Appendix U, Part 2

Comment Letters on the 2019 RDEIR/SDEIS

This page left blank intentionally.

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

VIA EMAIL

March 20, 2019

Sheryl Looper
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, California 95825
slooper@usbr.gov

Review of the Revised Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement (RDEIS/SDEIR) for the Long-Term Water Transfers (State Clearinghouse # 2011011010)

Dear Ms. Looper:

The Department of Water Resources (DWR) has reviewed the Revised Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement (RDEIS/SDEIR) for the Long-Term Water Transfers (State Clearinghouse # 2011011010).

Under the Alternative 2 (Proposed Action), every year from 2019 through 2024, a number of entities upstream of the Sacramento-San Joaquin Delta (hereinafter referred to as Sellers) would transfer up to 250 thousand acre-feet (TAF) per year of water to willing buyers downstream of the Sacramento-San Joaquin Delta (hereinafter referred to as Buyers) to reduce the water supply shortage effects of the Central Valley Project (CVP). 8.1
The transfer water would be made available through a combination of groundwater substitution transfers, cropland idling transfers, and reservoir release transfers.

As some of the transfers contemplated in the Proposed Action will be approved by DWR and/or conveyed through State Water Project facilities, DWR has an interest in how the Proposed Action and its impacts are described. As such, DWR offers the following comments on the RDEIS/SDEIR.

Data and Information

Some data and information referenced in the RDEIS/SDEIR to describe the affected environment are out of date and do not reflect latest conditions, such as the recent drought ended in 2016 and updates to groundwater subbasin boundaries. For example, Section 3.3.1.1 Area of Analysis lists the West Butte subbasin, which does not exist 8.2
anymore due 2018 SGMA basin boundary modification; and the Sacramento Valley well depths in Table 3.3-4 were based on DWR 2003 data.

DWR recommends updates to the RDEIS/SDEIR description of the Sacramento Valley groundwater pumping-related land subsidence in Section 3.3.1.2.2 to reflect the latest findings from the 2017 GPS Survey Report of the Sacramento Valley Subsidence Network that DWR released on January 29, 2019. This report shows land subsidence in the following areas:(1) up to 2.14 feet in the Arbuckle area in Colusa County, (2) 0.3 to 1.1 feet in Yolo County, (3) 0.44 to 0.59 feet in Glenn County, and (4) 0.20 to 0.36 feet in Sutter County between 2008 and 2017. Most subsidence occurred during the 2014 and 2015 drought due to record low groundwater levels and record amounts of groundwater extraction. In Section 3.3.1.2.1, the RDEIS/SDEIR states there is no land subsidence monitoring in the Redding Area Groundwater Basin, which is inconsistent with DWR's 2019 report. In this same section, under Land Subsidence, the discussion of the geology related to the Seller's location needs to be more comprehensive. 8.3

Moreover, DWR has been conducting field experiments to update the consumptive use of different crop types, including rice, and applied the latest data in the 2018 California Water Plan Update. It is important to apply the latest available data and science for the Proposed Action, like DWR land and water use studies (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use). 8.4

Groundwater Monitoring Program and Mitigation Plan

As a likely responsible agency, DWR has an interest in ensuring that land subsidence is properly monitored and addressed. Under Mitigation Measure GW-1, the RDEIS/SDEIR provided a monitoring program that relies solely on groundwater level triggers from different Groundwater Management Plans (GMP) as a proxy to monitor the occurrence of land subsidence. It appears that GMPs for the Sacramento Valley have very little to no quantitative criteria. Also, some Sellers' areas may not have sufficient data to sufficiently demonstrate what the historic low groundwater levels are and, as such, relying on groundwater levels to avoid land subsidence may not be appropriate. In such cases, DWR recommends, in addition to groundwater level monitoring, land surface elevation survey prior to, during, and after the groundwater substitution transfer, to directly monitor land subsidence in the vicinity of Seller's region. 8.5

In addition, while not discussed or updated in the REIS/SEIR, DWR notes that Mitigation Measure WS-1 of the Long-Term Water Transfers Final Environmental Impact Statement/Environmental Impact Report states that the minimum streamflow depletion factor will be 13 percent, but this factor may be adjusted based on additional information. Additional information related to streamflow depletion is likely to be developed in the near future as Groundwater Sustainability Plans (GSP) that cover the Sellers' areas are adopted and implemented. As contemplated in Mitigation Measure WS-1, DWR, along with the U.S. Bureau of Reclamation, will assess and determine the appropriate streamflow depletion factor based on the new technical information that is developed during GSP development and implementation, or in some other context. 8.6

Lastly, since DWR will be approving or facilitating certain transfers under the Proposed
Action, DWR offers its assistance in the review of the completeness and quality of the
transfer proposal on a case-by-case basis, including but not limited to: (1) the 8.7
groundwater level monitoring well network, (2) groundwater level triggers, and (3)
mitigation plans, to ensure less than significant impacts from the Proposed Action and
protect California natural resources.

Conclusion

The RDEIS/SDEIR should be updated with the latest data and information to better reflect
the current environmental setting. Also, additional land subsidence monitoring may be
more appropriate in certain areas and under certain circumstances. 8.8

DWR would appreciate copies of any subsequent environmental documentation. Please send any future correspondence relating to the proposed Project to:

Anna Fock
Supervising Engineer, Water Resources
State Water Project Analysis Office
Department of Water Resources
1416 Ninth Street, Room 1620
Sacramento, California 94236-0001

If you have any questions, please contact Anna Fock at (916) 653-0190.

Sincerely,

Pedro Villalobos
Chief, State Water Project Analysis Office

AQUALLIANCE
DEFENDING NORTHERN CALIFORNIA WATERS

california water impact network

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE CSPA *Since 1983*

ATA AQUA TERRA AERIS LAW GROUP

March 18, 2019

Attn: Dan Cordova
U.S. Bureau of Reclamation
2800 Cottage Way, MP-410
Sacramento, CA 95825
dcordova@usbr.gov

Re: Comments on the Recirculated Environmental Impact Report/Supplemental Draft Environmental Impact Statement for the Long-Term Transfers (2019-2024)

Dear Mr. Cordova:

AquAlliance, the California Sportfishing Protection Alliance, and the California Water Impact Network (hereinafter "AquAlliance coalition"), represented by the Aqua Terra Aeris Law Group, submit the following comments and questions for the Bureau of Reclamation ("Reclamation") and the San Luis Delta Mendota Water Authority ("SLDMWA") ("Lead Agencies") in opposition to the Recirculated Draft Environmental Impact Report ("RDEIR") and Supplemental Draft Environmental Impact Statement ("SDEIS") ("RDEIR/SDEIS"), for the 2019-2024 Long Term North-to-South Water Transfer Program ("Project" or "2019/2024 Water Transfer Program"). 9.1

The Project purpose echoes past attempts by Reclamation and its partner agency, the California Department of Water Resources ("DWR"), to drain as much water as possible from the Sacramento River Watershed and the Delta to provide water for some of the most destructive forms of desert agriculture, urban sprawl, and industrial extraction. The RDEIR/SDEIS attempts to disclose impacts as required by the California Environmental Quality Act ("CEQA") and the National Environmental Policy Act ("NEPA"), but simultaneously obfuscates many of the direct and indirect impacts. The AquAlliance coalition seeks to bring to light some of these hidden impacts and baseline information as we have before and to underscore the destructiveness of the Project that is part-and-parcel of the Sacramento River Water Management Agreement and the WaterFix (Twin Tunnels), which would deplete the Sacramento River Watershed, the Delta, and Sacramento Valley communities, farms, and habitat of essential fresh water.

The RDEIR/SDEIS has numerous deficiencies and should be withdrawn. The absence of disclosure and analysis of significant direct, indirect, and cumulative impacts alone renders the RDEIR/SDEIS seriously deficient. For this and other reasons, the Lead Agencies must withdraw the RDEIR/SDEIS or revise and recirculate it for public review and comment before a final Project RDEIR/SDEIS is considered. 9.2

This letter relies significantly on, references, and incorporates by reference as though fully stated herein, for which we expressly request that a response to each comment contained therein be provided, the following comments submitted on behalf of AquAlliance:

- Custis, Kit H., 2019. Comments and recommendations on U.S. Bureau of Reclamation and San Luis & Delta-Mendota Water Authority Draft Long-Term Water Transfer DRAFT SEIS/REIR, Prepared for AquAlliance. ("Custis," Exhibit A)
- Mish, Kyran D., 2014. Comments for AquAlliance on Long-Term Water Transfers Draft EIR/EIS. ("Mish," Exhibit B)

I. <u>SLDMWA Failed to Follow Required Procedures and Circulate a Draft EIR.</u>

CEQA Guidelines Section 15088.5(c) is inapplicable to the RDEIR, and SLDMWA has failed to circulate a draft environmental review document that complies with CEQA. CEQA provides that "[a] draft environmental impact report, environmental impact report, negative declaration, or mitigated negative declaration prepared pursuant to the requirements of this division shall be prepared directly by, or under contract to, a public agency." Pub. Resources Code § 21082.1, subd. (a). SLDMWA has failed to circulate any of these recognized and required CEQA documents. Instead, SLDMWA only recirculated a revised versions of parts of the EIR/EIS while stating that the parts of the 2014 EIS/EIR left unrevised are for informational purposes only and not subject to comments:

> The remaining sections from the 2014 Draft EIS/EIR do not have changes resulting from the Court's ruling and are not included in this RDEIR/SDEIS; however, the 2014 Draft EIS/EIR is still available to the public for informational purposes, as described below in Section 1.6. After public review of this RDEIR/SDEIS, Reclamation and SLDMWA will consider public comments received, respond in writing to any significant environmental issues raised, and develop a Final Long-Term Water Transfers EIS/EIR that incorporates the 2014 Draft EIS/EIR (and responses to comments on that document) and the material in this RDEIR/SDEIS. RDEIR/SDEIS at 1-4. 9.3

However, CEQA does not permit a project to proceed based upon a cobbling together of a previously invalidated final EIR and a new and very narrowly focused RDEIR/SDEIS. *See Russian Hill Improvement Ass'n v. Board of Permit Appeals* (1974) 44 Cal.App.3d 158 [compilation of documents does not equate an EIR]. Indeed, SLDMWA's departure from CEQA's normal and mandatory procedures appears to be expressly intended to limit the broad public participation that would normally accompany a draft EIR. SLDMWA discourages any review and comment of the EIR/S, stating that "After public review of this RDEIR/SDEIS, Reclamation and SLDMWA will consider public comments received, respond in writing to any significant environmental issues raised, and develop a Final Long-Term Water Transfers EIS/EIR that incorporates the 2014 Draft EIS/EIR (and responses to comments on that document) and the material in this RDEIR/SDEIS."

RDEIR/SDEIS at 1-4. In other words, comments are only being accepted on the RDEIR/SDEIS, not the EIR/EIS.

The nature of SLDMWA' procedural violation, above, thwarts CEQA's purpose of meaningful public participation to improve informed environmental decision-making. CEQA requires that EIRs should be organized and written in a manner that will make them "meaningful and useful to decision-makers and to the public." Pub Res Code § 21003(b). The information in an EIR must be presented in a manner that is designed to adequately inform the public and decision-makers. *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 442. An EIR should be written in a way that readers are not forced "to sift through" to 9.4
find important components of the analysis. *San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.App.4th 645, 659; *see also California Oak Found. v. City of Santa Clarita* (2005) 133 Cal.App.4th 1219, 1239. Accordingly, an EIR is usually prepared as a stand-alone document. CEQA provides that EIRs should be prepared in a "standard format" when feasible. Pub. Resources Code § 21100(a). It is inappropriate, however, to use a group of documents collected together to serve the function of an EIR, as SLDMWA appears to be attempting here. *See Russian Hill Improvement Ass'n v. Board of Permit Appeals* (1974) 44 Cal.App.3d 158. SLDMWA's EIR/EIS and RDEIR/SDEIS combination clearly fails all of these tests. Presumably, SLDMWA intended a reader to discern its environmental impact analysis by reading the RDEIR/SDEIS, then determining which parts of the prior EIR/EIS remain applicable. This is a difficult exercise for a reader to undertake, not only due to the time-consuming and unwieldly nature of the process.

It is for these reasons that an EIR may not be comprised of a group of independent documents sewn together (*Russian Hill*, *supra*, 44 Cal.App.3d 158) and that a reader must not be forced to "to sift through" disparate documents to piece together a project's environmental analysis. *San Joaquin Raptor*, 149 Cal.App.4th at 659; *California Oak Found.*, 133 Cal.App.4th at 1239; *Vineyard Area Citizens*, 40 Cal.4th at 442. Indeed, a reader opening the EIR/EIS documents for review would immediately be presented with outdated, inaccurate, and conflicting information, that would stultify 9.5
public participation. SLDMWA's attempt to cobble together variations of SLDMWA's CEQA documents ignored the requirement to provide a comprehensive index or table of contents to a single EIR, as the law requires. Pub. Resources Code, § 21061; CEQA Guidelines § 15122 ("An EIR shall contain at least a table of contents or an index to assist readers in finding the analysis of different subjects and issues"). The closest the RDEIR/SDEIS comes to provide such an analysis is a confusing table provided on 1-7 of the RDEIR/SDEIS, which fails to provide any meaningful "table of contents or and index." For all these reasons, the RDEIR/SDEIS circulating for review is so disorganized, confusing, and internally inconsistent, as to stifle meaningful public participation.

The court in *AquAlliance v. Bureau of Reclamation* could have ordered partial recirculation, as SLDMWA sought, but it did not. *Cf.* Pub. Resources Code, § 21168.9 ["the order shall be limited to that portion of a determination, finding, or decision or the specific project activity or activities found to be in noncompliance only if a court finds that (1) the portion or specific project activity or activities are severable, (2) severance will not prejudice complete and full compliance with this division, and (3) the court has not found the remainder of the project to be in noncompliance with 9.6
this division."] Here, the EIS/EIR was "set aside," in other words, it was no longer valid and cannot be used. Nonetheless, SLDMWA is attempting to move forward with the remedy it proposed, partial revision, which the was rejected by the court. *AquAlliance v. United States Bureau of Reclamation* (E.D.Cal. 2018) 312 F. Supp. 3d 878. CEQA Guidelines section 15088.5 does not provide for partial recirculation of an EIR five years after it was certified and subsequently fully

vacated by the court. Here, the CEQA and NEPA violations of the vacated EIR/S went to the heart of the Project and could not have been more serious. The Lead Agencies therefore must give the public the opportunity to *meaningfully* comment on the whole of the proposed project.

The leading treatise, for example, explains that "A lead agency may decide to recirculate a revised portion of the draft EIR before preparing the final EIR, or may decide to recirculate a revised portion of the final EIR." Kostka & Zischke at § 16.18. SLDMWA has done neither of these things.

II. Significant New Information Since the 2014 EIR/S Necessitates Recirculation of the Entire EIR/S.

Four years have almost passed since the prior EIR/S was approved, nearly all of the information in the EIR/S regarding the environmental and regulatory conditions has changed in a considerable way so as to require that an entire new EIR/S be drafted and circulated. The present approach, for the RDEIR/SDEIS to attempt to rely on some (but insufficient) new environmental and regulatory conditions, while the un-recirculated chapters continue to consider environmental and regulatory conditions from 2014 or older, simply renders the whole of the EIR/S internally disjointed, and disconnected from present concerns. An EIR violates CEQA if it "thwarts the statutory goals" of "informed decisionmaking" and "informed public participation." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 712. "The EIR is therefore the heart of CEQA." *Laurel Heights Improvement Ass'n v. Regents of the Univ. of Cal.* (1988) 47 Cal.3d 376, 392 (cites and quotes omitted). "An EIR is an 'environmental alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." *Id.* (cites and quotes omitted). "The foremost principle under CEQA is that the Legislature intended the act 'to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language.'" *Id.* at 390. Here, following full vacatur of the project and all related approvals, the Lead Agencies abuse their discretion by failing to update the whole of the EIR/S to include a description of the present-day existing environmental conditions, and an assessment of the proposed project's likely changes to those conditions. 9.7

An outline of considerations that must be included in a wholly revised EIR/S follows:

3.1 Water Supply

- 3.1.1: Affected Environment/Setting
  - Sellers/buyers may have changed, and/or their capacities/requirements
  - Affected waterways have changed
  - Regulatory Setting: Revisions to Bay-Delta Plan have occurred and are planned; SWRCB Temporary Urgency Change Orders waived critical D-1641 and other protections during transfer years; all county BMOs must be reviewed; federal policy changes from changed executive branch leadership; and changes/addendum to Coordinated Operations Agreement, December 13, 2018 would affect key issues such as operations and modeling assumptions.
  - 3.1.1.3 Existing Conditions: effects from worst drought in California history have depleted water supplies 9.8
- 3.1.2 Environmental Consequences/Environmental Impacts
  - 3.1.2.1 Assessment Methods: prior EIR/S states that "Reservoir storage data is not available for all reservoirs included in the area of analysis," but this data may be

available now; modeling must be updated for existing supplies, demands, regulatory environment, and climate change
    - Alternatives analysis are outdated, as the project description has changed.
- 3.1.3 Comparative Analysis of Alternatives
    - Alternatives analysis are outdated, as the project description has changed.
- 3.1.4 Environmental Commitments/Mitigation Measures
- 3.1.6 Cumulative Effects: changed buyers/sellers, climate change data and modeling, changed project description, changed recently past, current, and future projects, all give rise to new cumulative impact scope.

<u>3.2 Water Quality</u>

- 33.1.1: Affected Environment/Setting
    - Sellers/buyers may have changed, and/or their capacities/requirements
    - Affected waterways have changes
    - Regulatory Setting: Revisions to Bay-Delta Plan have occurred and are planned; 2010 303(d) list in 2014 EIR/S is outdated; SWRCB Temporary Urgency Change Orders waived critical D-1641 and other protections during transfer years; and changes/addendum to Coordinated Operations Agreement, December 13, 2018 would affect key issues such as operations and modeling assumptions.
- 3.1.2 Environmental Consequences/Environmental Impacts
    - 3.1.2.1 Assessment Methods: prior EIR/S states that "Reservoir storage data is not available for all reservoirs included in the area of analysis," but this data may be available now; modeling must be updated for existing supplies, demands, regulatory environment, and climate change
    - Alternatives analysis are outdated, as the project description has changed.
- 3.1.3 Comparative Analysis of Alternatives
    - Alternatives analysis are outdated, as the project description has changed.
- 3.1.4 Environmental Commitments/Mitigation Measures

  3.1.6 Cumulative Effects: changed buyers/sellers, climate change data and modeling, changed project description, changed recently past, current, and future projects, all give rise to new cumulative impact scope. How have the Camp[1] [2]and Carr[3] Fires and the 2017 Oroville Dam spillways disaster[4] and reconstruction impacted baseline surface and groundwater quality in areas that are in the sellers' districts?

9.9

<u>3.4 Geology and Soils</u>

- 3.4.2 Environmental Consequences/Environmental Impacts
    - Updated climate models may present new information that must be considered to effectively plan crop idling practices

9.10

---

[1] https://buttecountyrecovers.org/
[2] http://cdfdata.fire.ca.gov/incidents/incidents_details_info?incident_id=2277
[3] http://cdfdata.fire.ca.gov/incidents/incidents_details_info?incident_id=2164
https://krcrtv.com/news/carr-fire/future-concerns-over-drinking-water-quality-in-shasta-county-post-carr-fire
https://www.redding.com/story/news/2018/08/18/carr-fire-rained-down-toxic-ash-redding-now-race-protect-fish-water-sacramento-river-california/990343002/
[4] Greene, Todd 2017. Presentation at CSU Chico March 2017 highlighting the known, naturally occurring asbestos that was under the damaged spillways at Oroville Dam. Exhibit D.

- Effects of Carr and Camp Fires should be considered
- 3.4.3 Comparative Analysis of Alternatives
  - project description has changed
- 3.4.6 Cumulative Effects
  - project description has changed
  - Camp and Carr Fires and changed recently past, current, and future projects have affected existing soil conditions
  - Crop idling could exacerbate worsened climate effects to soil

<u>3.5 Air Quality</u>

- 3.5.1.3 Existing Conditions
  - Are areas still in attainment following Camp and Carr Fires
- 3.5.2 Environmental Consequences/Environmental Impacts
  - Air pollution from cropland idling and pumping: Impacts to air pollution that were assessed could have changed – different conditions now. District requirements may have changed
  - Alternatives analysis is flawed because project description has changed. Also, buyer/sellers may have changed.
- 3.5.3 Comparative Analysis of Alternatives
  - Alternatives analysis is flawed because project description has changed. Also, buyer/sellers may have changed.
- 3.5.6 Cumulative Effects
  - Camp and Carr Fires, the 2017 Oroville Dam spillways disaster and reconstruction, and changed recently past, current, and future projects have adversely affected air quality and project effects may be more cumulatively considerable

9.11

<u>3.7 Fisheries</u>

- 3.7.1 Affected Environment/Environmental Setting
  - Changes to buyer and seller areas could implicate new species and/or habitat that should be considered
  - Regulatory Setting: Revisions to Bay-Delta Plan have occurred and are planned; 2010 303(d) list in 2014 EIR/S is outdated; SWRCB Temporary Urgency Change Orders waived critical D-1641 and other protections during transfer years; and changes/addendum to Coordinated Operations Agreement, December 13, 2018 would affect key issues such as operations and modeling assumptions; current progress or lack thereof towards salmonid doubling goals and delta smelt targets.[5]
  - Affected special status species have reached yet lower all-time lows, and any impacts should be considered cumulatively considerable in this setting. For example, the status of Delta Smelt was downgraded to endangered in 2009 and this population set progressively lower record population lows in 2004, 2005, 2008, 2009, 2014, 2015, and 2017; and, the 2018 FMWT index was 0 – yet another new low. Longfin smelt set new population lows in 2007, 2015, and 2016. Southern Resident Killer Whale specialize in feeding on salmon and steelhead and this population's continuing

9.12

---

[5] See, https://www.fws.gov/lodi/anadromous_fish_restoration/afrp_index.htm; https://www.fws.gov/sfbaydelta/CVP-SWP/SmeltWorkingGroup.htm.

decline and subsequent inability to recover have been linked to persistently low production of Central Valley Chinook Salmon (NMFS 2009, 2018). Abundance of all runs of Central Valley Chinook salmon are far lower than they were historically, declining by more than half relative to their 1967-1991 baseline, despite implementation of the current water quality objectives and passage of the federal Central Valley Project Improvement Act (CVPIA) in 1992 – both of these programs were intended to double natural production of Central Valley anadromous fishes (including Chinook Salmon) over the 1967-1991 baseline. After rebounding from a historic low set in the early 1990s, returns of adult winter-run Chinook Salmon exceeded 15,000 in both 2005 and 2006; however, the population has declined since then and returning adults numbered less than 1,000 in 2017. Spring-run Chinook salmon also increased during a wet period between 1995 and 2000, and returning adults numbered greater than 30,000 as recently as 2003; the population has since declined substantially with less than 2000 adults observed in 2017. By 2016, the Southern Resident Killer Whale population had dropped 15%, from 87 in 2005 to 74 individuals in 2018 (Orca Task Force 2018). In addition, one SRKW was stillborn in 2018; failed pregnancies are increasingly common among this population, as a result of inadequate supplies of their main food source, Chinook Salmon (Wasser et al. 2017). The RDEIR/SDEIS must be revised to account for these and other species' significantly worsened conditions.

<u>Section 3.9 Agricultural Land Use</u>

9.13

- 3.9.1 Affected Environment/Environmental Setting
  - Project description has changed – different buyer/seller areas?
  - Significant new economic and water demand data should be incorporated (*see*, *infra*, Section IX).
  - Have any of the regulatory setting changed?
    - Fed: Conservation Reserve Program
    - State: Williamson Act, California Farmland Conservancy Program (CFCP), Farmland Mapping and Monitoring Program (FMMP)
    - Regional: different county plans may have changed?
- 3.9.2 Environmental Consequences/Environmental Impacts
  - Alternatives analysis: project description has changed, including different buyers and sellers
  - Groundwater levels have changed
  - New climate data likely changes foreseeable agricultural practices
- 3.9.3 Comparative Analysis of Alternatives
  - Alternatives analysis: project description has changed, different buyers/sellers? Groundwater levels have changed, new climate data
- 3.9.6 Cumulative Effects
  - Project timeframe is wrong, it's been changed to 2019 – 2024
  - Seller/ buyer service areas info has likely changed (e..g. using a general plan for Glenn County from 1993) – land use, populations
  - Alternatives analysis: project description has changed, different buyers/sellers?
  - Recently past, current, and future projects.

<u>Section 3.10 Regional Economics</u>

- 3.10.1 Affected Environment/Environmental Setting
  - Project description has changed – different buyer/seller areas?
  - Significant new economic and water demand data should be incorporated (*see*, *infra*, Section IX).
  - Has any of the regulatory setting changed?
    - Fed: Conservation Reserve Program
    - State: Williamson Act, California Farmland Conservancy Program (CFCP), Farmland Mapping and Monitoring Program (FMMP)
  - Regional: different county plans may have changed? Existing conditions have changed. E.g. crop acreage summaries go through 2012, and many of the studies are from 2010/11.
- 3.10.2 Environmental Consequences/Environmental Impacts
  - Alternatives analysis: project description has changed, including different buyers and sellers
  - Groundwater levels have changed
  - New climate data likely changes foreseeable agricultural practices
  -
- 3.10.3 Comparative Analysis of Alternatives
  - changed conditions, changed project description
- 3.10.4 Cumulative Effects
  - Wrong timeframe stated. Changed project description would affect this analysis, since smaller project, other alternatives could exist.

9.14

<u>Section 3.11 Environmental Justice</u>

- 3.11.1 Affected Environment/ Environmental Setting: possible changed areas given changed project description
  - In general, the studies cited in the 2014 EIR/S are older, and again fail to account for effects such as present climate change impacts, and/or wildfire effects such as Camp, Carr Fires and the 2017 Oroville Dam spillways disaster and reconstruction, resulting air quality and/or displacement, and the likelihood of such disasters recurring in the sellers' areas. Recently past, current, and future projects must be considered.

9.15

<u>Section 3.14 Visual Resources</u>

- Project description has changed and now affects new areas.
- Does not address climate change impacts to reduced river flows.

Each of these items constitutes significant new information that has come into existence since the now-vacated EIR/S was approved, and long since the NOP was released in 2013. It would be an abuse of discretion for the Lead Agencies to rely on environmental analysis that fails to consider these baseline conditions and the concomitant effects.

9.16

III. The RDEIR/SDEIS Contains an Inadequate Project Description

A. The Project Description is Unstable, and Requires a New EIR

The RDEIR/SDEIS incorporates by reference and relies upon the prior EIR. *See* RDEIR/SDEIS 1-3 to 1-4. This results in an unstable project description as the RDEIR/SDEIS analyzes only a 250,000 acre-feet limit, or about 49% of the amount analyzed in the 2014 Draft EIS/EIR:

> The 2014 Draft EIS/EIR analyzed transfers of up to 511,094 acre-feet, but this amount of water is substantially greater than the buyer demand or the amounts that actually have been historically transferred. After Reclamation and SLDMWA completed the Long-Term Water Transfers EIS/EIR process, the only year with transfers that occurred under that document was in 2015. In 2015, SLDMWA purchased 164,153 acre-feet, and East Bay Municipal Utility District purchased 13,268 acre-feet (Reclamation 2018). The buyers have considered their demand for transfers between 2019 and 2024 and have determined that their demand is less than what was included in the 2014 Draft EIS/EIR. This RDEIR/SDEIS presents (and analyzes) transfers from multiple sellers, but all transfers (combined) in a year would be limited so as not to exceed 250,000 acre-feet. This change could decrease effects to some resource analyses, but the changes would not represent a material change to the analysis. RDEIR/SDEIS at 1-4.

9.17

"An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR." *County of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193 (1977). "Only through an accurate view of the project may affected outsiders and public decision makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal . . . and weigh other alternatives in the balance." *Id.* at 192-93. A project description may not provide conflicting signals to decision makers and the public about the nature and scope of the project as such a description is fundamentally inadequate and misleading. *San Joaquin Raptor Rescue Center v. County of Merced,* 149 Cal. App. 4th 645, 655-656 (2007) (EIR on mining project was conflicted when project description asserted that no increases in mine production were being sought, despite also providing for substantial increases in mine production).

Courts have applied *County of Inyo* to find project descriptions conflicting and unlawful when their scope or size reveal internal inconsistencies. *See San Joaquin Raptor,* 149 Cal. App. 4th at 655 (project description unlawful when draft EIR asserted project would not significantly increase a mine's annual output, while proposed permit that would be approved by final EIR permitted a more than doubling of mine output); *Communities for a Better Env't v. City of Richmond*, 184 Cal. App. 4th 70, 84 (2010) project description inadequate when project proponent offered conflicting characterizations of oil refinery project about whether project would allow refinery to process a more polluting product).

9.18

Here, the RDEIR/SDEIS purportedly halves the entire project, which results in an unstable description that denies the public or decision makers the ability to "balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal . . . and weigh other alternatives in the balance." *County of Inyo*, at 192-93. As the court in *AquAlliance v. United States Bureau of Reclamation* (E.D.Cal. 2018) 287 F. Supp. 3d 969 noted, "The FEIS/R identifies potential buyers and sellers, AR 25370-72, and provides the maximum potential transfer that is covered by the FEIS/R for each seller, for a total maximum of

511,094 Acre Feet ("AF")." *AquAlliance* at 999. Such discrepancies give conflicting signals to the public and decision makers, thereby rendering the RDEIR/SDEIS inadequate and misleading. *See San Joaquin Raptor,* 149 Cal. App. at 655-656

Moreover, the RDEIS' project description is unstable as it adds new transfers to Alternative 2: "The 2014 Draft EIS/EIR specified that transfers to East Bay MUD and Contra Costa WD were not 9.19
considered to be part of the Proposed Project, but they are included in Alternative 2 for this document for analysis under CEQA." RDEIR/SDEIS at 2-24. The RDEIR/SDEIS fails to include any updated impact analyses in these newly added districts.

In addition, and as discussed further, below, the RDEIR/SDEIS does not include an alternatives analysis that assesses these major changes to the project, which likely would lead to other viable alternatives. *See, infra,* Section XI. The RDEIR/SDEIS similarly makes no attempt to consider how or whether any of the project effects may change, instead cursorily concluding that all would be 9.20
less. By circulating multiple draft EIR documents that describe different projects, the RDEIR/SDEIS consists of an unstable project description that thwarts full and complete analysis and public participation.

Finally, although the RDEIR/SDEIS asserts that groundwater substitution for all participating agencies will be limited to 250,000 acre feet per year, the RDEIR/SDEIS does not indicate how this maximum project level will be monitored or enforced. This is particularly challenging if not impossible where some transfers require no approval by one or either of the Lead Agencies. Table 9.21
ES-2 further admits that the potential sellers' upper limits available exceeds 250,000 acre feet per year, but says that the buyers would never collectively exceed this amount, with no explanation whatsoever as to how this upper limit can be monitored and maintained. RDEIR/SDEIS ES-5. With no ability to ensure that the project implemented will be the project now proposed, the RDEIR/SDEIS fail to offer a stable project for review.

B. The Project / Proposed Action Alternative Description Lacks Detail Necessary for Full Environmental Analysis.

1. <u>Statewide demand for water from the Sacramento River Watershed is not identified.</u>

There are extraordinary consumptive claims on water from the Sacramento River basin that exceed the unimpaired runoff by 5.6 times. However, the sources of these claims are not disclosed or considered in the formulation of Project alternatives. The RDEIR/SDEIS also fails to explain that the Central Valley Project ("CVP") and the State Water Project ("SWP") retain junior claims, 9.22
coming late in California's history. Both the CVP and the SWP are engaged in the Project by the release of waters through Shasta (CVP) and Oroville (SWP) dams, the transmission of transfer water through the Jones and Banks pumping plants in the south Delta, and via canals south of the Delta.

The State of California has been derelict in its management of scarce water resources. We are supplementing these comments on this matter of wasteful use and diversion of water by incorporating by reference and attaching the 2016 complaint to the State Water Resources Control Board on public trust, waste and unreasonable use and method of diversion as additional evidence of a systemic failure of governance by the State Water Resources Control Board, DWR, and Reclamation. (Exhibit C)

2. Specific groundwater conditions in the source watershed are lacking.

The RDEIR/SDEIS must disclose current groundwater conditions beyond the abstract modeling baseline employed. Presented below are tables that illustrate maximum and average groundwater elevation decreases for Butte, Colusa, Glenn, and Tehama counties at three aquifer levels in the Sacramento Valley between the fall of 2004 and 2017.[6] These data present serious, continuing declines that represent county and site-specific issues that aren't captured in the RDEIR/SDEIS. What is presented is modeling with results like Figure 3.3-2, Cumulative Annual Change in Storage as Simulated by the USGS's Central Valley Hydrologic Model.

Modeling, as opposed to actual data, is a way to view groundwater conditions conceptually and at a scale that obfuscates significant local groundwater conditions in counties where groundwater substitution transfers are proposed. It is also fair to say that almost any basin in California would look better than the San Joaquin and Tulare basins due to the massive groundwater abuse by many of the Project's buyers. With only modeling discussed in the opening paragraph of section 3.3.1.2.2, Sacramento Valley Groundwater Basin, the RDEIR/SDEIS asserts that, "[g]roundwater storage in the Sacramento Valley Groundwater Basin has been relatively constant over the long term. Storage tends to decrease during dry years and increase during wetter periods."[7] This is easily contradicted by the results found in DWR's maps that are presented in Table 1 and by information and study (e.g. Brush 2013a and 2013b, NCWA, 2014a and 2014b).

9.23

Table 1. Northern Sacramento Groundwater Changes by County.

County	Deep Wells (Max decrease gwe) Fall '04 - '17	Deep Wells (Max decrease gwe) Fall '04 - '16
Butte	-13.9	-28.3
Colusa	-67.2	-66.4
Glenn	-166.3	-65.8
Tehama*	-44.0	-35.8

County	Intermediate Wells (Max decrease gwe) Fall '04 - '17	Intermediate Wells (Max decrease gwe) Fall '04 - '16
Butte	-22.1	-28.3
Colusa	-62.4	-78.9
Glenn	-51.5	-58.3
Tehama*	-35.0	-29.3

[6] DWR. https://data.cnra.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps

[7] Page 3.3-4.

County	Shallow Wells (Max decrease gwe) Fall '04 - '17	Shallow Wells (Max decrease gwe) Fall '04 - '16
Butte	-10.8	-18.3
Colusa	-51.8	-51.7
Glenn	-58.7	-59.6
Tehama*	-28.9	-36.3

*Tehama County portion in the Sacramento Valley groundwater basin.

Surprisingly, the next paragraph in the RDEIR/SDEIS starts with, "Groundwater levels in the northern Sacramento Valley Groundwater Basin have declined over the last decade or so (spring 2004 to spring 2017)." p. 3.3-5. However, instead of providing significant well results, averages are used to further confuse the reader. 9.24

The Project additionally conflicts with attempts at local management, particularly in areas where there are existing groundwater problems. Just consider that the City of Sacramento, Sacramento County Water Agency, and Sacramento Suburban Water District propose to transfer surface water into the state water market and substitute 35,000 af of groundwater with the Project. However, the Sacramento County Water Agency *Water Management Plan* indicates that intensive use of this groundwater basin has resulted in a general lowering of groundwater elevations that will require extensive conservation measures to remediate.[8] The Sacramento Groundwater Authority provides additional details such as : "These wells [AB3 and AB4] provide groundwater data for three or four depth-specific zones extending to 985 and 1070 feet below ground. Both well locations show a downward vertical flow gradient, from shallow to middle to deep. The water level elevations vary seasonally, but overall, show a somewhat downward trend, based on annual high water level elevations. This trend is likely due to variations in annual precipitation but is also affected by pumping, as shown by the much lower water levels in the middle to deep wells since late 2013."[9] 9.25

Failing to present actual groundwater conditions in the areas-of-origin and the receiving areas should be disclosed and addressed in a recirculated CEQA/NEPA document.

<u>General Project Comments</u>

The RDEIR/SDEIS fails to indicate which, if any, responsible and trustee agencies were provided with the RDEIS/SDEIS for comment. This information must be disclosed in any final or revised document. 9.26

The RDEIR/S should consider transfer potential and sources/deliveries in annual water supply allocations. ES-3, line 2. 9.27

[8] Sacramento Suburban Water District 2016. *2015 Urban Water Management Plan.* http://www.waterresources.saccounty.net/scwa/Documents/Engineering%20Reports/Sac_CWA_2015_UWMP_6-28-2016.pdf

[9] Sacramento Groundwater Authority *2016. Basin Management Report 2016 Update*. p. 20.

These service areas include a wide range of water contractor entities with different water rights and controls that should be under the oversight and control of the State Board, not Reclamation or DWR. What is the basis for transfer potential of each of the sellers, especially in drought years when buyers need water? If they have such rights, what is their basis for the need for each individual seller and buyer?

How do each of these work as transfers and under what rules? RDEIR ES-6, line 3-8. What is the basis of the 600 taf and justification? What is the basis of the 360 taf? Are the State Board or ESA agencies likely to alter the transfer window based on Delta demands?

ES-7, line 2: why are SWP facilities and transfers not mentioned?
ES-11, line 8: what assurance are there that transferred water reaches the Delta?
ES-2, Line 25: water users may have need but not the right to take, store, transport, deliver, or use transfers. Can allocations be made to sellers who have no intention of using, but rather, selling their surface water? Line 36: Allocations for CVP contractors should include specs for that year's potential transfers. 9.28

C. The DEIR Improperly Segments Environmental Review of the Whole of This Project.

As discussed throughout these comments, the proposed Project does not exist in a vacuum, but rather is another transfer program in a series of many that have been termed either "temporary," "short term," "emergency," or "one-time" water transfers, and is cumulative to numerous broad programs or plans to develop regional groundwater resources and a conjunctive use system. The *2019-2024 Water Transfer Program* is also only one of several proposed and existing projects that affect the regional aquifers. 9.29

For example, the proposed Project is, in fact, just one project piece required to implement the Sacramento Valley Water Management Agreement ("SVWMA"). The Bureau has publically stated the need to prepare programmatic environmental review for the SVWMA for over a decade, and the present EIS/EIR covers a significant portion of the program agreed to under the SVWMA. In 2003, the Bureau published an NOI/NOP for a "Short-term Sacramento Valley Water Management Program EIS/EIR." (68 Federal Register 46218 (Aug 5, 2003).) As summarized on the Bureau's current website:

> The Short-term phase of the SVWM Program resolves water quality and water rights issues arising from the need to meet the flow-related water quality objectives of the 1995 Bay-Delta Water Quality Control Plan and the State Water Resources Control Board's Phase 8 Water Rights Hearing process, and would promote better water management in the Sacramento Valley and develop additional water supplies through a cooperative water management partnership. Program participants include Reclamation, DWR, Northern California Water Association, San Luis & Delta-Mendota Water Authority, some Sacramento Valley water users, and Central Valley Project and State Water Project contractors. SVWM Program actions would be locally-proposed projects and actions that include the development of groundwater to substitute for surface water supplies, conjunctive use of groundwater and surface water, refurbish existing groundwater extraction wells, install groundwater monitoring stations, install new groundwater extraction wells, reservoir re-operation, system improvements such as canal lining, tailwater recovery, and improved operations, or surface and groundwater planning studies. These short-term projects and

9.30

> actions would be implemented for a period of 10 years in areas of Shasta, Butte, Sutter, Glenn, Tehama, Colusa, Sacramento, Placer, and Yolo counties.[10]

The resounding parallels between the SVWMA NOI/NOP and the presently proposed project are not merely coincidence: they are a piece of the same program. In fact, the SVWMA continues to require Reclamation and SLDMWA to facilitate water transfers through crop idling or groundwater substitution:

> *Management Tools for this Agreement.* A key to accomplishing the goals of this Agreement will be the identification and implementation of a "palette" of voluntary water management measures (including cost and yield data) that could be implemented to develop increased water supply, reliability, and operational flexibility. Some of the measures that may be included in the palette are:
>
> . . .
>
> (v) Transfers and exchanges among Upstream Water Users and with the CVP and SWP water contractors, either for water from specific reservoirs, or by substituting groundwater for surface water . . . [11]

It is abundantly clear that Reclamation and SLDMWA continue to propose a program through the RDEIR/SDEIS to implement this management tool, as required by the SVWMA. But neither CEQA nor NEPA permit this approach of segmenting and piecemealing review of the whole of a project down to its component parts. The water transfers proposed for this project will directly advance SVWMA implementation, and Reclamation and DWR must complete environmental review of the whole of the program, as first proposed in 2003 but since abandoned. For example, the draft EIS/EIR does not reveal that the current Project is part of a much larger set of plans to develop groundwater in the region, to develop a "conjunctive" system for the region, and to integrate northern California's groundwater into the state's water supply.

In this vein, the U.S. Department of Interior's 2006 Grant Assistance Agreement, *Stony Creek Fan Conjunctive Water Management Program and Regional Integration of the lower Tuscan Groundwater formation* laid bare the intentions of Reclamation and its largest Sacramento Valley water district partner, Glenn Colusa Irrigation District, to take over the Tuscan groundwater basin to further the implementation of the SVWMA, stating: 9.31

> GCID shall define three hypothetical water delivery systems from the State Water Project (Oroville), the Central Valley Project (Shasta) and the Orland Project reservoirs sufficient to provide full and reliable surface water delivery to parties now pumping from the Lower Tuscan Formation. The purpose of this activity is to describe and compare the performance of three alternative ways of furnishing a substitute surface water supply to the current Lower Tuscan Formation groundwater users to eliminate the risks to them of more aggressive pumping from the Formation and to optimize conjunctive management of the Sacramento Valley water resources.

---

[10] Accessed 3/12/19. "NOI/NOP was published on August 5th 2003. Public scoping meetings held August 20/21 2003. Draft and Final EIS/EIR dates to be determined. "https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=788

[11] Accessed 3/12/19. http://www.norcalwater.org/wp-content/uploads/2010/12/sac_valley_water_mgmt_agrmt_new.pdf

IV. Document Deficiencies in Disclosure or Detail

A. Planning and mitigation is inconsistently presented.

Is the Project depending on the 2014 or the 2015 version of the *DRAFT Technical Information for Preparing Water Transfer Proposals (Water Transfer White Paper) Information for Parties Preparing Proposals for Water Transfers Requiring Department of Water Resources or Bureau of Reclamation Approval* document ("DTIPWTP")? Page ES-6 refers to a 2015 version[12] as the most recent version while page 3.3-25 presents the 2014 version as the most current. The Lead Agencies must correct this. They must also explain whether the May 2015 Addendum to the DTIPWTP remains viable. In addition, Reclamation and DWR, the identified authors of the DTIPWTP, must explain what prevents the agencies from producing a final version as opposed to drafts from four and five years ago. A draft DTIPWTP isn't a regulation, but a guidance document. The Project must have mitigation that complies with CEQA. In order to legally defer any such mitigation measure, the RDEIR/SDEIS must provide the actual regulatory guidance that will be used. 9.32

B. Hydrographs of simulated groundwater levels are missing.

According to the RDEIR/SDEIS at page 3.3-15, Appendix F, Groundwater Monitoring Results, was supposed to contain a series of hydrographs to simulate groundwater level changes in seven model layers at 34 selected locations. Please provide the material or disclose where it is located. If it was not in the circulated RDEIR/SDEIS, the document must be corrected and recirculated with a clean copy and a redline version. This information is critical to any understanding of the RDEIR/SDEIS's assessment of groundwater impacts in the first instance. 9.33

C. Assessment Methods section is missing

"As discussed in the Assessment Methods (Appendix H of the RDEIR/SDEIS), if groundwater levels are more than 15 feet below ground surface, a change in groundwater levels would not likely affect overlying terrestrial resources." p. 3.8-7 "A detailed discussion of the methods for assessing impacts on natural communities and special-status plants and wildlife is contained in Appendix H of the RDEIR/SDEIS. Appendix H of the RDEIR/SDEIS also contains a description of impact mechanisms specific to each transfer type." p. 3.8-5. However, the Assessment Methods are not presented in Appendix H. This is a major omission that requires correction and then recirculation of the RDEIR/SDEIS with a clean copy and a redline version. 9.34

D. Stream Depletion Factor

The RDEIR/SDEIS merely references Mitigation Measure WS-1 in Appendix C, Table C-1. Potential Impacts Summary. The RDEIR/SDEIS lacks credibility by not presenting the full WS-1 in this abbreviated CEQA/NEPA document. WS-1 is the sole mitigation proposed to deal with the following impact that was acknowledged in the 2014 DEIS/EIR: "Groundwater substitution transfers could decrease flows in surface water bodies following a transfer while groundwater basins recharge, which could decrease pumping at Jones and Banks Pumping Plants and/or require additional water releases from upstream CVP reservoirs." p. ES-13. This is a major omission that requires correction and then recirculation of the RDEIR/SDEIS with a clean copy and a redline version. 9.35

---

[12] Exhibit E.

E. Specific Inadequacies in Chapter 3, Groundwater Resources

- Well depth ranges are not disclosed for the Redding Area basin in the northern Sacramento Valley. Anderson-Cottonwood Irrigation district is a seller located in this basin, which necessitates disclosure of similar well depth ranges as presented in Table 3.3-4.[13] 9.36
- The data used for Table 3.3-4 are from 2003 and therefore very outdated.[14] This table should be updated.

V. The Long-Term Water Transfers Has Significant Impacts on Species

A. No Agency Has Considered Public Trust Doctrine Duties

For the prior EIR/S, the AquAlliance coalition expressly asked the Lead Agencies to consider and discuss their applicable duties under the common law Public Trust Doctrine. The Lead Agencies refused, stating in full:

> CDFW is a trustee agency under CEQA because it has "jurisdiction by law over natural resources affected by a project, that are held in trust for the people of the State of California." (CEQA Guidelines Section 21070) CDFW reviewed this EIS/EIR and provided comments, which have been addressed. For more information on the appropriate CEQA lead agency, see Common Response 1. 9.37

The courts have expressly rejected this approach to compliance with the Public Trust Doctrine: "[T]he brief acknowledgment of the obligation of *other agencies* to protect public trust resources reinforces our conclusion that the [lead agency] did not implicitly consider its *own* obligations under the public trust doctrine as part of its CEQA review of this project." *San Francisco Baykeeper*, 242 Cal.App.4th at 242. In that case, the court noted the public trust doctrine is not satisfied merely by performing CEQA review. *Id.* (citing *Citizens for East Shore Parks v. State Lands Comm'n* (2011) 202 Cal.App.4th 549). The court went further and held that state agencies have an affirmative duty to perform a public trust consistency analysis, based on substantial evidence in the administrative record, as a part of their CEQA review. *Id.*

Here, the Lead Agencies have committed the errors identified by the court in *S.F. Baykeeper v. California State Lands Commission*. First, the Lead Agencies incorrectly assumed their duty to perform a public trust analysis was discharged by virtue of performing CEQA review. In fact, case law dictates that public trust impact analysis is a necessary component within the greater CEQA review process, not a separate legal hurdle cleared only by virtue of having performed CEQA review. *S.F. Baykeeper*, 242 Cal.App.4th at 242. Second, the mere acknowledgement of the public trust duties of other agencies is not enough to discharge the public trust duties of the lead agencies. *Id.* Accordingly, the EIR remains critically inadequate without an analysis, based on substantial evidence, of the impacts of the Project on public trust uses. 9.38

[13] Project RDEIR/SDEIS/SDEIS. p. 3.3-19.

[14] *Id.*

B. Plants and Wildlife

1. The 2019-2024 Water Transfer Program has potential adverse impacts for fish

a. P3.2-1, line 21: Potential changes **will** likely be made even if only adapt management is used in the next five years as these are also mandated in BOs and recovery plans. This should be considered in cumulative assessment. 9.39

b. Line 33: Dry periods are potentially any month but mainly July through October of wet years. So increases in dam releases in these periods will cause reductions in others or come from storage, which could be detrimental. Decreasing storage releases in spring and increasing fall releases for transfers could have negative consequences in both periods. Spring effects on water quality weigh more than summer/ early fall. 9.40

c. P3.2-2, line 3: The RDEIR/S must assess changes associated with impacts flow and temperature, turbidity, salinity, in Rivers and Delta prior to Delta diversion that will change with unregulated transfers. For example, reduced spring calls on reservoir water will lower river flows and raise water temperatures during critical salmon migrations. Bumps in warmer reservoir outflows could delay spawning and lead to redd dewatering later in fall or early winter. There is a general call for more natural flow patterns in Valley rivers and Delta inflow – transfers will cause the opposite. 9.41

d. Line 16 para: if inflows are reduced in spring-early summer and increased in late summer/fall, there could be substantial spring-summer water quality effect, especially given unknown controls on Delta project and non-project diversions. For example, Yuba calls in spring-early summer say 50,000 af, how will that water be protected on its way to south Delta pumps? If 50,000 af of base flows are saved from fallowing or groundwater substitution in spring-summer, how will it be protected, captured and stored/used by buyers downstream? What about groundwater substitutions that draw from river aquifers? It will be different water with effects on Delta water quality from taking the different water. How will fall inflows be protected from Other non-project Delta diversions. If other diversions are not controlled, there could be detrimental effects from reduced outflow – from lack of adequate accounting. 9.42

e. Section 3.7.6.1, para 1

i. The effects on fisheries from real changes to river flows and associated water quality and project and non-project diversions in the rivers and in the Delta must also be analyzed. Salmon need spring summer water in river for transport, turbidity, and lower water temperatures. High fall transfer water flows and temperatures delay spawners and hinder gonad development, and may lead to later increase risks to redd dewatering. 9.43

The REIS fails to adequately address the potential effects on specific river flows and water temperatures. For example, summer Yuba transfers are detrimental to Yuba ecology, steelhead, and salmon: opposite of natural flow pattern; attracts stray salmon bound for upper Sac River, Battle Creek, and other tributaries; can keep Yuba too cold stimulating early salmon spawning, salmon spawning in marginal habitat, lower steelhead growth, or early salmon smolt emigration toward warmer downstream areas; also bad for bed scouring and riparian vegetation. Similar effects may occur below many of the Valley's rim dams that may accommodate transfers. Similar problems may occur with changes to Delta inflow/export ratio under unchanged outflow. 9.44

Any change in river flows or Delta inflows can effect non-project diversions. For example, lower Sac River irrigation diversion rates are partially controlled by water levels.

Each transfer will have unique footprint and ramifications, and potential for impact to fish and fish habitat.

2. <u>The 2019-2024 Water Transfer Program has potential adverse impacts for the giant garter snake, a threatened species.</u>

As the Lead and Approving Agencies are well aware, the purpose of the ESA is to conserve the ecosystems on which endangered and threatened species depend and to conserve and recover those species so that they no longer require the protections of the Act. 16 U.S.C. § 1531(b), ESA § 2(b); 16 U.S.C. § 1532(3), ESA §3(3) (defining "conservation" as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary"). "[T]he ESA was enacted not merely to forestall the extinction of species (i.e., promote species survival), but to allow a species to recover to the point where it may be delisted." Gifford Pinchot Task Force v. U.S. Fish & Wildlife Service, 378 F3d 1059, 1069 (9th Cir. 2004). To ensure that the statutory purpose will be carried out, the ESA imposes both substantive and procedural requirements on all federal agencies to carry out programs for the conservation of listed species and to insure that their actions are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. 16 U.S.C. § 1536. See NRDC v. Houston, 146 F.3d 1118, 1127 (9th Cir. 1998) (action agencies have an "affirmative duty" to ensure that their actions do not jeopardize listed species and "independent obligations" to ensure that proposed actions are not likely to adversely affect listed species). To accomplish this goal, agencies must consult with the Fish and 9.45
Wildlife Service whenever their actions "may affect" a listed species. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). Section 7 consultation is required for "any action [that] may affect listed species or critical habitat." 50 C.F.R. § 402.14. Agency "action" is defined in the ESA's implementing regulations to "mean all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States." 50 C.F.R. § 402.02.

The giant garter snake ("GGS") is an endemic species to Central Valley California wetlands.[15] The giant garter snake, as its name suggests, is the largest of all garter snake species, not to mention one of North America's largest native snakes, reaching a length of up to 64 inches. Female GGS tend to be larger than males. GGS vary in color, especially depending on the region, from brown to olive, with white, yellow, or orange stripes. The GGS are distinguished from the common garter snake by its lack of red markings and its larger size. GGS feed primarily on aquatic fish and specialize in ambushing small fish underwater, making aquatic habitat essential to their survival. Females give birth to live young from late July to early September, and brood size can vary from 10 to up to 46 young. Some studies have suggested that the GGS is sensitive to habitat change in that it prefers areas that are familiar and will not typically travel far distances.

The RDEIR/SDEIS finds that the proposed Project, "[h]as the potential to subject more snakes to the stressors of finding new foraging areas" and that this is a significant impact. p. 3.8-19. The RDEIR/SDEIS relies on Mitigation Measure VEG and WILD-1 that is intended to, "[r]educe the potential for death or decreased fitness of individual giant garter snake" by keeping "[a]dequate water in water conveyance ditches and canals adjacent to idled/shifted fields," providing
verification of requirements by Reclamation, and prohibiting "[t]ransfers from areas with important 9.46
giant garter snake populations." (*Id.*) These measures are an attempt to protect GGS, but fail to encompass the complete needs of the species. Any habitat modification, not just areas with

[15] USFWS 2017. Final Recovery Plan for the Giant Garter Snake. p. I-2.

"important" GGS populations, may result in "take" under the ESA, and should be considered significant. Further, mitigation measures VEG and WILD-1 must account for these impacts considerations, which they do not.

The Final Recovery Plan for the Giant Garter Snake ("GGS Recovery Plan") provides extensive information about GGS needs, most of which are not discussed in the RDEIR/SDEIS but are essential to evaluating the project's impacts to GGS. 9.47

Thermal Ecology

The GGS Recovery Plan discusses the thermal ecologic needs of the species. "Snakes are ectothermic animals, relying on external sources of heat to warm their bodies. Ectothermic animals regulate their body temperatures by daily behavioral activities such as basking in the sun or resting on a warm rock to heat their bodies, or by resting under vegetation or in the water to cool their bodies (Lincoln et al. 2001; Pough et al. 2001). A snake's ability to thermoregulate its body within narrow limits using external sources of heating and cooling are believed to play an important role in feeding and digestion, growth, reproduction, and in their vulnerability to predation, such as when basking without cover (Pough et al. 2001). Wylie et al. (2009a) found that giant garter snakes remain cool during hot days by remaining in underground burrows and warm themselves in cool weather by basking on canal banks."[16] How has the Project required that these needs are addressed? 9.48

Reproduction

The RDEIR/SDEIS fails to focus on reproductive needs and stresses even with some basic commentary presented in Appendix H. The Final Recovery Plan for the Giant Garter Snake provides facts "Male giant garter snakes are believed to reach sexual maturity in an average of 3 years and females in an average of 5 years (USFWS 1993); therefore, we estimate that a generation is 5 years for the giant garter snake. The mating season is believed to extend from March, soon after emergence, into May (Coates et al. 2009). The giant garter snake usually gives birth in summer to early fall after a gestation period of 2 -3 months. R. Hansen and G. Hansen (1990) found that parturition (giving birth) for female giant garter snakes taken into captivity occurred from late July through early September, and neonates (newly born young) emerge from the female fully developed. Litter size is variable with the giant garter snake, and averages between 17 and 23 young (R. Hansen and G. Hansen 1990; Halstead et al. 2011)."[17] How will the Project protect the reproductive lives and offspring since it operates through the GGS active season? 9.49

Predation

"A number of native mammals and birds are known, or are likely, predators of giant garter snakes, including raccoons (Procyon lotor), striped skunks (Mephitis mephitis), otters (Lontra canadensis), hawks and harriers (Buteo species, Accipiter species, Circus cyaneus), and great blue herons (Ardea herodias). Many areas supporting giant garter snakes have been documented to have abundant predators (R. Hansen 1980; G. Hansen and Brode 1993; Wylie et al. 1997a). However, predation is not believed to be a limiting factor in areas that provide abundant cover, high concentrations of prey items, and connectivity to a permanent water source (Wylie et al. 1997a)." The RDEIR/SDEIS adds, "Although individual snakes that must relocate would be subject to greater risk of predation as they move to find new suitable foraging areas, it is likely that some individuals would be able to successfully relocate in suitable habitat elsewhere within the area. Young snakes (two years old and less) that need to relocate may be particularly vulnerable to 9.50

---

[16] (*Id.*) p. I-5.

[17] (*Id.*)

increased predation risk." pp. 3.8-18 to 3.8.19. The RDEIR/SDEIS fails to propose mitigation requirements that will consider the vulnerabilities experienced by all GGS, most particularly the young.

Foraging

The RDEIR/SDEIS acknowledges the potential for significant impacts despite knowing what are GGS foraging needs. "The reduction in suitable foraging habitat within rice fields could cause some individuals to relocate away from an area that may have been their foraging area in prior years. Giant garter snakes occupying canals adjacent to fields that are fallowed in a particular year may disperse to canals that are in close proximity to active rice fields in order to obtain sufficient prey throughout their life-cycle. Although individual snakes that must relocate would be subject to greater risk of predation as they move to find new suitable foraging areas, it is likely that some individuals would be able to successfully relocate in suitable habitat elsewhere within the area. Young snakes (two years old and less) that need to relocate may be particularly vulnerable to increased predation risk." pp. 3.8-18 to 3.8.19. Sadly, the foraging needs are not addressed in the proposed Mitigation Measure VEG and WILD-1. 9.51

Conclusion

The RDEIR/SDEIS attempts downplays the significance of the Project on the federal and state listed threatened species by revealing why GGS continue to decline. "Because giant garter snakes in the Seller Service Area are within an active rice growing region that experiences variability in rice production and farming activities, they are already subject to these risks in the absence of the Proposed Action." p. 3.8-19. The AquAlliance Coalition would assert that the RDEIR/SDEIS misses the mark here as the Project's possible 60,693 acres of fallowed rice fields are hardly a norm in the lucrative rice market. Correctly, the RDEIR/SDEIS concludes that, "The Proposed Action has the potential to subject more snakes to the stressors of finding new foraging areas. This potential impact would be significant." 9.52

The RDEIR/SDEIS uses the research of Gabriel A. Reyes, et al to illustrate the most Project-friendly statement: "While giant garter snakes are known to use rice fields seasonally, the species is strongly associated with the canals that supply water to and drain water from rice fields; these canals provide much more stable habitat than rice fields because they maintain water longer and support marsh-like conditions for most of the giant garter snake active season (Reyes et. al. 2017)." 9.53

The RDEIR/SDEIS refers the reader to Appendix H for "in-depth discussion" of GGS use of rice land (p. 3.8-18), however this appendix filled with 74 pages of animal and plant species tables and only 3.5 pages of general information about GGS. Appendix H acknowledges that canals are important as "movement corridors" (p. H-78), but that many other needs are ideal. Unfortunately, these ideal, or to put it another way, <u>vital</u> needs are not listed as part of Mitigation Measure Veg and Wild-1, such as:

- Water present from March through November.
- Slow moving or static water flow with mud substrate.
- Presence of emergent and bankside vegetation that provides cover from predators and may serve in thermoregulation. 9.54
- Absence of a continuous canopy of riparian vegetation.
- Available prey in the form of small amphibians and small fish.
- Thermoregulation (basking) sites with supportive vegetation such as folded tule clumps immediately adjacent to escape cover.

- Absence of large predatory fish.
- Absence of recurrent flooding, or, where flooding is probable, the presence of upland refugia.

Noticeably some additional research that conflicts with the Project impact analysis and mitigation are omitted: 9.55

- "Although our study indicated that giant gartersnakes make little use of rice fields themselves, and avoid cultivated rice relative to its availability on the landscape, rice is a crucial component of the modern landscape for giant gartersnakes."[18]
- "[m]aintaining canals without neighboring rice fields would be detrimental to giant gartersnake populations, with decreases in giant gartersnake survival rates associated with less rice production in the surrounding landscape."[19]
- "The abundances of fish and frogs at a site in a given year were positively correlated."[20]

The RDEIR/SDEIS incorrectly concludes that, "[i]mpacts from cropland idling/shifting transfer actions on the giant garter snake would be reduced to a less-than-significant level" because VEG and WILD-1 will minimize effects to individual garter snakes because 1) "[r]equiring that: transfers be reviewed to ensure cropland idling does not occur in or adjacent to areas with known important giant garter snake populations" and 2) "[b]y keeping at least 2 feet of water in the major irrigation and drainage canals (or no less than existing conditions)" and 3)"[b]y maintaining water in smaller drains and conveyance canals with emergent vegetation for GGS escape and foraging habitat." p. 3.8-19. By focusing so heavily on these three requirements, the RDEIR/SDEIS ignores the importance of this species vulnerability when forced to leave its historic neighborhood habitat as sections of the RDEIR/SDEIS and Appendix H reveal as we note above. 9.56

The flawed less-than-significant conclusion also plainly ignores the impacts to GGS at a population level. "Implementation of Mitigation Measure VEG and WILD-1 will ensure potential effects to *individual* giant garter snake are minimized" by requiring the three items above: review to keep fallowing from occurring near or in important GGS areas; maintain a minimum of two feet of water in the major irrigation and drainage canals; and keeping some water in smaller drains and canals. (emphasis added)These measures contradict what little science exists as well as other discussion in the RDEIR/SDEIS that explains more needs of the species. Failing to fully consider individual impacts and population impacts at all, is significant. 9.57

The GGS Recovery Plan also presents these crucial points:

> Depending on the type of water transfer that occurs, if transfers are away from giant garter snake habitat, the following effects to giant garter snakes and their habitat can reasonably be anticipated: increased stress on snakes that must disperse further to find suitable habitat (including summer water) and prey items, increased predation on snakes due to the loss of refugia, increased competition for food and shelter resources between displaced and resident snakes, and ultimately, reduced reproduction and recruitment as females are displaced from familiar retreats and basking sites and neonates and juveniles are deprived of essential nutrients to facilitate growth and sexual maturation. These detrimental impacts to 9.58

[18] Reyes, Gabriel A., et al., 2017. *Behavioral Response of Giant Gartersnakes (Thamnophis gigas) to the Relative Availability of Aquatic Habitat on the Landscape*. p. 1.
[19] (*Id.*)
[20] Rose, Jonathan P., et al.2018. *Spatial and Temporal Variability in Growth of Giant Gartersnakes: Plasticity, Precipitation, and Prey*. Journal of Herpetology, Vol. 52, No. 1, 40–49,

> individuals have the potential to become population-level effects as the quality of habitat and food resources is reduced persistently, over time, or undergoes annual fluctuations of high magnitude. p. V-6.

An additional and noticeable detail is missing from the RDEIR/SDEIS. While rice fields abutting or immediately adjacent to important GGS habitat will not be permitted to participate in cropland idling/shifting transfers, there is no definition of how large a buffer would be required between a participating fallowed field and important GGS habitat areas. This issue must be clarified and corrected.

Please explain the inclusion of the following paragraph in the RDEIR/SDEIS. Voluntary practices are not enforceable and are not mitigation for impacts from the Project.

> Standard farm practices associated with participating in cropland idling/shifting water transfers (e.g. valve or gate operations, equipment transportation, facility maintenance), may also increase risk to giant garter snakes if they were to encounter personnel or equipment. This could result in injury, death, or decreased fitness of giant garter snakes. These risks are minimized because sellers voluntarily perform giant garter snake best management practices, including educating maintenance personnel to recognize and avoid contact with giant garter snakes, cleaning only one side of a conveyance channel per year, and implementing other measures to enhance habitat for giant garter snake. Additionally, ditch maintenance is typically done when there is no water in the canals and ditches. This means that giant garter snake adjacent to fields idled/shifted under the Proposed Action will not be affected by ditch maintenance during their active season. p. 3.8-19. 9.59

Finally, any loses of GGS should be considered in a cumulative context, since the species has been more than decimated from historical levels, hence its special status listings. As the Lead Agencies are aware, the 2015 BO and the amended BO were vacated through *AquAlliance v. United States Bureau of Reclamation* (E.D.Cal. 2018) 312 F. Supp. 3d 878, 880, 5 U.S.C. § 706(2)(A), and no revised BO has been adopted. Nevertheless, even the 2015 BO conceded that "the overall status of the snake has not improved since its listing," and that "by far the most serious threats to snake continues to be loss and fragmentation of habitat from . . . changes in rice production." The final rule listing the GGS as threatened explained, "fluctuations in rice production and changes in water management including reductions in water availability due to drought and water transfers were cited as threats to the continued existence of the snake." GGS are in further peril by cumulative impacts from warming climate, which effects the Project would aggravate. For each of these reasons, VEG and WILD-1 fails to ensure that impacts to GGS as a result of fallowing will be detected by qualified, third-party scientists or mitigated to less than significant levels, through binding, enforceable and objective performance standards. 9.60

The Lead Agencies must revise the RDEIR/SDEIS to incorporate the GGS Recovery Plan's first priority that is to:

> Establish an incentive or easement program(s) to encourage private landowners and local agencies to provide or maintain agricultural practices (e.g. rice cultivation) and wetland habitats that benefit the giant garter snake. Work with nonprofit organizations (such as land trusts) to assist private landowners in conserving and recovering the giant garter snake through economic and other incentive programs. Agricultural incentives should be developed and made available to landowners and water districts and users who conserve 9.61

giant garter snakes on their property or who may provide suitable habitat. (Priority 1)[21]

The RDEIR/SDEIS requires that "The water seller will keep adequate water in major irrigation and drainage canals," but fails to define what constitutes a "major irrigation and drainage canal," nor does the RDEIR/SDEIS demonstrate that irrigation and drainage canals *not* deemed to be "major" would *not* provide habitat for GGS, pond turtles, or impacted avian species. RDEIR/SDEIS 3.8-39. Thus, but the impact assessment and the deferred mitigation measure are unduly vague to support adequate informational disclosure, and lack objective performance standards to ensure impacts will be mitigated. To determine how much water is "adequate," the RDEIR/SDEIS states that "water depths should be similar to years when transfers do not occur," but given climatic and other variations in California water management, this could easily present a range of water depths to choose from, some of which may be inadequate. If the project results in only the minimum historical/non-transfer year water depths being made permanent, which VEG and WILD-1 could permit, on their face, then the project's significant impact to these habitats would not be avoided. VEG and WILD-1 similarly provide no objective performance standard to determine if adequate water would remain in smaller canals and ditches. RDEIR/SDEIS 3.8-39. "Loose or open-ended performance criteria" are prohibited. (Rialto Citizens for Responsible Growth v. City of Rialto (2012) 208 Cal.App.4th 899, 944.) "[T]entative plans for future mitigation after completion of the CEQA process," without any "specific performance criteria for evaluating the efficacy of the measures" violate CEQA. (POET, LLC v. Calif. Air Resources Bd. (2013) 218 Cal.App.4th 681, 738; see also Guidelines, § 15121(a).) It is also unclear if this aspect of the mitigation measure would ensure that adequate water could and would be provided before any crop idling transfer would be approved or commence. 9.62

Finally, it is unclear if Reclamation has recommenced consultation with USFWS, and/or if any new BO is expected prior to project implementation, both of which would be required under the ESA.

3. <u>The 2019-2024 Water Transfer Program has potential adverse impacts for plants.</u>

Regarding impacts to vegetation, GW-1 permits that "If historic data show that groundwater levels in the area where actions are being taken to make water available for transfer have typically varied by more than this amount annually during the proposed transfer period [between 10 to 25 feet below ground surface], then the transfer may be allowed to proceed." RDEIR/SDEIS 3.3-28. Here the RDEIR/SDEIS fails to provide any evidence that this would avoid impact to deep rooted vegetation, since it is not known whether (1) any historic period in which such groundwater levels were breached could have itself had significant effects to vegetation, and/or (2) new vegetation could have taken root since that time.

Very disconcertingly, the RDEIR/SDEIS seems to simply allow groundwater substitution to continue even if impacts to deep rooted vegetation occur. The RDEIR/SDEIS never states that pumping must stop if such effects occur, but rather, requires that, "If significant adverse impacts to deep-rooted vegetation (that is, loss of a substantial percentage of the deep-rooted vegetation as determined by Reclamation based on site-specific circumstances in consultation with a qualified biologist) occur as a result of the transfer despite the monitoring efforts and implementation of the mitigation plan, the seller will prepare a report documenting the result of the restoration activity to plant, maintain, and monitor restoration of vegetation for 5 years to replace the losses." 9.63

---

[21] USFWS 2017. Final Recovery Plan for the Giant Garter Snake. p. III-2.

RDEIR/SDEIS 3.3-28. Mitigation measures identified in an EIR are legally inadequate if they are so undefined that it is impossible to gauge their effectiveness. Preserve Wild Santee v City of Santee (2012) 210 Cal.App.4th 260, 281 (plan for active habitat management did not describe anticipated management actions or include standards or guidelines for actions that might be taken).

GW-1 is woefully inadequate to protect vegetation from groundwater extraction, where it provides:

> If no monitoring wells with the requirements discussed in the previous paragraph exist, monitoring would be based on visual observations by a qualified biologist of the health of these areas of deep-rooted vegetation until it is feasible to obtain or install shallow groundwater monitoring. If significant adverse impacts to deep-rooted vegetation (that is, loss of a substantial percentage of the deep-rooted vegetation as determined by Reclamation based on site-specific circumstances in consultation with a qualified biologist) occur as a result of the transfer despite the monitoring efforts and implementation of the mitigation plan, the seller will prepare a report documenting the result of the restoration activity to plant, maintain, and monitor restoration of vegetation for 5 years to replace the losses.

RDEIR/SDEIS 3.3-28. First, there are no objective performance standards to determine how a qualified biologist can determine if tree health is affected by project groundwater pumping. Worse, the ultimate determination of whether any effects are significant rests not with the qualified biologist, but rather with Reclamation, with no guiding standards at all, in its sole discretion, to determine whether "significant adverse impacts" are occurring to a "substantial percentage" of deep-rooted vegetation across some undefined "area." How frequently would visual monitoring occur? How quickly would Reclamation review a biologist's report? How would Reclamation or a biologist determine whether impacts have "occur[ed] as a result of the transfer", especially in a cumulative context where multiple effects may be limiting water supply to deep-rooted vegetation, during times of shortage in which transfers are intended to occur? The mitigation measure makes no mention of whether any impacted vegetation may provide habitat to any special species, for which additional impact disclosure and mitigation would be required. Nor does GW-1 indicate by when any mitigation efforts through replanting vegetation must be completed, nor how like-for-like vegetation will be provided. Where deep-rooted vegetation may be significantly mature, for example, mitigation at a 1:1 ratio would not suffice, nor would regrowth over the 5-year replacement period proposed by GW-1. Finally, any loses of mature vegetation should be considered in a cumulative context, where oak and riparian habitat has been more than decimated from historical levels, and is further threatened by cumulative impacts from warming climate, which effects this project would exacerbate. For each of these reasons, GW-1 fails to ensure that impacts to vegetation as a result of groundwater pumping will be detected or mitigated to less than significant levels, through binding, enforceable and objective performance standards. 9.63 Cont.

VI. Hydrology

A. Streamflow

1. Significant Past, Present, and Future Streamflow Depletion is Not Disclosed

Streamflow depletion is only mentioned in generalities in the RDEIR/SDEIS. Historic streamflow changes must be provided so the public and policy makers may have a basic understanding of how water development in the Sacramento River Watershed has been affected by the CVP and SWP. The RDEIR/SDEIS also fails to disclose or map exactly where the areas are with depressed 9.64

groundwater levels and where the rivers are losing flow. We submit one of DWR's maps that indicate areas of depressed groundwater[22] and stipulate that a revised and recirculated RDEIR/SDEIS must contain this and all other maps and data that would provide an adequate depiction of the existing conditions and problems.

Custis illuminates the RDEIR/SDEIS problems with inadequate disclosure and analysis for streamflow depletion.

> The 2018 RDEIR/SDEIS evaluates the potential for groundwater substitution transfer pumping to impact rivers and creeks using the SACFEM2013 groundwater model simulations for years 1970 to 2003. The document sets as the threshold of significance standard, a reduction in mean monthly flow of 10 percent and greater than one cubic foot per second (cfs) change in flow. The document relies on groundwater level monitoring requirements and mitigations in GW-1 to prevent impacts to terrestrial species, natural communities and special-status species. The document doesn't provide data or analysis on why the proposed ten percent and 1 cubic foot per second (10% & 1 cfs) threshold is an appropriate standard of protection. The 10% & 1 cfs standard isn't compared to existing instream flow standards such as those utilized by the California Department of Fish and Wildlife. Mitigation GW-1 doesn't require that baseline conditions be measured or documented. There are no standards for monitoring, and no standards for the level of environmental significance for the species and resources being protected. The other terrestrial mitigation, VEG and WILD-1, is only for cropland idling transfer and therefore doesn't provide monitoring or mitigation for groundwater substitution transfers. Mitigation GW-1 has no specific requirements to monitor these biological resources prior, during or after transfer pumping. The 2018 RDEIR/SDEIS also claims that many streams are "essentially" dry during periods of pumping and therefore pumping can't cause an impact. This assessment ignores the long-term implications of surface water capture discussed in my comment No. 5, in particular, the increase in stream seepage caused by lowering the water table, the third type surface water capture. Long-term impacts from lowering groundwater levels beneath streams and the effect on reducing surface water flows aren't considered in the document or mitigated in GW-1. p. 5. 9.65

There was a time when the public and policy makers believed that the CVP and the SWP operated within the law, albeit with more water on paper than could ever be available. Once the limits of hydrology caused DWR, Reclamation, and some of their contractors to look for tools to game the law – and the hydrology - of California, it became clearer that the state and federal governments have facilitated a destructively unrealistic demand for water. Ever willing to destroy natural systems to meet demand for profit, the San Joaquin River dried up and subsidence caused by groundwater depletion in the San Joaquin Valley is even cracking water conveyance facilities.[23] The continual, 9.66

[22] DWR at https://data.cnra.ca.gov/dataset/northern-region-groundwater-elevation-change-maps. Exhibit F. Maps are being moved to the url above soon, as the former url is no longer operable (http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/gw_level_monitoring.cfm).
[23] Sneed, et al., 2012. Abstract: Renewed Rapid Subsidence in the San Joaquin Valley, California.
"The location and magnitude of land subsidence during 2006–10 in parts of the SJV were determined by using an integration of Interferometric Synthetic Aperture Radar (InSAR), Global Positioning System (GPS), and borehole extensometer techniques. Results of the InSAR measurements indicate that a 3,200-km^2 area was affected by at least 20 mm of subsidence during 2008–10, with a localized maximum subsidence of at least 540 mm. Furthermore, InSAR results indicate subsidence rates doubled during 2008. Results of a comparison of GPS, extensometer, and groundwater-level data suggest that most of the compaction occurred in the deep aquifer system, that the critical head in some parts

long-term groundwater overdraft in the San Joaquin Valley, the expansion of new permanent crops in both the San Joaquin and Sacramento valleys, and groundwater substitution transfers by CVP and SWP contractors *all* cause streamflow depletion. Failing to disclose how the CVP and SWP cause streamflow depletion is a major omission, as is the current state of streamflow depletion in the Sacramento River Hydrologic Region, the source for the CVP and SWP.[24]

Expert testimony supports this "[t]hat the Sacramento Valley is already impacted by historical groundwater pumping with a decrease in the level of groundwater, the decrease in groundwater storage, and loss of flow in surface waters. These negative historical impacts to groundwater are consistent with the medium to high CASGEM ranks for the groundwater basins and the need to develop Sustainable Groundwater Management Plans."[25]

9.66 Cont.

The significant past, present, and future Project and cumulative streamflow depletion must be presented, analyzed, and included in a recirculated RDEIR/SDEIS. Moreover, it must identify the threshold of significance below which significant impacts would not occur. WS-1 purports to avoid "legal injury" where it is explained in the 2014 Long-Term Transfer DEIS/EIR, but fails to define any threshold or criteria that will be applied in the performance of WS-1 to clearly determine when legal injury would ever occur.

B. The RDEIR/SDEIS Fails to Correct the Lack of Disclosure of the Lead Agencies and DWR's Conjunctive Use and Water Transfer Plans, Programs, Projects, and Funding.

The RDEIR/SDEIS fails to reveal that the current Project is part of many more plans, programs, projects, and funding to develop groundwater in the Sacramento Valley, to develop a "conjunctive" system for the region, and to place water districts in a position to integrate the groundwater into the state water supply. These are plans that Reclamation, together with DWR, water districts, and others have been pursuing and developing for many years.[26] [27]

An environmental impact statement should consider "[c]onnected actions." 40 C.F.R. §1508.25(a)(1). Actions are connected where they "[a]re interdependent parts of a larger action and depend on the larger action for their justification." *Id.* §1508.25(a)(1)(iii). Further, an environmental impact statement should consider "[s]imilar actions, which when viewed together with other *reasonably foreseeable or proposed agency actions*, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." *Id.* §1508.25(a)(3). Reclamation's participation in funding, planning, attempting to execute, and frequently executing the programs, plans and projects has circumvented the requirements of NEPA. DWR's failure to conduct project or programmatic level CEQA review for water transfers and comprehensive environmental review for the *Sacramento Valley Water Management Agreement* has 9.67

of the deep system was exceeded in 2008, and that the subsidence measured during 2008–10 was largely permanent." Conference presentation at *Water for Seven Generations: Will California Prepare For It?*, Chico, CA.

[24] Custis, 2014. Graph for AquAlliance, Comparison of Ground Water Pumping and Accretion, Sacramento Valley 1920-2009. Exhibit R.

[25] Custis, Kit 2016. Testimony for Part 1of the BDCP/WaterFix Change in Point of Diversion State Water Resources SWRCB hearing. p. 11. Exhibit G.

[26] Hauge, Carl, 2011. Presentation to the State Water Commission, September 14, 2011. pp. 11,12,14.

[27] McManus, Dan, 2014. Presentation to the State Water Commission, March 3, 2014. p. 2. "Future Water Supply Program (FWSP), Provides data collection and analysis to facilitate and support Sacramento Valley groundwater substitution transfers and conjunctive mgmt."

segmented a known, programmatic project for decades, which means that Reclamation is also failing to comply with state law as the CVPIA mandates. A list of connected actions and similar actions is found in the Cumulative Impacts section below.

C. The RDEIR/SDEIS Fails to Disclose Adequately the Existing Geology that is the Foundation of the Sacramento River's Hydrology and the Sacramento Valley's Groundwater Basins.

The RDEIR/SDEIS fails, as did the 2015 FEIS/EIR for the Project, to note a significant geographic feature in the Sacramento River hydrologic region: the Cascade Range (p. 3.3-6). The Cascade Range is the genesis of the Sacramento River and some of its most significant tributaries: the Pit and the McCloud Rivers. The enormous influence of the Cascade Mountain Range on not only the Sacramento River, but the geology, soils, and hydrology of the Sacramento Valley's ground water basin is also completely missing. The California Department of Conservation describes the Range thusly: "The Cascade Range, a chain of volcanic cones, extends through Washington and Oregon into California. It is dominated by Mt. Shasta, a glacier-mantled volcanic cone, rising 14,162 feet above sea level. The southern termination is Lassen Peak, which last erupted in the early 1900s. The Cascade Range is transected by deep canyons of the Pit River. The river flows through the range between these two major volcanic cones, after winding across interior Modoc Plateau on its way to the Sacramento River."[28] The Sacramento River Watershed Program provides another simple, adequate description of its namesake: "The Sacramento River is the largest river and watershed system in California (by discharge, it is the second largest U.S. river draining into the Pacific, after the Columbia River). This 27,000–square mile basin drains the eastern slopes of the Coast Range, Mount Shasta, the western slopes of the southernmost region of the Cascades, and the northern portion of the Sierra Nevada. The Sacramento River carries 31% of the state's total surface water runoff."[29] 9.68

The repeated failure of the Lead Agencies to provide this most basic geologic, geographic and hydrologic information on which the entire Project depends causes the reader to wonder what else has been ignored or purposely omitted in the document.

D. The DEIR Fails to Disclose the Over Appropriation of Water Rights in the Sacramento River Watershed.

As mentioned above, the public is presented with inadequate baseline data with which to consider the consequences of the Project. The comparison of the average unimpaired flow of the Sacramento River Watershed stacked against the claims that have been made for water is but one example. The average annual unimpaired flow in the Sacramento River basin is 21.6 MAF, but the consumptive use claims are an extraordinary 120.6 MAF![30] Informing the public about water rights claims would necessarily show that buyers, Reclamation, and DWR clearly possess junior water rights as compared with those of many willing sellers. Full disclosure of these disparate water right claims and their priority is needed to help explain the actions and motivations of buyers and sellers in the 2019-2024 Water Transfer Program. Otherwise the public and decision makers have insufficient information on which to support and make informed choices. 9.69

---

[28] California Department of Conservation, California Geological Survey, 2002. *California Geomorphic Provences.* [sic]
[29] http://www.sacriver.org/aboutwatershed/roadmap/sacramento-river-basin
[30] California Water Impact Network, AquAlliance, and California Sportfishing Protection Alliance 2012. *Testimony on Water Availability Analysis for Trinity, Sacramento, and San Joaquin River Basins Tributary to the Bay-Delta Estuary.*

To establish a proper legal context for these water rights, the RDEIR/SDEIS should also describe more extensively the applicable California Water Code sections about the treatment of water rights involved in water transfers, such as:

> *California Water Code Section 1810 and the CVPIA protect against injury to third parties as a result of water transfers. Three fundamental principles include (1) no injury to other legal users of water; (2) no unreasonable effects on fish, wildlife or other in-stream beneficial uses of water; and (3) no unreasonable effects on the overall economy or the environment in the counties from which the water is transferred.*

9.69 Cont.

Like federal financial regulators failing to regulate the shadow financial sector, subprime mortgages, Ponzi schemes, and toxic assets of recent economic history, the state of California has been derelict in its management of scarce water resources. As we mentioned above we are supplementing these comments on this matter of wasteful use and diversion of water by incorporating by reference and attaching the 2016 complaint to the State Water Resources Control Board of the California Water Impact Network the California Sportfishing Protection Alliance, and AquAlliance on public trust, waste and unreasonable use and method of diversion as additional evidence of a systemic failure of governance by the State Water Resources Control Board, DWR and Reclamation. (Exhibit C)

E. The EIS/EIR Fails to Disclose Irreversible and Irretrievable Commitment of Resources, and Significant and Unavoidable Impacts.

Under NEPA, impacts should be addressed in proportion to their significance (40 C.F.R. § 1502.2(b)), and all irreversible or irretrievable commitment of resources must be identified (40 C.F.R. § 1502.16). And CEQA requires disclosure of any significant impact that will not be avoided by required mitigation measures or alternatives. CEQA Guidelines § 15093. Here, the RDEIR/SDEIS does neither, relegating significant impacts to groundwater depletion, land subsidence, and hardened demand for California's already-oversubscribed water resources, to future study pursuant to inadequately described mitigation measures, if discussed at all. 9.70

1. <u>The RDEIR/SDEIS Analysis of Groundwater Impacts is Inadequate</u>

As discussed, above, the RDEIR/SDEIS groundwater supply mitigation measures rely heavily on monitoring and analysis proposed to occur after groundwater substitution pumping has begun, perhaps for a month or more. Only after groundwater interference, injury, overdraft, or other harms (none of which are assigned a definition or significance threshold) occur, would the RDEIR/SDEIS require sellers to implement mitigation measures, which are as of yet undefined and therefore unknown to the public. As a result, significant and irretrievable impacts to groundwater are fully permitted by the proposed project. 9.71

In addition, noticeably missing is disclosure and analysis of the quantity of groundwater that must be pumped to irrigate crops with a groundwater substitution transfer. "There is a question of what amount of groundwater would need to be pumped to maintain the crops that were irrigated by the transferred surface water. This can be estimated by accounting for the losses in transfer water of 33 to 43 percent resulting from the BoR-SDF and the carriage water loss. For example, if the crop was 9.72

irrigated with 1,000 acre-feet of surface water, the maximum amount of allowable transfer water would range from 570 to 670 acre-feet. If it is assumed that the crop needs 1,000 acre-feet of irrigation, then the ratio of groundwater pumped to transferred water ranges from 1.5 to 1.75 (1,000 /670 = 1.5; 1,000 / 570 = 1.75). **Therefore, the proposed transfer of up to 250,000 acre-feet per year would require pumping 375,000 to 437,500 acre-feet of groundwater each year to meet the same irrigation demand.** Based on size of the graph bars for annual transfer volume in Figure 3.3-4, the SACFEM2013 modeling doesn't appear to have simulated the maximum groundwater volume that would need to be pumped in any one year or during the combined 6 years that the project is proposing."[31] (Emphasis added).

Groundwater Effects

"Water made available for transfer from groundwater substitution pumping actions would reduce groundwater levels near the participating wells, which could affect surrounding third parties or potentially cause subsidence. These effects would be reduced through monitoring and mitigation plans. If groundwater levels fall below local Basin Management Objectives or historic low groundwater levels, transfer pumping would stop until groundwater levels recover. This requirement would avoid potential groundwater pumping related-land subsidence, which could occur when groundwater levels fall below historic low levels." ES-10.

9.73

The RDEIR/SDEIS' description of groundwater levels in the Sacramento Valley Groundwater Basin is incomplete in inconsistent. The RDEIR/SDEIS's repeated refrain that storage tends to decrease in dry years and increase in wet years simply ignores the reality that groundwater demands have and are continuing to increase. The RDEIR/SDEIS does acknowledge that "Urban pumping in the Sacramento Valley increased from approximately 250,000 acre-feet annually in 1961 to more than 800,000 acre-feet annually in 2003," but more important and not included would be information regarding increased demand since 2003 for both urban and agricultural uses, and/or projected into the future for the life of this proposed project. RDEIR/SDEIS 3.3-4. Without factoring increased recent, present, and near-term demand, the RDEIR/SDEIS does disclose that "Groundwater levels in the northern Sacramento Valley Groundwater Basin have declined over the last decade or so (spring 2004 to spring 2017)." RDEIR/SDEIS 3.3-5. This period does include both wet and dry periods, and again belies the RDEIR/SDEIS's unsupported assumption that groundwater always recovers.

Similarly, the RDEIR/SDEIS admits, without further analysis or concern, that "Approximately 7.3 percent of the wells showed a continued decline in groundwater levels between spring 2016 and spring 2017; this decline is attributed to changes in irrigation practices and land use trends in the valley." RDEIR/SDEIS 3.3-5. And despite the fact that "Water Year 2017 was classified as one of the wettest years on record since 1983," the RDEIR/SDEIS states that "Changes in groundwater levels between spring 2011 and spring 2017 show a decline of 2.6, 5.2 and 5.8 feet in the shallow, intermediate and deep aquifer zones, respectively" in the Sacramento Valley. RDEIR/SDEIS 3.3-5. 9.74

[31] Custis, Kit H. 2019. Exhibit A. pp. 31-32.

Table 3.3-2.
Historic Groundwater Pumping and Groundwater Basin Safe Yields for Potential Buyers

Potential Buyer Agency	Underlying Groundwater Basin	Safe Yield of Groundwater Basin (acre-feet)	Groundwater Pumping (acre-feet/year)
Westlands WD[1]	Westside subbasin	200,000	15,000 – 600,000[2]
SCVWD[3]	Santa Clara Plain subbasin	373,000 – 383,000	93,500 - 122,300[4]
	Llagas subbasin	150,000 – 165,000	41,600 - 49,700[4]
Contra Costa WD[5]	-	-	3,000

[1] Source: Westlands WD 1996. Based on data from 1988 to 2011.
[2] Average pumping is approximately 218,600 acre-feet/year
[3] Source: SCVWD 2012
[4] Based on data from 2000 to 2009. Combined average pumping for Santa Clara Plain and Llagas subbasins is approximately 156,330 acre-feet/year
[5] Source: Contra Costa WD 2011

RDEIR/SDEIS 3.3-11. What is the source of these data? Citations are unclear.
Nothing stops buyers in these areas from continuing these pumping rates, even with project transfer water. 9.75

The RDEIR/SDEIS's stated threshold of significance, that groundwater impacts would be significant if it caused "A net reduction in groundwater levels that would result in substantial adverse environmental effects or effects to non-transferring parties" is circular and so vague as to render the threshold completely susceptible to the Lead Agencies' subjective interpretations. RDEIR/SDEIS 3.3-10. Nevertheless, the RDEIR/SDEIS asserts that "Impacts of Action Alternatives on groundwater levels were analyzed using a quantitative approach with a numerical groundwater model." This is simply irreconcilable with the vague and non-objective threshold of significance set forth. 9.76

For the Redding Area Groundwater Basin, the RDEIR/SDEIS concludes, with no supporting facts or analysis whatsoever, that "Additional pumping is not expected to be in locations or at rates that would cause substantial long-term changes in groundwater levels that would cause changes to groundwater quality. Changes to groundwater quality due to increased pumping would be less than significant in the Redding Area Groundwater Basin." RDEIR/SDEIS 3.3-12. 9.77

The RDEIR/SDEIS modeling in the Sacramento Valley indicates that "Groundwater levels at this location return to near-baseline conditions approximately three to four years after the single year groundwater substitution transfer event in WY 1981. Recovery occurs after approximately six years following the multi-year transfer event from WY 1986 to WY 1994." RDEIR/SDEIS 3.3-15. In another modeled location, "Groundwater levels return to approximately 75 percent of the 1 baseline level five years after the single year transfer event in WY 1981 and between 50-75 2 percent six years after the multi-year transfer event from WY 1986 to WY1994." RDEIR/SDEIS 3.3-16. These long and uncertain recovery, and even partial recovery, periods would extend beyond the duration of the proposed project itself. And a six year recovery for a single year transfer could easily lead to significant effects for multiple year transfers. Added to this, the RDEIR/SDEIS fails to account for increased climate variability, temperatures, and demand. See, *infra* at section VIII below. 9.78

The RDEIR/SDEIS asserts that there is a chance of subsidence at only two well locations, but this information is difficult to support. The figures and tables in this section do not match the text or each other. They talk about subsidence at two locations out of eight locations, and refer to Figure E-10 in Appendix E. They also list wells in Table 3.3-5, but it is unclear what two subsidence wells are on the Figure E-10. In fact, it is unclear if any of the wells in Table 3.3-5 are on Figure E-10. 9.79

Page 3.3-20 refers to a hydrograph at Location 30 in Appendix F, but there are no hydrographs in Appendix F. Appendix F has the maps of the simulated drawdown, but no hydrographs. Even the 9.80 2014 EIR/S Appendix E hydrographs do not indicate any of the lowest historical groundwater levels or a trigger level. As a result, it is impossible to confirm the RDEIR/SEIS's conclusions.

To determine subsidence potential, the RDEIR/SDEIS should look at groundwater levels when the transfer is proposed and estimate what the normal drawdown would be without the transfer, and then add in the drawdown from transfer. Given measurement margins of error, if this is even close 9.81 to exceeding the threshold, the transfer shouldn't be allowed. Second, the drawdowns in Table 3.3-5 are at some unspecified distance from the wells, where drawdown levels and subsidence risk are far lower than at or adjacent to the production well itself.

The RDEIR/SDEIS's conclusion that groundwater pumping would not risk spreading any areas of contaminated groundwater is also conclusory, not supported by evidence, and internally inconsistent. The RDEIR/SDEIS asserts that since "Groundwater substitution pumping under the Proposed Action would be limited to short-term withdrawals during the irrigation season. Effects from the migration of reduced groundwater quality would be less than significant." The RDEIR/SDEIS asserts that "Inducing the movement or migration of reduced quality water into previously unaffected areas due to groundwater substitution pumping is not likely to be a concern 9.82 unless groundwater levels and/or flow patterns are substantially altered for a long period of time." The RDEIR/SDEIS fails to provide evidence or analysis of any evidence as to why increased groundwater extraction would not cause this effect. The RDEIR/SDEIS's qualitative speculation that pumping would not substantially alter flow patterns for a long period of time is contradicted by the RDEIR/SDEIS's own model results (which we believe understate the impact) which indicate up to 5 or 6 years of recharge can be required to offset effects from *a single year* of groundwater substitution pumping.

The RDEIR/SDEIS misleadingly states that "The Proposed Action may result in a reduced use of groundwater resources during periods of shortage by supplementing water supply with transferred water. Therefore, the impact of the Proposed Action on groundwater levels in the Buyer Service Area would be beneficial." RDEIR/SDEIS 3.3-23. This conclusion is unsupported by evidence and 9.83 misleading. Agricultural and municipal demand have steadily increased in the Buyer Service Areas. The RDEIR/SDEIS fails to present any information to rebut this trend, which supports the opposite conclusion that groundwater not needed to meet existing demands would then be available to meet growth demands.

Mitigation measure GW-1 first requires that potential sellers submit well data as "detailed in the most current version of the *DRAFT Technical Information for Preparing Water Transfer Proposals* (Reclamation and DWR 2014)." RDEIR/SDEIS 3.3-25. The RDEIR/SDEIS fails to provide any further information on this point, rendering GW-1 completely incapable of being analyzed. What 9.84 types of information would be necessary in order to sufficiently and effectively evaluate the effects of any transfer and any subsequent mitigation measures; and does the *DRAFT TIPWTP* necessarily include this information?

GW-1 next requires that "Potential sellers must complete and implement a monitoring program subject to Reclamation's approval that shall include, at a minimum, the following components . . . ." RDEIR/SDEIS 3.3-25. Is there a clear mechanism for Reclamation to require these submissions and enforce this mitigation measure as to any seller districts that are not transferring water subject to 9.85

Reclamation approval? Will Reclamation have legal authority to deny any project that fails to include a suitable monitoring well program?

GW-1 explains that "Suitable monitoring well(s) would: (1) be within a two-mile radius of the seller's transfer pumping well; (2) be located within the same Bulletin subbasin as the pumping well; and (3) 4 have a screen depth(s) in the same aquifer level (shallow, intermediate, or deep) as the pumping well." RDEIR/SDEIS 3.3-26. The expert comment of Kit Custis, submitted concurrently herewith, demonstrate that groundwater impacts may occur nearer, and over 10 miles away.[32] For a single well at a distance of up to two miles, it simply does not follow that "Monitoring requirements at the participating pumping well and suitable monitoring well(s) would detect impacts to third parties." RDEIR/SDEIS 3.3-26. 9.86

Next, the RDEIR/SDEIS reveals, for the first time, that as a result of the worst drought in California history, the RDEIR/SDEIS is actually *lowering* its threshold of significance to no effects greater than groundwater levels during the historic drought period. 3.3-26. The RDEIR/SDEIS states "Wells with short historic records could be considered, but short records (that do not extend to 2014 or earlier) could limit the transfer because the historic low would not reflect the persistent dry weather from 2011 to 2015. In this situation, the lowest groundwater level for the short period of record would be used, but because the groundwater level would likely be higher than the historic low during the prior drought period, the groundwater level triggers (described below) would be more restrictive (i.e., the lowest recorded groundwater level could be reached more quickly during transfer-related pumping than occurred in the short period of record when groundwater levels were higher." 3.3-26. 9.87

Could the BMOs, or the RDEIR/SDEIS' threshold of significant for areas without a BMO, also lower their threshold of significance *every year there is a lower historical low*? This is tantamount to no limit at all. Is there any historical pattern of this for how each county manages its BMOs?

The groundwater monitoring threshold of significant in the RDEIR/SDEIS, which aims to maintain groundwater above "historic low" levels, fails to consider whether the projects' incremental effects may nonetheless be cumulatively considerable. Where, for example, an aquifer is already in a state of decline or near historic low levels, adding groundwater substitution demands that help the aquifer to persist in an overdraft condition, at or near historically low levels, should be considered to be cumulatively considerable. 9.88

The RDEIR/SDEIS should include each relevant BMO it proposes to use, since the Lead Agencies are in possession of this information, and this would clearly disclose the proposed project's potential effects. The use of some BMOs may require clarification. For example, Butte County has adopted various "Alert Stages" related to its BMO implementation, and the RDEIR/SDEIS should clarify that the initial BMO, and not subsequent lower "Alert Stage" levels, will be used. Some Butte County BMOs were established "by taking the historical low reading and adding 20% of the range of measurements, calculated from the first year on record through 2006." (Groundwater Status Report, Butte County, 2017.) The RDEIR/SDEIS does not adopt this approach for areas where no BMO is set (which includes some areas within Butte County), but rather, simply uses historical low groundwater levels. The RDEIR/SDEIS misleadingly says that most BMOs are based on historical lows, but this is plainly untrue where Butte County adds an additional protective 9.89

[32] Custis, Kit H. 2019. Comments on the Long-Term Water Transfers, RDEIR/SDEIS. p. 11.

measure of 20%. The RDEIR/SDEIS's use of historical lows is thus arbitrary and, rather obviously, not protective of groundwater.

The RDEIR states that "it is likely that groundwater levels in the pumping well would decline to the
historic low level sooner than at the monitoring well(s)," RDEIR/SDEIS 3.3-27, but depending on
the heterogeneity of the aquifer, this may not be the point at which the impact is most severe, and 9.90
provides no information for any slope to the water table, nor where the greatest opening in any
aquifer may be occurring. See, e.g., Appendix E, Figs E-46 to E-54. The RDEIR/SDEIS must, but
fails to, provide sufficient well monitoring for subsidence effects.

GW-1 impermissibly defers formulation of critical components of the mitigation measure itself by
requiring that "The monitoring program will include a plan to coordinate the collection and
organization of monitoring data. This plan will describe how input from third parties (i.e.
groundwater wells not participating in water transfers) will be incorporated into the monitoring
program and will include a plan for communication with Reclamation as well as other decision
makers and third parties." RDEIR/SDEIS 3.3-28 (emphasis added). This is simply a plan to create a
plan. "[T]entative plans for future mitigation after completion of the CEQA process," without any
"specific performance criteria for evaluating the efficacy of the measures" violate CEQA. (*POET,
LLC, supra*, 218 Cal.App.4th 681, 738; *see also* Guidelines, § 15121(a).) There is no reason that
this plan cannot and should not be provided now. For instance, GW-1 next provides that
"Reclamation, SLDMWA, and potential seller(s) will coordinate closely with potentially affected
third parties to collect and monitor groundwater data." RDEIR/SDEIS 3.3-28. DWR already possess
well permit information, including location, for all wells in the vicinity of each potential
groundwater substitution production pump. This information should be sought out and disclosed 9.91
now in the RDEIR/SDEIS. Instead, Reclamation is simply illegally deferring this analysis to a later
date, as part of the mitigation measure. Surely, Reclamation would be required to review publicly
available DWR well data at such time as it would determine the "potentially affected third parties"
in the future. GW-1 states that "If a third party expects that it may be affected by a proposed
transfer, that party should contact Reclamation and the seller with its concern." RDEIR/SDEIS 3.3-
28. But how would a third party know that a groundwater substitution is about to occur? It should
be the duty of Reclamation and the seller to contact the potentially affected third party with
sufficient time in advance of the transfer for the affected third party to provide information
regarding their well and groundwater. Indeed, as stated, those individuals should be knowable and
included in the RDEIR/SDEIS now. In addition, other aspects of this future possible plan are very
likely infeasible or of very limited value, and that information needs to be recognized before the
EIR is certified and Reclamation issues a Record of Decision allowing approval of an inadequate
mitigation measure. The court has already rejected prior GW-1 language as inadequate to articulate
any meaningful threshold of significance regarding impacts to third parties, and this RDEIR/SDEIS
relies on the same plan to "coordinate closely" with potentially affected third parties, with no
objective thresholds of what impacts will be considered potentially significant, and no performance
standards to reduce those to a less than significant level.

The RDEIR/SDEIS recognizes that Glenn-Colusa ID adopted a new "Supplemental Supply program
proposes to operate ten groundwater wells (five existing wells and five proposed wells) to augment
surface water diversions." RDEIR/SDEIS 3.3-31. The RDEIR/SDEIS asserts that this project will
have no cumulatively considerable impact for the sole reason that "Glenn-Colusa ID's supplemental
supply program and Glenn-Colusa ID's groundwater substitution pumping to make surface water
available for transfer are not expected to occur simultaneously." This fails to support any conclusion 9.92
that the projects, in conjunction, would not have significant cumulative impacts, since the

RDEIR/SDEIS does acknowledge that its own groundwater substitution effects could take years to recover from any single transfer. If the GCID Supplemental Supply program draws down groundwater that the RDEIR/SDEIS assumes is recharging and offsetting groundwater substitution effects, then the two projects taken together would be cumulatively considerable. The RDEIR/SDEIS also fails to acknowledge that GCID abandoned the Supplemental Supply program in 2016: "This letter is to inform you that the Glenn-Colusa Irrigation District (GCID) Board of Directors has made the decision to suspend the environmental review process for the Groundwater Supplemental Supply Project and corresponding Environmental Impact Report (EIR), and instead independently pursue the development of a comprehensive Water Resource Plan (WRP)."[33] How this changes GCID's transfer program is unclear and should be considered.

The RDEIR/SDEIS provides no analysis of the cumulative effects in conjunction with the Davis-Woodland Water Supply Project. The RDEIR/SDEIS simply concludes that GW-1 will prevent any significant effects, but fails to consider entirely whether both projects can be fulfilled without adversely affecting other groundwater users, nor considering the cumulative effects of both projects, in conjunction, at all. 9.93

The RDEIR/SDEIS concludes that GW-1 will absolutely avoid any cumulatively considerable impacts, but it will not. As discussed, GW-1 is premised only upon maintaining groundwater levels at or below historically low groundwater levels, but admits that as historical groundwater levels lower further still, GW-1 will simply incorporate the new historically low groundwater level as a baseline. Thus, if a groundwater substitution project reaches but does not exceed historical lows, but a subsequent cumulative project does exceed that historical low, the following year transfer project may incorporate the new historical low, thus cumulatively creating a significant effect. Alternatively, even assuming that these projects also prohibited groundwater drawdown below historical lows, and assuming that GW-1 allows this project's groundwater substitutions to reach historical lows, then there would simply be no remaining groundwater available for the cumulative 9.94
projects, resulting in a significant effect to their implementation. This would further violate CVPIA's mandate that any transfer have no significant impact on the seller's groundwater. CVPIA Section 3405 (a)(1)(J) states that no transfer shall be approved unless it is determined that "such transfer will have no significant long-term adverse impacts on groundwater conditions in the transferor's service area." To comply with the provision of CVPIA, the Bureau will have to arrive at some level of certainty that groundwater substitution will not adversely affect the transferor's basin under current operations or the preferred alternative. Again, this must be developed and presented in a revised and recirculated CEQA/NEPA document.

2. <u>Subsidence</u>

The RDEIR/SDEIS suffers the same flaw of catching and proposing to mitigate subsidence impacts after they occur just as planned with groundwater levels, Damages from both groundwater levels dropping and subsidence can be severe, permanent, and complicated. The RDEIR/SDEIS at least acknowledges this when it identifies subsidence as "irreversible," "permanent/irreversible," and "irreversible (permanent) ." pp. 3.3-22, 3.3-26. Despite this acknowledgement, the RDEIR/SDEIS purports to avoid these impacts to less than significant levels: 9.95

[33] Bettner, Thad 2016. Memo: *Development of a Comprehensive GCID Water Resource Plan and Suspension of the Environmental Review Process for the Groundwater Supplemental Supply Project*. p. 1. Exhibit H.

> Potential sellers must complete and implement a mitigation plan to avoid potentially significant groundwater impacts and ensure prompt corrective action in the event unanticipated effects occur. If groundwater level triggers are reached at the participating pumping well(s) or the suitable monitoring well (s) (either BMO triggers or historic low groundwater levels), transfer- related pumping would stop from the participating pumping well that reached the trigger. Transfer related pumping would be stopped when the trigger is first reached at either the participating pumping well(s) or the suitable monitoring well(s). Transfer-related pumping could not continue from this well (in the same year or a future year) until groundwater levels recovered to above the groundwater level trigger. Implementation of the mitigation plan thus avoids any potentially significant groundwater impacts. Other corrective actions could include:
> - Lowering of pumping bowls in non-transferring wells affected by substitution pumping.
> - Reimbursement to non-transferring third parties for significant increases in their groundwater pumping costs due to the groundwater substitution pumping action, as compared with their costs absent the transfer.
> - Reimbursement to non-transferring third parties for modifications to infrastructure that may be affected.
> - Other appropriate actions based on local conditions. p. 3.3-29.

9.95 Cont.

As noted in section VI of our comments above, the groundwater monitoring threshold of significant in the RDEIR/SDEIS, which aims to maintain groundwater above "historic low" levels, fails to consider whether the projects' incremental effects may nonetheless be cumulatively considerable. Also discussed is the fact that it is misleadingly says that most BMOs are based on historical lows when this is clearly untrue since Butte County adds an additional protective measure of 20%. The RDEIR/SDEIS's use of historical lows is thus arbitrary and, rather obviously, not protective of groundwater.

Even if there are adequate thresholds of significance through so-called historic lows or BMOs, stopping groundwater pumping does not necessarily stop subsidence. Delayed subsidence should be monitored according to the findings of Kyran D. Mish, PhD. Dr. Mish notes that, "It is important to understand that all pumping operations have the potential to produce such settlement, and when it occurs with a settlement magnitude sufficient enough for us to notice at the surface, we call it subsidence, and we recognize that it is a serious problem (since such settlements can wreak havoc on roads, rivers, canals, pipelines, and other critical infrastructure)"[34] Dr. Mish further explains that "[b]ecause the clay soils that tend to contribute the most to ground settlement are highly impermeable, their subsidence behavior can continue well into the future, as the rate at which they settle is governed by their low permeability."[35] "Thus simple real-time monitoring of ground settlement can be viewed as an unconservative measure of the potential for subsidence, as it will generally tend to underestimate the long-term settlement of the ground surface."[36] (emphasis added) 9.96

The model used for the Project is not equipped to handle the tasks necessary to predict Project impacts like subsidence and damage to an aquifers capacity.
It is actually quite easy to avoid all these adjustments and oversimplifications entirely, and treat the aquifer as it is, namely as a true three-dimensional physical body of large extent, with a time-

[34] Mish, Kyran D. 2008. *Commentary on Ken Loy GCID Memorandum*. p. 3. Exhibit I.
[35] (*Id.*) p. 4.
[36] (*Id.*)

9.97

varying location of the water table, and with accurate treatment of the complex hydraulic conductivity inherent to the subsurface conditions of California. It's also remarkably simple to include poromechanical effects (see discussion below) in such a 3D model so that accurate local and regional estimates of environmental impacts such as subsidence and loss of aquifer capacity can be predicted and validated. All of this technology has been available for decades, but it is not utilized in the SacFEM2013 model. *The citizens of California clearly deserve a better model for decision-making involving one of their most precious resources!*[37]

<u>Subsidence in the Sacramento Valley</u>
The RDEIR/SDEIS asserts that, "Land subsidence has not been monitored in the Redding Area Groundwater Basin. However, there would be potential for subsidence in some areas of the basin if groundwater levels decline below historic low levels. The groundwater basin west of the Sacramento River is composed of the Tehama Formation. This formation has exhibited subsidence in Yolo County and the similar hydrogeologic characteristics in the Redding Area Groundwater 9.98
Basin could be conducive to land subsidence."[38] That the vulnerable Redding Area Basin (as classified in the RDEIR/SDEIS) hasn't been monitored, is contradicted in a report that was released in December of 2018, which states, "The [subsidence monitoring] network encompasses all or part of 11 counties, from Shasta County at the north end of the valley to Solano and Sacramento counties in the south."[39] The report, *2017 GPS Survey of the Sacramento Valley Subsidence Network* ("Subsidence Report"), also notes that this monitoring network was established in <u>*2008*</u>.[40]

The Subsidence Report demonstrates that between 2008 and 2017, "The Arbuckle area (Colusa County) showed the most subsidence with a maximum change of -2.14 feet (ft.). Surrounding stations and InSAR data confirm this result with changes ranging from -0.49 to -1.00 ft. In eastern Yolo County (Zamora to Davis), the largest spatial extent of station declines was observed with several benchmarks showing changes between -0.3 and -1.1 ft. In Glenn County (Artois and Orland 9.99
area), three stations, ARTO, K852, and AGUI showed changes of -0.59 ft., -0.46 ft., and -0.44 ft., respectively. An area on the south side of the Sutter Buttes showed changes ranging from -0.19 to -0.36 ft. The remainder of the valley shows little change overall."[41] Later in the report it states, "Of greatest concern for comparison were stations SECO and HAHN in the Arbuckle area that showed major changes of -2.14 and -1.69 ft., respectively."[42]

The subsidence monitoring that is taking place in the Redding Area Basin as noted in the Subsidence Report is not acknowledged in the RDEIS/SDEIS and it also fails to mention the subsidence monitoring network as well. The RDEIR/SDEIS does acknowledge that, "Historically, land subsidence occurred in the eastern portion of Yolo County and the southern portion of Colusa County, owing to groundwater extraction and geology. Due to groundwater withdrawal over several decades, as much as four feet of land subsidence has occurred east of the town of Zamora," but without a citation.[43] It would benefit the reader to know what is meant by "historically" in this context and how this was reported prior to the subsidence monitoring network's existence and 9.100
reports. If the Lead Agencies seek to plead they knew nothing of the 2018 subsidence results due to the timing of the preparation of the RDEIR/SDEIS, they surely knew about preliminary results that

---

[37] Mish, Kyran D. 2014, Exhibit B.
[38] Project RDEIR/SDEIS/SDEIS p. 3.3-3.
[39] DWR, 2018. *2017 GPS Survey of the Sacramento Valley Subsidence Network.* p. v. Exhibit Q.
[40] (*Id.*)
[41] (*Id.*)
[42] (*Id.*) p. 16.
[43] Project RDEIR/SDEIS/SDEIS. p. 3.3-6.

were released in August 2015 by DWR[44] and the National Aeronautic and Atmospheric Administration.[45]

Inadequacy of Mitigation

As Custis presents, GW-1 is not up to the task to even monitor impacts let alone mitigate impacts. Mitigation GW-1 doesn't require the seller to comply with DWR's Best Management Practices for land subsidence monitoring networks. Mitigation GW-1 lacks specific information on what rate and amount of land subsidence would be considered significant and therefore trigger the corrective action to provide financial reimbursement to third parties for modification of their wells or infrastructure damaged by land subsidence. Mitigation GW-1 doesn't require that transfer sellers demonstrate that they have the financial assurance to reimburse third parties for mitigation costs. Mitigation GW-1 doesn't identify the procedures for third parties to making a claim of land subsidence damage. pp. 5-6. 9.101

As copied above, the RDEIR/SDEIS provides for:

- Lowering of pumping bowls in non-transferring wells affected by substitution pumping.
- Reimbursement to non-transferring third parties for significant increases in their groundwater pumping costs due to the groundwater substitution pumping action, as compared with their costs absent the transfer.
- Reimbursement for modifications to infrastructure that may be affected by non-reversible subsidence."

This unequivocally provides for significant and irreversible impacts to occur.

3. Transfer Water Dependency.

The EIS/EIR fails to account for long-term impacts of supporting agriculture and urban demands and growth with transfer water. Agriculture hardens demand by expansion and crop type and urban users harden demand by expansion. Both sectors may fail to pursue aggressive conservation and grapple with long-term hydrologic constraints with the delivery of more northern California river water that has been made available by groundwater mining and fallowing. Since California has high variability in precipitation year-to-year (http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST) (Exhibit 9.102
Y), and how will purchased water be used and conserved? Should agricultural water users be able to buy Project water, how will DWR and Reclamation assure that transferred water for irrigation is used efficiently? Could purchased water be used for any kind of crop or landscaping, rather than clearly domestic purposes or strictly for drought-tolerant landscaping?

Without a hierarchy of priority uses among agricultural or urban users for purchasing CVP and non-CVP water, the EIS/EIR fails to ensure that California water resources will not go to waste, and will not be used to harden unsustainable demands.

VII. RDEIR/SDEIS Fails to Analyze Climate Change Impacts

A number of high-profile studies on climate change in California since 2014, when the prior EIR/S was approved, have concluded that climate change is already impacting California's water supplies and will continue to do so. These reports include California's Fourth Climate Change Assessment

9.103

[44] DWR 2015. Press Release. Exhibit J.

[45] Farr, Tom G. et al. 2015. *Progress Report: Subsidence in the Central Valley, California*. Exhibit K.

issued in 2018 (http://www.climateassessment.ca.gov) and a joint study by the California Office of Environmental Health Hazard Assessment and California Environmental Protection Agency dated May 9, 2018 (https://oehha.ca.gov/climate-change/report/2018-report-indicators-climate-change-california). Neither of these reports were cited in the RDEIR/SDEIS, which must be revised to accurately describe existing and project-duration conditions. As detailed in these reports, indicators such as rising temperatures, a pattern of increasing dryness, more extreme weather, and decreases in Sierra snowpack and runoff among others underscore how critical climate change is a factor to any water management plan in California. The impacts of this project will undoubtedly exacerbate those of climate change.

It is undeniable that temperatures in California are rising. California's Fourth Climate Change Assessment concluded that "present-day (1986-2016) temperatures throughout the state have warmed above temperatures recorded during the first six decades of the 20th century (1901-1960)." Bedsworth, Louise, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission), 2018. Statewide Summary Report, California's Fourth Climate Change Assessment, Publication number: SUMCCCA4-2018-013 ("CFCCA Summary"), at 12. The report by the Office of Environmental Health Hazard Assessment and California Environmental Protection Agency similarly concluded that "California temperatures have risen since records began in 1895" and that the "last four years showed unprecedented temperatures: 2014 is the warmest on record, followed by 2015, 2017 and 2016." Office of Environmental Health Hazard Assessment, California Environmental Protection Agency (2018), Indicators of Climate Change in California (2018) ("OEHHA/CALEPA Report") at 53. This is significant new information since the 2014 EIR/S was approved, necessitating a more comprehensive update than the present RDEIR/SDEIS provides. 9.104

Droughts in California have also become more extreme. "A universally used indicator of drought — the Palmer Drought Severity Index — shows that California has become drier over time. Five of the eight years of severe to extreme drought (when index values fell below -3) occurred between 2007 and 2016, with unprecedented dry years in 2014 and 2015." OEHHA/CALEPA Report at S-5. 9.105

Precipitation patterns are also becoming more extreme, with "models projecting less frequent but more extreme daily precipitation, year-to-year precipitation becomes more volatile and the number of dry years increases." CFCCA Summary, at 22. As air temperatures warm, more moisture is lost from soils, which in turn leads to drier conditions seasonally even when precipitation increases. CFCCA Summary, at 23. Summer dryness may become prolonged. *Id.* 9.106

The amount of precipitation has become increasingly variable statewide. "In seven of the last ten years, statewide precipitation has been below the statewide average (22.9 inches)" and "California's driest consecutive four-year period occurred from 2012 to 2015." OEHHA/CALEPA Report at S-5.

The CFCCA report noted that "Current management practices for water supply and flood management in California may need to be revised for a changing climate […] in part because such practices were designed for historical climatic conditions, which are changing and will continue to change during the rest of this century and beyond." CFCCA Summary, at 11. 9.107

Another important factor is the reduction in snowpack and snowmelt. From "1950 to present, snow-water content in both the northern and southern Sierra Nevada long-term snow courses have been declining." OEHHA/CALEPA Report at 115. Similarly, "Since 1906, the fraction of annual 9.108

unimpaired snowmelt runoff that flows into the Sacramento River between April and July has decreased by about nine percent." *Id.* at 109.

These studies and others released since the EIR/EIS implicate almost every aspect of the proposed project, including groundwater recharge, surface water quality, delta outflow, water supplies and demands, and carriage water. However, the RDEIR/SDEIS fails to sufficiently analyze these effects, and the dated RDEIR/SDEIS climate model fails to incorporate this significant new information that will actually describe existing environmental conditions and likely project effects. Climate change is an existing condition and hazard and its effects could potentially exacerbated by the proposed project, yet the RDEIR/SDEIS fails to sufficiently evaluate these effects in violation of CEQA. *See East Sacramento Partnerships for a Livable City v. City of Sacramento*, 5 Cal. App. 5th 281, 296-97, 209 Cal. Rptr. 3d 774 (2016), *as modified on denial of rehearing* (Dec. 6, 2016) ("*ESPLC*"). The project may exacerbate impacts to water supply caused by climate change. For example, ground subsidence from groundwater pumping is linked to climate change as more groundwater is pumped during droughts, yet groundwater pumping by the project could exacerbate these impacts. The Project depends on surface water for recharge. Climate change anticipates more rain and less snow, thereby flashier storms, thus slowing and altering groundwater recharge patterns that the RDEIR/SDEIS profoundly relies upon to mitigate groundwater pumping impacts. The RDEIR/SDEIS fails to meaningfully address climate change impacts to and from proposed groundwater pumping and recharge. RDEIR/SDEIS section 3.3 states: 9.109

> groundwater levels in the Sacramento Valley Groundwater Basin have recovered to better than spring 2016 levels but have not improved to pre-drought levels (prior to 2011) It should be noted that groundwater level declines discussed above were due to five consecutive drought years and only partial recovery from one wet year is consistent with historic patterns of drawdown and recovery. Past groundwater trends are indicative of groundwater levels declining during extended droughts and recovering to pre-drought levels after subsequent wet periods. RDEIR/SDEIS at 3.3.6.

Here, the RDEIR/SDEIS simply ignores the fact raised in the recent climate changes studies noted above that droughts in California have become more extreme as noted by the climate changes studies above: "A universally used indicator of drought — the Palmer Drought Severity Index — shows that California has become drier over time. Five of the eight years of severe to extreme drought (when index values fell below -3) occurred between 2007 and 2016, with unprecedented dry years in 2014 and 2015." OEHHA/CALEPA Report at S-5.

Mitigation measure VEG and WILD-1 relies on recent water depths in canals in non-transfer years as sufficient to provide adequate habitat for GGS and other aquatic/riparian species, but if those water levels have been lowered in recent years due to warming temperatures, increasing demands, and climate variability, then that baseline may be insufficient to protect these threatened and special status species, and the project's effects would clearly exacerbate those of a changing climate. The same can be said of the lowered, historical low groundwater level baseline, that occurred following the 2015 drought, which this project will institutionalize as the new normal and threshold of significance: again, the project's effects on groundwater will be cumulatively considerable in conjunction with climate change. Similarly, the EIR/S streamflow depletion factor, expressed as a percentage of normal flows, may now and in the future operate from a baseline of even lower flows, less able to withstand a 10% reduction by the project. And GW-1 plainly allows impacts to deep-rooted vegetation, which effects will only exacerbate the strain on this vegetation caused by warmer temperatures, and decreased and less predictable water availability. The RDEIR/SDEIS fails to 9.110

assess any of these climate effects in a cumulative context. The model utilized by the RDEIR/SDEIS to evaluate groundwater recharge is fundamentally outdated and needs to consider new climate data such as California's Fourth Climate Change Assessment issued in 2018 (http://www.climateassessment.ca.gov) and a joint study by the California Office of Environmental Health Hazard Assessment and California Environmental Protection Agency dated May 9, 2018 (https://oehha.ca.gov/climate-change/report/2018-report-indicators-climate-change-california).

VIII. Growth Inducing Impacts

Evidence in the RDEIR/SDEIS itself makes clear that transfer water is necessary to support any growth in the buyer service areas. The RDEIR/SDEIS states that "[u]nder the No Action/No Project Alternative, some agricultural and urban water users may face potential shortages in the absence of water transfers. These potential shortages will likely be met by increasing groundwater pumping, idling cropland, reducing landscape irrigation, land retirement, or rationing water." p. ES-8. "In the past decades, water entities have been implementing water transfers to supplement available water supplies to serve existing demands." RDEIR/SDEIS p. 1-1. With transfer water in place, however, this groundwater is plainly available to meet growth demands. Providing transfer water therefore has the effect of supporting growth in buyer areas. 9.111

Buyer districts *are* on average growing, and therefore additional transfer water received by these districts could and *would* support current and future growth. An analysis of almond agriculture in California illustrates this growth trend. A 2017 California Department of Food and Agriculture report on almond data shows a consistent increase in the number of bearing acres of almonds over the last 20 years: 442,000 acres were recorded in 1997, 545,000 acres in 2002, 640,000 acres in 2007, 820,000 acres in 2012, and an estimated 1,000,000 acres in 2017.[46] These data are echoed by the 2018 annual report of the California Almond Board which reports a steady increase in almond bearing acreage from 710,000 in 2008/09 to an estimated 1,070,000 acres in 2018/19.[47] County of Fresno Department of Agricultural reports going back to the 1950s further illustrates this steady trend of growth in acreage devoted used for almonds. 1,248 bearing acres of almonds in Fresno County were reported in 1957 (1957 Report at 12), 4,360 acres in 1967 (1967 Report at 10), 16,862 acres in 1977 (1977 Report at 20), 30,648 acres in 1987 (1987 Report at 6), 45,529 acres in 1997 (1997 Report at 7), 116,700 acres in 2007 (2007 Report at 7), and 228,109 acres in 2017 (2017 Report at 15).[48] Gross production value of fruits and nuts generally in Fresno County grew from $746,702,000 in 1987, to $1,362,559,800 in 1997, to $1,806,133,000 in 2004, to $1,992,093,000 in 2005, to $2,056,619,000 in 2006, and to $2,112,735,000 in 2007.[49] 9.112

The RDEIR/SDEIS simply fails to acknowledge and analyze these persistent growth trends, nor acknowledge that as demands grow, so, too, shortages—without new water supplies—will worsen. Thus, this project approval will foreseeably create a newly available water supply that can and will be factored in to growth and demand projections. As growth continues, it will be simply impossible to state whether transfer water approved by this project will serve historic demands or growth demands. Thus, these and related growth inducing effects must be fully analyzed in this RDEIR/SDEIS. Commenters were able only to uncover scattered data regarding buyer service area

---

[46] California Department of Food and Agriculture , 2018. *2017 California Almond Nursery Sales Report*. p.2. Exhibit L.
[47] Almond Board of California, 2018. *Almond Almanac 2018*. p. 35, http://newsroom.almonds.com/document/2018-annual-report.
[48] Reports available at https://www.co.fresno.ca.us/departments/agricultural-commissioner/crop-report-history.
[49] Fresno County, 2007. Ag. Report, p.17; see also, https://fas.org/sgp/crs/misc/R44093.pdf/ (2015).

historic, present, and foreseeable future growth and demands, but such data is fully in the Lead Agencies' possession and must be fully disclosed to enable a meaningful review of the project's effects.

IX. The Cumulative Impacts Analysis Is Flawed

As discussed above, the Project is dependent on the hydrology of the Sacramento River and Delta watersheds to implement the proposed Project The cumulative impact analysis is abysmal as it fails to consider other past, present and reasonably foreseeable future actions in the Delta watersheds by deferring analysis to a future day.

The Ninth Circuit Court makes clear that NEPA mandates "a useful analysis of the cumulative impacts of past, present and future projects." *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 810 (9th Cir. 1999). "Detail is required in describing the cumulative effects of a proposed action with other proposed actions." *Id.* CEQA further states that assessment of the project's incremental effects must be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (CEQA Guidelines § 15065(a)(3).) "[A] cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines § 15065(a)(3).) 9.113

An EIR must discuss significant cumulative impacts. CEQA Guidelines §15130(a). Cumulative impacts are defined as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. CEQA Guidelines § 15355(a). "[I]ndividual effects may be changes resulting from a single project or a number of separate projects. CEQA Guidelines § 15355(a). A legally adequate cumulative impacts analysis views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impacts might compound or interrelate with those of the project at hand. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. CEQA Guidelines § 15355(b). The cumulative impacts concept recognizes that "[t]he full environmental impact of a proposed . . . action cannot be gauged in a vacuum." *Whitman v. Board of Supervisors* (1979) 88 Cal. App. 3d 397, 408 (internal quotation omitted).

In assessing the significance of a project's impact, Reclamation must consider "[c]umulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." 40 C.F.R. §1508.25(a)(2). A "cumulative impact" includes "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Id. §1508.7. The regulations warn that "[s]ignificance cannot be avoided by terming an action temporary or by breaking it down into small component parts." Id. §1508.27(b)(7). 9.114

An environmental impact statement should also consider "[c]onnected actions." Id. §1508.25(a)(1). Actions are connected where they "[a]re interdependent parts of a larger action and depend on the larger action for their justification." Id. §1508.25(a)(1)(iii). Further, an environmental impact statement should consider "[s]imilar actions, which when viewed together with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their

9.115

environmental consequences together, such as common timing or geography." Id. §1508.25(a)(3) (emphasis added).

As discussed, below, the RDEIR/SDEIS fails to comport with these standards for cumulative impacts upon surface water and groundwater supplies, subsidence, vegetation, and biological resources. The baseline and modeling data (WY 1970-2003) relied upon by the RDEIR/SDEIS do not account for related transfer projects since 2001 (see below). It also fails to use the baseline for all related transfer projects since the CalFed ROD was signed in 2000.

A. Delta Outflow

The RDEIR/SDEIS cumulative impacts analysis is flawed because it relies on the same type of analysis regarding cumulative effects to net delta outflow that the Court found illegal in its order. *See* Order, at 74-77. In its order, the Court relied on *Kings County [Farm Bureau v. City of Hanford*, 221 Cal. App. 3d 692, 718 (1990), *Los Angeles Unified (Sch. Dist. v. City of Los Angeles*, 58 Cal. App. 4th 1019 (1997), and *Communities for a Better Environment. v. California Resources Agency*, 103 Cal. App. 4th 98 (2002) ("*CBE*") for the general rule that "the greater the existing environmental problems are, the lower the threshold should be for treating a project's contribution to cumulative impacts as significant." Order at 74-75, quoting CBE at 120. The Court held that Defendants failed to account for the fact that "the Condition of the Delta is already precarious, due in part to reduced Delta outflows," when they asserted that changes to outflows would be small and subject to other regulatory constraints without more environmental analysis. *Id.* at 75. This "total absence of consideration of the existing environmental problems related to outflow is a legal failure." *Id.* The Court further held that since the FEIS/R discounted the effects of outflow increases because of magnitude, and not timing, they had the potential to be prejudicial under CEQA. *Id.* 9.116

Here, the RDEIR/SDEIS repeats these problems identified the Court by again failing to properly evaluate environmental impacts. Although the RDEIR/SDEIS includes information on the timing of flow increases or decreases, which is a step in the right direction, it still makes conclusory assertions regarding the in*significance* of changes to flows without any analysis of the environmental impacts such as those on fish species. RDEIR/SDEIS 3.2.4.1 "Changes in Delta outflows could result in water quality impacts" subsection states, in part:

> Because of existing degraded water quality conditions in the Delta, the combination of cumulative actions is considered to have significant impacts on water quality in the Delta. The range of potential water transfers that constitute the Proposed Action would increase Delta outflows slightly during the transfer period because carriage water would become additional Delta outflow, which would not adversely affect Delta water quality. The range of potential water transfers that constitute the Proposed Action would increase Delta outflows slightly during the transfer period because carriage water would become additional Delta outflow, which would not adversely affect Delta water quality. During other times of the year, transfers of water analyzed under this RDEIR/SDEIS could decrease Delta outflows. [...] The decreases to Delta outflow could only occur during wetter periods when the Delta is in excess conditions. During balanced conditions, the CVP would be required to release additional flow to maintain the standards in the Central Valley Water Quality Control Plan, so the Delta outflows would not change. Because the changes in Delta outflow associated with the potential water transfers are insubstantial and occur only during wetter conditions, the Proposed Action's incremental contribution to potentially significant cumulative water quality impacts would not be 9.117

cumulatively considerable.

This subsection relies on discounting flow changes as "insubstantial" or changing flows only "slightly," without any analysis of environmental impacts of these changes, even though they are occurring in an area that the Court has held to be "precarious." The RDEIR/SDEIS 3.2.4.1 "Changes in Delta inflows, outflows, and exports could affect Delta salinity" states, in part:

> Because of existing salinity concerns in the Delta, the combination of past, present, and future cumulative actions is considered to have significant impacts on salinity in the Delta. As shown in the water quality modeling, the Proposed Action would result in nominal decreases in Delta outflows and changes in the position of X2. Decreased water quality conditions (associated with decreased Delta outflow and downstream movement of the X2 position) would occur only during wetter periods because the CVP is required to maintain conditions during periods when the Delta is in balanced conditions. During balanced conditions, the CVP must release flow from upstream reservoirs to provide adequate flows to meet in-Delta water supply needs and standards for water quality and flow (see footnote 2, above). Because the changes in Delta outflow associated with the potential water transfers are insubstantial and occur only during wetter conditions, the Proposed Action's incremental contribution to potentially significant cumulative salinity impacts in the Delta would not be cumulatively considerable.

9.118

Again, SLDMWA relies on conclusory assertions regarding the significance of an increase or decrease, when the precarious state of the Delta demands an analysis of the environmental impacts. The RDEIR/SDEIS must be revised to explain the actual effect of this change.

RDEIR/SDEIS Appendix J assessed five possible scenarios posed by climate change, as well as a "No Climate Change" scenario. Appendix J at J-7 to J-9. These scenarios resulted in a wide range of run-off volumes for the Sacramento and San Joaquin river systems. Appendix J, Figures J-4 and J-5, at J-12. The scenarios differ not only in run-off volumes, but also in timing. J-15 to J-16. However, RDEIR/SDEIS/S 3.2.4 Cumulative Impacts section fails to include any analysis of impacts from climate change on net delta outflow, despite the significant possible changes in outflow identified in Appendix J. The scenarios contemplated in RDEIR/SDEIS/S 3.2.4 Table 3.2-1 do not include the scenarios detailed in Appendix J. The Project will thus exacerbate the impacts caused by climate change. As detailed in Appendix J, outflows can impact seller and buyer behavior, which in turn could exacerbate the changed runoff patterns caused by climate change. *See e.g.*, Appendix J Figure J-22, at J-28 ("Results summarized in Table J-5 show climate change may create considerable variability in the annual average volume of transfers that may occur"); *see also*, Appendix J Table J-5, at J-29. 9.119

B. Sites Reservoir

The Sites Reservoir project would consist of a 1.2 to 1.8 million acre-foot reservoir created by two large dams on Stone Corral Creek and Funks Creek. Water to fill the Sites Reservoir would be diverted from the Sacramento River and pumped into the reservoir. Some water to fill Sites could also be diverted from the Colusa Drain. Sites could produce an estimated annual yield of 236 to 428 thousand acre-feet of water, depending on various diversion scenarios and constraints. How this water could be part of the Project, operated in conjunction with the Project, and how it would impact the Project are not disclosed or analyzed, failing CEQA's mandate that an assessment of the project's incremental effects must be "viewed in connection with the effects of past projects, the 9.120

effects of other current projects, and the effects of probable future projects." (CEQA Guidelines § 15065(a)(3).) "[A] cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines § 15065(a)(3).)

The SVWMA NOI/NOP, mentioned above in II. B., specifically discloses the Sites Reservoir project.[50] "Role of Sites Reservoir. The Parties recognize that new off-stream surface storage is an essential part of the long-term water management program, and agree that Sites Reservoir is a potentially significant off-stream surface-water storage project that could help meet the goals and objectives of this Agreement, including providing capacity to increase the reliability of water supplies for Upstream and Export Water Users, flexibility during critical fish migration periods on the Sacramento River, and storage benefits for other CALFED programs. Work being undertaken pursuant to CALFED's Sites MOU will be integrated into this Agreement and the Parties will work with CALFED to accelerate feasibility studies and completion of appropriate environmental and permitting processes for the reservoir."[51] 9.121

C. Recently Past, Current, and Future Transfers are Not Disclosed.

As mentioned above in the Hydrology section, the RDEIR/SDEIS failed to present significant past transfer records. Therefore, the public is deprived of knowledge or connection to recent periods of groundwater substitution transfer pumping and other groundwater impacting events, such as recent changes in groundwater elevations and groundwater storage, and the reduced recharge due to the recent periods of drought. Below is a list of transfers from the recent past that at a minimum should have been considered in the RDEIR/SDEIS .

1. <u>North-to-South Transfers</u>

The RDEIR/SDEIS fails to illustrate the early history of water transfers and to provide more current information. Here are significant context and history that should be presented in another CEQA/NEPA document.

- 1991. WY – Critical. Reported transfers amounted to 820,000 af.
- 1992. WY – Critical. Reported transfers amounted to 193,000 af. (Id.)
- 1993. WY – Above Normal. No transfers appear to have occurred. (Id.)
- 1994. WY – Critical. Reported transfers amounted to 220,000 af. (Id.) 9.122
- 2002. WY - Dry. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Reported transfers amounted to 172,000 af.
- 2003. WY - Above Normal. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Reported transfers amounted to 206,000 af. (*Id.*)
- 2004. WY - Below Normal. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Reported transfers amounted to 120,500 af. (*Id.*)
- 2005. WY – Above Normal. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Reported transfers amounted to 5 af. (*Id.)*
- 2006. WY – Wet. Settlement Contractors in the Sacramento Valley received 100% of their allocation. No transfers were reported. (*Id.)*

[50] 2001. The Sacramento Valley Water Management Agreement. pp. 8, 12, etc.
[51] *(Id.)* p. 12.

- 2007. WY – Dry. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Reported transfers amounted to 147,000 af. *(Id.)*
- 2008. WY - Critical. Settlement Contractors in the Sacramento Valley received 100% of their allocation. GCID alone planned an 85,000 af transfer[52] of an expected cumulative total from the Sacramento Valley of 360,000 af.[53] Another source revealed that the actual transfers for that year were 233,000 af.[54]
- 2009. WY – Dry. Reclamation approved a one-year water transfer program under which a number of transfers were made. Settlement Contractors in the Sacramento Valley received 100% of their allocation. Regarding NEPA, Reclamation issued a FONSI based on an EA. DWR opined that, "As the EWA's exclusive mechanism in 2009 for securing replacement water for curtailed operations through transfers, the DWB is limited to the maximum 600,000 acre feet analyzed in the EIS/EIR for the program." Reported transfers amounted to 274,000 af.
- 2010-2011. WY Below Normal, Wet. Reclamation approved a two-year water transfer program. No actual transfers were made under this approval. Regarding NEPA, Reclamation again issued a FONSI based on an EA. Settlement contractors in the Sacramento Valley received 100% of their allocation for both years. The 2010-2011 Water Transfer Program sought approval for 200,000 AF of CVP related water transfers and suggested there would be a cumulative total of 395,910 af of CVP and non-CVP water. Reclamation asserted that no actual transfers were made under the 2010/2011 Water Transfer Program, however, a Western Canal Water District Negative Declaration declared that 303.000 af were transferred from the Sacramento Valley and through the Delta in 2010.[55] 9.122 Cont.
- 2012. WY – BN. Settlement contractors in the Sacramento Valley received 100% of their allocation. Reclamation planned 2012 water transfers of 76,000 AF of CVP water all through groundwater substitution, but it is unclear if CVP transfers occurred. SWP contractors and the Yuba County Water Agency ("YCWA") did transfer water and the cumulative total transferred is stated to be 190,000 af.[56]
- 2013. WY – Dry. Settlement contractors in the Sacramento Valley received 100% of their allocation. Reclamation approved a 1-year water transfer program, again issuing a FONSI based on an EA. The EA incorporated by reference the environmental analysis in the 2010-2011 EA. The *2013 Water Transfer Program* proposed the direct extraction of up to 37,505 AF of groundwater (pp. 8, 9, 11, 28, 29, 35), the indirect extraction of 92,806 AF of groundwater (p. 31), and the cumulative total of 190,906 (p. 29).[57] Reported transfers amounted to 210,000 af.[58]

---

[52] GCID, 2008. Initial Study and Proposed Negative Declaration for *Option Agreement Between Glenn-Colusa Irrigation District, San Luis & Delta-Mendota Water Authority and the United States Bureau of Reclamation for 2008 Operations, and Related Forbearance Program.*

[53] USBR, 2008. Draft Environmental Assessment for the *Option Agreement Between Glenn-Colusa Irrigation District, Bureau of Reclamation, and the San Luis & Delta-Mendota Water Authority for 2008 Operations.* (pp. 4 and 17)

[54] Western Canal Water District, 2015. *Initial Study and Proposed Negative Declaration for Western Canal Water District 2015 Water Transfer Program.* (p. 21)

[55] Western Canal Water District, 2012. *Initial Study and Proposed Negative Declaration for Western Canal Water District 2012 Water Transfer Program.* (p. 25)

[56] Western Canal Water District, 2015. *Initial Study and Proposed Negative Declaration for Western Canal Water District 2015 Water Transfer Program.* (p. 21)

[57] USBR, 2013. Draft Environmental Assessment and Findings of No Significant Impact for the *2013 Water Transfers.* (p. 29)

[58] Western Canal Water District, 2015. *Initial Study and Proposed Negative Declaration for Western Canal Water*

- 2014. WY - Critical. Federal Settlement Contractors in the Sacramento Valley received 75% and State Settlement Contractors received 100% of their allocations. Total maximum proposed north-to-south transfers were 378,733 af and total maximum proposed north-to-north transfers were 295,924 af.[59] Reported north-to-south transfers amounted to 198,000 af.[60]
- 2015. WY – Critical. SLDMWA purchased 164,153 acre-feet, and East Bay Municipal Utility District 18 purchased 13,268 acre-feet.[61]
- 2018-2022. Western Canal Water District and Richvale Irrigation District Water may transfer up to 60,000 af per year to south of the Delta though fallowing.[62]

9.122 Cont.

2. Additional Water Transfer Plans and Programs

Reclamation's *Sacramento Valley Regional Water Management Plan (2006)* (SVRWMP) and the forbearance water transfer program that the Bureau and DWR facilitate jointly. As noted above, the Programmatic EIS for the 2002 Sacramento Valley Water Management Agreement or Phase 8 Settlement was initiated, but never completed, so the SVRWMP was the next federal product moving the Phase 8 Settlement forward. The purported purpose of the Phase 8 Settlement and the SVRWMP were to improve water quality standards in the Bay-Delta and local, regional, and statewide water supply reliability. In the 2008 forbearance program, 160,000 af was proposed for transfer to points south of the Delta. To illustrate the ongoing significance of the demand on Sacramento Valley water, we understand that GCID alone entered into "forbearance agreements" to provide 65,000 af of water to the San Luis and Delta Mendota Water Authority in 2008, 80,000 af to State Water Project contractors in 2005, and 60,000 af to the Metropolitan Water District of Southern California in 2003.

The Bureau, its contractors, and its partner DWR are party to numerous current and reasonably foreseeable water programs that are related to the water transfers contemplated in the RDEIR/SDEIS including, but not limited to, the following: 9.123

- Sacramento Valley Integrated Regional Water Management Plan (2006)
- Sacramento Valley Regional Water Management Plan (January 2006)
- Stony Creek Fan Conjunctive Water Management Program
- Sacramento Valley Water Management Agreement (Phase 8, October 2001)
- Draft Initial Study for 2008-2009 Glenn-Colusa Irrigation District Landowner Groundwater Well Program
- Regional Integration of the Lower Tuscan Groundwater Formation into the Sacramento Valley Surface Water System Through Conjunctive Water Management (June 2005) (funded by the Bureau)
- Stony Creek Fan Aquifer Performance Testing Plan for 2008-09
- Annual forbearance agreements (2008 had an estimated 160,000 acre feet proposed).

District 2015 Water Transfer Program. (p. 21)

[59] AquAlliance, 2014. *2014 Sacramento Valley Water Transfers.* (Data from: 1) USBR, 2014 EA for *2014 Tehama-Colusa Canal Authority Water Transfers*; 2) USBR and SLDMWA, 2014. EA/Negative Declaration, *2014 San Luis & Delta Mendota Water Authority Transfers.*)

[60] Western Canal Water District, 2015. *Initial Study and Proposed Negative Declaration for Western Canal Water District 2015 Water Transfer Program.* (p. 21)

[61] USBR/SLDMWA 2018. *Long-Term Water Transfers* RDEIR/SDEIS . p. 1-4.

[62] Western Canal/Richvale ID, 2018. *Western Canal Water District and Richvale Irrigation District Water Transfers from 2018 to 2022 Environmental Impact Report, Final.* p. 2-1.

These closely related impacts must be assessed in a cumulative impact context. CEQA Guidelines, §§ §15065(a)(3), 15130(b)(1)(A), 15355(b).

3. South-of-Delta Transfers

There are numerous south-of-delta transfers to some of the same buyers that are not disclosed or discussed cumulatively. There are most assuredly many more that the Lead Agencies must disclose and consider.

9.124

a) *West Side farmers to benefit from water agreement*

Apr 05, 2013 | Patterson Irrigator

In the face of major cuts to their water supply, West Side farmers received good news this week after two irrigation districts agreed to sell Stanislaus River water that will be available to many local farm water districts.

Oakdale Irrigation District's board of directors agreed Tuesday, April 2, to sell up to 40,000 acre-feet of river water to the San Luis and Delta-Mendota Water Authority and the state Department of Water Resources. South San Joaquin Irrigation District's board agreed to sell the same amount to those agencies on March 26.

The agreement will aid the water authority's 29 agencies in the western San Joaquin Valley and San Benito and Santa Clara counties, including most irrigation districts on the West Side. The extra water comes during a critically dry year when West Side farmers have only been allowed to draw up to 20 percent of their full federal Central Valley Project water allotments from the Delta-Mendota Canal. Exhibit M.

b) J.G. Boswell sold 14,000 af to Westlands WD, which paid $28, 011,916.51 for "water purchases." Exhibits N and O.

c) Change in Point of Use 2016

"Notes: There was a revision due to an increase of the total CPOU amount from 305,820 af to 307,900 af. The 305,820 af was the amount submitted to SWRCB on March 28, 2016. The 307,900 af was the final amount approved by the SWRCB on July 21,2016." Exhibit P.

d) *Reclamation released draft environmental documents for Harris Farms and Shows Family Farms multi-year banking and transfer program*

FRESNO, Calif. – The Bureau of Reclamation has released for public review the Draft Environmental Assessment and Draft Finding of No Significant Impact for the proposed approval of annual transfers of up to 15,000 acre-feet per year of available Central Valley Project water supplies over a nine-year period.

Central Valley Project contractors would transfer water to Harris Farms and Shows Family Farms either for direct agricultural use on their lands located within Westlands Water District, San Luis Water District, and Semitropic Water Storage District, or for banking in Semitropic and/or the Kern Water Bank for later use on their lands within those same districts. 9.124 Cont.

The documents are available at https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=32081.

D. Yuba River Transfers

The Yuba River is the major tributary to the Feather River. The RDEIR/SDEIS lists the Yuba River Accord in the following cumulative impacts sections: Fisheries, Water Quality, and Vegetation and Wildlife. The Yuba Accord is defined in the RDEIR/SDEIS : "The set of agreements of the Lower Yuba River Accord is designed to provide additional water to meet fisheries needs in the lower Yuba River. In addition, up to 60,000 acre-feet of water per year would be made available for purchase by Reclamation and DWR for fish and environmental purposes. The Proposed Action would not affect the ability of the Accord to provide a benefit to environmental resources within its action area. Both efforts combined, however, could affect Delta exports." p. 3-1. 9.125

From this definition, a reader would conclude that the only transfers from the Yuba River are for fish and the environment. Conspicuously missing are additional transfer agreements/plans. For example, the relationship between the federal and state agencies seeking or facilitating transfer water is illuminated in a 2013 Environmental Assessment. "The Lower Yuba River Accord (Yuba Accord) provides supplemental dry year water supplies to state and Federal water contractors under a Water Purchase Agreement between the Yuba County Water Agency and the California Department of Water Resources (DWR). Subsequent to the execution of the Yuba Accord Water Purchase Agreement, DWR and The San Luis & Delta- Mendota Water Authority (Authority) entered into an agreement for the supply and conveyance of Yuba Accord water, to benefit nine of the Authority's member districts (Member Districts) that are SOD [south of Delta] CVP water service contractors." [63]

Also absent in the SDEIS/REDIR is clarity found in a Bureau Fact Sheet regarding DWR's involvement and some numerical context to the Yuba Accord by stating, "Under the Lower Yuba River Accord, up to 70,000 acre-feet can be purchased by SLDMWA members annually from DWR. This water must be conveyed through the federal and/or state pumping plants in coordination with Reclamation and DWR. Because of conveyance losses, the amount of Yuba Accord water delivered to SLDMWA members is reduced by approximately 25 percent to approximately 52,500 acre-feet. Although Reclamation is not a signatory to the Yuba Accord, water conveyed to CVP contractors is treated as if it were Project water." [64] 9.126

Additionally, cumulative impacts from the Project and the YCWA Long-Term Transfer Program from 2008 - 2025 are not disclosed or considered. The Yuba County Water Agency ("YCWA") may transfer up to 200,000 under Corrected Order WR 2008-0014 for Long-Term Transfer and, "In any year, up to 120,000 af of the potential 200,000 af transfer total may consist of groundwater 9.127

[63] Bureau of Reclamation, 2013. Storage, Conveyance, or Exchange of Yuba Accord Water in Federal Facilities for South of Delta Central Valley Project Contractors.
[64] Bureau of Reclamation, 2013. Central Valley Project (CVP) Water Transfer Program Fact Sheet.

substitution. (YCWA-1, Appendix B, p. B-97.)." [65] How the Project and the total of Yuba River transfers could simultaneously have a very significant impact on the environment and economy of the watersheds and counties of origin as well as the Delta is not any part of the Project's RDEIR/SDEIS .

Also not available in the RDEIR/SDEIS is disclosure of any controversial issues associated with the Yuba River transfers that have usually been touted as a model of success. The Yuba County Water Agency ("YCWA") transfers have encountered troubling trends for over a decade that, according to the draft Environmental Water Account's EIS/EIR, were mitigated by deepening domestic wells (2003 p. 6-81). While digging deeper wells is at least a response to an impact, it hardly serves as a proactive measure to avoid impacts. Additional information finds that it may take 3-4 years to recover from groundwater substitution in the south sub-basin[66] although YCWA's own analysis fails to determine how much river water is sacrificed to achieve the multi-year recharge rate. None of this is found in the Project's RDEIR/SDEIS . What was found in the *2015-2024 Long-Term Water Transfer Program*'s environmental review is that even the inadequate SACFEM2013 modeling reveals that it could take more than six years in the Cordua ID area to recover from multi-year transfer events, although recovery was not defined (pp, 3.3-69 to 3.3-70). This is a very significant impact that is not addressed cumulatively here. 9.128

In addition,

- "Past and current projects, including SWP transfers, refuge transfers, and the Yuba Accord, have affected Delta outflows and degraded water quality in the Delta. These effects on Delta outflow would generally be insubstantial but would be increasing outflow during dry periods of the year." p. 3.2-1. This conclusory assertion that "effects on Delta outflow would generally be insubstantial" is completely uncertain, undefined, and provides no meaningful information to the public.
- "The projects considered for the vegetation and wildlife cumulative condition are the SWP water transfers, CVP Municipal and Industrial Water Shortage Policy (WSP), Lower Yuba River Accord, refuge transfers, San Joaquin River Restoration Program (SJRRP), and Exchange Contractors 25-Year Water Transfers, described in more detail Chapter 4 of the 2014 Draft EIS/EIR. SWP transfers could involve groundwater substitution pumping in the Seller Service 2 Area and, therefore, could affect vegetation and wildlife resources." pp. 3.8-40 to 3.8-41. 9.129

If the Project is not withdrawn, the Yuba Accord and other Yuba River water transfers' cumulative impacts must be analyzed and presented to the public in a revised and recirculated draft NEPA/CEQA document.

E. WaterFix and Interrelated Projects/Actions

If the WaterFix is built as planned with the capacity to take from 9,000 to 15,000 cubic feet per second ("cfs") from the Sacramento River, the Twin Tunnels will have the capacity to drain between 38% - 63% of the Sacramento River's average annual flow of 23,490 cfs at Freeport[67] 9.130

[65] State Water Resources Control Board, 2008. ORDER WR 2008 - 0025

[66] 2012. *The Yuba Accord, GW Substitutions and the Yuba Basin*. Presentation to the Accord Technical Committee. (pp. 21, 22).

[67] USGS 2009. http://wdr.water.usgs.gov/wy2009/pdfs/11447650.2009.pdf

(north of the planned WaterFix). As proposed, the WaterFix will also increase water transfers when the infrastructure for the Project has capacity:

> "Alternative 4 provides a separate cross-Delta facility with additional capacity to move transfer water from areas upstream of the Delta to export service areas and provides a longer transfer window than allowed under current regulatory constraints. In addition, the facility provides conveyance that would not be restricted by Delta reverse flow concerns or south Delta water level concerns. As a result of avoiding those restrictions, transfer water could be moved at any time of the year that capacity exists in the combined cross-Delta channels, the new cross-Delta facility, and the export pumps, depending on operational and regulatory constraints, including BDCP permit terms as discussed in Alternative 1A."[68]

9.130 Cont.

Here, the Project's RDEIR/SDEIS fails to present any of this information, obscuring analysis of significant cumulative impacts.

1. SWP Contract Extensions

DWR's efforts to facilitate and finance the massive and costly Delta tunnels project known as California WaterFix resulted in three separate SWP Contract Extension environmental review documents over protest:

9.131

- DWR approved the California WaterFix project on July 21, 2017 based on its certification of the Final BDCP/WaterFix CEQA document. DWR's WaterFix decision-making, and a project order relating to WaterFix (Project Order No. 40) filed the same day without any environmental review, failed to confront the WaterFix project's lack of legal and contractual authority for WaterFix revenue bonds, particularly in the absence of specific changes to timing and facilities limitations in the existing the existing SWP contracts that would otherwise preclude eligibility. Reclamation has yet to complete its NEPA process for the BDCP/WaterFix EIS.
- DWR approved the Water Supply Contract Extension Project on December 11, 2018, based on a Final EIR for that project DWR certified on November 13, 2018. DWR's decision and certification treated California WaterFix as a "separate, independent project" having independent utility in addressing debt compression problems under the long-term water supply contracts (Contract Extension Final EIR, 2-9). However, DWR's review failed to address testimony, analyses and comments during 2018—some from DWR itself, or from other state reviewers—that demolished the foundation for this assumption of independence from WaterFix. They also demonstrated that the misnamed "extension" amendments proposed risky redefinition of contractual terms that would remove certain specific obstacles to imposing revenue bond debt for WaterFix in current SWP contracts. 9.132
- The third of three segmented EIRs addressing DWR's intertwined efforts to facilitate and finance the massive and costly Delta tunnels project presents the *State Water Project Water Supply Contract Amendments for Water Management and California WaterFix* project. The comment period closed on January 9, 2019. The proposed contract amendments would increase water transfers and exchanges with the SWP. 9.133

[68] Bay Delta Conservation Plan/WaterFix 2016. FEIS/EIR p. 5-112.

The Project's RDEIR/SDEIS fails to present any of this information, obscuring analysis of significant cumulative impacts.

F. Bay-Delta Water Quality Control Plan

DWR and the California Department of Fish and Wildlife are facilitating possible "Voluntary Agreements" in the hope of avoiding SWRCB action that would require flow criteria for the Sacramento River, Feather River, Yuba River, American River, Mokelumne River, Tuolumne River, Friant Division of the Central Valley Project, and Delta. The stated voluntary effort seeks to "[t]o integrate flow and non-flow measures to establish water quality conditions that support (1) the viability of native fishes in the Bay-Delta watershed, and (2) the achievement of related objectives in the Bay-Delta Plan, as amended."[69] "The SRSCs propose that during above normal, below normal and dry years, which cumulatively total about 58% of all years according the Sacramento Valley 8-station index, they would make available 100,000 acre-feet through land fallowing/crop shifting (or limited groundwater substitution) within their service areas."[70] 9.134

G. State Water Project Water Supply Contract Amendments for Water Management and California WaterFix

"DWR and the PWAs have agreed to enter into the process for amending the Contracts to confirm and supplement certain provisions for several water management actions, including transfers and exchanges, and to address changes in financial provisions related to the costs of California WaterFix." 9.135

H. Species

There is a clear history of formal consultation and commitments that are not considered here. There must be cumulative disclosure and analysis of impacts to the giant garter snake from recently past, current, and future transfer, infrastructure, and agricultural projects. A particular failure for cumulative analysis and attempts at recovery are revealed in the 2015 GGS Biological Opinion, which acknowledged that the USFWS consulted eight times formally or informally with Reclamation since 2000. "The Service has consulted with Reclamation, both informally and formally, eight times since 2000 on various forbearance agreements and proposed water transfers for which water is made available in the Sacramento Valley by fallowing rice (and other crops), substituting other crops for rice, or substituting groundwater for surface supplies. Although transfers of this nature were anticipated in our 2004 biological opinion on the Environmental Water Account (EWA; Service Pile 03-F-0321), that program expired in 2007 and, to our knowledge, no water was ever made available to EWA from rice fallowing or rice crop substitution."[71] The 2015 BO was designated a "programmatic" document albeit with less stringent requirements than past annual transfer BOs. Naming a BO as programmatic does not make so. As the Lead Agencies are aware, the 2015 BO and the amended BO were vacated through *AquAlliance v. United States Bureau of Reclamation* (E.D.Cal. 2018) 312 F. Supp. 3d 878, 880. 5 U.S.C. § 706(2)(A). 9.136

---

[69] Mancebo, Gene, et al., 2019. Cover Letter for the *Planning Agreement Proposing Project Description and Procedures for the Finalization of the Voluntary Agreements to Update and Implement the Bay-Delta Water Quality Control Plan*. p. 1.

[70] Nemeth, Karla A. and Charlton H. Bonham, 2019. *Planning Agreement Proposing Project Description and Procedures for the Finalization of the Voluntary Agreements to Update and Implement the Bay-Delta Water Quality Control Plan*. p. 1.
Appendices A1-A10. p. A-6.

I. Other Projects

Additional projects with cumulative impacts upon groundwater and surface water resources affected by the proposed project: 9.137

1. The DWR Dry Year Purchase Agreement for Yuba County Water Agency water transfers from 2015-2025 to SLDMWA.[72]
2. Installation of numerous production wells by Project water districts that sell water, many with the use of public funds such as Butte Water District,[73] GCID, Anderson Cottonwood Irrigation District,[74] RD108, and Yuba County Water Authority, [75] among others.

X. <u>RDEIR/SDEIS Fails to Evaluate Reasonable Range of Alternatives</u>

The RDEIS/SDEIS fails to evaluate a reasonable range of alternatives, instead relying wholly upon the alternatives evaluated in 2014. By relying on alternatives from a vacated environmental document, the Lead Agencies fail to take into account any and all new analysis and information in the revised/supplemental EIR/S, including the revised project description, and changed regulatory settings, to determine whether its range of alternatives is reasonable, and whether any alternatives would reduce or avoid significant or potentially significant project effects.

The RDEIS/SDEIR is required to evaluate and implement feasible project alternatives that would lessen or avoid the project's potentially significant impacts. Pub. Resources Code §§ 21002, 21002.1(a), 21100(b)(4), 21150; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564. This is true even if the EIS/EIR purports to reduce or avoid any or all environmental impacts to less than significant levels. *Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376. Alternatives that lessen the project's environmental impacts must be considered even if they do not meet all project objectives. CEQA Guidelines § 15126.6(a)-(b); *Habitat & Watershed Caretakers v City of Santa Cruz* (2013) 213 Cal.App.4th 1277, 1302; *Center for Biological Diversity v. County of San Bernardino* (2010) 185 Cal.App.4th 866. Further, the EIS/EIR must contain an accurate no-project alternative against which to consider the project's impacts. CEQA Guidelines § 15126.6(e)(1); *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477. 9.138

Under NEPA, the alternatives analysis constitutes "the heart of the environmental impact statement" (40 C.F.R. § 1502.14). The agency must "rigorously explore and objectively evaluate all reasonable alternatives" (40 C.F.R. § 1502.14(a), 40 C.F.R. § 1502.14(b)), and to identify the preferred alternative (40 C.F.R. § 1502.14(e)). The agency must consider the no action alternative, other reasonable courses of action, and mitigation measures that are not an element of the proposed action (40 C.F.R. § 1508.25(b)(1)-(3)).

---

[72] SLDMWA Resolution # 2014 386
http://www.sldmwa.org/OHTDocs/pdf_documents/Meetings/Board/Prepacket/2014_1106_Board_PrePacket.pdf

[73] Prop 13. Ground water storage program: 2003-2004 Develop two production wells and a monitoring program to track changes in ground.

[74] "The ACID Groundwater Production Element Project includes the installation of two groundwater wells to supplement existing district surface water and groundwater supplies."
http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=8081

[75] Prop 13. Ground water storage program 2000-2001: Install eight wells in the Yuba-South Basin to improve water supply reliability for in-basin needs and provide greater flexibility in the operation of the surface water management facilities. $1,500,00;

A. Feasible Alternatives to Lessen Project Impacts are Excluded

Alternatives must feasibly meet most of the project objectives. Here, the objectives for long-term water transfers through 2024 are twofold: (1) "Develop supplemental water supply for member agencies during times of CVP shortages to meet existing demands," and (2) "Meet the need of member agencies for a water supply that is immediately implementable and flexible and can respond to changes in hydrologic conditions and CVP allocations." RDEIR/SDEIS 1.2. Moreover, "Because shortages in water supplies are expected due to hydrologic conditions, climatic variability, and regulatory requirements, transfers are needed to meet water demands." RDEIR/SDEIS/S 1-2. 9.139

However, given the changed circumstances, including better climate data, and changed project description and demands, new alternatives should be considered. For example, as discussed above, the RDEIR/SDEIS analyzes only a 250,000 acre-feet limit, or about 49% of the amount analyzed in the 2014 Draft EIS/EIR, yet no additional alternatives have been presented to account for such a major change. See RDEIR/SDEIS at 1-4.

The summary discussion of alternatives is highly skewed and misleading. First, the RDEIR/SDEIS omits co-equal informational disclosure of the no project alternative, since "the analysis did not identify changes from existing conditions." p. ES-8. Second, the RDEIR/SDEIS states that 9.140 "Cropland idling could include a variety of crops but idling in upland areas would be within the historic range of Long-Term Water Transfers Revised Draft EIR/Supplemental Draft EIS variation and would have less than significant effects on natural communities and special-status 1 species." p. ES-9-ES-10. This is simply unintelligible as written.

In light of the oversubscribed water rights system of allocation in California, changing climate conditions, and severely imperiled ecological conditions throughout the Delta, the EIS/EIR should 9.141 consider additional project alternatives to lessen the strain on water resources. Alternatives not considered in the EIS/EIR that promote improved water usage and conservation include:

Fallowing in the area of demand. The EIS/EIR proposes fallowing in the area of origin to supply water for the transfers yet fails to present the obvious alternative that would fallow land south of the Delta that holds junior, not senior, water rights. This would qualify as an, "immediately 9.142 implementable and flexible" alternative that is part of the Purpose and Need section. Whether or not this is a preference for the buyers, this is a pragmatic alternative that should be fully explored in a recirculated EIS/EIR.

Crop shifting in the area of demand. The EIS/EIR proposes crop shifting in the area of origin to supply water for the transfers yet fails to present the obvious alternative that would shift crops south of the Delta for land that holds junior, not senior, water rights. Hardening demand by planting perennial crops (or houses) must be viewed as a business decision with its inherent risks, not a 9.143 reason to dewater already stressed hydrologic systems in the Sacramento Valley. This would qualify as an, "immediately implementable and flexible" alternative that is part of the Purpose and Need section. Whether or not this is a preference for the buyers, this is a pragmatic alternative that should be fully explored in a recirculated EIS/EIR.

Mandatory conservation in urban areas. In the third year of a drought, an example of urban areas failing to require serious conservation is EBMUD's flyer from October's bills that reflects the weak 9.144 mandates from the SWRCB.

- Limit watering of outdoor landscapes to two times per week maximum and prevent excess runoff.
- Use only hoses with shutoff nozzles to wash vehicles.
- Use a broom or air blower, not water, to clean hard surfaces such as driveways and sidewalks, except as needed for health and safety purposes.
- Turn off any fountain or decorative water feature unless the water is recirculated.

9.144 Cont.

While it is laudable that EBMUD customers have cut water use by 20 percent over the last decade, before additional water is ever transferred from the Sacramento River watershed to urban areas, mandatory usage cuts must be enacted during statewide droughts. This would qualify as an, "immediately implementable and flexible" alternative that is part of the Purpose and Need section. This alternative should be fully vetted in a recirculated EIS/EIR.

Land retirement in the area of demand. Compounding the insanity of growing perennial crops in a desert is the resulting excess contamination of 1 million acres of irrigated land in the San Joaquin Valley and the Tulare Lake Basin that are tainted with salts and trace metals like selenium, boron, arsenic, and mercury. This water drains back—after leaching from these soils the salts and trace metals—into sloughs and wetlands and the San Joaquin River, carrying along these pollutants. Retirement of these lands from irrigation usage would stop wasteful use of precious fresh water resources and help stem further bioaccumulation of these toxins that have settled in the sediments of these water bodies. The Lead and Approving Agencies have known about this massive pollution of soil and water in the area of demand for over three decades. Accelerating land retirement could diminish south of Delta exports and provide water for non-polluting buyers. Whether or not this is a preference for all of the buyers, this is a pragmatic alternative that should be fully explored in a recirculated EIS/EIR. 9.145

Adherence to California's water rights. As mentioned above, the claims to water in the Central Valley far exceed hydrologic realty by more than five times. Unless senior water rights holders wish to abandon or sell their rights, junior claimants must live within the hydrologic systems of their watersheds. This would qualify as an, "immediately implementable and flexible" alternative that is part of the Purpose and Need section. Whether or not this is a preference for the buyers, this is a pragmatic alternative that should be fully explored in a recirculated EIS/EIR. 9.146

Given the significantly revised project description, as well as the significantly changed existing environmental conditions, the EIS/EIR must consider these and other potentially feasible alternatives that would lessen the project's adverse environmental effects. 9.147

B. No Environmentally Superior Alternative is Identified.

The RDEIS/SDEIR fails to follow the law and significantly misleads the public and agency decision-makers in declaring that none of the proposed alternatives are environmentally superior. (p. 2-29.) Neither CEQA nor NEPA provide the lead agencies with discretion to sidestep this determination. As the Council on Environmental Quality (CEQ) has explained, "[t]hrough the identification of the environmentally preferable alternative, the decision maker is clearly faced with a choice between that alternative and the others, and must consider whether the decision accords with the Congressionally declared polices of the Act."[76] CEQA provides that "[i]f the 9.148

[76] Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 48 Fed. Reg. 18,026 (Mar.16, 1981) Questions 6a.

environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." (CEQA Guidelines § 15126.6(e)(2).)

First, the RDEIR/SDEIS fails to identify whether the "no project" alternative is environmentally superior to each other alternative. If that is the case, the RDEIR/SDEIS must then identify the next most environmentally protective or beneficial alternative. Here, the RDEIR/SDEIS presents evidence that Alternative 3 and Alternative 4 each would lessen the environmental impacts of the proposed project (p. 2-19). The RDEIR/SDEIS however then shirks its responsibility to identify the environmentally superior alternative by casting the benefits of Alternatives 3 and 4 as mere "trade-offs." This gross mischaracterization misleads the public and agency decision-makers, as the only "trade-off" between the proposed alternative and Alternatives 3 or 4 would be more or less adverse environmental effect. 9.149

The RDEIR/SDEIS argument that its conclusion that no project impacts are significant and unavoidable misses the point. Just as an EIS/EIR may not simply omit any alternatives analysis when there is purported to be no significant and unavoidable impact, neither can the agencies decline to identify the environmentally superior alternative. In fact, the proposed project would cause numerous significant and adverse environmental effects, and the RDEIR/SDEIS relies on wholly deferred and inadequate mitigation measures to lessen those effects, even allowing some level of significant impacts to occur before kicking in. But mitigation measures alone are not the only way to lessen or avoid significant project effects: the alternatives analysis performs the same function, and should be considered irrespective of the mitigation measures proposed. It is prejudicial error for the Lead Agencies to fail to identify an environmentally superior alternative, and deprives the public and decision-makers with information necessary to sound environmental decision-making. 9.150

XI. Additional Comments and Questions

A. Reduced Reliance on Water From the Delta

Water Code Section 85021 requires that all regions of California reduce their dependence on water imported from the Delta: "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts." How will the proposed Project adhere to this requirement? 9.151

Impacts of water transfers on buyer water quality must be evaluated

Surface water quality in potential buyer's areas is often poor and compromised by salts and irrigation runoff. For example, selenium runoff in the Westlands Water District is a well-known and serious issue, which threatens birds and other wildlife. *See* https://psmag.com/environment/cleaning-up-californias-three-decades-old-water-problem. A baseline analysis of buyer's water quality must account for up-to-date information on contaminants. Moreover, the additional environmental impacts of runoff caused by the Project must be evaluated for all potential buyers. 9.152

XII. Conclusion

The Lead Agencies careless treatment of the serious issues enumerated above leave the RDEIR/SDEIS woefully inadequate. In so doing, this deprives decision makers and the public of their ability to evaluate the potential environmental effects of this Project and violates the full-disclosure purposes and methods of CEQA. For each of the foregoing reasons, we urge the Lead Agencies to withdraw the environmental review document for this Project. If Reclamation and SLDMWA chose to move forward, they must substantially revise and recirculate another CEQA/NEPA document for public and agency review and comment. 9.153

The AquAlliance coalition respectfully requests notification of any meetings or actions that address the Project.

Sincerely,

Barbara Vlamis
Executive Director
AquAlliance
P.O. Box 4024
Chico, CA 95927
(530) 895-9420

Bill Jennings, Chairman
California Sportfishing
Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204
(209) 464-5067
deltakeep@me.com

Carolee Krieger, President
California Water Impact
Network
808 Romero Canyon Road
Santa Barbara, CA 93108
(805) 969-0824
caroleekrieger@cox.net

Jason Flanders
Aqua Terra Aeris Law Group

March 16, 2019

To: Barbara Vlamis
Executive Director
AquAlliance
P.O. Box 4024
Chico, CA 95927

From: Kit H. Custis
CA PG 3942, CEG 1219, CHG 254
P.O. Box 337
Fair Oaks, CA 95628

RE: Comments on the U.S. Bureau of Reclamation and San Luis & Delta-Mendota Water Authority Revised Draft Environmental Impact Report and Supplemental Draft Environmental Impact Statement for Long-Term Water Transfers, December 2018

This letter provides comments and recommendations on the information in the December 2018 U.S. Bureau of Reclamation [BoR] and San Luis and Delta-Mendota Water Authority [SLDMWA] Revised Draft Environmental Impact Report and Supplemental Draft Environmental Impact Statement for Long-Term Water Transfers of water from the Sacramento Valley (2018 RDEIR/SDEIS).

This document evaluates the potential impacts over a 6-year period, 2019 through 2024, of transferring Central Valley Project (CVP) and non-CVP water from north of the Sacramento-San Joaquin Delta (Delta) to CVP contractors south of the Delta. These transfers require the use of 9.154
CVP and State Water Project (SWP) facilities. The 2018 RDEIR/SDEIS evaluated impacts of alternatives for water transfers made available through groundwater substitution, cropland idling, crop shifting, reservoir release, and conservation. The combined upper limit for transfers by all methods in any one year would be 250,000 acre-feet with up to 60,693 acres of cropland idled (pages ES-8 and ES-9, Alternatives 2, 3 or 4).

In 2014, BoR and SLDMWA prepared a joint Draft Long-Term Water Transfer EIS/EIR (2014 Draft EIS/EIR) for water transfers from sellers north to buyers south of Sacramento River Delta and issued a Final Long-Term Water Transfer EIS/EIR in March 2015 (2015 Final EIS/EIR). The 2014 Draft EIS/EIR and 2015 Final EIS/EIR were challenged in United States District Court 35 for the Eastern District of California in the case *AquAlliance, et al., v. U.S. Bureau of Reclamation, et al.* On July 5, 2018, the U.S. District Court entered judgment vacating SLDMWA's decisions to approve the Final Long-Term Water Transfers EIS/EIR and approve the Proposed Action, vacating the 2015 Final EIS/EIR, and vacating the U.S. Fish and Wildlife Service's biological opinion. The 2018 RDEIR/SDEIS was prepared to address specific issues identified in the ruling (page ES-1 and ES-2).

The proposed action in the 2018 RDEIR/SDEIS is Alternative 2, the full range of transfers, that includes groundwater substitution, cropland idling/shifting, stored reservoir release, and conservation. The 2018 RDEIR/SDEIS proposes two mitigation measures, GW-1 for groundwater impacts, and VEG-WILD-1 for impacts to terrestrial species, along with the stream depletion factor mitigation measure WS-1 from Section 3.1.4.1 in the 2015 Final EIS/EIR to address the potential impacts from the water transfers from sellers north of the Sacramento Delta to buyers south of the Sacramento Delta (See Table C-1 in Appendix C for list of potential impact mitigations measures). This letter focuses on the groundwater substitution element of the water transfers from the Sacramento Valley groundwater basin and provides comments and recommendations regarding the deficiencies in the analysis of potential environmental impacts, the technical information submitted, and the monitoring and mitigation measures, and provides recommendations for amending the monitoring and mitigation measures. 9.155

This letter provides comments and recommendations on eleven subject areas. The following is a brief description of these eleven comments on the 2018 RDEIR/SDEIS.

1. The 2018 RDEIR/SDEIS acknowledges that groundwater substitution transfers will result in long-term depletion of groundwater storage, which affects surface water resources. The document however doesn't analyze the potential impacts of long-term depletion to surface waters, wildlife and vegetation, or groundwater aquifer systems. Furthermore, mitigations GW-1 and WS-1 don't require long-term monitoring and do not address or mitigate any potential impacts.

2. The information and analysis in the 2018 RDEIR/SDEIS are insufficient to demonstrate how the monitoring and mitigation measures proposed in GW-1 and VEG-WILD-1 provide adequate corrective actions to mitigate all potential impacts from groundwater substitution transfer pumping to less than significant. 9.156 Specifically, the document fails to show how the proposed monitoring and corrective actions for declining groundwater levels will effectively mitigate potential significant and harmful changes in groundwater quality, increased basin overdraft, increased subsidence, or harm to groundwater dependent ecosystems.

3. The information and analysis in the 2018 RDEIR/SDEIS are insufficient to demonstrate how the monitoring and mitigation measures proposed in GW-1 will ensure compliance with the Sustainable Groundwater Management Act of 2014 (SGMA) (California Water 9.157

Code Sections 10720 to 10933). In addition, restriction in GW-1 on the placement of groundwater monitoring wells, the lack of process and procedures for notifying third party well owners within the entire area of potential groundwater pumping impacts, and restriction on eligibility of third parties to seek monetary reimbursement to correct transfer pumping impacts, all run counter to the goals of preventing and mitigating potential impacts to a level of insignificance. 9.157 Cont.

4. The 2018 RDEIR/SDEIS mitigation measures GW-1 and WS-1 don't require any specific corrective actions to mitigate the long-term impacts from transfer pumping to the current overdraft groundwater basins of the proposed sellers in groundwater substitution transfers. Mitigations WS-1 and GW-1 only require year-of-transfer monitoring and mitigation measures, which fails to analyze or address impacts that occur after the transfer and the cumulative impacts from each additional transfer event. The document doesn't address how the mitigations will maintain the 2015 baseline basin conditions that are assumed in SGMA, or how the mitigations will contribute to maintaining basin sustainability within the 50-year SGMA planning and implementation horizon [California Water Code Section 10721(r)]. Stating that groundwater substitution transfers will comply in the future with the requirements of one or more Groundwater Sustainability Plans once they are developed doesn't provide the analysis or specific mitigations needed to address the long-term impacts of groundwater substitute transfer on basin sustainability that occur prior to the development of the Groundwater Sustainability Plans. 9.158

5. The 2018 RDEIR/SDEIS fails to inform and analyze potential impacts from groundwater substitute transfers using currently available published scientific documents on surface water and groundwater interactions. The document doesn't analyze the long-term impacts of groundwater pumping on the volume of stored groundwater, changes in surface water flows, or reductions in water availability to sustain groundwater dependent ecosystems. Three available groundwater modeling studies indicate that long-term impacts from transfer pumping are significant and continue beyond the year of the transfer. Instead of recognizing known long-term impacts of transfer pumping, mitigation WS-1 states that "*[t]he exact percentage of the streamflow depletion will be assessed and determined on a regular basis by Reclamation and DWR*," and it "*… will be refined as new information becomes available and may become more site specific as better data and groundwater modeling becomes available*." Although the revised document acknowledges there are long-term impacts to stream and groundwater storage (See my comment no. 1), mitigations WS-1 and GW-1 don't require that currently available scientific methods be used to calculate the stream depletion factor for a transfer pumping well. Failure to use readily available scientific methods to calculate and mitigate stream depletion and aquifer storage loss from transfer pumping will likely result in inadequate mitigation of the potential impacts to both surface water and ground water resources. 9.159

6. The 2018 RDEIR/SDEIS analysis of potential impacts to water quality fails to inform, analyze, monitor, or mitigate known water quality problems in the proposed groundwater transfer substitution source areas of Sacramento Valley. The evaluation for potential migration of known chemical pollutants consists of a general statement that water quality is typically good, based on concentrations of total dissolved solids, but then notes that there are also 481 active contaminant clean-up sites in Sacramento Valley. There are no actions or standards in mitigation GW-1 that require sellers to demonstrate that the transfer pumping will not re-direct or spread known contaminated groundwater. The document does however provide analysis that suggests that transfer pumping will result in change in the direction of groundwater flow that can draw shallow groundwater contaminants into deeper aquifer zones. 9.160

7. The 2018 RDEIR/SDEIS mitigations GW-1, and VEG and WILD-1 don't require identifying, evaluating, monitoring or mitigating groundwater dependent vegetation with roots shallower than 10 feet. Monitoring and mitigation is required only for deep-rooted vegetation, which they define as vegetation with a tap root greater than 10 feet long. Monitoring is required only within a half-mile radius of the transfer pumping well and when groundwater levels are between 10 and 25 feet below the ground surface. The document refers to an assessment-methods section in Appendix H for justification of this limited monitoring requirement. However, this assessment isn't actually included in Appendix H. The failure of GW-1 to require protection of shallow root vegetation and all groundwater dependent ecosystems that may be impacted by the transfer pumping will likely result in significant impacts to these resources. 9.161

8. The 2018 RDEIR/SDEIS mitigation GW-1 requires that if there are no wells meeting the requirements for monitoring deep-rooted or shallow-rooted vegetation, then monitoring can be done visually by a qualified biologist. Mitigation GW-1 doesn't provide any requirement or standards for establishing baseline conditions of the vegetation, require any reporting of the baseline condition, or documentation of pre- and post-transfer conditions and any changes in vegetation during the period of transfer. Mitigation GW-1 fails to recognize that multiple years of transfer will have a cumulative effect on the health of vegetation. No long-term monitoring of changes to vegetation are required. No standard is defined for revegetation plan development and revegetation success criteria, and there is no requirement to continue revegetation efforts until the vegetation is re-established and meets or exceeds the revegetation standard. Mitigation GW-1 doesn't require the seller to coordinate biological monitoring with state or local agencies such as California Department of Fish and Wildlife. Mitigation GW-1 doesn't require the seller provide any financial assurance to ensure that revegetation will be completed successfully 9.162

and doesn't indicate who will complete the revegetation should the seller fail to comply with the mitigation measures.

9. The 2018 RDEIR/SDEIS evaluates the potential for groundwater substitution transfer pumping to impact rivers and creeks using the SACFEM2013 groundwater model simulations for years 1970 to 2003. The document sets as the threshold of significance standard, a reduction in mean monthly flow of 10 percent and greater than one cubic foot per second (cfs) change in flow. The document relies on groundwater level monitoring requirements and mitigations in GW-1 to prevent impacts to terrestrial species, natural communities and special-status species. The document doesn't provide data or analysis on why the proposed ten percent and 1 cubic foot per second (10% & 1 cfs) threshold is an appropriate standard of protection. The 10% & 1 cfs standard isn't compared to existing instream flow standards such as those utilized by the California Department of Fish and Wildlife. Mitigation GW-1 doesn't require that baseline conditions be measured or documented. There are no standards for monitoring, and no standards for the level of environmental significance for the species and resources being protected. The other terrestrial mitigation, VEG and WILD-1, is only for cropland idling transfer and therefore doesn't provide monitoring or mitigation for groundwater substitution transfers. Mitigation GW-1 has no specific requirements to monitor these biological resources prior, during or after transfer pumping. The 2018 RDEIR/SDEIS also claims that many streams are "*essentially*" dry during periods of pumping and therefore pumping can't cause an impact. This assessment ignores the long-term implications of surface water capture discussed in my comment No. 5, in particular, the increase in stream seepage caused by lowering the water table, the third type surface water capture. Long-term impacts from lowering groundwater levels beneath streams and the effect on reducing surface water flows aren't considered in the document or mitigated in GW-1. 9.163

10. Except for monitoring of groundwater levels and stopping pumping when trigger levels are reached, mitigation GW-1 doesn't require any other specific actions to prevent subsidence and provides only general statements about reimbursing third parties for modifications of wells or infrastructure, and other appropriate actions. The impact analysis, and monitoring and mitigation measures, lack information regarding the current areas and amounts of subsidence, the methods, timing and organizations that the transfer sellers need to coordinate their subsidence monitoring. Mitigation GW-1 doesn't require the seller to comply with DWR's Best Management Practices for land subsidence monitoring networks.[1] Mitigation GW-1 lacks specific information on what rate and amount of land subsidence would be considered significant and therefore trigger the 9.164

[1] https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-2-Monitoring-Networks-and-Identification-of-Data-Gaps.pdf

corrective action to provide financial reimbursement to third parties for modification of their wells or infrastructure damaged by land subsidence. Mitigation GW-1 doesn't require that transfer sellers demonstrate that they have the financial assurance to reimburse third parties for mitigation costs. Mitigation GW-1 doesn't identify the procedures for third parties to making a claim of land subsidence damage.

11. The 2018 RDEIR/SDEIS used the SACFEM2013 groundwater model to evaluate potential impacts from groundwater substitution pumping on groundwater levels, water quality, and stream depletion from historical transfer pumping during the water years 1970 to 2003. The SACFEM2013 modeling effort's failure to use data on historical conditions or transfers after 2003 is a significant limitation on the utility of the model for estimating potential impacts from the proposed 6 years of groundwater substitution transfers. Sacramento Valley groundwater basin hydrologic conditions after 2003 include continued localized decreases in groundwater levels, decreases water quality, and development of areas of land subsidence. The decrease in groundwater levels and quality has resulted in the many of the Sacramento Valley groundwater subbasins being listed as medium to high priority under SGMA. These subbasins are considered unsustainable under current conditions, and therefore require management under a Groundwater Sustainability Plan. The modeling effort doesn't appear to account for the causes of the SGMA ranking or clearly address the potential for creating or expanding any SGMA undesirable results. The modeling effort didn't evaluate the impacts from 6 continuous years of groundwater substitution transfers at the proposed maximum transfer volume and didn't state the modeled volume of groundwater pumping. Because the 2018 RDEIR/SDEIS didn't use the existing degraded hydrologic conditions in modeling the potential impacts from the transfers, the assessments and conclusions in the document likely underestimate the potential environmental impacts. 9.165

<u>Comments and Recommendations for 2018 RDEIR/SDEIS</u>

1. The 2018 RDEIR/SDEIS acknowledges that groundwater pumped for groundwater substitution transfers lowers groundwater levels by taking water out of groundwater storage and then surface water recharge refills the depleted groundwater, provided surface waters are available, and that the process of refilling will occur slowly over time.

9.166

> *"Groundwater substitution would temporarily decrease levels in groundwater basins near the participating wells. Water produced from wells initially comes from groundwater storage. Groundwater storage would refill (or "recharge") over time, which affects surface water sources. Groundwater pumping captures some groundwater that would otherwise discharge to streams as baseflow and can also induce recharge from streams. Once*

pumping ceases, this stream depletion continues, replacing the pumped groundwater slowly over time until the depleted storage fully recharges (page 2-5, lines 4-19).

The fact that the 2018 RDEIR/SDEIS recognizes that refilling the groundwater extracted for groundwater substitution transfers will slowly over an extended period of time decrease surface water flows is critical to understanding the environmental impacts from the transfers. The proposed mitigation measure for decreases in surface water flows is listed in the Potential Impacts Summary Table C-1 of Appendix C as WS-1: the Stream Depletion Factor, which is from the 2015 Final EIS/EIR. Although this mitigation measure isn't discussed in the 2018 RDEIR/SDEIS it is used as a mitigation measure in the revised document and stream depletion is repeatedly discusses (see pages ES-7, ES-10, 2.9 and 3.3-1). The text for mitigation WS-1 is given in the 2015 Final EIS/EIR in Section 3.1.4.1 on pages 3.1-22 and 3.1-23. In addition, requirements for the BoR-SDF are also given in the 2015 DRAFT Technical Information for Preparing Water Transfer Proposals (2015 Water Transfer White Paper) (DWR-BoR, 2015b). These requirement are also relevant to stream depletion mitigation and WS-1 because the 2018 RDEIR/SDEIS requires "*[a]ll transfer must be consistent with the guidance provided in the most recent version of the DRAFT Technical Information for Preparing Water Transfer Proposals*," and the May 2015 addendum (DWR-BoR, 2015a) revised the stream flow depletion factor discussed in Section 3.4.3 of the Water Transfer White Paper from 12 percent to 13 percent. Apparently, both WS-1 and the Water Transfer White Paper are linked because they both have mitigation measures for stream depletion and a BoR-SDF of 13 percent. 9.166 Cont.

Mitigation GW-1 is proposed in Table C-1 of Appendix C for lowering of groundwater levels in sellers' service areas from groundwater substitution transfers. However, the proposed corrective actions for the surface water losses in mitigations WS-1 and GW-1 for lowering of groundwater levels as a result of storage losses don't account for the continued loss in surface water flows, impacts of lowering groundwater levels on wildlife and vegetation, or the slow refilling of pumped groundwater beyond the year of the transfer. Although the stated intent of mitigation WS-1 (2015 Final EIS/EIR, Section 3.1.4.1 on pages 3.1-22 and 3.1-23) is to "*…offset the streamflow effects of the added groundwater pumping due to transfer*," the current minimum value in WS-1 for the BoR steam depletion factor (BoR-SDF) is 13 percent in the year of transfer, which provides no mitigation for stream flow losses in successive years as the remaining groundwater storage lost during a transfer is recharged. 9.167

While the mitigation WS-1 does indicate that BoR and the California Department of Water Resources (DWR) will refine the BoR-SDF as new information becomes available, the statement in the 2018 RDEIR/SDEIS that acknowledges surface water will slowly refill the depleted storage seems to be sufficient information to require revision of mitigations WS-1 and GW-1 to require that the seller provide for continued augmentation of the flows in streams impacted by the transfer up to the volume of the total water transferred and the full duration of the impact. With 9.168

the current BoR-SDF of 13 percent, up to an additional 87 percent of the volume pumped needs to be withheld and released slowly over a long time to mitigate the known impacts to surface waters. The outstanding questions for the seller, BoR, and other water users include the rate, volume and timing that long-term stream depletion mitigation waters should be released to the affected stream. In addition, WS-1 doesn't address how transfer pumping-affected streams and water bodies that aren't directly connected to the transferred surface waters will be mitigated by the BoR-SDF. Recent studies by Leake and others (2008, 2010) using superposition groundwater modeling to simulate river depletion by groundwater wells in Arizona's Upper San Pedro Basin and the lower Colorado River could assist in providing a method for answering these questions. Leake and others, 2010, attached as Exhibit 8. 9.168 Cont.

I recommend that the 2018 RDEIR/SDEIS be revised to provide specific monitoring and mitigation measures that address the potential long-term impacts from groundwater substitution transfers depleting groundwater storage, and the resulting impacts to surface water resources and all surface water dependent wildlife and vegetation.

2. Mitigation measure GW-1 deals with groundwater substitution transfer impacts has several required monitoring program elements (Section 3.3.4, pages 3.3-25 through 3.3-29). The main monitoring requirement of GW-1 is measurement of groundwater levels. The mitigation requires that transfer pumping stops if groundwater levels drop to the depth of a trigger level, typically an elevation at or below the known historic low (Section 3.3.4.3, page 3.3-29). Although mitigation GW-1 lists monitoring elements other than groundwater levels, such as groundwater quality, flow metering of pumped groundwater, and shallow groundwater monitoring for deep-rooted vegetation, the corrective actions listed for GW-1 are primarily based on making engineering fixes to wells or infrastructure caused by a drop in groundwater levels. The evaluation and reporting element of GW-1 requires a transfer summary report that identifies transfer-related effects on groundwater and surface water, local groundwater users, and ecological resources such as fish, wildlife and vegetation resources. However, GW-1 doesn't require, or obviously link to other monitoring and/or mitigation measures that require, monitoring, assessment and reporting of the baseline conditions of the resources whose transfer impacts should be reported per GW-1. Establishment of baseline conditions is fundamentally necessary to quantify changes that occurred during transfer pumping and transfer-related impacts. 9.169

In addition to GW-1 not requiring establishment of baseline conditions, the surface water mitigation measure WS-1 from 2015 Final EIS/EIR only addresses the stream depletion factor but has no requirement to identify existing instream flow requirements, or measure and calculate the minimal instream flows, or other minimal stream characteristic such as depth of flow, temperature, or the condition of the fisheries, wildlife or riparian habitats. Without establishing baseline conditions and minimal threshold triggers for the surface water, assessment of transfer 9.170

pumping impacts is difficult. Mitigation WS-1 doesn't require knowledge of pre-pumping conditions to ensure that flows in the stream will be sufficient to allow for all of the existing surface water diversions as well as the depletion caused by transfer pumping. Mitigation WS-1 doesn't require that the sellers use established methods for evaluating minimum instream flows and habitat values such as those provided by the California Department of Fish and Wildlife.[2] The requirements for establishing minimal stream flows and habitat values should follow accepted methods and be used to guide the timing and volume of releases of the BoR-SDF mitigation waters and to establish standards for evaluating the effectiveness of the WS-1 as a mitigation measure. 9.170 Cont.

A third 2018 RDEIR/SDEIS mitigation measure, VEG-WILD-1, only deals with terrestrial species associated with cropland idling transfers (Section 3.8.4, page 3.8-38 through 3.8-40). Despite limiting the VEG-WILD-1 mitigation measure to cropland idling transfers, Table C-1 of Appendix C links GW-1 and VEG-WILD-1 together as revised mitigations for a number of potential vegetation and wildlife impacts associated with groundwater substitution transfers (See pages C-8 through C-10). 9.171

In addition to the three mitigations given in the 2018 RDEIR/SDEIS, there are other potential monitoring and mitigation measures that seem to be incorporated by reference in the 2015 DWR-BoR document titled *Draft Technical Information for Preparing Water Transfer Proposals* (2015 Water Transfer White Paper). In particular, Appendix B in the 2015 Water Transfer White Paper is a Transfer Information Checklist for both cropland idling and groundwater substitution information requirements. The monitoring and mitigation measures in the 2015 Water Transfer White Paper and the Appendix B checklist appear to be linked to mitigations WS-1, GW-1, and VEG and WILD-1 because of repeated reference in the 2018 RDEIR/SDEIS to the 2015 Water Transfer White Paper. (See pages ES-6, 1-4, 3.3-25, and 3.3-28 for the discussion of the 2105 Water Transfer White Paper in the 2018 RDEIR/SDEIS.) However, many of the monitoring and mitigation measures in the 2015 Water Transfer White Paper aren't included in the 2018 RDEIR/SDEIS and in places they are contradicted. 9.172

For example, the corrective actions in GW-1 are focused on mitigating impacts to pumping costs and infrastructure from changes in groundwater levels using engineered modifications. The GW-1 list of mitigation corrective actions includes lowering the pump intakes, cost reimbursement for impacts to non-transferring third-party wells, and other undefined appropriate actions. Mitigation GW-1 doesn't appear to require monitoring or estimation of the rate and duration of natural refilling of the loss in groundwater storage caused by transfer pumping, even though the objective of the mitigation is stated wanting to "*avoid significant adverse environmental effects from groundwater level declines*." GW-1 doesn't appear to require any specific corrective action(s) to 9.173

[2] https://www.wildlife.ca.gov/Conservation/Watersheds/Instream-Flow

replace the stored groundwater extracted by the transfers other than requiring the groundwater level to rise above the trigger level before transfer pumping can continue. The basic assumption of GW-1 seems to be that any detrimental effects from groundwater extracted for transfers are either temporary and/or they can be mitigated with engineering. This appears to conflict with the statement that *[o]nce pumping ceases, this stream depletion continues, replacing the pumped groundwater slowly over time until the depleted storage fully recharges*" (section ES.4.1, page ES-7; Section 2.2.2.1, page 2-5). 9.173 Cont.

I recommend that the mitigations WS-1, GW-1, and VEG and WILD-1 be revised to incorporate monitoring, mitigations and corrective actions using acceptable methods that provide specific standards for: (1) measuring baseline environmental conditions; (2) establishing minimum instream flows requirements, including minimal stream characteristics such as depth of flow and temperature; (3) establishing minimal habitat value for fisheries, riparian habitats, wildlife and vegetation that occur within the area of transfer drawdown; (4) establishing the locations, timing and volume of releases of the BoR-SDF mitigation waters needed to protect the potentially impacted resources; (5) incorporating the monitoring and mitigation requirements of the 2015 Water Transfer White Paper; and (6) requiring communications and regulatory interactions with local and state agencies who have the responsibility to protect fisheries, wildlife and vegetation species, including obtaining all necessary permits. 9.174

3. The 2018 RDEIR/SDEIS doesn't require analyses of the long-term impacts of groundwater substitution transfer pumping to groundwater levels or of the sustainable yield of the seller's groundwater basin and any adjacent basins. Maintaining the sustainable yield of a groundwater basin as now required by the 2014 Groundwater Sustainability Management Act (SGMA) (Water Code Sections 10720 to 10933). Instead the seller is required to "*confirm*" by an unspecified procedure that their proposed groundwater pumping is "*compatible*" with state and local regulation including, Groundwater Management Plans (Appendix D, page D-7), and Groundwater Sustainability Plans developed by Groundwater Sustainability Agencies (Appendix D, page D-5). The 2018 RDEIR/SDEIS doesn't specify whether the local or state agencies in charge of administering these plans and SGMA need to provide written comments and approvals of the transfer proposals, issue permits, or whether the seller can self-certify the transfer proposal's compatibility. 9.175

The transfer proposal compatibility with local and state regulations may be incomplete because the limits that GW-1 places on a "*suitable*" groundwater transfer monitoring network are that monitoring wells be within a two-mile radius of the seller's transfer pumping well, and that wells be located within the same Bulletin 118 subbasin as the pumping well (page 3.3-26). This limit in 9.176

mitigation GW-1 on the maximum distance for a suitable monitoring well and the limit of monitoring only in the pumping well's DWR Bulletin 118 subbasin may result in unmonitored and therefore unmitigated impacts in areas outside the two-mile radius and/or adjacent subbasins. 9.176 Cont. This restriction on monitoring area may be difficult to demonstrate to SGMA agencies that the transfer proposal will effectively monitor all potential impacts. For example, in the 2015 Environmental Impact Report for the Glenn-Colusa Irrigation District (GCID, 2015) Groundwater Supplemental Supply Project the groundwater modeling done to forecast the extent of groundwater level drawdown from pumping up to 10 agriculture production wells at a rate of 2,500 gallons per minute and a maximum annual production of 28,500 acre-feet per year found shallow groundwater drawdown extending beyond a two-mile radius from the pumping wells and extending into adjacent counties and DWR Bulletin 118 subbasins.

The rate and volume of pumping for the GCID wells is similar to that proposed for transfer wells in the 2018 RDEIR/SDEIS. (See Table 2-2 for the proposed range for annual volumes of transfer and Table 3.3-3 for proposed range of pumping rates). Attached Exhibit 1 is a map of the extent of the simulated shallow groundwater drawdown taken from the 2015 GCIS EIR, which shows that the radius of drawdown is much greater than two miles; the maximum extend is 9.177 approximately 12 miles. Attached Exhibit 2 is a figure that combines the Exhibit 1 limits of the shallow groundwater drawdown from pumping the GCID wells with the DWR Bulletin 118 subbasin boundaries. This figure shows that effects of GCID pumping extend into two and possibly four adjacent subbasins. Attached Exhibit 3 is a figure that combines the limits of shallow groundwater drawdown with the number of domestic wells in each section. Exhibit 3 shows that the extent of the drawdown from pumping GCID's wells will impact a large number of domestic wells and many of these well are outside a two-mile radius and outside the pumping well's DWR Bulletin 118 subbasin.

Therefore, the limits that GW-1 places on suitable monitoring wells may result in a number of domestic wells and, potentially, production wells that are impacted by the transfer pumping without receiving adequate monitoring. Some of the affected well owners will likely have no access to any of the corrective actions listed in GW-1 (page 3.3-29) because they're assumed to be outside the area of impact. In addition, it is likely that third parties with wells within the two- 9.178 mile radius, but outside of the DWR Bulletin 118 subbasin of the transfer pumping, will not receive notice of the transfer pumping plan and also be ineligible for the GW-1 corrective actions. Therefore, well owners outside of the GW-1 defined mitigation area may have no opportunity to provide input into the transfer coordination plan as required in GW-1 (page 3.3-28), and lose the right to remedies of the GW-1 mitigations, in particular, monetary reimbursement to correct for impacts to their wells or other infrastructure.

I recommend that mitigation GW-1 be revised to extend the monitoring, mitigation and corrective actions out to all areas of potential impact from groundwater 9.179

substitution transfers regardless of the distance from the well or the Bulletin 118 subbasin. Mitigation GW-1 should also be revised to require that the transfer proposal include analysis, monitoring, mitigation measures and corrective action for potential impacts to the groundwater that could otherwise prevent long-term sustainability management as required by SGMA for all subbasins potentially impacted by the transfer pumping. The transfer proposal should include demonstrating how the monitoring and mitigation measures will prevent SGMA undesirable results [See Water Code 10721(x)]. 9.179 Cont.

4. The 2018 RDEIR/SDEIS mitigation measures GW-1 and WS-1 from the 2015 Final EIS/EIR don't require any specific corrective actions to mitigate the long-term impacts from groundwater substitution transfer pumping to the sustainable yield of a proposed seller's currently overdrafted groundwater basins or any of the adjacent subbasins. Mitigations WS-1 and GW-1 only require year-of-transfer monitoring and mitigation measures, which fails to analyze or address transfer impacts that occur after the transfer, or the cumulative impacts from each additional transfer event. 9.180

The lack of a requirement to maintain the groundwater sustainable yield conflicts with the fact that many of the Sacramento Valley DWR Bulletin 118 subbasins proposed as a source for groundwater substitution transfers are in overdraft for a variety of reasons. Many of the source area basins are therefore ranked by DWR's CASGEM[3] program as having a medium to high priority under the SGMA which requires that groundwater sustainability agencies (GSA) or the State Water Resources Control Board (SWRCB) develop and manage the basins using groundwater sustainability plans (GSP). For the Sacramento Valley, the GSPs must be developed by January 31, 2022 with the medium- to high-priority basins achieving sustainability within 20 years, by 2042. The ending date the 2018 RDEIR/SDEIS is 2024, or two years past the start date for implementing the GSPs. Appendix D Section 1.3 and Table D-1 in the 2018 RDEIR/SDEIS provides a list of the GSA, and the subbasins of each jurisdiction along with any web sites or other contact information. Attached as Exhibit 4 is a map of the DWR subbasin ranking for the Sacramento Valley. 9.181

The document doesn't address how the mitigations will contribute to achieving the sustainable yield and prevent undesirable results in the seller's basin and any adjacent impacted basin within the 50-year SGMA planning and implementation horizon (California Water Code Section 10721(r)). Instead the 2018 RDEIR/SDEIS states that groundwater substitution transfers will comply in the future with the requirements of one or more Groundwater Sustainability Plans once they are developed. This requirement doesn't provide the analysis or specific mitigations needed in 2018 RDEIR/SDEIS document to demonstrate that the potential long-term impacts of 9.182

[3] https://water.ca.gov/Programs/Groundwater-Management/Groundwater-Elevation-Monitoring--CASGEM

groundwater substitute transfer on basin sustainability that occur prior to the plan development, but continue after the plan implementation in 2022, have been addressed and mitigated.

The effects on the long-term impacts to sustainable yield from groundwater transfer pumping are acknowledged but left unanalyzed in the 2018 RDEIR/SDEIS. Mitigations WS-1 and GW-1 deal only with impacts during the year of transfer and don't require monitoring or evaluating long-term impacts or provide corrective measures for the long duration that might be required to refill the groundwater pumped as part of a transfer. There are no required mitigations of long-term impacts that refilling the groundwater basin will have on surface water resources, terrestrial resources, vegetation and wildlife, or on other users of the groundwater and surface water supplies. The lack of long-term monitoring and mitigation measures or corrective actions in the 2018 RDEIR/SDEIS likely means that most of the long-term impacts from groundwater substitution transfer pumping won't be measured or mitigated. 9.183

I recommend that mitigations WS-1 and GW-1 be revised to require analysis, and mitigate for long-term impacts from groundwater substitution transfers, to achieve groundwater sustainability of the seller's basin and any adjacent impacted basins out to at least the 50-year SGMA planning and implementation horizon.

5. Any effort to correct the lack of analysis in the 2018 RDEIR/SDEIS of the long-term impacts from transfers to the sustainability of the groundwater basins in the source areas needs to utilize the existing scientific literature on surface water and groundwater interactions. Fundamental to evaluating the surface water and groundwater interactions associated with transfers is recognition that pumped groundwater is first taken from groundwater storage and then over time the lost storage is replaced by recharging surface waters. This concept was acknowledged in the 2018 RDEIR/SDEIS (See my comment no. 1) but the importance of this process is lacking in the analysis of environmental impacts and development of monitoring requirements, mitigation measures and corrective actions. Konikow and Leake published a paper in 2014 titled: "*Depletion and Capture: Revisiting "The Source of Water Derived from Wells,*" attached as Exhibit 5. In their paper, they analyze the trade-offs between depletion of groundwater storage and replenishment of storage through "capture" of surface waters. Figure 1 in their paper, attached as Exhibit 6a, shows the two theoretical curves that give the changes in percentages of storage depletion and surface water capture with increased duration of pumping. Note the sum of storage depletion and surface water capture equals 100 percent. Exhibit 6a shows that the percentage of loss of groundwater storage is highest at the start of pumping, while the percentage of pumped water taken by capturing of surface waters is lowest. The increased pumping duration and the expanding cone of depression around the pumping well causes increases in hydraulic impacts to intersected surface waters. Therefore, the percentage of capture as a source of the water pumped by a well increases and correspondingly less water is taken out of groundwater storage. The importance of the Exhibit 6a is that the decrease with pumping time in percentage loss of 9.184

groundwater storage is countered by an increase in capture percentage. In other words, the loss of surface waters increases with duration of pumping. The two sources of water being extracted by a well balance each other, unless there is no more surface water to capture, then the extraction is "mining" the water stored in the groundwater system because there is no replacement.

The term "capture" used by Konikow and Leake includes several hydrologic factors and processes that include the BoR's streamflow depletion factor (BoR-SDF), which was analyzed as part of mitigation WS-1. However, their paper expands the concept of surface water capture by a pumping groundwater well to include the four hydrologic processes of: (1) increased recharge through induced infiltration from streams or other surface water bodies; (2) decreased groundwater discharge to springs, streams, and other surface water bodies (i.e., decreases in stream base flow); (3) increased recharge as a result of water-table declines from pumping in areas where potential recharge from precipitation under natural conditions is normally rejected and runs off the land surface because high water tables preclude infiltration; and (4) decreased evapotranspiration in areas where the water table that is close to the land surface drops, reducing the plant roots' access to water, which results in stress or die off of vegetation and thereby lowers evapotranspiration. Only capture processes 1 and 2 are covered by the BoR-SDF in mitigation WS-1 from 2015 Final EIS/EIR. 9.185

The 2014 Konikow and Leake paper provides estimates of the percentages of long-term cumulative storage depletion and surface water capture in 31 areas and aquifers within the United States. The Central Valley of California (Central Valley) is one of the areas studied. Their analysis of groundwater storage depletion and surface water capture for the Central Valley was based on results of the U.S. Geological Survey's (USGS) 2009 Central Valley Hydrologic Model developed for the years 1961 through 2003 (Faunt and others, 2009). Figure 14 in Konikow and Leake's 2014 paper, attached as Exhibit 6b, shows groundwater storage and surface water capture curves from that model. Konikow and Leake conclude that in 2003 the Central Valley, on average, 14.7 percent of the groundwater pumped is taken from groundwater storage and the remaining 85.3 percent is derived from capture of surface waters (See Exhibit 5 page 2 of Table S1). This estimate is consistent with my estimate taken from the 2014 Northern California Water Association's analysis of DWR's 2013 C2VSim groundwater model that the loss in surface water flows in the Sacramento Valley since the 1920s is approximately equal to 80 percent of the groundwater currently being extracted (See comment no. 20 and Exhibit 10.7 in my November 25, 2014 letter on the 2014 DEIS/EIR). 9.186

Konikow and Leake's 2014 paper is also consistent with the previous analysis by CH2MHill (2010) of the 2009 Drought Water Bank Program in Sacramento Valley groundwater substitution transfer impacts for water years 1970 to 2003 using SACFEM groundwater model, attached as Exhibit 7 (Also see my comment no. 21 and Exhibits 11.3a in my November 25, 2014 letter on 9.187

the 2014 DEIS/EIR). The 2009 study provided graphs of the cumulative stream flow depletion caused by groundwater substitution pumping. These graphs show that streamflow losses extend for at least 25 years following the end of pumping, and at the end of that time approximately 60% of the groundwater storage loss had been refilled for the stream impacts from the 1976 transfer pumping (See Figure 4d in attached Exhibit 7). One of the conclusions from the CH2MHill report is that: 9.187 Cont.

> *"The effect of groundwater substitution transfer pumping on stream flow, when considered as a percent of the groundwater pumped for the program, is significant. The impacts were shown to vary as the hydrology of the periods following the transfer program varied. The three scenarios presented here estimated effects of transfer pumping on stream flow when dry, normal, and wet conditions followed transfer pumping. Estimated stream flow losses in the five-year period following each scenario were 44, 39, and 19 percent of the amount of groundwater pumped during the four month transfer period."*

These scientific studies of the impacts on Central Valley surface water from groundwater extractions demonstrates that the environmental analysis of impacts from groundwater substitution pumping in the 2018 RDEIR/SDEIS is still deficient because it: (1) lacks any estimates of the potential long-term rate for refilling the loss in groundwater storage from transfer pumping; (2) lacks specific performance standards in mitigations WS-1 or GW-1 to measure the impacts from long-term refilling of lost groundwater storage; and (3) lacks any methods for measuring the effectiveness of any corrective actions taken to mitigate the long-term impacts from transfer pumping on surface water flows, groundwater storage, groundwater dependent ecosystems and wildlife, or the sustainability of water resources in the seller's water source area.

As discusses in my comment no. 1, recent studies by Leake and others (2008, 2010) using superposition groundwater modeling to simulate river depletion by groundwater wells in Arizona's Upper San Pedro Basin and the lower Colorado River could assist in providing a method for answering these questions. Leake and others, 2010, is attached as Exhibit 8. 9.188

I recommend that mitigations WS-1 and GW-1 be amended to address the long-term impacts from transfer pumping by adding monitoring requirements for assessing the rate and volume of long-term stream depletion and refilling of the loss in groundwater storage caused by transfer pumping, provide procedures and standards for estimating long-term stream depletion and groundwater storage loss, provide mitigation measures and corrective actions for impacts to stream flow, stream and terrestrial habitats, and third party users of surface water and groundwater for the duration of the impacts. 9.189

6. The 2018 RDEIR/SDEIS addresses the issue of potential impacts to water quality from groundwater substitution transfer pumping with the statements that: "[g]*roundwater quality in the Sacramento Valley Groundwater Basin is generally good and sufficient for municipal, agricultural, domestic, and industrial uses. However, there are some localized groundwater quality issues in the basin.*" (page 3.3-6), and "[g]*roundwater in the Redding Area Groundwater Basin is typically of good quality, as evidenced by its low total dissolved solids (TDS) concentrations, which range from 70 to 360 milligrams per liter (mg/L).*" (page 3.3-3). It also states that: "…. *groundwater quality impacts were analyzed using a qualitative approach.*" (page 3.3-7), and that "…. [g]*roundwater quality impacts were assessed by considering areas of known water quality concerns and determining whether modeled groundwater drawdown could cause those areas to migrate.*" (page 3.3-10). The 2018 RDEIR/SDEIS notes that the "*Sacramento Valley has 481 active clean-up program sites, 234 leaking underground tank sites, 54 Military sites (includes military privatized UST sites), and one land disposal site as of August 29, 2018.*" (page 3.3-7). Figure E-55 in Appendix E of the 2018 RDEIR/SDEIS shows the locations of known contaminated sites in the Sacramento Valley taken from the SWRCB's GeoTracker GIS website. The 2018 RDEIR/SDEIS then concludes that: "[*i*]*n the Seller Service Area, groundwater pumping would be expected to continue on the same pattern as currently observed. Therefore, the potential for groundwater quality degradation in the Seller Service Area would be the same as existing conditions.*" (page 3.3-11). With this analysis, the 2018 RDEIR/SDEIS found that no mitigation measure is needed to address potential changes in groundwater quality from groundwater substitution transfer pumping (page C-4 of Table C1 in Appendix C). 9.190

The 2018 RDEIR/SDEIS discussion of the groundwater level drawdown modeling for groundwater substitution transfer pumping impacts refers to a series of hydrographs of simulated groundwater levels changes in seven model layers at 34 selected locations that were supposed to be included in Appendix F of the 2018 RDEIR/SDEIS. Unfortunately, these 238 hydrographs aren't included in Appendix F. There are however, five hydrographs at selected locations that record simulated changes in groundwater levels in two model layers, 0-to-70 feet below the ground surface (bgs), and 690-to-910 feet bgs, Figures 3.3-5 to 3.3-9 (pages 3.3-16 through 3.3-18). Four of these combined hydrographs, 3.3-5, 3.3-6, 3.3-8, and 3.3-9, show that during a period of no transfer pumping there is an upward vertical groundwater gradient between the shallow and deep model layers. That is, the head in the deep pumping zone is higher than the head in the water table. But during modeled periods of transfer pumping the vertical gradient is downward, that is, the shallow zone groundwater head is higher than the deeper zone head. This reversal of gradient means that transfer pumping can cause groundwater in the shallower zones to flow into the deeper zones. This would be expected because pumping forces water to flow towards the well both horizontally and vertically. This reversal however, also increases the potential for the migration of shallow contaminated groundwater into deeper aquifer zones. The 2018 RDEIR/SDEIS assumes that because this is normal, the potential for degradation of groundwater quality would be the same as existing conditions. However, this assessment of environmental impacts doesn't provide any actual data or information on the current groundwater quality in the 9.191

areas of the proposed transfer pumping, or how the groundwater flow model simulation demonstrates contaminants won't migrate to the transfer wells.

Attached Exhibits 9a, 9b and 9c are composite figures that show the contaminate sites from GeoTracker given in Figure E-55. They are overlain by the outlines of the model simulated groundwater drawdown under the 1990 conditions for the 200-to-300-foot aquifer depth taken 9.192 from Figures F-5a, F-5b and F-5c in Appendix F of the 2018 RDEIR/SDEIS. The 200-to-300-foot model zone was selected for comparison because it's the next zone below the shallowest aquifer and the most likely to be receive the shallow contaminants as a result of transfer pumping. These three figures show that there are a number of existing contaminate sites within the area of groundwater drawdown from transfer pumping.

In addition to Figure E-55, information on existing groundwater contaminants in the transfer source area north of the Sacramento Delta can be obtained from the SWRCBs' Geotracker and Geotracker-GAMA web sites, and scientific literature. Attached Exhibit 10 is a screen print of the Geotracker contaminant site for the Redding area that wasn't included in Figure E-55, which shows there are a number of contaminated sites in the Redding area that may be impacted by the Anderson-Cottonwood Irrigation District's transfer pumping. Exhibits 11a, 11b and 11c are screen prints of the GeoTracker-GAMA[4] web site that show the number of wells contaminated with one or more pesticides in the transfer source area north of the Sacramento Delta. Exhibit 12 is a table showing the number of wells with chromium VI, nitrate-N, or total dissolved solids (TDS) above selected concentrations in each of the ten transfer Counties in Sacramento Valley. Information in Exhibit 12 was taken from the GeoTracker-GAMA web site. 9.193

Exhibit 12 shows that there are 1,684 wells with chromium VI concentrations equal to or greater than 5 micrograms per liter (ug/L) with concentrations in 531 wells or approximately 32 percent of those wells above the health-based screening level (HBSL) of 20 ug/L. The table also shows that 1,184 wells have nitrate concentrations above 5 ug/L with concentrations in approximately 39 percent of those wells, 459 wells, at or above the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L). The number of wells with total dissolved solids greater than 1,000 mg/l MCL is 327. Exhibits 13, 14 and 15 give the GeoTracker-GAMA screen prints for each of the three contaminants in each of the 10 counties in the Sacramento Valley seller's transfer water source area. The 2018 RDEIR/SDEIS didn't graphically document the known occurrences of contaminated wells and the relationship to potential transfer pumping wells.

Exhibits 16a and 16b are figures taken from a study on the occurrence of chromium VI [Cr(VI)] in California by Isbecki and others (2015; the full report is attached as Exhibit 16c), that show the 9.194 areal extent of chromium-containing rocks and soils in California, and the range of concentrations

[4] http://geotracker.waterboards.ca.gov/gama/gamamap/public/

found in public water supply wells from 2000 to 2012. Chromium VI is a known carcinogen and is on California's Proposition 65 notification list, see attached Exhibit 17. Isbecki and others concluded that: "[h]*igh Cr(VI) occurs in water from wells in alluvial aquifers along the west-side of the Central Valley results from high-chromium in source rock eroded to form those aquifers, and areal recharge processes (including irrigation return) that can mobilize chromium from the unsaturated zone. Cr(VI) co-occurred with oxyanions having similar chemistry, including vanadium, selenium, and uranium. Cr(VI) was positively correlated with nitrate, consistent with increased concentrations in areas of agricultural land use and mobilization of chromium from the unsaturated zone by irrigation return.*" The results of this study suggest that potential presence of naturally occurring contaminants in soils and groundwater along the west side of the Sacramento Valley are consistent with the finding of 1,684 wells with chromium VI occurring throughout the valley, Exhibits 12 and 13. 9.194 Cont.

Information provided in Figure E-55 and attached Exhibits 9 to 16 show that the seller's water source area north of the Sacramento Delta has a significant number of known contaminated sites and potential for groundwater pollution from natural or released contaminants, based on the detections in numerous wells within the seller's transfer water source area north of the Delta. When combined with groundwater simulations results that show transfer pumping can cause a change in vertical groundwater flow from normally upward flowing to downward flowing during transfer pumping, the assumption that transfer pumping won't degrade groundwater quality isn't sufficiently supported by the existing data or the analysis in the 2018 RDEIR/SDEIS to reach the conclusion that no water quality mitigation measures are required. These Geotracker-GAMA derived exhibits clearly show that existing groundwater quality in the Sacramento Valley can't be assumed to be "*generally good*" and water quality monitored for known contaminants should be required of water extracted during the groundwater substitution transfer pumping. 9.195

The 2018 RDEIR/SDEIS determination that there is no mitigation requirement for potential impacts to groundwater quality in the seller's water supply area (Appendix C, page C-4) doesn't agree with the stated purpose of the monitoring plan required by the 2015 Water Transfer White Paper. The requirements of the 2015 Water Transfer White Paper monitoring plan are relevant because the 2018 RDEIR/SDEIS states that "[*a*]*ll transfers must be consistent with the guidance provided…*" (page ES-6). The stated purpose of the 2015 Water Transfer White Paper monitoring program is to "… [*i*]*dentify any changes in groundwater levels or quality so that the seller can take actions to avoid or mitigate any injury to legal users of water due to the water transfer*." (2015 Water Transfer White Paper Section 3.5, page 31). One of the required elements of the monitoring program is the submittal of detailed information on the "[*i*]*dentification of known contaminated areas that could be affected by transfer pumping*." (Section 3.5.2, page 32). The 2015 Water Transfer White Paper also states that some wells may require more comprehensive water quality testing, such as wells in areas of known groundwater quality problems (Section 3.5.2, page 34). The failure of the 2018 RDEIR/SDEIS to require the documentation of known contaminant areas and known polluted wells in the seller's water source areas for a groundwater substitution transfer 9.196

proposal, and not require water quality monitoring or mitigation measures when potential contaminant sources exist, directly conflicts with the stated purpose of the monitoring plan in the 2015 Water Transfer White Paper that all transfer proposals have to follow.

The 2018 RDEIR/SDEIS should provide more site-specific information on the current groundwater quality in the areas of the seller's transfer wells to support the general statement that water quality is good and therefore monitoring and migration of poor-quality or polluted water isn't likely, which resulted in the conclusion that no mitigation measure for transfer pumping impact to groundwater quality is required. Because of the known number of contaminated sites and polluted wells in the seller's water source area north of the Sacramento Delta, mitigation measure GW-1 should be amended to require a groundwater quality monitoring and sampling plan for contaminants of concern at the start of transfer pumping, at approximately the middle of the expected pumping duration, and at the end of pumping. The sellers should seek review and approval from the Central Valley Regional Water Quality Control Board, and any other state or local agency responsible for water quality and environmental health, that the contaminates to be sampled in the water quality monitoring and sampling plan and the field sampling procedures are appropriate. This would include the laboratory testing methods and reporting limits so that the results of the transfer sampling can be incorporated into the SWRBC's water quality database. 9.197

I recommend that mitigation GW-1 be revised to require in the transfer proposal that: (1) the seller conduct a contaminant screening study by contacting local and state environmental quality agencies and searching available water quality databases such as Geotracker, to determine the potential source and types of contaminants in groundwater, surface water and soils within the area of transfer pumping impact; (2) a water quality sampling and reporting program be developed and implemented for specific chemical contaminants identified during the transfer contaminant screening study; (3) transfer pumping immediately stop at any well where a contaminant of concern is measured in a monitoring well above the action level, and the concentrations of all measured water quality constituents and contaminants should be reported immediately to the Regional Water Quality Control Board and the local agency responsible for water quality and environmental health; and (4) notifications be given to third party well owners within the area of influence for the transfer pumping wells when any impairment to water quality is found. Water quality and environmental health agencies may also require notification of other third party well owners in the area adjacent to the polluted transfer well(s). 9.198

7. Mitigation measure GW-1 requires monitoring only in areas with deep-rooted vegetation, which it defines as vegetation with tap roots greater than 10 feet deep (page 3.3-27). Monitoring associated with deep-rooted vegetation is required only within a one-half mile radius of a pumping 9.199

groundwater substitution transfer well and areas where groundwater levels are between 10 and 25 feet below the surface of the ground (bgs) prior to the start of transfer pumping (page 3.3-28). All groundwater level monitoring wells around pumping wells participating in transfers are required by GW-1 to: "*(1) be within a two-mile radius of the seller's transfer pumping well; (2) be located within the same Bulletin 118 subbasin as the pumping well; and (3) have a screen depth(s) in the same aquifer level (shallow, intermediate, or deep) as the pumping well.*" (page 3.3-23.) As discussed above in my comment no. 3, the radius of pumping drawdown will likely exceed the two-mile maximum limit of GW-1, and extend drawdown and potential impacts into adjacent DWR Bulletin subbasins. 9.199 Cont.

The 2018 RDEIR/SDEIS states that an Assessment Methods section of Appendix H determined that monitoring and mitigation measures aren't required for shallow rooted vegetation because when "*… groundwater levels are more than 15 feet below ground surface, a change in groundwater levels would not likely affect overlying terrestrial resources.*" (Section 3.8.2.4.1, page 3.8-7). Unfortunately, Appendix H doesn't appear to have a section labeled Assessment Methods. The text in Appendix H starts on page H-72 and continues through H-89 with assessing a number of "special-status species," but there doesn't appear to be a discussion of groundwater levels and the relationship to terrestrial resources and groundwater dependent ecosystems (GDEs) in the Sacramento Valley to document that when the water table is more than 15 feet below ground surface a lowering of groundwater levels would not likely affect overlying terrestrial resources. No analysis is provided for setting the deep-rooted vegetation threshold at 10 feet bgs, while the shallower rooted terrestrial resources threshold is 15 feet bgs.

9.200

The 2018 RDEIR/SDEIS does discuss the relationship between shallow groundwater levels and terrestrial resources and wildlife in the main portion of the document. For example, Section 3.8.2.4.1 states that in the few locations north of the Sacramento Delta associated with wetlands where the depth to groundwater is less than 15 feet, the modeling indicates that the maximum drawdown from transfer pumping would be 0.8 feet, and then concludes that plant roots would be able to adjust to this drawdown (page 3.8-7.) The 2018 RDEIR/SDEIS doesn't provide any maps that show the distribution of the shallow- or deep-rooted terrestrial resources or GDEs relative to the simulated drawdown maps such as those in Appendix F, or areas where the depth to groundwater is less than 15 feet. Mitigation GW-1 does refer to the DWR Natural Communities Commonly Associated with Groundwater GIS[5] web site (DWR-GDEs-GIS) for GDE maps to identify deep-rooted vegetation (page 3.3-28). This reference to DWR's web site for GDE maps appears to suggest that there may be other GDEs in the seller's transfer water source

[5] https://data.ca.gov/dataset/natural-communities-commonly-associated-groundwater

area, but GW-1 recommends using this web mapping resource to only identify deep-rooted vegetation.

Based on my review of the DWR-GDEs-GIS web site, more than just deep-rooted vegetation is mapped in the seller's transfer water source area north of the Sacramento Delta. Attached Exhibit 18 is screen print from the DWR-GDEs-GIS web site for the middle portion of the transfer water source area surrounding Sutter Buttes that shows numerous areas of vegetation. Attached Exhibits 19a, 19b, and 19c are color coded Spring 2018 groundwater depth contour maps of the Sacramento Valley taken from DWR's Groundwater Information Center Interactive Map Application[6]. Attached Exhibit 20 is a composite of the area in Exhibit 18 with Exhibit 19b 9.201
a color shaded contour map of the depth to groundwater in the Spring of 2018. This composite map shows that there are a number of areas of terrestrial vegetation where the depth to groundwater is 10 feet or less. The depth to 15 feet can be interpolated between the 10- and 20-foot contours. Therefore, the existing data on GDEs and shallow groundwater depths in the seller's transfer water source area north of the Sacramento Delta suggest that there are a number of areas where GDEs could be impacted by a lowering of groundwater level during transfer pumping. Mitigation GW-1 should be amended to require monitoring and mitigation measures for all terrestrial resources and GDEs.

There is additional evidence on the normal depth to groundwater in the seller's transfer water source area during non-transfer pumping periods in the 34 selected simulation hydrographs from the SACFEM2013 groundwater modeling that are supposed to be in Appendix F (page 3.3-15; See my comment no. 6). Attached as Exhibit 21 is a table that identifies the depth to shallow groundwater characteristics for 22 of the 34 selected model locations, 65%, where the simulated non-transfer depth to shallow groundwater was equal to or less than 10 feet. Eight of these hydrographs have simulated groundwater heads above the surface of the ground during periods of no transfer pumping. At 22 of the 34 simulation locations, the maximum simulated decline in 9.202
shallow groundwater level during periods of transfer pumping was at least 10 feet, 65%, and at 15 locations, 44%, the decline was at least 15 feet. The maximum simulated depth to groundwater during periods of transfer pumping at 18 locations, 53%, was equal to or lower than 15 feet bgs. At 12 of the wells, 55%, the drawdown during transfer pumping was greater than the simulated baseline. These simulation hydrographs appear to contradict the assumption in the 2018 RDEIR/SDEIS that shallow groundwaters in the transfer pumping area is too deep to support shallow rooted vegetation or GDEs during periods of non-transfer. That during the simulated periods of transfer pumping, groundwater levels drop more than the baseline at 12 selected locations, a majority at 55%, suggests that transfer pumping can have an impact of shallow-rooted vegetation and GDEs.

---

[6] https://gis.water.ca.gov/app/gicima/

Several conclusions can be made from the above discussion:

A. Failure to require groundwater level monitoring out to the predicted limits of the transfer pumping drawdown, regardless of the subbasin, will likely result in unmonitored and therefore unmitigated environmental impacts to vegetation and wildlife that depends on the vegetation. 9.203
B. The data on the distribution of GDEs and the depth to shallow groundwater equal to or less than 15 feet suggest that there is a significant percentage of the seller's transfer water source area north of the Sacramento Delta that supports GDEs that can be impacted by groundwater substitution transfer pumping.
C. Mitigation GW-1 fails to protect GDEs with roots extending less than 10 feet deep by not requiring the mapping and monitoring of all GDEs within the anticipated transfer pumping drawdown area.

I recommend that mitigation measure GW-1 should be revised to require the identification and mapping of all GDEs and other wildlife habitats that lie within the anticipated area of shallow groundwater drawdown, and require monitoring of changes in shallow groundwater in a sufficient number of monitoring wells in the vicinity of the mapped GDEs and wildlife areas to characterize the changes in groundwater pre-transfer, during transfer pumping, and post-transfer. GW-1 should require the use of shallow groundwater level triggers that are biologically based for the type of GDEs being monitored. GDE triggers should be established based on the most vulnerable species, while ensuring protecting of all GDEs in the area. 9.204

8. Mitigation GW-1 requires that if there are no wells that meet the requirements for monitoring deep-rooted vegetation, then monitoring can be done based on visual observations by a qualified biologist (page 3.3-28). If there is significant adverse impact to a substantial percentage of the deep-rooted vegetation as a result of transfer pumping, then the seller will prepare a report on restoration activities and monitor revegetation efforts for 5 years. Mitigation GW-1 provides no guidance on what standards should be followed to establish whether deep-rooted, or shallow rooted, vegetation has been significantly impacted. There is no requirement to provide a restoration plan for agency approval prior to beginning restoration work. No requirement to confer with wildlife agencies on the adequacy of the restoration plan and work. No standards are given for how to develop a plan for vegetation restoration, how to monitor the restoration, how to determine restoration success, or to determine if the restored vegetation can survive more than 5 years. 9.205

Mitigation GW-1 doesn't require establishing a baseline condition for the deep-rooted, or shallow rooted, vegetation, or other terrestrial resources within the area of potential transfer pumping impact (See my comment no. 7) with or without wells monitoring of groundwater level changes. A baseline of the vegetation and terrestrial resource conditions is necessary so that there is a standard to measure transfer pumping impacts against. This baseline would also be used to develop a restoration plan and establish the restoration success criteria. The requirement in GW-1 to implement restoration work is based on BoR's determination that a substantial percentage of the vegetation has been lost, but there is no standard for measuring or calculating the percentage of lose (page 3.3-28). GW-1 doesn't require that a restoration plan be developed or approved by any wildlife agency, it only requires consultation with BoR and reporting of restoration activities. Only one restoration report is required at the end of 5 years or possibly earlier if restoration succeeds before that time. GW-1 doesn't require any consultation with other wildlife agencies such as U.S. Fish and Wildlife or California Department of Fish and Game, or DWR on the restoration activities. GW-1 doesn't require posting of any financial assurances to complete the work if the seller can't complete the restoration work. If restoration work isn't completed, then oversight agencies should have funds available to continue the work and complete the restoration. The financial assurances are in fact required as an element of a mitigation plan in the 2015 Water Transfer White Paper, which requires "[*a*]*dequate financial resources are available to cover reasonably anticipated mitigation needs*" (Section 3.6.2, page 36). 9.206

I recommend that mitigation GW-1 be amended to require: (1) specific technical standards for monitoring the baseline health of vegetation, both shallow- and deep-rooted, and other terrestrial resources; (2) baseline surveys be done by qualified biologist using standards and protocols acceptable to wildlife oversight agencies; (3) written documentation of the baseline vegetation, stream habitats, and terrestrial resources conditions; (4) standards for vegetation, stream, and/or terrestrial resource restoration and monitoring plans should corrective action be necessary; (5) biological monitoring out to the anticipate extent of groundwater drawdown before, during and after transfer pumping; (6) the hydrological monitoring of surface water conditions and habitats if necessary before, during and after transfer pumping; (8) provide standards and methods for establishing biologically based groundwater and surface water triggers that prevent significant impacts; and (7) standards and procedures for demonstrating and providing financial assurances for potential mitigation corrective actions prior to the start of transfer pumping. 9.207

9. In the discussion of environmental consequences and environmental impacts to rivers and creeks, the 2018 RDEIR/SDEIS relies heavily on the results of the simulations of transfer pumping drawdown from the SACFEM2013 groundwater modeling to identify potential impacts to terrestrial species, natural communities and special-status species. (Section 3.8.2, pages 3.8-10 9.208

through 3.8-26). Mitigation measure GW-1 is also relied on to reduce impacts to these resources to less than significant. However, there are several areas in the discussion of impacts and mitigations where the findings and recommendations appear to contradict one another. For example:

> In the discussion of the Sacramento River Watershed, a statement is made that: *"[i]n addition, an initial screening evaluation of modeled flows in several smaller creeks was conducted (See Section 3.8.2.1 for details). The evaluation concluded that impacts to terrestrial species in the following waterways are less than significant: …. Little Chico Creek, (Table I-1 in Appendix I of the RDEIR/SDEIS)."* (page 3.8-10, lines 10 to 18)

This statement was followed by:

> *"Historical flow data are limited or not available for …. the percentage change in flow in these streams due to the Proposed Action could not be determined. Therefore, the Proposed Action has the potential result in a greater than ten percent change in mean monthly flows and greater than one cubic foot per second (cfs) change in at least one water year type and month of the year for these streams."* (page 3.8-10, lines 19 to 25)

> *"Under the Proposed Action, …., Little Chico Creek, …. would potentially experience a greater than ten percent change in mean monthly flows and greater than one cubic foot per second (cfs) change in at least one water year type and month of the year (Table I-1 in Appendix I of the RDEIR/SDEIS)."* (page 3.8-10, lines 31 to 34).

> *"As modeled, flows in Little Chico Creek would be reduced by more than ten percent in multiple water year types during July through October (up to 100 percent of instream flows)."* (page 3.8-12, lines 4 and 5)

The rivers and creek discussion concludes that:

> *"Because flow reductions would be small and only during months when the creek is essentially dry, changes in stream flow would not substantially reduce natural communities or special-status plant and wildlife species habitat. Therefore, the Proposed Action would have a less than significant impact on natural communities and special-status species habitat along Little Chico Creek"* (page 3.8-12, lines 18 to 22).

In the discussions on natural communities and special-status species, mitigation GW-1 is relied on repeatedly to mitigate, to less than significant, impacts from reduced flows in creeks, flows to wetlands, and riparian habitats. There is a problem with the reliance on GW-1 to prevent impacts

9.208 Cont.

to terrestrial species, natural communities and special-status species from groundwater substitution transfer pumping because the mitigation measure doesn't require groundwater levels triggers to be set to protect these resources. As with vegetation mitigations discussed above in my comment no. 8, GW-1 doesn't require baseline studies; gives no technical requirements or standards for how to conduct monitoring studies, no standards for determining the level of significance of impact. Mitigation GW-1 doesn't require monitoring terrestrial species, natural communities and special-status species prior, during and post transfer pumping. Mitigation GW-1 requires monitoring of deep-rooted vegetation only within a half mile of the pumping transfer well and where pre-pumping groundwater is 10 to 25 feet deep (page 3.3-28). As discussed above in my comments nos. 3 and 7, the distance for potential drawdown is likely to be greater than a half mile from the transfer pumping well. As noted in my comment no. 7, there is no discussion or analysis of how or why terrestrial species, natural communities and special-status species shouldn't be evaluated, monitored, and protected by mitigations in pumping impact areas where the depth to groundwater is less than 10 to 25 feet. 9.208 Cont.

I recommend that the 2018 RDEIR/SDEIS be amended to clarify the apparent conflicting statements on potential impacts to rivers, streams and creeks by groundwater substitution transfer pumping. Amended to provide the information recommended in my comments nos. 3, 7 and 8.

10. The monitoring well network in mitigation GW-1 is intended to measure groundwater levels to "*... identify potential concerns for both third party impacts and irreversible subsidence based on the identified trigger points*" (page 3.3-26). The trigger levels for groundwater elevation are either existing Best Management Objectives (BMO) (See Table D-2 in Appendix D), or the historic low groundwater level when no BMO exists (page 3.3-27). Sellers of transfer water will manage groundwater levels, presumably through management of pumping, to the triggers and the initiate corrective actions in the GW-1 mitigation plan if groundwater levels reach the trigger (page 3.3-27). The primary corrective action in the GW-1 mitigation plan when groundwater levels reach the trigger is to stop pumping and then wait for levels to recover above the trigger before pumping can continue. Mitigation GW-1 doesn't provide additional specific corrective actions to mitigate potential impacts from subsidence except general statements of reimbursement to third parties for modifications need to repair affected wells or infrastructure, and other appropriate actions based on local conditions (page 3.3-29). 9.209

The 2018 RDEIR/SDEIS monitoring and mitigation measures don't require all of the monitoring or mitigation elements required in the 2015 Water Transfer White Paper, which the seller's transfer proposal is required to follow (page ES-6). For example, the 2015 Water Transfer White Paper monitoring program requires for subsidence (page 46): 2.210

(1) *"A monitoring well network that adequately covers the surface area and aquifer intervals within the affected pumping area. The Project Agencies recommend using dedicated monitoring wells to the maximum extent possible."*

(2) A "[m]*ethod to detect land subsidence or a determination that land subsidence is unlikely to occur."*

(3) *"Plans to coordinate data collection and cooperate with regional monitoring efforts."*

The 2015 Water Transfer White Paper mitigation plan also requires (page 36 and 46):

(1) *"A procedure for the transfer proponent to receive reports of purported impacts to other legal users of water or environmental resources, including reports of potential subsidence"* (page 36).

(2) *"A procedure for the seller to receive reports of purported environmental or local economic effects and to report that information to the Project Agencies and, as required, to local agencies"* (page 46).

(3) *"A procedure and schedule for investigating any reported effect."* (pages 36 and 46)

(4) *"A procedure for developing mitigation options for legitimate effects and schedule for implementing those options in cooperation with the affected third parties, including a strategy for conflict resolution."* (pages 36 and 46)

(5) *"Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs."* (page 36 and 46)

2.210 Cont.

These monitoring and mitigation requirements of the 2015 Water Transfer White Paper are missing or restricted by the requirements of mitigation GW-1. For example, GW-1 limits the monitoring network to a two-mile radius from the transfer pumping well, which conflicts with the 2015 Water Transfer White Paper requirement to "*cover the surface area within the affected pumping area.*" The coordination plan, and the evaluation and reporting requirements of GW-1 only address collection, organization and reporting of transfer pumping related monitoring data (pages 3.3-28 and 3.3-29). Mitigation GW-1 doesn't address or require procedures: (1) to develop mitigation options; (2) for scheduling implementing those options in cooperation with the affected third parties; or (3) for developing a conflict resolution strategy. Mitigation GW-1 does require that if a third party expects that the transfer may affect them, they should contact BoR and the seller with their concerns (pages 3.3-28 and 3.3-29). Mitigation GW-1 does state that non-transferring third parties could be reimbursed for groundwater substitution pumping impacts, as compared with their costs absent the transfer. However, mitigation GW-1 doesn't provide any specific procedure for calculating the increases in cost of pumping or assessing the design and cost of modifications to infrastructure. Mitigation GW-1 has no stated procedure for a third party making a claim, how and by whom a claim will be reviewed and approved, what information is required to make a claim, or whether a claim of impacts or injury that occurs after the year of the transfer pumping will be accepted. Without standards and procedures for making a claim, affected third parties will have difficulty in preparing the needed evidence for their claim, which may result in denial of the claim. 2.210 Cont.

The 2015 Water Transfer White paper states that the "*project agencies will work with the transfer proponent to develop a mutually agreed upon subsidence monitoring program consistent with Mitigation Measure GW-1 contained in the Long-Term EIS/EIR.*" (page 34). While the 2018 RDEIR/SDEIS states that all transfers must be consistent with the latest version of the Water Transfer White Paper (page ES-6). The 2015 Water Transfer White Paper requires a subsidence monitoring program unless it's determined "*… that land subsidence is unlikely to occur.*" Apparently, the 2018 RDEIR/SDEIS has made the determination that land subsidence isn't likely because groundwater level monitoring and BMO triggers required in GW-1 will prevent subsidence. However, this determination of no potential for subsidence in the transfer pumping area north of the Sacramento Delta doesn't appear to have utilize the data from the most recent December 2018 DWR subsidence report for the Sacramento Valley, attached as Exhibits 22a and 22b. In addition, GW-1 doesn't require any data be collected or analyzed to confirm that subsidence has ceased in the transfer pumping area north of the Sacramento Delta or that GW-1 will prevent transfer pumping from contributing to subsidence caused by other groundwater pumpers in the area of transfer pumping. 2.211

The 2015 Water Transfer White Paper states that "[*t*]*he monitoring program could include periodic determination of land surface elevation at strategic locations throughout the transfer area up to and including installation and monitoring of extensometers and/or continuous GPS stations.*" (page 34). Mitigation GW-1 does address the requirement for monitoring land surface elevation, subsidence or reporting on subsidence that occurred during transfer pumping. Mitigation GW-1 doesn't have a requirement for a land surface subsidence trigger that would require transfer pumping to stop if the land surface elevation dropped below the trigger elevation. Mitigation GW-1 doesn't require communication with agencies overseeing subsidence conditions, such as DWR or the USGS, or require during the proposed 6 years of transfer pumping that periodic measurements of land surface elevation be made at strategic locations to evaluate whether mitigation GW-1 has been effective at preventing subsidence. Unless covered under the "*other appropriate actions*" category for reimbursements to impacted third parties, mitigation GW-1 doesn't have any mitigation requirements or procedures to pay for additional subsidence monitoring and reporting should it be needed. For example, additional land surveys, installation and monitoring of extensometers and/or GPS stations, or other subsidence monitoring as recommended as Best Management Practice (BMP) by DWR (2016). Periodic surveys of land elevation in the transfer pumping area, regular communication with regional subsidence monitoring agencies, and regular review and reporting on the status of subsidence in the Sacramento Valley are all critical actions 2.212

needed to show that mitigation GW-1 is effective at preventing and mitigating subsidence. These actions should be added to the monitoring plan and mitigation measures in GW-1.

Mitigation GW-1 is essentially a reactive and not preventative because sellers of groundwater substitution transfer water are only required to wait until groundwater levels drop to the elevation of a pre-defined trigger before taking corrective action. The sellers aren't required to evaluate as part of the transfer proposal whether the anticipated drawdown from the proposed transfer pumping will result in groundwater levels being lower than the trigger. Mitigation GW-1 doesn't require as part of an assessment of the feasibility of a proposed groundwater substitution transfer that the sellers use the hydraulic and hydrogeologic information about a well and the adjacent aquifers gained from previous transfers. Examples include the extent and magnitude of any previous drawdown, or regional trends in groundwater levels or climate such as a downward trend in water levels or predictions that the upcoming transfer pumping season will be a below normal water year. Information of past transfer pumping drawdown could be combined with groundwater modeling with current conditions to predict the drawdown from the proposed transfer. A proposal for a groundwater substitution transfer should utilize all of the technical information available including information on trends in regional groundwater pumping and subsidence that might cause groundwater levels to hit or exceed the trigger(s). This should include predicting the drawdown from pumping other non-transfer wells. The transfer proposal assessment should determine if the transfer pumping would contribute along with other non-transfer pumping in lowering groundwater levels down to the trigger level. If this could occur, then the transfer shouldn't proceed because of the fundamental requirement that transfers cannot cause "injury to any legal user of the water involved." (page D-2 in Appendix D; Water Code Section 1810). 2.213

I recommend that mitigation GW-1 be amended to: (1) require the subsidence monitoring and mitigation measures provided in the 2015 Water Transfer White Paper and the DWR (2016) subsidence BMPs; (2) require a transfer proposal to use all available and historical data and information about the well hydraulics and the hydrogeologic characteristics of the aquifer system to evaluate the potential for the propose transfer pumping to lower groundwater levels to the triggers and/or cause subsidence; (3) require coordination with those agencies that are responsible for monitoring subsidence and utilize the most current subsidence data in the transfer proposal, (4) require the transfer seller contribute funds to monitoring subsidence in the area of the transfer pumping if the existing network isn't adequate to manage subsidence, (5) require hydrographs be reported for all transfer pumping and monitoring wells that show the all historical and transfer period groundwater level measurements and the trigger levels; (6) require annual reporting that evaluates the regional subsidence in the area that might be affected by transfer pumping, including 2.214

the results of GPS station or land surveys elevation measurements and/or extensometers readings; and (7) require transfer sellers to demonstrate that they have sufficient financial assurances to fund any potential mitigation measures

11. The 2018 RDEIR/SDEIS used the SACFEM2013 groundwater model to evaluate potential impacts from groundwater substitution pumping on groundwater levels (page 3.3-10. 3.3-13, and 3.3-20) and stream depletion (page 3.8-10). The model simulated transfer pumping from the water years (WY) 1970 to 2003. SACFEM2013 documentation is given in Appendix D of the 2014 10-Year Long-Term Draft EIS/EIR. The model was calibrated to historical conditions from WY 1970 through WY 2009. However, the simulated time period of transfer pumping was reduced to the WY 1970 to 2003 because CalSim II results are available only through 2003 (2014 DEIS/DEIR page 3.3-60). It is unclear if the model's termination at WY 2003 would capture any of the changes in groundwater conditions from 2004 to 2009. The SACFEM2013 model simulation used historical annual transfers volumes for pumping volumes, Figure 3.3-4 (page 3.3-13, lines 9 to 11). The maximum simulated one-year transfer volume is slightly greater than 300,000 AF in WY 1987 (see Figure 3.3-4). Results of the SACFEM2013 model are given for two hydrologic scenarios, WY 1976 (a critical dry year) and WY 1990 (year four of a multiyear drought). Drawdown maps of simulations of change in groundwater level are given in Appendix F. 2.215

The SACFEM2013 modeling using no data on historical conditions or transfers after 2003 is a significant limitation on the utility of the model for estimating potential impacts from the 2018 RDEIR/SDEIS proposed 6 years of groundwater substitution transfers. There have been significant changes in the condition of the groundwater and surface water resources in the Sacramento Valley in the 16 years since 2003. For example, Appendix E in the 2018 RDEIR/SDEIS presents a series of contour maps for a portion of the Sacramento Valley, Figures E-46 through E-54, that show the change in groundwater depth in three aquifer zones, shallow, (<200 feet bgs) intermediate (200 to 600 feet bgs), and deep (>600 feet bgs). These maps give contours and statistics for changes in the depth for three time intervals, 2004 to 2017, 2011 to 2017, and 2016 to 2017. Attached Exhibit 23 is a table summarizing the data in these maps that gives the maximum and average changes in depth to groundwater, by County, for the three aquifer zones and three periods. Exhibit 23 shows that: 2.216

A. The maximum decrease in the depth to groundwater between 2004 and 2017 ranged from 2.3 to 60.2 feet in the shallow zone, 3.2 to 64.3 feet in the intermediate zone, and 0 to 51.5 feet in the deep zone.
B. The maximum decrease in the depth to groundwater between 2011 and 2017 ranged from 6.9 to 34.7 feet in the shallow zone, 0.3 to 49.5 feet in the intermediate zone, and 0 to 39.6 feet in the deep zone.

C. The maximum decrease in the depth to groundwater between 2016 and 2017 ranged from 0 to 15.4 feet in the shallow zone, 0 to 8.4 feet in the intermediate zone, and 0 to 4.0 feet in the deep zone.
D. The annual rate of maximum decrease in depth to groundwater between the year 2011 and 2017 is generally greater than the annual rate from 2014 to 2017. This suggests that groundwater levels declined faster during the later years.
E. The one-year rate of maximum decrease in depth to groundwater in 2016 to 2017 is greater than the annual rate of decline between 2004 and 2017 in eight out of the eighteen areas, or 44 percent. This suggests that at least locally the groundwater system continues to decline.

Exhibit 23 also gives the average change in the depth to groundwater, which generally shows a decline, but sometimes a rise. In particular, the average change in 2016-2017 shows a rise even though the maximum decline is often greater than the long-term annual averages. This seeming contradiction points to an important issue when using groundwater level statistics, mainly, that the location of the measurement is important. The distribution of the locations for measurements used for a statistic like the average can significantly impact the utility of the information. A statistic like an average doesn't take into account the location of the information. Therefore, when a number of measurements are taken in proximity, they can have a similar value and unreasonably weight the average. For example, the significance of a decrease in depth to groundwater of 50 feet at one location can be reduced by ten measurements of a 5-foot increase measured in a small area or scattered throughout the basin. The resulting 0-foot average change hides the significance of a developing large groundwater depression. The fact that in one area there was a 50-foot decline in water level is critical information about the state of the basin. Therefore, understanding the changes in the depth of the groundwater in a basin requires knowledge of the distribution of the changes, which are best shown by contour maps like Figures E-46 to E-54, the maximum decrease in depth, and the long-term annual rate of change in depth. Average values are of little value for understanding the state of the basin unless the data are collected at appropriate locations and properly weighted in calculating the statistic. 2.216 Cont.

Figures E-46 to E-54 show that a number of areas of decreased groundwater depth throughout the Sacramento Valley, likely the result of ongoing pumping that exceeds recharge. With the long-term continuation of depletion, the depth of the depression increases, and width expands when the rate of recharge is less than the rate of extraction. The greater annual rate of decrease in WY 2011 to 2017 suggests that volume of recharge is less than the volume of extraction. Some of these depressions are associated with areas of subsidence. Compare the groundwater depth depressions around Orland, and Williams to Woodland, with the land subsidence measurements shown in Exhibits 22a and 22b. Therefore, the SACFEM2013 model likely fails to 2.217

accurately simulate the potential of transfer pumping impacts for the proposed project because it doesn't report on basin conditions after 2003.

Recently updated groundwater change maps for the Sacramento Valley for WY 2004 to 2018 are attached as Exhibits 24a to 24d[7]. The areas of groundwater depression are similar to those in E-46, E-49 and E-52, although the width of the depressions appears to be greater in the 2018 maps. The overall maximum change in depth of groundwater is also greater for all areas except the Redding area. 2.218 Maximum groundwater decline during the 14 years and annual decline are now respectively, 57.7 feet and 4.12 feet per year for the shallow zone, 70.6 feet and 5.04 feet per year for the intermediate zone, and 112.4 feet and 8.03 feet per year for the deep zone. The 2018 groundwater change maps now provide statistics on groundwater elevation change by DWR subbasin, which is useful for implementing SGMA.

There is an additional issue with the SACFEM2013 modeling in that the simulations are for historical transfer values, not the proposed 2018 RDEIR/SDEIS maximum annual transfer of 250,000 acre-feet. It is unclear if the simulated volume of groundwater pumped is equal to the transfer value or to the value necessary to replace the irrigation water needed to meet crop requirements. The 2018 RDEIR/SDEIS notes on page 3.3-1 that "*[t]he volume of groundwater pumped is higher than the total volume of surface water transferred to account for the streamflow* 2.219 *depletion losses and carriage water.*" The carriage water loss values are said to typically range from 20 to 30 percent of the transfer volume (page 2-13). The streamflow depletion value, BoR-SDF, for a groundwater substitution transfer is assumed to be that in the 2015 Water Transfer White Paper, or 13 percent of the transfer amount (See page ES-6 and my comment no. 2). This results in a range of loss of 33 to 43 percent for a groundwater substitution transfer.

The maximum annual transfer amount for the 6-year project is up to 250,000 acre-feet (page 2-2). There is a question of what amount of groundwater would need to be pumped to maintain the crops that were irrigated by the transferred surface water. This can be estimated by accounting for the losses in transfer water of 33 to 43 percent resulting from the BoR-SDF and the carriage water loss. 2.220 For example, if the crop was irrigated with 1,000 acre-feet of surface water, the maximum amount of allowable transfer water would range from 570 to 670 acre-feet. If it is assumed that the crop needs 1,000 acre-feet of irrigation, then the ratio of groundwater pumped to transferred water ranges from 1.5 to 1.75 (1,000 / 670 = 1.5; 1,000 / 570 = 1.75). Therefore, the proposed transfer of up to 250,000 acre-feet per year would require pumping 375,000 to 437,500 acre-feet of groundwater each year to meet the same irrigation demand.

---

https://data.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps

Based on size of the graph bars for simulated annual groundwater substitution transfer volume in Figure 3.3-4, the SACFEM2013 modeling doesn't appear to have simulated the maximum groundwater volume that would need to be pumped in any one year or during the combined 6 years that the project is proposing. Because depletion of groundwater storage and stream 2.221
depletion increase in rate, volume and area with greater pumping, and the impacts accumulate with each subsequent pumping event, the groundwater modeling effort should have simulated multiple years of pumping at the project's maximum volume and rate to fully calculate changes under recent hydrological conditions to reasonably assess the project's potential environmental impacts.

The modeled area for SACFEM2013 that's reported in the 2018 RDEIR/SDEIS doesn't extend south into the Delta area (See Figures F-1 to F-6). Table D-1 (page D-6) lists the Northern Delta Groundwater Sustainability Agency (GSA) as part of the Solano subbasin and indicates declining groundwater levels and salt intrusion as the reasons for the high CASGEM priority ranking under SGMA. Exhibit 25 is a Spring 2017 groundwater contour map for Delta and southern Sacramento Valley areas. The map shows a red line for sea level or zero elevation contour that defines a north-south oriented trough, along with added labels that identify the low points inside the sea level contours. This elongated trough is likely caused by groundwater pumping in excess of recharge and likely intercepts fresh groundwater that historically flowed from the Sierra Nevada 2.222
towards the Delta. Pumping by several of the proposed groundwater transfer agencies in Placer and Sacramento counties will likely increase the interception of fresh groundwater and possibly surface water to the Delta by expanding the depression that forms the north-south below-sea-level trough and/or increasing depletion from the rivers draining off the Sierra Nevada. The SACFEM2013 modeling does show drawdown in aquifer zones in the Placer and Sacramento counties in Figures F-1c to F-6c, but fails to analyze or assess the potential impacts to the Delta groundwater levels or quality from transfer pumping. A lack of fresh water flowing into the Delta likely contributes to the salinity problem in the quality of the groundwater. The lack of analysis, monitoring and mitigation measures for salinity issues in the Delta is a significant deficiency in the 2018 RDEIR/SDEIS.

The 2018 RDEIR/SDEIS only briefly mentions the fact that the transfer source areas in the Sacramento Valley are ranked as medium to high CASGEM priority and need a groundwater sustainability plan as required by SGMA (See Mitigation Measure GW-1 page 3.3-25; Table D-1 in Appendix D; my comment no. 4 and my Exhibit 4). Many of the basins have been operating 2.223
under existing Groundwater Management Plans, yet they are ranked medium to high priority (See Table D-2 in Appendix D). Several general reasons for the CASGEM rankings listed in Table D-1 for the Sacramento Valley subbasins suggest there are already undesirable results, high-priority basins are ranked because of:

A. Participation in Type A groundwater transfers (Redding-Anderson and Sutter subbasins).
B. Localized groundwater quality issues and subsidence (Yolo subbasin).
C. Declining groundwater levels and localized groundwater quality issues (West Butte subbasin).
D. Localized groundwater contamination and declining groundwater levels (North and South American subbasin). 2.223 Cont.
E. Declining groundwater levels, localized groundwater quality issues, and increased housing development (Colusa subbasin).
F. Declining groundwater levels and salt intrusion (Solano subbasin).

The SACFEM2013 model simulations don't appear to address the question of potential transfer impacts on groundwater basin sustainability and the development or expansion of undesirable results [See Water Code Section 10721(x)] because these issues aren't specifically acknowledged except in Table D-1.

In summary, the SACFEM2013 groundwater modeling likely doesn't accurately evaluate the potential impacts from the proposed 2018 RDEIR/SDEIS 6-year transfer project because:

A. The model year terminates at 2003, which doesn't account for documented decreases in groundwater levels from 2004 to recent years. 2.224
B. The modeling didn't simulate the proposed transfers at the maximum rate being requested by the project for each of the 6 years.
C. The volume of groundwater pumped in the simulations, while unstated, likely isn't the amount of water needed to maintain crops when the project maximum annual transfer volume of 250,000 acre-feet is made entirely by groundwater substitution.
D. The model doesn't appear to address the conditions in the subbasins identified in the SGMA rankings or how the transfers will affect the continuation or development of undesirable results and groundwater sustainability.

I recommend that the groundwater modeling for evaluating the impacts from groundwater substitution pumping for the proposed 6-year transfer project be revised to: (1) use the current hydrologic conditions in the Sacramento Valley and Delta areas; (2) analyze the changes to groundwater and surface water resources from pumping at the maximum rates and volumes associated with the maximum transfer volume; (3) analyze the changes to groundwater and surface water resources from pumping for a continuous 6 years at the maximum rate; (4) analyze 2.225

the effects of groundwater pumping on salinity in the Delta; (5) evaluate the long-term impacts to groundwater and surface water resources such as storage depletion, stream depletion and GDEs; and (7) evaluate the impact the transfer pumping will have on subbasin SGMA sustainability and the creation or continuation of undesirable results.

References Cited

CH2MHill, 2010, Technical Memorandum - Groundwater Substitution Transfer Impact Analysis, Sacramento Valley, To: Abdul Khan/California Department of Water Resources and Bob Niblack/California Department of Water Resources, From: Peter Lawson/CH2M HILL, Redding, California, March 29, 2010, Project No. 376301.08.01, pp. 21.

Department of Fish and Wildlife, 2019, Instream Flow Program web site, https://www.wildlife.ca.gov/Conservation/Watersheds/Instream-Flow.

Department of Water Resources and Bureau of Reclamation-Mid Pacific Region, 2015a, Addendum to DRAFT Technical Information for Preparing Water Transfer Proposals (Water Transfer White Paper), May 2015, (https://water.ca.gov/LegacyFiles/watertransfers/docs/2015_Water_Transfer_Guidelines_Addendum.pdf).

Department of Water Resources and Bureau of Reclamation-Mid Pacific Region, 2015b, DRAFT Technical Information for Preparing Water Transfer Proposals (Water Transfer White Paper) Information for Parties Preparing Proposals for Water Transfers Requiring Department of Water Resources or Bureau of Reclamation Approval, December 2015, (https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Technical-Information--for-Preparing-Water-Transfer-Proposals-December-2015.pdf).

Department of Water Resources, 2016, Monitoring Networks and Identification of Data Gaps Best Management Practice, BMP 2, December 2016,

https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-2-Monitoring-Networks-and-Identification-of-Data-Gaps.pdf

Department of Water Resources, 2018a, Sacramento Valley Subsidence Network Fact, 2017 Sacramento Valley GPS Survey Project Fact Sheet, December 2018,

(https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Regional-Reports/2017_Sacramento_Valley_Subsidence_Survey_Project_Factsheet.pdf).

Department of Water Resources, 2018b, 2017 GPS Survey of the Sacramento Valley Subsidence Network Report, December 2018, p. 103, (https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Regional-Reports/2017_GPS_Survey_of_the_Sacramento_Valley_Subsidence_Network.pdf).

Department of Water Resources, Groundwater Sustainability Agency Map Viewer GIS web site (https://sgma.water.ca.gov/webgis/index.jsp?appid=gasmaster&rz=true).

Department of Water Resources, Natural Communities Dataset Viewer GIS web site, (https://gis.water.ca.gov/app/NCDatasetViewer/#).

Department of Water Resources, Groundwater Information Center Interactive Map Application GIS web-site, (https://gis.water.ca.gov/app/gicima/).

Department of Water Resources, Northern Sacramento Valley Groundwater Elevation Change Maps, California Open Data Portal, (https://data.ca.gov/dataset/northern-sacramento-valley-groundwater-elevation-change-maps).

Faunt, C.C., R.T. Hanson, K. Belitz, W. Schmid, S.P. Predmore, D.L. Rewis, and K. McPherson. 2009, Numerical model of the hydrologic landscape and groundwater flow in California's Central Valley, Chapter C - *Groundwater availability of the Central Valley Aquifer, California*, ed. C.C. Faunt, pgs. 121–212. U.S. Geological Survey Professional Paper 1766. Reston, Virginia, (https://ca.water.usgs.gov/projects/central-valley/central-valley-hydrologic-model.html).

Glenn-Colusa Irrigation District, June 2015, Environmental Impact Report for the Glenn-Colusa Irrigation District Groundwater Supplemental Supply Project, Prepared by CH2MHill, Redding, California, (https://www.gcid.net/groundwater-supplemental-supply-project).

Izbicki, J.A., Wright, M.T., Seymour, W.A., McCleskey, R.B., Fram, M.S., Belitz, K., Esser, B.K., 2015, Cr(VI) Occurrence and Geochemistry in Water from Public-Supply Wells in California, Applied Geochemistry, v. 63, pgs. 203-217. (http://dx.doi.org/10.1016/j.apgeochem.2015.08.007) This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/)

Konikow, L.F. and Leake, S.A., 2014, "Depletion and Capture: Revisiting "The Source of Water Derived from Wells", *USGS Staff -- Published Research.* Paper 832.

(http://digitalcommons.unl.edu/usgsstaffpub/832).

Leake, S.A., Greer W., Watt, D., and Weghorst, P., 2008, Use of superposition models to simulate possible depletion of Colorado River water by ground-water withdrawal: U.S. Geological Survey Scientific Investigations Report 2008-5189, 25 p., (https://pubs.usgs.gov/sir/2008/5189/).

Leake, S.A, Reeves, H.W., and Dickinson, J.E., 2010, A New Capture Fraction Method to Map How Pumpage Affects Surface Water Flow, vol. 48, No. 5, Ground Water, September-October 2010 (pages 690–700),
(https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1745-6584.2010.00701.x).

Northern California Water Association, 2014, Sacramento Valley Groundwater Assessment, Active Management – Call to Action, Technical Supplement, prepared by Davids Engineering, Macaulay Water Resources, and West Yost Associates, June 2014, pp. 91
(http://www.norcalwater.org/res/docs/NCWA_supp-web.pdf).

The Office of Environmental Health Hazard Assessment (OEHHA), Toxicological summary of Chromium VI, from Proposition 65 Warning web site, accessed February 17, 2019, (https://www.p65warnings.ca.gov/fact-sheets/chromium-hexavalent-compounds-chromium-6-chromium-vi).

State Water Resource Control Board, GeoTracker map web site,
(https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento).

State Water Resource Control Board, GeoTracker-GAMA map web site,
(https://geotracker.waterboards.ca.gov/gama/gamamap/public/).

List of Attached Exhibits

1. Map showing simulated shallow groundwater drawdown, Figure 3-6 from 10 GCID supply wells taken from June 2015, Environmental Impact Report for the Glenn-Colusa Irrigation District (GCID) Groundwater Supplemental Supply Project.
2. Map showing simulated shallow groundwater drawdown from 10 GCID supply wells and DWR Bulletin 118 subareas, taken from June 2015, Environmental Impact Report for the Glenn-Colusa Irrigation District Groundwater Supplemental Supply Project.
3. Map showing simulated shallow groundwater drawdown from 10 GCID supply wells taken from June 2015 Environmental Impact Report for the Glenn-Colusa Irrigation District Groundwater Supplemental Supply Project on a base map from DWR, Northern Region, Domestic Well Depth Summary with Depth to Groundwater Contours for Wells Screened at Depths Less Than 150 ft., January 2014.
4. Map of DWR Bulletin 118 subbasins in Sacramento Valley with SGMA-CASGEM priority, taken from DWR GSA map viewer GIS web site, February 2019.
5. Konikow L.F. and Leake, S.A., 2104, "Depletion and Capture: Revisiting "The Source of Water Derived from Wells", *USGS Staff -- Published Research.* Paper 832.
6. Konikow L.F. and Leake, S.A., 2104, a) Figure 1 graph of fraction for each source of water to a well with pumping duration; and b) Figure 14 graph showing simulated fraction of capture and groundwater storage depletion in years 1961 to 2003 in Central Valley California based on 2009 USGS Central Valley Hydrologic Model, Faunt and others, 2009.
7. CH2MHill, 2010, P. Lawson, Groundwater Substitution Transfer Impact Analysis, Sacramento Valley, March 29, 2010.
8. Leake, S.A, Reeves, H.W., and Dickinson, J.E., 2010, A New Capture Fraction Method to Map How Pumpage Affects Surface Water Flow, vol. 48, No. 5, Ground Water, September-October 2010, pgs. 690–700.
9. Three composite maps, a, b, and c, showing Geotracker contaminated sites from Figure E-55 overlain with outlines of 200- to 300-foot aquifer model simulation drawdown boundaries for 1990 conditions from SACFEM2013 model. Figures F-5a, F-5b, and F-5c in Appendix F of 2018 RDEIR/SDEIS.
10. Map of Geotracker contaminated sites in the Redding area, data not included in 2018 RDEIR/SDEIS Figure E-55, accessed February 16, 2019.
11. Three maps, a,b and c, taken from Geotracker-GAMA web site showing the number of wells contaminated by one or more pesticides in the transfer source area north of the Sacramento Delta, accessed February 11, 2019.
12. Table of the number of wells in ten counties in the Sacramento Valley contaminated by Chromium VI, Nitrate-N and Total Dissolved Solids; data from Geotracker-GAMA web site, accessed March 5, 2019.

13. Ten maps, a through j, taken from Geotracker-GAMA web site showing Chromium VI contaminated wells by county in Sacramento Valley, accessed March 5, 2019.
14. Ten maps, a through j, taken from Geotracker-GAMA web site showing Nitrate-N contaminated wells by county in Sacramento Valley, accessed March 5, 2019
15. Ten maps, a through j, taken from Geotracker-GAMA web site showing wells with Total Dissolved Solids (TDS) => 1,000 mg/L by county in Sacramento Valley, accessed March 5, 2019
16. Two maps, a and b, taken from Isbecki and others, 2015. Exhibit 16a, Figure 1 from Isbecki and others showing areal extend of chromium containing rocks and soils in California. Exhibit 16b, Figure 3 from Isbecki and others, showing hexavalent chromium, Cr(VI), concentrations in water from public-supply well in California. Exhibit 16c is copy of full article.
17. OEHHA Toxicological summary of Chromium VI, from Proposition 65 Warning web site, accessed February 17, 2019,
18. Map of groundwater dependent ecosystems in central Sacramento Valley around Sutter Buttes taken from DWR's Natural Communities Dataset Viewer web site, accessed February 7, 2019.
19. Three maps, a, b and c, color shaded Spring 2018 groundwater depth contours of northern, middle and southern Sacramento Valley, from DWR's Groundwater Information Center Interactive Map Application, access February 9, 2019.
20. A composite map of Exhibit 18 groundwater dependent ecosystems and Exhibit 19b color shaded groundwater depth contours for middle Sacramento Valley around Sutter Buttes.
21. Table tabulating characteristic of 22 simulated hydrographs out of 34 selected well locations on "Simulated Changes in Groundwater Levels from Groundwater Substitution Transfers in Hydrographs at Selected Locations in SACFEM 2013 Model Results from 2014 BoR 10-Year Long-Term Transfer DEIS/DEIR for Wells Where Non-Pumping GWL is <= 10 feet bgs."
22. Department of Water Resources, a) 2017 Fact Sheet, and b) full 2018 report on 2017 GPS Survey of the Sacramento Valley Subsidence Network, December 2018.
23. Table of groundwater level changes in Sacramento Valley, 2004 to 2017, taken from Figures E-46 to E-54 in Appendix E of the 2018 RDEIR/SDEIS.
24. Four maps of Northern Sacramento Valley Change in Groundwater Elevation Maps, Spring 2004 to Spring 2018, dated August 2018: a) shallow wells, < 200 ft bgs – Plate 1S-B; b) intermediate wells, 200 to 600 ft bgs – Plate 1I-B; c) 100 to 450 ft bgs wells – Plate 1C-B; d) deep well, > 600 ft bgs – Plate 1D-B.
25. Map of Spring 2017 Groundwater Elevation Contours in the Delta and Southern Sacramento Valley, from Department of Water Resources, Groundwater Information Center Interactive Map Application GIS web-site.

Exhibit B

Summary

The Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report Public Draft (henceforth referred to as the "EIR/EIS") articulates an ambitious plan to transfer water within the state of California. But this ambition is not matched by a similar degree of technical merit, as the modeling components of the EIR/EIS are potentially inadequate, inaccurate, and insufficient to the task. Because of this shortcoming, the EIR/EIS fails to demonstrate that environmental impacts of these transfers will be acceptably small. In particular, the groundwater substitution components of the proposed water transfers are based on modeling assumptions that likely limit their practical accuracy, and on computational simulation techniques that cannot be trusted for their intended use without additional work.

The EIR/EIS as written fails to make a technically-persuasive case for these water transfers, and therefore the proposed transfers should be rejected until the various water transfer stakeholders can advocate more effectively for these transfers by using sound scientific principles instead of mere assertions of negligible impact on the environment.

Critique Overview

This critique concentrates on the groundwater modeling portions of the EIR/EIS, as those portions of the EIR/EIS provide the least technical information relative to the importance of this particular part of the transfer plans. Groundwater resources are seldom seen directly, but their influence is present throughout the hydrological cycle. When the water table sinks, streams dry up and fish die. And when that phreatic surface drops below the level available to domestic water-supply wells, families lose their water supply. Groundwater mining is an all-too-common source of environmental woes, including irreversible loss of aquifer capacity and subsidence observable at the surface of the ground. So accurate groundwater modeling is an essential component of any trustworthy assessment of potential negative environmental effects.

This critique focuses on four particular aspects of the groundwater modeling efforts outlined in the EIR/EIS, namely:

- the lack of a defensible technical basis for the use of the SacFEM2013 groundwater model in assessing man-made hazards due to groundwater substitution activities,
- the inherent assumptions and potential inaccuracies present in the SacFEM2013 model, including an exposition of how better groundwater modeling techniques could have been deployed to engender more trust in the computed results,
- the lack of any formal characterization of uncertainty in the model that might be used to assess the impact of those SacFEM2013 model inaccuracies, and
- some general comments on the EIR/EIS's all-too-often inadequate technical treatment of aquifer mechanics.

Sins of omission and commission are thus found in the EIR/EIS, and this critique will attempt to guide the reader through a discussion of each, towards the goal of more accurate and technically-defensible modeling that would be required to support the proposed water transfers.

Professional Background

My professional experience has long been concentrated in the development and deployment of large-scale computational models for engineered and natural systems. I have worked in this professional field for well over thirty years, and have published refereed journal publications on subsurface mechanics and computational simulation of geological processes, as well as texts and related educational works on computational modeling in solid and fluid mechanics. I have served as a regular faculty member on the Civil Engineering faculties of two major U.S. research universities (the University of California, Davis, and the University of Oklahoma), as well as in leading-edge technical and administrative capacities at federal national laboratories. With my academic colleagues and graduate students, I have published journal articles and technical reports on aquifer mechanics, computational geomechanics, fluid-solid interaction, high-performance computing, and on the inherent limits to accuracy of computational modeling for complex systems in the presence of inherent uncertainties. I have an earned M.S. and Ph.D. in Civil Engineering and a B.S. in Mathematics, all from the University of California, Davis. I have lived in Northern California for more than one-half of my adult life, and have long provided *pro bono* technical assistance on science and engineering topics of import to the quality of life for residents of California. My current work involves simulation of complex man-made and natural systems using some of the largest computers in the world, and so I am well-equipped to describe the state-of-the-art in predictive modeling for large-scale water transfers in California.

Overview of Technical Concerns

This review focuses primarily on the groundwater substitution aspects of the EIR/EIS, because those aspects are where my own expertise is deepest. The groundwater model utilized in the EIR/EIS has enough shortcomings to call into question the trustworthiness of the entire EIR/EIS, and until these shortcomings are remedied, such groundwater transfers should not be permitted. Some representative problems with the SACFEM2013 model are presented below.

Fundamental Technical Problems with the SacFEM2013 Model

In simplest terms, the EIR/EIS fails to make a compelling case for the use of the SacFEM2013 groundwater model in assessing man-made hazards due to groundwater substitution activities.

For example Appendix D of the EIR is provided to document the SacFEM2013 model, but this section of the EIR/EIS raises more questions than answers about the suitability of the model. Some of the assertions made in Appendix D are incorrect, while others are irrelevant to the purpose of the EIR/EIS. And the most fundamental problem with the information presented on the SacFEM2013 model is that Appendix D fails to provide enough technical context to justify the use of SacFEM2013. A technically-informed citizen interested in providing accurate public commentary on the EIR/EIS must search the literature and other open-source documents to find relevant information about the suitability of the SacFEM2013 model. Unfortunately, these searches prove fruitless, because there simply is not enough information provided in the EIR/EIS to perform a technically-defensible characterization of the suitability of SacFEM2013. Because of this, some of the my comments include qualifiers such as “appears to be” or “apparently”. These qualifiers do not imply any insufficiency in my own understanding: they are explicit reminders that the EIR/EIS fails to provide an adequate technical basis for use of SacFEM2013.

One example of incorrect modeling assertions in the EIR/EIS is the characterization[1] of SacFEM2013 and its parent code MicroFEM as "three-dimensional" and "high-resolution". In fact, the SacFEM2013 model provides only a linked set of two-dimensional analyses[2], and would more charitably be described as "two-and-a-half dimensional" instead of possessing a fully-3D modeling capability. This limitation is not an unimportant detail, as a general-purpose 3D groundwater model could be used to predict many important physical responses, e.g., the location of the phreatic surface within an unconfined aquifer. For the SacFEM2013 model, this prediction is part of the data instead of part of the computed solution, and hence SacFEM2013 apparently has no predictive capability for this all-important aquifer response. Here is the relevant EIR/EIS content on this topic[3]:

> The uppermost boundary of the SACFEM2013 model is defined at the water table. To develop a total saturated aquifer thickness distribution and, therefore, a total model thickness distribution, it was necessary to construct a groundwater elevation contour map and then subtract the depth to the base of freshwater from that groundwater elevation contour map. Average calendar year groundwater elevation measurements were obtained from the DWR Water Data Library. These measurements were primarily collected biannually, during the spring and fall periods; and these values were averaged at each well location to compute an average water level for each location. These values were then contoured, considering streambed elevations for the gaining reaches of the major streams included in the model, to develop a target groundwater elevation contour map for the year 2000.

Note that, in order to begin a SacFEM2013 analysis, the phreatic surface must be specified instead of predicted, and that this specification is based on past records of water table location instead of on verifiable accurate predictions of future groundwater resources. Since California is currently in an unprecedented drought, and because the assessment of similarly-unprecedented future large-scale groundwater transfers is the whole point of the EIR/EIS, it is technically inappropriate to use an averaged historical basis to locate the water table surface simply because the SacFEM2013 is unable to predict that important parameter from first principles!

A good example of an irrelevant assertion in the EIR/EIS is the list of reasons given[4] why MicroFEM was chosen as the modeling platform. The first reason is true of *any* finite-element code used to model groundwater response, and the second and third arise from the existence of a graphical user interface for the model input and output data. Any modern computational tool (e.g., the word-processing application I'm using to write this critique) possesses such a user interface, so all three reasons apply equally well to any well-designed finite element application, yet they are used to motivate the choice of only one such application. Why this specific choice of MicroFEM was made is never developed in the EIR/EIS, but it should be, as with the choice of computational model comes a set of model constraints that can limit the model's utility.

> ***Technical sidebar:*** *finite element models are particularly easy to develop and deploy graphical user interfaces for, because the interpolation scheme used to generate the finite element results provides uniquely-defined and easy-to-compute results for every point in the spatial domain. In addition to this readily-accessible supply of spatial data available for visual interpretation of results, these models also can produce results at regular time*

---

[1] *EIR/EIS, Appendix D, Page 1*
[2] *S.A. Leake and P.A. Mock, "Dimensionality of Ground Water Flow Models", Ground Water, Volume 35, Number 6, Page 930, 1997*
[3] *EIR/EIS, Appendix D, Page 4*
[4] *EIR/EIS, Appendix D, Page 1*

intervals (e.g., monthly) that make it easy to generate animations of the spatial data. So the presence of a graphical user interface is a poor reason to choose a particular finite element application, as custom visualization tools are readily developed at low cost to support the use of the model, or public-domain visualization tools can be utilized instead.

Unfortunately for the results presented in the EIR/EIS, MicroFEM is a poor choice for such large-scale modeling. It is an old code that apparently utilizes only the simplest (and least accurate) techniques for finite-element modeling of aquifer mechanics, and MicroFEM (and hence SacFEM2013) embed serious limitations into the model that compromise the accuracy of the computed results. These limitations include, but are not limited to, the following:

- The model places a remarkably-low upper limit on problem resolution, i.e., 250,000 surface nodes are available to the modeler, but no more. This limit would appear to the technically-oriented reader to indicate that the advanced age of the MicroFEM program has constrained its software architecture so that high-resolution and high-fidelity models are beyond its capabilities. In particular, its MS/DOS origins might indicate an inability to address sufficient computer memory to support a higher-resolution model, or that its solver routines do not scale to support the multiple-processor capabilities available on virtually all current computers. If this is the case, then this problem should be explicitly noted in the EIR/EIS as a model limitation. If it is not the case, then some justification for this upper limit should be provided to aid in the impartial evaluation of the SacFEM2013 model.
- As mentioned above, the SacFEM2013 model is only partially predictive, in that some aquifer responses are entered as input data instead of being computed as predictive quantities. The most serious of these is the lack of ability to predict the location of the phreatic surface in the aquifer. This location is a natural candidate as the single the most important predicted quantity available for understanding near-surface environmental effects of groundwater motion, yet it is apparently not computed by SacFEM2013, which instead relies on its location via the a priori data-entry process quoted above.
- As mentioned earlier, the model is not a three-dimensional model, but instead estimates groundwater response via approximations involving a suite of two-dimensional layers with uniform horizontal permeabilities coupled via estimated leakage parameters that represent the actual three-dimensional flow fields of groundwater resources. The limitations of this self-induced model constraint are outlined in more detail below, but the summary is simple enough: the real-world complexities of California's groundwater aquifers are over-simplified by the SacFEM2013 model into no more than 25 available two-dimensional layers of uniform composition, and hence the model results are at best computational simplifications not necessarily representative of actual groundwater responses to pumping.

In addition to the model not being a true 3D model of the actual geometric nature of the state's groundwater resources, some other problems with the model include the following:

- The model requires considerable data manipulation to be used, and these manipulations are necessarily subject to interpretation. This fact implies that the model results depend on the choices made by the analyst, and are hence not necessarily reproducible. In other words, adjusting of the results (by accident or by design) is an inherent characteristic of the model, and that characteristic alone erodes trust in the model. There are technically-defensible ways to provide accurate assessments of how such adjustments might affect output results used in decision-making (e.g., sensitivity analyses for these parameters), but these means for evaluating trust in the model are not mentioned in the EIR/EIS, and one can only conclude that they have never been performed.

- The model description in the EIR/EIS presents no validation results that can be used to provide basic quality-assurance for the analyses used in the EIR/EIS. The reader can seek information on the parent code MicroFEM, but precious little data is available on that code's capabilities, so the question of "can the results of this model be trusted?" is not answered by the EIR/EIS. An expert reviewing the EIR/EIS might seek to examine the MicroFEM code directly, but the underlying source code is not available, and the MicroFEM tool can only be purchased for a substantial fee ($1500), so it is infeasible to gain informed public comment on the suitability of MicroFEM or SacFEM2013 without paying a substantial price.
- The model is not predictive in some aquifer responses (as mentioned above), so its results are a reflection of past data (e.g., streamflows, phreatic surface location, etc.) instead of providing a predictive capability for future events. Since accurate prediction of future environmental effects is the whole point of the EIR/EIS, the SacFEM2013 model is arguably not even suitable for use in the EIR/EIS, much less in real-world hydrological practice.

The problem of data manipulation mentioned in the first bullet above represents a serious limitation of the SacFEM2013 model. Model quality can be measured by standard quality-assurance processes utilized for software development, such as the CMM model[5] widely used in software practice. The five stages of increasing quality in the CMM model are termed ad hoc (or chaotic), repeatable, defined, managed, and optimized, and the repeatable stage is generally accepted as the minimal level of quality appropriate for any critical analysis methodology. Since analyst intervention in data preparation creates an obvious risk of analyst dependencies in the output data used to set policy, the current SacFEM2013 workflow is likely only at the "ad hoc/chaotic" state of quality assurance for a model. This is simply not appropriate for critical analyses that are used in decision-making on such important resources as water in California.

A typical example of analyst intervention in data preparation can be found in Appendix D of the EIR/EIS[6]:

> After a transmissivity estimate was computed for each location, the transmissivity value was then divided by the screen length of the production well to yield an estimate of the aquifer horizontal hydraulic conductivity (Kh). The final step in the process was to smooth the Kh field to provide regional- scale information. Individual well tests produce aquifer productivity estimates that are local in nature, and might reflect small-scale aquifer heterogeneity that is not necessarily representative of the basin as a whole. To average these smaller scale variations present in the data set, a FORTRAN program was developed that evaluated each independent Kh estimate in terms of the available surrounding estimates. When this program is executed, each Kh value is considered in conjunction with all others present within a user-specified critical radius, and the geometric mean of the available Kh values is calculated. This geometric mean value is then assigned as the representative regional hydraulic conductivity value for that location. The critical radius used in this analysis was 10,000 meters, or about six miles. The point values obtained by this process were then gridded using the kriging algorithm to develop a Kh distribution across the model domain. The aquifer transmissivity at each model node within each model layer was then computed using the geometric mean Kh values at that node times the thickness of the model layer. Insufficient data were available to attempt to

---

[5] *M.C. Paulk, C.V. Weber, B. Curtis, M.B. Chrissis, "Capability Maturity Model for Software (Version 1.1)". Technical Report, Software Engineering Institute, Carnegie Mellon University, 1993*

[6] *EIR/EIS, Appendix D, Page 13*

> subdivide the data set into depth-varying Kh distributions, and it was, therefore, assumed that the computed mean Kh values were representative of the major aquifer units in all model layers. The distribution of K used throughout most of the SACFEM2013 model layers is shown in Figure D-4. During model calibration, minor adjustments were made to the Kh of model layer one east of Dunnigan Hills and in model layers six and seven in the northern Sacramento Valley based on qualitative assessment of Lower Tuscan aquifer test data in this area.

Note the presence of terms such as "adjustments", "assumed", "insufficient data", and "representative". What is being described in this paragraph is a potentially non-repeatable process that converts the three-dimensional permeability tensor into a homogenized number Kh that is then used to estimate conductivity in a plane parallel to the ground surface. Permeability is a local tensorial property of the aquifer (i.e., it varies from point to point in the 3D subsurface domain), but the resulting Kh is smeared across the domain to convert this tensor with six independent spatially-dependent components into a single number that is applied over a huge geographical area instead. And this conversion is subject to the judgment of each analyst, so the results depend on the skill (or lack thereof) of the particular analyst doing the modeling.

> ***Technical sidebar:*** *it is remarkably straightforward to perform accurate and technically-defensible computational analyses to assess the ultimate effect of these data adjustments. One of the most easily-deployed of these techniques is the use of a sensitivity analysis that measures how computed output results depend on adjustments to input parameters. Sensitivity analyses are readily grafted onto nearly any computational model, and while these computations require more effort than not using them, most of the additional effort can readily be offloaded to the computer, so that undue levels of human efforts are not required for their application. Formal sensitivity analyses can also be used to aid in the assessment of model uncertainty (see discussion below), so their omission in the EIR/EIS is a mystery to the technically-informed impartial reviewer of the EIR/EIS.*

And that's only the tip of the larger iceberg of problems with these ad hoc techniques. It is actually quite easy to avoid all these adjustments and oversimplifications entirely, and treat the aquifer as it is, namely as a true three-dimensional physical body of large extent, with a time-varying location of the water table, and with accurate treatment of the complex hydraulic conductivity inherent to the subsurface conditions of California. It's also remarkably simple to include poromechanical effects (see discussion below) in such a 3D model so that accurate local and regional estimates of environmental impacts such as subsidence and loss of aquifer capacity can be predicted and validated. All of this technology has been available for decades, but it is not utilized in the SacFEM2013 model. *The citizens of California clearly deserve a better model for decision-making involving one of their most precious resources!*

Regarding The Need to Characterize Uncertainty in Engineered and Natural Systems

Some discussion is warranted at this point on the difference between a natural and an engineered system, towards the goal of appreciating why characterizing uncertainty in any proposed water-transfer strategy is an essential goal of a well-considered EIR/EIS. An engineered system is designed entirely by humans, so each component of that system is reasonably well-understood *a priori*, and the uncertainties that are inherent in any system (natural or man-made) are limited to defined uncertainties such as materials chosen, geometric specifications, and conditions of construction and use. So an engineered system such as an automobile (or a groundwater-pumping facility) is uncertain in many aspects, but that uncertainty can in theory be constrained by quality-control efforts or similar means of repeatability. Constraining these uncertainties comes at a price, of course: that is a large part of what we mean when we refer to *quality* in an engineered system such as in cars or consumer electronics.

A natural system has a much higher threshold for uncertainty, as we often do not even know of all the components of the system, much less their precise characterization (e.g., in a water-bearing aquifer, the materials that entrain the water are by definition unavailable for characterization, and the mere act of digging some of them up for laboratory inspection often changes their physical behaviors so that the tests we perform in the laboratory may not be entirely relevant to the response of the actual subsurface system). So when studying a natural system, a scientist or engineer must exercise due diligence in the examination and characterization of the system's response to stresses of operational use, and must consistently provide means to determine the presence and effect of these inherent uncertainties. To do otherwise is to risk visitation by Murphy's Law, i.e, "anything that can happen, will happen."

Thus one of the most obvious metrics for evaluating the quality of any environmental plan is to examine the plan's use of terms such as "uncertainty", as well its technical relatives that include "validation" (testing of models via physical processes such as laboratory experiments), "verification" (testing of models via comparison with other generally-accepted models), and "calibration" (tuning a model using a given set of physical data that will be used as initial conditions for subsequent verification, validation, and uncertainty characterization). These basic operations are fundamental characteristics of any computational model, and are used in everyday life for everything from weather prediction (where uncertainty dominates and limits the best efforts at forecasting) to the simple requirement that important components of infrastructure such as highway bridges be modeled using multiple independent analyses to provide verification of design quality before construction can begin.

Unfortunately, the EIR/EIS does not contain a formal characterization of model uncertainty, either for the SacFEM2013 application itself, or for the underlying data gathered to support the SacFEM2013 analyses. As described in previous sections, both the model and the input data contain simplifications that potentially compromise the model's ability to provide accurate estimates of real-world responses of water resources, and these idealizations create *more* need for uncertainty characterization, not less. And the all-important technical terms "validation" and "verification" do not appear the EIR/EIS. The term "calibration" occurs twice[7] with regard to groundwater models, but only in the context of ad-hoc "adjustments" of the model data.

Lack of Trust in the SacFEM2013 Model

In addition to generally-poor modeling assumptions inherent in the SacFEM2013 model, the all-important task of characterizing uncertainty in the model's implementation and data is neglected in the EIR/EIS. On page 19 of Appendix B, the reader is promised that model uncertainty will be described in Appendix D, but that promise is never delivered: the only mention of this essential modeling component occurs merely as an adjunct to discussion of deep percolation uncertainty.

[7] *EIR/EIS, Appendix D, Pages 10 and 13*

This lack of any formal measure of uncertainty is not an unimportant detail, as it is impossible to provide accurate estimates of margin of error without some formal treatment of uncertainty. Many such formal approaches exist, but apparently none were deployed for the EIR/EIS modeling efforts. In simple terms, this lack of uncertainty characterization removes the basis for trust in the model results, and hence the entire groundwater substitution analysis presented in the EIR/EIS is not technically defensible. Until this omission is remedied, the EIR/EIS simply proposes that water interests in California trust a model that is arguably not worthy of their trust.

And it's even worse than this, as while the model is asserted to be "high-resolution", in fact the SacFEM2013 model is quite the opposite. The actual spatial resolution of the model is given in Appendix D as ranging from 125 meters for regions of interest, up to 1000 meters for areas remote from the transfer effects. Nodal spacing along flood bypasses and streams is given as 500 meters. No mention is made in the EIR/EIS of exactly what this means in terms of trust in the model, but in accepted computational modeling practice, this is not a particularly high resolution.

In fact, there are formal methods for characterizing the ability of a discretized model such as SacFEM2013 to resolve physical responses of interest. These methods are based on elementary aspects of information theory (e.g., the Nyquist-Shannon sampling theorem), and their practical result is that a discrete analog (i.e., a computer model) of a continuous system (i.e., the actual subsurface geological deposits that entrain the groundwater) cannot resolve any feature that is less than a multiple of the size of the discretization spacing. For regular periodic features (e.g., the waveforms that make radio transmission possible), that multiple can be a small as two, but for transient phenomena (e.g., the response of an aquifer), established practice in computational simulation has demonstrated that a factor of five or ten is the practical limit on resolution.

Thus the practical limit of the SacFEM2013 model to "see" (i.e., to resolve) any physical response is measured in kilometers! The model can compute results smaller than this scale, but those results cannot be implicitly trusted: they are potentially the computational equivalent of an optical illusion. For this reason alone, the SacFEM2013 model cannot be trusted without substantial follow-on work that the EIR/EIS gives no indication of ever having been performed. And thus any physical response asserted by the model's results has a margin of error of 100% if that response involves spatial scales smaller than a kilometer or more, i.e., there is little or no predictive power in the model for those length scales.

The additional verification effort required to gain some measure of trust in the model (i.e., refining the nodal spacing by a factor of two and four to create more refined models, and then comparing these higher-resolution results to gain assurance that no computational artifacts exist in the original model, i.e., no optical illusions are being used to set water transfer policy) is quite straightforward and is also standard practice in verifying the utility of a computational model. It is something of a mystery why this standard modeling quality-assurance technique is not presented in the EIR/EIS, but this omission provides yet-another sound technical reason to reject the results of the EIR/EIS until better modeling efforts are provided.

> ***Technical sidebar:*** *one important side benefit of performing verification studies by refining the finite element mesh in the spatial and temporal domains is that this extra effort provides important information as to whether the resolution of the model is sufficient. In practice, improving the resolution of a computer model is only a means to*

the desired end of gaining higher fidelity, i.e., a closer approximation to reality. So what we really desire from a computer model is not resolution, but fidelity, and while it is notoriously difficult to assess measures of fidelity, verification techniques based on refining the finite element mesh do provide some measure of trust in model results. One particularly simple verification measure involves plotting the computed results for a quantity of interest (e.g., groundwater flux at some point in the aquifer) as a function of model resolution (e.g., a metric indicating the number of the elements in the model, or a representative spatial scale used) for successive refinements of the finite-element mesh. Such plots help the analyst estimate whether the results at any given resolution yield an asymptotically-accurate estimate of the best results the model can provide given its inherent modeling assumptions. When combined with validation data (e.g., model predictions compared to real-world measured data), these verification-and-validation techniques provide a more sound basis for trust in the model than the minimal motivations found in the EIR/EIS.

It is likely that the SacFEM2013 model may be incapable of performing these more refined higher-resolution analyses because of its underlying assumptions (e.g., idealizing the three-dimensional subsurface domain as a set of coupled two-dimensional layers), and if that is the case, then the underlying groundwater model is simply not up to the requirements of accurate regional water transfer modeling. The underlying MicroFEM model is an old simulation tool, originally written for the MS/DOS platform, and it appears to be near the practical limit of its resolution at the stated size[8] of 153,812 nodes (compared to the maximum nodal resolution in MicroFEM of 250,000 nodes cited above). But the current generation of desktop computers can easily handle many millions of nodes for such simulations, and enterprise computers well within the budgets of government agencies are routinely utilized to model systems with hundreds of millions of nodes, so if the SacFEM2013 model is already at its limit of resolution, then it's clear that a newer, better computational model should be used to replace it.

Inadequacy of Basic Aquifer Mechanics Principles in the EIR/EIS

In addition to all the fundamental problems inherent in the SacFEM2013 model, the EIR/EIS presents a biased view of basic principles of aquifer mechanics, and this bias serves to understate the risks of serious environmental problems that have long been a bane of water policy in California. In particular, the EIR/EIS simply understates the risk of these environmental effects, beginning with its executive summary and continuing throughout the rest of the document. Here's a representative sample of the problem at its first occurrence[9]:

> Groundwater substitution would temporarily decrease levels in groundwater basins near the participating wells. Water produced from wells initially comes from groundwater storage. Groundwater storage would refill (or "recharge") over time, which affects surface water sources. Groundwater pumping captures some groundwater that would otherwise discharge to streams as baseflow and can also induce recharge from streams. Once pumping ceases, this stream depletion continues, replacing the pumped groundwater slowly over time until the depleted storage fully recharges.

---

[8] *EIR/EIS, Appendix D, Page 3*
[9] *EIR/EIS, Executive Summary, Page 10*

The use of the adverb “fully” implies that the original storage is entirely recovered, but this is not necessarily the case. The science of poromechanics demonstrates that irreversible loss of aquifer capacity can occur with groundwater extraction, and while this physical phenomenon is explained elsewhere in the EIS/EIR, it is apparently ignored by the SacFEM2013 model, and hence it is not predicted with any degree of accuracy for use in estimating this important environmental effect. California has seen many examples of the accumulation of this environmental risk, as the readily-observable phenomenon known as subsidence is the surface expression of this loss of aquifer capacity. The small strains induced in the aquifer skeleton by groundwater extraction accumulate over the depth of the aquifer, and are expressed by the slow downward movement of the ground surface. The EIR/EIS makes little connection between groundwater extraction process modeled by SacFEM2013 and the all-too-real potential for surface subsidence, and the attendant irreversible loss of aquifer capacity. It is remarkably simple to model these coupled fluid- and solid-mechanical effects using modern computers, and it is thus a fatal shortcoming of the EIR/EIS that such a rational science-based approach to estimating these environmental risks has not been undertaken.

The problem is especially important during drought years, when groundwater substitution is most likely to occur. In a drought, the aquifer already entrains less groundwater than normal, so that additional stresses due to pumping are visited upon the aquifer skeleton. This is exactly the conditions required to cause loss of capacity and the risk of subsidence. Yet the EIR/EIS makes scant mention of these all-too-real problems, and no serious modeling effort is presented in the EIR/EIS to assess the risk of such environmental degradation.

Taken together with the other problems catalogued above, it is clear that the EIR/EIS does not accurately estimate potential environmental risks due to groundwater extraction. And since this component of the water transfer process is only one aspect of how water might be moved within the state, the interested reader of the EIR/EIS can only wonder what other important environmental effects have not been accurately assessed in the EIR/EIS.

Conclusions

The current draft version of the EIR/EIS fails to accurately estimate environmental effects likely to occur during water transfers. The model used to predict groundwater resources is flawed by being based on old technology that is apparently not up to the task of accurate large-scale modeling as combined with requisite validation measures and uncertainty characterization efforts needed to justify the use of the model. The reasons given for the use of this model do not stand up even to the most rudimentary examination, and the model neglects important environmental effects that have long been observed in California. The proposed transfers should be rejected until a more sound scientific basis can be established for prediction of all substantial environmental effects, and established practices in the use of computational models are developed and deployed in all aspects of computational prediction of those effects.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Habitat Conservation Planning Branch
P.O Box 944209
Sacramento, CA 94244-2090
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

March 20, 2019

Frances Mizuno
Assistant Executive Director
San Luis and Delta-Mendota Water Authority
842 6th St.
Los Banos, CA 93635

Dear Ms. Mizuno:

Long-Term Water Transfers (PROJECT)
DRAFT JOINT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (RDEIR/SDEIS)
SCH# 2011011010

The California Department of Fish and Wildlife (CDFW) received a Notice of Availability of a revised EIR/supplemental EIS (RDEIR/SDEIS) from San Luis and Delta-Mendota Water Authority (SLDMWA) for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1] CDFW previously submitted comments in response to the originally circulated Draft EIR/EIS (enclosed)

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the project proponent may seek related take authorization as provided by the Fish and Game Code.

PROJECT DESCRIPTION SUMMARY

Proponent: Reclamation and SLDMWA

Objective: The objective of the Project is to:

- Develop supplemental water supply for member agencies during times of Central Valley Project (CVP) shortages to meet existing demands,
- Meet the needs of member agencies for a water supplies that are immediately implementable and flexible and can respond to changes in hydrologic conditions and CVP allocations. 10-2

The SLDMWA and Reclamation will allow the transfer of water from willing sellers to willing buyers to meet the buyer's water needs. Primary Project activities include making water available for transfer and developing the infrastructure for the transfer. This requires implementing actions to reduce consumptive use of water by the seller, which include the use of groundwater to make surface water available or the release of additional water from reservoir storage.

Location: Sellers and buyers include water districts from the Central Valley and the Delta.

Timeframe: Through 2024.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist the SLDMWA in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources. Editorial comments or other suggestions may also be included to improve the document. Based on the potential for the Project to have a significant impact on biological resources, CDFW concurs that an Environmental Impact Report is appropriate for the Project. 10-3

Comment 1:
Section #: ES 7.1, **Page #:** ES-10

Issue: Under the heading 'Groundwater Substitution,' the Executive Summary (ES) indicates that groundwater monitoring will be used to 'avoid changing groundwater levels that could affect stream flows or riparian vegetation.' Non-riparian, phreatophyte vegetation is not included in this monitoring protection.

Specific impact: This exclusion of groundwater dependent vegetation located outside the riparian zone from groundwater monitoring may lead to degraded or lost phreatophyte habitat.

Why impact would occur: A failure to monitor groundwater levels under groundwater dependent vegetation will lead to an inability to effectively manage groundwater pumping for substitution transfers. Phreatophytes can be sensitive to depth to groundwater threshold impacts (Naumburg et al. 2005, Froend and Sommer 2010). Without data on groundwater elevation near vegetated groundwater-dependent ecosystems, vegetation stress or loss may occur without notice and without necessary changes to pumping regimes. 10-4

Evidence impact would be significant: There are significant potential vegetated GDEs in the Seller Service Area according to the Department of Water Resources Natural Communities Commonly Associated with Groundwater Dataset (DWR 2018), not all of which are riparian.

NOTE: Page 3.3-28 does address deep-rooted vegetation in the context of monitoring systems, but deep-rooted/groundwater dependent vegetation should also be acknowledged in the ES.

Comment 2:
Section #: 3.3.1.2.2, **Page #:** 3.3-4

Issue: Groundwater use in 'Sacramento Valley Groundwater Basin' is noted as less than 30% of annual supply under normal hydrologic conditions. This RDEIR/SDEIS is intended to help address CVP water supply shortages, most of which occur in dry hydrologic conditions. 10-5

Specific impact: Analyzing basin groundwater reliance for this RDEIR/SDEIS under normal hydrologic conditions when the need for groundwater substitutions transfers increases with dry hydrologic conditions may overestimate available groundwater supply in the Seller Service Area and underestimate potential local and cumulative basin impacts.

Comment 3:
Section #:3.3.2 **Page #:** 3.3-11

The two subheadings: 'Groundwater pumping would not cause groundwater level declines that would lead to permanent land subsidence,' and 'Groundwater pumping would not cause groundwater level declines that would lead to migration of poor quality groundwater.'

- The paragraphs below each caveat these subheadings, noting that the potential for groundwater level declines that would cause the adverse impact in the Seller or Buyer Service Area under the 'No Action Alternative' would be 'the same as existing conditions.'

  Therefore, the subheadings/statements in italics may be misleading if significant subsidence and/or migration of poor quality groundwater is actively happening already. A thorough analysis of 'No Action Alternative' should account for current subsidence and groundwater quality impacts cause by pumping in the Seller/Buyer Service Areas.

10-6

Comment 4:
Section #: 3.3.4 **Page #:** 3.3-28

Issue: The subheading 'Shallow Groundwater Level Monitoring for Deep Rooted Vegetation' explains how monitoring will trigger mitigation activities.

- Mitigation under this subheading may be triggered too late, both where monitoring wells exist, and where biologists are required to observe vegetation response.

Specific impact: Late mitigation triggers could lead to irreversible, or slowly reversible, loss of vegetated groundwater dependent ecosystems and the species therein.

10-7

Why impact would occur: Where monitoring wells exist, the requirement to mitigate action is triggered after groundwater levels have dropped below the local vegetation rooting depth. Recovery time for groundwater levels is unknown and prone to pumping lag impacts, meaning vegetation may have to endure substantial periods of stress. Furthermore, where monitoring wells are not required, a loss of deep-rooted vegetation triggers mitigation actions. The term 'loss' suggests vegetation can no longer serve habitat functions – it is already beyond short-term recovery – which in turn can lead to species loss.

Evidence impact would be significant: Some plant and animal species have low resiliency, and may not survive late or un-protective mitigation triggers, potentially permanently reducing the plant or animal species populations.

Comment 5:

Section #3.8.2.4.3: **Page #:** Starting 3.8-17

Issue: The RDEIR/SDEIS proposes that Mitigation Measure GW-1 will reduce potentially significant impacts from groundwater substitution pumping on special status species. This Mitigation Measure may be insufficient to address potential significant impacts because:

1. Mitigation Measure GW-1 hinges on triggers that could be too late to prevent habitat and species loss (see comment above);
2. Mitigation Measure GW-1 does not require paired groundwater and surface water monitoring, and therefore may not be able to accurately predict the relationship between groundwater pumping and local impacts to surface water/wetlands; and 10-8
3. The RDEIR/SDEIS assumes a <10% reduction in surface water will not cause significant impacts on species, which may not always hold true and is dependent on each stream's respective hydrology, water availability, and species needs[2].

Specific impact: Habitat and species loss.

Why impact would occur: Inadequate mitigation triggers, insufficient monitoring, and un-protective thresholds allow for habitat degradation – both vegetated and aquatic – to go unnoticed and unmitigated until species loss has already occurred.

Evidence impact would be significant: The presence of GDEs in the Seller Service Area (DWR 2018) suggests that the potential for habitat and species loss could be significant if the monitoring and mitigation requirements are not strengthened.

Comment 6:

Section # 1.4, **Page #** 1-5

Issue: *"When proposing or approving a specific water transfer in the future, the Lead Agencies and/or Responsible Agencies will consider whether the proposed transfer was analyzed in the Final Long-Term Water Transfers EIS/EIR. If so, the Lead Agencies can rely on the analysis in the Final Long-Term Water Transfers EIS/EIR. If it is not covered or there have been significant changes, the Lead Agencies may need to supplement the Final Long-Term Water Transfers EIS/EIR."* 10-9

Re-initiation of Consultation of the Long-Term Operations of the CVP and State Water Project (SWP) proposes numerous significant changes to water operations under the

[2] Richeter et al. suggest a high level of ecological protection with unimpaired flow alterations of less than 10%, but few streams in California flow unimpaired (Richter 2011). Therefore, while a 10% depletion on an unimpaired stream may have minimal ecological harm, the same percentage reduction on an impaired stream may have significant impacts on ecological function.

existing National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) Biological Opinions (BOs) are proposed under the recently submitted Biological assessments (BA) for long-term operations of the CVP and SWP. The CalSim analysis upon which this RDEIR/SDEIS is based on will no longer be valid and will need to supplement this RDEIR/SDEIS upon implementation. These changes include widening of the current transfer window evaluated in this document to also include October and November.

Specific impact: The new USFWS and NOAA BOs proposed changes to operating requirements, including widening of the transfer window, would lead to dewatering and potentially significant impacts to salmonid redds. Therefore, upon implementation of new CVP and SWP operating criteria the lead agencies would have to conclude that the analysis provided for proposed transfers this RDEIR/SDEIS or in the previous EIR/EIS is no longer valid.

Why impact would occur: Analysis in this RDEIR/SDEIS is based on current CVP and SWP operating criteria which are likely to be substantially modified under Re-initiation of Consultation of the Long-Term Operations of the CVP and State Water Project (SWP). As such, the analysis provided is insufficient to adequately analyze impacts upon implementation of new CVP and SWP operation criteria and is not valid for the term proposed in this RDEIR/SDEIS which is 2024. In particular, the current transfer window avoids part of the state and federally listed Spring-run Chinook salmon spawning and fall/late fall Chinook salmon spawning periods which occur August through January. The egg incubation period for salmonids is approximately 90 days dependent on water temperature. Water transfers during October and November could result in flows being higher for a short period in which salmonids would build redds in margin habitat that would not be sustained for the duration of egg incubation. This would result in redd dewatering mortality when the transfer flows end. There is no analysis for redd dewatering potential during October and November. 10-9

Evidence impact would be significant: Water transfers during the extended October and November period are not described or analyzed. Thus, there is the potential for significant impact.

The lead agencies will need to supplement the Final Long-Term Water Transfers EIS/EIR analysis once a new CVP/SWP operations under the new BOs are implemented. This supplement will require new analysis which includes the new CVP SWP long term operations criteria as the existing analysis provided in this document will no longer be valid. New operational criteria for the CVP and SWP are likely to be implemented prior to the time period that this RDEIR/SDEIS proposes to cover operations through 2024.

Comment 7:

Section # 2.2.2.1 **Page #** 2.5

Issue: The Coordinated Operations Agreement (COA) was renegotiated and has recently been implemented. It is unclear if the analysis provided accounts for this change and it is unlikely that the change was incorporated in this RDEIR/SDEIS.

Specific impact: The potential impact is that the analysis provided does not rely on current operations of the SWP and the CVP

Why impact would occur: The entire analysis could be incorrect. Potential changes could be significant with subsequent significant species impacts.

Evidence impact would be significant: This project proposes to conduct transfers when conditions are balanced. COA dictates the respective shares that the CVP and the SWP must release from storage to meet in-basin demands including the State Water Resources Control Board Decision -1641 for implementation of the water quality objectives for the San Francisco Bay/San Joaquin Delta Estuary. While the in-basin demands do not change the switch in percentages each project must release water to meet these demands, it does have an effect in overall operations due to differences in the projects. The SWP has lower storage capacity but higher export capacity while the CVP has higher storage capacity and lower export capacity. 10-10

These differences may lead to changes in how reservoirs are refilled with subsequent changes to outflow that may not be reflected in Table 3.7-1 which is the basis of the conclusions that impacts to fisheries resources are less than significant.

CDFW recommends that if the COA was not incorporated into the analysis, the analysis be redone to include the COA since Table 3.7-1 does not accurately reflect current operations.

Comment 8

Section # 3.7 **Page #** 3.7-1

Issue: "*Water transfer actions under the Proposed Action would have a less than significant impact on fisheries resources that may be influenced by Delta outflow, as mean changes in Delta outflow would be small (1.2 percent or lower than baseline depending on month and water year type) in all months and water year types (Table 3.7-1). All cumulative water operations projects affecting Delta exports would be required to meet existing Delta water quality standards (e.g., D-1641) and meet the requirements of the USFWS and NOAA Fisheries BOs for the long-term coordinated operations of the CVP and SWP.*" 10-11

By presenting averages, actual impacts to species may appear to be insignificant. By examining this more thoroughly there is take of listed longfin smelt that must be fully mitigated under CESA.

Specific Impact: While the percentages in given months are small, the total for Above Normal water year types (AN years) is -105.8 thousand-acre feet less outflow from January through June (Table 3.7.1). This would result in a significant impact on CESA listed longfin smelt. Similar but smaller reductions in outflow would occur in all other year types during the January through June period resulting in smaller but cumulatively significant impacts to Longfin smelt. 10-11

Why impact would occur: The Kimmerer 2008 regression is a January through June flow-survival relationship utilized to analyze impacts on longfin smelt juvenile recruitment. As per the Kimmerer regression analysis, reduction in outflow will result in take of CESA listed Longfin smelt that must be fully mitigated under CESA. This analysis must be applied to the information presented in Table 3.7.1 to fully analyze the impacts to Longfin smelt. These potentially significant impacts are not offset by minimal summer outflow increases due to carriage water associated with water transfers as the species is not dependent on outflow during this time period.

Evidence impact would be significant: The Kimmerer 2008 analysis was not conducted for this RDEIR/SDEIS; however, because this analysis is an outflow survival dependent relationship the identified reductions in outflow during January through June will result in take of CESA listed Longfin smelt. While the text states that the PA will adhere to the current USFWS and NOAA BOs these do not cover longfin smelt which are a state listed species only. Similar to the previous comments, the current CVP and SWP operating criteria are being revised and this RDEIR/SDEIS will need to be updated to reflect those substantial changes upon implementation of new CVP and SWP operating criteria.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Plants-and-Animals. 10-12

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs., tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION 10-13

CDFW appreciates the opportunity to comment on the RDEIR/SDEIS to assist the SLDMWA in identifying and mitigating Project impacts on biological resources.

Questions regarding this letter or further coordination should be directed to CDFW staff Karen Carpio, Senior Environmental Scientist at (916) 653-3864 or Karen.Carpio@wildlife.ca.gov.

Sincerely,

fw Richard Macedo
Branch Chief

Enclosures: 2014 letter for the original Draft EIR/EIS.

cc: Office of Planning and Research, State Clearinghouse, Sacramento
P.O. Box 3044
Sacramento, CA 94244-2460

ec: California Department of Fish and Wildlife

Robert Holmes, Environmental Program Manager
Water Branch
Robert.Holmes@Wildlife.ca.gov

Kenneth Kundargi, Senior Environmental Scientist (Supervisor)
Water Branch
Kenneth.Kundargi@wildlife.ca.gov

Briana Seapy, Senior Environmental Scientist
Water Branch
Briana.Seapy@wildlife.ca.gov

Cathie Vouchilas, Environmental Program Manager
Habitat Conservation Planning Branch
Cathie.Vouchilas@wildlife.ca.gov

Ryan Mathis, Senior Environmental Scientist (Supervisor)
Habitat Conservation Planning Branch
Ryan.Mathis@wildlife.ca.gov

Karen Carpio, Senior Environmental Scientist
Habitat Conservation Planning Branch
Karen.Carpio@wildlife.ca.gov

REFERENCES

California Department of Water Resources (DWR). 2018. Natural Communities Commonly Associated with Groundwater Dataset. https://gis.water.ca.gov/app/NCDatasetViewer/

Decision – 1641 https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/decision_1641/

Froend R., and B. Sommer. 2010. Phreatophytic vegetation response to climatic and abstraction-induced groundwater drawdown: Examples of long-term spatial and temporal variability in community response. *Ecological Engineering*. 36:1191-1200.

Naumburg, E., R. Mata-Gonzalez, R.G. Hunter, T. McLendon, D.W. Martin. 2005. Phreatophytic vegetation and groundwater fluctuations: a review of current research and application of ecosystem response modeling with an emphasis on great basin vegetation. *Environmental Management*. 35(6):726-40.

Richter, B.D., M. M. Davis, C. Apse, and C. Konrad. 2011. A presumptive standard for environmental flow protection. *River Research and Applications*.