Tule Subbasin, which, as defined in the Tule Subbasin Coordination Agreement (Coordination Agreement), is "the absence of significant and unreasonable undesirable results associated with groundwater pumping."[2]

In our initial comment letter of May 28, 2019, we notified each GSA that FWA would be carefully reviewing the draft GSPs in terms of the description and definition of undesirable results with respect to subsidence impacts to the Canal, and noted that while SGMA established a 20-year planning period to bring the Tule Subbasin into sustainability, the continuation of unmitigated land subsidence impacts to the Canal would be unacceptable and that feasible solutions must be identified. With that

[1] Water Code § 10720 and following.
[2] Coordination Agreement, § 4.2.

outcome in mind, we provide our specific comments on the draft GSPs, particularly the GSP of the Eastern Tule GSA (ETGSA).

We support the stated intent in the Coordination Agreement as to the purpose of avoiding undesirable results in the context of land subsidence: "the avoidance of an undesirable result of land subsidence is to protect critical infrastructure for the beneficial uses within the Tule Subbasin, including excessive costs to fix, repair, or otherwise retrofit such infrastructure and may also result in an interim loss of benefits to the users of such infrastructure."[3] It cannot be disputed that the FKC is one of if not THE most critical infrastructure facility in the Tule Subbasin with respect to the conveyance of water for beneficial use. It also cannot be disputed, as documented in the GSPs, that groundwater pumping in the vicinity of the Canal has resulted in upwards of 9 feet of land subsidence in recent decades - several feet of which has occurred in recent years even after the adoption of SGMA.[4] Because the Canal's conveyance system relies on a "gravity" design, this subsidence has reduced the conveyance capacity of the Canal to 40% of its original capacity (from 4,000 to 1,650 cubic-feet per second (cfs)) in these subsided areas. The resulting constriction in the Canal is precluding the delivery of significant amounts of water to Friant Division Contractors (Friant Districts) below the subsided areas and also affects the ability to Friant Districts above the constricted area to engage in exchanges or transfers of water.

As a result of the persistent overdraft conditions in the Tule Subbasin, FWA, at considerable expense, is developing plans, undertaking environmental review, and pursuing permitting to address these existing subsidence impacts by restoring capacity through a project referred to as the "Friant-Kern Canal Middle Reach Capacity Correction Project" (Project). The current engineering estimates place the cost of the Project in excess of $500 million.

With this well-documented and undisputed background in mind, including the extensive information, analysis and modeling in the GSPs and their supporting technical appendices, FWA must express its dissatisfaction with both the proposed "minimum thresholds" for subsidence and the criteria used to define "undesirable results" with respect to future subsidence as applied to the FKC. Specifically, the draft GSPs provide for **up to three feet of additional subsidence along the Canal** caused by transitional pumping/use **BEFORE** the identified ***minimum thresholds*** are exceeded. This impact will be compounded by the reliance of the GSPs on the definition of undesirable results in the Coordination Agreement, which provides as follows:

> § 4.3.4.2 Criteria to Define Undesirable Results: "*the criteria for an undesirable result for land subsidence is defined as the unreasonable subsidence below minimum thresholds at* ***greater than 50% of GSA Management Area RMS*** *resulting in significant impacts to critical infrastructure*." (Emphasis added.)

Figure 5-1 of the GSP for the ETGSA identifies seven Representative Monitoring Sites (RMS) along the most severely subsided portion of the FKC covering a distance of approximately 12 miles measured from the Tule River at Avenue 152 to Avenue 80. Using the proposed criteria for defining an undesirable result, the "transitional" overdraft pumping will be permitted to potentially cause 3 additional feet of

[3] Coordination Agreement, § 4.3.4.3.
[4] ETGSA GSP, § 4.3.5; see also FWA's Friant-Kern Canal Fact Sheet (attached).

subsidence over at least a 4-6 mile area (the distance of 4 of 7 RMS (i.e., more than 50% of the Representative Monitoring Sites)) BEFORE being deemed an undesirable result.[5] This is not acceptable to FWA unless there is concurrent and corresponding mitigation in the form of compensation to FWA and the Friant Districts to pay for the damages resulting from such pumping as discussed further below.[6] If the GSAs agree to incorporate the prompt adoption of management actions that would provide reasonable compensation to address "interim" subsidence (i.e., the continuation of subsidence until the proposed "minimum thresholds" are reached), then FWA would not object to the GSPs maintaining these objectives, not as minimum thresholds that must be exceeded before management action is taken, but rather, as a basis for ***additional*** management actions, including greater compensation for damages to the Canal and Friant Districts and potential additional reductions in groundwater pumping to achieve sustainability sooner and avoid further impacts to the Canal if these so-called minimum thresholds are exceeded.

In addition to establishing a uniform zero-tolerance for additional subsidence impacts to the Canal absent appropriate compensation/mitigation, the criteria for monitoring any continued undesirable results for land subsidence as pertaining to the Canal need to be site specific and should be based on <u>any additional subsidence detected at a</u> <u>single RMS location</u>. Furthermore, because the FKC is critical infrastructure, FWA recommends that the Tule Subbasin GSPs incorporate additional RMS along the FKC for the entire length of the Tule Subbasin and that such RMS locations be spaced not more than one mile apart. Some of the Friant Districts are adding such monitoring sites for their own water banking/recharge projects near the FKC, and we would encourage the GSAs to incorporate these facilities as part of their subsidence monitoring management actions with respect to the FKC.

While the GSPs do not calculate the amount of capacity loss to the Canal from the contemplated 3 additional feet of subsidence that is predicted over the first 15 years of the GSPs, FWA estimates this capacity reduction to be on order of 460 cubic feet per second (cfs), which would result in a conveyance capacity of 1,140 cfs (based on current deficient conditions) and put the Canal capacity at 2,860 cfs below the original design capacity of 4,000 cfs. FWA further estimates that the 3 additional feet of subsidence contemplated under the GSPs will result in further reduced water deliveries to Friant Districts below the impacted area on the order of at least 30,000 to 40,000 acre feet (AF) per year, in addition to the already significant inability to convey water during wet years such as 2017 and 2019 where FWA estimates that upwards of 300,000 AF could have been delivered to Friant Districts <u>but for</u> the capacity restrictions caused by subsidence due to overdraft groundwater pumping in the Tule Subbasin. Under such conditions, Friant Districts' imported surface water supplies through the FKC will be even further restricted, which in turn will diminish their ability to contribute to the sustainable management of their own respective subbasins in the future.

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[5] See ETGSA GSP, § 5.8.3.1.2 (Quantified Minimum Thresholds).

[6] See Civil Code section 3479: "**Anything which is injurious to** health, including, but not limited to … an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, or unlawfully obstructs **the free passage or use**, in the customary manner, **of any** …**canal** … **is a nuisance**." (Emphasis added.) It is FWA's position that any pumping activity causing further subsidence to the Canal constitutes a nuisance unless appropriate compensation/mitigation is provided.

FWA is encouraged that the GSP for ETGSA establishes a "Friant-Kern Canal Subsidence Management Area." However, neither that Plan nor any of the other GSPs establish specific management actions or mitigation to address the continued subsidence impacts to the Canal despite the fact that the GSPs contemplate continued overdraft conditions (aka "transitional pumping/use") through the implementation period of 2040.[7]

For the above reasons, **all** further subsidence along the Canal as contemplated in the GSPs should be considered significant and unreasonable and deemed to substantially interfere with surface land uses unless appropriate mitigation is provided to fairly compensate FWA and the Friant Districts for such interference.[8] Accordingly, the GSPs should be revised to mandate the prompt adoption of management actions (following adoption of the GSP) that provide for such equitable compensation as a condition of the transitional groundwater pumping permitted under each GSP in areas where such pumping can reasonably be demonstrated to cause continued subsidence impacts to the Canal.

Given the acknowledged effects of continued subsidence proximate to the FKC, these immediate management actions to mitigate such impacts are required. To this end, concurrent with the adoption of the final GSPs, as amended to address the comments provided herein, FWA respectfully request that the Board of each GSA direct staff to continue to work with FWA and Friant Districts to promptly develop and bring back for adoption management actions that would establish mechanisms to mitigate future subsidence impacts in the form of compensation to FWA and Friant Districts to pay for the costs of repairs to the FKC resulting from the transitional pumping/use permitted under the GSPs as well as the reduced water deliveries to Friant Districts until such repairs are completed. This mitigation could come in the form of fees or charges imposed on groundwater pumping and/or assessments or charges spread over the lands benefitting from groundwater pumping permitted under the GSPs that have caused, and can reasonably be demonstrated will continue to cause, undesirable results to the Friant-Kern Canal.

On behalf of FWA, I appreciate your consideration of these comments. FWA staff looks forward to continued collaboration on prompt and appropriate actions that will help us move forward with our mandate to restore critically needed capacity to the Friant-Kern Canal.

Sincerely,

Jason Phillips, CEO

Attachment: FWA Subsidence Fact Sheet

[7] We acknowledge that the Delano-Earlimart GSP does contain management actions that assert it will achieve sustainability, but because the plan still anticipates that future subsidence will occur, more attention to address FWA's concerns regarding compensation for continuing subsidence impacts to the FKC is still warranted.
[8] See Water Code § 10721(x)(5).

GLEN MARTIN RANCHES

Glen and Geralyn Martin

1430 Pamela Circle – Porterville CA 93257

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December 16, 2019

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA) and a member of the Eastern Tule White Area Growers, Inc. (ETWAG).

The members of ETWAG formed our organization to give a voice to the many landowners within the GSA farming outside the boundaries of any water or irrigation district. ETWAG has submitted comments to the GSA regarding the GSA's draft Groundwater Sustainability Plan (GSP). We support ETWAG's comments, and we incorporate by reference that comment letter and its enclosed memorandum into this letter.

As landowners, we appreciate the GSA's work on our behalf. We look forward to continued collaboration as the GSA implements the adopted GSP.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Sincerely,

Glen E Martin

Glen E. Martin, Owner/Operator

Joseph D. Hughes 661-328-5217 jhughes@kleinlaw.com

4550 California Ave., Second Floor, Bakersfield, CA 93309
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December 12, 2019

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave.
Porterville, CA 93257

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

We are counsel for Eastern Tule White Area Growers, Inc. (ETWAG), and submit this comment letter on behalf of ETWAG. ETWAG appreciates the opportunity that Eastern Tule Groundwater Sustainability Agency (GSA) has provided for stakeholders to comment on the GSA's draft Groundwater Sustainability Plan (GSP). We understand and appreciate the efforts undertaken by the GSA and your consultants to reach this point. Our hope in submitting these comments is that the GSA will appropriately modify the draft GSP to address our concerns and those of our members.

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the draft GSP. In addition to those comments, we add the following.

A primary concern of our members is the apparent conclusion that the GSA will allocate groundwater according to gross acreage owned by landowners within the GSA. This is consistent with the GSA discussions in which we have been allowed to participate. Indeed, the draft Coordination Agreement dated September 16, 2019, uses the gross acreage method after dismissing historical use. Put simply, we disagree with your approach in both substance and process.

A gross acreage methodology ignores accepted legal principles and equitable considerations governing the allocation of native yield. We fear that the GSA is sacrificing fairness and the law for the sake of convenience. Historical use of groundwater and investment based on that productive use of the resource must be considered in the allocation methodology. ETWAG has previously provided the GSA with our position on this issue, which has not changed.

ETWAG also disagrees with the process by which the GSA is handling this critical issue of water rights. The draft Coordination Agreement notes that historic use of groundwater might be considered in the future. If the GSA recognizes now that historic use should be an element in the allocation of native yield, then the process should include that element. The GSA should not rush the process simply because the GSA wants the issue settled now. Further discussion and

stakeholder involvement on this issue could avoid unnecessary legal challenges. We urge the GSA to allow for more stakeholder engagement and, if necessary, dispute resolution before reaching its conclusion as to how native yield should be allocated.

We are encouraged that the draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits. Such a market system should be as flexible as possible to facilitate the needs of farmers with lands in different areas of the sub-basin. We ask that the GSA fully engage stakeholders who will be participating in a market as the GSA develops this groundwater management tool.

The GSA and its stakeholders have reached a significant milestone in completing a draft GSP and, in short order, submitting a final GSP to the Department of Water Resources. But as the GSA is aware and notes throughout the draft GSP, there is much work to be done in the implementation of the GSP. We urge the GSA to continue with active engagement of the stakeholders. The GSP is a planning document. Implementation will require collaboration, among other things, and ETWAG anticipates working closely with the GSA in that process.

Please feel free to contact us if you have any questions or wish to discuss any of our comments as you finalize the GSP.

Very truly yours,

Joseph D. Hughes

JDH:sbh

Enclosure

BONDY
Groundwater Consulting, Inc.

MEMORANDUM

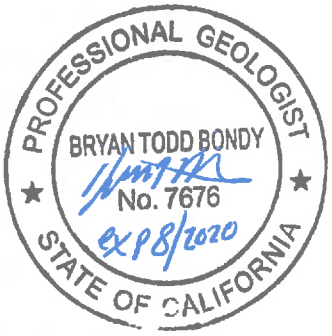
To: Eastern Tule White Area Growers, Inc.

From: Bryan Bondy, P.G., CHG / Bondy Groundwater Consulting, Inc.

CC: Project File

Date: December 13, 2019

Re: Evaluation of Eastern Tule Subbasin Draft Groundwater Sustainability Plan



Introduction

Eastern Tule White Area Growers, Inc. (ETWAG) retained Bondy Groundwater Consulting, Inc. (BGC) to review the September 2019 Draft Groundwater Sustainability Plan (GSP) for the Eastern Tule Subbasin prepared by the Eastern Tule Groundwater Sustainability Agency (ETGSA). This memorandum presents the results of BGC's evaluation, which are organized by GSP section.

Please note that the GSP review was focused on technical aspects of the GSP and it is understood that my firm's familiarity with the Tule Subbasin and time available for review were both limited. Furthermore, it is important to note that much of the GSP is based on groundwater modeling that is not yet documented in a publically available report; therefore, much of technical basis for the GSP cannot be reviewed at this time. Based on the foregoing, this review should not be considered exhaustive. Lack of comments on any particular section, issue, or topic should not be considered agreement with the associated content.

Overarching Comment

Much of the technical foundation of the GSP is provided by the groundwater flow model and simulations of future conditions made using the model. The groundwater flow model and the specifics of the modeling runs used to develop the projected future water budget, sustainable yield, sustainable management criteria (measureable objectives, interim milestones, and minimum thresholds) are not documented in a publically available report. Therefore, much of technical basis for the GSP cannot be reviewed at this time, which is obviously problematic for stakeholders who desire a review of the technical basis for the key aspects of the GSP.

BONDY
Groundwater Consulting, Inc.

Section 1 – Introduction

Comment 1-1: Executive Summary: The executive summary could do a better job of providing a more informative summary of the plan, including key groundwater conditions in the basin, undesirable results, and what actions will be taken to address undesirable results. Suggest providing more information.

Comment 1-2: Executive Summary: Statement that "...overdraft conditions have caused issues for those reliant on groundwater pumping..." is vague. What are the issues and are they considered significant and unreasonable?

Comment 1-3: Executive Summary: Description of the sustainability goal differs from that provided in Section 5.2.

Section 2 – Agency Information

Section not reviewed.

Section 3 – Description of Plan Area

Comment 3-1: Section 3.6 - Management Areas within ETGSA: The purposes of the six management areas listed in this section are vague. More information is need to understand how and why management might differ in the various management areas.

Comment 3-2: Figure 3-6 - Management Areas within the ETGSA: The "Friant-Kern Canal Subsidence Management Area" listed in Section 3.6 is not depicted on Figure 3-6, map of management areas within ETGSA.

Section 4 – Basin Setting

Comment 4-1: GSP Section 4.2.2 and Tule Subbasin Setting Section 2.1.3 Lateral Basin Boundaries: These sections state that 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." These sections should be revised to note that the southernmost portion of the eastern boundary near White River is the contact between the older sedimentary rocks and alluvial sediments.

BONDY
Groundwater Consulting, Inc.

Comment 4-2: GSP Section 4.2.3 and Tule Subbasin Setting Section 2.1.4 Bottom of Basin: These sections define the basin bottom as the contact between the Santa Margarita Formation (GSP) or Tertiary deposits (Tule Subbasin Setting) and granitic bedrock. The definitions differ between Section 4.2.3 and the Tule Subbasin Setting and should be reconciled. More importantly, the basin bottom definitions are inconsistent with the lateral basin boundary and SGMA.

The basin bottom definitions are inconsistent with the lateral basin boundary because neither the Santa Margarita Formation (GSP) or Tertiary deposits are included in the lateral basin boundary where they outcrop in the southeastern portion of the basin (See Figure 2-4 of the Tule Subbasin Setting). In other words, how can these units be included in the basin vertically, but not laterally?

SGMA defines "Basin" as a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to Chapter 3 (commencing with Section 10722). DWR's Bulletin 118 defines the basin as the Pliocene to Holocene continental deposits, including flood-basin deposits, younger alluvium, older alluvium, Tulare Formation, and undifferentiated continental deposits (Attachment A). The 2016 basin boundary modification was jurisdiction in nature and, therefore, did not modify the 2004 DWR description of the basin bottom.

Based on the foregoing, it appears the bottom of the GSP should define the basin bottom as the base of the oldest unit described by DWR (2004), i.e. the Tulare Formation. This is important because the basin bottom defines which hydrostratigraphic units are subject to regulation by the GSAs.

Comment 4-3: Tule Subbasin Setting Section – Figure 2-4: Cross Sections C-C', D-D', and E-E' depicted on Figure 2-4 are not provided in the document. In particular, including Cross Section C-C would presumably help illustrate the points made in early comments about the basin boundary.

Comment 4-4: GSP Section 4.2.6 and Tule Subbasin Setting Section 2.1.7.1 – Principal Aquifers and Aquitards: These sections identify the Pliocene Marine Deposits, Santa Margarita Formation, and Olcese Formation as principal aquifers within the basin. As pursuant to earlier comments, these units should not be listed as principal aquifers because they are not part of the basin.

BONDY
Groundwater Consulting, Inc.

Comment 4-5: GSP Section 4.2.6.2 and Tule Subbasin Setting Section 2.1.7.2 –Aquifer Physical Properties: The Tule Subbasin Setting should describe and show (on Tule Subbasin Setting Figures 2-10 through 2-13) the spatial distribution of textural data used to estimate hydraulic conductivity and storage properties. Any significant gaps should be identified and discussed, particularly in key areas, such as for the lower aquifer in subsidence areas, both in this section and Tule Subbasin Setting Section 2.1.8 – Uncertainty in the Hydrogeologic Conceptual Model.

Comment 4-6: GSP Section 4.3.6 and Tule Subbasin Setting Section 2.2.6 – Interconnected Surface Water Systems: Both sections conclude that there are no interconnected surface water systems in the basin. While this appears to be a potentially reasonable conclusion, the GSP does not provide the necessary technical justification for eliminating this sustainability indicator. DWR will be looking for such justification during its review of the GSP. This justification should be included in the GSP to prevent DWR from finding the GSP inadequate and so that further consideration of this sustainability indicator will not be required.

The discussion and analysis of percolating groundwater and subterranean streams included in GSP Section 4.3.6 is a separate issue from whether there are interconnected surface water systems within the basin. That discussion does not provide the justification needed for concluding there are no interconnected surface water systems in the basin. Instead, the technical justification should demonstrate that surface water is not hydraulically connected by a continuous saturated zone to the underlying aquifer and that the overlying surface water is not completely depleted at any location and time throughout the year, since 2015 and going forward. Specifically, the analysis should address the easternmost reaches of Tule River, Deer Creek, and White River where shallow groundwater depths are indicated in January 2015 (Tule Subbasin Setting Figure 2-26).

Comment 4-7: GSP Section 4.3.7 and Tule Subbasin Setting Section 2.2.7 – Groundwater Dependent Ecosystems: The GSP is not clear regrading whether groundwater dependent ecosystems are present in the basin, as required by the GSP Emergency Regulations. While groundwater dependent ecosystems do not appear to be a principal issue for the basin, the current level of characterization may be noted as a plan deficiency by DWR.

Comment 4-8: GSP Section 4.4.1 and Tule Subbasin Setting Section 2.3.1 – Surface Water Budget: The GSP and Tule Subbasin Setting state that the difference between estimated surface water inflows and outflows is 0.2 percent. This implies a greater level of accuracy for the surface water flows than actually exists. It is commonly known that there is considerable error in measuring/estimate inflow and outflow terms, ranging from a minimum of approximately 5%

for metered flows to 30+% for unmetered (estimated) flows. The uncertainty in the water balance terms should be estimated, reported in the GSP, and considered in a modeling sensitivity analysis to determine the impact on model calibration and sustainable yield estimation.

Comment 4-9: GSP Section 4.4.2.6 and Tule Subbasin Setting Section 2.3.2.6 – Sustainable Yield: The process for determining the sustainable yield is not documented sufficiently to critically evaluate. Specifically, the sustainable yield was developed using a groundwater flow model and simulations that are not documented in the draft GSP or other publically available report.

Groundwater inflow and outflow is a major consideration for determining the sustainable yield. Under historical conditions, the net inflow to the subbasin was estimated to be 53,000 acre-feet per year (118,000 acre-feet of inflow and 65,000 acre-feet of outflow). Under simulated future conditions, the net inflow to the subbasin from the model results is negative (-)34,000 acre-feet per year (54,000 acre-feet of inflow and 88,000 acre-feet of outflow). In other words, the model is predicting a 87,000 acre-feet per year decrease in net inflow to the basin under future conditions. Based on the information presented in the GSP, it appears that the reason for this is that the modeling does not consider groundwater level increases in neighboring subbasins that should be expected to occur as a result of SGMA implementation. In short, the modeling appears to significantly underestimate future net groundwater inflow to the subbasin. This is a material consideration given the magnitude of the difference between estimated historical versus simulated future net groundwater inflows. Given that the swing in net groundwater inflow is more than half of the sustainable yield, further evaluation of this aspect is certainly warranted.

The other consideration for groundwater outflow is the source of water. The Tule Subbasin Setting treats all groundwater inflows and outflows as native water for the purpose of estimating sustainable yield. In reality, groundwater flowing into or out of the subbasin is likely a mixture of native and non-native water, particularly for the upper aquifer. Likewise, recharge of imported water may displace native water out of the subbasin. It may be appropriate to treat groundwater inflows the same as native water when estimating the sustainable yield because that water was not imported into the basin by specific entities in the subbasin like imported surface water supplies are. However, more thought should be given to the treatment of groundwater outflows. In essence, the approach used in the Tule Subbasin Setting assumes that all groundwater flowing out of the basin is derived from native sources. Certainly some groundwater outflow is derived from recharge of imported sources and should probably not be included in the calculation of sustainable yield just like groundwater recharge and return flows

derived from imported sources of are excluded from the calculation. Consistent treatment of imported water is needed for an equitable assessment of the sustainable yield.

Lastly, the sustainable yield does not appear to be optimized and may be lower than it needs to be to prevent undesirable results. This is suggested by model simulated groundwater levels presented in the Tule Subbasin Setting appendices that show continuously rising groundwater levels after approximately 2030 in some areas of the subbasins (most notably many of the representative monitoring wells in ETGSA) versus other areas where groundwater levels are predicted to stabilize. This is likely the result of simulating a uniform application of sustainable yield across the subbasin. In other words, some areas could probably stand to pump more than allowed by a uniform distribution of sustainable yield without causing undesirable results. Differential pumping reductions could be considered to increase the overall yield of the subbasin. Financial incentives and/or projects to transfer water within the subbasin could be considered to address any inequities created by imposing differential pumping reductions.

Comment 4-10: GSP Section 4.5 - Management Areas: These sections describe five management areas, whereas six are described in Section 3.6 of the plan. The number of management areas needs to be clarified throughout the GSP.

The "Friant-Kern Canal Subsidence Management Area" is not discussed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4, but is listed in GSP Section 3.6. The GSP should clarify whether "Friant-Kern Canal Subsidence Management Area" is truly a management area, or simply a monitoring area as described in the Tule Subbasin Setting, page 45.

The purposes of the management areas listed in Section GSP Section 4.5 and Tule Subbasin Setting Section 2.4 are vague. More information is need to understand how and why management might differ in the various management areas.

Section 5 – Sustainable Management Criteria

Comment 5-1: The process for establishing measureable objectives and minimum thresholds for groundwater levels, groundwater storage, and land subsidence appears arbitrary and may not necessarily be designed to prevent undesirable results. As I understand the process, the groundwater flow model was run with future hydrology assumptions and assumed projects and management actions. The predicted groundwater levels (adjusted in some cases) and predicted land subsidence were then selected at 2025, 2030, and 2035 as the interim milestones and 2040 as the measureable objectives. The minimum threshold was then selected by subtracting measured groundwater level declines and subsidence during the recent 10-year

drought (2007-2016) from the measureable objective. In the case of the Friant-Kern Canal area, the deduction was limited to 3 feet, without explanation or justification. The process described in the GSP is backwards from what SGMA requires, which is to establish minimum thresholds based on metrics that prevent undesirable results and the establish measureable objectives and interim milestones that provide operational flexibility (essentially a safety factor so that the minimum thresholds are not exceeded).

In short, there is no nexus presented between the minimum thresholds and preventing undesirable results. For groundwater levels and storage, minimum thresholds in the upper aquifer may be unnecessarily high in many cases for preventing the undesirable result, which the coordinate agreements states is "a new productive well cannot be constructed". In the lower aquifer, the minimum threshold levels are below the top of screen in some wells, which potentially indicates conversion of the lower aquifer from confined to unconfined conditions that could have significant impacts on well performance and lifespan. For subsidence, the minimum thresholds are not linked in any way to the coordination agreement definition of undesirable results, which is "loss of a functionality of a structure or a facility to the point that, due to subsidence, the structure or facility cannot reasonably operate without either significant repair or replacement." The section does not provide any information to assess whether the subsidence minimum thresholds will prevent undesirable results or whether they are overly restrictive.

Perhaps there is more to the sustainable management criteria analysis that is not being described in this GSP section; nonetheless, the current sustainable management criteria discussion does not appear to meet the requirements of the GSP Emergency Regulations.

Comment 5-2: Tables 5-4 and 5-5 (IM, MO, and MTs for groundwater storage) are blank.

Section 6 – Monitoring Network

Section not reviewed.

Section 7 – Projects and Management Actions

Comment 7-1: Many good project concepts are presented in this section, most of which appear to lack specific plans of funding, which is to be expected at this stage. However, two concerns are noted. First, the GSP assumes that most of the projects will be developed and implemented by member agencies. This may create a significant challenge given that much of the GSA is comprised of white areas that do not have a district to lead the develop and implementation of

project(s). Perhaps the County would fill this role, but the GSP does not address this potentially significant issue. The other concern is the lack of projects specifically targeted to address key undesirable results, such as subsidence along the Friant-Kern Canal.

Because it is anticipated that competition for funding from GSA fees and competitive grants will be high, allocating limited available funds will likely be one of the most significant challenges faced by ETGSA and its partner GSAs within the subbasin and a will likely be a source of conflict. It is recommended that the ETGSA begin working internally and with the other subbasin GSAs to develop a process for screening and ranking projects for funding. This process should start immediately in anticipation of future rounds of Prop 1 funding for GSP implementation. The screening and ranking process should be heavily weighted toward projects that have the greatest impact on preventing undesirable results at the lowest cost. Projects that provided water supply benefits, but do not contribute significantly to preventing undesirable results should rank lower. Projects that screen high should be moved as quickly as possible into feasibility evaluation and design to maximize the potential for funding when grant opportunities present themselves.

Section 8 – Notices and Communications

Section not reviewed.

Section 9 – References and Technical Studies

Comment 9-1: Documentation of the groundwater model development, calibration, sensitivity analysis, and predictive simulations for the GSP should be provided.

BONDY
Groundwater Consulting, Inc.

Limitations

This memorandum was prepared by Bondy Groundwater Consulting, Inc. (BGC) for Eastern Tule White Area Growers, Inc. BGC has employed accepted geologic and hydrogeologic procedures and its opinions are made in accordance with generally accepted principles and practices of these professions. The analyses, conclusions, and recommendations contained in this memorandum reflect BGC's best judgment in light of the information readily available to BGC at the time of preparation, experience with similar projects, and project scope, schedule, and budget. All locations depicted and/or described in the memorandum are approximate and are provided as general information only. Interpretations, location descriptions, location depictions, conclusions, and other information presented in this memorandum should not be relied upon to site or design wells or any other infrastructure without field confirmation of assumptions and estimates made in this memorandum. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this memorandum.

Closing

Please contact me if you have any questions regarding this memorandum. The opportunity to assist Eastern Tule White Area Growers, Inc. is greatly appreciated.

BONDY
Groundwater Consulting, Inc.

Attachment A

San Joaquin Valley Groundwater Basin
Tule Subbasin

- Groundwater Basin Number: 5-22.13
- County: Tulare
- Surface Area: 467,000 acres (733 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Tule Groundwater Subbasin is generally bounded on the west by the Tulare County line, excluding those portions of the Tulare Lake Subbasin Water Storage District and Sections 29 and 30 of Township 23 South, Range 23 East, that area west of the Homeland Canal. This boundary is shared with the Tulare Lake Groundwater Subbasin. The northern boundary of the subbasin follows the northern boundaries of Lower Tule Irrigation District and Porterville Irrigation District and is shared with the Kaweah Groundwater Subbasin. The eastern boundary is at the edge of the alluvium and crystalline bedrock of the Sierra Nevada foothills, and the southern boundary is the Tulare-Kern County line and is shared with the Kern County Groundwater Basin

West-flowing Tule River, Deer Creek and the White River are the major drainages in the subbasin which empty into the Tulare lakebed. Annual average precipitation is seven to 11 inches, increasing eastward.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. It is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The sediments that comprise the subbasin's aquifer are continental deposits of Tertiary and Quaternary age (Pliocene to Holocene). These deposits include flood-basin deposits, younger alluvium, older alluvium, the Tulare Formation, and continental deposits undifferentiated.

The flood-basin deposits consist of relatively impermeable silt and clay interbedded with some moderately to poorly permeable sand layers that interfinger with the younger alluvium. These deposits are probably not important as a source of water to wells but may yield sufficient supplies for domestic and stock use. The younger alluvium is a complex of interstratified and discontinuous beds of unsorted to fairly well sorted clay, silt, sand, and gravel, comprising the materials beneath the alluvial fans in the valley and stream channels. Where saturated the younger alluvium is very permeable, but this unit is largely unsaturated and probably not important as a source of water to wells. The older alluvium consists of poorly sorted deposits of clay, silt, sand, and gravel. This unit is moderately to highly permeable and is a major source of water to wells. The Tulare Formation consists of poorly sorted deposits of clay, silt, sand, and gravel derived predominately from the Coast Ranges. It contains the Corcoran Clay Member, the major confining bed in the subbasin. The formation is moderately to highly permeable and yields moderate to large quantities of water to wells. The continental deposits undifferentiated consist of poorly sorted lenticular deposits of clay, silt, sand, and gravel derived from the Sierra Nevada. The unit is moderately to highly permeable and is a major source of ground water in the subbasin.

The estimated average specific yield for this subbasin is 9.5 percent. This estimation is based on DWR San Joaquin District internal data and Davis (1959).

Land subsidence of 12 to 16 feet due to deep compaction of fine-grained units has occurred in the subbasin (Ireland 1984).

Restrictive Structures

Groundwater flow is generally westward (DWR 2000). Groundwater elevation contours diverge from the path of the Tule and White Rivers in the north and south portions of the subbasin, respectively, suggesting that these drainages act as losing streams throughout most of their extent. Based on current and historical groundwater elevation maps, horizontal groundwater barriers do not appear to exist in the subbasin.

Recharge Areas

Groundwater recharge is primarily from stream recharge and from deep percolation of applied irrigation water (Hilton and others 1963; DWR 1995).

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased about four feet from 1970 through 2000. The period from 1970 to 1978 showed a general decline, bottoming out at 13 feet below 1970 levels in 1978. There is a steep increase in water levels in the ten-year period from 1978 to 1988, topping out at 20 feet above 1970 water levels in 1988. There is a very sharp decrease in water levels of 34 feet from 1988 to

1995, with the lowest level reached in 1993 at 16 feet below 1970 water levels. From 1995 to 2000, water levels generally increase, eventually reaching four feet above 1970 water levels in 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.5 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 14,600,000 af to a depth of 300 feet and 94,100,000 af to the base of fresh groundwater. These same calculations give an estimate of 9,100,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 33,000,000 af to a depth of $\leq$1000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

The natural recharge into the subbasin is estimated at 34,400 af. Artificial recharge and subsurface inflow are not determined. There is about 201,000 af of applied water recharge into the subbasin. Annual urban extraction and annual agricultural extraction are estimated to be 19,300 af and 641,000 af, respectively. Other extractions and subsurface outflow are not determined.

Groundwater Quality

Characterization. The water in the northern portion of this subbasin has a calcium bicarbonate type (Croft and Gordon 1968), while the southern portion of the subbasin is better characterized by a water chemistry of a sodium bicarbonate type (Hilton and others 1963). TDS values typically range from 200 to 600 mg/L. TDS values of shallow groundwater in drainage problem areas are as high as 30,000 mg/L (Fujii and Swain 1995). The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 65 wells ranging from 20 to 490 mg/L, with an average value of 256 mg/L

Impairments. There is shallow, saline groundwater in the western portion of the subbasin (Vink 2001). The eastern side of the subbasin has localized nitrate pollution.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	73	0
Radiological	71	3
Nitrates	71	6
Pesticides	73	1
VOCs and SVOCs	71	5
Inorganics – Secondary	73	10

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)
Municipal/Irrigation	Range: 50 – 3,000
	Total depths (ft)
Domestic	
Municipal/Irrigation	Range: 200 - 1,400

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency	
DWR (incl. Cooperators)	Groundwater levels	459	Semi-annually
Department of Health Services (and cooperators)	Title 22 Water quality	150	Varies

Basin Management

Groundwater management:	None
Water agencies	
Public	Alpaugh I.D., Angiloa W.D., Atwell Island W.D., Delano-Earlimart I.D., Ducor I.D., Kern-Tulare W.D., Lower Tule River I.D., Pixley I.D., Porterville I.D., Rag Gulch W.D., Saucelito I.D., Teapot Dome W.D., Terra Bella I.D., Vandalia I.D.
Private	California Water Service.

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Additional References

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Errata

Changes made to the basin description will be noted here.

GOLDEN GROVES RANCH COMPANY

310 Irving Drive, Oxnard CA 93030

December 16, 2019

VIA E-MAIL ONLY

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA) and a member of the Eastern Tule White Area Growers, Inc. (ETWAG).

The members of ETWAG formed our organization to give a voice to the many landowners within the GSA farming outside the boundaries of any water or irrigation district. ETWAG has submitted comments to the GSA regarding the GSA's draft Groundwater Sustainability Plan (GSP). We support ETWAG's comments, and we incorporate by reference that comment letter and its enclosed memorandum into this letter.

As landowners, we appreciate the GSA's work on our behalf. We look forward to continued collaboration as the GSA implements the adopted GSP.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Kind regards,

Mark E. Golden

Managing General Partner

December 16, 2019

VIA E-MAIL ONLY

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA). As landowner in the white area, I appreciate the GSA's work on my behalf and have the following concerns as to the Groundwater Sustainability Plan:

1) Allocation of groundwater based on Gross Acres with no consideration for historical use. Using Gross acres, including land without developed water sources and disregarding white area land holders investments in water infrastructure is unfair.

2) Governance of the GSA. The white growers make up over half of the acreage in the district and only have one vote on board. Representation is lacking.

3) Given this is a basin wide problem, a new irrigation district should be created that encompasses the entire basin as this would create the most efficient and fair way to allocate water in the basin.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Sincerely,

Khalid Arain
Land Owner

KINGSBURG
Citrus Ranch Management

December 12, 2019

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W Morton Ave.
Porterville, CA 93257

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

We are counsel for Eastern Tule White Area Growers, Inc. (ETWAG), and submit this comment letter on behalf of ETWAG. ETWAG appreciates the opportunity that Eastern Tule Groundwater Sustainability Agency (GSA) has provided for stakeholders to comment on the GSA's draft Groundwater Sustainability Plan (GSP). We understand and appreciate the efforts undertaken by the GSA and your consultants to reach this point. Our hope in submitting these comments is that the GSA will appropriately modify the draft GSP to address our concerns and those of our members.

Enclosed with this letter is a memorandum prepared by our consultant, Bondy Groundwater Consulting, Inc., focusing on the technical issues and concerns identified during their review of the draft GSP. In addition to those comments, we add the following.

A primary concern of our members is the apparent conclusion that the GSA will allocate groundwater according to gross acreage owned by landowners within the GSA. This is consistent with the GSA discussions in which we have been allowed to participate. Indeed, the draft Coordination Agreement dated September 16, 2019, uses the gross acreage method after dismissing historical use. Put simply, we disagree with your approach in both substance and process.

A gross acreage methodology ignores accepted legal principles and equitable considerations governing the allocation of native yield. We fear that the GSA is sacrificing fairness and the law for the sake of convenience. Historical use of groundwater and investment based on that productive use of the resource must be considered in the allocation methodology. ETWAG has previously provided the GSA with our position on this issue, which has not changed.

ETWAG also disagrees with the process by which the GSA is handling this critical issue of water rights. The draft Coordination Agreement notes that historic use of groundwater might be considered in the future. If the GSA recognizes now that historic use should be an element in the allocation of native yield, then the process should include that element. The GSA should not rush the process simply because the GSA wants the issue settled now. Further discussion and

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stakeholder involvement on this issue could avoid unnecessary legal challenges. We urge the GSA to allow for more stakeholder engagement and, if necessary, dispute resolution before reaching its conclusion as to how native yield should be allocated.

We are encouraged that the draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits. Such a market system should be as flexible as possible to facilitate the needs of farmers with lands in different areas of the sub-basin. We ask that the GSA fully engage stakeholders who will be participating in a market as the GSA develops this groundwater management tool.

The GSA and its stakeholders have reached a significant milestone in completing a draft GSP and, in short order, submitting a final GSP to the Department of Water Resources. But as the GSA is aware and notes throughout the draft GSP, there is much work to be done in the implementation of the GSP. We urge the GSA to continue with active engagement of the stakeholders. The GSP is a planning document. Implementation will require collaboration, among other things, and ETWAG anticipates working closely with the GSA in that process.

Please feel free to contact us if you have any questions or wish to discuss any of our comments as you finalize the GSP.

Very truly yours,

Bruce F. Kelsey

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Eastern Tule GSA
Lower Tule River Irrigation District GSA
Pixley Irrigation District GSA
Delano-Earlimart Irrigation District GSA
Tri-County Water Authority GSA
Alpaugh GSA

RE: Public Comments to Tule Basin Groundwater Sustainability Plans (GSP)

To: Directors and Staff of the Referenced Groundwater Sustainability Agencies

Lindsay Strathmore Irrigation District supports the comment letter dated December 16, 2019, submitted on behalf of Friant Water Authority concerning your Groundwater Sustainability Plans (GSP) for the Tule Subbasin. By and through this letter, the District adopts each comment and objection in that letter as its own, along with any exhibits or attachments to that letter, and incorporates herein by this reference all such comments, objections, and documents.

The District specifically wants to emphasize the importance of addressing and resolving the ongoing subsidence issues with the Friant-Kern Canal that are caused or exacerbated by groundwater pumping in the Tule Subbasin. Allowing for three (3) additional feet of subsidence along the Friant-Kern Canal is unacceptable without adequate mitigation. Nor is it acceptable to further handicap this issue by requiring more than 50% of the seven (7) monitoring sites to show three (3) feet of subsidence before considering this matter an undesirable result. To prevent further water supply loss and economic injury to the Friant Contractors, the District urges you to meaningfully address and resolve the issue of subsidence in your GSPs, including undertaking the actions suggested by Friant Water Authority.

Sincerely,

Craig N. Wallace
General Manager
Lindsay-Strathmore Irrigation District

cc. LSID Board of Directors
Friant Water Authority
District Legal Counsel

MAC RANCHES
P. O. BOX 2732
Visalia, California 93279
(559) 635-8184 (559) 635-8187 - Fax

December 13, 2019

VIA E-MAIL ONLY

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo:

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA) and a member of the Eastern Tule White Area Growers, Inc. (ETWAG).

The members of ETWAG formed our organization to give a voice to the many landowners within the GSA farming outside the boundaries of any water or irrigation district. ETWAG has submitted comments to the GSA regarding the GSA's draft Groundwater Sustainability Plan (GSP). We support ETWAG's comments, and we incorporate by reference that comment letter and its enclosed memorandum into this letter.

As landowners, we appreciate the GSA's work on our behalf. We look forward to continued collaboration as the GSA implements the adopted GSP.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Sincerely,

John Matthiessen

December 16, 2019

Sent via email to info@easterntulegsa.com

Re: Comments on Draft Groundwater Sustainability Plan for Eastern Tule Groundwater Basin

To Whom It May Concern,

On behalf of the above-listed organizations, we would like to offer the attached comments on the draft Groundwater Sustainability Plan for the Eastern Tule Groundwater Basin. Our organizations are deeply engaged in and committed to the successful implementation of the Sustainable Groundwater Management Act (SGMA) because we understand that groundwater is a critical piece of a resilient California water portfolio, particularly in light of our changing climate. Because California's water and economy are interconnected, the sustainable management of each basin is of interest to both local communities and the state as a whole.

Our organizations have significant expertise in the environmental needs of groundwater and the needs of disadvantaged communities.

- The Nature Conservancy, in collaboration with state agencies, has developed several tools[1] for identifying groundwater dependent ecosystems in every SGMA groundwater basin and has made that tool available to each Groundwater Sustainability Agency.
- Local Government Commission supports leadership development, performs community engagement, and provides technical assistance dealing with groundwater management and other resilience-related topics at the local and regional scales; we provide guidance and resources for statewide applicability to the communities and GSAs we are working with directly in multiple groundwater basins.
- Audubon California is an expert in understanding wetlands and their role in groundwater recharge and applying conservation science to develop multiple-benefit solutions for sustainable groundwater management.
- Community Water Center (CWC) acts as a catalyst for community-driven water solutions through organizing, education, and advocacy. CWC seeks to build and enhance leadership capacity and local community power around water issues, create a regional movement for water justice in California, and enable every community to have access to safe, clean, and affordable drinking

[1] https://groundwaterresourcehub.org/

water. CWC has supported SGMA implementation through hosting several technical capacity building workshops, developing SGMA education materials, and supporting local leadership and community engagement.

- Clean Water Action and Clean Water Fund are sister organizations that have deep expertise in the provision of safe drinking water, particularly in California's small disadvantaged communities, and co-authored a report on public and stakeholder engagement in SGMA[2].

Because of the number of draft plans being released and our interest in reviewing every plan, we have identified key plan elements that are necessary to ensure that each plan adequately addresses essential requirements of SGMA. A summary review of your plan using our evaluation framework is attached to this letter as Appendix A. Our hope is that you can use our feedback to improve your plan before it is submitted in January 2020.

This review does not look at data quality but instead looks at how data was presented and used to identify and address the needs of disadvantaged communities (DACs), drinking water and the environment. In addition to informing individual groundwater sustainability agencies of our analysis, we plan to aggregate the results of our reviews to identify trends in GSP development, compare plans and determine which basins may require greater attention from our organizations.

Key Indicators

Appendix A provides a list of the questions we posed, how the draft plan responds to those questions and an evaluation by element of major issues with the plan. Below is a summary by element of the questions used to evaluate the plan.

1. Identification of Beneficial Users. This element is meant to ascertain whether and how DACs and groundwater-dependent ecosystems (GDEs) were identified, what standards and guidance were used to determine groundwater quality conditions and establish minimum thresholds for groundwater quality, and how environmental beneficial users and stakeholders were engaged through the development of the draft plan.
2. Communications plan. This element looks at the sufficiency of the communications plan in identifying ongoing stakeholder engagement during plan implementation, explicit information about how DACs were engaged in the planning process and how stakeholder input was incorporated into the GSP process and decision-making.
3. Maps related to Key Beneficial Uses. This element looks for maps related to drinking water users, including the density, location and depths of public supply and domestic wells; maps of GDE and interconnected surface waters with gaining and losing reaches; and monitoring networks.
4. Water Budgets. This element looks at how climate change is explicitly incorporated into current and future water budgets; how demands from urban and domestic water users were incorporated; and whether the historic, current and future water demands of native vegetation and wetlands are included in the budget.
5. Management areas and Monitoring Network. This element looks at where, why and how management areas are established, as well what data gaps have been identified and how the plan addresses those gaps.

[2] https://www.cleanwater.org/publications/collaborating-success-stakeholder-engagement-sustainable-groundwater-management-act

6. Measurable Objectives and Undesirable Results. This element evaluates whether the plan explicitly considers the impacts on DACs, GDEs and environmental beneficial users in the development of Undesirable Results and Measurable Objectives. In addition, it examines whether stakeholder input was solicited from these beneficial users during the development of those metrics.
7. Management Actions and Costs. This element looks at how identified management actions impact DACs, GDEs and interconnected surface water bodies; whether mitigation for impacts to DACs is discussed or funded; and what efforts will be made to fill identified data gaps in the first five years of the plan. Additionally, this element asks whether any changes to local ordinances or land use plans are included as management actions.

Conclusion

We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss our evaluation as you finalize your Plan for submittal to DWR. Feel free to contact Suzannah Sosman at suzannah@aginnovations.org for more information or to schedule a conversation.

Sincerely,

Jennifer Clary
Water Program Manager
Clean Water Action/Clean Water Fund

Danielle V. Dolan
Water Program Director
Local Government Commission

Samantha Arthur
Working Lands Program Director
Audubon California

Adriana Renteria
Regional Water Management Coordinator
Community Water Center

Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

Appendix A
Review of Public Draft GSP

Groundwater Basin/Subbasin: Tule Subbasin (DWR 5.22-13)
GSA: Eastern Tule GSA
GSP Date: September 2019 Public Review Draft, revised 10/2/2019

1. Identification of Beneficial Users

Were key beneficial users identified and engaged?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
(a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.
GSP Element 2.2.2, "Groundwater Conditions" (§354.16):
(d) Groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes.
(f) Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
(g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
GSP Element 3.3, "Minimum Thresholds" (§354.28):
(4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page[1])
1. Do beneficial users (BUs) identified within the GSP area include:	a. Disadvantaged Communities (DACs)	X			"Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems -SDACs include the communities of Terra Bella, Ducor, Richgrove and East Porterville. City of Porterville is considered a DAC." Pursuant SB 244, County of Tulare undertook and included as Appendix D of the Tulare County GP a Disadvantaged Communities Assessment. This Assessment provides an inventory of water and sewer systems, services, and connections for the County's disadvantaged communities. Communities described in this report that wholly or partially reside within ETGSA include East Porterville, Terra Bella, Ducor, Richgrove, Poplar-Cotton Center, Deer Creek Colony, Ponca, Worth, Zante, and Jones Corner.	Appendix 8-A, Page 326 Section 3.13.1.1.3 Water Resources and Supply, page 128
	b. Tribes		X		"The Agency has not identified at this time any Native American Tribes located within the boundaries of the Agency. However, the Tule Indian Tribe on the South Fork of the Tule River is located to the east of ETGSA's boundaries."	Appendix 8-A, Page 326
	c. Small community public water systems (<3,300 connections)	X			"Public water system operators within the Agency not included in the municipal well operator category above include the California Water Services Company, Del Oro Water Company, Ducor Community Services	Appendix 8-A, Page 326

[1] Page numbers refer to the page of the PDF.

						District, Porter Vista Public Utility District, and Richgrove Community Services District. Terra Bella Irrigation District also provides drinking water to residents within its jurisdiction."	
2.	What data were used to identify presence or absence of DACs?	a. DWR DAC Mapping Tool[2]		X		The data source is not clear from the GSP.	
		i. Census Places			X		
		ii. Census Block Groups			X		
		iii. Census Tracts			X		
		b. Other data source		X			
3.	Groundwater Conditions section includes discussion of:	a. Drinking Water Quality	X			"While nitrate is not an issue for agricultural irrigation or dairy supply, elevated nitrate in groundwater from small domestic supply wells could limit the beneficial use of water where these wells are impacted."	Appendix A - Attachment 2 - 2.2.4, Page 747
		b. California Maximum Contaminant Levels (CA MCLs)[3] (or Public Health Goals where MCL does not exist, e.g. Chromium VI)	X			"Nitrate concentrations in excess of the Maximum Contaminant Level (MCL) of 45 mg/L have been detected in some wells, particularly in the northwest portion of the subbasin (see Figure 2-15)."	Appendix A - Attachment 2 - 2.2.4, Page 747
4.	What local, state, and federal standards or plans were used to assess drinking water BUs in the development of Minimum Thresholds (MTs)?	a. Office of Environmental Health Hazard Assessment Public Health Goal (OEHHA PHGs)[4]		X			
		b. CA MCLs[3]	X			"any specific Title 22 MCL exceedance at baseline sampling event in Spring 2020" will be monitored.	5.7.2.1.2, Page 225
		c. Water Quality Objectives (WQOs) in Regional Water Quality Control Plans		X			
		d. Sustainable Communities Strategies/ Regional Transportation Plans[5]		X			
		e. County and/or City General Plans, Zoning Codes and Ordinances[6]		X			
5.	Does the GSP identify how environmental BUs and environmental stakeholders were engaged throughout the development of the GSP?		X			"Following formation, the Agency formed its Interested Parties List, distributed applications for the appointment of members of the public to the Stakeholder Committee, advertised in local media regarding its formation and solicitation of Stakeholder Committee members, posted notice and held a hearing regarding its intent to become an exclusive GSA, resolved to become a GSA, notified DWR of its resolve to become a GSA, and was approved by DWR on June 6, 2017 to serve as one of seven exclusive GSAs within the Tule Subbasin. Input from stakeholders and beneficial users of groundwater was received throughout this process during Board and Executive Committee meetings, which were held during this time and open to both the public and to public comment." 2.1 Stakeholder Group	Appendix 8-A, page 323

[2] DWR DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/
[3] CA MCLs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html
[4] OEHHA PHGs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html
[5] CARB: https://ww2.arb.ca.gov/resources/documents/scs-evaluation-resources
[6] OPR General Plan Guidelines: http://www.opr.ca.gov/planning/general-plan/

				"The following list identifies stakeholder groups who have an interest in the beneficial use of groundwater, as assessed by ETGSA to date, pursuant to CWC § 10723.2: • Agricultural users - Approximately half of the Agency's area is composed of agricultural land. Many of those who farm this land use groundwater to irrigate their crops. … Environmental users of groundwater - At this time, the Agency is not aware of any environmental users of groundwater within the Agency's boundaries. Nonetheless, environmental groups are encouraged to partake in the phases of GSP development and a member of the Sequoia Riverlands Trust serves on the ETGSA Stakeholder Committee."	Appendix 8-A, page 326
				3.1 Stakeholder survey "Modelled after DWR's Stakeholder Survey Template, ETGSA has created an initial Stakeholder Survey with the following questions: • Are you familiar with the Sustainable Groundwater Management Act (SGMA) Regulations? … The Stakeholder Survey was made available online on ETGSA's website in mid-August, 2018. It is being advertised at ETGSA's regular meetings and has been included in the correspondence and regular newsletters of some of the entities identified in Section 2."	Appendix 8-A, page 333

Summary/ Comments

It appears that the Tulare County General Plan was used to identify disadvantaged communities. However, the disadvantaged community needs assessment in Appendix D doesn't identify how those communities were identified. It may be helpful to use an overlay of the DWR DAC mapping tool to ensure that all DACS have been identified, including domestic well users and small water systems (5-14 connections).

2. Communications Plan

How were key beneficial users engaged and how was their input incorporated into the GSP process and decisions?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:
(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.
(d) A communication section of the Plan that includes the following:
(1) An explanation of the Agency's decision-making process.
(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.
(3) A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
(4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

DWR Guidance Document for GSP Stakeholder Communication and Engagement[7]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Is a Stakeholder Communication and Engagement Plan (SCEP) included?	X			Communication and Engagement Plan, dated October 4, 2018	Appendix 8-A, Page 310
2. Does the SCEP or GSP identify that ongoing engagement will be conducted during GSP implementation?	X			"Phase 4 will begin following submission of the adopted GSP to DWR, which is expected to occur between mid-2019 and January 31, 2020. ETGSA's Phase 4 communication will focus on educating constituents of the new policies, ordinances, rules, and long-term plans that will come into effect in order to achieve sustainable groundwater management by 2040. Active involvement will be continually encouraged during the implementation and reporting phase, and ETGSA will provide public notice prior to the imposition or increase of any fees (pursuant SGMA's requirements)." Section 6 lists the outreach timeline which includes "historical events related to ETGSA's outreach and its planned future activities."	Appendix 8-A, Page 325, 349
3. Does the SCEP or GSP specifically identify how DAC beneficial users were engaged in the planning process?	X			"Stakeholder Committee: An advisory committee composed of eleven members of the public appointed by the Board who represent the interests of the environment, Richgrove Community Services District, Ducor Community Services District, agriculture, and all other interests of beneficial uses and users of groundwater. The Board often recommends items for consideration by the Stakeholder Committee who reports its recommendation to the Executive Committee who reports the recommendations of the Stakeholder Committee to the Board. However, the Stakeholder Committee can, if directed by the Board or upon request, report directly to the Board. A quorum of the members consists of a simple majority of the members, and an	Appendix 8-A, Page 321, 327

[7] DWR Guidance Document for GSP Stakeholder Communication and Engagement
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Document-for-Groundwater-Sustainability-Plan---Stakeholder-Communication-and-Engagement.pdf

				affirmative vote of at least a majority of those in attendance at the meeting is required for any action." "Many entities that may represent and advocate for the interests of the above stakeholder groups have been identified by ETGSA (Table 3). ETGSA sees these entities as a critical part of ETGSA's outreach plan and will attempt to engage with as many of these entities as possible." The organizations that represent DACs include Community Water Center, Porterville Area Coordinating Council, Porterville United for Justice, Self-Help Enterprises, and Sí Se Puede en Ducor. No specific actions are discussed in the GSP.	
4. Does the SCEP or GSP explicitly describe how stakeholder input was incorporated into the GSP process and decisions?	**X**			Phase 1: GSA Formation and Coordination "Input from stakeholders and beneficial users of groundwater was received throughout this process during Board and Executive Committee meetings, which were held during this time and open to both the public and to public comment." Phase 2: GSP Preparation and Submission "Phase 2 is ongoing. This Phase began on June 7th, 2018 (following approval from DWR to serve as an exclusive GSA). […] During the development of the draft, ETGSA will engage with stakeholders directly through a number of venues for the purpose of educating the general public, soliciting feedback and input, ensuring that all beneficial users of groundwater are given the opportunity to have their concerns considered, and developing a draft GSP that is informed by an engaged constituency. The Board of Directors approved a Timeline for Draft GSP Completion at its September 6th, 2018 meeting that outlines ETGSA's intended draft GSP development schedule (Figure 3). The Timeline is posted on the Agency's website and a link was distributed to ETGSA's Interested Parties List on September 7, 2018 in an effort to communicate its intended schedule with members of the public and to invite their participation in the draft GSP development process in an up-to-date manner. Additionally, the Board of Directors approved at its September 6th, 2018 meeting a series of Policy Points for consideration. These Policy Points, and their associated schedule and process for consideration, are intended to assist ETGSA in developing various potential Management Actions and other components of its GSP in a manner that provides for stakeholder participation and input. The Policy Points can be found on ETGSA's website (http://easterntulegsa.com/resources/). In addition to being discussed at the Executive and Stakeholder Committees, members of the public may also submit their comments using this link (https://goo.gl/forms/BXWrzQf3l5bmS6Ct2). The intent is to receive all comments and recommendations by the December 6th, 2018 Board meeting." Section 6 lists the outreach timeline which includes "historical events related to ETGSA's outreach and its planned future activities."	Appendix 8-A, Page 322, 349

				Section 5.3 "The Sustainable Management Criteria (hereafter "SMC") discussed and established in this Section were developed in consultation with ETGSA's member agencies, local stakeholders, Tule Subbasin GSA counterparts, technical leads, regional partners, interbasin stakeholders, and many other interested parties." … "Soliciting public feedback through public comment, Stakeholder Surveys, written correspondence, formal meetings, and informal meetings to gather information on local values, locally relevant groundwater issues, and how local stakeholders might define groundwater conditions that they consider to be undesirable; and"	5.3, page 206-207

Summary/ Comments

It is important that stakeholder engagement be maintained through the development of future projects and management actions and other SGMA compliance and implementation steps, and that such engagement be tailored for diverse audiences, including environmental interests and disadvantaged communities.

3. Maps Related to Key Beneficial Uses

Were best available data sources used for information related to key beneficial users?

Selected relevant requirements and guidance:
GSP Element 2.1.4 "Additional GSP Elements" (§354.8):
Each Plan shall include a description of the geographic areas covered, including the following information:
(a) One or more maps of the basin that depict the following, as applicable:
(5) The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the Department, as specified in Section 353.2, or the best available information.

GSP Element 3.5 Monitoring Network (§354.34)
(b) Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation. The monitoring network objectives shall be implemented to accomplish the following:
(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:
(1) Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:
(A) A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.
(4) Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.
(6) Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:
(A) Flow conditions including surface water discharge, surface water head, and baseflow contribution.
(B) Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.
(C) Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.
(D) Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.
(f) The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:
(3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP Include Maps Related to Drinking Water Users?	a. Well Density	X			Figure 3-9: Wells within ETGSA Well Use Type	3.9, Page 108
	b. Domestic and Public Supply Well Locations & Depths		X		Well locations are provided in Figure 3-9, but this figure does not differentiate between types of wells (i.e., domestic, public supply, and agricultural). No information on well depths is provided.	3.9, Page 108
	i. Based on DWR Well Completion Report Map Application[8]?	X			"The counting, categorization, and density of wells within ETGSA is based on the DWR's Well Completion Report Map Application tool." Well depths are available from the same tool but not presented in the GSP.	3.9, Page 108

[8] DWR Well Completion Report Map Application: https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

	ii. Based on Other Source(s)?		X			
2. Does the GSP include maps related to Groundwater Dependent Ecosystem (GDE) locations?	a. Map of GDE Locations	X			Figure 3-10: Potentially Groundwater Dependent Ecosystems within ETGSA "Section 4.3.7 notes that GDEs are unlikely to occur in the Tule Subbasin given that the average depth to groundwater relative to the root zone for groundwater dependent plants is well below those plants' roots systems." "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. Based on the CDWR Groundwater Dependent Ecosystems database (www.groundwaterresourcehub.org), the deepest root zones for groundwater dependent plants in the Tule Subbasin are for Valley Oak, which can reach a depth of approximately 25 feet. Figure 2-26 is a depth to groundwater map based on groundwater levels in January 2015. As shown, there were no areas of the subbasin where the groundwater was within 25 feet of the land surface at that time. It is noted that there may be periods of time when the groundwater level is within 25 feet of the land surface in some areas of the subbasin. The areas most likely to support groundwater dependent ecosystems are along the Tule River in and upstream of Porterville, and in the upper reaches of Deer Creek and White River."	3.10.1, page 110 Attachment 2, 2.2.7, page 749
	b. Map of Interconnected Surface Waters (ISWs)		X		"Surface water features are addressed in Section 4.2.4 of this GSP, as well as in Chapter 2.1.5 and 2.2.7 of the Tule Subbasin Setting. As presently assessed, there is no indication of interconnected surface water systems within the Tule Subbasin per the definition provided in 23 CCR § 351(o)."	4.3.6, page 181
	i. Does it identify which reaches are gaining and which are losing?		X			
	ii. Depletions to ISWs are quantified by stream segments.		X			
	iii. Depletions to ISWs are quantified seasonally.		X			
3. Does the GSP include maps of monitoring networks?	a. Existing Monitoring Wells	X			Figure A1-2. Existing and Proposed Upper Aquifer Groundwater Level Monitoring Well Locations Figure A1-5. Existing and Proposed Lower Aquifer Groundwater Level Monitoring Well Locations	Appendix A - Attachment 1, Page 465, 468
	b. Existing Monitoring Well Data sources: i. California Statewide Groundwater Elevation Monitoring (CASGEM)	X			"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."	Appendix A – 3.2.1.1, Page 372
	ii. Water Board Regulated monitoring sites	X			"Several state programs collect and monitor groundwater data, including: • DWR Water Data Library; • DWR California Data Exchange Center; • SWRCB Groundwater Ambient Monitoring and Assessment program; and • California Statewide Groundwater Elevation Monitoring program."	3.11.1.1, Page 112
	iii. Department of Pesticide Regulation (DPR) monitoring wells	X			"Figure 3-12: Groundwater Protection Areas within ETGSA provides a map that visualizes the GWPAs currently within ETGSA's jurisdiction. As a part of DPR's groundwater protection program, it also maintains a statewide database of wells sampled for pesticides.	3.11.3.3, Page 118

	c. SGMA-Compliance Monitoring Network	X			Figure 6-1: RMS for Monitoring Groundwater Levels Figure 6-2: RMS for Monitoring Groundwater Quality Figure 6-3: RMS for Monitoring Land Subsidence	6.2.3.1, Page 267 6.2.3.4, Page 269 6.2.3.5, Page 271
	i. SGMA Monitoring Network map includes identified DACs?	X				
	ii. SGMA Monitoring Network map includes identified GDEs?		X			

Summary/ Comments

The GSP should include detailed information about the location and depths of domestic wells. Providing maps of the monitoring network overlaid with location of DACs, domestic wells, community water systems, GDEs, and any other sensitive beneficial users will allow the reader to evaluate the adequacy of the network to monitor conditions near these beneficial users.

Based on a study TNC recently submitted to Frontiers in Environmental Science Journal, they have observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Given this, the GSP should use depth to groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. Please refer to TNC's guidance on Identifying GDEs Under SGMA (https://groundwaterresourcehub.org/public/uploads/pdfs/TNC_NCdataset_BestPracticesGuide_2019.pdf) for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. The GSP should provide more discussion to verify that there are no ISWs or GDEs in the plan area.

4. Water Budgets

How were climate change projections incorporated into projected/future water budget and how were key beneficial users addressed?

Selected relevant requirements and guidance:
GSP Element 2.2.3 "Water Budget Information" (Reg. § 354.18)
Each Plan shall include a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored. Water budget information shall be reported in tabular and graphical form.

*Projected water budgets shall be used to estimate future baseline conditions of supply, **demand**, and aquifer response to Plan implementation, and to identify the uncertainties of these projected water budget components. The projected water budget shall utilize the following methodologies and assumptions to estimate future baseline conditions concerning hydrology, water demand and surface water supply availability or reliability over the planning and implementation horizon:*
(b) The water budget shall quantify the following, either through direct measurements or estimates based on data:
(5) If overdraft conditions occur, as defined in Bulletin 118, the water budget shall include a quantification of overdraft over a period of years during which water year and water supply conditions approximate average conditions.
(6) The water year type associated with the annual supply, demand, and change in groundwater stored.
(c) Each Plan shall quantify the current, historical, and projected water budget for the basin as follows:
*(1) Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, **water demand**, and land use information.*

DWR Water Budget BMP[9]
DWR Guidance for Climate Change Data Use During GSP Development and Resource Guide[10]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are climate change projections explicitly incorporated in future/ projected water budget scenario(s)?	X			"The model projection also incorporated adjustments to the hydrology and water deliveries to account for potential climate change."	Appendix A - Attachment 2 - 2.3.5, Page 773
2. Is there a description of the methodology used to include climate change?	X			"Baseline Tule River flows, Friant-Kern Canal deliveries, and the State Water Project's California Aqueduct deliveries used in the future projection for the model were adjusted to account for projections of future climate change. Adjustments were applied based on output from the DWR's CalSim-II model, which provided adjusted historical hydrology for major drainages and imported supplies based on scenarios recommended by the DWR Climate Change Technical Advisory Group. Climate change adjustments to hydrology and surface water	Appendix A - Attachment 2 - 2.3.5, Page 773

[9] DWR BMP for the Sustainable <management of Groundwater Water Budget: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-4-Water-Budget.pdf
[10] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf

						deliveries were applied over two time periods within the SGMA planning horizon, as defined by California Water Commission (2016): 1. A 2030 central tendency time period, which provides near-term projections of potential climate change impacts on hydrology, centered on the year 2030, and 2. A 2070 central tendency time period, which provides long-term projections of potential climate change impacts on hydrology, centered on the year 2070. For imported water supplies from the Friant-Kern Canal, TH&Co utilized projected delivery schedules from the Friant Water Authority (Friant Water Authority, 2018). The projected water deliveries include adjustments to supplies associated with the planned San Joaquin River Restoration Project (SJRRP). Adjustments to Friant-Kern Canal supplies to account for climate change and SJRRP were applied beginning in 2025. The adjustments were applied incrementally between 2025 and 2030 such that the full adjustments were in effect in 2030. TH&Co applied the 2070 central tendency time period climate-related adjustments to imported water deliveries in the Tule Subbasin model projection for the period from 2050 to 2070."	
3. What is used as the basis for climate change assumptions?	a. DWR-Provided Climate Change Data and Guidance[11]		X			"Adjustments were applied based on output from the DWR's CalSim-II model, which provided adjusted historical hydrology for major drainages and imported supplies based on scenarios recommended by the DWR Climate Change Technical Advisory Group."	Appendix A - Attachment 2 - 2.3.5, Page 773
	b. Other			X			
4. Does the GSP use multiple climate scenarios?				X			
5. Does the GSP quantitatively incorporate climate change projections?			X			See above. Results of the projected water budget are presented in Table 3a, 3b and 4.	Appendix A - Attachment 2 - 2.3.5, Page 773 Table 3a, 3b, 4, Page 859-861
6. Does the GSP explicitly account for climate change in the following elements of the future/projected water	a. Inflows:	i. Precipitation		X		"Baseline Tule River flows, Friant-Kern Canal deliveries, and the State Water Project's California Aqueduct deliveries used in the future projection for the model were adjusted to account for projections of future climate change."	Appendix A - Attachment 2 - 2.3.5, Page 773
		ii. Surface Water	X				
		iii. Imported Water	X				
		iv. Subsurface Inflow		X			
	b. Outflows:	i. Evapotranspiration		X			

[11] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf
DWR Resource Guide DWR-Provided Climate Change Data and Guidance for Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Resource-Guide-Climate-Change-Guidance_v8.pdf

budget?		ii. Surface Water Outflows (incl. Exports)	X				
		iii. Groundwater Outflows (incl. Exports)		X			
7. Are demands by these sectors (drinking water users) explicitly included in the future/projected water budget?	a.	Domestic Well users (<5 connections)		X		"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."	Appendix A – 3.7.2.1.5, Page 383
	b.	State Small Water systems (5-14 connections)		X		"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"	
	c.	Small community water systems (<3,300 connections)	X				
	d.	Medium and Large community water systems (> 3,300 connections)	X				
	e.	Non-community water systems		X			
8. Are water uses for native vegetation and/or wetlands explicitly included in the current and historical water budgets?			X			2.3.1.2.6 Evapotranspiration Evapotranspiration of Precipitation from Crops and Native Vegetation "Evapotranspiration (ET) is the loss of water to the atmosphere from free-water evaporation, soilmoisture evaporation, and transpiration by plants (Fetter, 1994). Evapotranspiration of precipitation is assumed to be the balance between total precipitation and areal recharge. This value includes evapotranspiration of precipitation from crops as well as native vegetation. From water years 1986/87 to 2016/17, evapotranspiration of precipitation was estimated to average approximately 286,000 acre-ft/yr (see Column T of Table 2-2b, Page 2)."	Attachment 2, 2.3.1.2.6, page 760
9. Are water uses for native vegetation and/or wetlands explicitly included in the projected/future water budget?			X			Historical water budget table: Table 2-1 Projected water budget table: Table 2-8a	Attachment 2 Table 2-1, page 784 Table 2-8a, page 794

Summary/ Comments

Based on the data presented, it is not clear how climate change is expected to affect some specific elements of the water budget (i.e., precipitation and evapotranspiration), and multiple climate scenarios are not discussed in the projected water budget section of the GSP.

The description of the water budget in the draft GSP (and Coordination Agreement) is not fully transparent, and it is not clear how drinking water users will be protected when sustainable yield allocations are implemented. The GSP should include specific information on groundwater use by public water suppliers so that the public can determine if water use by all public water suppliers has been considered. The GSP should include information on the rural population estimates and density so that the public can assess whether it is a reasonable assumption to exclude rural residential demands from the water budget. It is also recommended that the GSP provide more detail on how the projected municipal pumping was determined so the public can assess the accuracy of the municipal pumping specified in the projected water budget.

5. Management Areas and Monitoring Network

How were key beneficial users considered in the selection and monitoring of Management Areas and was the monitoring network designed appropriately to identify impacts on DACs and GDEs?

Selected relevant requirements and guidance:
GSP Element 3.3, "Management Areas" (§354.20):

(b) A basin that includes one or more management areas shall describe the following in the Plan:
(2) The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large.
(3) The level of monitoring and analysis appropriate for each management area.
(4) An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable.
(c) If a Plan includes one or more management areas, the Plan shall include descriptions, maps, and other information required by this Subarticle sufficient to describe conditions in those areas.

CWC Guide to Protecting Drinking Water Quality under the SGMA[12]
TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs[13]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP define one or more Management Area?	X			"The ETGSA is subdivided into six Management Areas." Figure 3-6: Management Areas within ETGSA	3.6, Page 98
2. Were the management areas defined specifically to manage GDEs?		X			
3. Were the management areas defined specifically to manage DACs?	X			The Community Management Areas are defined around DACs.	
a. If yes, are the Measurable Objectives (MOs) and MTs for GDE/DAC management areas more restrictive than for the basin as a whole?		X		The methods of developing MOs and MTs are the same for the different management areas. Water quality MOs and MTs depend on the beneficial uses of groundwater.	
b. If yes, are the proposed management actions for GDE/DAC management areas more restrictive/ aggressive than for the basin as a whole?		X		It is not apparent based on the GSP whether the proposed management actions for DAC management areas more restrictive/aggressive.	
4. Does the GSP include maps or descriptions indicating what DACs are located in each Management Area(s)?	X			"The six ETGSA Management Areas are described below and grouped by Type: Type: Community Management Areas 1. Porterville Community Management Area 2. Terra Bella Community Management Area 3. Ducor Community Management Area Type: Cross-Boundary Management Areas 4. Kern-Tulare Water District Management Area Type: Subsidence Management Area 5. Friant-Kern Canal Subsidence Management Area	3.6, Page 98

[12] CWC Guide to Protecting Drinking Water Quality under the SGMA: https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858
[13] TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs: https://www.scienceforconservation.org/assets/downloads/GDEsUnderSGMA.pdf

				Type: Greater Tule Management Area 6. Greater Tule Management Area"	
5. Does the GSP include maps or descriptions indicating what GDEs are located in each Management Area(s)?		X		No GDE within the ETGSA area is identified in the GSP. "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. Based on the CDWR Groundwater Dependent Ecosystems database (www.groundwaterresourcehub.org), the deepest root zones for groundwater dependent plants in the Tule Subbasin are for Valley Oak, which can reach a depth of approximately 25 feet. Figure 2-26 is a depth to groundwater map based on groundwater levels in January 2015. As shown, there were no areas of the subbasin where the groundwater was within 25 feet of the land surface at that time. It is noted that there may be periods of time when the groundwater level is within 25 feet of the land surface in some areas of the subbasin. The areas most likely to support groundwater dependent ecosystems are along the Tule River in and upstream of Porterville, and in the upper reaches of Deer Creek and White River."	Appendix A - Attachment 2 - 2.2.7, Page 749
6. Does the plan identify gaps in the monitoring network for DACs and/or GDEs?		X		The GDE does not illustrate the l location of these data gaps or mention DACs or GDEs in the data gap section.	Attachment 2, 4.1, page 449
a. If yes, are plans included to address the identified deficiencies?			X	"Despite the number of existing monitoring wells that have been identified within the Tule Subbasin, there remain data gaps that, if addressed, would improve the ability to monitor groundwater level changes and flow patterns specific to the Upper and Lower aquifers. The current data gaps relate primarily to spatial coverage of monitoring features necessary to prepare complete groundwater level contour maps specific to the Upper and Lower aquifers in the subbasin. The 15 additional proposed monitoring wells identified herein will address many of the groundwater level monitoring data gaps in the subbasin." "In addition to groundwater level data gaps, there is a lack of aquifer parameter data, as obtained from controlled pumping tests of wells. The groundwater flow model has been developed based predominantly on short-term pumping tests, which enable the development of estimates of aquifer transmissivity. However, these tests are not as representative as long-term pumping tests (24-hr tests or longer). Further, pumping tests where groundwater level interference is measured in nearby monitoring wells have not been conducted. These tests enable the estimation of aquifer storage properties. During the construction of new monitoring features, it is anticipated that longterm pumping tests will be conducted to obtain aquifer parameter data specific to both the Upper and Lower aquifers. Further, pumping tests will be planned, where feasible, on existing highcapacity groundwater production wells." Recommended Monitoring Features and Testing to Address Data Gaps §354.38 (d) "In order to address the groundwater level data gaps, new monitoring well locations have been identified for monitoring the individual aquifers in the Tule Subbasin. New wells for monitoring the Upper Aquifer are shown on Figure A1-2 and described in Section 2.1.1.1 herein. The new monitoring wells,	

				combined with existing Upper Aquifer monitoring wells, will improve the Tule Subbasin TAC's ability to develop detailed and representative Upper Aquifer groundwater contour maps and provide a better network of calibration targets for the subbasin-wide groundwater model. It is further anticipated that many of the new monitoring wells will eventually replace currently assigned representative monitoring sites. … Pumping wells will be selected near proposed monitoring wells in order to enable pumping interference measurements during the test. Each test will consist of a 24-hr constant rate pumping test."	

Summary/ Comments

Care should be taken so that the management areas and the associated monitoring network are designed to adequately assess and protect against impacts to all beneficial users, including DACs. It is recommended that the GSP discuss what, if any, differential impacts would be anticipated as a result of the separate management of these areas.

The GSP should provide additional analysis to back-up the conclusion that states "The areas most likely to support groundwater dependent ecosystems are along the Tule River in and upstream of Porterville, and in the upper reaches of Deer Creek and White River," and, given this, provide further data to substantiate the conclusion that no GDEs are present.

6. Measurable Objectives, Minimum Thresholds, and Undesirable Results

How were DAC and GDE beneficial uses and users considered in the establishment of Sustainable Management Criteria?

Selected relevant requirements and guidance:
GSP Element 3.4 "Undesirable Results" (§ 354.26):
(b) The description of undesirable results shall include the following:
(3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results

GSP Element 3.2 "Measurable Objectives" (§ 354.30)
(a) Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are DAC impacts considered in the development of Undesirable Results (URs), MOs, and MTs for groundwater levels and groundwater quality?		X		The impacts to DACs are not explicitly considered.	
2. Does the GSP explicitly discuss how stakeholder input from DAC community members was considered in the development of URs, MOs, and MTs?		X		"The Sustainable Management Criteria (hereafter "SMC") discussed and established in this Section were developed in consultation with the Agency's member agencies, local stakeholders, Tule Subbasin GSA counterparts, technical leads, regional partners, interbasin stakeholders, and many other interested parties." Input from DACs is not explicitly discussed.	5.3, Page 207
3. Does the GSP explicitly consider impacts to GDEs and environmental BUs of surface water in the development of MOs and MTs for groundwater levels and depletions of ISWs?		X		5.5.2.1.1 Process for Determining Measurable Objectives & Interim Milestones "The following four (4) steps detail the process for setting interim milestones and the measurable objective at each RMS well. Step 1: Locate the RMS defined in the Tule Subbasin Monitoring Plan, identify which portion of the aquifer it represents, and prepare a hydrograph using available historical groundwater elevation data. Step 2: Incorporate into the RMS Well Hydrograph groundwater elevation data from the Groundwater Flow Model that includes historical and projected groundwater elevation data. Step 3: Adjust the GFM projected groundwater elevations at the RMS well to the most recent physically measured groundwater elevation. Each RMS site will further be adjusted to the groundwater elevation measured during February 2020 to establish the starting baseline conditions. Step 4: Utilize the adjusted GFM projected groundwater elevations for the period 2020 to 2040 to quantify numerically the interim milestones and the measurable objective value in 2040." 5.5.3.1 Criteria to Define Minimum Thresholds "The following four (4) steps detail the process for setting the minimum threshold at each RMS well. Step 1: Utilize the Hydrograph created for each RMS well based on process for establishing the interim milestones and measurable objective which assumes average hydrology.	5.5.2.1.1, page 212 5.5.3.1, page 214

					.. Step 4: Establish the minimum threshold for groundwater elevation for the entire plan implementation period as a single value below the interim milestones and measurable objective. The difference between the interim milestones and measurable objective is the operational flexibility established at each RMS well." EThe GSP does not identify impacts of groundwater levels dropping to MTs or MOs on potential GDEs and BUs.	
4.	Does the GSP explicitly consider impacts GDEs and environmental BUs of surface water and recreational lands in the discussion and development of Undesirable Results?		X		5.5.1.3 Potential Effects on Beneficial Uses and Users "This requirement is satisfied by the description provided in Section 4.3.1 of the Coordination Agreement (Appendix A)." 4.3.1.3 Potential Effects on Beneficial Uses and Users (§354.26(b)(3)) "Pursuant to 23 Cal. Code Regs. §354.26(b)(3), generally, the avoidance of an undesirable result for the chronic lowering of groundwater levels is to protect unreasonable lowering of groundwater levels may effect groundwater users by causing well failures, additional operational costs for groundwater extraction from deeper pumping levels, and additional costs to lower pumps, deepen wells, or drill new wells. Localized lowering of groundwater levels to the extent that an undesirable result is experienced may also affect other nearby monitoring areas, management areas, or GSAs to maintain groundwater levels above their minimum thresholds and/or prevent them from achieving their measurable objectives."	5.5.1.3, page 211
5.	Does the GSP clearly identify and detail the anticipated degree of water level decline from current elevations to the water level MOs and MTs?		X		The anticipated degree of water level decline is not clearly identified.	
6.	If yes, does it include: b. Is this information presented in table(s)?		X			
	c. Is this information presented on map(s)?		X			
	d. Is this information presented relative to the locations of DACs and domestic well users?		X			
	e. Is this information presented relative to the locations of ISW and GDEs?		X			
2.	Does the GSP include an analysis of the anticipated impacts of water level MOs and MTs on drinking water users?		X		Impacts on drinking water users are not clearly identified.	
3.	If yes: a. On domestic well users?		X			
	b. On small water system production wells?		X			
	c. Was an analysis conducted and clearly illustrated (with maps) to identify what wells would be expected to be partially and fully dewatered at the MOs?		X			
	d. Was an analysis conducted and clearly illustrated (with maps) to identify what wells would be expected to be partially and fully dewatered at the MTs?		X			

e. Was an economic analysis performed to assess the increased operation costs associated with increased lift as a result of water level decline?		X			
9. Does the sustainability goal explicitly include drinking water and nature?	X			"The Sustainability Goal of the Tule Subbasin is defined in the Coordination Agreement pursuant to Section 4.2, as the absence of significant and unreasonable undesirable results associated with groundwater pumping, accomplished by 2040 and achieved through an integrated program of sustainable groundwater management between the Tule Subbasin GSAs and their many stakeholders. It is further the goal of the Tule Subbasin GSAs that coordinated implementation of their respective Groundwater Sustainability Plans 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."	5.2, Page 206

Summary/ Comments

Based on the presented information, DAC members are not explicitly considered in the discussion of URs, MOs, and MTs for groundwater levels and water quality. More detail and specifics regarding DAC members, including those that rely on smaller community drinking water systems and domestic wells, is necessary to demonstrate that these beneficial users were adequately considered.

The draft GSP provides very limited discussions on current groundwater conditions. It is not clear what method was used to develop the water quality SMCs and what the ETGSA intends to use to define water quality sustainability. The GSP should clearly and transparently describe the basis for its SMCs, identify the numerical values that will be used, and illustrate how the MOs/MTs will be sufficient to ensure that the stated water quality UR of impacting the long-term viability of the groundwater resource, particularly for domestic water users and DACs, will be avoided.

The GSP should describe how the approach to developing water level MOs/MTs is protective of the diverse drinking water users within the ETGSA area. An impact analysis should be performed to evaluate the potential impacts to wells associated with the water level MOs/MTs and presented in the GSP. The locations of potentially impacted wells should be identified and presented in maps in the GSP so that the public and DWR may assess the well impacts specific to DACs and other sensitive users within the ETGSA area.

The GSP should clearly identify and detail the anticipated degree of water level decline from current elevations to the water level MOs and MTs. Given that the subbasin is in critical overdraft, the GSP should explain how the projected additional water level declines at MTs will result in sustainable conditions for beneficial users. The GSP should also consider and quantify both the potential dewatering of wells and the pumping costs associated with the increased lift at the projected lower water levels, in order to more fully and transparently consider the impacts to beneficial users.

It is also recommended that the impacts to groundwater gradients at the proposed MOs and MTs be analyzed and described in the GSP, in addition to the likely impacts to drinking water wells. The GSP and/or the Coordination Agreement should demonstrate how the proposed SMCs are achievable, analyze the changes to water level gradients, and clearly describe the impacts expected to result from the proposed SMCs within the ETGSA area, and particularly in areas with significant localized variability in anticipated water level changes.

Table 5-5: Reduction of Groundwater Storage Minimum Thresholds is completely blank.

7. Management Actions and Costs

What does the GSP identify as specific actions to achieve the MOs, particularly those that affect the key BUs, including actions triggered by failure to meet MOs? What funding mechanisms and processes are identified that will ensure that the proposed projects and management actions are achievable and implementable?

Selected relevant requirements and guidance
GSP Element 4.0 Projects and Management Actions to Achieve Sustainability Goal (§ 354.44)
(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
(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.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP identify benefits or impacts to DACs as a result of identified management actions?			X		The Groundwater Accounting Action is expected to benefit groundwater quality. The impacts to DACs are not explicitly identified.	7.2.1.2, Page 278
2. If yes:	f. Is a plan to mitigate impacts on DAC drinking water users included in the proposed Projects and Management Actions?		X		The GSP does not identify a clear plan to mitigate impacts. Section 7.2.1.11 contemplates several well mitigation actions that could potentially be implemented if funds are yielded from the groundwater accounting program.	7.2.1.11, Page 282
	g. Does the GSP identify costs to fund a mitigation program?		X			
	h. Does the GSP include a funding mechanism to support the mitigation program?		X			
4. Does the GSP identify any demand management measures in its projects and management actions?		X				
5. If yes, does it include:	a. Irrigation efficiency program	X			"On-Farm irrigation distribution system upgrades (e.g. drip systems, field leveling)"	7.3.1, Page 285
	b. Ag land fallowing (voluntary or mandatory)	X			7.3.4 Agricultural Land Retirement "Examples of Agriculture Land Retirement Projects within the ETGSA may include, but are not limited to: 1. Member Agency purchase of land to permanently retire, which would include removal of agriculture farming infrastructure from the land area retired. 2. Individual landowner setting aside a portion of their farm, permanently to reduce crop consumptive demand. 3. Individual Landowner setting aside a portion of their farm, on an annual basis, depending on the availability of water each year."	7.3.4, Page 299
	c. Pumping allocation/restriction	X			7.2.1 Groundwater Accounting Action	7.2.1, Page 276
	d. Pumping fees/fines	X			"Use of charges and fees to finance the system's operation, agency administration, monitoring, and mitigation measures (in the form of projects, payments, and/or claims)"	7.2.1, Page 277
	e. Development of a water market/credit system	X			"Establishment of rules to transfer water allocations and other groundwater credits to optimize the use of available groundwater resources"	7.2.1, Page 277
	f. Prohibition on new well construction		X			

	g. Limits on municipal pumping		X		It is not clear from the GSP if there will be limits on municipal pumping.	
	h. Limits on domestic well pumping		X		It is not clear from the GSP if there will be limits on domestic well pumping.	
	i. Other		X			
6. Does the GSP identify water supply augmentation projects in its projects and management actions?		X				
7. If yes, does it include:	a. Increasing existing water supplies	X			7.3.1 Water Supply Optimization	7.3.1, Page 285
	b. Obtaining new water supplies	X			7.3.2 Surface Water Development	7.3.2, Page 289
	c. Increasing surface water storage	X			7.3.2 Surface Water Development	7.3.2, Page 289
	d. Groundwater recharge projects – District or Regional level	X			7.3.3 Managed Aquifer Recharge and Banking	7.3.3, Page 294
	e. On-farm recharge	X			Recharge Policy projects by Porterville ID and Saucelito ID	Appendix A, Page 791
	f. Conjunctive use of surface water	X			7.3.3 Managed Aquifer Recharge and Banking	7.3.3, Page 294
	g. Developing/utilizing recycled water	X			7.3.3 Managed Aquifer Recharge and Banking	7.3.3, Page 294
	h. Stormwater capture and reuse		X			
	i. Increasing operational flexibility (e.g., new interties and conveyance)	X			7.3.1 Water Supply Optimization	7.3.1, Page 285
	j. Other		X			
8. Does the GSP identify specific management actions and funding mechanisms to meet the identified MOs for groundwater quality and groundwater levels?		X			6.2.1 Groundwater Accounting Action "The ETGSA will develop a groundwater accounting system to track groundwater use, develop an allocation of groundwater to be used for implementation of SGMA during the plan implementation period, and to develop water budgets for individual landowners and management areas."" "Projects and Management Actions to be funded by the Agency landowners or Member Agencies through the Accounting System may include, but are not limited to: • Groundwater elevation and land subsidence programs; • Groundwater recharge and banking programs; • Surface water conveyance programs; • Well rehabilitation and deepening programs; • Land conservation and retirement programs; • Municipal service connection programs; • Clean drinking water and in-home treatment programs; and • Infrastructure rehabilitation programs. The costs associated with various types of mitigation programs have not yet been assessed." 7.3 Member Agency / Landowner Project and Management Actions "Following is a list of the categories of the various types of projects and management actions to help achieve sustainability within the ETGSA: 1. Water Supply Optimization: Optimizing efficiencies in existing surface water or groundwater operations. 2. Surface Water Development: Developing new	7.2.1, page 276 7.2.1.11, page 282 7.3, page 283

				surface water supplies. 3. Managed Aquifer Recharge and Banking: Developing recharge and groundwater banking projects. 4. Agricultural Land Retirement: Projects related to fallowing agriculture land." Funding for member agency / landowner project: State or Federal Grant Programs; Member Agency Assessments; Private Landowner Contributions.	7.3, page 283-302
9. Does the GSP include plans to fill identified data gaps by the first five-year report?	**X**			"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." 4.1 Data Gaps also discusses plans to address data gaps.	Appendix A – 5.2, Page 409 Appendix A – Attachment 1 – 4.1, Page 449
10. Do proposed management actions include any changes to local ordinances or land use planning?		**X**			
11. Does the GSP identify additional/contingent actions and funding mechanisms in the event that MOs are not met by the identified actions?		**X**			
12. Does the GSP provide a plan to study the interconnectedness of surface water bodies?		**X**		"there is no indication of interconnected surface water systems within the Tule Subbasin per the definition provided in 23 CCR § 351(o)"	4.3.6, Page 181
13. If yes: a. Does the GSP identify costs to study the interconnectedness of surface water bodies?			**X**		
b. Does the GSP include a funding mechanism to support the study of interconnectedness surface water bodies?			**X**		
14. Does the GSP explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies?		**X**		7.3.2 Surface Water Development "The ability to develop additional surface water into the ETGSA will be very beneficial to offset the current overdraft and subsidence that is occurring. The primary benefit is to offset groundwater pumping by providing surface water to meet demand. Ancillary benefits include mitigating the decline of local groundwater levels and mitigating the occurrence of other conditions associated with declining groundwater levels, such as subsidence and the migration of contaminant plumes." One of the projects is to develop surface water development; however, the benefits on groundwater levels near surface water bodies are not discussed explicitly.	7.3.2.9, page 292

Summary/ Comments

A discussion should be added for each project or management action to clearly identify the benefits to DAC drinking water users and potential impacts to the water supply. For all potential impacts, the project/management action should include a clear plan to monitor for, prevent, and/or mitigate against such impacts.

Given the method used to develop water level MOs and MTs (i.e., model projected future water levels assuming implementation of projects and management actions), the GSP should discuss what the implications of the uncertainty in projects and management actions is on the ETGSA's ability to reach sustainability by 2040 and to maintain water levels pursuant to the SMCs. The GSP should also explicitly describe what risks to water quality will be evaluated and monitored as a part of the development of the specific recharge

projects. The ETGSA should develop an assistance program for potentially impacted beneficial users, including DACs, small community water systems, and domestic well users, to mitigate adverse impacts. The GSP should identify the groundwater accounting plan or mechanism for each type of user that will be used to create individually tailored allocations, or, at a minimum identify key policies that will be incorporated into the groundwater accounting system that will ensure that DACs, small community water systems, and domestic well users will have access to safe, clean, affordable, and accessible drinking water. The GSP should explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies.

26-1498349

PADILLA HARVESTING INC.

Farm Labor Contractor

LIC. #61121

P.O. Box 326 Woodlake, CA 93286

Office #: (559) 594-4187 Res. #: (559) 534-2442 Cell #: (559) 805-4440 Fax #: (559) 594-4658

December 16, 2019

VIA E-MAIL ONLY

Rogelio Caudillo, Executive Director
Eastern Tule Groundwater Sustainability Agency
info@easterntulegsa.com

Re: Comments to Draft Groundwater Sustainability Plan

Dear Mr. Caudillo

The undersigned is a landowner in the Eastern Tule Groundwater Sustainability Agency (GSA). As landowner in the white area, I appreciate the GSA's work on my behalf and have the following concerns as to the Groundwater Sustainability Plan:

1) Allocation of groundwater based on Gross Acres with no consideration for historical use. Using Gross acres, including land without developed water sources and disregarding white area land holders investments in water infrastructure is unfair.

2) Governance of the GSA. The white growers make up over half of the acreage in the district and only have one vote on board. Representation is lacking.

3) Given this is a basin wide problem, a new irrigation district should be created that encompasses the entire basin as this would create the most efficient and fair way to allocate water in the basin.

Please feel free to contact me if you have any questions or wish to discuss any of my comments as you finalize the Agency's GSP.

Sincerely,

Tony Padilla
Land Owner

Setton Pistachio of Terra Bella, Inc.
CALIFORNIA PISTACHIOS

SettonFarms.com

December 16, 2019

Eastern Tule Groundwater Sustainability Agency Joint Powers Authority
Attention Mr. Rogelio Caudillo, Interim Executive Director
881 West Morton Avenue, Suite D
Porterville, CA 93257
rcaudillo@easterntulegsa.com

Dear Mr. Caudillo,

Thank you for the opportunity to review and comment on the Eastern Tule Groundwater Sustainability Plan (GSP). Setton Pistachio's main processing facility is located in the heart of the Subbasin, in Terra Bella, and we farm within many of the districts and white area in the region. Our business interests are deep, and so is our interest in this community.

While we have read the GSP and found several minor inconsistencies, we have confidence others will provide technical comments. The three subjects we believe should be prioritized by the Board, as well as others with land use decision making authority in the Subbasin are:

1. Fix the Friant-Kern Canal-fixing the Friant-Kern Canal is an expensive and complex problem. In that regard, we encourage the East Tule Subbasin Joint Powers Authority to fully invest in the Water Blueprint for the San Joaquin Valley. The Water Blueprint: 1) encourages policy and regulatory changes to expedite processes; 2) identifies infrastructure needs; and 3) requests the State and Federal economic investment;
2. Expand Ducor Irrigation District and Hope Water District- There are thousands of acres of high-value farmland within the white areas of the Eastern Tule Subbasin. As non-project water is available in the system, the Bureau of Reclamation and other water and irrigation districts will want to transfer and/or wheel water with water or irrigation districts, not private landowners. For this reason, policies should be encouraged to allow these white areas to be annexed into Ducor and Hope.
3. Bring in more surface water and build infrastructure- As project and non-project surface water are available in the State and Federal system, we must have the means to deliver and store the water. All means, especially grants, should be sought after and attained that provide new surface water and infrastructure to the region.

With an annual overdraft estimated at 82,400 acre-feet per year and continued land subsidence, we understand reduced groundwater use is necessary. While we agree a ramp down in groundwater use, as proposed in Table 7-1, full implementation by the beginning of the 2021 Water Year seems overly aggressive. Subbasin wide data management and creating water accounts are complex and doing it right the first time must be a priority.

Thank you for your efforts thus far and I look forward to continuing to participate during the implementation of the GSP.

Sincerely,

Mike Smith

Mike Smith
Grower Relations Manager

SIERRA CLUB
KERN-KAWEAH CHAPTER

P.O. Box 3357
Bakersfield, CA 93385
December 16, 2019

VIA ELECTRONIC MAIL

Eastern Tule Groundwater Sustainability Agency Joint Powers Authority
881 W. Morton Avenue, Suite D,
Porterville, CA 93257
Email**:** info@easterntulegsa.com rcaudillo@easterntulegsa.com

Kern-Tulare Water District
5001 California Avenue, Suite 102
Bakersfield, CA 93309
Email: sdalke@kern-tulare.com

Re:
Comments regarding the *Eastern Tule Groundwater Sustainability Agency* (ETGSA) Draft Groundwater Sustainability Plan (GSP)

Dear: *Eastern Tule Groundwater Sustainability Agency* Board of Directors,

The *Sierra Club* has reviewed the draft *Eastern Tule Groundwater Sustainability Plan* (ETGSP) and would like to comment about the Agencie's plans.

LACK OF OUTREACH TO NATIVE AMERICAN STAKEHOLDERS

The ETGSA did not search out or encourage participation by local Indians.
The *Tule Indian Tribe* is a sovereign nation that owns Tule River riparian property within the ETGSA district and has a deep spiritual connection to the valley's waterways.
If the Agency could not identify any local Native American Tribes they must not have been looking very hard. I would suggest they send out another scouting party.

LACK OF INCLUTION OF WHITE AREA FARMERS.

If future SGMA regulations restrict pumping in the district, farmers and dairymen that rely entirely on groundwater will potentially suffer greater financial hardships then the growers and herdsmen that have access to both well and ditch water. During the process of writing the Draft GSP farmers that have water rights and own ditchwater stock have been well represented by local irrigation companies that have many members seated on the boards that make up of the leadership of the ETGSA. The white area folks who are not members of an irrigation company do not have anyone looking out for their interests, and they may have the most to lose.

Before the Plan moves forward the ETGSA should reach out and engage agriculture stakeholders that are not represented by an irrigation company or water agency.

These so called white area farmers should be included in any new flood water/recharge programs that are currently being discussed and planned. Those emergency water allocation decisions should be based on good science and sound hydrology not water stock ownership.

KERN-KAWEAH WATER DISTRICT OIL FIELD WATER REUSE PROJECT

The *Draft Eastern Tule GSA* GSP repeatedly ignores water quality issues. An example is their claim of exemption from the issue of *Seawater Intrusion* sighting the basin's distance from the Pacific Ocean. It is our position that GSAs should address the potential contamination of fresh water aquifers with the older ancient seawater that lies below them in deeper aquifers.

The GSP lists oil field produced water as an additional source of water for the basin's farmers and describes this current project on page 969.

> **Produced Water:** The District executed a 20-year contract with Hathaway, LLC in 2016 to receive produced water. The District currently receives about 2,400 acre-feet per year of water from this source on the east side of the District, which is delivered to the District's Big 4 reservoir to be blended with other water sources before being distributed. The source of oilfield produced water is from exempted aquifers beneath and hydrologically separated from the fresh-water bearing zones of the basin.

The GSP claims that the fresh water aquifers are separate from the ancient seawater aquifers that contain oil and gas deposits, and because they are not normally connected the deeper aquifers get some kind of exemption. Completely ignored are the thousands of current oil/gas and water wells that have pierced through those multi layers of stacked geological zones with well casing conduits that can fracture and leak.

This is summary of the pending oil field waste water project. Kern-Tulare Water District Oil Field Water Reuse Project.pdf The project proposes to blend produced water with freshwater from the Friant-Kern canal to a point that it can be used to grow salt tolerant crops. This is a Draft Environmental Assessment of the proposed project SGMA\Oil Waste Water Project.pdf. There is no assessment of the cumulative impact the project will have on the health and viability of the irrigated lands. It is well documented that one of the greatest threats to our valley's agriculture based economy is salinity build up from unsound irrigation practices. https://www.watereducation.org/video/salt-earth-salinity-californias-central-valley-0

The average oil field in the USA produces 9.2 gallons of produced water for every 1 gallon of crude recovered[1]. Disposal of contaminated produced water has always been problematic for the oil companies. By selling water that is undoughtly classified as hazardous waste to farmers for irrigation purposes the oil companies have found a money making solution to their disposal problems.

THE IMPACT OF FRACKING CHEMICALS ON THE PROJECT

Fracking in various forms has been going on for decades. Now in the name of energy independence and jobs oil companies have been given the green light by the Trump administration to expand the practice of fracking the valley's oil and gas wells.
How will blended fracking fluids impact the quality of the crop water?

The small Tulare County city of Farmersville has taken a brave stand against the expansion of fracking in an effort to protect its groundwater quality. Farmersville formally opposes fracking in Tulare County – The Sun-Gazette Newspaper.mht The impact fracking chemical would have on the project's water quality is not addressed in the GSP.

This is a list of the known fracking chemicals that are at the disposal of the oil companies. What Chemicals Are Used FracFocus Chemical Disclosure Registry I .mht The list may not be complete because oil companies can withhold their favorite recipes by declaring them "Trade Secrets"

We have a lot of questions regarding the pending project between the California Resources Corporation (CRC is an oil and natural gas exploration and production company operating high-growth, high-return conventional and unconventional assets exclusively in California) and the irrigation districts. Can you tell us what an "ant-degrading analysis" is and if those are public record? See. Guzman Reservoir Pipeline Project .docx. .

We would also like to know who will be testing this reintroduced seawater for safety and what exactly will they be testing for. When blending the waters what level of salinity is judged acceptable? Who makes that decision, agriculture experts or oil companies?

It appears that the importation, blending and distribution of oil field produced water into the valley's irrigation systems is currently going on. In these pre-pipeline project days, how is the produced water currently being transported to the District's distribution reservoirs? Are they using railroad tank cars, trucks, old pipelines or lined ditches? Before being blended does it needs to be handled as hazardous waste?

Please place the Sierra Club on the distribution list for any noticing of meetings and hearings and to receive related environmental documents. We prefer email communications and electronic formatting of documents. Thank you for your consideration and for the opportunity to comment.

Sincerely,

Richard J. Garcia - Water Committee-Chair

richardjgarcia@comcast.net
559 624 0199

1. Produced Water Volumes and Management Practices. http://www.gwpc.org/sites/default/files/Produced%20Water%20Report%202014-GWPC_0.pdf

TULARE COUNTY FARM BUREAU

Mission: to promote and enhance the viability of Tulare County agriculture.

October 30, 2019

Eastern Tule Basin JPA Groundwater Sustainability Agency
881 W. Morton Avenue, Suite D,
Porterville, CA 93257

Re: GSP Comments

To Whom It May Concern:

Tulare County Farm Bureau represents approximately 1,500 farm and ranch members in the county. We are committed to serving as a resource to our farm community, and work to surface and address problems and identify solutions for our members.

We want to thank your GSA management team for the many years of hard work, planning, and organization that has occurred to bring us to this point. We appreciate the work that has been assumed by many irrigation districts, water agencies, paid and volunteer leaders, which have been thrust into these roles to help our basins collectively solve the undesirable conditions set forth in SGMA law, enacted in 2015.

Our over-arching comments are:

- Groundwater sustainability plans should remain a fluid, living, breathing, adaptive document which provides operational flexibility for the management team to use in maximizing water resources for the farm and rural communities impacted by the GSP implementation
- Water pumped from this sub basin should be applied here, care should be given to avoid impacts to our sustainability and safe yield. We discourage exportation of waters out of the sub-basin where it would negatively impact local landowners.
- Plans should seek to address disparity amongst the landowners, and serve the white area and non-white area lands as equitable as possible. We encourage cautious and investigative due diligence in the development of a water market, or any model which may place certain landowners at a competitive disadvantage.
- We encourage strategies which will protect agriculture land from fallowing, or retirement.
- We encourage incentives that will promote marginal or impaired land being used for recharge and the landowner receiving a financial incentive for making these changes in their cropping strategies.
- We encourage plans to look at broad long-range and short-term ideas that will maximize bringing new non-native water supplies into our hydrologic basin for recharge, and to increase the supply available.
- We support GSPs that seek to study, investigate, and monitor basin conditions before significant disruptive management changes are required of landowners in their jurisdictions.
- We support sustainability goals that help unify each sub-basin and provide additional benefits for the cultivation of crops here in the Tulare Lake basin hydrologic region. We encourage projects to be advanced that promote maintaining agricultural acreage while minimizing the need to idle farmland.
- We support rigorous and relevant education to growers and landowners in the GSA's territory with frequent updates and opportunities for public outreach and feedback.

Sincerely,

Tricia Stever Blattler

TRICIA STEVER BLATTLER
Executive Director

737 North Ben Maddox Way • Visalia, CA 93292 • Mailing: PO Box 748 • Visalia, CA 93279 • (559) 732-8301 • (559) 732-7029 FAX
E-mail: tcfb@tulcofb.org • Web: www.tulcofb.org • Join Farm Bureau: www.joinfb.org

TULARE IRRIGATION DISTRICT

6826 Avenue 240 ◆ Tulare, California 93274 ◆ Telephone (559) 686-3425

December 16, 2019

Eastern Tule Groundwater Sustainability Agency
Board of Directors
881 West Morton Avenue, Suite D
Porterville, California 93257

Subject: Comments on the Eastern Tule GSA Draft Groundwater Sustainability Plan

Dear Eastern Tule Groundwater Sustainability Agency Board of Directors;

The Tulare Irrigation District (District) is providing comments on the Draft Groundwater Sustainability Plan (Draft GSP) prepared by the Eastern Tule Groundwater Sustainability Agency (ETGSA) under the Sustainable Groundwater Management Act (SGMA). The District is a 70,000-acre agricultural irrigation district in the Kaweah Subbasin that has a contract with the United States Bureau of Reclamation (USBR) for surface water from the Friant Division of the Central Valley Project, which is delivered via the Friant-Kern Canal (the "Canal"). Similar to the ETGSA and its members, the District is pursuing compliance with SGMA as a member of the Mid-Kaweah Groundwater Sustainability Agency (MKGSA).

After a careful review of the ETGSA Draft GSP, the District believes that the Draft Plan has some deficiencies in the approach to identifying, monitoring, and halting the undesirable result of subsidence and its direct impact on the Canal. SGMA requires, in the California Code of Regulation (CCR) Title 23. §350.4 (f) that "A Plan will be evaluated, and its implementation assessed, consistent with the objective that a basin be sustainably managed within 20 years of Plan implementation without ***adversely affecting the ability of an adjacent basin to implement its Plan or achieve and maintain its sustainability goal over the planning and implementation horizon***."

As you may already be aware, it is estimated that subsidence in the Tule Subbasin and within the ETGSA has subsided the Canal upwards of 12 feet and caused a 60% reduction in the Canal capacity (from 4,000 CFS to approximately 1,650 CFS). Correspondingly, this has limited the ability of the District to receive, transfer, and exchange imported surface water from the Canal, and has therefore increased its groundwater overdraft potential. The District is also currently being saddled with the burden of funding the correction of the subsided zone, which potentially subjects the District to millions of dollars of construction costs. This financial exposure presents a significant impact on the District's ability to operate and maintain its ongoing operations, including its ability to achieve sustainability in compliance with SGMA.

The District respectfully submits the following comments on the ETGSA GSP:

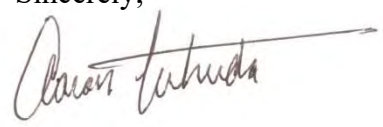
1. Title 23 CCR §354.26(b)(3) states that Undesirable Results shall take into consideration the *"Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and* ***other potential effects*** *that may occur or are occurring from undesirable results."* (Emphasis added.) In light of the effect on the District of Canal subsidence as described above, the District recommends that the loss of *any* capacity in the Canal beyond the current capacity of 1,650 CFS be considered an undesirable result, in that (i) such loss impedes the ability of Tule Subbasin, adjacent subbasins, and entities that rely on water from Canal including the District to received and deliver surface water to achieve sustainability and compliance with SGMA, and (ii) it therefore "substantially interferes with surface land uses" in violation of SGMA (Water Code § 10721(x)(5)).
2. The ETGSA Coordination Agreement (included in the Draft GSP as Appendix A) defines subsidence as an Undesirable Result as follows: "The criteria for an undesirable result for land subsidence is defined as the unreasonable subsidence below minimum thresholds at greater than 50% of the GSA Management Area RMS resulting in significant impacts to critical infrastructure." Per table 5-10 in section 5.8.3.1.2 of the ETGSA Draft GSP there are a total of seven Representative Monitoring Sites along the Canal that will be used to determine the occurrence of an undesirable result. The existence of an undesirable result will only take place if more than 50% of the RMS sites exceed the quantified minimum threshold, which would mean that four sites would need to exceed their quantified minimum threshold before an undesirable result would be encountered. Based on the information provided in Table 5-10, the average allowable minimum threshold for subsidence is an additional 2.57' of subsidence. The Draft GSP does not include a determination of the additional capacity loss to the Canal due to the potential additional subsidence; however, the District recommends that this be zero capacity loss and no further subsidence of the Canal.
3. Included in the Tule Subbasin Chapter 2 – Basin Setting Document is Table 2-7 Planned Transitional Pumping by GSA. It is not clear that the proposed Transitional Pumping being proposed is consistent with the Measurable Objectives or Minimum Thresholds established for subsidence. Furthermore, based on the recommendation that the ETGSA Draft GSP allow for no further capacity loss in the Canal, the District cannot support the ongoing Transitional Pumping program as proposed.
4. The District could not find any reference in the Draft GSP to projects or management actions that address subsidence and specifically subsidence of the Canal. The District recommends that the ETGSA develop projects and/or management actions that can mitigate any future loss of capacity in the Canal.
5. The District is aware that the ETGSA is currently coordinating with the Friant Water Authority to establish a mitigation program that would account for the ongoing subsidence within the GSA and the impacts on the Canal. The District supports these discussions and encourages the ETGSA to adopt and include mitigation measures within their Draft GSP so that any loss in capacity is mitigated and an undesirable result can be avoided such that adjacent subbasins and the District are not impacted.

In conclusion, the ETGSA Draft GSP needs to address all SGMA statutes and regulations, and the District strongly recommends that the Draft GSP consider the impacts to the Canal and its role in achieving sustainability for adjacent subbasins and other regions that rely upon its surface

water. The District recommends that the ETGSA consider the above comments before the Draft GSP is submitted to the Department of Water Resources (DWR) for review.

The District appreciates the opportunity to review and provide comments on the Eastern Tulare GSA Draft GSP. If you have any further questions, please do not hesitate to contact Aaron Fukuda at akf@tulareid.org or (559) 686-3425.

Sincerely,



Aaron Fukuda
General Manager

CC: Alpaugh GSA
Delano Earlimart Irrigation District GSA
Lower Tule River Irrigation District GSA
Pixley Irrigation District GSA
Tri-County Water Authority GSA
Paul Hendrix, Mid-Kaweah GSA
Eric Osterling, Greater Kaweah GSA
Mike Hagman, East Kaweah GSA

United States Department of the Interior
BUREAU OF RECLAMATION
Mid-Pacific Region
South-Central California Area Office
1243 N Street
Fresno, CA 93721-1813

IN REPLY REFER TO:
SCC-100
2.2.4.23

DEC 16 2019

VIA ELECTRONIC AND U.S. MAIL

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dbrogan@deid.org

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Pixley Irrigation District GSA
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pixleygsp@ltrid.org

Tri-County Water Authority GSA
944 Whitley Avenue, Suite E
Corcoran, CA 93212
djackson@tcwater.org

Subject: Comments on Tulare Subbasin Groundwater Sustainability Plans

Dear Tule Subbasin Groundwater Sustainability Agencies:

The United States Bureau of Reclamation (Reclamation) provides these comments on the draft groundwater sustainability plans submitted by the addressee Groundwater Sustainability Agencies (GSA) in the Tule Subbasin.

We commend and appreciate your efforts, time, and energy devoted to the very difficult task of developing groundwater sustainability plans (GSP) to comply with the Sustainable Groundwater Management Act of 2014.

The mission of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. In the Friant Division, one of the most critical features of infrastructure that allows us to meet our mission is the Friant-Kern Canal, which, has been operated and maintained by the Friant Water Users Authority and subsequently the Friant Water Authority (FWA) since 1986. The Friant-Kern Canal delivers water to numerous water and irrigation districts, as well as cities, and about 15,000 family farms, and the very existence and inspiration of the canal was to, among other things, combat issues such as subsidence by conveying surface water to incentivize farmers to pump less ground

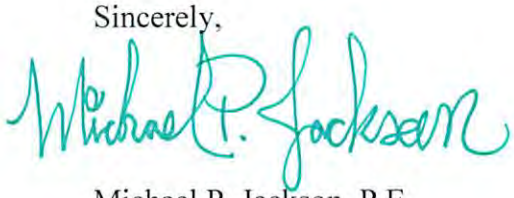
water. For decades, the Friant Division system has performed as intended and the farms and towns on the eastside of the San Joaquin Valley have flourished.

However, after the last prolonged drought that ended in 2017, it was discovered that about 60% of the Friant-Kern Canal delivery capacity had been lost due to severe land subsidence. The clearest explanation for this subsidence, is that it was caused largely by the over-pumping of groundwater on lands not currently served by surface water that lie within your respective GSAs. At the current detrimental rate of subsidence, FWA estimates that the Friant-Kern Canal will be operating at 30% capacity within three years. This is a trajectory that we ought naught allow to continue unchecked, and proactive measures need to be taken now to mitigate and prevent this cause and effect phenomenon.

For these and other reasons, as title holder and owner of the Friant-Kern Canal, we substantially concur with the comment letter submitted to the GSAs of the Tule Subbasin by the FWA on December 16, 2019 (attached) and look forward to the coordination and collaboration necessary to adopt appropriate management actions and plans to properly deal with staving off subsidence and its detrimental effects to the Friant-Kern Canal.

If you should have any questions on this matter, please contact me at (559) 262-0300 or by cellphone at (559) 260-8714, by electronic mail at mjackson@usbr.gov or for the hearing impaired at TTY (800) 877-8339.

Sincerely,



Michael P. Jackson, P.E.
Area Manager

Enclosure
Friant Water Authority Comment letter dated December 16, 2019

cc: Mr. Jason Phillips, CEO
Friant Water Authority
854 North Harvard Avenue
Lindsay, CA 93247
(w/enclosure)

Friant
WATER AUTHORITY

854 N. Harvard Ave.
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December 16, 2019

Alpaugh GSA
Delano Earlimart Irrigation District GSA
Eastern Tule GSA
Lower Tule River Irrigation District GSA
Pixley Irrigation District GSA
Tri-County Water Authority GSA

Re: **Comments on Tule Subbasin Groundwater Sustainability Plans**

To: The Directors and Staff of the Referenced Groundwater Sustainability Agencies

The Friant Water Authority (FWA), which operates the 152-mile long Friant-Kern Canal (FKC or Canal) on behalf of the United States Department of Interior's Bureau of Reclamation (Reclamation) and which Canal conveys contract water to 34 water agencies and municipalities that in turn serve tens of thousands of residential customers and over 1 million acres of farmland, respectfully submits this comment letter on the Groundwater Sustainability Plans (GSPs) that have been drafted by each of the Groundwater Sustainability Agencies (GSAs) addressed in this letter pursuant to the Sustainable Groundwater Management Act (SGMA).[1]

As a preliminary matter, we commend the various boards, staff members and technical consultants for the efforts that have gone into the preparation of the draft GSPs and for the transparent and collaborative manner in which the GSAs have engaged with stakeholders such as FWA. We are in this together, and your leadership to date, as evidenced by the outreach to our agency, has been exemplary. With the exception of the issues noted below, FWA fully supports the adoption and implementation of the GSPs. To that end, FWA looks forward to continuing our collaboration in order to achieve the "Sustainability Goal" of the Tule Subbasin, which, as defined in the Tule Subbasin Coordination Agreement (Coordination Agreement), is "the absence of significant and unreasonable undesirable results associated with groundwater pumping."[2]

In our initial comment letter of May 28, 2019, we notified each GSA that FWA would be carefully reviewing the draft GSPs in terms of the description and definition of undesirable results with respect to subsidence impacts to the Canal, and noted that while SGMA established a 20-year planning period to bring the Tule Subbasin into sustainability, the continuation of unmitigated land subsidence impacts to the Canal would be unacceptable and that feasible solutions must be identified. With that

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[1] Water Code § 10720 and following.

[2] Coordination Agreement, § 4.2.

outcome in mind, we provide our specific comments on the draft GSPs, particularly the GSP of the Eastern Tule GSA (ETGSA).

We support the stated intent in the Coordination Agreement as to the purpose of avoiding undesirable results in the context of land subsidence: "the avoidance of an undesirable result of land subsidence is to protect critical infrastructure for the beneficial uses within the Tule Subbasin, including excessive costs to fix, repair, or otherwise retrofit such infrastructure and may also result in an interim loss of benefits to the users of such infrastructure."[3] It cannot be disputed that the FKC is one of if not THE most critical infrastructure facility in the Tule Subbasin with respect to the conveyance of water for beneficial use. It also cannot be disputed, as documented in the GSPs, that groundwater pumping in the vicinity of the Canal has resulted in upwards of 9 feet of land subsidence in recent decades - several feet of which has occurred in recent years even after the adoption of SGMA.[4] Because the Canal's conveyance system relies on a "gravity" design, this subsidence has reduced the conveyance capacity of the Canal to 40% of its original capacity (from 4,000 to 1,650 cubic-feet per second (cfs)) in these subsided areas. The resulting constriction in the Canal is precluding the delivery of significant amounts of water to Friant Division Contractors (Friant Districts) below the subsided areas and also affects the ability to Friant Districts above the constricted area to engage in exchanges or transfers of water.

As a result of the persistent overdraft conditions in the Tule Subbasin, FWA, at considerable expense, is developing plans, undertaking environmental review, and pursuing permitting to address these existing subsidence impacts by restoring capacity through a project referred to as the "Friant-Kern Canal Middle Reach Capacity Correction Project" (Project). The current engineering estimates place the cost of the Project in excess of $500 million.

With this well-documented and undisputed background in mind, including the extensive information, analysis and modeling in the GSPs and their supporting technical appendices, FWA must express its dissatisfaction with both the proposed "minimum thresholds" for subsidence and the criteria used to define "undesirable results" with respect to future subsidence as applied to the FKC. Specifically, the draft GSPs provide for **up to three feet of additional subsidence along the Canal** caused by transitional pumping/use **BEFORE** the identified ***minimum thresholds*** are exceeded. This impact will be compounded by the reliance of the GSPs on the definition of undesirable results in the Coordination Agreement, which provides as follows:

> § 4.3.4.2 Criteria to Define Undesirable Results: *"the criteria for an undesirable result for land subsidence is defined as the unreasonable subsidence below minimum thresholds at* ***greater than 50% of GSA Management Area RMS*** *resulting in significant impacts to critical infrastructure."* (Emphasis added.)

Figure 5-1 of the GSP for the ETGSA identifies seven Representative Monitoring Sites (RMS) along the most severely subsided portion of the FKC covering a distance of approximately 12 miles measured from the Tule River at Avenue 152 to Avenue 80. Using the proposed criteria for defining an undesirable result, the "transitional" overdraft pumping will be permitted to potentially cause 3 additional feet of

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[3] Coordination Agreement, § 4.3.4.3.

[4] ETGSA GSP, § 4.3.5; see also FWA's Friant-Kern Canal Fact Sheet (attached).

subsidence over at least a 4-6 mile area (the distance of 4 of 7 RMS (i.e., more than 50% of the Representative Monitoring Sites)) BEFORE being deemed an undesirable result.[5] This is not acceptable to FWA unless there is concurrent and corresponding mitigation in the form of compensation to FWA and the Friant Districts to pay for the damages resulting from such pumping as discussed further below.[6] If the GSAs agree to incorporate the prompt adoption of management actions that would provide reasonable compensation to address "interim" subsidence (i.e., the continuation of subsidence until the proposed "minimum thresholds" are reached), then FWA would not object to the GSPs maintaining these objectives, not as minimum thresholds that must be exceeded before management action is taken, but rather, as a basis for ***additional*** management actions, including greater compensation for damages to the Canal and Friant Districts and potential additional reductions in groundwater pumping to achieve sustainability sooner and avoid further impacts to the Canal if these so-called minimum thresholds are exceeded.

In addition to establishing a uniform zero-tolerance for additional subsidence impacts to the Canal absent appropriate compensation/mitigation, the criteria for monitoring any continued undesirable results for land subsidence as pertaining to the Canal need to be site specific and should be based on any additional subsidence detected at a single RMS location. Furthermore, because the FKC is critical infrastructure, FWA recommends that the Tule Subbasin GSPs incorporate additional RMS along the FKC for the entire length of the Tule Subbasin and that such RMS locations be spaced not more than one mile apart. Some of the Friant Districts are adding such monitoring sites for their own water banking/recharge projects near the FKC, and we would encourage the GSAs to incorporate these facilities as part of their subsidence monitoring management actions with respect to the FKC.

While the GSPs do not calculate the amount of capacity loss to the Canal from the contemplated 3 additional feet of subsidence that is predicted over the first 15 years of the GSPs, FWA estimates this capacity reduction to be on order of 460 cubic feet per second (cfs), which would result in a conveyance capacity of 1,140 cfs (based on current deficient conditions) and put the Canal capacity at 2,860 cfs below the original design capacity of 4,000 cfs. FWA further estimates that the 3 additional feet of subsidence contemplated under the GSPs will result in further reduced water deliveries to Friant Districts below the impacted area on the order of at least 30,000 to 40,000 acre feet (AF) per year, in addition to the already significant inability to convey water during wet years such as 2017 and 2019 where FWA estimates that upwards of 300,000 AF could have been delivered to Friant Districts but for the capacity restrictions caused by subsidence due to overdraft groundwater pumping in the Tule Subbasin. Under such conditions, Friant Districts' imported surface water supplies through the FKC will be even further restricted, which in turn will diminish their ability to contribute to the sustainable management of their own respective subbasins in the future.

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[5] See ETGSA GSP, § 5.8.3.1.2 (Quantified Minimum Thresholds).

[6] See Civil Code section 3479: "**Anything which is injurious to** health, including, but not limited to ... an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, or unlawfully obstructs **the free passage or use**, in the customary manner, **of any ...canal ... is a nuisance**." (Emphasis added.) It is FWA's position that any pumping activity causing further subsidence to the Canal constitutes a nuisance unless appropriate compensation/mitigation is provided.

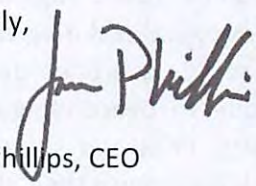
FWA is encouraged that the GSP for ETGSA establishes a "Friant-Kern Canal Subsidence Management Area." However, neither that Plan nor any of the other GSPs establish specific management actions or mitigation to address the continued subsidence impacts to the Canal despite the fact that the GSPs contemplate continued overdraft conditions (aka "transitional pumping/use") through the implementation period of 2040.[7]

For the above reasons, **all** further subsidence along the Canal as contemplated in the GSPs should be considered significant and unreasonable and deemed to substantially interfere with surface land uses unless appropriate mitigation is provided to fairly compensate FWA and the Friant Districts for such interference.[8] Accordingly, the GSPs should be revised to mandate the prompt adoption of management actions (following adoption of the GSP) that provide for such equitable compensation as a condition of the transitional groundwater pumping permitted under each GSP in areas where such pumping can reasonably be demonstrated to cause continued subsidence impacts to the Canal.

Given the acknowledged effects of continued subsidence proximate to the FKC, these immediate management actions to mitigate such impacts are required. To this end, concurrent with the adoption of the final GSPs, as amended to address the comments provided herein, FWA respectfully request that the Board of each GSA direct staff to continue to work with FWA and Friant Districts to promptly develop and bring back for adoption management actions that would establish mechanisms to mitigate future subsidence impacts in the form of compensation to FWA and Friant Districts to pay for the costs of repairs to the FKC resulting from the transitional pumping/use permitted under the GSPs as well as the reduced water deliveries to Friant Districts until such repairs are completed. This mitigation could come in the form of fees or charges imposed on groundwater pumping and/or assessments or charges spread over the lands benefitting from groundwater pumping permitted under the GSPs that have caused, and can reasonably be demonstrated will continue to cause, undesirable results to the Friant-Kern Canal.

On behalf of FWA, I appreciate your consideration of these comments. FWA staff looks forward to continued collaboration on prompt and appropriate actions that will help us move forward with our mandate to restore critically needed capacity to the Friant-Kern Canal.

Sincerely,



Jason Phillips, CEO

Attachment: FWA Subsidence Fact Sheet

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[7] We acknowledge that the Delano-Earlimart GSP does contain management actions that assert it will achieve sustainability, but because the plan still anticipates that future subsidence will occur, more attention to address FWA's concerns regarding compensation for continuing subsidence impacts to the FKC is still warranted.

[8] See Water Code § 10721(x)(5).

Wonderful orchards.
Wonderful citrus™

December 13, 2019

Rogelio Caudillo, Interim Executive Director
Eastern Tule Groundwater Sustainability Agency
881 W. Morton Avenue, Suite D
Porterville, CA 93257

VIA EMAIL: info@easterntulegsa.com

Re: Comments on Eastern Tule Groundwater Sustainability Agency's Draft Groundwater Sustainability Plan

Dear Mr. Caudillo and Board of Directors,

Wonderful Orchards LLC and Wonderful Citrus LLC (collectively, "Wonderful") appreciate all the hard work that has gone into preparing the draft Groundwater Sustainability Plan ("GSP") by the Eastern Tule GSA ("ETGSA"), as well as the Tule Subbasin Coordination Agreement ("Coordination Agreement") prepared by each of the member GSAs in the Tule Subbasin ("Subbasin").

Wonderful, and our related entities, farm and process almonds, pistachios, various citrus varietals, pomegranates and nursery stock in Central California, including Tulare County. As a major agricultural entity in the Central Valley, we understand how important it is to formulate a GSP that meets the sustainability needs of the groundwater basin well into the future.

In order to best execute the GSP's goal to achieve sustainability by 2040, we encourage ETGSA to continue to facilitate a stakeholder-driven process as the GSA pushes forward from GSP creation to implementation. To that end, we request that the following comments be considered prior to the GSP being finalized and implemented.

Allocation of Native Yield

Page 45 of the Coordination Agreement – Draft 9/16/19 indicates that the Subbasin has agreed to divide, or allocate, the Subbasin's sustainable yield (inclusive of native yield) at both the GSA level and the individual landowner level using an approach referred to as a "gross acreage" method. While coordination of allocation methodology across the Subbasin is desirable, the chosen methodology should be informed by a stakeholder-driven process for establishing landowner-level allocations of native yield that can then be coordinated across the Subbasin. Further, any allocation methodology adopted must be consistent with various legal considerations drawn from applicable case law and be consistent with groundwater rights, recognizing that GSAs do not have statutory authority to make a binding determination of water rights. An equal-per-gross acre approach to allocations is not likely to be consistent with

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established water rights doctrine, which must recognize many factors and equitable considerations in addition to acreage owned, to determine a legally defensible allocation. Further information regarding allocation methodology can be found in *Groundwater Pumping Allocations Under California's Sustainable Groundwater Management Act – Environmental Defense Fund and New Current Water & Land, July 2018*.

Pumping Restrictions

Wonderful understands that there are instances where it may be necessary to restrict pumping in order to achieve basin-wide sustainability. If this becomes a necessity, the GSA should implement pumping restrictions when supported by the best available data and appropriate analytical tools. Furthermore, if possible, pumping should be ramped down gradually over the implementation period to avoid a sudden disruption in economic activity.

As with native yield allocations, initial pumping allowances and ramp down schedules should be coordinated across the entire basin so that similarly situated pumpers in the basin are treated equitably regardless of their respective GSA (ex. a ramp down schedule for groundwater-only lands that is consistent across the Subbasin). Like allocations, pumping restrictions may not determine or alter water rights.

Groundwater Markets

Markets are essential in facilitating the highest and best use of a limited resource and in giving landowners the most flexibility to minimize the economic impacts of pumping restrictions. To enable a market that works for all landowners in the Subbasin, it is imperative that all pumpers know exactly how much marketable water they have available for use or transfer. Unless it is deemed necessary to prevent undesirable results, markets should not place geographic or jurisdictional limitations on transfers within a Subbasin and should allow for carry-over of allocations from one year to the next. Like allocations and pumping restrictions, markets may not determine or alter water rights.

Groundwater Recharge and Banking

GSAs must develop clear policies and conditions that are consistent with existing storage rights and protect existing investment in groundwater banking and banked inventory, and without interference with existing rules and regulations. GSAs must also find a way to incentivize additional investment, such as on-farm recharge, and allow flexibility for recharged or banked water to be freely transferrable (subject to the rights and conditions of use associated with the source water and the avoidance of undesirable results). Where possible, GSPs should also identify management areas that may benefit from additional recharge and banking. We also recommend that GSAs work to develop incentives for public or private investment to expand recharge and banking capacity, as these facilities help to achieve multiple benefits (e.g., habitat, water quality, drinking water, etc.).

Measurement and Data Management

Finally, GSAs should develop a coordinated basin-wide data management system ("DMS") that is capable of tracking groundwater and surface water use at the landowner, field, or parcel level, and a coordinated methodology for measuring landowner-level use of groundwater. The DMS

should also include, or be capable of interfacing with, a groundwater market platform that allows for individual users to conduct transactions.

Markets will be most effective if there is confidence in the accuracy of the measurements taken, consistency in the data sources relied upon, and flexibility to allow for transactions across the basin. For instance, GSAs using remote sensing to calculate crop evapotranspiration ("ET") as a measurement of consumptive use of groundwater should develop methodologies and quality assurance elements to allow for grower provided information to be included into the ET calculation and calibration. Additionally, GSAs should establish criteria and procedures to address any apparent inaccuracies in the ET calculations (e.g., if calculated ET is greater than applied water and precipitation).

***

Wonderful appreciates the opportunity to provide feedback on the GSP. We would be happy to discuss these comments at your convenience. Thank you for your consideration.

Sincerely,

Rob C. Yraceburu
President
Wonderful Orchards LLC

Adam Brown
Vice President, California Farming
Wonderful Citrus LLC

CC: Eric Limas, Lower Tule River and Pixley Groundwater Sustainability Agencies
Dale Brogan, Delano Earlimart Groundwater Sustainability Agency
Deanna Jackson, Tri County Water Authority Groundwater Sustainability Agency
David Kahn, Alpaugh Groundwater Sustainability Agency

Comment Response Summary

ETGSA GSA Public Review Draft Groundwater Sustainability Plan dated September 23, 2019

Comment letters on the ETGSA Draft GSP were received from the following entities/individuals:

Comment Letter	Entity/Individual	Abbreviation
A	Arvin-Edison Water Storage District/ Shafter-Wasco Irrigation District	AEWSD/ SWID
	-EKI Review of Subsidence in the vicinity of FKC	
	-GSI Subsidence Focused Review of Tule Subbasin GSPs	
B	Community Water Center	CWC
C	Department of Fish & Wildlife	DFW
D	Delano-Earlimart Irrigation District Groundwater Sustainability Plan	DEIDGSA
E	Ducor Community Service District	DCSD
F	Friant Water Authority	FWA
G	Lindsay-Strathmore Irrigation District	LSID
H	The Nature Conservancy	TNC
I	Setton Pistachio of Terra Bella	SPTB
J	Sierra Club	SC
K	Tulare County Farm Bureau	TCFB
L	Tulare Irrigation District	TID
M	United Stated Bureau of Reclamation	USBR
N	Wonderful Orchards/ Wonderful Citrus	WO/ WC
O	Eastern Tule White Area Growers	ETWAG
	-Bondy Evaluation of ETGSA Tule Subbasin Draft GSP	
O1	Bill Samarin	BS
O2	Juan Carranza	JC
O3	Farmland Reserve/ South Valley Farms	FR/ SVF
O4	ELMCO 200	ELMCO
	-Bondy Evaluation of ETGSA Tule Subbasin Draft GSP	
O5	FLS Enterprises	FLSE
O6	Golden Groves Ranch	GGR
O7	Khalid Arain	KA
O8	Kingsburg Citrus Ranch Management	KCRM
O9	MAC Ranches	MACR
O10	Padilla Harvesting	PH
O11	Glen Martin Ranches	GMR
P	Catherine Capone	CC

Review comments have been grouped by similar topic and summarized, with a response from the GSA.

Topics

- Public Engagement / Notice & Communication
- Water Budgets
- Groundwater Levels
- Groundwater Quality
- Undesirable Results
- Sustainable Management Criteria
- Impacts on DACs and domestic water users
- Monitoring Network
- Interconnected Surface Water
- Groundwater Dependent Ecosystems
- Sustainability Goal
- Projects and Management Actions
- Basin Setting
- General Comments

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Public Engagement / Notice & Communication	Comments received from: CWC, TNC/CWA-CWF/ LGC/ AC/ CWC, SC, WO/ WC, WTWAG	
Comment No.	Review Comment Summary *	GSA Response
B.44	Communicate future P&MAs to the public through an active stakeholder outreach and communication process.	Communication will occur as noted in GSP Appendix 8-A: ETGSA Communication and Engagement Plan
B.50	ETGSA was collaborative in its development and implementation of their Communication and Engagement Plan.	Comment taken under consideration.
B.51	In early 2018, the draft GSP and policy points began to be developed through an ad-hoc committee, which was not open to the public.	Comment taken under consideration. Refer to Section 8.
B.52	The ETGSA first released the draft GSP on September 16th, 2019, and then re-released a revised draft, without public notice, on October 2nd, 2019.	Refer to revised Section 8.3.
B.53	As noted in the community comments, not all landowners received timely notification about the formation of the ETGSA or the release of the draft GSP.	Refer to revised Section 8.3.
B.54	Water boards were contacted but contact with residents was really only made explicitly through coordination with CWC on workshops.	Refer to revised Section 8.3.
B.55	Utilize existing community venues for community meetings, workshops and events to provide information.	Refer to revised Section 8.3.
B.56	Identify community social media (Facebook, Instagram, etc.) groups, pages and websites and post information.	Refer to revised Section 8.3.
B.57	Identify, and work with key community leaders /trusted messengers to distribute information and encourage community participation.	Refer to revised Section 8.3.
B.58	Continue to provide bilingual (English and Spanish) information and materials on the website, via email and short notices in water bills and/or community newsletters.	Comment taken under consideration.
B.59	Partner with other educational programs to leverage resources and explore opportunities to educate different generational groups.	Comment taken under consideration.
B.60	Consider hiring a bilingual Stakeholder and Outreach Communication specialist as part of the ETGSA staff.	Comment taken under consideration.
H.2	Stakeholder engagement should be maintained through the development of future P&MAs and other SGMA compliance and implementation steps, and that such engagement be tailored for diverse audiences, including environmental interests and	Refer to Appendix 8-A.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Public Engagement / Notice & Communication	Comments received from: CWC, TNC/CWA-CWF/ LGC/ AC/ CWC, SC, WO/ WC, WTWAG	
Comment No.	Review Comment Summary *	GSA Response
	DACs.	
J.1	The GSA lacked outreach to Native American stakeholders.	Refer to Appendix 8-A, Section 2.1.
J.2	White Area landowners were not well represented in the development of the GSP.	Refer to Section 2.1.3.
N.1	Allocation of Native Yield should be developed through a stakeholder driven process.	Comment taken under consideration.
O.3	Encourage active stakeholder engagement during the implementation of the GSP.	Comment taken under consideration.

Water Budgets	Comments received from: DCSD, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
E.5	The draft GSP be revised to guarantee adequate groundwater for planned growth.	Comment taken under consideration.
H.5	Based on the data presented, it is not clear how climate change is expected to affect some specific elements of the water budget.	See Tule Subbasin Setting (Attachment 2 of Appendix A) Section 2.3.2.6 for details on how climate change was included in water budgets.
H.6	The GSP should include specific information on groundwater use by public water suppliers so that the public can determine if water use by all public water suppliers has been considered.	See Tule Subbasin Setting (Attachment 2 of Appendix A) Section 2.3.2.2.1 for details on how water use for public water suppliers was determined.
O.1	Allocation of Sustainable Yield should not be on a gross acreage basis and should be on historical use and stakeholder engagement.	See revised Section IV of Coordination Agreement.

Groundwater Levels	Comments received from: TNC/ CWA-CWF/ LGC/ AC/ CWC	
Comment No.	Review Comment Summary *	GSA Response
H.12	The GSP should clearly identify and detail the anticipated degree of water level decline from current elevations to the water level MOs and MTs.	Refer to GSP Appendix 5-1: RMS Groundwater Elevation Hydrographs.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Groundwater Quality	Comments received from: CWC, DCSD, SC	
Comment No.	Review Comment Summary *	GSA Response
B.13	Add more information regarding known groundwater quality.	Refer to Tule Subbasin Setting (Attachment 2 of Appendix A) Section 2.2.4 and Figures 2-14 & 2-15
B.27	Clarify inconsistencies in the various locations where groundwater quality SMC's are discussed, particularly between the ETGSA draft GSP and the Tule Subbasin Coordination Agreement.	Comment taken under consideration.
B.28	Clearly identify and describe the current level of contamination at each representative monitoring well and attribute specific numeric values for MTs/MOs for each contaminant of concern.	Comment noted. Refer to GSP Section 5.7.2.1.1 & Table 5-7. Spring 2020 monitoring will fill existing data gaps.
B.31	Revise the Undesirable Results for groundwater quality.	Comment taken under consideration.
B.32	Provide an analysis of water quality data in the GSA with a discussion of if the contaminant qualifies as a Contaminant of Concern to be included in the GSP.	Refer to Section 3.1.4.
B.33	Include maps of existing contaminants of concern in the ETGSA.	Refer to Tule Subbasin Setting Figure 2-15 and 2-16.
B.34	Include an analysis of the relationship between changes in groundwater levels and groundwater quality concentrations.	Comment taken under consideration.
B.35	Consider working with local and regional water agencies or the county to implement groundwater quality remediation projects that could improve both quality as well as levels and to ensure groundwater management does not cause further degradation of groundwater quality.	Comment taken under consideration.
B.38	Include specific discussions of the water quality conditions and trends for applicable constituents and uses within the ETGSA area.	Refer to GSP Section 4.2.6.4
B.39	Provide greater clarity on how monitoring sites and sampling schedules will ensure effective monitoring of degraded groundwater quality.	Refer to Section 6.2.3.4.
B.40	The GSP should fully consider all available water quality data in its analysis of groundwater conditions and the hydrogeologic conceptual model.	Refer to Section 6.2.3.4.
B.42	Clarify how the GSA plans to align groundwater monitoring efforts and the sustainable management criteria with any emerging contaminants of concern and new MCLs.	Refer to Section 6.2.3.4.
E.3	The GSP revised to clearly articulate the groundwater quality sustainability criteria.	Refer to GSP Section 5.7.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Groundwater Quality	Comments received from: CWC, DCSD, SC	
Comment No.	Review Comment Summary *	GSA Response
E.4	The GSP should include an analysis of how the proposed SMC for groundwater quality might impact Ducor's ability to maintain safe drinking water over the long term.	Comment taken under consideration.
J.3	The Draft GSP ignores water quality issues.	Refer to GSP Section 4.2.6.4

Undesirable Results	Comments received from: AESWD/ SWID, CWC, DEIDGSA, LSID	
Comment No.	Review Comment Summary *	GSA Response
A.5	UR be defined at each RMS for Subsidence on the FKC rather than 50%.	Refer to revised GSP Section 5.8.1.
A.10	The definition of Undesirable Results in the TSCA and the Tule Subbasin GSPs is not compliant with the GSP Regulations.	Refer to GSP Section 5.4
A.15	The "URs for Land Subsidence" were not adequately defined regarding subsidence related impacts on the FKC.	Refer to revised GSP Section 5.8.1.2
A.16	Allowing less than 50% of the RMSs to exceed the MT criterion might not be protective of adequate conveyance capacity of the FKC.	Refer to revised GSP Section 5.8.1.2
B.18	Undesirable Results are not protective of drinking water users.	Comment taken under consideration.
B.23	Clarify how the projected water level decline before reaching the UR is not significant and unreasonable as described in 23 CCR § 354.26.	Refer to GSP Section 5.5.1.1 & Appendix A - Tule Subbasin Coordination Agreement, Section 4.3.1.
B.37	Revise this section to include relevant information for undesirable results that is currently included in the Coordination Agreement.	Comment taken under consideration.
D.20	Limiting undesirable results to those associated with groundwater pumping is inconsistent with SGMA.	See revised Section IV of Coordination Agreement.
D.21	Undesirable results are not limited to a "significant and unreasonable portion" of the basin.	Refer to updated GSP Section 5.4
G.2	Unacceptable to allow 3 additional feet of subsidence and for 50% of RMS to reach their MT before an UR occurs.	Refer to updated GSP Section 5.8.1.2.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Sustainable Management Criteria	Comments received from: AEWSD/ SWID, CWC, DFW, DEIDGSA, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG, FR/ SVF	
Comment No.	Review Comment Summary *	GSA Response
A.1	Minimum thresholds are not protective of beneficial users' ability to receive FKC water deliveries downstream of the Tule Subbasin due to subsidence in the Tule Subbasin.	Refer to revised GSP Section 5.8.1.2.
A.2	Tule Subbasin GSPs should include P&MAs that allow zero additional subsidence beyond legacy.	See revised 3.6, 4.5, 5.8.1.2.and 7.2.3
A.3	Analysis of subsidence MTs would impact the FKC and beneficial users was not performed.	Comment taken under consideration. See revised 3.6, 4.5, 5.8.1.2.and 7.2.3
A.4	An uncertainty analysis needs to be conducted on modeling used for establishing MTs.	Refer to GSP Appendix A, Attachment 2 – Tule Subbasin Setting, Section 2.3.2.6.
A.13	The proposed SMCs for subsidence are insufficient in their consideration of impacts on adjacent basins.	See revised 3.6, 4.5, 5.8.1.2.and 7.2.3.
A.17	The FKC current and projected conveyance capacity based on SMC should be defined.	See revised 3.6, 4.5, 5.8.1.2.and 7.2.3.
A.18	The relationship between the FKC conveyance capacity and MOs.	See revised 3.6, 4.5, 5.8.1.2.and 7.2.3.
A.19	Model uncertainties and margin of error should be incorporated into subsidence related SMC.	Refer to GSP Appendix A, Attachment 2 – Tule Subbasin Setting, Section 2.3.2.6.
B.16	Include quantifiable SMCs for all identified RMWs in the ETGSA or clarify the inconsistency with the Tule Subbasin Coordination Agreement.	See revised 3.6, 4.5, 5.8.1.2.and 7.2.3
B.17	Minimum thresholds are not protective of diverse drinking water users.	Comment taken under consideration.
B.20	Clarify the rationale for the water level decline used to develop MTs/MOs.	Refer to GSP Section 5.5.2.1.1.
B.24	Clarify the process for evaluating minimum threshold exceedance and the potential actions to address exceedance.	Refer to GSP Section 5.5.2.4.
B.29	Provide more clarity about how the GSA will determine whether MTs or Undesirable Results will be evaluated.	Refer to GSP Section 5.5.2.4.
B.36	Revise Tables 5-4 and 5-5 to include MTs for reduction in groundwater storage.	Refer to revised GSP Section Table 5-4 & Table 5-5.
C.4	The SMC demonstrates no consideration of URs for environmental beneficial uses and users of groundwater and MTs do not reflect a "Critically Over drafted" Basin status.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Sustainable Management Criteria	Comments received from: AEWSD/ SWID, CWC, DFW, DEIDGSA, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG, FR/ SVF	
Comment No.	Review Comment Summary *	GSA Response
D.22	Measurable Objectives (MOs) in the GSP are not quantified as required under SGMA.	Refer to updated GSP Section 5.6.2.1.2
D.23	Minimum Thresholds are not narratively explained.	Refer to GSP Section 5.5.3.1, 5.6.3.1, 5.7.3.1, & 5.8.3.1.1.
F.2	Undesirable Result would occur if Minimum Threshold occurred at 1 RMS.	Refer to revised GSP Section 5.8.1
H.9	Based on the presented information, DAC members are not explicitly considered in the discussion of URs, MOs, and MTs for groundwater levels and water quality.	Refer to revised GSP Section 5.6.2.1.2
H.11	The GSP should describe how the approach to developing water level MOs/MTs is protective of the diverse drinking water users within the ETGSA area.	Comment taken under consideration.
O.18	The process for establishing SMCs is not documented sufficiently to critically evaluate.	Refer to GSP Section 5.3.
O.20	The process for establishing SMC appears arbitrary and may not necessarily be designed to prevent undesirable results.	Refer to GSP Section 5.3.
O.21	IM, MO, and MTs for groundwater storage are blank.	Refer to updated GSP Table 5-4 & 5-5.
O3.6	Minimum thresholds should be set based on 2 consecutive 10-year droughts.	Comment taken under consideration.

Impacts on DACs and domestic water users	Comments received from: CWC, DEIDGSA, DCSD, TNC/ CWA-CWF/ LGC/ AC/ CWC	
Comment No.	Review Comment Summary *	GSA Response
B.8	Require an additional drinking water impact assessment prior to the construction of new wells with high production capacity.	Comment taken under consideration.
B.19	Disproportionate impacts to drinking water users.	Comment taken under consideration.
B.21	Describe how the approach to develop MTs/MOs is protective of diverse drinking water users.	Comment taken under consideration.
B.22	Undertake a drinking water well impact analysis that adequately quantifies and captures well impacts at the minimum thresholds, measurable objectives, and proposed undesirable results.	Refer to revised GSP Section 5.5.1.2.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Impacts on DACs and domestic water users	Comments received from: CWC, DEIDGSA, DCSD, TNC/ CWA-CWF/ LGC/ AC/ CWC	
Comment No.	Review Comment Summary *	GSA Response
B.25	Develop and include a plan that outlines steps that will be taken if a drinking water well goes dry as a result of the ETGSA's management actions and projects.	Refer to revised GSP Section 5.5.1.2.
B.26	Develop a protective minimum threshold near vulnerable communities, including domestic wells, to avoid localized impacts and ensure the protection of these important water sources.	Refer to revised GSP Section 5.5.3.4.
B.30	Revise SMCs to be more protective of DAC and drinking water stakeholders or demonstrate how these will be sufficient to ensure that the stated water quality Undesirable Result of "impacting the long-term viability of the groundwater resource" for drinking water beneficial users will be avoided.	Refer to GSP Appendix A – Tule Subbasin Coordination Agreement, Section 4.3.3.
B.41	Describe how the monitoring network will detect impacts to domestic well users, or else propose improvements to the existing network to cover these data gaps.	Refer to revised GSP Section 5.5.1.2.
B.43	Identify accounting plan or mechanism for each type of use that is tailored to each user individually, ensuring DACs, small community water systems and domestic well users have access to safe, clean and affordable drinking water.	Refer to Section 7.2.1.
B.45	Assess the impacts and identify the benefits of the water supply augmentation projects near DACs and small water systems.	Comment taken under consideration.
D.14	An analysis of the expected well failures within the ETGSA, including those specifically within groundwater dependent communities, would assist in understanding the impacts of the transitional pumping project identified in Section 7 of the GSP.	Refer to revised GSP Section 5.5.1.2.
E.1	Include an analysis of the potential impact the identified MOs and MTs could have on drinking water wells in the Ducor area, quantifying both the potential dewatering of wells as well as the associated costs.	Refer to revised GSP Section 5.5.1.2.
E.2	Based on results from impact analysis, revise MO/MTs to be protective of private and public drinking water wells in the Ducor area.	Refer to revised GSP Section 5.5.1.2.
E.7	The draft GSP should include specific proposals on assessment fees, with special considerations of the financial challenges faced by small systems serving DACs.	Refer to revised GSP Section 7.2.3
H.1	The GSP is not clear on how DACs are identified.	See Appendix 8-A, Section 2.1.
H.7	It is recommended that the GSP discuss what, if any, differential impacts would be anticipated as a result of the separate management of these areas.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Impacts on DACs and domestic water users	Comments received from: CWC, DEIDGSA, DCSD, TNC/ CWA-CWF/ LGC/ AC/ CWC	
Comment No.	Review Comment Summary *	GSA Response
H.13	It is also recommended that the impacts to groundwater gradients at the proposed MOs and MTs be analyzed and described in the GSP, in addition to the likely impacts to drinking water wells.	Refer to revised GSP Section 5.5.1.2.
H.14	A discussion should be added for each project or management action to clearly identify the benefits to DAC drinking water users and potential impacts to the water supply.	Refer to revised GSP Section 5.5.1.2.
H.16	The ETGSA should develop an assistance program for potentially impacted beneficial users, including DACs, small community water systems, and domestic well users, to mitigate adverse impacts.	Refer to GSP Section 7.2.3.

Monitoring Network	Comments received from: AESWD/ SWID, CWC, DEIDGSA, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
A.6	Incorporate RMS at 1-mile intervals along FKC.	Refer to revised GSP Section 6.2.3.5.
A.12	The Monitoring Network for subsidence in the vicinity of the FKC is inadequate.	Refer to revised GSP Section 6.2.3.5.
A.20	Insufficient RMSs along the FKC in the DEID GSA MA.	Refer to revised GSP Section 6.2.3.5.
A.21	RMSs at river crossing might not be approximate.	Comment taken under consideration.
A.22	There are not RMSs dedicated to address the concern of FKC structural damages.	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.
A.23	The FKCSMA does not include the portions of FKC in the ET and DEID GSA MA. Although historical subsidence along the FKC in the DEID GSA MA has been small, future subsidence will increase if groundwater extraction increases in the vicinity of the FKC.	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.
B.14	Revise Section 4-5 to include the referenced “Friant-Kern Canal Subsidence Management Area.”	Refer to revised GSP Section 4.5.
D.6	We believe there is a critical need to have the important issue of subsidence along the Friant-Kern Canal within the ETGSA identified and treated as a separate management area.	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Monitoring Network	Comments received from: AESWD/ SWID, CWC, DEIDGSA, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
D.17	Monitoring for purposes of addressing land subsidence needs more details.	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.
D.19	Monitoring notes anticipated continued subsidence due to “legacy impacts” but does not reference nor quantify subsidence impacts expected from transitional pumping.	Refer to GSP Section 6.2.1.1.
F.3	Incorporate additional RMS along the FKC, spaced no more than 1 mile apart.	Refer to revised GSP Section 4.5.
F.4	Develop a "Friant-Kern Canal Subsidence Management Area".	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.
H.3	The GSP should include detailed information about the location and depths of domestic wells. Providing maps of the monitoring network overlaid with location of DACs, domestic wells, community water systems, GDEs, and any other sensitive beneficial users will allow the reader to evaluate the adequacy of the network to monitor conditions near these beneficial users.	Refer to GSP Section 5.5.1.2.
O.9	The “Friant-Kern Canal Subsidence Management Area” listed in Section 3.6 is not depicted on Figure 3-6, map of management areas within ETGSA.	Refer to revised GSP Section 3.6, 4.5, 5.8.1, 6.2.3.5, & 7.2.3.

Interconnected Surface Water	Comments received from: DFW, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
C.2	The ISW analysis lacks sufficient evidence to justify an absence of interconnected streams in the Tule Subbasin.	Refer updated GSP Section 4.3.6, Revised Monitoring Plan 2.6
C.5	The number and distribution of shallow groundwater monitoring wells in the GSP area and along the surface waters in the Tule Subbasin are insufficient for analysis of shallow groundwater trends and groundwater-surface water interconnectivity.	Refer updated GSP Section 4.3.6, Revised Monitoring Plan 2.6
O.15	Not enough reasonable justification was provided for concluding no ISWs occurred in the subbasin.	Refer updated GSP Section 4.3.6, Revised Monitoring Plan 2.6

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Groundwater Dependent Ecosystems	Comments received from: DFW, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
C.3	The GDE identification section is based on limited information to identify ecosystems that may depend on groundwater.	Refer revised GSP Section 4.3.6; Revised Tule Subbasin Setting Section 2.2.7.
H.4	The GSP should provide more discussion to verify that there are no ISWs or GDEs in the plan area and use tools developed by TNC to identify GDEs.	Refer revised GSP Section 4.3.6; Revised Tule Subbasin Setting Section 2.2.7.
H.8	The GSP should provide additional analysis to back-up the conclusion that states "The area's most likely to support groundwater dependent ecosystems are along the Tule River in and upstream of Porterville, and in the upper reaches of Deer Creek and White River," and, given this, provide further data to substantiate the conclusion that no GDEs are present.	Refer revised GSP Section 4.3.6; Revised Tule Subbasin Setting Section 2.2.7.
O.16	The current level of characterization of no GDEs in the basin may be noted as a plan deficiency by DWR.	Refer revised GSP Section 4.3.6; Revised Tule Subbasin Setting Section 2.2.7.

Sustainability Goal	Comments received from: AEWSD/ SWID, DEIDGSA, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
A.9	The Sustainability Goal in the TSCA and the Tule Subbasin GSPs is not fully consistent with the General Principles laid forth in the GSP Regulations.	Refer to revised Section 4.2 of TSCA, and Revised Section 5.2 of GSP.
D.1	The Executive Summary should be clearer about the Project and Management Actions that will be undertaken to meet the Sustainability Goal.	Comment taken under consideration.
D.2	Sustainability goal to achieve "no long-term change in groundwater storage" needs to be rephrased.	Refer to revised Section 4.2 of TSCA, and Revised Section 5.2 of GSP.
O.7	Description of the sustainability goal differs from that provided in Section 5.2.	Refer to revised Section 4.2 of TSCA, and Revised Section 5.2 of GSP.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Projects and Management Actions	Comments received from: AESWD/SWID, CWC, DEIDGSA, DCSD, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, TID, WO/ WC, ETWAG, FR/ SVF	
Comment No.	Review Comment Summary *	GSA Response
A.7	GSP does not identify P&MA's that will be taken to avoid subsidence UR along the FKC.	Refer to revised GSP Section 7.2.3.
A.8	P&MA proposing mitigation to damages to the FKC should be proposed.	Refer to revised GSP Section 7.2.2.
A.14	The proposed P&MAs do not adequately address and mitigate impacts from subsidence.	Refer to revised GSP Section 7.2.3.
A.26	Curtailment of groundwater extraction near the FKC should be included in Projects & Management Actions.	Refer to revised GSP Section 7.2.3.
B.2	Include more detail on the mechanisms to collect revenue from the relative funding sources.	Refer to revised GSP Section 7.2.2.
B.46	The GSP should discuss what the implications of the uncertainty in P&MAs is on the ETGSA's ability to reach sustainability by 2040 and to maintain water levels pursuant to the SMCs.	Comment taken under consideration.
B.48	The GSP should clearly indicate how the specified reductions of "transitional" groundwater pumping will be achieved through a P&MA.	Refer to GSP Section 7.2.1.5.
D.11	Landowner recharge and banking using groundwater recharge credits needs additional clarification.	Comment taken under consideration.
D.12	Further information is needed as to anticipated "new alternative" sources of water.	Comment taken under consideration.
D.26	Stating that projects and management actions "will be evaluated" (GSP, p. 6-2) if minimum thresholds are exceeded does not satisfy SGMA's requirements to avoid undesirable results.	See revised GSP Section 6.2.1.1
D.29	Voluntary projects need additional detail.	Comment taken under consideration.
E.6	The draft GSP be revised to include an analysis of potential P&MAs the GSA may have impacts on Ducor, as well as neighboring communities.	Comment taken under consideration.
F.1	Mitigation for additional subsidence along the FKC caused from "Transitional Pumping".	Refer to updated GSP Section 3.6, 4.5, 7.2.2
H.15	The GSP should discuss what the implications of the uncertainty in projects and management actions is on the ETGSA's ability to reach sustainability by 2040 and to maintain water levels pursuant to the SMCs.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Projects and Management Actions	Comments received from: AESWD/SWID, CWC, DEIDGSA, DCSD, FWA, TNC/ CWA-CWF/ LGC/ AC/ CWC, TID, WO/ WC, ETWAG, FR/ SVF	
Comment No.	Review Comment Summary *	GSA Response
H.17	The GSP should identify the groundwater accounting plan or mechanism for each type of user that will be used to create individually tailored allocations.	Refer to Section 7.2.1.
H.18	The GSP should explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies.	Comment taken under consideration.
L.3	Ongoing Transitional Pumping is not supported due to capacity loss to the Canal.	Comment taken under consideration.
L.4	Develop P&MAs that mitigate any future capacity loss to the capacity of the Canal.	Refer to revised GSP Section 7.2.3.
L.5	Mitigation discussions with the Friant Water Authority for future subsidence to the Canal is supported.	Refer to revised GSP Section 7.2.3.
N.2	Pumping restrictions should be supported by best available data and analytical tools and should be consistent across the subbasin.	Refer to revised GSP Section 7.2.1.
N.3	Groundwater markets should be created, and transferrable water should be known by all pumpers. There should not be geographical restrictions placed on transferring water unless to prevent URs.	Refer to revised GSP Section 7.2.1.
N.4	The GSA should develop clear policies and conditions on groundwater banking and recharge.	Refer to GSP Sections 7.2.1, 7.3
O.22	P&MAs are documented as being implemented by member agencies and also lacks projects specifically targeted to address key undesirable results, such as subsidence along the FKC.	Refer to revised GSP Section 7.2.3.
O3.2	Projects should be developed by others besides the GSAs member agencies to ensure all landowners are given opportunities.	Refer to GSP Section 7.1.
O3.3	Lack of projects targeting subsidence along the FKC.	Refer to revised GSP Section 7.2.3.
O3.5	Additional clarification on the ramp-down percentages for future groundwater pumping.	Refer to GSP Section 7.2.1.5.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

Basin Setting	Comments received from: AESWD/SWID, TNC/ CWA-CWF/ LGC/ AC/ CWC, ETWAG	
Comment No.	Review Comment Summary *	GSA Response
A.11	The Basin Setting information lacks sufficient discussion of the serious issue of subsidence.	Refer to revised GSP Section 4.3.6.
H.10	The draft GSP provides very limited discussions on current groundwater conditions.	See GSP Section 4.3 & Tule Subbasin Setting Section 2.2.
O.6	Statement that "…overdraft conditions have caused issues for those reliant on groundwater pumping…" is vague.	Comment taken under consideration.
O.10	These sections should be revised to note that the southernmost portion of the eastern boundary near White River is the contact between the older sedimentary rocks and alluvial sediments.	Comment taken under consideration.
O.11	Bottom of basin definitions are inconsistent.	Comment taken under consideration.
O.12	Cross Sections C-C', D-D', and E-E' depicted on Figure 2-4 are not provided in the document. In particular, including Cross Section C-C would presumably help illustrate the points made in early comments about the basin boundary.	Comment taken under consideration.
O.13	These sections identify the Pliocene Marine Deposits, Santa Margarita Formation, and Olcese Formation as principal aquifers within the basin. As pursuant to earlier comments, these units should not be listed as principal aquifers because they are not part of the basin.	Comment taken under consideration.
O.14	The Tule Subbasin Setting should describe and show (on Tule Subbasin Setting Figures 2-10 through 2-13) the spatial distribution of textural data used to estimate hydraulic conductivity and storage properties.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

General Comments	Comments received from: AESWD/SWID, CWC, DFW, DEIDGSA, LSID, SPTB, TCFB, TID, USBR, ETWAG, BS, JC, FR/ SVF, ELMCO, FLSE, GGRC, KA, KCRM, PH, GMR, CC	
Comment No.	Review Comment Summary *	GSA Response
A.25	Subsidence and associated ground deformation are mostly irreversible.	Comment taken under consideration.
B.1	Provide more detail and clarity on how the estimated cost of implementation was calculated.	Comment taken under consideration.
B.3	Revise Figure 3-6 to include the Friant-Kern Canal Subsidence Management Area.	See revised GSP Section 3.6, 4.5, 7.2.3
B.4	Revise Table 3-4 and Figure 3-11 to include Poplar-Cotton Center and Richgrove.	Comment taken under consideration.
B.5	Revise Section 3 to include and identify locations of domestic well communities.	Comment taken under consideration.
B.6	Revise section 3.8.3 to include a map of existing percolation ponds and GW recharge sites.	Refer to GSP Appendix A, Attachment 2 – Tule Subbasin Setting, Figure 2-7.
B.7	Consider revising Section 3.14 to include a plan for improving the well permitting and replacement process.	Comment taken under consideration.
B.9	Consider working with counties to expand well construction policies to include policies that would prevent new wells being constructed in areas with high groundwater quality contamination.	Refer to Section 3.11.2.4, 3.14.
B.15	Provide more clarity about how management areas will be implemented, including providing more detailed descriptions on the SMCs and P&MAs.	Comment taken under consideration.
C.1	The GSP does not identify environmental beneficial uses and users of groundwater.	See revised GSP Section 3.8 & Appendix 8-1.
D.4	Reference to Memorandum of Understanding needs to be replaced with reference to Coordination Agreement.	See revised GSP Section2.1.2.
D.5	We believe that areas covered by a district or private water company with imported water supplies should be identified as separate management areas as provided by SGMA.	Comment taken under consideration.
D.8	Please note that water under a riparian water right may not be distributed or diverted outside of the land to which the right attaches without a proper permit. (Wat. Code, §§ 101, 1201.)	Comment taken under consideration.
D.9	City of Porterville's UWMP may not be consistent with mandatory statewide water conservation requirements.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

General Comments	Comments received from: AESWD/SWID, CWC, DFW, DEIDGSA, LSID, SPTB, TCFB, TID, USBR, ETWAG, BS, JC, FR/ SVF, ELMCO, FLSE, GGRC, KA, KCRM, PH, GMR, CC	
Comment No.	Review Comment Summary *	GSA Response
D.10	It appears that the City of Porterville boundaries overlaps other districts with imported water supplies. This may be inflating the water budget for the City. Water assets of each local agency should be separated out and included in its own management area.	Comment taken under consideration.
D.16	Extensive referencing to the Thomas Harder report should be clarified.	Comment taken under consideration.
D.24	Extensive referencing is made to the Coordination Agreement.	Comment taken under consideration.
D.25	Legacy related land subsidence needs further clarification.	See revised GSP Section 5.2.8.1.
D.28	Additionally, the assertion as to applicability of CEQA/NEPA requirements to proposed transitional pumping needs revisiting.	See revised GSP Section 7.2.1.6.
D.30	Consideration should be given to incorporating Kern-Tulare GSP fully into the ETGSA GSP to avoid the confusion of having two sperate GSPs for a single GSA.	Comment taken under consideration.
G.1	Concurrence with FWA letter to Tule Subbasin GSA's	Comment taken under consideration.
I.1	The GSA should fully invest in solutions to fixing the FKC.	See revised GSP Section 3.6, 4.5, 7.2.3.
I.2	Allow white area lands to be annexed into Ducor and Hope.	Comment taken under consideration.
I.3	Bring in more surface water and build infrastructure into the GSA.	Comment taken under consideration.
K.1	GSPs should remain adaptive documents to maximize water resources for farm and rural communities impacted by the GSP implementation.	Comment taken under consideration.
K.2	Avoid exportation of local water resources.	Comment taken under consideration.
K.3	Water markets should be developed carefully.	Comment taken under consideration.
K.4	Land fallowing and retirement should be avoided at all cost.	Comment taken under consideration.
K.5	GSAs should incentivize landowner recharge.	Comment taken under consideration.
K.6	Increase importations of water resources.	Comment taken under consideration.
K.7	GSAs should prevent management changes.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

General Comments	Comments received from: AESWD/SWID, CWC, DFW, DEIDGSA, LSID, SPTB, TCFB, TID, USBR, ETWAG, BS, JC, FR/ SVF, ELMCO, FLSE, GGRC, KA, KCRM, PH, GMR, CC	
Comment No.	Review Comment Summary *	GSA Response
K.8	GSAs should prevent the idling farmland.	Comment taken under consideration.
K.9	GSAs should promote public outreach.	Comment taken under consideration.
L.1	The loss of any capacity in the Canal beyond the current capacity of 1,650 CFS be considered an undesirable result.	See revised GSP Section 5.8.1.2
L.2	The Draft Plan does not include a determination of any additional capacity loss to the canal due to the potential additional subsidence; however, its recommended there be zero capacity loss and no further subsidence on the canal.	See Revised Section 3.6, 4.5, 7.2.3.
M.1	Concurrence with FWA letter to Tule Subbasin GSA's	Comment taken under consideration.
N.5	A coordinated basin wide data management system should be developed.	Refer to GSP Appendix A -Tule Subbasin Coordination Agreement, Section 5.3.
O.2	Encourage the Draft GSP addresses the possibility of a market for the exchange or transfer of groundwater credits.	Comment taken under consideration.
O.4	The Tule Subbasin GFM and specifics of modeling runs were not publicly available which is problematic for reviewing technical basis of key aspects of the GSP.	Comment taken under consideration.
O.5	The executive summary could do a better job of providing a more informative summary of the plan, including key groundwater conditions in the basin, undesirable results, and what actions will be taken to address undesirable results.	Comment taken under consideration.
O.8	More information is needed to understand how and why management might differ in the various management areas.	Comment taken under consideration.
O.19	The number of management areas needs to be defined consistently throughout the GSP.	See revised GSP Section 3.6, 4.5.
O.23	Documentation of the groundwater model development, calibration, sensitivity analysis, and predictive simulations for the GSP should be provided.	Refer to Tule Subbasin Groundwater Flow Model Report.
O1.1	The ETGSA has an inherent unfairness of the governance structure and biased self-serving conflicts of interest among governing officials.	Comment taken under consideration.
O2.1	Groundwater should be allocated based on historical use rather than a gross acreage basis.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

General Comments	Comments received from: AESWD/SWID, CWC, DFW, DEIDGSA, LSID, SPTB, TCFB, TID, USBR, ETWAG, BS, JC, FR/ SVF, ELMCO, FLSE, GGRC, KA, KCRM, PH, GMR, CC	
Comment No.	Review Comment Summary *	GSA Response
O2.2	Lack of white area growers in the GSA governance.	Refer to GSP Section 2.1.3.
O2.3	A new irrigation district should be created, encompassing the entire subbasin.	Comment taken under consideration.
O3.1	Groundwater should be allocated based on historical use rather than a gross acreage basis.	Comment taken under consideration.
O3.4	Provide flexibility in groundwater markets.	Comment taken under consideration.
O3.7	Groundwater accounting system should be created with robust input from stakeholders.	Comment taken under consideration.
O4.1	Concurrence with ETWAG letter to ETGSA.	Comment taken under consideration.
O4.2	Allocation of groundwater should not be on a gross acreage but rather based on historical use.	Comment taken under consideration.
O4.3	Significant portions of the GSP were not available to review prior to the comment deadline.	Refer to Revised Section 8.3.
O5.1	Concurrence with ETWAG letter to ETGSA.	Comment taken under consideration.
O5.2	Allocation of groundwater should not be on a gross acreage but rather based on historical use.	Comment taken under consideration.
O5.3	Significant portions of the GSP were not available to review prior to the comment deadline.	Comment taken under consideration.
O6.1	Concurrence with ETWAG letter to ETGSA.	Comment taken under consideration.
O7.1	Groundwater should be allocated based on historical use rather than a gross acreage basis.	Comment taken under consideration.
O7.2	Lack of white area growers in the GSA governance.	Comment taken under consideration.
O7.3	A new irrigation district should be created, encompassing the entire subbasin.	Comment taken under consideration.
O8.1	Groundwater should be allocated based on historical use rather than a gross acreage basis.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

General Comments	Comments received from: AESWD/SWID, CWC, DFW, DEIDGSA, LSID, SPTB, TCFB, TID, USBR, ETWAG, BS, JC, FR/ SVF, ELMCO, FLSE, GGRC, KA, KCRM, PH, GMR, CC	
Comment No.	Review Comment Summary *	GSA Response
O8.2	Encourage the GSA is considering a groundwater market that allows the transfer of groundwater credits.	Comment taken under consideration.
O8.3	Urge the GSA to continue active engagement with stakeholders throughout the implementation of the GSP.	Refer to GSP Appendix 8-A.
O9.1	Concurrence with ETWAG letter to ETGSA.	Comment taken under consideration.
O10.1	Groundwater should be allocated based on historical use rather than a gross acreage basis.	Comment taken under consideration.
O10.2	Encourage the GSA is considering a groundwater market that allows the transfer of groundwater credits.	Comment taken under consideration.
O10.3	Urge the GSA to continue active engagement with stakeholders throughout the implementation of the GSP.	Comment taken under consideration.
O11.1	Concurrence with ETWAG letter to ETGSA.	Comment taken under consideration.
P.1	Consider the implementation of programs which reduce the use of water for landscape irrigation while supporting pollinators, birds, and the invertebrates that birds need to survive.	Comment taken under consideration.

* Review comments have been grouped by similar topic and summarized. For full text of comment, see respective comment letter as noted.

9 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:

- *DWR Well Completion Report Map Application, https://dwr.maps.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37*
- *DWR Natural Communities Dataset Viewer (2019), https://gis.water.ca.gov/app/NCDatasetViewer/*
- *DWR Bulletin 118, California's Groundwater, Update 2003*
- *Surface Water Monitoring Plan, Tule Basin Water Quality Coalition, 2014*
- *City of Porterville Urban Water Management Plan Update 2015*
- *Tulare Lake Basin Plan 3rd Edition, Central Valley Regional Water Quality Control Board, 2018*
- *Tulare County General Plan 2030 Update*
- *City of Porterville 2030 General Plan*
- *Porterville Area Community Plan 2015*
- *Terra Bella Community Plan 2015 Update*
- *Ducor Community Plan 2015 Update*
- *Hydrogeological Conceptual Model and Water Budget of the Tule Subbasin*, Volumes 1-2, Thomas Harder & Co, August 1, 2017. Prepared for Tule Subbasin MOU Group.
- Tulare County General Plan Update, Phase 1 - Water Supply Evaluation
- Groundwater Management Plan Update (2012), 4-Creeks Inc, May 2012. Prepared for Deer Creek & Tule River Authority.
- *Tule River Basin 2018 Integrated Regional Water Management Plan - Draft*, 4-Creeks Inc, June 2018.
- *Kern-Tulare Water District Groundwater Evaluation and Management Plan*, Kern-Tulare Water District, 2018.
- *Kern-Tulare Water District Groundwater Sustainability Plan,* Kern-Tulare Water District, 2019
- *East Porterville Water Supply Project Feasibility Study, 2016.*
- *Tule Basin Management Zone Early Action Plan, Attachment F to the Preliminary Management Zone Proposal*, Tule Basin Management Zone 2021.

Appendix A: Tule Subbasin Coordination Agreement

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

TABLE OF CONTENTS

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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").

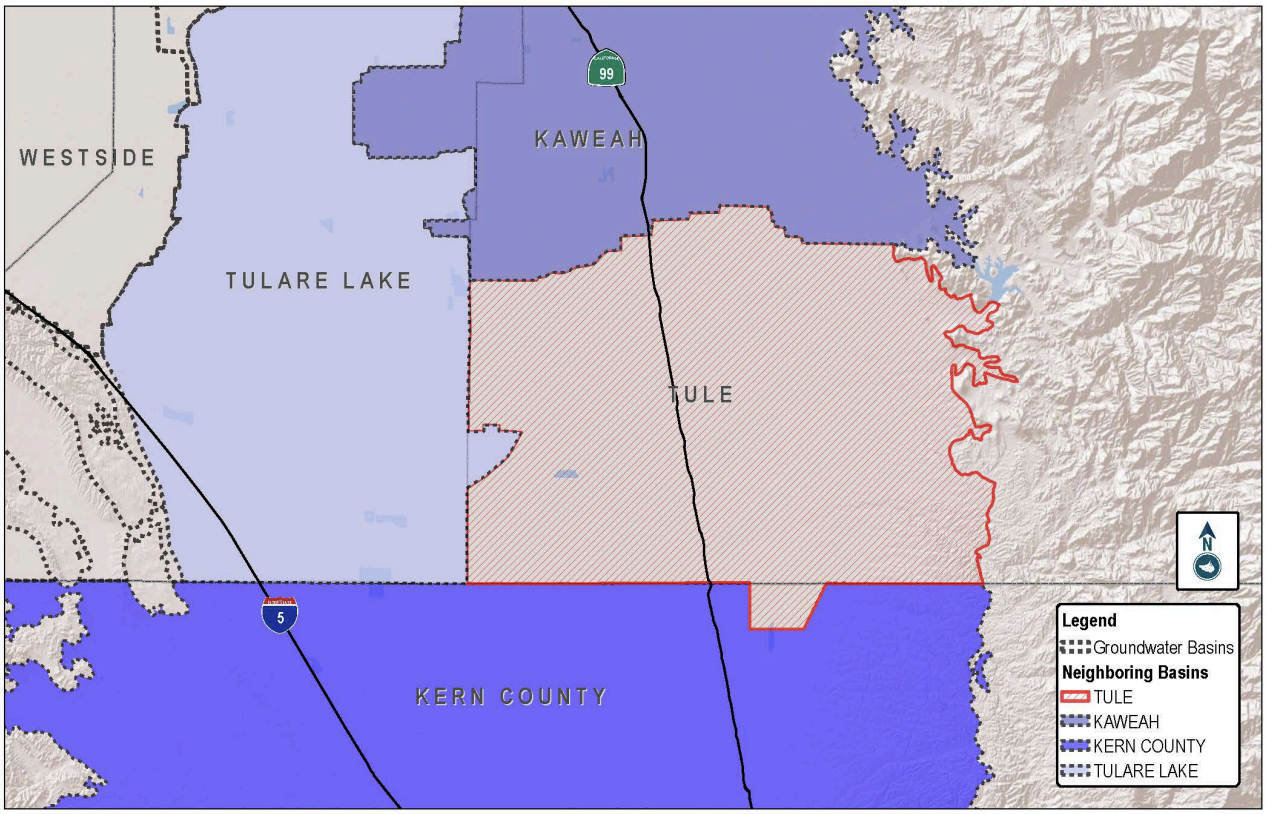

FIGURE 1-1: TULE SUBBASIN

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.

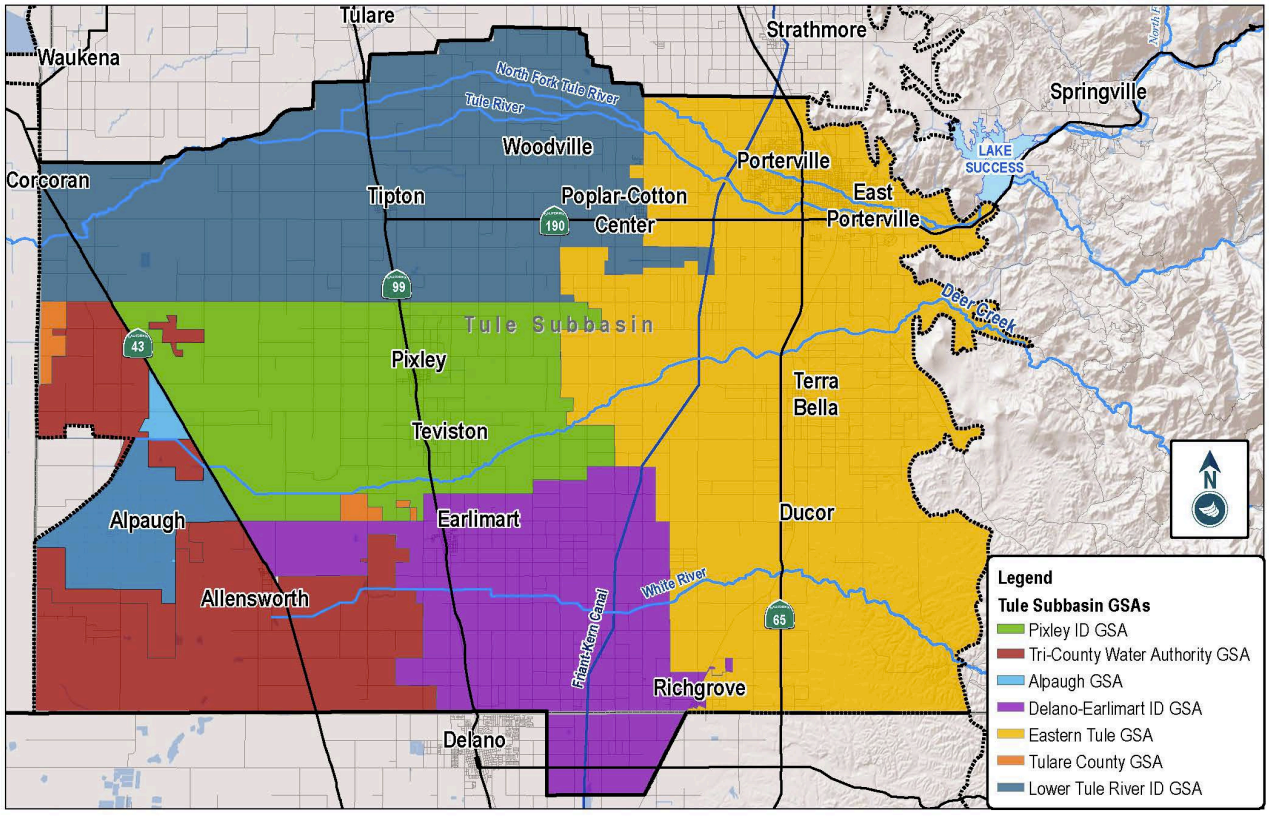

FIGURE 1-2: TULE SUBBASIN GROUNDWATER SUSTAINABILITY AGENCIES

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:

$\underline{DC_{Gaged}}$	=	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:

$\underline{TR_{Gaged}}$	=	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):