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August 17, 2021

Jennifer Larsen
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**Subject: COMMENTS ON THE SOUTH AMERICAN SUBBASIN DRAFT
 GROUNDWATER SUSTAINABILITY PLAN**

Dear Ms. Larsen:

The California Department of Fish and Wildlife's (Department) North Central Region is providing comments on the South American Subbasin Draft Groundwater Sustainability Plan (GSP) prepared by the County of Sacramento Groundwater Sustainability Agency (GSA), Northern Delta GSA, Omochumne-Hartnell Water District GSA, Sacramento Central Groundwater Authority GSA, and Sloughhouse Resource Conservation District GSA pursuant to the Sustainable Groundwater Management Act (SGMA). As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of GSPs under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters, including ecosystems on Department-owned and -managed lands within SGMA-regulated basins. SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to Groundwater Sustainability Plans:

- Groundwater Sustainability Plans must **identify and consider impacts to groundwater dependent ecosystems** [23 CCR § 354.16(g) and Water Code § 10727.4(l)];
- Groundwater Sustainability Agencies must **consider all beneficial uses and users of groundwater**, including environmental users of groundwater [Water Code §10723.2 (e)]; and Groundwater Sustainability Plans must **identify and consider potential effects on all beneficial uses and users of groundwater** [23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3)];
- Groundwater Sustainability Plans must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including depletions of interconnected surface water that have

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significant and unreasonable adverse impacts on beneficial uses of the surface water [23 CCR § 354.22 *et seq.* and Water Code §§ 10721(x)(6) and 10727.2(b)] and describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters [23 CCR § 354.34(c)(6)(D)]; and

- Groundwater Sustainability Plans must **account for groundwater extraction for all Water Use Sectors** including managed wetlands, managed recharge, and native vegetation [23 CCR §§ 351(a) and 354.18(b)(3)].

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to navigable surface waters and surface waters tributary to navigable surface waters are also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses (*Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844). Accordingly, groundwater plans should consider potential impacts to and appropriate protections for navigable interconnected surface waters and their tributaries, and interconnected surface waters that support fisheries, including the level of groundwater contribution to those waters.

In the context of SGMA statutes and regulations, and Public Trust Doctrine considerations, the Department values SGMA groundwater planning that carefully considers and protects groundwater dependent ecosystems (GDE), and fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.

COMMENT OVERVIEW

The Department is writing to support ecosystem preservation in compliance with SGMA and its implementing regulations based on Department expertise and best available information and science.

The Department recognizes and appreciates the effort of the GSAs to thoroughly and quantitatively consider all beneficial users of groundwater in the subbasin, and the draft GSP includes thoughtful analysis of modeled scenarios to evaluate the identified management criteria for undesirable results. However, the Department disagrees with the GSP's assessment of what impacts constitute an unreasonable impact for environmental users and believes the GSP could improve its methods for identifying environmental users of groundwater and establish more protective management criteria. Accordingly, the Department recommends that South American Subbasin GSAs address the following comments before submitting the GSP to the Department of Water Resources (DWR).

COMMENTS AND RECOMMENDATIONS

The Department comments are as follows:

1. **Comment #1 Beneficial Uses and Users** (Plan Area and Basin Setting, 2.1.3 Description of Beneficial Uses and Users of Groundwater, page 2-19): The GSP

does not specifically identify environmental uses and users as beneficial users of groundwater in the subbasin.

- a. *Issue:* The GSP defines beneficial uses of groundwater in the subbasin as municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply. GSAs are required to consider all beneficial uses of groundwater, including environmental uses [Water Code 10723.2(e)].
 - b. *Recommendation:* The Department recommends revising the Section 2.1.3 description of beneficial uses and users to more accurately describe all groundwater users in the subbasin, similar to the more inclusive description of environmental beneficial users included in Section 1.5.3.1 (page 1-14).
- 2. Comment #2 CoSANA Model** (Plan Area and Basin Setting, 2.2 Hydrogeologic Conceptual Model, 2.4 Water Budget): The GSP does not include sufficient detail on CoSANA model development.
- a. *Issue:* The GSP states that “The CoSANA model and model layers are described in detail in the Model Development technical memorandum” (page 2-78) and that “Additional information on the data and assumptions used to develop the CoSANA model is included as an appendix to the GSP” (page 2-172). However, neither of these documents are included with the draft GSP.
 - b. *Recommendation:* The Department recommends the technical information referenced regarding CoSANA model development be included to facilitate careful review of the GSP.
- 3. Comment #3 Interconnected Surface Waters** (Plan Area and Basin Setting, 2.3.6 Interconnected Surface Water Systems, starting page 2-159): GSP identification of interconnected surface waters (ISW), defined by 23 CCR § 351(o) as surface water hydraulically connected “at any point” to the underlying aquifer, is based on a methodology that relies on a narrower definition of ISW than the definition included in the regulations and that risks misidentifying surface waters as disconnected.
- a. *Issues:*
 - i. ISW Identification: The methodology for identifying a surface water reach as interconnected requires a majority of CoSANA stream nodes to be connected for a season in order to be considered ISW (line 2358, Appendix_3-C). However, this methodology applies a narrower definition of interconnected surface waters than 23 CCR § 351(o), which defines surface water as ISW if the surface water is hydraulically connected to groundwater “at any point.” Therefore,

surface water reaches that have connected nodes, regardless of whether those nodes represent a majority for a given season, meet the definition of interconnected surface water and should be evaluated accordingly in the GSP. Additionally, the GSP applies this ISW identification methodology inconsistently by identifying the Cosumnes River approximately between Deer Creek and Twin Cities Road as a data gap due to “sub-seasonal connection” (line 2366). The GSP does not discuss whether other surface waters throughout the basin were evaluated for sub-seasonal connections. 23 CCR § 351(o) does not require connection to last for the duration of a season for a reach to be interconnected.

- ii. Streamflow Depletion: The GSP states that increased streamflow will increase the hydraulic gradient and therefore increase ISW depletion (page 3-11, line 397).
- b. *Recommendations*:
- i. ISW Identification: The Department recommends revising the methodology for identifying ISW so that surface water reaches that are connected at any node, regardless of whether the nodes reach the majority threshold or are connected for a full seasonal duration, are considered ISW. The reach of the Cosumnes River between Deer Creek and Twin Cities Road should be classified as ISW, rather than as a data gap. Additionally, the GSP should provide additional clarification on the sub-seasonal interconnection analysis and whether other surface water reaches in the subbasin similarly demonstrated short term interconnectedness.
 - ii. Streamflow Depletion: The Department recommends clarifying that increased streamflow may increase the rate of stream water seeping from ISW into the underlying aquifer; but increased streamflow will not necessarily *cause* greater depletion of surface waters.

4. Comment #4 Groundwater Dependent Ecosystems (Plan Area and Basin Setting, 2.3.7 Groundwater Dependent Ecosystems, starting page 2-164): GDE identification, required by 23 CCR § 354.16(g), is based on methods that risk exclusion of ecosystems that may depend on groundwater.

- a. *Issues*:
 - i. Depth to Groundwater: Methods applied to the Natural Communities Commonly Associated with Groundwater dataset to eliminate potential GDEs may exclude deep rooted vegetation. The GSP removes potential GDEs with a depth to groundwater greater than 30 feet; however, mature Valley Oak (*Quercus lobata*) can

access groundwater up to 80 feet below the ground surface (Howard 1992, Lewis & Burgy, 1964). The use of a 30-foot threshold may incorrectly exclude Valley Oak communities within the subbasin from further consideration as a GDE.

- ii. Special Status Species: Though Appendix 3-B of the GSP references a compiled resource of GDE beneficial uses and users, the annotated list of species and their groundwater dependence (Appendix E to Appendix 3-B) has not been included for review with this draft GSP.

b. *Recommendations*:

- i. Depth to Groundwater: The Department recommends the GSP update the methodology for GDE identification to reflect accurate maximum rooting depth specifically for Valley Oak communities. The Department recommends use of the NCAAG, field verification, and/or other local data to identify the locations of Valley Oak within the subbasin. For those areas, the GDE analysis should apply a threshold of 80 feet below the ground surface as the maximum potential depth at which the potential GDE could access groundwater. The Department accepts the use of a 30-foot threshold as sufficiently conservative for other potential GDEs within the subbasin that likely do not contain Valley Oak.
- ii. Special Status Species: The Department recommends including the list of GDE environmental users of groundwater within an appendix to the GSP.

5. Comment #5 Sustainable Management Criteria (Sustainable Management Criteria; 3.3.1, 3.4.1 Groundwater Levels and 3.3.4, 3.4.4 Depletions of Interconnected Surface Water): Groundwater level and interconnected surface water sustainable management criteria (SMC) may not protect against undesirable results for fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.

a. *Issues*:

- i. Minimum Thresholds: Minimum thresholds (MTs) for groundwater levels, and by proxy, for depletions of interconnected surface water, are not likely to prevent undesirable results for environmental beneficial uses and users of groundwater and interconnected surface water. The GSP assumes that conditions that have previously occurred in the basin did not lead to significant and unreasonable impacts to beneficial users of groundwater, relying on a circa 2015 baseline. At this baseline, which occurred towards the end of an extended period of dry from 2012 to 2016 (including two

back-to-back Sacramento Valley critically dry water years in 2014 and 2015), wherein groundwater extraction increased to replace more than 70% of lost agricultural water supplies (Lund 2018), it is probable that vegetated and aquatic GDEs were experiencing adverse impacts due to combined groundwater depletion and reduced surface water availability. These adverse impacts included stressed or dying riparian vegetation, poor instream habitat availability, and increased water temperatures (DFW 2019). The GSP contends that only groundwater conditions that worsen beyond historic lows would constitute an undesirable result. However, GSPs must first evaluate potential adverse impacts to beneficial uses and users and determine at what groundwater levels those impacts would occur, and *then* set minimum thresholds accordingly. Defaulting to the post-2015 low groundwater level as minimum thresholds because similar conditions have occurred previously is invalid reasoning for determining SMCs.

- ii. Undesirable Results: The GSP metrics for declaring an undesirable result for the chronic lowering of groundwater, and by proxy, the depletion of interconnected surface water, may not sufficiently protect environmental beneficial users of groundwater. The GSP requires 25% of representative monitoring wells in the subbasin to fall below their MTs for three consecutive years before identifying an undesirable result to GDEs or ISW. While environmental users are adapted to sustain short-term lowering of groundwater levels during dry periods, environmental users may not be able to sustain extended periods of reduced groundwater access that would result from allowing groundwater levels to fall to historic lows for three consecutive years. The scenarios analyzed in the GSP showed that climate change impacts are likely to be most acutely felt by interconnected surface waters and GDEs that rely on shallower groundwater (line 559). By the time an undesirable result is declared, and management actions are triggered in response to the undesirable result, environmental users will have already experienced significant stress and potentially irreversible mortality.
- b. *Recommendations*:
- i. Minimum Thresholds: The Department recommends the GSP reselect minimum thresholds that would better protect environmental uses and users of groundwater, rather than defaulting to the historical low groundwater levels for the subbasin.
 - ii. Undesirable Results: The Department recommends the GSP reconsider the 3-year duration of groundwater levels below MTs

required to constitute an undesirable result, recognizing that extended durations of groundwater inaccessibility for environmental users will likely lead to adverse impacts that cannot be easily reversed when groundwater levels recover. At a minimum, the Department recommends identifying physical triggers (e.g., declining Normalized Difference Vegetation Index (NDVI) signals) and associated management actions (e.g., demand reduction) to mitigate localized patterns of lowering groundwater or depleted ISW that can be implemented before the third consecutive year of MT exceedances. These interim action triggers will help preempt irreversible losses and undesirable results, instead of waiting for three years before deciding a trend is unacceptable. Protective MT criteria and/or interim action triggers are particularly important if anticipated supply augmentation PMAs are not implemented in a timely or predictable manner (see Comment #6).

6. Comment #6 Monitoring Networks (Sustainable Management Criteria, 3.3 Minimum Thresholds, 3.4 Measurable Objectives and Interim Milestones, 3.5 Assessment and Improvement of the Monitoring Network): The GSP is inconsistent in identifying data gaps and plans for improvement of the monitoring network.

a. *Issue:*

- i. Shallow Groundwater Monitoring: Existing shallow groundwater monitoring wells may not be sufficient to characterize groundwater level trends as they relate to potential GDEs within the subbasin. The GSP identified the need for additional shallow groundwater data near both surface waters and natural communities commonly associated with groundwater (2.2.9, line 1738); while the GSP later discusses plans to install paired monitoring wells and stream gauges (3.5.5, line 1735), there is no further discussion of the plan to collect additional shallow groundwater data near GDEs.
- ii. Representative Monitoring Points: While Table 3-4 (page 3-36) includes the geographic coordinates of the representative monitoring points (RMP), the points are not explicitly identified on any of the maps that display the RMP thresholds.
- iii. Groundwater Elevation Mapping: The maps in Section 3 that display groundwater levels of minimum thresholds (Figures 3-13 and 3-17; beginning on page 3-37) and measurable objectives (Figures 3-15 and 3-18) utilize elevations above mean sea level. Without a reference to the ground surface elevation, it is difficult to determine the depth of groundwater levels below ground surface

- and evaluate potential impacts to groundwater dependent ecosystems and interconnected surface water.
- iv. ISW Data Gaps: The GSP states “reaches of the Cosumnes River approximately between Deer Creek and Twin Cities Rd. ... are considered a data gap for planning purposes, and more research and inter-basin coordination is needed to determine the nature of surface groundwater interactions in this region. It is expected that by the next plan update (2027), a revised determination of ISW in this area will be developed” (page 3-29). The GSP describes how other data gaps, such as the lack of well perforation data, “will be addressed in future fieldwork during the GSP implementation period” (page 3-55). The GSP proposes that “additional stream gage and continuous monitoring will be installed in the area” to address the data gaps (page 3-79); however, the proposed monitoring network (displayed in Figure 3-21 on page 3-58) does not include any indicators for interconnected surface water near the stretch of the Cosumnes River that has been identified as a data gap. In particular, the two representative monitoring points closest to this area are proposed to only monitor groundwater level and groundwater storage, but not ISW.
 - v. ISW Monitoring: Figure 3-21 (page 3-58) identifies interconnected surface waters in the far northeast portion of the subbasin. However, the representative monitoring points closest to these interconnected surface waters are proposed only to monitor groundwater level and groundwater storage, but not ISW.
- b. *Recommendation*:
- i. Shallow Groundwater Monitoring: Consistent with the GSP’s acknowledgement of the need for additional shallow groundwater monitoring, the Department recommends the GSAs propose a specific plan for installing a discrete number of additional shallow groundwater monitoring wells near GDEs. The Department recommends using the list of GDE-associated beneficial users (not available for review, see Comment #3(ii)) to identify locations of GDE communities within the subbasin that are most likely to support special status species. GDEs that support special status species, or that are most vulnerable to reduced access to lowered groundwater levels (e.g., have limited surface water supply), should be prioritized for siting additional shallow groundwater monitoring wells.

- ii. Representative Monitoring Points: The Department recommends providing an identification number to each RMP listed in Table 3-4 and including a map identifying the location of each of the RMPs.
- iii. Groundwater Elevation Mapping: The Department recommends including ground surface elevation and groundwater depth below ground surface for the included maps.
- iv. ISW Data Gaps: The Department recommends that the GSP include specific gage and monitoring well plans and locations to address the data gap on the Cosumnes River.
- v. ISW Monitoring: The Department recommends that all interconnected surface waters are adequately monitored.

7. Comment #7 Project and Management Actions (Project and Management Actions (PMA); 4.6 Results of Model Scenarios; starting page 4-20): Projects and management actions that would support demand management in the subbasin lack specificity.

- a. *Issue*: The modeled project and management action scenarios presented in the GSP include two demand management scenarios that would involve reductions in both urban and agricultural water use (Table 4-3). Though the GSP provides detailed explanations for the three supply augmentation scenarios included in the PMA modeling, similar specificity is not provided for demand reduction scenarios. The GSP states that 2020 urban water management plans, developed by water supply agencies within the subbasin, are anticipated to lead to increased conservation and encourage demand management scenarios (line 786). However, as water management plan specifics are not provided, it is unclear whether it is reasonable for the GSP to assume that these plans will be able to collectively meet the demand reductions modeled in Scenario 1 and 2, or when and how they would be implemented within the subbasin. PMA Scenario 5, which includes implementation of the Harvest Water, Omochochumne-Hartnell Water District (OHWD) Recharge, and Regional Conjunctive Use projects (Table 4-4, Scenario 5) results in an annual net storage change deficit of 100 acre-feet per year with climate change. Should any of the three projects encounter delays or result in less than the projected benefit to groundwater storage volumes, annual subbasin storage deficits could increase significantly. Only six of the 172 potential projects and management actions presented in Appendix 4-A are categorized as demand management; the lack of specificity for how and when these demand reduction actions would be implemented within the subbasin could delay implementation and undermine the subbasin's ability

to achieve sustainability goals, particularly if the expected PMA supply augmentation benefits are not realized as anticipated.

- b. *Recommendation:* The Department recommends detailing when and how demand reduction projects and management actions would be implemented to meet the targets outlined in Scenarios 1 and 2. Add specific measures that would lead to initiation of demand reduction actions should planned projects within the basin fail to provide the necessary benefit to groundwater levels in the subbasin.

8. Comment #8 Water Storage Investment Program, Harvest Water Project:

The Department's dedicated Water Storage Investment Program (WSIP) staff have completed additional review of the GSP's inclusion of the Harvest Water Project as a PMA and provide the following comments for GSA consideration.

- a. *Background:* In July 2018, the Sacramento Regional County Sanitation District (Regional San) received a maximum conditional eligibility determination of \$287.5 million from the California Water Commission for the public benefits to be provided by the Harvest Water Program. The California Water Commission is administering funds dedicated by Proposition 1 through the WSIP for public benefits associated with water storage projects. The Department is the administering agency for public ecosystem benefits. As required by regulations, to receive funding, the Department will be contracting with Regional San for administration of Harvest Water's proposed ecosystem benefits to riparian, wetland, Greater sandhill crane, and vernal pool habitats, as well as increased Cosumnes River flows.

More specifically, three of Harvest Water's proposed public ecosystem benefits are dependent upon increasing groundwater levels: enhancement of riparian habitat, enhancement of wetland habitat, and increased flows in the Cosumnes River to support fall-run Chinook salmon. The implementation of the GSP and the resultant groundwater levels in the subbasin will influence Harvest Water's ability to increase groundwater levels within their project area to elevations necessary for these public ecosystem benefits. The WSIP contract between the Department and Regional San will constitute a long-term commitment by the Harvest Water Program to administer public ecosystem benefits for the life of the project, estimated during the WSIP application process to be 84 years.

- b. *Issues:*
 - i. Groundwater Levels: The GSP states the Harvest Water project is expected to restore "depleted groundwater levels up to 35 feet within 15 years" (page 4-8) but elsewhere states "model simulations

indicate groundwater levels will increase upwards of 25 feet in the main recharge zone” (page 3-44). The GSP also notes that the measurable objectives for eight of the representative monitoring points “within or near the Harvest Water recharge project” are increased to reflect “an aspirational goal of increasing groundwater levels in the southern SASb” (page 3-44).

- ii. Measurement Frequency: The GSP states “All wells will collect at least biannual measurements... Wells in or adjacent to the Harvest Water Recharge management zone will collect monthly measurements” (page 3-57). However, Figure 3-23 (page 3-60) indicates that most of the RMPs near the Harvest Water program area will be monitored biannually (indicated by the green dots) while other areas will be monitored on a 15-minute frequency. This mapping leaves the reader to guess which of these “biannual” RMPs will be monitored on a monthly frequency.
- iii. Model Assumptions: The GSP describes only limited assumptions utilized to model the Harvest Water project (page 4-21).

c. *Recommendations*:

- i. Groundwater Levels: The GSP should clarify expected groundwater levels in the Harvest Water program area and their relation to minimum thresholds and measurable objectives. Further, the GSP should explicitly describe how GSP implementation will meet these aspirational goals, which will support Harvest Water’s groundwater elevation targets.
- ii. Measurement Frequency: For the sake of clarity, the GSP should indicate which RMPs will be monitored more frequently than biannually.
- iii. Model Assumptions: Due to the importance of this project in the subbasin, the GSP should more thoroughly describe the inputs and assumptions utilized when modeling Harvest Water. Specific topics on which the GSP should elaborate include:
 - 1. The locations of in-lieu recharge and winter application recharge.
 - 2. The total volume of water delivered to the subbasin. Specifically, the volume of the in-lieu net recharge (22,500 Acre Feet per Year [AFY]) and the winter application (8,750 AFY) do not correctly sum to the total delivery volume (41,250 AFY).
 - 3. Restrictions to delivery of recycled water imposed by the 2019 Wastewater Change Petition.

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4. Project ramp-up timing (i.e., as the project ramps up delivery volumes from startup to full operation).

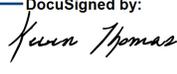
CONCLUSION

In conclusion, the draft GSP thoughtfully discusses all beneficial uses and users of groundwater, provides detailed characterization of groundwater conditions in the basin, and incorporates robust modeling of future scenarios; however, the GSP can further refine its management criteria to better avoid potential impacts to GDEs and ISW, and provide additional detail for planned projects and management actions. The Department recommends that the South American Subbasin GSAs address the above comments before GSP submission to DWR to best prepare for the following regulatory criteria for plan evaluation:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [23 CCR § 355.4(b)(1)] (See Comments #1, 2, 3, 4, 5)
2. The GSP does not identify reasonable measures and schedules to eliminate data gaps. [23 CCR § 355.4(b)(2)] (See Comment #6)
3. The interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have not been considered. [23 CCR § 355.4(b)(4)] (See Comments #1, 3, 4, 5)
4. The projects and management actions are not feasible and/or not likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. [23 CCR § 355.4(b)(5)] (See Comment #7)

The Department appreciates the opportunity to provide comments on the South American Subbasin Draft GSP. Please contact Bridget Gibbons, Environmental Scientist, by email at Bridget.Gibbons@wildlife.ca.gov with any questions.

Sincerely,

DocuSigned by:

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Enclosures (Literature Cited)

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