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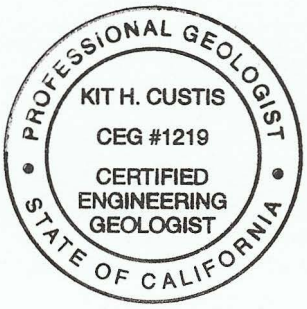
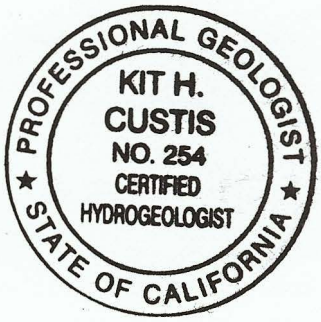
To: Barbara Vlavis
Executive Director
AquAlliance
P.O. Box 4024
Chico, CA 95927

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





RE: Comments and Recommendations on U.S. Bureau of Reclamation and San Luis & Delta-Mendota Water Authority Draft Long-Term Water Transfer DRAFT EIS/EIR, dated September 2014

This letter provides comments and recommendations on the information provided in the September 2014 Draft Long-Term Water Transfer Environmental Impact Statement/ Environmental Impact Report (Draft EIS/EIR) prepared by the U.S. Bureau of Reclamation (BoR) and San Luis & Delta-Mendota Water Authority (SLDMWA). This document evaluates the potential impacts of alternatives over a 10-year period, 2015 through 2024, for 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 CVP and State Water Project (SWP) facilities. This Draft EIS/EIR evaluated impacts of alternatives for water transfers made available through groundwater substitution, cropland idling, crop shifting, reservoir release, and conservation.

This letter focuses mostly on the groundwater substitution element of the transfers for the Sacramento Valley groundwater basin and proves comments and recommendations regarding the potential impacts, technical information submitted, and monitoring and mitigation measures. Comments and recommendations are also provided regarding the biological resources, crop idling/crop shifting when those resources or activities impact or are impacted by the groundwater substitution transfers. This letter has two parts. The first part comments on the Draft Long-Term Water Transfer Draft EIS/EIR. The second part provides additional technical information on surface water–groundwater interactions that are relevant to the evaluation of potential impacts from the proposed water transfers, monitoring during the transfers and designing and implementing mitigation measures.

I. Comments and Recommendations on the Draft Long-Term Water Transfer DRAFT EIS/EIR

The Draft EIS/EIR evaluated a number of potential environmental impacts from the groundwater substitution transfers using a finite element groundwater model, SACFEM2013. The potential impacts evaluated include: groundwater levels; surface water flow; water quality; biological resources, including vegetation, wildlife and fisheries; and the associated cumulative effects and impacts. Two mitigation measures, WS-1 and GW-1, are provided for monitoring and

mitigating potential impacts from groundwater substitution transfers. I will provide comments and recommendations on these topics following seven comments and recommendations on general issues, assumptions and methods that are used throughout the Draft EIS/EIR.

General Comments

1. The Draft EIS/EIR has an underlying assumption that specific information on each proposed transfer will be evaluated in the future by the Bureau of Reclamation, the California Department of Water Resources (DWR), perhaps the California State Water Resources Control Board (SWRCB), and local agencies, presumably the County, or other designated local agency (Sections 1.5, 3.1.4.1-WS-1 and 3.3.4.1-GW-1). The Draft EIS/EIR relies on the results of the SACFEM2013 groundwater modeling effort to validate the conclusion of less than significant and reasonable impacts that cause no injury from the groundwater substitution transfer pumping. This conclusion is reached based on model simulation results, and assumption of implementation of mitigation measures WS-1 and GW-1. However, the Draft EIS/EIR provides only limited information on the wells to be used in the groundwater substitution transfers (see Table 3.3-3), and no information on non-participating wells that may be impacted. Information that is still needed to evaluate the potential impacts simulated by the groundwater modeling and the potential significance of the groundwater substitution transfer pumping includes, but isn't limited to:

a. proposed transfer wells locations that are sufficiently accurate to allow for determination of distances between the wells and areas of potential impact,
b. the distances between the transfer wells and surface water features,
c. the number of non-participating wells in the vicinity of the transfer wells that may be impacted by the pumping,
d. the distance between the transfer wells and non-participant wells that may be impacted by the transfer pumping, including domestic, public water supply and agricultural wells,
e. the number of non-participating wells in the vicinity of the transfer wells that can be expected to be pumped to provide public water supply or irrigation water during the same period as the transfer pumping,
f. the amount of well interference anticipated at each of the non-participating domestic, public water supply and agricultural wells in the vicinity of transfer wells,
g. the aquifers that the non-participating wells in the vicinity of the transfer wells are drawing groundwater from,
h. groundwater level hydrographs near the non-participating and participating transfer wells, to document the pre-transfer trends and fluctuations in groundwater elevations in order to evaluate the current conditions and serve as a reference for monitoring impacts from transfer pumping,
i. the identity and locations of wells that will be used to monitor groundwater substitution transfer pumping impacts, the aquifers these wells are monitoring, frequency for taking and reporting measurements, and the types and methods for monitoring and reporting,
j. groundwater level decline thresholds at each monitoring well that require actions be taken to reduce or cease groundwater substitution transfer pumping to prevent impacts from excessive drawdown, including impacts to non-participating wells, surface water features, fisheries, vegetation and wildlife, other surface structures, and regional economics.

   This list addresses only the minimum of information needed about the groundwater wells and does not address other elements of the groundwater substitution transfer, which I will discuss under separate sections, including the WS-1 and GW-1 mitigation measures, the SACFEM2013 groundwater modeling effort, and stream depletion impacts.

I recommend the Draft EIS/EIR be revised to include the additional well information and monitoring requirements listed above. I recommend that mitigation measures WS-1 and GW-1 be revised to provide specific requirements for monitoring, thresholds of significance, and actions to be taken when the thresholds are exceeded.

2. The only maps provided by the Draft EIS/EIR that show the location of the groundwater substitution transfer wells, and the rivers and streams potentially impacted are the simulated drawdown Figures 3.3-26 to 3.3-31, which are at a scale of approximately 1 inch to 18 miles on letter size paper. These figures show clusters of wells and several rivers, creeks and canals. A few are labeled, but apparently not all of the streams and creeks evaluated for groundwater substitution impacts are shown. Figures 3.7-1 and 3.8-2 show the major rivers and reservoirs evaluated in the biological analyses, and Tables 3.7-2, 3.7-3, and 3.8-3 list up to 34 small rivers or creeks that were apparently evaluated for stream depletion using the SACFEM2013 groundwater model. Without river/stream/creek labels on the drawdown figures at a scale that allows for reasonable measurement and review, it is difficult to determine the anticipated drawdown at the 34 small rivers and creeks or other important habitat areas.

   The Fisheries Section 3.7, and Vegetation and Wildlife Section 3.8 provide discussions of the potential impacts from groundwater substitution transfer induced stream depletion (Sections 3.7.2.1.1, 3.8.2.1.1 and 3.8.2.1.4). The Well Acceptance Criteria of Table B-1 in Appendix B of the October 2013 joint DWR and BoR document titled *Draft Technical Information for Preparing Water Transfer Proposals* (DTIPWTP) lists in the table footnotes eight major and three minor surface water features tributary to the Delta that are affected by groundwater pumping. Apparently, the Well Acceptance Criteria in Table B-1 will be applied to these eleven surface water features as part of mitigation measure GW-1. Whether the Well Acceptance Criteria will also be applied to the creeks listed in Tables 3.7-2, 3,7-3 and 3.8-2 is not specifically stated in the Draft EIS/EIR or GW-1.

   The lack of maps with sufficient detail to see the relationship between the wells and the surface water features prevents adequate review of the Draft EIS/EIR analysis to determine whether mitigation measures WS-1 and GW-1 will be effective at mitigating pumping impacts. As I will discuss in Part 2 of this letter, the distance between a surface water feature and a pumping well is a critical parameter in estimating the rate and duration of stream depletion. Maps are needed of each seller's service area at a scale that allows for reasonably accurate measurement of distances between the groundwater substitution transfer wells and surface water features, other non-participating wells, proposed monitoring wells, fisheries, vegetation and wildlife areas, critical surface structures, and regional economic features.

   I recommend the Draft EIS/EIR be revised to provide additional maps of each seller's service area at a scale that allows for reasonably accurate measurement of distances between the groundwater substitution transfer wells and surface water features listed in Tables 3.7-2, 3.7-3, 3.8-3 and B-1 as well as other non-listed surface water dependent features such as wetlands and riparian areas, non-participating wells, the proposed monitoring wells, wildlife areas, critical surface structures, regional economic features, and other structures that might be impacted by groundwater substitution pumping.

3. The Draft EIS/EIR evaluated a number of potential environmental impacts from the groundwater substitution transfers using the finite element groundwater model SACFEM2013. The results of the modeling effort were used in the assessment of the

potential biological resource impacts from reductions in surface water flow caused by groundwater substitution transfer pumping (pages 3.7-18 to 3.7-30, and 3.8-49 to 3.8-67). The Draft EIS/EIR assumes that SACFEM2013 model results are sufficiently accurate to justify removing most of the small creeks from a detailed effects analysis (Table 3.7-3 and 3.8-3).

Statements are given that the mean monthly reduction in the Sacramento, Feather, Yuba and American rivers will be less than 10 percent (pages 3.7-25 and 3.8-49) and that other stream requirements of flow magnitude, timing, temperature, and water quality would continue to be met. However, actual SACFEM2013 model results on anticipated changes in flow, temperature and water quality are not provided for all of the surface water features that may be potentially impacted by the groundwater substitution transfer projects. Creeks that passed a preliminary screening, Tables 3.7-3 and 3.7-4, were selected to be modeled by water year type for stream depletion that exceeds 1 cubic feet per second (cfs) and 10% reduction in mean monthly flow. Results of the modeling effort are presented in Tables 3.8-4 to 3.8-7.

The Draft EIS/EIR notes that not all surface water features were evaluated because some lacked sufficient historical flow data, or they were too small to model (page 3.7-20). The Draft EIS/EIR then assumes that the pumping impacts to un-modeled small surface water features are similar to nearby modeled features. No maps with sufficient detail are provided to allow for determination of the spatial relationship between the modeled and un-modeled surface water features, or the relationship between the groundwater substitution transfer wells and the modeled and un-modeled surface water features (see comment no. 2). The distance between a well and a surface water feature is a critical parameter in determining the rate and timing of surface water depletion resulting from groundwater pumping. The validity of the assumption that the un-modeled surface water features will respond similarly to the modeled is dependent on the distance between them and their respective distances to the pumping transfer well(s). I will discuss in more detail in Part 2 the importance of distance in the calculation of stream depletion.

The Draft EIS/EIR also provides Figures B-5 and B-6 of Draft EIS/EIR Appendix B that graph in aggregate the changes in stream-aquifer interactions, presumably equal to changes in stream flow, based on the SACFEM2013 simulations. While these graphs are interesting for several reasons, they don't provide information specific to each seller service area on flow losses expected in each river and creek. No figures are provided that show the longitudinal- or cross-sections of channel where impacts are expected, or the rate of stream depletion in each channel section. Maps with rates and times of stream depletion by longitudinal channel section are needed to allow for an adequate review of the Draft EIR/EIS conclusion of less than significant and reasonable impacts with no injury. These maps are also needed to evaluate the specific locations for monitoring potential impacts.

Statements are made in Section 3.7 that reductions in surface flow due to groundwater substitution pumping would be observed in monitoring wells in the region as required by mitigation measure GW-1. Thus detailed maps that show the locations of the monitoring wells and the areas of potential impact along with the rates and seasons of anticipated stream depletion are needed for each service area. These maps are also needed to allow for evaluation of the cumulative effects whenever pumping by multiple sellers can impact the same resource. Without site-specific information on expected locations and changes in flow at each potentially impacted surface water feature, it's difficult to evaluate the adequacy of any monitoring effort.

I recommend the Draft EIS/EIR be revised to provide additional information on the anticipated changes in surface water flow, temperature, water quality and channel geomorphology for each river, creek and surface water feature in the areas of groundwater substitution transfer pumping. In addition, I recommend that maps showing the along channel longitudinal sections, the maximum anticipated changes in flow rate, water temperature, water quality, and the timing of the maximum anticipated rate of stream depletion due to groundwater substitution transfer pumping be provided at an appropriate scale to allow for adequate measurement and review in the Draft EIS/EIR, and for use in the WS-1 and GW-1mitigation monitoring programs.

4. The results of the SACFEM2013 simulation are used to evaluate stream depletion quantities and impacts for vegetation and wildlife resources that are dependent on surface water (Sections 3.7 and 3.8), and to determine the expected lowering of groundwater levels in the areas of transfer pumping (Section 3.3). The groundwater substitution transfer pumping simulation was run from water year (WY) 1970 to WY 2003 and assumed 12 periods of groundwater substitution transfer at various annual transfer volumes as shown in Figure 3.3-25. The apparent Draft EIS/EIR baseline for analysis of groundwater pumping impacts ends with WY 2003 because of limitations of the CalSim II surface water operations model. The CalSim II model was jointly developed by DWR and BoR and is used to determine available export capacity of the Delta. The WY 2003 time limitation was adopted in the SACFEM2013 groundwater-modeling effort apparently because of the desire to combine the simulation of groundwater impacts with estimating the timing of when groundwater substitution water could be transferred through the Delta (Section 3.3.2.1.1). The description of the SACFEM2013 modeling effort states that the volume of groundwater pumping was determined by "comparing the supply in the seller service area to the demand in the buyer service area" (page 3.3-60).

   While this is an interesting modeling exercise, and much can be learned from it, the simulations didn't evaluate the impacts of pumping the maximum annual amount proposed for each of the 10 years of the project. It is important that with any simulation used to analyze potential project impacts that the maximum levels of stress, pumping, proposed by the project be simulated at each of the project locations for the entire duration of the project. This is especially important whenever the simulations are used to justify the conclusion that project impacts will be less than significant, reasonable and cause no injury. Because the groundwater modeling effort didn't include the most recent 11 years of record, it appears to have missed simulating the most recent periods of groundwater substitution transfer pumping and other groundwater impacting events, such as recent changes in groundwater elevations and groundwater storage (DWR, 2014b), and the reduced recharge due to the recent periods of drought. Without taking the hydrologic conditions during the recent 11 years into account, the results of the SACFEM2013 model simulation may not accurately depict the current conditions or predict the effects from the proposed groundwater substitution transfer pumping during the next 10 years.

   Although the Draft EIS/EIR project description is specific on the volumes and periods of groundwater substitution transfer pumping as shown in Tables 2-4 and 2-5, the write-up of the groundwater modeling effort aggregated the volume pumped (Sections 3.3.2.4.2 and B.4.3.1.2 in Appendix B). The simulated volume of groundwater pumped doesn't reach the maximum being requested by the project in any individual year or for all ten years (Figures B-4 in Appendix B and 3.3-25). Note, the annual groundwater substitution transfer amounts shown in Figure B-4 in Appendix B are not the same as the amounts simulated by the SACFEM2013 model as shown in Figure 3.3-25. The presentation of the SACFEM2013

model results in Sections 3.3.2.4.2 and B.4.3.1.2 don't tabulate or provide detailed maps by seller service area on the pumping rates, cumulative pumped volumes, pumping times and durations, or which aquifers were pumped in the simulations. The model documentation doesn't provide the maximum drawdown or the expected centers of maximum drawdown for each seller service area.

The documentation of the SACFEM2013 model results should also discuss the variations in potential impacts that might result from pumping transfer wells other than those simulated. If the groundwater simulation didn't pump all of the transfer wells listed in Table 3.3-3 for each seller at their maximum rate, then the modeling documentation should describe how the impacts from the simulation should be evaluated for the non-simulated transfer wells and for those well simulated at less than maximum pumping. For example, if the modeling effort provides the pumping time and distance drawdown characteristics of each well this information can be used to estimate the drawdown at different distances, pumping rates, and durations of pumping (see pages 238 to 244 in Driscoll, 1986). The Draft EIS/EIR should provide the time-drawdown and distance-drawdown hydraulic characteristics for each groundwater substitution transfer well so that non-simulated impacts can be estimated. The Draft EIS/EIR should then describe a method(s) for estimating the drawdown at different distances, rates and durations of pumping so that non-participant well owners can estimate and evaluate the potential impacts to their well(s) from well interference due to the pumping of groundwater substitution transfer well(s).

Because the rate of stream depletion is scaled to pumping rate and because the model documentation doesn't indicate the pumping locations, rates, volumes, times or durations that produced the pumped volumes shown in Figure 3.3-25, or the stream depletions shown in Figures B-5 and B-6 in Appendix B, there is uncertainty whether the SACFEM2013 modeling simulated the maximum rate of stream depletion for the proposed 10-year project. The annual volume of groundwater pumping shown in Figure 3.3-25 are less than the maximum requested, and pumping for a continuous 10 years was not simulated. This suggests that the stream-interaction values or stream depletion(?) shown in Figures B-5 and B-6 of Appendix B are not the maximum level of impact that might occur from the 10-year project.

Without information on the rate, timing and duration of the groundwater pumping, there can be no evaluation of whether the annual simulated impacts are representative of the two pumping seasons listed in Table 2-5, or just a single 3-month pumping season. Whenever the simulated annual pumping rate was greater than the single season maximum of 163,571 acre-feet (AF), two seasons of pumping are required, but the percentage in each season is unknown. If the simulated pumping time represents only one season or a mixture of the two seasons, then the simulation may not reflect the actual timing and/or duration of maximum groundwater substitution pumping impacts proposed in Table 2-5. If a simulation doesn't evaluate the project under existing conditions or simulate the maximum stress allowed by the project description, then it raises a question of whether the Draft EIS/EIR adequately evaluated the projects potential impacts. Without thorough documentation of the SACFEM2013 groundwater impact simulation, it is difficult to review and analyze the model's predictions for potential impacts from each seller's groundwater substitution transfer project, or use the model results in designing and setting impact thresholds for the groundwater monitoring required in mitigation measure GW-1.

I recommend the Draft EIS/EIR be revised to provide a more complete description of the SACFEM2013 groundwater modeling effort, including tabulation of the groundwater substitution pumping rates, volumes, durations,

and dates for each simulated well; the hydraulic characteristics of each well simulated; the aquifer(s) pumped by each simulation well; the impacts from the maximum proposed pumping, annually and during the 10-years of the proposed project; sufficiently detailed maps of the well locations in each seller's service area that non-participants and the public can use to identify any well's relationship to the groundwater substitution transfer wells and understand the potential impacts to groundwater levels. I recommend the Draft EIS/EIR provide, for each transfer well, the pumping time and distance drawdown characteristics such that drawdown for durations, distances and rates of pumping other than those simulated can be estimated. I recommend the Draft EIS/EIR also provide an explanation of why the simulation is representative of the current (2014) conditions, how the simulation can be used to assess current and future conditions, and how the simulation can be used to evaluate, monitor and set impact thresholds for future impacts from the 10-year project at the maximum groundwater substitution transfer pumping volumes listed in Tables 2-4 and 2-5.

5. The Draft EIS/EIR was written from the perspective of the process of transferring surface waters through the Delta. This surface water point of view has carried over into some of the analyses of impacts and mitigations for groundwater pumping. For example, the discussions of potential impacts to surface water users, fisheries, and other stream dependent biological resources are thought of as occurring "downstream" of the groundwater substitution wells. While it is correct that groundwater pumping can impact down gradient resources, pumping can also affect up gradient and lateral resources. A pumped well creates a depression in the surrounding aquifer, often referred to as a "cone of depression." Thus, the area of impact around a pumping well is not a single point, but a region whose extent is sometimes called the "area, radius or zone of influence." The length of stream affected by groundwater pumping is related to the distance between the well and the stream (Figures 16 and 29 from Barlow and Leake, 2012; Exhibits 1.1 and 1.2). Miller and Durnford (2005) noted that for an ideal aquifer and stream at longer durations of pumping, when the stream depletion rate approaches the well pumping rate, 50% the stream depletion occurs within a stream reach length of twice the distance between the stream and well, and 87% of the depletion occurs within a reach length of 10 times the stream to well distance. Obviously, for non-ideal aquifers and streams the length of stream depleted will vary from the ideal, but this illustrates that stream depletion caused by a pumping well is not focused at one point, but occurs along a length of stream with impacts that occur upstream and downstream from the point on the stream that is typically closest to the well.

   Because groundwater is generally flowing, the water table or piezometric surface has a slope. This slope causes the cone of depression around a pumping well to elongate along the direction of regional flow. The elongated cone of depression is often referred to as a "capture zone" (Frind and others, 2002) and determining its extent is a basic part of a pump and treat groundwater cleanup program (USEPA, 2008a). This "capture zone" is related to stream depletion capture because the pumping well intercepts groundwater that would eventually discharge to surface water or be used by surface vegetation. If the "capture zone" extents far enough it may cross a surface water feature and induce greater seepage. However, unlike the capture needed for a contaminant plume, stream depletion can occur without the actual molecule of water that enters the well having to originate from the stream (Figure 29; Exhibit 1.2).

   The stream depletion occurs when groundwater is either intercepted before reaching the stream or seepage from the stream is increased. This water only has to backfill the change

in storage caused by pumping, it doesn't have to enter the well. The "capture zone" also extends upgradient to the recharge area that's the normal source of water flowing past the well. The aquifer recharge that flows past the pumping well may be derived from a wide mountain front area, it could be a section of another river that crosses the the "capture zone", or an overlying area of agricultural irrigation. In a complex hydrogeologic setting, numerical modeling that utilize particle tracking is needed to define where a pumping well is recharged and where it may deplete surface water features (Frind and others, 2002; Franke and others, 1998).

The concepts of a wide zone of influence and an elongated "capture zone" are important for the Sacramento Valley groundwater substitution transfers projects because the analysis and monitoring of potential pumping impacts requires a multidirectional evaluation. It can't be assumed that stream depletion impacts from pumping occur only downstream from the point on the stream closest to the pumping well. Any monitoring of the effects of groundwater substitution pumping on surface or ground water levels, rates and areas of stream depletion, fisheries, vegetation and wildlife impacts, and other critical structures needs to cover a much wider area than what is needed for a direct surface water diversion. This is a fundamental issue with the Draft EIS/EIR. The environmental analyses, monitoring requirements and mitigation measures appear to be developed without adequately considering the multidirectional, wide extent of potential impacts from groundwater substitution transfer pumping.

I recommend the Draft EIS/EIR be revised to address the wide extent of potential impacts for groundwater substitution transfer pumping. This should include conducting numerical modeling of the groundwater basin using particle tracking to determine which surface water features and other structures are potentially impacted by the pumping of each transfer well and to determine the extent of stream depletion along each potentially impacted surface water feature. The monitoring and mitigation measures WS-1 and GW-1 should also be revised to account for a wide area of potential impact from groundwater substitution transfer pumping.

6. The Draft EIS/EIR is written with the assumption that project specific evaluation for each seller agency will be done at a later time by the BoR and/or DWR, and at the local level (see Section 3.3.1.2.3, mitigation measure GW-1 in Section 3.3.4.1, and Section 3.1 in the DTIPWRP). The Draft EIS/EIR lists in Table 3.3-1 and Table 3-1 of the DTIPWRP the Groundwater Management Plans (GMP), agreements and county ordinances that regulate the sellers at a local level. The Draft EIS/EIR discusses only two county ordinances, the Colusa Ordinance No. 615 and Yolo Export Ordinance No. 1617, one agreement, the Water Forum Agreement in Sacramento County, and one conjunctive use program, the American River Basin Regional Conjunctive Use Program. The Table 3-1 in the DTIPWRP lists short descriptions of the county ordinances related to groundwater transfers, if one exists. These descriptions don't always identify the actual ordinance number that applies to a groundwater substitution transfer, but sources for additional information are provided in the table.

   The DTIPWRP (page 27) and GW-1 (page 3.3-88) instructs the entity participating in a groundwater substitution transfer that they are responsible for compliance with local groundwater management plans and ordinances. Except for the brief discussion of the two ordinances, one agreement, and one conjunctive use program listed above, the Draft EIS/EIR doesn't describe the requirements of local GMPs, ordinances, and agreements listed in Tables 3.3-1 (page 3.3-8) and Table 3-1 (page 27). Thus, the actual groundwater substitution

transfer project permit requirements, restrictions, conditions, or exemptions required for each seller service area by BoR, DWR, and one or more County GMP or groundwater ordinance will apparently be determined at a future date. It follows that any actual monitoring requirements, mitigation measures, thresholds of significance required by BoR, DWR or local governing agencies will also be determined at a future date. The mechanism for the public to participate in the determination of the actual groundwater substitution transfer project permit requirements, restrictions, conditions, mitigation measures or exemptions isn't specified in the Draft EIS/EIR.

Addition information is needed on what the local regulations require for exporting groundwater out of each seller's groundwater basin. The Draft EIS/EIR needs to discuss how the local regulations ensure that the project complies with California Water Code (WC) Sections 1220, 1745.10, 1810, 10750, 10753.7, 10920-10936, and 12924 (for more detailed discussion of these Water Codes see Draft EIS/EIR Section 3.3.1.2.2). Although the Draft EIS/EIR doesn't document, compare or evaluate the requirements of all local agencies that have authority over groundwater substitution transfers in each seller service area, the Draft EIS/EIR concludes that the environmental impacts from groundwater substitution transfer pumping by each of the sellers will either be less than significant and cause no injury, or be mitigated to less than significant through mitigation measures WS-1, and GW-1 with it's reliance on compliance with local regulations. Because the spatial limits of groundwater substitution pumping impacts are controlled by hydrogeology, hydrology, and rates, durations and seasons of pumping, the impacts may not be limited to the boundaries of each seller's service area, GMPs, or County. There is a possibility that a seller's groundwater substitution area of impact will occur in multiple local jurisdictions, which should results in project requirements coming from multiple local as well as state and federal agencies. The Draft EIS/EIR doesn't discuss which of the multiple local agencies would be the lead agency, how an agreement between agencies would be reached, or how the requirements of the other agencies will be enforced. The Draft EIS/EIR only briefly mentions the Northern Sacramento Valley Integrated Regional Water Management Plan (IRWMP) (page 3.3-91 and -92) and doesn't mention the American River IRWMP (http://www.rwah2o.org/rwa/programs/irwmp/), the Yuba County IRWMP (http://yubairwmp.org/the-plan-irwmp/content/irwmp-plan), or the Yolo County IRWMP (http://www.yolowra.org/irwmp.html). The Draft EIR/EIS doesn't provide information on the water management requirements of the IRWMP covering each seller service area or how the groundwater substitution transfers will be accounted for in the IRWMP process.

Because the Draft EIS/EIR requires that each individual transfer project meet the requirements of Water Code sections listed above, and because it assumes that each of the sellers will separately comply with all federal, state and local regulation, GMPs, IRWMPs, ordinances or agreements, the Draft EIS/EIR should provide an analysis of how these local regulations, GMPs, ordinances or agreements will ensure each seller's project achieves the goals of no injury, less than significant and reasonable impacts. Each seller's project analysis should identify what future analyses, ordinances, project conditions, exemptions, monitoring and mitigation measures are required to ensure that each of the seller's project meets or exceed the goals of the Draft EIS/EIR.

I recommend the Draft EIS/EIR be revised to include a discussion and comparison of the local regulations, GMPs, IRWMPs, ordinances and agreements that govern each of the seller's proposed groundwater substitution transfers. I recommend each analysis demonstrate that each seller's project will meet or exceed the environmental protection goals of the Draft EIS/EIR. I recommend an analysis that compares local and regional management plans,

ordinances, regulations, and agreements with the monitoring and mitigation measures in the Draft EIS/EIR to identify any additional mitigation measures needed to ensure compliance with local, regional, state and federal regulations. I recommend an analysis that includes: (1) a discussion on how the local lead agency will be determined; (2) how multiagency jurisdictions will be enforced; (3) how conflicts between different local, regional, state and federal regulatory jurisdictions will be resolved; and (4) how public participation will occur.

7. The Draft EIS/EIR provides only one groundwater elevation map of the Sacramento Valley groundwater basin, Figure 3.3-4, which shows contours from wells screened from a depth greater than 100 feet to less than 400 feet below ground surface (bgs) (>100 to < 400 feet bgs) and only for the northern portion of the proposed groundwater substitution transfer seller area. The Draft EIS/EIR doesn't provide maps showing groundwater elevations, or depth to groundwater, for groundwater substitution transfer seller areas in Placer, Sutter, Yolo, Yuba, and Sacramento counties.

   The DWR provides on a web site a number of additional groundwater level and depth to groundwater maps at: http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/gw_level_monitoring.cfm#Well%20Depth%20Summary%20Maps.

   For example, there are maps that show the change in groundwater levels from the spring of 2004 to spring of 2014 for shallow screened wells (<200 feet bgs), intermediate wells (>200 to <600 feet bgs), deep wells (>600 feet bgs), and well screened in the >100 to < 400 feet bgs interval. In addition, the DWR web site has a series of well depth summary maps for Butte, Colusa, Glenn, and Tehama counties, and the Redding Basin that show the density of wells screened at less than 150 feet bgs, and between 150 and 500 feet bgs, along with contours of the depth to groundwater in the summer of 2013. There are also numerous other groundwater elevation contour maps on DWR's web page, going back to 2006. Historical and recent groundwater elevation and depth contours maps for Placer, Sutter, Yolo, Yuba, and Sacramento counties may be available from the groundwater substitution transfer sellers, other water agencies in those counties, the IRWMP documents, or technical reports on groundwater management (for example, Northern California Water Association, 2014a, b, and c).

   Historic change and current groundwater contour maps are critical to establishing an environmental baseline for the groundwater substitution transfers. This information is needed to evaluate the impacts from groundwater substitution transfers because it establishes the present groundwater basin conditions and document the changes and trends in groundwater levels in the last 10-plus years, which were not simulated by the SACFEM2013 modeling.

   Information on the depth to shallow groundwater is critically important because of the analysis of impacts to vegetation and wildlife in Section 3.8 assumed, based on the results of the SACFEM2013 model, that the current depth to shallow groundwater is greater than 15 feet bgs for most of the Sacramento Valley groundwater basin (page 3.8-32). Because the simulation showed a condition of greater than 15 feet depth to groundwater, the Draft EIS/EIR concluded that impacts from lowering of the shallow water table as a result of the groundwater substitution transfer pumping would be less than significant (page 3.8-47).

   This assumption however appears to conflict with the DWR shallow well depth summary maps (DWR, 2014a) that show contours of the depth to groundwater in wells less than 150 feet bgs in the summer 2013. These maps show extensive areas around the Sutter Buttes

and to the north were the depth to groundwater is less than 10 feet and 20 feet (Exhibit 2.1). These maps also show extensive areas where the depth to groundwater is less than 40 feet, a depth significant to some tree species such as the valley oak (page 3.8-32). There is also a recent trend of lower groundwater levels in a number of areas in the Sacramento Valley as shown on the DWR 2004 to 2014 groundwater change maps for shallow, intermediate, deep aquifer zones available from the web site listed above (DWR, 2014b). Exhibit 2.1 has a composite map of the shallow zone well depth maps and traces of the shallow zone 2004 to 2014 groundwater elevation change contours.

These groundwater elevation, depth and changes in elevation maps are important for documenting baseline groundwater conditions. The recent trend of decreased groundwater levels should be included in the analysis of groundwater substitution pumping impacts because the drawdowns shown in Figures 3.3-26 to 3.3-31 will interact with existing conditions, and may cause additional long-term decreases in groundwater levels. The Draft EIS/EIR's assessment of the impacts from groundwater substitution transfer pumping to existing and future wells, fisheries, vegetation and wildlife, and surface structures should factor in these recent trends in groundwater levels and not rely solely on SACFEM2013 model simulations that ended in 2003. In addition, the hydrographs in Appendix E that show the SACFEM2013 model results should identify wells near the selected 34-hydrograph locations where groundwater level measurements have been taken and show these actual groundwater levels on the hydrographs. Currently the public is left with the task of finding groundwater level data near the 34 selected hydrograph locations and then validating the simulation results by making comparisons between the simulated water levels and the actual water levels. This model validation task should be part of the Draft EIS/EIR.

I recommend the Draft EIS/EIR be revised to include maps of recent groundwater levels and depths to groundwater along with changes in groundwater levels and depths for at least the last 11 years for all of the counties where the seller agencies propose a groundwater substitution transfer project. I recommend that the Draft EIS/EIR be revised to provide additional verification of the SACFEM2013 model results by comparing them to measured groundwater levels in the vicinity of the 34 selected modeling hydrograph locations. I also recommend the hydrographs of actual water level measurements in the vicinity be included on the simulation hydrographs, so that the public can review the accuracy of the simulation. I recommend contour maps showing the current depth to groundwater be made from actual shallow groundwater measurements and that these contours be shown on maps of the surface water features identified and evaluated in Draft EIS/EIR Sections 3.3-Groundwater, 3.7-Fisheries (Table 3.7-3), and 3.8-Vegegation and Wildlife (Table 3.8-3). I recommend that the SACFEM2013 simulation drawdowns be combined with the current (2014) groundwater elevations for each groundwater substitution transfer aquifer to show the cumulative impacts of the 10-year project on existing groundwater elevations.

Groundwater Model SACFEM2013

A finite element groundwater model, SACFEM2013, was used to evaluate the potential for changes in groundwater levels and stream depletion from groundwater substitution transfer pumping during the 10-year period of the project. The results of the simulations were used to evaluate the impacts to fisheries, vegetation and wildlife (Section 3.7 and 3.8). Section 3.3.2.1 discusses the use of the model for estimating regional groundwater level declines due to groundwater substitution pumping. Figures 3.3-26 to 3.3-31 provide simulated changes in

groundwater elevation or head for three intervals, up to 35 feet bgs, 200 to 300 feet bgs, and 700 to 900 feet bgs. Figures 3.3-32 to 3.3-40 and Appendix E provide hydrographs of model simulations for 34 selected locations shown on the simulated groundwater elevation change maps. Sections 3.7.2.1.1, 3.7.2.1.3, 3.7.2.4.1, 3.8.2.1.1, 3.8.2.1.4, and 3.8.2.4.1 provide discussion on the potential impacts of groundwater substitution transfer pumping on fisheries, vegetation and wildlife resources from a drop in the shallow groundwater table and depletion of stream flows.

The SACFEM2013 model was set up to simulate transient flow conditions from WY 1970 to WY 2010 (page 3.3-60). Historic data from 1970 to 2003 were use to estimate the potential impacts from groundwater substitution transfers during the 10-year period of the project. The simulation terminated at 2003 because that was the last simulation period available for the CalSim II model, a planning model designed to simulate operations of the CVP and SWP reservoirs and water delivery systems. Additional SACFEM2013 model documentation is given in Appendix D, which provides information on the model gridding, layering, assumptions and calculation methods. Several of the model designs and parameters selected likely influenced the model's ability to predict future impacts from the 10-year groundwater substitution transfer project. Those include: the time period of the model, the assumptions about the amount and frequency of groundwater substitution pumping, the model's nodal spacing, estimates of aquifer properties, the number of streams simulated, streambed parameters, and specified-flux boundaries. There are at least two other groundwater simulation models developed for the Sacramento Valley, a U.S. Geological Survey model, USGS-CVHM (Faunt, ed., 2009) and a DWR-C2VSim model (Brush and others, 2013a and 2013b).

A comparison between the SACFEM2013 and these two other models provides an interesting assessment of how these three models estimated the hydrogeologic character and conditions of the Sacramento Valley. A comparison also demonstrates that there is no one correct groundwater model, that models with different parameter distributions can achieve reasonable calibration. With models of differing hydrogeologic characteristics, the predictions of future impacts by each model should be expected to differ. Determining which of the models accurately predicts future impacts requires the validation of each model's prediction with new field data. The Draft EIS/EIR mitigation measures for groundwater substitution transfer pumping shouldn't assume that the SACFEM2013 model results are all that is needed to demonstrate no injury and less than significant impacts from the proposed project. Validation of the model-based conclusion of no impacts requires collection of new field data and comparison to simulation predictions throughout and beyond the 10-year project.

A comparison of portions of the SACFEM2013 simulation for the Draft EIS/EIR with the two other models is given below.

8. *Period of Modeled Historic Groundwater Conditions* – Although the model simulation period ended in 2003, the Draft EIS/EIR indicates that the model was run to 2010, but the results were not provided. From the model write-up it is unknown whether the latest groundwater elevations were a factor in the modeling effort. The simulation hydrographs in Appendix E terminate in 2004. Apparently, the hydrologic conditions for the latest 10 years are not included because the Draft EIS/EIR doesn't discuss how the model simulations agree with the current baseline conditions. Specifically, the change in groundwater elevation between 2004 and 2014 as document by DWR (2014b) in a series of three maps. I've

provided in attached Exhibits 3.1 to 3.3 maps that are composites of DWR's 2004 to 2014 groundwater change maps with Draft EIS/EIR Figures 3.3-29, 3.3-30 and 3.3-31, the SACFEM2013 1990 hydrologic conditions simulations of drawdown by zone. The 1990 hydrologic condition was selected for comparison because the sequence of groundwater pumping events is the closest match to the actual pumping requested in the Draft EIS/EIR. Note that the depth intervals of the two sets of maps don't exactly coincide, but they are generally grouped as shallow, intermediate and deep aquifers.

Exhibits 3.1 to 3.3 show that the simulated changes in groundwater elevation from the 10-year groundwater substitution transfer project appear to widen the existing groundwater depressions. The pumping depression southwest of Orland will expands to the east and northeast, as will the depression in the Williams area. A pumping depression will develop in the Live Oaks area and to the east. In the southeastern Sacramento area, the pumping depression from the 10-year project will apparently extent southeastward beyond the limits of the Sacramento Valley transfer project boundary. Combining the existing areas of recent sustained groundwater drawdown with the additional drawdown from the groundwater substitution transfer pumping could slow the recovery of groundwater elevations. The 10-year project pumping east of Orland may connect the two existing groundwater depressions around Orland and Chico to create one large depression. Because the DWR 2004 to 2014 groundwater change maps don't extend completely to the southern portions of the Sacramento Valley groundwater substitution transfer area in Placer, Sutter, Yolo, Yuba, and Sacramento counties, no evaluation can be made about the impact of 10 years of groundwater substitution transfer pumping on existing groundwater conditions in those or adjacent areas.

I recommended the Draft EIS/EIR be revised to discuss how the SACFEM2013 simulations incorporate the changes in groundwater level from 2004 to 2014 in assessing the potential impacts from the proposed 10 years of groundwater substitution transfer pumping. I recommended this discussion include evaluation of the rate and duration of groundwater level recovery that factors in the existing (2014) groundwater levels. I also recommend the Draft EIS/EIR be revised to discuss how during the 10 years of project transfers through the Delta will be made with a CalSim II model that's only current to the year 2003.

9. *Simulation Pumping Volume and Frequency* - The model simulated a series of groundwater pumping events in 12 out of the 34 years of simulation (page 3.3-60). The logic of a multiyear, variable hydrology simulation was that it allowed for evaluation of the cumulative effects of pumping in previous years (page 3.3-61). Figure 3.3-25 shows the simulated periods of groundwater substitution transfer pumping. The 1990 simulation period most closely matches the multiyear pumping being requested by the 10-year project. The 1990 simulation period included groundwater pumping 7 out of 10 years, with pumping values ranging from approximately 95,000 acre-feet per year (AFY) to approximately 262,000 AFY, as measured from Figure 3.3-35. Note the actual pumping rates, volumes, and pumping durations were not provided in the simulation documentation. Apparently, none of the modeled groundwater substitution pumping simulation periods was given the actual maximum groundwater substitution pumping value of 290,495 AFY as calculated from Table 2-5. The time-weighted annual average pumping rate for the 1990 simulation period is approximately 126,900 AF, as measured from Figure 3.3-35. This represents approximately 44% of the maximum pumping rate requested in the Draft EIS/EIR (126,900 AF/290,495 AF = 0.437). Therefore the SACFEM2013 Draft EIS/EIR simulations may only represent a portion of the project's potential impacts from groundwater substitution transfer pumping.

I recommend the Draft EIS/EIR be revised to discuss how the SACFEM2013 simulations provide a full and accurate estimation of the potential impacts from the groundwater substitution transfer pumping throughout the 10-year project. I also recommend the Draft EIS/EIR be revised to include SACFEM2013 simulations at the maximum requested annual volume of 290,495 AF for each of the 10 years of pumping.

10. *Simulation Grid Size* - The SACFEM2013 documentation states that the grid used for groundwater substitution transfer simulations has 153,812 nodes and 306,813 elements (page D-3 of Appendix D). The model nodal spacing varies from 410 feet to 3,000 feet, with an approximate nodal spacing of 1,640 feet along streams and flood bypasses. While this nodal spacing is reasonable for regional groundwater simulations, the results of the simulations may not provide the detail needed to evaluate drawdown interference between the groundwater substitution transfer wells and adjacent non-participating wells. Information is needed on the locations of the groundwater substitution transfer wells and the adjacent non-participating wells in order to determine whether the current simulation grid spacing can accurately estimate well interference. The Draft EIS/EIR analysis of groundwater substitution pumping impacts should be based on an appropriate model grid spacing to establish accurate maximum thresholds for well interference caused by the transfer well pumping. The Draft EIS/EIR should provide sufficient information that an owner of a non-participating well can determine accurately the maximum anticipated increase in drawdown at their well during the 10 years of groundwater substitution transfer pumping. Whether this amount of increased drawdown is significant at each non-participating well is a matter of the current well design and groundwater conditions at each well. The Draft EIS/EIR should establish values for the maximum allowable well interference drawdown from groundwater substitution transfer pumping, which should be based on the costs and inconvenience of lowering the water level. The Draft EIS/EIR should establish the economic costs and level of injury that are reasonable for a non-participating well owner to assume and will keep the impacts from the 10-year project in compliance with the no injury rule as required by WC Section 1706, 1725 and 1736 (Section 1.3.2.3).

    I recommend the Draft EIS/EIR be revised to discuss how the maximum thresholds for water level drawdown due to well interference from groundwater substitution transfer pumping will be established for non-participating wells, and provide a process for assigning a threshold to each non-participating well, along with monitoring requirements and specific mitigation measures should the threshold be exceeded. The Draft EIS/EIR also should be revised to provide the threshold values for well system repair costs used in set the maximum allowable well interference drawdown, along with the documentation and analysis of why the well interference drawdown and cost thresholds are considered reasonable and result in no injury to non-participating well owners, and comply with the Water Code.

11. *Simulation Hydrogeologic Parameter Values* - The SACFEM2013 model was developed with seven layers of varying thickness that extend from the shallow water table to the base of fresh water. The USGS-CVHM model has ten layers, while the DWR-C2VSim model has 3 layers. All of the models assume that the uppermost layer, layer 1, was unconfined and the lower layers are confined aquifer. The hydrogeologic parameters values differ for each of these models as shown in a summary table in Exhibit 4.1. Both the CVHM and C2VSim models divided the Central Valley in to 21 subregions (Figure 3, Brush and others, 2013a; Exhibit 4.4). The SACFEM2013 doesn't use subregions from the Sacramento Valley model. As discussed below, the SACFEM2013 appears to use the same distribution of the

horizontal hydraulic conductivity, Kh, for all model layers (Figure D-4 of Appendix D). Both the CVHM and the C2VSim models appear to have more varied hydraulic conductivity distributions then SACFEM2013.

Development of the SACFEM2013 simulations used horizontal hydraulic conductivity values derived from the well logs of large-diameter irrigation wells. Shallow and low-yielding wells, less than 100 gallons per minute (gpm), and domestic-type wells were not used (page D-12 of Appendix D). The values of specific capacity (gallons per minute per foot of drawdown) from the DWR well completion reports were used to estimate transmissivity around a well using an empirical equation for confined aquifer developed from Jacob's modified non-equilibrium equation (see equation 8 page D-13 and Appendix 16D of Driscoll, 1986 in Exhibit 4.6). Transmissivity was converted to Kh by assuming the aquifer thickness was equal to the length of the well screen interval. These well Kh values were then averaged using a geometric mean with surrounding wells within a critical distance of 6 miles. The results of the geometric mean averaging were then gridded using a kriging to produce Kh values across the modeled area (Figure D-4 in Appendix D). The transmissivity of each model layer was then calculated at each node by multiplying the kriged geometric mean value of Kh by the aquifer layer thickness. The vertical hydraulic conductivity, Kv, was calculated by assuming a uniform Kh:Kv ratio of 50:1 for layer 1 and 500:1 for layers 2 to 7.

The CVHM model (Faunt, ed., 2009) used the percentage of coarse-grained material from well logs and boreholes as the primary variable in a sediment texture analysis of the Central Valley, which was divided into nine textural provinces and domains (Figures A10 to A14; Exhibits 4.7a to 4.7i). The Sacramento Valley has three textural domains, Redding, eastern, and western Sacramento domains (page 30, Faunt, ed., 2009). The coarse-grained fraction was correlated to horizontal (Kh) and vertical (Kv) conductivity (page 154, Faunt, ed., 2009). The Kh values were estimated using kriging and a weighted arithmetic mean, a type of power mean, whereas the Kv value estimates used either a harmonic or geometric mean. Faunt (ed., 2009) notes that the arithmetic mean is most influenced by the coarser-grained material, whereas the fine-grained material more heavily weights both the harmonic and geometric means. Figure C14 (Exhibit 4.7j) shows the relationship between the percentage of coarse-grained deposits and hydraulic conductivity for the different types of means. For the Sacramento Valley the texture-weighted power-mean value was -0.5, a value midway between the harmonic and geometric means (Table C8, Exhibit 4.3).

Table C8 lists the end member hydraulic conductivity values used in the CVHM model with those for the Sacramento Valley ranging from 670 feet/day (ft/day) for coarse-grained to 0.075 ft/day for fine-grained. The table also lists field and laboratory values of Kh and Kv for coarse and fine-grained deposits. The Redding textural domain has the highest percentage of coarse-grained material of the three in Sacramento Valley, a mean of 39 percent, with the western portion becoming coarser with depth (page 30, Faunt, ed., 2009). The western and eastern Sacramento domains are finer-grained, with the eastern mean at 32 percent coarse-grained deposits, and the western mean at 25 percent. Figure A15B(A?) (Exhibit 4.7k) shows the cumulative distribution of kriged sediment textures for each layer of the CVHM model for the Sacramento Valley. Figures A12A to A12E (Exhibits 4.7c to 4.7g) show the distribution of coarse-grained deposits in CVHM groundwater model layers 1, 3, Corcoran Clay, 6 and 9 for the Sacramento and San Joaquin Valleys. Isolated coarser-grained deposits that occur in layer 1 are associated with the Sacramento River, distal parts of fans from the Cascade Range and northern Sierra Nevada, and the American River (page 30, Faunt, ed., 2009; Figure A14, Exhibit 4.7i). Although the texture maps, Figures A12A to A12E of CVHM, and the hydraulic conductivity distribution map of Figure D4 of SACFEM2013, show different characteristic of each model's hydraulic conductivity, they can be compared by

their visual complexity. The CVHM texture also varies by model layer, whereas the SACFEM2013 apparently applied the same Kh distribution to each layer. The CVHM western and eastern Sacramento domains appear to have smaller coarse-grained areas than the SACFEM2013 higher hydraulic conductivity areas (Figures A12, C14 and A15 in Exhibits 4.7c, 4.7j, and 4.7k versus D4 in Appendix D). Figure 12E (Exhibit 4.7g) shows layer 9 with high percentages of coarse-grained deposits that have higher Kh values (Figure C14) in the western parts of the Redding (10) and northern western portion of the western Sacramento (11) province. Whereas Figure D4 of SACFEM2013 shows these same areas as having the lowest Kh values, suggesting finer-grained textures dominate.

The C2Vsim model divided the Sacramento Valley into seven subregions, as did the USGS-CVHM model. Like the USGS model, hydraulic conductivity varies with the three model layers for the Sacramento Valley. The spatial variability of the Kh and Kv values for the C2VSim model is greater than with the SACFEM2013 model (compare Figures 34 and 35 from Brush and others, 2013a in Exhibits 4.8a to 4.8f to Figures D4 of Appendix D). Table 5 of Brush and others, 2013a (Exhibit 4.2) shows the range of model parameters for the saturated groundwater portion of the C2VSim model. Kh values range from 2.2 ft/day to 100 ft/day, and Kv from 0.005 ft/day to 0.299 ft/day. The highest Kh value for the C2VSim model is less than for SACFEM2013 (100 ft/day vs 450 ft/day), while the lowest values are lower (0.005 ft/day vs <0.1 ft/day).

I recommend the Draft EIS/EIR discuss the uncertainty in aquifer hydraulic parameter estimations for the groundwater substitution transfer pumping simulations and the sensitivity of the model results to the uncertainty in the groundwater hydraulic parameters. I recommend the Draft EIS/EIR discuss how the uncertainty in hydraulic conductivity parameters influences: (1) estimates of potential stream depletion (Section 3.3), (2) evaluations of fisheries impacts (Section 3.7), (3) evaluations of vegetation and wildlife impacts (Section 3.8), and (4) the screening procedures that removed a number of the small streams from further environmental impact analysis (Table 3.7-3 and 3.8-3).

12. *Simulation Groundwater Storage Parameters* - The SACFEM2013 simulations assigned to the upper unconfined model layer 1 a uniform specific yield (Sy) value of 0.12 (dimensionless) (page D-14 in Appendix D; Exhibit 4.1). For the confined model layers 2 to 7 a uniform specific storage, Ss, value of 6.5×10^{-5} per foot (ft) was used (page D-14 of Appendix D; Exhibit 4.1). Both the CVHM and C2VSim simulations used a range of values of Sy and Ss that were more variable than SACFEM2013 (Exhibits 4.1, 4.8n, and 4.8o). The CVHM simulation used a range of Sy and Ss values, (CVHM Table C8, Exhibits 4.3). The CVHM simulation also used a range of Ss values for coarse-grain elastic and fine-grained elastic and inelastic deposits to simulating subsidence from groundwater pumping. The C2VSim simulations used a range of Sy values for model layer 1 and separate ranges of Ss values for layers 2 and 3 (C2VSim Table 5, Exhibits 4.2; Exhibits 4.8g to 4.8i). The C2VSim and CVHM models assigned a range of coefficients for elastic (Sce) and inelastic (Sci) deposits used in simulating subsidence (Exhibits 4.1, 4.8j to 4.8m). Note, the Ss values are multiplied by the aquifer thickness at each model node at to obtain the dimensionless value of storativity (S) for confined aquifers (S = Ss x thickness), which is similar to the dimensionless Sy parameter for an unconfined aquifer.

I recommend the Draft EIS/EIR discuss the uncertainty in aquifer storage parameter estimations for the groundwater substitution transfer pumping simulations and the sensitivity of the model results to the uncertainty in the groundwater storage parameters. I recommend the Draft EIS/EIR discuss how

uncertainty in groundwater storage parameters influences: (1) estimates of potential stream depletion (Section 3.3), (2) evaluations of fisheries impacts (Section 3.7), (3) evaluations of vegetation and wildlife impacts (Section 3.8), and (4) the screening procedures that removed a number of the small streams from further environmental impact analysis (Table 3.7-3 and 3.8-3).

13. *Simulation River and Stream Parameters* - All three models simulated the interactions between the groundwater and streams or rivers. The rate and direction of movement of water between streams and shallow groundwater is governed by the vertical hydraulic conductivity of the streambed, Kvb, thickness of the streambed, m, the wetted perimeter of the stream, w, and the difference in elevation between groundwater table and stream. The hydraulic parameters of a streambed are combined into a term called conductance, C, which is calculated as the product of Kvb times the wetted perimeter divided by the streambed thickness (C = [Kvb x w]/m).

    The SACFEM2013 simulations assigned all eastern streambeds draining from the Sierra Nevada a Kvb value of 6.56 ft/day (2 meters/day), except the Bear River and Big Chico Creek, whose values were unstated (page D-7 of Appendix D). For all western streambeds draining the Coast Ranges, a higher value of Kvb at or above 16.4 ft/day (5 meters/day) was assigned. Figure 3.3-24 in the Draft EIS/EIR shows the SACFEM2013 groundwater boundary and the simulated rivers and streams. This map may not be showing all of the small streams evaluated in the simulation based on the streams listed in Tables 3.7-3 and 3.8-3 (also see general comment no. 2).

    The streambed Kvb values used in CVHM simulation are shown in Figure C26 (Exhibit 5.3). The values of Kvb for the Sacramento Valley varying from approximately 0.04 ft/day to 5.6 ft/day are shown in Figure C26. Results of the CVHM simulation of surface water-groundwater interactions, gains and losses, from 1961 to 1977 are compared to measured and simulated stream gauge values in Figures C19A and C19B (Exhibits 5.4a and 5.4b).

    The C2VSim simulations also used varying values for streambed Kvb ranging from 0 to 44 ft/day with a mean of 1.8 ft/day and lake bed Kvb of 0.67 ft/day (page 100, Brush and others, 2013a; Exhibit 5.1). Simulated streambed conductance values are shown in Figure 40 of Brush and others, 2013a (Exhibit 5.2).

    I recommend the Draft EIS/EIR discuss the uncertainty in streambed parameter estimations for the groundwater substitution transfer pumping simulations and the sensitivity of the model results to the uncertainty in the hydraulic characteristics of the streambeds. I recommend the Draft EIS/EIR discuss how uncertainty in the hydraulic characteristics of the streambeds influences: (1) estimates of potential stream depletion (Section 3.3), (2) evaluations of fisheries impacts (Section 3.7), (3) evaluations of vegetation and wildlife impacts (Section 3.8), and (4) the screening procedures that removed a number of the small streams from further environmental impact analysis (Table 3.7-3 and 3.8-3).

14. *Groundwater Flow Between Sub-regions* - Of the three previously discussed regional groundwater models for the Sacramento Valley, only the reports for the C2VSim simulation provided information on the volume of groundwater that flows laterally among groundwater subregions. The C2VSim simulation results show that groundwater flow between subregions has changed significantly in some areas (Figures 81A to 81C of Brush and others, 2013a and Figure 39 of Brush and others, 2013b; Exhibits 6.1a to 6.1c and 6.2). The SACFEM2013 simulations results presented in the Draft EIS/EIR don't provide information on the exchange between subregion areas used in simulations by the USGS (Faunt, ed.,

2009) and DWR (Brush and others, 2013a and 2013b). Therefore, the flow of groundwater between the subregions and/or counties of the 10-year project's groundwater substitution transfer sellers wasn't evaluated for potential impacts on neighboring areas. The loss or gain of groundwater from neighboring subregions should be evaluated in the Draft EIS/EIR.

Accounting for subsurface flow among subregions is an important part of the water balance because it is measures of the amount of impact that groundwater pumping in one subregion has on it's neighboring subregions. The subsurface inter-basin movement of groundwater is an important element in the analysis of the environmental impacts from the 10-year groundwater substitution transfer projects because the groundwater substitution transfer pumping by sellers in one region can have a significant impact on the groundwater levels, storage and stream depletion in adjacent regions.

The C2VSim simulations calculated the volume of groundwater that flowed between the subregions and presented the results for three decades, 1922-1929, 1960-1969, and 2000-2009, and for the total simulation period, 1922-2009. Tables 10 through 13 (Brush and others, 2014a; Exhibits 6.3a to d) provide the sum of inter-region groundwater flow for each model subregion, but not the individual values of flow among adjoining subregions. Figures 81 and 39 (Exhibits 6.1a to 6.1c and 6.2) give the simulated annual volume of inter-region flow for the three decades and from 1922 to 2009. An estimate of a portion of the long-term changes in groundwater storage in each subregion can be made by comparing the change in annual volume and flow direction between sub-regions.

For example, in the 1922 to 1929 simulation period subregion 9 (Sacramento-San Joaquin Delta received 81,000 AFY of groundwater flow from adjoining subregions 6, 8, 10 and 11 (Exhibit 6.1a). By 1969 the simulation shows that subregion 9 was still receiving a small volume, 2,000 AFY, of groundwater flow from subregion 6, but losing approximately 56,000 AFY to subregions 8, 10, and 11 (Exhibit 6.1b). A change in groundwater storage from 1929 to 1969 in the Delta of 135,000 AFY; from a plus 81,000 AFY to a minus 54,000 AFY. For 2002-2009, the simulation shows that the Delta still receiving a small volume, 4,000 AFY, of groundwater flow from subregion 6, but now losing 137,000 AFY to subregions 8, 10 and 11 (Exhibit 6.1c). A loss in storage in the Delta of 214,000 AFY from 1929. The 2000-2009 simulation period shows that subregion 8 is receiving a large portion of the groundwater flow out of the Delta, 112,000 AFY, a reversal in groundwater flow direction and a cumulative annual loss to the Delta from 1922-1929 of 147,000 AFY. Subregion 8 in turn loses 17,000 AFY of groundwater flow to subregion 7 in 2000-2009, and receives 123,000 AFY from subregion 11 (Exhibit 6.1c). A reversal of 1922-1929 when subregion 8 received 1,000 AFY from subregions 7 and gave 1,000 AFY to subregion 11.

The 10-year transfer project proposes under the groundwater substitution to pump up to approximately 75,000 AFY from subregions 7 and 8, Table 2-5. This additional pumping will likely cause additional groundwater to flow from the subregion 9, the Delta, and subregion 11 into subregion 8, and eventually to subregion 7. Similar shifts in direction and annual volumes of groundwater flow have occurred with the other Central Valley subregions. The changes direction and volume of flow between the Delta and surrounding subregions appear to be the largest shift in groundwater flow for in Sacramento Valley area.

I recommend the Draft EIS/EIR be revised to evaluate the subsurface flows between subregions in Sacramento Valley due to the proposed groundwater substitution transfer pumping. I recommend the Draft EIS/EIR be revised to include groundwater model simulations that account for the rates, volumes, times, and changes in direction of groundwater flow between the seller pumping areas and the surrounding non-participating regions. I recommend the Draft

EIS/EIR also analysis the short- and long-term impacts from the changes in subregional groundwater flow caused by the 10-year transfer project.

Mitigation Measure WS-1

15. The purpose of mitigation measure WS-1 as stated in Draft EIS/EIR Section 3.1.4.1 is to mitigate potential impacts to CVP and SWP water supplies from stream depletion caused by groundwater substitution transfer pumping. The stream depletion factor (BoR-SDF) is imposed by the BoR and DWR because they *will not move transfer water if doing so violates the no injury rule* (page 3.1-21). The no injury rule is discussed in Section 1.3.2.3 and cites CA WC Sections 1725, 1736 and 1706. The language from WC 1736 that also requires transfers to not result in unreasonable effects to fish, wildlife, or other instream beneficial uses is discussed in the subsequent Section 1.3.2.4.

    Draft EIS/EIR Sections 3.1.2.4.1 (page 3.1-15) and 3.1.6.1 (page 3.1-21) discuss the impacts from groundwater substitution transfers on surface water. On page 3.1-16 the Draft EIS/EIR states that groundwater recharge, presumably greater because of groundwater substitution pumping, occurring during higher flows would decrease flow in surface waterways. During periods of high flow, the decrease in surface flow won't affect water supplies or the ability to meet flow or quality standards. The document also states that if groundwater recharge occurs during dry periods, presumably occurring when groundwater substitution transfers are needed, groundwater recharge would decrease flows and affect BoR and DWR operations. BoR and DWR would then need to either decrease Delta exports or release additional flows from surface storage to meet the required standards. These statements are followed by seemly conflicting statements that:

    > *Transfers would not affect whether the water flow and quality standards are met, however, the actions taken by Reclamation and DWR to meet these standards because of instream flow reductions due to the groundwater recharge could affect CVP and SWP water supplies.* (page 3.1-16)
    >
    > *Increased releases from storage would vacate storage that could be filled during wet periods, but would affect water supplies in subsequent years if the storage is not refilled.* (page 3.1-17)

    The potential for the reduction in surface water storage to eventually cause reductions in streamflow and water quality isn't clearly addressed in the Draft EIS/EIR.

    > *Overall, the increased supplies delivered from water transfers would be greater than the decrease in supply because of streamflow depletion; however, the impacts from streamflow depletion may affect water users that are not parties to water transfers. On average, the losses due to groundwater and surface water interaction would result in approximately 15,800 AF of water annually compared to the No Action/No Project Alternative, or approximately a loss of 0.3 percent of the supply.* (page 3.1-18)
    >
    > *In a period of multiple dry years (such as 1987-1992), the streamflow depletion causes a 2.8 percent reduction in CVP and SWP supplies, or 71,200 AF.* (page 3.1-18)
    >
    > *To reduce these effects, Mitigation Measure WS-1 includes a streamflow depletion factor to be incorporated into transfers to account for the potential water supply impacts to the CVP and SWP. Mitigation Measure WS-1 would reduce the impacts to less than significant.* (page 3.1-18)

    Additional information on the requirements of WS-1 appears to be contained in the October 2013 joint DWR and BoR document titled *Draft Technical Information for Preparing Water Transfer Proposals* (DTIPWTP) because the discussion in that document's Section 3.4.3

on estimating the effects of transfer operations on streamflow says that a default BoR-SDF of 12 percent will be applied *"unless available monitoring data analyzed by Project Agencies supports the need for the development of a transfer proposal site-specific SDF"* (page 33). The document also states that:

> *Although real time streamflow depletion due to groundwater substitution pumping for water transfers cannot be directly measured, impacts on streamflow due to groundwater pumping can be modeled. Project Agencies have applied the results from prior modeling efforts to evaluate potential groundwater transfers in the Sacramento Valley to establish an estimated average streamflow depletion factor (SDF) for transfers requiring the use of Project Facilities.*

I have several comments on this analysis of stream depletion impacts and mitigation measure WS-1:

a. Sections 2.3.2.2 and 2.3.2.3 discuss potential groundwater substitution and crop idling transfers and the limitations on the timing of the transfers. Transfers typically occur from July to September, but could also occur from April to June if conditions in the Delta allow for transfer. Surface water to be used in groundwater substitution and crop idling transfers would be stored during April to June if the condition of the Delta is unacceptable for transfer.

   My understanding of the BoR-SDF in mitigation measure WS-1 is that at the same time transfer surface waters are flowing towards the Delta, a portion of that water is assigned to the waterway to "offset" or compensate for stream depletion caused by groundwater substitution pumping. The Draft EIS/EIR doesn't seem to address the issue of how to compensate for groundwater substitution pumping impacts occurring before or after the transfer water flows to the Delta, the long-term losses caused by the pumping in subsequent years, and cumulative impacts from multiple years of pumping by all sellers. Yet the Draft EIS/EIR acknowledges that stream depletion is cumulative and a cumulative increase in depletion can be significantly greater than with a single event (Section 4.3.1.2 in Appendix B). The SACFEM2013 simulation shows that stream depletion will continue for a number of years after the groundwater substitution pumping event (Figures B-4, B-5 and B-6 in Draft EIS/EIR Appendix B). Mitigation measure WS-1 doesn't appear to fully address how mitigation will occur for stream depletion impacts from groundwater substitution pumping during entire duration of the impact.

   I recommend mitigation measure WS-1 be revised to clearly address how reductions in stream flows caused by groundwater substitution transfer pumping will be mitigated to less than significant for all of the times when stream depletion is occurring, including the time before and after the water is physically transferred; long-term impacts; and cumulative impacts from multiple sellers over multiple years of participating in groundwater substitution transfers.

b. Although mitigation measure WS-1 doesn't state that its implementation is linked to the October 2013 DTIPWTP (that linkage is part of mitigation measure GW-1), the DTIPWTP discusses the use of the BoR-SDF in the methodology for determining the amount of water available for groundwater substitution transfer, and the effects of the groundwater substitution pumping on streamflow in Section 3.4 (page 31). Item 5 on page 31 gives the formula for using four steps in determining the amount of transferable water, one of which is subtraction of the

estimated streamflow reduction. Section 3.4.3 states on page 33 of the DTIPWTP that:

> *Although real time streamflow depletion due to groundwater substitution pumping for water transfers cannot be directly measured, impacts on streamflow due to groundwater pumping can be modeled. Project Agencies have applied the results from prior modeling efforts to evaluate potential groundwater transfers in the Sacramento Valley to establish an estimated average streamflow depletion factor (SDF) for transfers requiring the use of Project Facilities.*
>
> *Project Agencies will apply a 12 percent SDF for each project meeting the criteria contained in this chapter unless available monitoring data analyzed by Project Agencies supports the need for the development of a transfer proposal site-specific SDF.*
>
> *Project Agencies are developing tools to more accurately evaluate the impacts of groundwater substitution transfers on streamflow. These tools may be implemented in the near future and may include a site-specific analysis that could be applied to each transfer proposal.*

Mitigation measure WS-1 states on page 3.1-21 that:

> *The exact percentage of the streamflow depletion factor will be assessed and determined on a regular basis by Reclamation and DWR, in consultation with buyers and sellers, based on the best technical information available at that time. The percentage will be determined based on hydrologic conditions, groundwater and surface water modeling, monitoring information, and past transfer data.*

From these statements it appears that: (1) the BoR, DWR and other Project Agencies have previously analyzed the amount of stream depletion caused by past groundwater substitution transfers, and (2) the default of 12% BoR-SDF may not be applied to groundwater substitution during the 10 years of transfers because transfer-specific studies will be needed. The Draft EIS/EIR doesn't provide information or cite references on the previous modeling and/or monitoring efforts to determine the correct stream depletion factor. It also doesn't provide specific information on the method(s) and review process to be used in implementing mitigation measure WS-1, or what additional assessments are needed to determine the "exact percentage" for the BoR-SDF. Mitigation measure WS-1 appears to require that the assessment, the calculation methodology, and determination of the correct BoR-SDF be done at a future time. The Draft EIS/EIR doesn't state whether other regulatory agencies and/or the public will have an opportunity in the future to review and comment on the methodology and determination of the "exact percentage" of the BoR-SDF for each groundwater substitution transfer seller. The Draft EIS/EIR also doesn't state whether other regulatory agencies and/or public comments will be considered by BoR and DWR in determining the BoR-SDF percentage.

The statement that real time stream depletion can't be directly measured contradicts other statements in the Draft EIS/EIR, requirements of mitigation measure GW-1, and the scientific literature. For example: Section 3.5 of the DTIPWTP states that one of the objectives of the monitoring plan is to:

> *Determine the extent of surface water-groundwater interaction in the areas where groundwater is pumped for the transfer.* (page 34)

This objective is in the project's monitoring program therefore it appears to

indicate that some method is available for monitoring the surface water-groundwater interactions, not just the pre-pumping model simulations. The Fisheries (3.7) and Vegetation Wildlife (3.8) sections of the Draft EIS/EIR appear to state that flow reductions in surface waterways caused by groundwater substitution pumping will be monitored. Paragraphs similar to the ones given below state that monitoring wells are part of the mitigation measure for surface waters:

> *In addition, flow reductions as the result of groundwater declines would be observed at monitoring wells in the region and adverse effects on riparian vegetation would be mitigated by implementation of Mitigation Measure GW-1 (See Section 3.3, Groundwater Resources), because it requires monitoring of wells and implementing a mitigation plan if the seller's monitoring efforts indicate that the operation of the wells for groundwater substitution pumping are causing substantial adverse impacts. The mitigation plan would include curtailment of pumping until natural recharge corrects the environmental impact. Therefore, the impacts to fisheries resources would be less than significant in these streams.* (pages 3.7-26 and 3.7-56)
>
> *In addition, the Proposed Action has the potential to cause flow reductions of greater than ten percent on other small creeks where no data are available on existing streamflows to be able to determine this. The impacts of groundwater substitution on flows in small streams and associated water ways would be mitigated by implementation of Mitigation Measure GW-1 (see Section 3.3, Groundwater Resources) because it requires monitoring of wells and implementing a mitigation plan if the seller's monitoring efforts indicate that the operation of the wells for groundwater substitution pumping are causing substantial adverse impacts. The mitigation plan would include curtailment of pumping until natural recharge corrects the environmental impact. Implementation of these measures would reduce significant effects on vegetation and wildlife resources associated with streams to less than significant.* (pages 3.8-51, 3.8-58 and 3.8-68)

All of these statements seem to contradict the statement in mitigation measure WS-1 that stream depletion can't be measured in real time. Although the Draft EIS/EIR doesn't provide the technical method(s) for determining surface water flow using monitoring in groundwater wells, it's reliance on mitigation measure GW-1 to ensure that streamflows are adequate implies that a method is available. Because WS-1 and GW-1 both have one of the same objectives, to mitigation streamflow losses due to groundwater substitution pumping, the mitigation measure are linked. Thus, the real time monitoring of groundwater intended to mitigate streamflow losses under GW-1 might also facilitate real time monitoring of streamflow needed for WS-1. I'll provide in Part 2 of this letter some additional discussion and references to scientific literature on studies and methods for measuring stream seepage and stream depletion caused by groundwater pumping.

I recommend the Draft EIS/EIR be revised to clearly discuss the methods available for determining the value of the BoR-SDF for each groundwater substitution transfer well. I recommend the Draft EIS/EIR be revised to discuss the procedure for Project Agency review and approval, along with process for review and comment by other public agencies and the public. I recommend the Draft EIS/EIR be revised to discuss the methods and results of prior BoR-SDF determinations. I recommend the Draft EIS/EIR be revised to define the data needed to

determine the "exact percentage" of stream depletion from groundwater substitution pumping during the 10-year transfer project, the technical method(s) that will be used to calculate the amount of stream depletion and the BoR-SDF, and the method(s) for monitoring surface water flow losses and verifying the effectiveness of the BoR-SDF and mitigation measure WS-1.

c. Section 3.4.1 of the DTIPWTP discusses calculation of baseline groundwater pumping for groundwater substitution transfers. Baseline groundwater pumping and stream depletion reduction are part of the four-step process for determining the amount of transferable water (page 31). Water transfer sellers wanting to use groundwater substitution pumping are requested to submit information to:

> *Identify all wells that discharge to the contiguous surface water delivery system within which a well is proposed for use in the transfer program,* and
>
> *The amount of groundwater pumped monthly during 2013 for each well that discharges to the contiguous surface water delivery system.*

Section 3.4.2 discusses measuring groundwater pumping provided for groundwater substitution transfers and states that:

> *Sellers should provide pumping records from all wells that discharge to a contiguous surface water delivery system used in groundwater substitution transfers.* (page 32)

The requirement that the groundwater transfer pumping baseline and metering of transfer pumping be conditioned on the water being discharged to the *contiguous surface water delivery system* suggests that if the groundwater substitution pumping discharges to a non-contiguous surface water or directly to a field that the establishment of a pre-transfer pumping baseline and transfer metering aren't required. Is that the case? If it is the case, then how is the amount of transferable water determined whenever the groundwater substitution transfer pumping doesn't discharge to a *contiguous surface water deliver system*? If the pre-transfer baseline pumping is removed from the calculation, does that increase or decrease the amount of transferable water and how does that change the BoR-SDF requirement? Is metering required for groundwater substitution transfer wells that don't discharge to a *contiguous surface streams water delivery system*? If not, how will measurement of transferred water and the required amount of the BoR-SDF be verified? All of these factors are relevant because they are linked to mitigation measure WS-1 through the DTIPWTP four-step process to determine the amount of transferrable water. The amount of transferrable water incorporates the BoR-SDF to prevent injury and reduce groundwater substitution pumping stream depletion impacts to less than significant.

I recommend the Draft EIS/EIR be revised to provide a discussion of how the baseline for pre-transfer groundwater pumping will be determined and how metering of all groundwater substitution transfer pumping for wells will be done regardless of whether the well discharges to a contiguous surface water delivery system. I recommend the Draft EIS/EIR be revised to discuss how the BoR-SDF will be determined, monitored, and it's effectiveness verified for all groundwater substitution transfer wells regardless of whether the well discharges to a contiguous surface water delivery system.

Mitigation Measure GW-1

16. The Draft EIS/EIR has only two mitigation measures that apply to the groundwater substitution transfers, WS-1 and GW-1. GW-1 is the principle mitigation measure for the 10-year transfer project's Draft EIS/EIR and is discussed in Section 3.3.4.1. The requirements contained in the October 2013 joint DWR and BoR *Draft Technical Information for Preparing Water Transfer Proposals* (DTIPWTP) and its 2014 Addendum are included in GW-1 by reference. The monitoring and mitigation measures of GW-1 are generally statements of objectives and requirements for development in the future monitoring and mitigation plans that are approved by BoR and perhaps DWR. GW-1 doesn't appear to provide any future opportunity for review and comment by parties that may be impacted by the groundwater substitution transfers such as the non-participating well owners, the public, or other regulatory agencies. GW-1 has statements such as:

    The monitoring program will incorporate a sufficient number of monitoring wells to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. (page 3.3-88)

    The monitoring program will include a plan to coordinate the collection and organization of monitoring data, and communication with the well operators and other decision makers. (page 3.3-89)

    Potential sellers will also be required to complete and implement a mitigation plan. (page 3.3-89)

    To ensure that mitigation plans will be feasible, effective, and tailored to local conditions, the plan must include the following elements: (page 3.3-90 and 3.3-91)

    - *A procedure for the seller to receive reports of purported environmental or effects to non-transferring parties;*
    - *A procedure for investigating any reported effect;*
    - *Development of mitigation options, in cooperation with the affected parties, for legitimate significant effects*
    - *Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.*

    Reclamation will verify that sellers adopt and implement these measures to minimize the potential for adverse effects related to groundwater extraction. (page 3.3-91)

    GW-1 does have some specifics on requirements for the frequency of groundwater level monitoring, such as weekly monitoring during the transfer period (page 3.3-89). Requirements for the frequency of reporting are less specific. Summary tables to BoR during and after transfer-related groundwater pumping, and a summary report sometime after the post-project reporting period. The project reporting period extends through March of the year following the transfer (page 3.3-90). The requirement for only a single year of groundwater monitoring appears to be insufficient given the duration of the simulated pumping impacts (see Figure B-5 in Appendix B). Other reporting requirements such as groundwater elevation contour maps are given as "should be included" rather than "shall be included" (page 3.3-90).

    The BoR should already have monitoring and mitigation plans and evaluation reports based on the requirements of the DTIPWTP for past groundwater substitution transfers, which likely were undertaken by some of the same sellers as the proposed 10-year transfer project. The Draft EIS/EIR should provide these existing BoR approved monitoring programs and mitigation plans as examples of what level of technical specificity is required

to meet the objectives of GW-1 that include: *(1) mitigate adverse environmental effects that occur; (2) minimize potential effects to other legal users of water; (3) provide a process for review and response to reported effects; and (4) assure that a local mitigation strategy is in place prior to the groundwater transfer* (page 3.3-91). In addition, examples of periodic reporting tables and final evaluation reports should be provided to demonstrate the effectiveness of the GW-1 process at preventing or mitigating impacts from the groundwater substitution transfer pumping. Other deficiencies in GW-1 have been discussed above in my comments nos. 1, 2, 3, 5, 6 and 15, and below in comment no. 18.

I recommend the Draft EIS/EIR be revised to include specifics on additional requirements that must be part of mitigation measure GW-1 including: (1) required distances from wells and surface water features, and aquifer zones for groundwater elevation monitoring; (2) the duration of the required post-transfer monitoring that accounts for the effects of the 10 years of pumping; (3) specifics requirements on scale and detail for maps, figures and tables needed to document groundwater substitution pumping impacts; and (4) specific threshold for changes in groundwater elevation, groundwater quality and subsidence that will be considered significant. I recommend the Draft EIR/EIS be revised to provide existing BoR approved monitoring and mitigation plans and reports for past groundwater substitution transfers as examples of the types of technical information necessary to ensure no injury with less than significant impacts and appropriate mitigations. I recommend the Draft EIS/EIR be revised to provide specifics on how the public will be able to participate in the BoR and DWR approval and revision process for the 10-year transfer project monitoring and mitigation plans. I also recommend the Draft EIS/EIR revise GW-1 to include the issues discussed elsewhere in my comments nos. 1, 2, 3, 5, 6, 15 and 18.

Water Quality

17. The Draft EIS/EIR discusses water quality in Section 3.2, but focuses on potential impacts to surface waters. Discussions of impacts from groundwater substitution transfer pumping on groundwater quality are given in Section 3.3 (pages 3.3-33 to 3.3-35). The Draft EIS/EIR discusses the potential for impacts to groundwater quality from migration of contaminants as a result of groundwater substitution pumping, but provides only a general description of the current condition of groundwater quality. Section 3.3 gives the following statements on water quality:

    Groundwater Quality: Changes in groundwater levels and the potential change in groundwater flow directions could cause a change in groundwater quality through a number of mechanisms. One mechanism is the potential mobilization of areas of poorer quality water, drawn down from shallow zones, or drawn up into previously unaffected areas. Changes in groundwater gradients and flow directions could also cause (and speed) the lateral migration of poorer quality water. (pages 3.3-59 and 3.3-60)

    Degradation in groundwater quality such that it would exceed regulatory standards or would substantially impair reasonably anticipated beneficial uses of groundwater; or (page 3.3-61)

    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. Consequently, changes to groundwater quality due to increased pumping would be less than significant in the Redding Area Groundwater Basin. (page 3.3-66)

> *Inducing the movement or migration of reduced quality water into previously unaffected areas through groundwater pumping is not likely to be a concern unless groundwater levels and/or flow patterns are substantially altered for a long period of time. Groundwater extraction under the Proposed Action would be limited to short-term withdrawals during the irrigation season. Consequently, effects from the migration of reduced groundwater quality would be less than significant. (*page 3.3-83*)*
>
> *Groundwater extracted could be of reduced quality relative to the surface water supply deliveries the seller districts normally receive; however, groundwater quality in the area is normally adequate for agricultural purposes. Distribution of groundwater for municipal supply is subject to groundwater quality monitoring and quality limits prior to distribution to customers. Therefore, potential impacts to the distribution of groundwater would be minimal and this impact would be less than significant.* (page 3.3-84)

The Draft EIS/EIR notes that several groundwater quality programs are active in the seller regions (pages 3.3-6 to 3.3-10). No maps are provided that show the baseline groundwater quality and known areas of poor or contaminated groundwater. Groundwater quality information on the Sacramento Valley area is available from existing reports by the USGS (1984, 2008b, 2010, and 2011) and Northern California Water Association (NCWA, 2014c). The Draft EIS/EIR doesn't compare the known groundwater quality problem areas with the SACFEM2013 simulated drawdowns to demonstrate that the proposed projects won't draw in or expand the areas of known poor water quality. The Draft EIS/EIR analysis doesn't appear to consider the impacts to the quality of water from private wells. Pumping done as part of the groundwater substitution transfer may cause water quality impacts from geochemical changes resulting from a lowering the water table below historic elevations, which exposes aquifer material to different oxidation/reduction potentials and can alter the mixing ratio of different quality aquifer zones being pumped. Changes in groundwater level can also alter the direction and/or rate of movement of contaminated groundwater plumes both horizontally and vertically, which may expose non-participating wells to contaminants they would not otherwise encounter.

As noted above in my general comment no. 7, the DWR well depth summary maps for the northern Sacramento Valley show that there are potentially thousands of private well owners in and adjacent to the proposed project areas of the groundwater substitution drawdown. Exhibit 2.1 has a composite map of DWR's northern Sacramento Valley well depth summary maps (DWR, 2014a) for the shallow aquifer zone, wells less than 150 feet deep and the areas of groundwater decline from 2004 to 2014 (DWR, 2014b). Exhibit 7.1 has a table that summarizes the range of the number of shallow wells by county that lie within the areas of groundwater decline from 2004 to 2014. In my general comment no. 5, I discussed the concept of capture zones for wells and the need for groundwater modeling using particle tracking to identify the areas where a well receives recharge. Particle tracking to define a well capture zone(s) can also be used to determine if known zones or areas of poor or contaminated water will migrate as a result of the groundwater substitution transfer pumping. Particle tracking can also identify private and municipal wells that lie within the capture zone of a groundwater substitution transfer well and might experience a reduction in water quality from the transfer pumping. Particle tracking can identify locations where mitigation monitoring of groundwater quality should be conducted to quantify changes in groundwater quality.

Even though there are already a number of shallow wells impacted by historic groundwater level declines, the Draft EIS/EIR reaches the conclusion that the groundwater substitution transfer pumping will not cause injury or a significant impact to groundwater quality. This

conclusion is reached in part because the assumed beneficial use of groundwater substitution pumped water is agricultural, or urban, where the quality of water delivered is monitored by an urban water agency. Only these two beneficial uses are assumed even though Table 3.2-2 lists numerous other uses for waters in the seller service areas. The Draft EIS/EIR doesn't provide sufficient information on existing water quality conditions in the Sacramento Valley to allow for evaluation of potential geochemical changes that groundwater substitution pumping might cause. The Draft EIS/EIR sets a standard of significance in degradation of groundwater quality that requires contaminants exceed regulatory standards or impair reasonably anticipated beneficial uses (page 3.3-61). This standard of significance ignores the regulatory requirements of the Water Quality Control Basin Plans (Basin Plans) (http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml). The Draft EIS/EIR only briefly discusses the role of the Basin Plans in maintaining water quality (page 3.2-7). In addition this water quality threshold of significance likely violates the State Water Resources Control Board Resolution No. 68-16, titled *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, that states:

> *"Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies became effective, such existing high quality will be maintained until it has been demonstrated to the state that any change will be consistent with the maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."*
>
> *"The nondegradation policy of the State Board (Resolution No. 68-16) applies to surface and groundwaters that are currently better quality than the quality established in 'adopted policies.' In terms of water quality objectives, the basin plans are the source of adopted policies."*

I recommend the Draft EIS/EIR be revised to document the known condition of the groundwater quality in the Sacramento Valley and Redding Basin and include available maps. I recommend that this assessment evaluate the potential impacts from migration of known areas of poor groundwater quality that could be further impaired or spread as a result of the groundwater substitution transfer pumping. I recommend a groundwater quality mitigation measure be provided for evaluation the existing water quality in wells (assuming owner cooperation) within and adjacent to known areas of poor groundwater quality that lie within and adjacent to the simulated groundwater transfer drawdown areas, especially those that lie within the capture zone. I recommend the groundwater quality mitigation measure include: (1) procedures for sampling wells, (2) methods of water quality analysis, (3) a QA/QC program, (4) standards and threshold for water quality impairment consistent with public health requirements and Basin Plan beneficial uses and SWRCB Resolution No. 68-16, (5) provisions for independent oversight and review by regulatory agencies and affected well owners, and (6) specific reporting and notification requirements that keep the owners of non-participating wells, the public, and regulatory agencies informed. I recommend the groundwater quality mitigation measure include provisions for modification and/or treatment of non-participating wells should the quality of water delivered be significantly altered by groundwater substitution transfers. I recommend the groundwater quality mitigation measure be in effect during the 10-year period of transfer pumping and the following recovery period until groundwater flows return to the pre-project condition. I recommend the Draft EIS/EIR also

require a funding mechanism for implementing the groundwater quality mitigation measures for the entire 10-year duration of the groundwater substitution transfers and the recovery period. I recommend the costs of the groundwater quality mitigation monitoring be the responsibility of the project proponents, not the non-participating wells owners or the public. These costs should include reimbursement of any costs incurred by regulatory agency oversight and costs incurred by non-participating well owners.

Subsidence

18. The impacts of subsidence due to groundwater substitution transfer pumping are discussed in Section 3.3. Section 3.3.1.3.2 discusses groundwater-related land subsidence and notes that Global Positioning System (GPS) surveying is conducted by DWR every three years at 339 elevation survey monuments throughout the northern Sacramento Valley (page 3.3-28). In addition, eleven extensometers, as shown in Figure 3.3-11, monitor land subsidence. Figure 3.3-11 provides graphs of the subsidence for five of the eleven extensometers; no information is provided on the results on the GPS surveys. Mitigation measure GW-1 also incorporates by reference the October 2013 DTIPWRP and its 2014 Addendum. The DTIPWRP doesn't add any additional monitoring or mitigation requirements for subsidence, stating that areas that are susceptible to land subsidence may require land surface elevation surveys, and that the Project Agencies will work with the water transfer proponent to develop a mutually agreed upon subsidence monitoring program (pages 34 and 37). Apparently the Draft EIS/EIR expects that the mutually agreed upon subsidence monitoring programs will be a future mitigation measure. The Draft EIS/EIR doesn't discuss how other regulatory agencies or the public will participate in the reviewing and commenting on any future subsidence mitigation measure.

    The Draft EIS/EIR relies on local GMPs and county ordinances to prevent impacts from subsidence, but doesn't discuss any specific monitoring or mitigation measures for each proposed groundwater substitution transfer pumping area (page 3.3-7). The Draft EIS/EIR acknowledges that subsidence has occurred in the past in portions of the Sacramento Valley in Yolo County (page 3.3-29), and that the Redding groundwater basin has never been monitored (page 3.3-17). Yet only a qualitative assessment of potential project impacts was done by comparing SACFEM2013 simulated groundwater drawdowns with areas of existing subsidence and by comparing estimates of pre-consolidated heads/historic low heads (page 3.3-61).

    The Draft EIS/EIR relies on the mitigation measure GW-1 to prevent and remedy any significant impacts from subsidence. The requirements in mitigation measure GW-1 for subsidence impacts specify that the BoR will determine, apparently in the future and only when mutually agreed upon, the "strategic" monitoring locations throughout the transfer area where land surface elevations will be measured at the beginning and end of each transfer year (page 3.3-89). When the land surface elevation survey indicates an elevation decrease in an area, more subsidence monitoring will be required, which could include: (1) extensometer monitoring, (2) continuous GPS monitoring, or (3) extensive land-elevation benchmark surveys conducted by a licensed surveyor. More extensive monitoring will be required for areas of documented historic or higher susceptibility to land subsidence (page 3.3-89). The Draft EIS/EIR concludes that with these subsidence monitoring mitigation measures of GW-1, impacts will be reduced to less than significant (page 3.3-66).

    Exhibits 8.1a to 8.1c provides composite maps using as a base DWR's *Spring 2004 to 2014 Change in Groundwater Elevations* (DWR, 2014b) for the shallow (less than 200 feet bgs), intermediate (200 to 600 feet bgs) and the deep (greater than 600 feet bgs) aquifer

zones in the northern Sacramento Valley. A map of the natural gas pipelines in the Sacramento Valley (Exhibit 8.6) has been scaled and combined with Exhibits 8.1a to 8.1c. Exhibit 8.2 depicts on DWR's (2014b) intermediate zone change in groundwater elevation map, the locations of extensometers and the GPS subsidence grid (from Figure 6 in DWR, 2008; Exhibit 8.4), and the known subsidence area southeast of Williams and into Yolo County (from Draft EIS/EIR Figure 3.3-11)).

The subsidence area in Yolo County isn't fully shown on the DWR's 2014 groundwater elevation change maps, but is shown in the composite maps (Exhibits 8.1a to 8.1c). These exhibits and Exhibit 8.2 show that the western line of extensometers lies along the eastern edge of the intermediate zone of greatest groundwater elevation change, and aligns with the central axis of the mapped changes in groundwater elevation in deeper aquifer zone. The extensometers don't appear to lie within the area of known subsidence southeast of Williams and into Yolo County (Figure 3.3-11). The GPS subsidence grid network does extend across eastern portion of the known subsidence area southeast of Williams and into Yolo County depicted in Figure 3.3-11 and the groundwater elevation change in the intermediate aquifer zone southwest of Orland (Exhibit 8.2).

Although there are several areas in the Sacramento Valley of known decrease in groundwater elevations, known areas of subsidence (Faunt, ed., 2009; Exhibit 8.3), and apparently a GPS network with repeated elevation measurements (Exhibit 8.4), the Draft EIS/EIR doesn't provide any specific information on the "strategic" locations where groundwater substitution pumping done under the 10-year transfer project will require additional subsidence monitoring. The historic subsidence data along with the GPS grid elevation data, historic groundwater elevation change data and the future areas of drawdown from the 10 years of groundwater substitution pumping shown in Figures 3.3-26 to 3.3-31 should be sufficient information to develop the initial "strategic" locations for monitoring potential subsidence. The Draft EIS/EIR should be able to provide the specific thresholds of subsidence that will trigger the need for additional extensometer monitoring, continuous GPS monitoring, or extensive land-elevation benchmark surveys by a licensed surveyor as required by GW-1. The Draft EIS/EIR should also specify in mitigation measure GW-1, the frequency and methods of collecting and reporting subsidence measurements, and discuss how the non-participating landowners and the public can obtain this information in a timely manner. In addition, the Draft EIS/EIR should provide a discussion of the thresholds that will trigger implementation of the reimbursement mitigation measure required by GW-1 for repair or modifications to infrastructure damaged by non-reversible subsidence, and the procedures for seeking monetary recovery from subsidence damage (page 3.3-90). The revised Draft EIS/EIR should review the information provided by Galloway and others (2008), and the Pipeline Research Council International (2009) regarding land subsidence hazards.

An objective of the mitigation measure GW-1 is to mitigate adverse environmental effects from groundwater substitution transfer pumping (page 3.3-88). As part of the preliminary assessment of potential environmental impacts from subsidence due to groundwater substitution pumping, a review and determination of the critical structures that might be impacts is recommended. There are a number of critical structures in the Sacramento Valley that may be susceptible to settlement and lateral movement. These include natural gas pipelines, gas transfer and storage facilities, gas wells, railroads, bridges, water and sewer pipelines, water wells, canals, levees, other industrial facilities. Exhibits 8.5 to 8.11 provide several maps of gas pipeline, and gas and oil related facilities obtained from the web sites of the CA Energy Commission (CEC) and the CA Department of Conservation's Division of Oil, Gas and Geothermal Resources (DOGGR). In addition, composite maps (Exhibits 8.1a

to 8.1c) are provided that show the locations of the natural gas pipelines (Exhibit 8.6) with the DWR 2004 to 2014 change in groundwater elevation maps (DWR, 2014b). Additional maps of railroads, bridges, canals, levees, water and sewer pipelines and important industrial facilities should be sought and the location of those structures compared to the potential areas of subsidence from groundwater substitution transfer pumping. Specific "strategic" subsidence monitoring locations should be given in mitigation measure GW-1 based on analysis of the susceptible infrastructure locations and the potential subsidence areas. The local, state and federal agencies that regulate these critical structures and pipelines as well as the facility owners should be contacted for information on the limitations on the amount of movement and subsidence the infrastructures can withstand. The limitations on movement and subsidence should be incorporated into any triggers or thresholds for additional monitoring and implementing mitigations needed to reduce subsidence impacts to less than significant and cause no injury.

I recommend that: (1) the Draft EIS/EIR be revised to provide information on initial "strategic" locations and types of subsidence monitoring that are necessary based on the existing conditions and the proposed groundwater substitution pumping areas; (2) the Draft EIS/EIR and mitigation measure GW-1 be revised to provide specific thresholds of subsidence that will trigger the need for additional subsidence monitoring; (3) mitigation measure GW-1 be revised to include the frequency and methods of collecting and reporting subsidence measurements; (4) the Draft EIS/EIR discuss how the non-participating landowners and the public can obtain subsidence information in a timely manner; (5) the Draft EIS/EIR and GW-1 be revised to provide the thresholds that trigger implementation of the reimbursement mitigation measure required by GW-1 for repair or modifications to infrastructure damaged by non-reversible subsidence along with the procedures for seeking monetary recovery from subsidence damage; and (6) the Draft EIS/EIR be revised to provide a map and inventory of critical structures in the Sacramento Valley that may be susceptible to settlement and lateral movement. These structures should include natural gas pipelines, gas transfer and storage facilities, gas wells, power plants, railroads, bridges, water and sewer pipelines, water wells, canals, levees, other industrial facilities. I further recommend that the Draft EIS/EIR solicit advice from local, state and federal agencies, as well as the infrastructure owners on the amount of subsidence that these critical structures and pipelines can withstand, and provide copies of their responses and incorporate their requirements in mitigation measure GW-1 to ensure the stability and function of these facilities.

Geology and Seismicity

19. Environmental impacts from the project to geologic and soil resources are discussed in Section 3.4 of the Draft EIS/EIR. The Draft EIS/EIR assumes that because the projects don't *involve the construction or modification of infrastructure that could be adversely affected by seismic events, seismicity is not discussed in this section.* The Geology and Soils section therefore focused on *chemical processes, properties, and potential erodibility of soils due to cropland idling transfers.* Impacts of subsidence are discussed in Section 3.3 of the Draft EIS/EIR and above in my comment no. 18.

    The Draft EIS/EIR reasoning that because the projects don't involve new construction or modification of existing structures that there are no potential seismic impacts from the activity undertaken during the transfers is incorrect. The project area has numerous

existing structures that could be affected by the groundwater substitution transfer pumping, specifically settlement induced by subsidence. Although the seismicity in the Sacramento Valley is lower than many areas of California, it's not insignificant. There is a potential for the groundwater substitution transfer projects to increase the impacts of seismic shaking because of subsidence causing additional stress on existing structures. The discussion in Section 3.3 on potential subsidence from groundwater substitution pumping was only qualitative because the SACFEM2013 simulations didn't calculate an estimate of subsidence from the transfer projects (page 3.3-61). The subsidence assessment also didn't acknowledge or consider the numerous natural gas pipelines or other critical facilities and structures that occur the Sacramento Valley. Exhibits 8.5 to 8.11 provide a series of maps that show some of the major natural gas pipelines, oil refineries, terminal storage, and power plants in the Sacramento Valley. In addition, there are a number of railroads, bridges, canals, and water and sewer pipelines within the transfer project area. As I discussed in my comment no. 18 on subsidence impacts, some of these existing structures and pipelines are sited within or traverse areas of known subsidence, existing areas of large groundwater drawdown, and areas within the proposed groundwater substitution transfer pumping. There are a number of technical documents on seismic impacts to pipelines (O'Rouke and Norberg, 1992; O'Rouke and Liu, 1999, 2012) as well as a proceeding from a recent ASCE conference on pipelines (Miami, Florida, August 2012).

The characteristics of future seismic shaking in California can be assessed using the following web resources provided by the California Geological Survey (CGS) in conjunction with the U.S. Geological Survey and other academic and professional organizations:

California Fault Activity Map web site:

http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html

Probabilistic Seismic Hazard Mapping web site:

http://www.consrv.ca.gov/cgs/rghm/psha/pages/index.aspx

Probabilistic Seismic Ground Motion Interpolator web site:

http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html

Earthquake Shaking Potential for California Map web site:

http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS48_revised.pdf

In addition to the potential impacts to existing infrastructure from seismic shaking, the occurrence of faults within the Sacramento Valley may influence the movement of groundwater. The USGS-CVHM groundwater model (Faunt, ed., 2009) incorporated a number of horizontal flow groundwater barriers (Figure C1-A, pages 160, 203, and 204; Exhibits 9.1, 9.2, 9.3a and 9.3b) that appear to align with faults shown in a series of screen plots from the interactive web site 2010 Fault Activity Map for California (CGS, 2010) (Exhibits 9.4a to 9.4d, 9.5 and 9.6). The SACFEM2013 model documentation didn't indicate that faults were considered as potential flow barriers and the resulting simulation maps in Figures 3.3-26 to 3.3-31don't show any flow barriers.

I recommend that the Draft EIS/EIR be revised to: (1) assess the potential environmental impacts from seismic shaking on critical structures and pipelines in areas of potential subsidence caused by the groundwater substitution transfer pumping; (2) provide maps that identify and locate existing pipelines and critical structures such as storage facilities, railroads and bridges within the areas

affected by groundwater substitution pumping; (3) solicit and provide results of the advice from local, state and federal agencies, as well as the infrastructure owners, on the amount of subsidence that these critical structures and pipelines can withstand under in both static and seismic conditions; (4) provide a mitigation measure(s) that addresses the requirements for monitoring the subsidence in the area of these critical structures and pipelines; and (5) provide specific monitoring and reporting requirements for potential seismic impacts to critical structures that includes establishing any additional structures for monitoring and taking subsidence measurements, and conducting additional periodic surveys of ground elevation and displacement. I recommend the Draft EIS/EIR be revised to provide the thresholds that trigger implementation of the reimbursement mitigation measure required by GW-1 for repair or modifications to infrastructure that may be damaged by seismic movement in areas that have exceeded the thresholds for non-reversible subsidence, and provide procedures for seeking monetary recovery from subsidence damage. I also recommend the Draft EIS/EIR be revised to discuss the importance and impacts of the horizontal flow barriers and/or faults within the Sacramento Valley on the results of the drawdown and stream depletion simulations of SACFEM2013.

II. Additional Technical Information Relevant to the Assessment of Potential Environmental Impacts from the 10-Year Groundwater Substitution Transfers.

Historic Changes in Groundwater Storage

20. The Draft EIS/EIR provides SACFEM2013 simulations of groundwater substitution transfer pumping effects for WY 1970 to WY 2003. The discussion of the simulation didn't provide specifics on how the model simulated the current conditions of the Sacramento Valley groundwater system or the potential impacts from the 10-year groundwater substitution transfer project based on current conditions. A DWR groundwater contour map, Figure 3.3-4, shows the elevations in the spring of 2013 for wells screened at depths greater than 100 ft. bgs. and less than 400 ft. bgs. Figures 3.3-8 and 3.3-9 provide the locations and simulation hydrographs for selected monitoring wells in the Sacramento Valley. Appendix E provides additional monitoring well simulation hydrographs for selected wells at locations shown on Figures 3.3-26 to 3.3-31. As discusses above in comments no. 7, these hydrographs appear to show only simulated groundwater elevations. Actual measured groundwater elevations are needed to evaluate the accuracy of the simulations. The Draft EIS/EIR briefly discusses on page 3.3-12 the groundwater production, levels and storage for the Redding Basin, and on pages 3.3-21 to 3.3-27 there is a similar discussion for the Sacramento Valley. Faunt (ed., 2009) is cited for the conditions of the Sacramento Valley groundwater budget and Figure 3.3-10, taken from Faunt (ed., 2009; Figure B9; Exhibit 10.2a), shows the historic change in groundwater storage in the Central Valley as determined by the CVHM model simulations. Based in part on the information in Faunt (ed., 2009), the Draft EIS/EIR concludes that the Sacramento Valley basin's groundwater storage has been relatively constant over the long term, decreasing during dry years and increasing during wetter periods. However, the Draft EIR/EIS's discussion of the status of groundwater in the Sacramento Valley doesn't utilize all of the information on groundwater storage or water balance available in Faunt (ed., 2009), more recent simulation studies by Brush and others (2013a and 2013b), or the summary of groundwater conditions in recent reports by the Northern California Water Association (NCWA) (2014a and 2014b).

Faunt (ed., 2009) provides in Table B3 (Exhibit 10.1) selected average annual hydrologic budget values for WYs 1962-2003. In addition, Figures B10-A and B10-B of Faunt (ed., 2009) show bar graphs for the average annual groundwater budget for the Sacramento Valley and the Delta and Eastside Streams (Exhibits 10.2b and 10.2c). Table B3 gives the water balances for subregions in the Sacramento Valley (1 to 7) and the Eastside Streams (8). Table B3 gives values for the *net storage from specific yield and compressibility of water*; positive values indicate an increase in storage, while a negative value is a decrease. For Sacramento Valley, the sum of the annual average from 1962 to 2003 in net storage is given as -99,000 AFY and for the Eastside streams -26,000 AFY. Unfortunately, the components in Table B3 don't seem to be a complete groundwater water budget, so following the calculations of the average annual net change in groundwater storage isn't obvious. Figures 10A and 10B (Exhibits 10.2a and10.2b), however, do provide bar graphs of the groundwater water budgets with values for the entire Sacramento Valley and the Delta and Eastside Streams. If it's assumed that groundwater pumping shown as a negative value in Figures 10A and 10B represents an outflow from groundwater storage, then other negative values would also be considered outflows. Positive values are therefore assumed to be inflows to groundwater storage.

For the entire Sacramento Valley (subregions 1 to 7), Faunt (ed., 2009) shows the net change in annual groundwater storage as the sum of the negative outflows and positive inflow in Figure 10A at a negative 650,000 AFY (-0.65 million AFY) (2.88 – [0.29+0.03+1.66+1.37+0.18] = 2.88 – 3.53 = -0.65). The values in Figure 10B can be summed in a similar manner and yield a net change in storage of a positive 90,000 AFY for the Delta and Eastside Streams. Unfortunately, the bar graph in Figure 10B for the Eastside Streams (subregion 8) doesn't have numerical values. A visual comparison of the inflow and outflow bars suggests that for subregion 8 the outflows, mostly pumping, are at or slightly greater than the inflows.

The groundwater budget information by Faunt (ed., 2009) can be compared with two other more recent sources of Sacramento Valley information contained in four documents, Brush and others (2013a and 2013b) and NCWA (2014a and 2014b). Brush and others report on the recent version of the C2VSim groundwater model (version R374) and provide simulation results. The NCWA reports also used the C2VSim (R374) model, but provided additional analysis and results of the historic land development, water use and water balances in Sacramento Valley. Some of the information developed by Brush and others (2013a and 2013b), and Faunt (ed., 2009) on the condition of the Sacramento Valley groundwater system was previously discussed in my comments on the SACFEM2013 model simulations, nos. 8 to 14.

My comment no. 14 on groundwater flow between subregions is also relevant to this discussion of the historic changes in groundwater storage. Accounting for the transfer of groundwater between regions is critical for understanding the impacts of pumping in one region or area on the adjacent regions. The sources of water backfilling a groundwater depression don't all have to come from surface waters, ie., stream depletion, precipitation, deep percolation, and artificial recharge. Some of that "recharge" can come from adjacent aquifers by horizontal and vertical flow. When pumping creates a depression in the water table or piezometric surface, the depression steepens the gradient thereby increasing the rate of flow towards it; the depression can also change the direction of groundwater flow. Often the "recharge" to a pumping depression comes from adjacent groundwater storage that lies outside the zone of influence of the pumping. When the rates and volumes of recharge from surface waters are insufficient to rapidly backfill a pumping depression, the impact on groundwater storage and elevations in adjacent regions increases.

Brush and others (2013a) provide a breakdown of water budget by subregion, Tables 10 to 13 (Exhibits 6.3a to 6.3d), but only for the selected three decades (1922-1929, 1960-1969, and 2000-2009), and for the total modeled period from 1922 to 2009. They do provide values for the change in groundwater storage for all 21 of the Central Valley subregions and 5 hydrologic regions. Of particular importance to the discussion of the current condition of the groundwater basin are the results of the C2VSim simulations of the annual average change in groundwater storage for each of the three decades and from 1922 to 2009, Tables 10 to 13 (Exhibits 6.3a to 6.3d). For the Sacramento Valley (subregions 1 to 7), Table 10 lists the 1922-2009 change in storage as -165,417 AFY (I'm assuming the units of the table are acre-feet), and for the Eastern Streams (subregion 8) -135,304 AFY. For the most recent decade, 2000-2009, the average annual change in groundwater storage has increased in both the Sacramento Valley and the Eastern Streams to -303,425 AFY and -140,715 AFY, respectively (Table 13). Although the tables in Brush and others don't list the groundwater flow between subbasins, Figures 81A to 81C (2013a) and Figure 39 (2013b) (Exhibits 6.1a to 6.1c and 6.2) provide this information for the selected decades and for the total simulation period. As discussed above in my comment no. 14, the change in interbasin groundwater flow can be significant particularly when recharge in a region is deficient. The Draft EIS/EIR should specifically discuss and account for any changes in the rate and direction of interbasin groundwater flow. Interbasin groundwater flow may become a hidden long-term impact that increases the time needed for recovery of groundwater levels from groundwater substitution transfer pumping, and can extend the impact from groundwater substitution transfer pumping to areas outside of the groundwater substitution transfer seller's boundary.

Two recent reports on the condition of groundwater in the Sacramento Valley are provided by the Northern California Water Association (NCWA, 2014a and 2014b). Tables 3-6, 3-7, and 3-8 in the NCWA technical supplement report (2014b; Exhibits 10.5a to 10.5c) provide water balance information for the Sacramento Valley for the same three decades as Brush and others (2013a). The NCWA tables separate the water balance elements into three types, land uses (Table 3-6), streams and rivers (Table 3-7), and groundwater (Table 3-8). The values of the change in groundwater storage given in Table 3-8 are similar to those given by Brush and others (2013a). The NCWA technical supplement report (2014b) also provides additional information on the 1922 to 2009 water balance through the use of graphs and bar charts. Figures 3-22 and 3-24 (Exhibits 10.6c and 10.6d) provide graphs of simulated estimates of annual groundwater pumping in the Sacramento Valley and the annual stream accretion. Positive stream accretion occurs when groundwater discharges to surface water, negative when groundwater is recharged. Other graphs include simulated deep percolation, Figures 3-26 and 3-27 (Exhibits 10.6e and 10.6f), annual diversions, Figures 3-19 and 3-20 (Exhibits 10.6a and 10.6b), and relative percentages of surface water to groundwater supplies, Figure 3-29 (10.6g).

The NCWA technical supplement report (2014b) notes in Sections 3.8 and 3.8.4 that negative changes in groundwater storage

> *... suggest that the groundwater basin is under stress and experiencing overdraft in some locations. Review of the Sacramento Valley water balance, as characterized based on C2VSim R374 and summarized in Tables 3-6 through 3-8 reveals substantial changes in water balance parameters over time that affect overall groundwater conditions. … Over time, it appears that losses from surface streams have increased as a result of declining groundwater levels. The declining levels result from increased demand for groundwater as a source of supply without corresponding increases in groundwater recharge.* (page 41)

> *A contributing factor to the decrease in accretions to rivers and streams over the last 90 years is that deep percolation of surface water supplies (and other forms of recharge) has not increased in a manner that offsets increased groundwater pumping.* (page 48)

The simulated groundwater pumping graph in NCWA Figure 3-22 and stream accretion graph in NCWA Figure 3-24 were combined into one graph by scaling and adjusting their axes (Exhibits 10.7). The vertical scales of these two graphs were adjusted so that a zero value of stream accretion aligned with 1.5 million acre-feet (MAF) of annual groundwater pumping. This alignment was done to reflect the fact that in the early 1920s, groundwater pumping was approximately 0.5 MAF per year (MAFY) while stream accretion was approximately 1.0 MAFY. As shown in the combined graph, stream accretion generally decreases at approximately the same rate as groundwater pumping increases. Thus, at a point of no appreciable groundwater pumping, pre-1920s, the total long-term average annual stream accretion was likely 1.5 MAF, based on the C2VSim simulations.

Drawn on top of the stream depletion and groundwater pumping graphs are several visually fit, straight trend lines. These lines, which run from 1940 to the mid-1970s and the late 1980s to mid-1990s, are mirror images reflected around the horizontal 0 accretion axis. Information provided at the bottom of the composite graph was taken from NCWA Tables 3-7 and 3-8 (Exhibits 10.5b and 10.5c). The slope of the trend line from 1940 to the mid-1970s is approximately (+-)27,000 AFY, and (+-)85,000 AFY in the late 1980s to the mid-1990s; a 3-fold increase in slope. After the mid-1990s the slope of groundwater pumping flattens to be similar to that of the 1940s–mid-1970s, while the stream depletion line became almost flat, ie., no change in rate of accretion. The reason for the stream depletion rate being flat is unknown, but there are several factors that could contribute to a fixed rate of stream accretion.

First, after depleting 1.5 MAFY from the Sacramento Valley streams, the surface waters may not be able to provide much more, at least no increase to match the pumping. Second, this may also be a consequence of the model design because the number of streams simulated was limited. Third, the model's grid may not extend out far enough to encompass all of the streams that contribute to groundwater recharge. More information on the areas of where streams gain and lose in the Sacramento Valley is needed to determine if there are any sections of stream, gaining or losing, that might still have the ability to interact at a variable rate in the future, ie., during and after the 10-year groundwater substitution transfer project.

A third graph is drawn on the composite accretion-pumping graph in Exhibit 10.7 that shows the C2VSim simulated cumulative change in groundwater storage for the Sacramento Valley from 1922 to 2009. This graph was taken from Figure 35 of Brush and others, 2013b (Exhibit 10.4). A straight trend line with a negative slope of approximately -163,417 AFY is drawn on top of the third graph, which is the value for average annual change in storage from 1922 to 2009 given in Table 10 of Brush and others (2013a; Exhibit 6.3a) for the seven subregions of the Sacramento Valley. The selected graph of the cumulative change in groundwater storage is one of three available.

The graph of cumulative change in groundwater storage for the Sacramento Valley in Figure 35 differs from the graph in Figure 83 in Brush and others (2013a; Exhibit 10.3) and in Figure B9 of Faunt (ed., 2009; Exhibit 10.2a). Both of Figure 83 and Figure B9 show a gain in groundwater storage with their Sacramento Valley graphs lying generally above the horizontal line of zero change in storage. The cumulative change in groundwater storage graph from Figure 35 (Exhibit 10.4) was selected because:

- its slope is a close match for the average annual change in storage from 1922 to 2009 of -163,417 AFY given in Table 10,
- the values for change in groundwater storage in the three selected decades are all negative (Table 3-8, NCWA, 2014b), which the other two graphs don't clearly indicate,
- the calculation of average annual change in groundwater storage from 1962 to 2003 shown in Table B3 and Figures B10-A and B10-B of Faunt (ed., 2009) are negative, which conflicts with Figures B9 and 83, and
- change in DWR groundwater elevation maps from spring 2004 to spring 2014 (Exhibit 3.1, 3.2 and 3.3) suggest that there are significant regions of the Sacramento Valley that have lost groundwater storage, which suggests that the current condition is one of a loss in storage rather than a gain.

Additional review and analysis of the changes in groundwater storage in the Sacramento Valley is needed. Any additional review of changes in groundwater storage in the Sacramento Valley should consider the recent changes in groundwater elevations such as those shown in DWR (2014b) for WYs 2004 to 2014, and Figures 2-4 and 2-5 of NCWA, 2014b (Exhibit 10.8 and 10.9), as well as other studies such as the support documents for the regional IRWMPs.

I recommend the Draft EIS/EIR be revised to provide a more comprehensive assessment of the historic change in groundwater storage in the Sacramento Valley groundwater basin, and other seller sources areas within the proposed 10-year groundwater substitution transfer project. I also recommend that the Draft EIS/EIR be revised to include an assessment of the impacts of groundwater flow among subregions due to the proposed 10-year groundwater substitution transfer project.

<u>The Concept of the Stream Depletion Factor, SDF</u>

21. The Draft EIS/EIR proposes that a stream depletion factor, BoR-SDF, be applied to groundwater substitution transfers as mitigation for flow losses due to groundwater pumping. The Draft EIS/EIR implies that the BoR-SDF will be a fixed percentage of the transferred groundwater substitution water. The main text of the Draft EIS/EIR doesn't clearly specify the BoR-SDF percentage, but appended documents state that the default is 12%, *unless available monitoring data analyzed by Project Agencies supports the need for the development of a transfer proposal site-specific SDF* (page 33 in the DTIPWTP). Elsewhere in the Draft EIS/EIR, the average annual surface water–groundwater interaction losses are estimated at approximately 15,800 AF and in multiple dry years losses of 71,200 AFY are anticipated (page 3.1-18). The Draft EIS/EIR proposes mitigation measure WS-1, which utilizes the BoR-SDF with the transfers to account for the losses from stream depletions, and thereby reduces the water supply impacts to less than significant (page 3.1-18). As I discussed above in my comment no. 9, the maximum annual groundwater substitution pumping is 290,495 AF as calculated from Table 2-5. The estimated annual average surface water–groundwater interaction loss of 15,800 AF is 5.4 % of the maximum allowable annual groundwater substitution transfer, while a loss of 71,200 AF is 24.5%.

    The use of a fixed percentage of transfer water to mitigate increased stream flow losses from the groundwater substitution pumping may not result in the reduction of stream flow impacts to less than significant. I've discussed above in my comment no. 15 several of the issues about the design of mitigation measure WS-1. The following are additional comments on WS-1 specific to the fixed percentage BoR-SDF and how it differs from the concept of stream depletion commonly used in scientific literature.

Jenkins (1968a and b; Barlow and Leake, 2012) defined the "stream depletion factor" (herein called the Jenkins-SDF) as the product of the square of the distance between a well and a surface water body (a^2) multiplied by the storage coefficient (S or Sy) divided by the transmissivity (T) (Jenkins-SDF = distance^2 x storage coefficient/transmissivity = a^2 x S/T) (see Table 1 and page 14 in Barlow and Leake, 2012). The units of the Jenkins-SDF are in time, ie., days, years, etc. The Jenkins-SDF also occurs in Theis' well function, *W(u)* (see pages 136 and 150 in Domenico and Schwartz, 1990). Domenico and Schwartz (1990) showed that the Jenkins-SDF can be expressed as a dimensionless Fourier number, which occurs in all unsteady groundwater flow problems. The Jenkins-SDF has several other important characteristics that are not part of the BoR-SDF, which likely influence the actual rate and volume of surface water lost due to groundwater substitution transfer pumping.

1. The value of stream depletion varies with the duration of pumping and unlike the BoR-SDF isn't a fixed value. For an ideal aquifer (homogeneous, isotropic and infinite), two ideal curves normalized to the Jenkins-SDF value can be created that show stream depletion as a percentage of the total pumping rate or total pumped volume against the normalized logarithm of pumping time (see Figure 1 from Miller and Durnford, 2005; Exhibit 11.1). In Figure 1, equation no. 1 shows the instantaneous rate of stream depletion as a percentage of the maximum pumping rate versus the logarithm of normalized time, and equation no. 2 shows the volume of depletion as a percentage of the total volume pumped versus the logarithm of normalized time. Jenkins somewhat arbitrarily defined his SDF as the pumping duration equal to the calculated stream depletion factor (a^2 x S/T). Jenkins noted that for the ideal aquifer at the time of the SDF, the cumulative volume of water depleted from the stream equals 28% of the total volume pumped (Jenkins, 1968a; Wallace and Durnford, 2005 and 2007). As shown in Figure 1 in Exhibit 11.1, when the actual pumping duration is normalized to the Jenkins-SDF, the ideal volume curve always goes through 28% when the pumping time equals the Jenkins-SDF (time/SDF = 1; Jenkins, 1968a).
2. An important factor in the Jenkins-SDF is that stream depletion varies with the square of the distance between the well and the stream, whereas, the depletion rate varies only linearly with changes in S or T. The ratio of T/S is also called the hydraulic diffusivity, D, which has units of length^2/time (see Table 1 and Box A in Barlow and Leake, 2012). The rate that hydraulic stress propagates through an aquifer is a function of the diffusivity. Greater values of D result in more rapid propagation of hydraulic stresses. Barlow and Leake (2012) note that the ratio T/S (or T/Sy) controls the timing of stream depletion and not each value individually. Streamflow depletion can occurs more rapidly in confined aquifers than in unconfined aquifers because S is much smaller than Sy, resulting in a larger D value.
3. For a given duration of pumping, the percentage of instantaneous depletion is greater than the percentage of volume depleted. For the ideal aquifer at a pumping duration equal to the Jenkins-SDF value, the instantaneous depletion is 48% of the maximum pumping rate, while the cumulative volume of depletion is 28% of the total pumped volume (Figure 1, Exhibit 11.1). For a non-ideal aquifer where numerical simulations are needed to estimate stream depletion, eg., the SACFEM2013 simulations, the time when the cumulative volume of stream depletion is at 28% of the total volume pumped can be used as an "effective" Jenkins-SDF to allow for evaluation and comparison of potential impacts from pumping.
4. Stream depletion continues to occur after pumping ceases. Jenkins (1968a, b) referred to this as residual depletion. Depending on the duration of pumping and the value of the Jenkins-SDF, stream depletion can be greater after pumping ceases (see

pages 42 to 45 in Barlow and Leake, 2012). Barlow and Leake (2012 on page 43) give the following five key points regarding stream depletion after cessation of pumping:

a. *Maximum depletion can occur after pumping stops, particularly for aquifers with low diffusivity or for large distances between pumping locations and the stream.*
b. *Over the time interval from when pumping starts until the water table recovers to original pre-pumping levels, the volume of depletion will equal the volume pumped.*
c. *Higher aquifer diffusivity and smaller distances between the pumping location and the stream increase the maximum rate of depletion that occurs through time, but decrease the time interval until water levels are fully recovered after pumping stops.*
d. *Lower aquifer diffusivity and larger distances between the pumping location and the stream decrease the maximum rate of depletion that occurs through time, but increase the time interval until water levels are fully recovered after pumping stops.*
e. *Low-permeability streambed sediments, such as those illustrated in figure 11, can extend the period of time during which depletion occurs after pumping stops.*
f. *In many cases, the time from cessation of pumping until full recovery can be longer than the time that the well was pumped.*

5. As noted above in key point no. 4b, the volume of stream depletion will eventually equal the total pumped volume. The time required for full aquifer recovery from pumping depends on the value of the Jenkins-SDF, availability of water to capture, the rate and duration of recharge above what normally occurs, and other factors like the streambed sediment permeability and aquifer layering. Figure 1 in Exhibit 11.1 also shows that for an ideal aquifer the time needed to reach 95% depletion is approximately 127 times the Jenkins-SDF value. This is consistent with the estimates made by Wallace and others (1990) in Table 3 (Exhibit 11.2) on the time it takes to reach 95% depletion, which they consider a point where a new dynamic equilibrium is established. Although the 127-times-SDF multiplier assumes continuous pumping, the fact is the time for full recovery by residual depletion without pumping shouldn't be any sooner than it takes to obtain 95% stream depletion with pumping. In other words, rate and volume of loss from a stream can't be any higher without pumping than with pumping, all other parameters being equal. This means that without some additional source of recharge above what normally occurs, including natural wet and dry cycles, the total time required to achieve full recovery from the 10 years of groundwater substitution transfer pumping will be much longer than the 5 years cited in the Draft EIS/EIR (pages 3.3-80). For additional discussion of the stream depletion under natural variations in recharge and discharge see Maddock and Vionnet (1998).

Another factor that isn't clearly acknowledged in the Draft EIS/EIR is the difference between the instantaneous depletion rate and cumulative volumetric depletion rate. The Draft EIS/EIR appears to focus on cumulative volumetric depletion in mitigation measure WS-1. However, the instantaneous stream depletion rate is probably more important when evaluating impacts to fisheries and stream habitat. The instantaneous rate of flow, instantaneous depth of flow and the corresponding instantaneous wetted perimeter of flow at any point in a stream are the best measures of habitat value to the fish and other water dependent species. The cumulative volume of stream depletion relative to the total pumped volume, on the other hand, can't be easily translated stream to instantaneous flow, water depth or wetted perimeter at a point in a stream because discharges having different hydrographs can result in the same total volume of flow. For example, if I estimate that the stream depletion during a 3- to 6-month period of groundwater substitution pumping will be a maximum of 1 cubic-foot-per-second, I can evaluate the significance of this change to the stream's habitat value using the stream's historic hydrograph and fluvial geomorphology. However, if I estimate that over the same period of pumping the stream will lose, at the end

of pumping, a total 12 percent of the total volume pumped, I can't determine what changes will occur in the habitat function of the stream at a specific time and place. Perhaps, if I assume that the cumulative volume of stream depletion increases linearly with time, going from zero at time zero, to 12% at the end of pumping, then I could also assume that the instantaneous rate of stream depletion would also change linearly from 0% at the start to 24% of the pumping rate at the end of pumping. Remember that in this case the area under the instantaneous depletion curve is triangular, and therefore the maximum instantaneous depletion rate would be twice the total cumulative depletion rate. In reality, the ratio of instantaneous to volumetric depletion for the ideal Jenkins-SDF curves vary with pumping duration; the ratio is approximately 1.7:1 for time/SDF = 1 (Figure 1, Exhibit 11.1). Figure 1 also shows for the ideal curve that when the instantaneous depletion (eq. 1) is 24%, the volumetric depletion is 10% (eq. 2), a ratio of 2.4:1, and when eq. 1 is at 83%, eq. 2 is at 70%, a ratio of 1.19:1.

Mitigation measure WS-1 appears to be based on the cumulative volume of water pumped for each period of groundwater substitution transfers, not the instantaneous rate of stream depletion caused by the pumping. Mitigation measure WS-1 uses of a fixed value for compensating stream losses, which is inconsistent with the hydraulics of stream depletion. Because stream depletion actually increases with pumping time, mitigation measure WS-1 needs to specify the maximum duration of pumping allowed, ensuring that the depletion rate stays below the WS-1 value, ie., 12%. This maximum duration of pumping should be established based on impacts to stream habitat from instantaneous changes in stream flow, not the cumulative change in volume. The maximum duration of allowable pumping would change with the distance between the well and stream and with the diffusivity around each well because these control the rate of stream depletion. The well acceptance criteria in Table B-1 of Appendix B in the DTIPWTP suggests that some calculation has been made to establish the specified setback distances, but no methodology or calculation is given in the Draft EIS/EIR. The Draft EIS/EIR should document how the maximum allowable stream depletion rate, instantaneous and volumetric, and the associated maximum duration of pumping will be calculated for each well in the groundwater substitution transfer project.

Although the Draft EIS/EIR doesn't fully evaluate the potential stream depletion that may occur with the proposed 10-year groundwater substitution transfer project, another report prepared by CH2MHill (2010) and submitted to DWR provides additional analysis on the simulated impacts from the 2009 groundwater substitution transfers. The simulations of the 2009 transfer impacts were done using the SACFEM model, presumably an earlier version of the SACFEM2013 model. Figures 4, 5 and 6 in the CH2MHill 2010 report provide simulation graphs of stream depletion for three groundwater substitution transfer periods, 1976, 1987 and 1994 (Exhibits 11.3a to 11.3c). Graphs (a) to (c) in each figure appear somewhat like Figures B-5 and B-6 in Appendix B of the Draft EIS/EIR in that they show a depletion peak shortly after pumping starts, with a gradual decay following the cessation of pumping. Graphs (d) of Figures 4, 5 and 6 are not provided in the Draft EIS/EIR, but provide important additional information. These (d) graphs show the cumulative depletion for each of the three scenarios and are essentially the volumetric depletion curve of eq. 2 in Miller and Durnford's Figure 1 (Exhibit 11.1). These cumulative volume depletion curves are important because they show the time needed to fully recover from the three groundwater substitution transfer pumping events. For example, Figure 4(d) shows that recovery from the pumping event in 1976 is only approximately 60% after 25 years; much longer than the 5 years for 55% to 75% recovery stated in the Draft EIS/EIR (pages 3.3-70). For comparison, Figure 4(d) of CH2Mhill (2010) is plotted on Miller and Durnford's Figure 1 in Exhibit 11.1 by normalizing the values plotted in 4(d) by an effective Jenkins-SDF value of 2.4 years.

Notice that for the simulated Figure 4(d) Jenkins-SDF curve, depletion initially occurs sooner than with an ideal aquifer, but then depletion slows. At 127 times the SDF, approximately 300 years, the depletion is at approximately 80%.

A point can be identified on each graph (d) where the volume of stream depletion is equal to 28%, the Jenkins-SDF point, and the time since pumping started measured. For example, in Figure 4(d) approximately at approximately 2.4 years after the beginning of pumping the volume of depletion reaches 28%. For Figure 5(d) the time to 28% is similar, estimated at 2.3 years. The time interval to 28% volumetric depletion in Figure 6(d) is significantly greater at an estimated 7.5 years. The results presented in both Figures 4 and 5 are from simulation of stream depletion during dry or critically dry years followed by normal or dry years, while the simulation scenario of Figure 6 is for a critical year followed by wet years. All of the cumulative (d) graphs are filtered for the Delta conditions. This may be the reason it takes longer for stream depletion to reach 28% during a wet period than dry period when one might expect the opposite because of the increased stream flow would provides more water for recharge.

The point of this discussion is that the simulated stream depletions from the SACFEM2013 modeling can also be presented as cumulative depletion response curves that are normalized by the effective Jenkin-SDF time. The stream depletion can then be estimated for any rate or duration of pumping at an individual well when the stream depletion response curves given as percentages of both the maximum pumping rate and total volume pumped are normalized to the effective Jenkins-SDF (without the Delta conditions filter). Losses for different distances between the well and surface water feature can be roughly estimated without the need to run another simulation by adjusting the Jenkins-SDF curves by the ratio of the square of the different distances. Cumulative depletion for different pumping rates during and following the 10-year groundwater substitution transfer project can be estimated by the principle of superposition (Wallace and other, 1990; Barlow and Leake, 2012). As I discussed in my comment no. 15b, additional discussion is needed in the Draft EIS/EIR on how the amount of stream depletion for WS-1 is calculated. This discussion should include normalized stream depletion response curves for each groundwater substitution transfer well so that impacts from pumping can be estimated for different pumping durations and rates.

Barlow and Leake (2012) provide an extensive discussion of the factors controlling stream depletion including several misconceptions (pages 39 to 45). Review of their discussion of stream depletion misconceptions is recommended as part of any revision of the Draft EIS/EIR. Barlow and Leake identified the following misconceptions regarding stream depletion (page 39):

- *Misconception 1. Total development of groundwater resources from an aquifer system is "safe" or "sustainable" at rates up to the average rate of recharge.*
- *Misconception 2. Depletion is dependent on the rate and direction of water movement in the aquifer.*
- *Misconception 3. Depletion stops when pumping ceases.*
- *Misconception 4. Pumping groundwater exclusively below a confining layer will eliminate the possibility of depletion of surface water connected to the overlying groundwater system.*

I recommend that the Draft EIS/EIR be revised to document stream depletion response curves for each groundwater substitution transfer well. These response curves should be normalized to the effective Jenkins-SDF value, given as a percentage of the pumping rate and total pumped volume, along with the

distance between the well and the modeled surface water feature. Multiple stream depletion response curves should be provided, if necessary. I recommend that the Draft EIS/EIR be revised to review how the BoR-SDF value accounts for the variability in rate and volume of stream depletion. I recommend that the Draft EIS/EIR be revised to document how the maximum allowable instantaneous and volumetric stream depletion rates, and the associated maximum duration of pumping will be calculated for each well in the groundwater substitution transfer project to ensure that the BoR-SDR provides adequate flow mitigation. I recommend that the Draft EIS/EIR be revised to discuss how WS-1 addresses the common stream depletion misconceptions noted by Barlow and Leake (2012).

Measurement of Stream Seepage in Real Time

22. Barlow and Leake (2012) state that methods for determining the effects of pumping on stream flow follow two general approaches: (1) collection and analysis of field data, and (2) analytical and numerical modeling (page 50). The Draft EIS/EIR states in the OTIPWTP that stream depletion can't be measured in real time (page 33) and instead relies on simulations of groundwater pumping to determine impacts to surface waters. As discussed in **my comment no. 15b**, the Draft EIS/EIR also states that monitoring of surface water-groundwater interaction is part of mitigation measures WS-1 and GW-1. The statement that stream depletion measurements, ie., stream seepage rates, surface water depths, and surface flows, can't be done in "real time" conflicts with scientific literature. Measurements of stream flow and water depth are fundamental to stream surveys. Although measurement of the seepage rate from or into a stream is done less often and is generally more difficult than other direct surface water measurements, procedures for making these measurements are well documented (Barlow and Leake, 2012; Rosenberry and LaBaugh, 2008; Zamora, 2008; Stonestrom and Constantz, ed., 2003; Constantz, 2008; Kalbus and others, 2006). Linking field measurements to changes in stream flow and seepage to adjacent groundwater pumping is made more difficult because of the lag between the start of pumping and stream response, damping of the pumping response with increases in distance between the well and measured surface water body, and the variation in seepage rate with the increases in pumping time or pumping cycles. Measurements of surface water and groundwater flow are also difficult because of inherent measurement errors that are sometimes greater than the change in flow being sought. Barlow and Leake (2012) discuss the measurement of stream depletion and conclude that:

> *Two general approaches are used to monitor streamflow depletion: (1) short-term field tests lasting several hours to several months to determine local-scale effects of pumping from a specific well or well field on streams that are in relative close proximity to the location of withdrawal and (2) statistical analyses of hydrologic and climatic data collected over a period of many years to test correlations between long-term changes in streamflow conditions with basinwide development of groundwater resources. Direct measurement of streamflow depletion is made difficult by the limitations of streamflow-measurement techniques to accurately detect a pumping-induced change in streamflow, the ability to differentiate a pumping-induced change in streamflow from other stresses that cause streamflow fluctuations, and by the diffusive effects of a groundwater system that delay the arrival and reduce the peak effect of a particular pumping stress.* (Page 77)

The Draft EIS/EIR provides the following statements in the DTIPWTP regarding groundwater substitution transfers, which are therefore part of mitigation measure GW-1:

- … *must account for* … the *extent to which transfer-related groundwater pumping decreases*

streamflow (resulting from surface water-groundwater interaction), and the timing of those decreases in available surface water supply. (page 25);

- *Project Agencies are developing tools to more accurately evaluate the impacts of groundwater substitution transfers on streamflow. These tools may be implemented in the near future and may include a site-specific analysis that could be applied to each transfer proposal.* (page 33);
- *Water transfer proponents transferring water via groundwater substitution transfers must establish a monitoring program capable of identifying any adverse transfer related effects before they become significant.* (page 34);

The objectives of the DTIPWTP groundwater substitution transfer-monitoring program include:

- *Determine the extent of surface water-groundwater interaction in the areas where groundwater is pumped for the transfer;*
- *Determine the direct effects of transfer pumping on the groundwater basin, observable until March of the year following the transfer;*
- *Assess the magnitude and potential significance of any effects on other legal users of water, instream beneficial uses, the environment, and the economy.* (page 34)

All of these statements and monitoring objectives imply that measurement of impacts to surface water from groundwater substitution transfer pumping is possible. While measurement of stream depletion is complex and problematic, it is possible. The conflicting statements in the Draft EIS/EIR that "real time" measurements can't be done while apparently including a requirement for field monitoring of the effects of stream depletion in mitigation measures WS-1 and GW-1 need further explanation.

I recommend that the Draft EIS/EIR be revised to evaluate and discuss the methods, techniques and procedures available for monitoring and measuring the rate, volume and impacts of stream depletion due to groundwater substitution transfer pumping. The revised Draft EIS/EIR should provide specific mitigation measures, procedures and methods for monitoring groundwater substitution transfer pumping impacts on surface water features, including the frequency of monitoring and reporting.

Other Available Data to Consider in the Establishing Baseline Conditions

23. The Draft EIS/EIR for the 10-year long-term water transfer project should provide a review of the existing technical documents that describe historic environmental, surface water and groundwater conditions in the Sacramento Valley. The information in these technical documents is critical for establish an accurate and complete environmental baseline and for evaluating the potential impacts from future water transfers. Exhibit 12.1 provides an annotated bibliography provided by researchers with AquAlliance (Nora and Jim) of some of the available technical reports on groundwater resources in the Sacramento Valley. In addition to creating a complete bibliography of relevant technical reports, the Draft EIS/EIR should provide an index map showing the areas or locations covered by each report should be developed. For an example of an index map, see the 1:250000 scale regional geologic map sheets produced by the California Geological Survey.

    Other information is likely available from local government agencies that would document the current condition of the groundwater basin both quantity and quality. For example, Exhibit 12.2 has a list provide by B. Smith, a researcher with AquAlliance, of recently well permits issued since January 1, 2009 for wells that have gone dry in Shasta County. A GIS should be used to plot the locations of the wells that have gone dry. The locations of these dry wells should then be compared to the current groundwater levels, past groundwater

substitution transfer pumping areas, and the proposed 10-year long-term project pumping areas. This type of spatial analysis would help to establish an accurate baseline on groundwater elevations and impacts on existing wells, and provide the foundation for assessing the potential impacts from the 10-year long-term groundwater substitution transfer pumping. Other relevant information on baseline conditions in the 10-year Transfer Project area can be found in the Integrated Regional Water Management Plans for the Northern Sacramento Valley Basin, the American River Basin, Yuba County, and Yolo County, see my comment no. 6.

I recommend the Draft EIS/EIR be revised to provide an annotated bibliography and index map(s) of all documents that are relevant to proposed 10-year long-term water transfer project and describe or provide data on the historic and environmental, surface water and groundwater baseline conditions in the Sacramento Valley. I also recommend the Draft EIS/EIR be revised to provide information from local and regional agencies on the conditions of wells within their jurisdictions covering at least the last 10 years. This local information should include, if available, replacement well permits issued for dry wells, complaints or treatment systems installed because of poor water quality, and damage to infrastructure from subsidence or settlement. I recommend this information be mapped and compared to areas of past groundwater substitution transfer pumping, areas of known groundwater level depression, and the pumping area for the proposed 10-year project.

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List of Exhibits

1.1 – Figure 16 from Barlow and Leake, 2012
1.2 – Figure 29 from Barlow and Leake, 2012
2.1 – Composite map of domestic wells, < 150 ft. bgs depth summary maps for northern Sacramento Valley (DWR, 2014a) and traced shallow zone, well depths < 200 ft. bgs., 2004 to 2014 changes in groundwater elevation (DWR, 2014b)
3.1 – Composite plot of DWR's spring 2004 to spring 2014 groundwater elevation change maps for shallow aquifer zone, well depths less than 200 feet bgs, and Draft EIS/EIR SACFEM2013-1990 hydrologic conditions simulations shown in Figures 3.3-29, aquifer depth approximately 35 feet
3.2 – Composite plot of DWR's spring 2004 to spring 2014 groundwater elevation change maps for intermediate aquifer zone, well depths greater than 200 feet and less than 600 feet bgs, and Draft EIS/EIR SACFEM2013-1990 hydrologic conditions simulations shown in Figures 3.3-30, aquifer depth approximately 200 to 300 feet
3.3 – Composite plot of DWR's spring 2004 to spring 2014 groundwater elevation change maps for deep aquifer zone, well depths greater than 600 feet bgs, and Draft EIS/EIR SACFEM2013-1990 hydrologic conditions simulations shown in Figures 3.3-31, aquifer depth approximately 700 to 900 feet
4.1 – Summary Table of Sacramento Valley Groundwater Model Parameters
4.2 – Table 5, Brush and others, 2013a, C2VSim model parameter ranges
4.3 – Table C8, Faunt, ed., 2009, CVHM model, measured and simulated hydraulic properties
4.4 – Figure 3, Brush and others, 2013a, C2VSim model subregions and hydrologic regions
4.5 – Table A1, Faunt, ed., 2009, CVHM Water-balance subregions within the Central Valley, California
4.6 – Appendix 16.D, Driscoll, 1986, Empirical equations used to estimate specific capacity and transmissivity
4.7a to k – Figures A10A and B (a, b), A12A to E (c to g), A13 (h), A14 (i), C14 (j) and A15 (k) from Faunt, ed., 2009, CVHM model parameters
4.8 a to f – Figures 34A to C (a, b, c), 35A to C (d, e, f), 37A to C (g, h, i), 38A and B(j, k), 39A and B (l, m), page 92 (n) from Brush and others, 2013a, and page 154 (o) from Faunt, ed., 2009
5.1 – Page 100 from Brush and others, 2013a
5.2 – Figure 40, River-bed conductance from Brush and others, 2013a
5.3 – Figure C26, Distribution of cells used for streams, streambed hydraulic conductivity values from Faunt, ed., 2009
5.4a, b – Figure C19A and B (a, b), Distribution of stream gain/loss segments used for model calibration, measured and simulated from Faunt, ed., 2009
6.1a to c – Figure 81A to C (a, b, c), Simulated average annual subsurface flows between subregions from Brush and others, 2013a
6.2 – Figure 39, Simulated net annual subsurface flow between hydrologic regions for water years 2000-2009 from Brush and others, 2013b
6.3a to d – Tables 10 to 13 (a, b, c, d), Central Valley basin flows from the C2VSim model from Brush and others, 2013a
7.1 – Table summarizing the range of the number of wells in that lie within the spring 2004 to spring 2014 shallow aquifer zone drawdown contours in northern Sacramento Valley from DWR, 2014a and DWR, 2014b (see Exhibit 2.1 for composite map)

8.1a to c – Shallow (a), intermediate (b) and deep (c) composite maps of spring 2004 to spring 2014 groundwater elevation changes in northern Sacramento Valley (DWR, 2014b) with California natural gas pipelines map by California Energy Commission (Exhibit 8.6)
8.2 – Intermediate spring 2004 to spring 2014 groundwater elevation changes in northern Sacramento Valley (DWR, 2014b) with DWR's GPS subsidence grid (DWR, 2008)
8.3 – Figure B15A, Areal extent of land subsidence in the Central Valley from Faunt, ed., 2009
8.4 – Figure 6, Extensometer and GPS survey locations in the Sacramento Valley from DWR, 2008
8.5 – Energy Map of California, Map S-2, 2000, California Department of Conservation, Division of Oil, Gas and Geothermal Resources
8.6 – California Natural Gas Pipelines map by California Energy Commission
8.7 – California Natural Gas Pipelines and Storage Facilities map by California Energy Commission
8.8 – California Oil Refineries and Terminals map by California Energy Commission
8.9 – California Natural Gas Pipelines – Oil Refineries and Terminals map by California Energy Commission
8.10 – California Power Plants map by California Energy Commission
8.11 – Electric Generation Facilities and Projects Reviewed by the California Energy Commission, 1976 to July, 2014 map by California Energy Commission
9.1 – Figure C1-A, Central Valley Hydrologic Model grid, with horizontal flow barrier from Faunt, ed., 2009
9.2 – Page 160 from Faunt, ed., 2009
9.3a, b – Pages 203 (a) and 204 (b) from Faunt, ed., 2009
9.4a to d – Four screen prints of CGS's 2010 Fault Activity Map of California web site, accesses October 31, 2014
9.5 – Explanation for 2010 Fault Activity Map of California
9.6 – An Explanatory Text to Accompany the Fault Activity Map of California, first 12 pages
10.1 – Table B3 from Faunt, ed., 2009
10.2a to c – Figures B9 (a), B10-A (b) and B10-B (c) from Faunt, ed., 2009
10.3 – Figure 83 from Brush and others, 2013a
10.4 – Figure 35 from Brush and others, 2013b
10.5a to c – Tables 3-6 (a), 3-7 (b) and 3-8 (c) from NCWA, 2014b
10.6a to g – Figures 3-19 (a), 3-20 (b), 3-22 (c), 3-24 (d), 3-26 (e), 3-27 (f), and 3-29 (g) from NCWA, 2014b
10.7 – Composite of Figures 3-22, 3-24 from NCWA, 2014b, and Figure 35 from Brush and others, 2013b
10.8 – Figure 2-4 from Brush and others, 2013b
10.9 – Figure 2-5 Brush and others, 2013b
11.1 – Figure 1 from Miller and Durnford, 2005
11.2 – Table 3 from Wallace and others, 1990
11.3a to c – Figures 4 (a), 5 (b) and 6 (c) from CH2MHill, 2010
12.1 – Annotated bibliography of reports relevant to groundwater resource assessment in the Sacramento Valley provided by Nora and Jim, researchers with AquAlliance, 11 pages
12.2 – List of permits to replace dry wells in Shasta County provided by B. Smith, researcher with AquAlliance, 2 pages

AQUALLIANCE
DEFENDING NORTHERN CALIFORNIA WATERS

May 21, 2013

Mr. Brad Hubbard
United States Bureau of Reclamation
2800 Cottage Way, MP-410
Sacramento, CA 95825
bhubbard@usbr.gov

Dean Messer, Chief Water Transfers Office
Department of Water Resources
1416 9th Street
Sacramento, CA 95814
dmesser@water.ca.gov

Subject: Comments on the Draft Environmental Assessment and Findings of No Significant Impact for the *2013 Water Transfer Program* and the *2010-2011 Water Transfer Program*

Dear Messrs. Hubbard and Messer:

AquAlliance submits the following comments and questions for the Draft Environmental Assessment ("EA") and Findings of No Significant Impact ("FONSI"), for the *2013 Water Transfer Program* ("Project"). We also provide comments about the purpose and need for the 2013 state and federal water transfer programs that are mirror images of the *2009 Drought Water Bank* and the *2010/2011 Water Transfer Program*.

The Bureau of Reclamation's draft environmental review of the Project does not comply with the requirements of National Environmental Policy Act ("NEPA"), 42 U.S.C. §4321 *et seq.* First, we believe that the Bureau needs to prepare an environmental impact statement ("EIS") on this proposal, as we believed for the *2009 Drought Water Bank* ("DWB") that allowed up to 600,000 acre-feet (AF) of surface water transfers, up to 340,000 AF of groundwater substitution, and significant crop idling. It also mirrors the *2010-2011 Water Transfer Program* that sought approval for 200,000 AF of CVP related water and assumed NEPA coverage for additional non-CVP transfer water up to 195,910 AF.

Bureau reliance on the EA itself violates NEPA requirements because, among other things, the EA fails to provide a reasoned analysis and explanation to support the Bureau's proposed finding of no significant impact. The EA contains a fundamentally flawed alternatives analysis, and treatment of the chain of cause and effect extending from project implementation leading to inadequate analyses of nearly every resource, growth inducing impacts, and cumulative impacts. An EIS would afford the Bureau, DWR, the State Water Resources Control Board, and the California public far clearer insight into how, where, and why the Project might or might not be needed. Litigation by AquAlliance and partners challenged the *2010-2011 Water Transfer Program* and appeared to prod the Bureau toward the necessary environmental review for their

multi-year, serial, so-called "temporary" water transfers with the scoping meetings that were held in January 2011 for the *Long-Term North to South Water Transfer Program* ("10-Year Plan") (http://www.usbr.gov/mp/cvp/ltwt/). The 10-Year Plan's proposal to transfer up to 600,000 AF of river water has stalled despite Bureau optimism that an EIS would be available in the fall of 2011 and again in the fall of 2012. Absent serious and comprehensive NEPA and California Environmental Quality Act ("CEQA") review, the Bureau offers another EA/FONSI here, which again fails to provide adequate disclosure of impacts.

Second, CEQA analysis of the 2013 Water Transfer Program is completely absent at the programmatic level. The Project's actual environmental effects —which are similar to the 2009 DWB, the Sacramento Valley Water Management Agreement, and the proposed 1994 Drought Water Bank (for which a final Program Environmental Impact Report was completed in November 1993) – are not presented in any document. The Bureau and DWR have known for over a decade that programmatic environmental review was and is necessary. The following examples highlight the Bureau and DWR's ("Agencies") deficiencies in complying with NEPA and CEQA.

- The Sacramento Valley Water Management Agreement was signed in 2002 and the need for a programmatic EIS/EIR was clear at that time it was initiated, but never completed.
- In 2000, the Governor's Advisory Drought Planning Panel report, *Critical Water Shortage Contingency Plan* promised a program EIR on a drought-response water transfer program, but was never undertaken.
- Twice in recent history, the state readily acknowledged that CEQA review for a major drought water banking program was appropriate.
- Last, but not least, is the attempt of the Bureau and San Luis Delta Mendota Water Authority to analyze the 10-Year Plan, which also has failed to materialize.

The Bureau's failure to conduct scientifically supported environmental review in an EIS and DWR's negligence to provide *any* form of CEQA review reflects an end-run around established law through the use of so-called "temporary" water transfers, in multiple years and is therefore vulnerable to legal challenge under NEPA and CEQA.

Finally, we also question the merits of and need for the Project itself. The existence of very dry conditions in California should not surprise the Agencies or require an urgent and "temporary" response once again. The existence of this water transfer program reflects the Agencies' abandonment of a sensible water policy framework. Our organizations believe the Bureau's EA/FONSI and the absence of programmatic CEQA review go too far to help a few junior water right holders at the expense of agriculture, communities, and the environment in and north of the Delta. The *2013 Water Transfer* Program will directly benefit the areas of California whose water supplies are the least reliable by operation of state water law and climate. Though their unreliable supplies have long been public knowledge, local, state, and federal agencies in these areas have failed to stop blatantly wasteful and irrational uses and diversions of water and to pursue aggressive planning for regional water self-sufficiency.

The proposed Project will have significant effects on the environment—both standing alone, as serial, so-called "temporary" water transfers, and when reviewed in conjunction with the multitude of other plans and programs (including the non-CVP water that is mentioned in the EA cumulative impacts section) that incorporate and are dependent on Sacramento Valley water. Ironically, the Bureau appears to recognize in its cumulative impacts discussion that there is potential for significant adverse impacts associated with the Project, but instead of conducting an EIS as required, attempts to assure the public that the *2013 Water Transfer Program* will be deferred to the "willing sellers" through individual "monitoring and mitigation programs" as well as through constraining actions taken by both DWR and Bureau professional staff whose criteria ought instead be incorporated into the Proposed Action Alternative (EA at p. 6, FONSI at pp. 1-4). It is impossible to evaluate whether or not the mitigation and monitoring plans will be adequate to relieve the Bureau and DWR of responsibility for impacts from the Project (including the non-CVP water transfers). The language used in the EA (pp.12-14, 25-27) and the *Draft Technical Information for Water Transfers in 2013* (February 2013) (pp. 39-45) fails to pass the blush test (details below).Of course, this is not a permissible approach under NEPA; significant adverse impacts should be mitigated—or avoided altogether as CEQA normally requires.[1] Moreover, in light of the wholly inadequate monitoring and mitigation planned for the 2013 Water Transfer Program's extensive water sales, the suggestion that the public should be required to depend on the insufficient monitoring to provide the necessary advance notice of "significant adverse impacts" is an unacceptable position.

We incorporate by reference the following documents:

- AquAlliance, California Sportfishing Protection Alliance, and California Water Impact Network *Testimony on Water Availability Analysis for Trinity, Sacramento, and San Joaquin River Basins Tributary to the Bay--Delta Estuary*. 2012.
- AquAlliance comments on the *Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration for the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project*. 2011.
- AquAlliance scoping comments for the 10-Year Plan. 2011.
- AquAlliance et. al comments on the *2010/2011 Water Transfer Program*. 2010.
- Jim Brobeck's comment letter for Butte Environmental Council on the Supplemental Environmental Water Account EIR/EIR, 2007.

[1] Perhaps even more telling, the Bureau actually began its own Programmatic EIS to facilitate water transfers from the Sacramento Valley, and the interconnected actions that are integrally related to it, but never completed that EIS and now has impermissibly broken out this current segment of the overall Program for piecemeal review in the present draft EA. See 68 Federal Register 46218 (Aug 5, 2003) (promising a Programmatic EIS on these related activities, "includ[ing] groundwater substitution in lieu of surface water supplies, conjunctive use of groundwater and surface water, refurbish existing groundwater extraction wells, install groundwater monitoring stations, install new groundwater extraction wells…" *Id.* At 46219. See also http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=788 (current Bureau website on "Short-term Sacramento Valley Water Management Program EIS/EIR").

- Lippe Gaffney Wagner LLP letter for Butte Environmental Council to DWR regarding the Drought Water Bank Addendum, 2009.
- Barbara Vlamis' letter for Butte Environmental Council to DWR regarding the 2009 Drought Water Bank Addendum.
- Multi-Signatories letter regarding the Drought Water Bank, 2008.
- Professor Kyran Mish's White Paper, 2008.
- Professor Karin Hoover's Declaration, 2008.

I. The Bureau and DWR Must Prepare an Environmental Impact Statement/ Environmental Impact Report on the Proposed *2013 Water Transfer Program*

We strongly urge the Bureau to withdraw this inadequate environmental document and instead prepare a joint EIS/R on the *2013 Water Transfer Program*, before approaching the State Water Resources Control Board (SWRCB) for a change in place of use, in order to comply with both NEPA and CEQA requirements for full disclosure of human and natural environmental effects. NEPA requires federal agencies to prepare a detailed environmental impact statement on all "major Federal actions significantly affecting the quality of the human environment . . . ." 42 U.S.C. §4332(2)(C). This requirement is to ensure that detailed information concerning potential environmental impacts is made available to agency decision makers and the public before the agency makes a decision. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). CEQA has similar requirements and criteria.

Under NEPA's procedures, an agency may prepare an EA in order to decide whether the environmental impacts of a proposed agency action are significant enough to warrant preparation of an EIS. 40 C.F.R. §1508.9. An EA must "provide sufficient evidence and analysis for determining whether to prepare an [EIS]" (*id.*), and must demonstrate that it has taken a "'hard look' at the potential environmental impact of a project." *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998) (internal quotation marks omitted). However, the U.S. Court of Appeals for the Ninth Circuit has cautioned that "[i]f an agency decides not to prepare an EIS, it must supply a convincing statement of reasons to explain why a project's impacts are insignificant." *Id.* (internal quotation marks omitted). The Bureau has not provided a convincing statement of reasons that would explain why the Projects's impacts are not significant. So long as there are "substantial questions whether a project *may* have a significant effect on the environment," an EIS must be prepared. *Id.* (emphasis added and internal quotation marks omitted). Thus, "the threshold for requiring an EIS is quite low." *NRDC v. Duvall*, 777 F. Supp. 1533, 1538 (E.D. Cal. 1991). Put another way, as will be shown through our comments, the bar for sustaining an EA/FONSI under NEPA procedures is set quite high, and the Bureau fails to surmount it in the *2013 Water Transfer Program*.

NEPA regulations promulgated by the Council on Environmental Quality identify factors that the Bureau must consider in assessing whether a project may have significant environmental effects, including:

(1) "The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." 40 C.F.R. §1508.27(b)(5).
(2) "The degree to which the effects on the quality of the human environment are likely to be highly controversial." *Id.* §1508.27(b)(4).
(3) "Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate on a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts." *Id.* §1508.27(b)(7).
(4) "The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration." *Id.* §1508.27(b)(6).
(5) "The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973." *Id.* §1508.27(b)(9).

Here, the Bureau has failed to take a hard look at the environmental impacts of the Project. As detailed below, there are substantial questions about whether the *2013 Water Transfer Program's* proposed water transfers will have significant effects on the region's environmental and hydrological conditions, especially groundwater; the interactions between groundwater and surface streams of interest in the Sacramento Valley region; and the species dependent on aquatic and terrestrial habitat. There are also substantial questions about whether the *2013 Water Transfer Program* will have significant adverse environmental impacts when considered in conjunction with the other related water projects that have occurred in the last dozen years and that are underway and proposed in the region. The Bureau simply cannot rely on the EA/FONSI for the foreseeable environmental impacts of the proposed *2013 Water Transfer Program* and still comply with NEPA's requirements.

A. The Proposed Action Alternative is poorly specified, making it difficult to identify chains of cause and effect necessary to analyze adequately the alternative's environmental effects.

The Proposed Action Alternative is poorly specified and needs additional clarity before decision makers and the public can understand the human and environmental consequences of the *2013 Water Transfer Program*. The EA describes the Proposed Action Alternative as one reflecting the Bureau's intention to approve transfers of Central Valley Project water from willing sellers who contract with the Bureau ordinarily to use surface water on their croplands. Up to 37,505 AF of CVP water are offered from these sellers, according to Table 2-1 (EA p. 9). In contrast to the EA/FONSI for the 2009 Drought Water Bank (p. 3-88), the Project EA contains no "priority criteria" to determine water deliveries and simply acknowledges that CVP river water will be transferred to San Luis & Delta Mendota Water Authority agricultural districts. The EA fails to indicate how much water has been requested by the buyers of CVP or non-CVP water, which is also in contrast to the EA/FONSI and DWR's addendum for the 2009 Drought Water Bank.

Potential buyers of non-CVP water are also not disclosed. These significant omissions eliminate the public's ability to consider, assess, and comment on possible impacts in the receiving areas. This denial of information further obfuscates the need for the Project.

The EA/FONSI's Background section (p. 3) states specifically that, "To facilitate the transfer of water within the State of California, Reclamation is considering whether to approve individual water transfers between willing sellers and buyers when Base Supply, Project Water or Project facilities are involved in the transfer." This paragraph omits mentioning DWR's role as an approving agency for SWP water sales while acknowledging its role in potentially wheeling both CVP and SWP river water. This failure to elucidate DWR's authority adds further confusion to a poorly defined project.

Another serious omission is that the EA/FONSI lacks a section that names and explains the purpose of the Project. AquAlliance agrees with the Bureau's *Reclamation's NEPA Handbook* (2012) that states, "The need for an accurate (and adequate) purpose and need statement early in the NEPA process cannot be overstated. This statement gives direction to the entire process and ensures alternatives are designed to address project goals." (p.11-1) While "need" is disclosed in section 1.2 (p. 4), there is no coherent discussion of the need. Merely stating that, "The hydrologic condition for 2013 is dry, and because the CVP and SWP are providing 20% and 35% of contract amounts, respectively, to contractors south of the Delta, there is a need for water to supplement local and imported supplies to meet demands," lacks context, specificity, and rigor. The purpose and need should also state that this transfer program would be subject to specific criteria for prioritizing transfers. The absence of a statement of purpose and the inadequate need statement renders the EA/FONSI wholly deficient.

The EA's description of the proposed action alternative needs to make clear what would occur if sale criteria are in fact applied and if exceptions will be allowed, and, if so, by what criteria would exceptions be made.. Do both Project Agencies, the Bureau and DWR, lack criteria to prioritize water transfers? What is the legal or policy basis to act without providing priority criteria? Without foundational criteria, the public is not provided with even a basic understanding of the need for the Project.

There is considerable ambiguity over just how many potential sellers there are and how much water they would make available. The EA states that, "Entities that are not listed in this table [2-1] may decide that they are interested in selling water, but those transfers would require supplemental NEPA analysis," (p. 9). Allowing a roving Project location is not permissible and avoids accurate analysis of all impacts including growth inducing and cumulative impacts.

Absent the names of buyers, buyers' request numbers, and the potential for the participation of unknown additional sellers, the EA signals that neither the Bureau nor DWR have a clear idea what the *2013 Water Transfer Program* is intended to be. This problem contributes greatly to and helps explain the poorly rendered treatment of causes and effects that permeate the Bureau's EA. The Project Agencies present decision-makers and the public with an ill-defined Project,

purpose, and need: they are moving targets. Such chaos and blunders reflect hasty consideration and poor planning by project proponents. Nor can the Agencies reasonably attribute their inadequate or absent environmental reviews on lack of warning. The Agencies know better than anyone that California has a Mediterranean climate with major fluctuations in precipitation and has long periods of drought (Anderson, 2009).

From data available in the EA/FONSI, it is not possible to determine with confidence just how much water is requested by potential urban and agricultural buyers. There is no attempt to describe how firmly tendered are offers of water to sell or requests to purchase. Left to guess at the possible requests for water, we look at the 2009 DWB where there were between 400,000 and 500,000 AF of presumably urban buyer requests alone (which had priority over agricultural purchases, according to the 2009 DWB priorities) and a cumulative total of less than 400,000 AF from willing sellers. It is highly possible, based on the example during the 2009 DWB, that many buyers are not likely to have their needs addressed by the *2013 Water Transfer Program*. If so, the Bureau and DWR should state the likelihood that many requests will not be fulfilled in order to achieve a full and correct environmental compliance treatment of the proposed action. Such an estimate is necessary for accurate explication of the chains of cause and effect associated with the *2013 Water Transfer Program*—and which must propagate throughout a NEPA document for it to be adequate as an analysis of potential natural and human environmental effects of the proposed project. We have additional specific questions:

- Are the San Luis and Delta Mendota Water Authority (SLDMWA) requests for agricultural or urban use of Project water?
- What are the specific urban requests for water nested within the SLDMWA request?
- Who are the buyers and what are their requests for the non-CVP river water?
- Will sale criteria be premised on full compliance with all applicable environmental and water rights laws? If so, how will cumulative impacts be analyzed under CEQA?

If priority criteria were actually revealed in the EA/FONSI, how would intervening economic factors beyond the control of the Project be analyzed? Given the added uncertainty, an EIS should be prepared to provide the Agencies with advance information and insight into what the sensitivity of the program's sellers and buyers are to the influences of prices—prices for water as well as crops such as rice, orchard and vineyard commodities, and other field crops. It is plausible that crop idling occurs more in field crops, while groundwater substitution would be more likely for orchard and vineyard crops. However, high prices for rice—the Sacramento Valley's largest field crop— undermines this logic and have lead to substantial groundwater substitution. These potential issues and impacts should be recognized as part of the *2013 Water Transfer Program* description and should directly apply to the Agriculture and Land Use, and Socioeconomic sections of the EA, because crop prices are key factors in choices potential water sellers would weigh in deciding whether to idle crops, substitute groundwater, or decline to participate in the Project altogether. The EA is inadequate because it fails to identify and analyze the market context for crops as well as water that would ultimately influence the size and scope of the *2013 Water Transfer Program*.

Rice prices are high because of conditions for the grain in the world market. Drought elsewhere is a factor in reduced yields, but growing populations in south and east Asia demand more rice; the rice industry has gladly tried to meet that demand.[2]

This is very important. The Bureau tacitly admits that the Bureau—and by logical extension, DWR—has no idea how many sales of what type (public health, urban, agricultural) can be expected to occur. Put another way, there is a range of potential outcomes for the *2013 Water Transfer Program,* and yet the Bureau has failed utterly to use the EA to examine a reasonable and representative range of alternatives as it concerns how the priority criteria would be established and affect Project transfers. And DWR has not bothered to conduct an appropriate level of review under CEQA.

Nor does the *2013 Water Transfer Program* prevent rice growers (or other farmers) from "double-dipping," but actually encourages it. Districts and their growers have opted to turn back their surface supplies from the CVP and the State Water Project and substitute groundwater to cultivate their rice crop—thereby receiving premiums on both their CVP contract surface water as well as their rice crop this fall when it goes to market. There appear to be no caps on water sale prices to prevent windfall profits to sellers of Sacramento Valley water — especially for crops with high market prices, such as in rice.

As stated, neither the Bureau nor DWR disclose what quantity of water from the transfers would go to public health, urban, or agricultural buyers. The EA must also (but fails to) address the ability and willingness of potential buyers to pay for Project water given the supplies that may be available. Complaints from agricultural water districts were registered in the comments on the Draft EWA EIS/R and reported in the Final EIS/R in January 2004 indicating that they could not compete on price with urban areas buying water from the EWA. Given the absence of priority criteria, will agricultural water buyers identified in Table 2-2 of the EA be able to buy water when competing with urban districts? Since buyers are not disclosed in the EA for non-CVP river water (as they also were not, for example, in the Negative Declaration for Butte Water District's 2013 non-CVP river water sales), not only is there a significant lack of disclosure, but the failure to access ramifications on economic policy and competition between and agricultural sectors is a serious omission? What factors other than price should be considered in allocating water among our state's regions? This fails dramatically to encourage regions to develop their own water supplies more efficiently and cost-effectively without damage to resources of other regions.

Full disclosure of each offer of and request for *2013 Water Transfer Program* water should be provided as part of the EA including non-CVP river water. This is necessary so the public can understand and have confidence in the efficacy of the Project's need, although the Project

[2] "Panic over rice prices hits California," *AZCentral.com*, April 24, 2008; UN News Service, "Bumper rice harvests could bring down prices but poor may not benefit, warns UN," 25 February 2009; "Era of cheap rice at an end in Taiwan: COA," *The China Post*, March 5, 2009; Jim Downing, "Sacramento Valley growers se rice prices soar," *Sacramento Bee*, 18 January 2009.

purpose, as discussed above, is completely absent. The public benefits from full disclosure of who requests what quantity of water, and for what uses, so that the public may easily verify chains of cause and effect. Agricultural and urban application of transferred surface water is not examined in the EA/FONSI, as though the ways potential buyers would use their purchased water had no environmental effects. 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. Since California has high variability in precipitation year-to-year (http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST), how will purchased water be used and conserved? What growth inducing impacts will such transferred water facilitate and how will hardening of demand be evaluated?

Nor is a hierarchy of priority uses among agricultural or urban users for purchasing CVP and non-CVP water presented. Could purchased water be used for any kind of crop or landscaping, rather than clearly domestic purposes or strictly for drought-tolerant landscaping? We cannot tell from the EA/FONSI narrative. How can the citizens of California be assured that water purchased through the *2013 Water Transfer Program* will not be used wastefully, in violation of the California Constitution, Article X, Section 2?

If urban buyers are participating in the CVP and/or non-CVP river water sales, and the public has not been presented with any information in this regard except that, "[u]rban water users would face shortages in the absence of water transfers" in the No Action discussion, (pp. 6 and 27), will they need their Project purchased water only in July through September, or is that the delivery period preferred in the Project because of ecological and fishery impact constraints on conveyance of purchased water?

Should agricultural water users be able to buy Project water, how will DWR and the Bureau assure that transferred water for irrigation is used efficiently? Many questions are embedded within these concerns that DWR and the Bureau should address, especially when they approach the State Water Resources Control Board to justify consolidating their places of use in their respective water rights permits:

- How much can be expected to be purchased by agricultural water users, given the absence of any criteria, let alone priority criteria, in the *2013 Water Transfer Program*?
- How much can be expected to be consumptively used by agricultural water buyers?
- How much can be expected to result in tailwater and ag drainage?
- How much can be expected to add to the already high water table in the western San Joaquin Valley?
- What selenium and boron loads in Mud Slough and other tributaries to the San Joaquin River may be expected from application of this water to WSJ lands?
- What mitigation measures are needed to limit such impacts consistent with the public trust doctrine, Article X, Section 2 of the California Constitution, the Porter-Cologne Water Quality Control Act, and California Fish and Game Code Section 5937?

In other words, the most important chains of cause and effect— from the potential for groundwater resource impacts in the Sacramento Valley to the potential for contaminated drainage water from farm lands in the western San Joaquin Valley where many of the agricultural buyers are located—are ignored in the Bureau's EA/FONSI and completely missing due to DWR's failure to comply with CEQA.

Will more of river water transfers go to urban users than to ag users or not? The EA's silence on this is disturbing, and it highlights the absence of priority criteria. What assurances will the Bureau and DWR provide that criteria exist or will be developed and how will these criteria be presented to the public and closely followed?

- The more transfers to urban water agencies, the less environmental impacts there would be on drainage-impaired lands of the San Joaquin Valley, a neutral to beneficial impact of the Project's operation on high groundwater and drainage to the SJR.
- However, the more Project water goes to agricultural users than to urban users, the higher would be groundwater levels, the more contaminated the groundwater would be in the western San Joaquin Valley and the more the San Joaquin River would be negatively affected from contaminated seepage and tailwater by operation of the Project.

We are pleased that the EA provides a map indicating where the CVP sellers and buyers are located, but the cumulative buyers and sellers in 2013, which includes non-CVP river water and groundwater substitution, are omitted. This is a major error.

Two issues concerning water rights are raised by this EA/FONSI:

- **Consolidated Place of Use.** The EA should fully disclosure the consolidated places of use for DWR and the Bureau. Why is the flexibility claimed for the consolidated place of use necessary for this year's water transfer program? Could the transfers be facilitated through transfer provisions of the Central Valley Project Improvement Act? Will the consolidation be a permanent or temporary request, and will the consolidation be limited to the duration of just the *2013 Water Transfer Program*? Is there an actual sunset date to this Project, since it continues serially in multiple years and plans a 10-Year Program? How do the consolidated places of use permit amendments to the SWP and CVP permits relate to their joint point of diversion? Why doesn't simply having the joint point of diversion in place under D-1641 suffice for the purpose of the Project?
- **Description of the water right claims of sellers, buyers, the Bureau, and DWR.** Informing the public about water rights claims would necessarily show that buyers and the Agencies 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 *2013 Water Transfer Program*. Otherwise the public and decision makers have insufficient information on which to support and make informed choices. We notice that a modicum of discussion is found in the *Draft Technical Information for Water Transfers in 2013*, but the EA/FONSI fails to take the opportunity to point the reader to it.

To establish a proper legal context for these water rights, the Project's Action Alternative section of the EA/FONSI should also describe more extensively the applicable California Water Code sections about the treatment of water rights involved in water transfers.

Thus, in many ways, the *2013 Water Transfer Program* is a poorly specified program for NEPA and CEQA purposes, leaving assessment of its environmental effects at best murky, and at worst, risky to all involved, especially users of Sacramento Valley groundwater resources. "Clearly, it is pointless to 'consider' environmental costs without also seriously considering action to avoid them." *Calvert Cliffs' Coordinating Comm., Inc. v. U.S. Atomic Energy Commn.*, 449 F.2d 1109, 1128 (D.C. Cir. 1971). It is thus the Bureau's duty to consider "alternatives to the proposed action" and to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. §§ 4332(2)(C)(iii), 4332(2)(E); 40 C.F.R. § 1502.14(a).

B. Correcting the EA's poorly specified chains of cause and effect forces consideration of an expanded range of alternatives.

Bureau and DWR water transfers are not just one- or two-year transfers, but rather many serial actions in multiple years by the Agencies, sellers, and buyers without the benefit of comprehensive planning or environmental analysis under NEPA and CEQA. The Agencies have been implementing so called "temporary" or "short term" water transfers over a dozen years and has had those same years to adequately consider the ramifications of these serial actions in multiple years in an EIS/EIR, yet the Agencies have chosen not to complete the task. See table below[3].

Past Water Transfers from the Sacramento Valley Through the Delta TAF Annually												
Program	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**Potential 2012**
DWR Drought Water Bank/Dry yr. Programs	138	22	11	0.5	0	0	0	0	74	0	0	0
Environ. Water Acct	80	145	70	120	5	0	147	60	60	60	0	60
Others (CVP, SWP, Yuba, inter alia)	160	5	125	0	0	0	0	173	140	243	0	190
Totals	378	172	206	120 .5	5	0	147	233	274	303	0	250

*Table reflects gross AF purchased prior to 2percent Delta carriage loss (i.e., actual amounts pumped at Delta are 20 percent less)

[3] This table is derived from the Western Canal Water District's Negative Declaration for a 2012 water transfer.

Adequate treatment of alternatives should have been examined in the EA with several reasonable scenarios beyond simply the Proposed Action and a "no action" alternative. Three reasonable permutations would have considered relative proportions of crop idling versus groundwater substitution (e.g., high/low, low/high, and equal proportions of crop-idled water and groundwater substitution). Other reasonable dry-year response alternatives that can meet operational and physical concerns merit consideration and analysis by the Bureau includes:

- Planned permanent retirement of upslope lands in the western San Joaquin Valley where CVP-delivered irrigation water is applied to lands contaminated with high concentrations of selenium, boron and mercury, and which contribute to high water table and drainage problems for lowland farmers, wetlands and tributaries of the San Joaquin River. Retirement of these lands would permanently free up an estimated 3.9 MAF[4] of state and federal water during non-critical water years. Ending irrigation of these lands would also result in substantial human environmental benefits for the San Joaquin River, the Bay-Delta Estuary, and the Suisun Marsh from removal of selenium, boron, and salt contamination. Having such reasonable and pragmatic practices in place would go a long way to eliminate the need for drought water banks in the foreseeable future.
- More aggressive investment in agricultural and urban water conservation and demand management among CVP and SWP contractors even on good agricultural lands, including metering of all water supply hook-ups by all municipal contractors, statewide investment in low-flush toilets and other household and other buildings' plumbing fixtures, and increased capture and reuse of recycled water. Jobs created from such savings and investments would represent an economic stimulus that would have lasting employment and community stability benefits as well as lasting benefits for water supply reliability and environmental stabilization.

C. The *2013 Water Transfer Program* EA fails to specify adequate environmental baselines, or existing conditions, against which impacts would be assessed and mitigation measures designed to reduce or avoid impacts.

The Project's EA/FONSI incorporates by reference the *2010/2011 Water Transfer Program* (pp. 11-13). The Project EA narrative discloses that no water was transferred under the *2010/2011 Water Transfer Program* (p. 13), but fails to mention that litigation was filed in 2010 by AquAlliance, CSPA, and C-WIN challenging the adequacy of the NEPA review.

The Bureau's *2010/2011 Water Transfer Program* environmental review incorporated by reference, for specific facets of the review, the 2003/2004 and 2007/2008 Environmental Water Account EIS/R documents. In both cases, these environmental reviews were conducted on a program whose essential purpose is to "provide protection to at-risk native fish species of the Bay-Delta estuary through environmental beneficial changes in State Water Project/Central Valley Project operations at no uncompensated water cost to the Projects' water users. This

[4] Pacific Institute, http://www.pacinst.org/reports/more_with_less_delta/index.htm.

approach to fish protection involves changing Project operations to benefit fish and the acquisition of alternative sources of project water supply, called the 'EWA assets,' which the EWA agencies use to replace the regular Project water supply lost by pumping reductions."

The two basic sets of actions of the EWA were to:

- Implement fish actions that protect species of concern (e.g., reduction of export pumping at the CVP and SWP pumps in the Delta); and
- Increase water supply reliability by acquiring and managing assets to compensate for the effects of the fish actions (such as by purchasing water from willing sellers for instream flows that compensates the sellers for forgone consumptive use of water).

Without going into further detail on the EWA program, there was no attempt by the EWA agencies to characterize its environmental review as reflective of water transfer programs generally; the EWA was a specific set of strategies whose purpose was protection of fish species of concern in the Delta, not dry-year aid for junior water right-holding areas of California. Is the Bureau still relying on the EWA analysis from 2003/2004 and 2007/2008 since it continues to point backward in each successive attempt to analyze water transfers? If so, one consequence of this attempt to rely on the EWA EIS/R is that it makes the public understanding of the environmental baseline of the *2013 Water Transfer Program* impossible, because environmental baselines, differing purpose and need for the project, and many relevant mitigation measures are not readily available to the public. Merely referring to the EWA documents in the *2010/2011 Water Transfer Program* (e.g.) p. 3-47) and then referring to the *2010/2011 Water Transfer Program* in the Project EA mocks the missions of NEPA and CEQA to inform the public adequately about the environmental setting and potential impacts of the proposed project's actions. Moreover, a Water Transfer Program for urban and agricultural sectors is plainly not the same thing as an Environmental Water Account.

Another consequence is that the chains of cause and effect of an EWA versus the *2010/2011 Water Transfer Program* or the *2013 Water Transfer Program* are entirely different because of their different purposes. While the presence of water purchases, willing sellers, and requesting buyers is similar, the timing of EWA water flows are geared to enhancing and protecting fish populations; the water was to flow in Delta channels to San Francisco Bay and the Pacific Ocean. In stark contrast, the *2010/2011 Water Transfer Program* and the *2013 Water Transfer Program* water flows focus water releases from the SWP and CVP reservoirs to exports for deliveries in the July through September period, whereas EWA assets would be "spent" year-round depending on the specific need to protect fish. EWA was about purchasing water to provide instream flows in the Delta, while the *2010/2011 Water Transfer Program* and the *2013 Water Transfer Program* facilitate water sales to serve consumptive uses outside of the Delta.

Furthermore, DWR and the Bureau do not even attempt to tease out the various ways in which the EWA review—itself a two-binder document consisting of well over 1,000 pages—could be used to provide appropriate environmental compliance for river water transfers with myriad potential for impacts in the areas of origin, despite at least having staff resources that could have

undertaken such task. It is therefore well beyond the reach of non-expert decision-makers and the public, and the use of the EWA EIS/R as part of the environmental review for the *2010/2011 Water Transfer Program* or the *2013 Water Transfer Program* therefore violates both NEPA and CEQA.

Nor is any attempt made in the EWA EIS/Rs to characterize the EWA as a "program level" environmental review, off of which a Water Transfer Program-like project could perhaps legitimately tier. In our view, this reliance on the EWA EIS/R obscures the environmental baselines of the Project from public view, inappropriately conflates the purposes of two (or maybe three) distinct environmental reviews, and flagrantly violates NEPA and CEQA. This could only be redressed by preparation of an EIS/R on the *2013 Water Transfer Program*.

Finally, the most significant baseline condition omitted in the Bureau's inadequate and DWR's negligent reporting relates to Sacramento Valley groundwater resources, discussed in the next section.

D. Scientific uncertainties and controversy about Sacramento Valley groundwater resources merit consideration that only an EIS can provide.

There is substantial evidence that the *2013 Water Transfer Program* may have significant impacts on the aquifer system underlying the project and the adjacent region that overlies the Tuscan Formation. This alone warrants the preparation of an EIS.

Additionally, an EIS is necessary where "[a] project['s] … effects are 'highly uncertain or involve unique or unknown risks.'" *Blue Mountains Biodiversity Project*, 161 F.3d at 1213 (quoting 40 C.F.R. §1508.27(b)(5)). Here, the draft EA/FONSI fails to adequately address gaps in existing scientific research on the hydrology of the aquifer system and the extent to which these gaps affect the Bureau's ability—and by logical extension, DWR's ability—to assess accurately the Project's environmental impacts.

1. Existing research on groundwater conditions indicates that the *2013 Water Transfer Program* may have significant impacts on the aquifer system.

The EA fails to describe significant characteristics of the aquifers that the *2013 Water Transfer Program* proposes to exploit. These characteristics are relevant to an understanding of the potential environmental effects associated with the *2013 Water Transfer Program*'s potential direct extraction of up to 37,505 AF of groundwater (pp. 8, 9, 11, 28,29, 35) and the indirect extraction of 92,806 AF of groundwater (p. 31). First, the draft EA/FONSI fails to describe a significant saline portion of the aquifer stratigraphy of the *2013 Water Transfer Program* area, which includes the non-CVP regions. According to Toccoy Dudley, former Groundwater Geologist with the Department of Water Resources and former director of the Butte County Water and Resources Department, saline groundwater aquifer systems of marine origin underlie

the various freshwater strata in the northern counties of Butte, Colusa, Glenn, and Tehama ("northern counties"). The approximate contact between fresh and saline groundwater occurs at a depth ranging from 1500 to 3000 feet. (Dudley 2005)

Second, the EA fails to discuss the pressurized condition of the down-gradient portion of the Tuscan formation, which underlies the northern counties. Dudley finds that the lower Tuscan aquifer located in the Butte Basin is under pressure. "It is interesting to note that groundwater elevations up gradient of the Butte Basin, in the lower Tuscan aquifer system, are higher than the ground surface elevations in the south-central portion of Butte Basin. This creates an artesian flow condition when wells in the central Butte Basin are drilled into the lower Tuscan aquifer." (Dudley 2005). The artesian pressure indicates recharge is occurring in the up-gradient portions of the aquifer located along the eastern margin of the Sacramento Valley.

Third, the EA fails to describe the direction of movement of water through the subbasins in the Sacramento Valley. To consider the Lower Tuscan Formation as an example, according to Dudley: "From Tehama County south to the city of Chico, the groundwater flow direction in the lower Tuscan is westerly toward the Sacramento River. South of Chico, the groundwater flow changes to a southwesterly direction along the eastern margin of the valley and to a southerly direction in the central portion of the Butte Basin." (2005) Adequate NEPA review would describe in detail all the subbasins where groundwater substitution transfers (or "mining" to be more direct) is planned to facilitate the Project.

Fourth, the draft EA fails to disclose that the majority of wells used in the Sacramento Valley are individual wells that pump from varying strata in the aquifers. The thousands of domestic wells in the target export areas of the Sacramento Valley are vulnerable to groundwater manipulation and lack historic monitoring. The Bureau's 2009 DWB EA elaborated on this point regarding Natomas Central MWC (p. 39) stating that, "Shallow domestic wells would be most susceptible to adverse effects. Fifty percent of the domestic wells are 150 feet deep or less. Increased groundwater pumping could cause localized declines of groundwater levels, or cones of depression, near pumping wells, possibly causing effects to wells within the cone of depression. As previously described, the well review data, mitigation and monitoring plans that will be required from sellers during the transfer approval process will reduce the potential for this effect."

As the latter statement made clear (even though the information from the 2009 DWB was excluded from the Project EA), the Bureau hoped that individual mitigation and monitoring plans created by the sellers would reduce the potential for impacts, but there wasn't in 2009 (and there certainly isn't in 2013) any assurance in the EA that it will reduce it to a level of insignificance for the thousands of well owners in the Sacramento Valley. AquAlliance questions the adequacy of individual mitigation and monitoring plans and suggests that an independent third party, such as USGS, oversee the mitigation and monitoring program, not the Bureau and DWR. After the fiasco in Butte County during the 1994 Drought Water Bank and with the flimsy, imprecise

proposal for mitigation and monitoring in the *2013 Water Transfer Program* (see details below), the agencies lack credibility as oversight agencies.

In addition, even the Sacramento Valley Integrated Water Management Plan (2006) proposed a Framework for Sacramento Valley regional water resource monitoring that would also benefit shallow domestic-well owners. The Framework acknowledged that, "The lowering of groundwater levels due to the interception of groundwater underflow to surface water systems due to the increased groundwater extraction associated with conjunctive water management programs, have the potential to impact the native habitat areas," and that, "In order to identify potential habitat impacts associated with implementation of conjunctive water management alternatives, a program-specific network of shallow monitor monitoring wells should be developed to detect changes in water levels over the shallowest portion of the aquifer. The groundwater monitoring network should contain shallow monitoring wells that will record changes to the water table elevation in the vicinity of these sensitive habitat areas." Unfortunately, the Framework was shelved, and the shallow monitoring network never got off the ground.

Fifth, the draft EA fails to provide recharge data for the aquifers. Professor Karin Hoover, Assistant Professor of hydrology, hydrogeology, and surficial processes from CSU Chico, found in 2008 that, "Although regional measured groundwater levels are purported to 'recover' during the winter months (Technical Memorandum 3), data from Spangler (2002) indicate that recovery levels are somewhat less than levels of drawdown, suggesting that, in general, water levels are declining." According to Dudley, "Test results indicate that the 'age' of the groundwater samples ranges from less than 100 years to tens of thousands of years. In general, the more shallow wells in the Lower Tuscan Formation along the eastern margin of the valley have the 'youngest' water and the deeper wells in the western and southern portions of the valley have the 'oldest' water," adding that "the youngest groundwater in the Lower Tuscan Formation is probably nearest to recharge areas." (2005). "This implies that there is currently no active recharge to the Lower Tuscan aquifer system (M.D. Sullivan, personal communication, 2004)," explains Dr. Hoover. "If this is the case, then water in the Lower Tuscan system may constitute fossil water with no known modern recharge mechanism, and, once it is extracted, it is gone as a resource," (Hoover 2008). In another sub-basin, Yuba County Water Agency has encountered troubling trends that, according to the Draft EWA EIS/EIR, are 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.

All aquifer characteristics are important to a full understanding of the environmental impacts of the *2013 Water Transfer Program*. In the Tuscan Aquifer, for instance, there are numerous indications that other aquifer strata are being operated near the limit of overdraft and could be affected by the *2013 Water Transfer Program* (Butte County 2007). The Bureau has not considered this important historic information in the draft EA/FONSI. According to Dudley, the Chico area has a "*long term average decline in the static groundwater level of about 0.35 feet-per-year*." (Letter to Lester Snow as presented to the Butte County Board of Supervisors as part

of agenda item 4.05, 2007) (emphasis added.) Declining aquifer levels are not limited to the Chico Municipal area. This trend of declining aquifer levels in Chico, Durham and the Cherokee Strip is illustrated in a map submitted with these comments (CH2M Hill 2006).

Declining groundwater elevations in Butte County are relevant to the Tuscan Aquifer, but also are emblematic of a valley-wide trend affecting other aquifers that illustrates serious overuse of groundwater. It is disturbing that neither the specifics of overuse conditions nor summaries of the groundwater basins and sub-basins are disclosed in the Project EA/FONSI. Below are some examples:

1. The Butte Basin Groundwater Status Report describes the "historical trend" in the Esquon Ranch area as showing "seasonal fluctuation (spring to fall) in groundwater levels of about 10 to 15 feet during years of normal precipitation and less than 5 feet during years of drought." The report further notes: "Long-term comparison of spring-to-spring groundwater levels shows a decline of approximately 15 feet associated with the 1976-77 and 1986-94 droughts (Butte Basin Water Users Association, 2007). The 2008 report indicates that, "The spring 2008 groundwater level measurement was approximately three feet higher than the 2007 measurement, however it was still four feet lower than the average of the previous ten spring measurements. Fall groundwater levels are approximately nine feet lower than the averages of those measured during either of the previous drought periods on the hydrograph. At this time it appears that there may be a downward trend in groundwater levels in this well," (Butte Basin Water Users Association, 2008).Thus, "*it appears that there may be a downward trend in groundwater levels in this well*." *Id.* (emphasis added). The 2012 Esquon Subinventory Unit report confirms this downward trend:

   > Water elevations have been monitored since 1953 at this location [20N02E09L001M] and the historical averages, including 2011 data, are; Spring=128 feet and Fall=121 feet. The spring 201i groundwater level measurement was approximately six feet lower than the average during the previous drought periods. Recent fall groundwater levels are approximately eleven feet lower than the averages of those measured during either of the previous drought periods on the hydrograph. At this time it appears that there may be a downward trend in groundwater levels in this well.

   This Esquon well is also one that was hammered during the 1994 DWB when water sales with groundwater substitution by Western Canal Water District and others in southern Butte County cause significant impacts. *Id* (p. 6)

2. Groundwater elevations in the Pentz sub-area in Butte County also reveal significant historical declines. The historical trend for this sub-area "…shows that the average seasonal fluctuation (spring to fall) in groundwater levels averages about 3 to 10 feet during years of normal precipitation and approximately 3 to 5 feet during years of drought. Long-term comparison of spring-to-spring groundwater levels shows a decline in groundwater levels during the period of 1971-1981, perhaps associated with the 1976-77 drought. Since a groundwater elevation high of approximately 145 feet in 1985 the

measured groundwater levels in this well have continued to decline. Recent groundwater level measurements indicate that the groundwater elevation in this well is approximately 15-25 feet lower than the historical high in 1985. *(Butte Basin Water Users Association, 2007* and 2012 Pentz Subinventory Unit report, p. 5*).* Water elevations at the Pentz sub-area well have been monitored since 1967. "Since 1985 spring groundwater levels in this well have been declining and the spring 2008 measurement remained ten feet below historical high levels and continues the downward trend on the hydrograph." *Id.* p. 6 The Pentz and Esquon Ranch areas are located on the east and west sides of U.S. 99 respectively, in the eastern portion of the Tuscan aquifer.

3. Further evidence of changing groundwater levels appear in the Vina sub-region of Butte County, where water elevations have been monitored since 1947 at well 23N01W09E001M. The historical averages, including 2012 data, are; Spring=156 feet and Fall=150 feet (Butte County, Vina BMO report, p. 19). Unfortunately, the groundwater level measurement at this well in 2008 was the lowest recorded since 1994 *Id* Rock Creek, which is also in the Vina sub-unit once held water all year, and salmon fishing was robust prior to the 1930s (Hennigan 2010). Declining groundwater levels have caused the valley portion of Rock Creek to run completely dry each year and have also been noticed with Hennigan Farms' wells since the 1960s. For example, a 1968 well had to be lowered 40 feet in 1974, another well constructed in 1978 had to be lowered 20 feet in 2009, and an old 1940s flood pump was lowered in the early 1960s, lowered again in 1976 when it was converted to a pressure pump, and lowered again in 1997 (Hennigan 2010).

The Natural Heritage Institute and Glenn Colusa Irrigation District acknowledge the declines in the Northstate aquifers, "Based on the most recent (Fall 2011) data collected by DWR, there appear to be some areas in the northern Sacramento Valley with persistent groundwater level declines, primarily in Glenn and Tehama Counties." (*Feasibility Investigation of Re-Operation of Shasta and Oroville Reservoirs in Conjunction with Sacramento Valley Groundwater Systems to Augment Water Supply and Environmental Flows in the Sacramento and Feather Rivers* p. v) Although the Bureau and DWR provided funds for the NHI/GCID report, the general knowledge of groundwater declines in Glenn and Tehama counties is neither presented nor referenced in the Project's EA.

In light of this downward trend in regional groundwater levels, the Bureau's EA should closely analyze replenishment of the aquifers affected by the proposed *2013 Water Transfer Program*. The draft EA fails to provide any in-depth assessment of these issues. For example, the EA fails to discuss the best available estimates of where groundwater replenishment occurs. Lawrence Livermore National Laboratory analyzed the age of the groundwater in the northern counties to shed light on this process: "Utilizing the Tritium (H3) Helium-3 (He3) ratio, the age of each sample was estimated. Test results indicate that the "age" of the groundwater samples ranges from less than 100 years to tens of thousands of years,: (Dudley et al. 2005). As mentioned above, Dudley opines that the youngest groundwater in the Lower Tuscan Formation is probably nearest to recharge areas. (2005).

Are isotopic groundwater data available for other regions in the Sacramento Valley? If so, they would be crucial for all concerned to understand the potential impacts from the proposed *2013 Water Transfer Program*. Where does the EA identify areas most vulnerable to groundwater impacts? Does the Bureau identify how the Project conflicts with attempts at local management, particularly in areas where there are existing groundwater problems? Just consider that the City of Sacramento proposes to transfer surface water into the state water market and substitute 3,800 AF of groundwater (EA p.31), but 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. The Sacramento County Water Agency has devised a plan to help lead the city to a sustainable groundwater use to avoid problems associated with unrestrained overuse (2011). The most reliable strategy is to reduce demand, particularly from outside a groundwater basin. Integrating the City's water supply into the state water supply would obviously increase demand and make the SCWA goals impossible to achieve.

The Bureau should prepare an EIS that discloses the fallacies inherent in its policies and actions. The need for almost 400,000 AF per year of water south of the Delta (*2010/2011 Water Transfer Plan*), 190,000 AF with the 2013 Project, and 600,000 AF per year in the 10-Year Plan springs from failed business planning. The Bureau and DWR must acknowledge this and further disclose that their agencies are willing to socialize the risks taken by corporate agribusiness and developers while facilitating private profit. Instead of asking northern California water districts and municipal water purveyors to place at risk their own water (as well as the water of their neighboring communities and thousands of residential well owners), water quality, fisheries, recreation, stream flow, terrestrial habitat, and geologic stability, the Bureau and DWR must disclose all the uncertainty in the *2013 Water Transfer Program* and then evaluate the risks with scientific methodology. This has clearly not been done.

2. The *2013 Water Transfer Program* proposes to rely on inadequate monitoring and mitigation to avoid the acknowledged possibility of significant adverse environmental impacts.

The draft EA and the *Draft Technical Information for Water Transfer Proposals in 2013* (http://www.water.ca.gov/watertransfers/) referenced in the EA require "willing sellers" to prepare individual monitoring and mitigation plans and to conduct the monitoring with oversight provided by the Bureau and DWR (p. 12 - 14, 32). This fails to provide the most basic framework for governmental authority to enforce the state's role as trustee of the public's water in California, let alone a comprehensive and coordinated structure, for a very significant program that could transfer up to 190,906 AF of water from the Sacramento Valley. The draft EA further defers responsibility to "willing sellers" for compliance with local groundwater management plans and ordinances to determine when the effects of the proposed extraction become "adverse," (EA at p. 12). "Each district will be required to confirm that the proposed groundwater pumping will be compatible with state and local regulations and groundwater management plans," (EA at

p. 25). It is not acceptable that the draft EA/FONSI and the *Draft Technical Information for Water Transfers in 2013*merely provide monitoring direction to "willing sellers" without identifying rigorous standards for the risks at hand, specific actions, acceptable monitoring and reporting entities, funding that will be necessary for this oversight, or resources with which to handle possible impacts.

AquAlliance proposes instead that the Bureau and DWR require, at a minimum, that local governments select independent third-party monitors, who are funded by surcharges on Project transfers paid by the buyers, to oversee the monitoring that is proposed in lieu of Bureau and DWR staff, and that peer-reviewed methods for monitoring be required. If this is not done, the Project's proposed monitoring and mitigation outline is insufficient and cannot justify the significant risk of adverse environmental impacts.

To be clear, the EA/FONSI and the *Draft Technical Information for Preparing Water Transfer Proposals* in 2013 fail to identify standards that would be used to monitor the *2013 Water Transfer Program*'s impacts. The documents fail to identify any specific monitoring protocols, locations (particularly in up-gradient recharge portions of the groundwater basins), and why chosen locations should be deemed effective for monitoring the effects of the proposed groundwater extraction. The EA/FONSI and the *Draft Technical Information for Preparing Water Transfer Proposals* in 2013 points to the "seller" as the responsible party to meet the objectives in the *Draft Technical Information for Preparing Water Transfer Proposals* in 2013, but the Bureau and DWR are the responsible agencies that approve and move the water (EA at p.24-26). The EA asserts that, "If monitoring indicated that adverse effects related to the degradation of groundwater quality from the transfer occurred, willing sellers in the region will be responsible for monitoring this degradation and mitigating any adverse effects in accordance with all applicable regulations." (p. 24). There is no explanation as to how the Bureau will hold the "willing sellers" responsible to meet the Bureau's obligations under NEPA.

Moreover, the EA/FONSI fails to provide a mitigation strategy for review and comment by the public. Instead it defers this vital mitigation planning effort to future documents created by the "willing sellers," (EA at p.25-27) despite the fact that the EA acknowledges the potential for significant impacts, however weakly. For example:

> Groundwater substitution transfers could affect groundwater hydrology. The potential effects would be decline in groundwater levels, interaction with surface water, land subsidence, and water quality impacts. The well reviews and plans were required from sellers for review by Reclamation. Reclamation would not approve transfers without adequate mitigation and monitoring plans. The well review and required monitoring and mitigation plans described would minimize or avoid potential adverse effects to groundwater resources, to water quality and to wildlife habitat. (EA at p. 12)

If the Bureau and DWR's approvals are so rigorous and protective of the communities, economy, and environment in the Sacramento Valley, where are the standards for review and approval? With the expectation that groundwater levels will decrease (EA at p. 12) where is the explanation that reveals the amount by which the groundwater is expected to decrease and what level of

decrease is considered to be acceptable? Where is an explanation as to why the amount of water to be extracted is not considered significant? Without thresholds and standards, there is no logical link that leads to the Bureau's conclusion that, "The well review and required monitoring and mitigation plans described would minimize or avoid potential adverse effects to groundwater resources, to water quality and to wildlife habitat." (EA at p.12)

The EA discloses that, "Emissions from the operation of diesel engines could exceed emissions thresholds for each air district and de minimis thresholds for General Conformity," and that , Emissions as a result of the Proposed Action were within thresholds for Glenn, Colusa, Sacramento, and Sutter counties." (EA at p. 12) Where are the support data to reach these conclusory statements? In addition, it is confusing is that the same paragraph assumes that, "Idling rice fields would reduce the use of farm equipment and associated pollutant emissions, resulting in a beneficial impact on air quality." This flies in the face of the Proposed Action that assumes groundwater substitution to replace river water that will be sold, so crop cultivation may continue, which could easily be rice. (EA at pp.6, 9) This incongruity must be explained or changed.

Coupled with the possible impacts that the Bureau is willing to disclose in the EA/FONSI are bold assertions that with Bureau oversight the "sellers" will acknowledge and mitigate impacts. Unfortunately, there is no factual grounding for this grand assumption, and there is no disclosure to demonstrate how a business or individual would demonstrate harm. Such was the problem in 1994, when DWR and the sellers told people without irrigation and residential well water that they couldn't prove it was the water sales or existing conditions. The environment also needs a voice in this water marketing scheme, but there isn't a method or plan to provide it. The EA rightly acknowledges that, "It is recognized that an increase in groundwater pumping will affect the rate of groundwater recharge during balanced conditions, which will affect stream flow," (p.11) but fails to suggest how this could be avoided, monitored, or mitigated. Also missing in this regard in the EA/FONSI are:

1. What is the definition of "balanced conditions" in the numerous regions where both CVP and non-CVP groundwater substitution is proposed and who will define it?
2. What are the existing conditions in the areas of origin in 2013 (let alone at the baseline), which must start no sooner that when the CalFed Record of Decision was approved in August 2000?
3. Because the Bureau , DWR, buyers, and sellers continue these multi-year, serial water transfers from the Sacramento Valley, without the benefit of comprehensive environmental review, how has climate change and local use already affected streams, fish, terrestrial species, and groundwater, to name just a few critical areas with significant impacts from the Project?

The EA noticeably omits painfully obvious and significant impacts in the current Project EA/FONSI that were previously disclosed by the Bureau in the *2010/2011 Water Transfer Program* EA/FONSI. For example:

- Surface water and groundwater interact on a regional basis, and, as such, gains and losses to groundwater vary significantly geographically and temporally. In areas where groundwater levels have declined, such as in Sacramento County, streams that formerly gained water from groundwater now lose water to the groundwater system through seepage (*2010/2011 Water Transfer Program* EA at p. 3-12).
- *Groundwater substitution transfers would alter ground water levels and potentially affect natural and managed seasonal wetlands and riparian communities, upland habitats and wildlife species depending on these habitats.* As a part of groundwater substitution transfers, the willing sellers would use groundwater to irrigate crops and decrease use of surface water. Pumping additional groundwater would decrease groundwater levels in the vicinity of the sellers' pumps. Natural and managed seasonal wetlands and riparian communities often depend on surface water/groundwater interactions for part or all of their water supply. Under the Proposed Action, subsurface drawdown related to groundwater substitution transfers could result in hydrologic changes to nearby streams and marshes, potentially affecting these habitats. Reduced groundwater elevations could also affect trees that access groundwater as a source of water through taproots in addition to extensive horizontal roots that use soil moisture as a water source. Decreasing groundwater levels could reduce part of the water base for species within these habitats (EA at p. 3-53 and 3-54).

Have these impacts dissipated, or were they not disclosed in the Project EA/FONSI?

The reader is directed to the Bureau and DWR's *Draft Technical Information for Water Transfers* in 2013 to discover the *minimal* objectives and required elements of the monitoring and mitigation component of the Project. "Water transfer proponents transferring water via groundwater substitution transfers must establish a monitoring program capable of identifying any adverse transfer related effects before they become significant." However, the reader (and possibly the sellers) are left wondering what exactly is "a monitoring program capable of identifying any adverse transfer related effects before they become significant," since there are no standards or particular guidance to manage and analyze the very complex hydrologic relationships internal to groundwater and its connection to surface waters.

Certainly the public has no idea or ability to comment, which fails the full disclosure mandate in NEPA and CEQA. Page 38of the *Draft Technical Information for Water Transfers* in 2013 briefly lists, "Potentially significant impacts identified in a water transfer proposals [that] must be avoided or mitigated for a proposed water transfer to continue, including:"

- Contribution to long-term conditions of overdraft;
- Dewatering or substantially reducing water levels in nonparticipating wells;
- Measurable contribution to land subsidence;
- Degradation of groundwater quality that substantially impairs beneficial uses or violates water quality standards; and
- Affecting the hydrologic regime of wetlands and/or streams to the extent that ecological integrity is impaired.

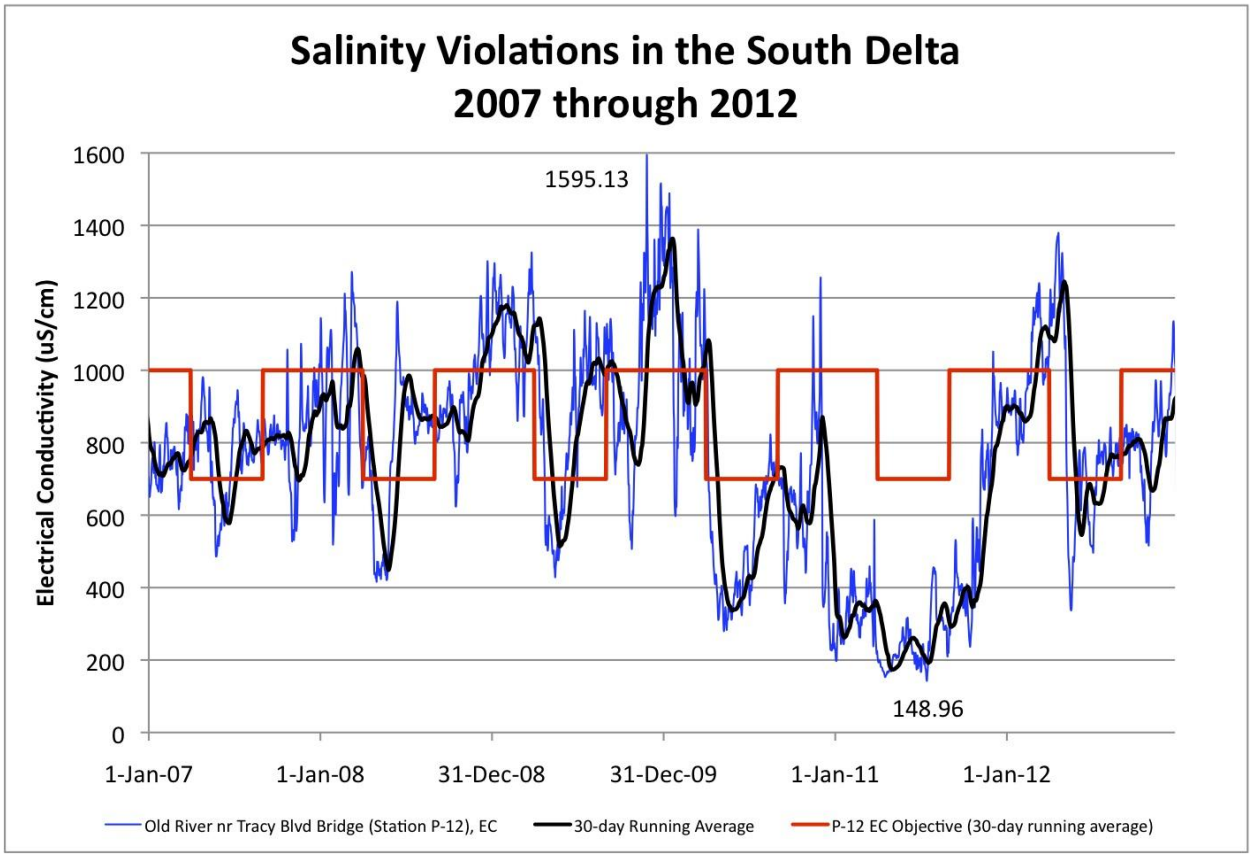
The *Draft Technical Information for Water Transfers* in 2013 continues with suggestions to curtail pumping from lower bowls, and pay higher energy costs to ease the impacts to third party wells owners (p. 38-39). While this bone thrown at mitigation is appreciated, the glaring omissions are notable. The *Draft Technical Information for Water Transfers* in 2013 completely fails to mention, even at a very general level, how individual well owners who may be harmed by the Project, will determine and prove where the impacts to their wells are coming from, that water quality and health could become a significant impact for impacted wells, users, and streams. The onus for coping with and disclosing potential impacts is deflected onto the nonparticipating public, species, and environment. How does this meet the requirements of NEPA and CEQA? Since wetlands and streams would require human observation or adequate monitoring to report an impact, how will, "Affecting the hydrologic regime of wetlands or streams to the extent that ecological health is impaired," be avoided or mitigated without standards and requirements from the Bureau and DWR? (*Draft Technical Information for Water Transfers* p. 38) There also appears to be no consideration for species monitoring, just "practices" or "conservation measures" to "minimize impacts to terrestrial wildlife and waterfowl," (*Draft Technical Information for Water Transfers* pp. 16, 20, 22-24).

The EA/FONSI and the *Draft Technical Information for Water Transfers* in 2013 don't appear to weigh the significance of avoidance of impacts, pre-Project mitigation, during Project mitigation, or post-Project mitigation. This fails to create objective standards and merely differs responsibility to the "willing sellers," a broadly unsuspecting public, and a voiceless environment.

Another example of the inadequacy of the proposed monitoring is that the draft EA fails to include any coordinated, programmatic plan to monitor stream flow of creeks and rivers located in proximity to the "willing sellers" that will evacuate more groundwater than has been used historically. The potential for immediate impacts would be very close to water sellers' wells, but the long term impacts could be more subtle and geographically diverse. What precautions has the Bureau and DWR made for the cumulative impacts that come not only from this one-year Project, but in combination with the water sales from the last dozen years and those that are planned by the Bureau into the future (see lists in Sections G, 4 & 5 below)? Bureau and DWR water transfers are not just one- or two-year transfers, but many serial actions in multiple years by the agencies, sellers, and buyers without the benefit of comprehensive environmental analysis under NEPA and CEQA.

As discussed above, adequate monitoring is vital to limit the significant risks posed by the Project to the health of the region's groundwater, streams, and fisheries (more discussion below). Moreover, to the extent this Project is conceived as an ongoing hardship program that will provide knowledge for future groundwater extraction and fallowing, its failure to include adequate monitoring protocols is even more disturbing and creates the risk of significant long-term, perhaps irreversible impacts from the Project.

a. The Bureau's assertion that the Project may be modified or halted in the event of significant adverse impacts to hydrologic resources is an empty promise in light of the wholly inadequate EA disclosure, and proposed monitoring for the *2013 Water Transfer Program.* Knowing that the Bureau and DWR deliberately and repeatedly violate the a major requirement like the X2 standard in the Delta does little to instill confidence from AquAlliance in the vague, non-specific monitoring program and mitigation criteria proposed in the EA/FONSI and associated documents..



Source: Tim Stroshane, May 2013

The *2010/2011 Water Transfer Program* has been incorporated by reference in the Project EA. AquAlliance found repeated illustrations of potential for significant injury to other groundwater users, water quality, streams, flora and fauna, and the soil profile in the *2010/2011 Water Transfer Program* (p. 3-12, 3-23, 3-24, 3-53, 3-54). Chapter Three contained numerous examples that illustrated the need for an EIS since there is insufficient, comprehensive planning for, let alone preparation to mitigate, adverse environmental impacts:

- *Acquisition of water via groundwater substitution or cropland idling would change the rate and timing of flows in the Sacramento River compared to the No Action Alternative.*
- *In Figure 3.2-2, groundwater substitution pumping results in a change in the groundwater/surface water interaction characteristics. In this case, the water pumped*

from a groundwater well may have two impacts that reduce the amount of surface water compared to pre-pumping conditions. These mechanisms are:

- *Induced leakage. The lowering of the groundwater table causes a condition where the groundwater table is lower than that the water level in the surface water. This conditions causes leakage out of the surface water.*
- *Interception of groundwater. The placement of groundwater substitution pumping may intercept groundwater that may normally have discharged to the surface water (i.e., water that has already percolated into the ground may be pumped out prior the water reaching the surface water and being allowed to enter the "gaining" stream).*

- *The changes in groundwater flow patterns (e.g., direction, gradient) due to increased groundwater substitution pumping may result in changes in groundwater quality from the migration of reduced quality water.*
- *Groundwater substitution transfers would alter ground water levels and potentially affect natural and managed seasonal wetlands and riparian communities, upland habitats and wildlife species depending on these habitats.*
- *Rice land idling transfers would reduce habitat and forage for resident and migratory wildlife populations.*
- *Water transfers could change reservoir releases and river flows and potentially affect special status fish species and essential fish habitat.*
- *Water transfers could affect fisheries and aquatic ecosystems in water bodies, including Sacramento and American River systems, the Sacramento-San Joaquin Delta, San Luis Reservoir, and DWR and Metropolitan WD reservoirs in southern California.*
- *Increased groundwater pumping for groundwater substitution transfers would increase emissions of air pollutants.*

The Bureau thus recognizes the potential for significant decline in groundwater levels in the Project's EA as it did in the proposed *2010/2011 Water Transfer Program* (EA at p. 3-23, 3-24, 3-53, 3-54). The acknowledgements alone are sufficient to require a full EIS, but, regrettably, the Bureau has returned with the Project EA in 2013, instead of the EIS for which it ostensibly held scoping meetings in January 2011. Moreover, as detailed below, the monitoring proposed by the *2013 Water Transfer Program* remains inadequate leaving the public and environment with no guarantee that adverse impacts will be discovered at all (or be discovered in time to avoid significant environmental impacts).

Glenn County will experience groundwater substitution if the Project moves forward. Glenn County realized that its management plan and ordinances were not sufficient for the challenges presented by the *2010/2011 Water Transfer Program* and cautioned that "[s]ince the groundwater management plan is relatively new and not fully implemented, the enforcement and conflict resolution process has not been vigorously tested," (2010) Subsequently, Glenn County updated their Ordinance 1237 and amended their *Groundwater Management to Groundwater Coordinated Resource Management Plan* (Glenn County Plan) in 2012, so it remains new and untested.. AquAlliance finds the Glenn County inadequate to protect humans and the

environment, since it states that, "The County does not hereby intend to regulate, in any manner, the use of groundwater; unless safe yield is exceeded or there is a threat to public health, welfare, or safety, but intends to adopt monitoring programs that will allow for the effective management of groundwater availability (groundwater level), groundwater quality, and indications of land subsidence." Moreover, the Glenn County Groundwater Management Plan does not have any provisions to monitor or protect the environment, will in no way protect the common Tuscan aquifer that is beyond Glenn County's border, and will protect no one or the environment that that is outside its jurisdictional boundary. The *2013 Water Transfer Program* EA fails to disclose the inadequacies of this and other local ordinances and plans.

Ordinance 1237, which updated the *Groundwater Management to Groundwater Coordinated Resource Management Plan* does not contain a definition of "safe yield," but defers it to the BMO method (Glenn County Plan at p.5) The BMO method is found on Glenn County's web site and was written by Toccoy Dudley in 2000 while he still worked for DWR. This method was created in an attempt to provide a fig leaf for a massive obstacle: safe yield is extremely difficult to determine. "In early 1999 the GCWAC began to focus on a countywide ordinance that did not attempt to control groundwater use, including export, as long as the aquifer system was not harmed and safe yield was not exceeded. But estimating safe yield appeared to be nearly impossible to accomplish given the inherent difficulties in determining safe yield and that no funding was available to do the required studies."
(http://www.glenncountywater.org/management_plan.aspx)

Monitoring based on the Glenn County Plan is clearly inadequate to the task because enforcement remains cumbersome and voluntary. "In the Glenn County structure, if a BMO threshold is exceeded, the process sets into motion a series of events. First the TAC reports on the regional extent and magnitude of the non-compliance to the WAC. The TAC then starts a fact-finding process to identify the cause(s) of the non-compliance and makes recommendations to the WAC on how to resolve the situation. The WAC then tries to resolve the problem in the affected area by negotiations with the locals if at all possible. Some of the possible actions that may be taken by the WAC might be to coordinate the following voluntary actions in the affected area." (Dudley, Basin Management Objective (BMO) Method Of Groundwater Basin Management, 2000 p.8)

The Bureau omitted discussion of the adequacy of the Glenn County Plan or any other county's plan, in the *2013 Water Transfer Program*, but we are pleased that at a minimum the *Draft Technical Information for Water Transfers in 2013* identifies local ordinances in Table 3-1 (p. 27). We believe that this is appropriate juncture to refer to some of the commitments that the Bureau is making for itself and the sellers in the EA. A review of county-of-origin ordinances reveals that they are inadequate to the task because of the absence of enforceable measures that could protect human and environmental health within each county:

- "The objectives of this process are: to mitigate adverse environmental effects that occur; to minimize potential effects to other legal users of water; to provide a process for review and response to reported third party effects; and to assure that a local mitigation strategy

is in place prior to the groundwater transfer. The seller will be responsible for assessing and minimizing or avoiding adverse effects resulting from the transfer within the source area of the transfer." (EA at p. 25)

- "Each district will be required to confirm that the proposed groundwater pumping will be compatible with state and local regulations and groundwater management plans. " (EA at p.25) What consideration is made for the inadequacy of a local ordinance that could lead to a serious impact to the human environment and the environment overall?
- "For purposes of this EA, Reclamation assumes that stream flow losses due to groundwater pumping to make water available for transfer are 12 percent of the amount pumped." (EA at p. 25) Where are the supporting data? How will this be mitigated?

Since the Project's EA fails to disclose limitations or inadequacies with local ordinances (also see AquAlliance's Attachments A & B), it is helpful that Butte County's Department of Water and Resource Conservation explains that local plans are simply not up to the task of managing a regional resource:

> Each of the four counties that overlie the Lower Tuscan aquifer system has their own and separate regulatory structure relating to groundwater management. Tehama County, Colusa, and Butte Counties each have their own version of an export ordinance to protect the citizens from transfer-related third party impacts. Glenn County does not have an export ordinance because it relies on Basin Management Objectives (BMOs) to manage the groundwater resource, and subsequently to protect third parties from transfer related impacts. Recently, Butte County also adopted a BMO type of groundwater management ordinance. Butte County, Tehama County and several irrigation districts in each of the four counties have adopted AB3030 groundwater management plans. All of these groundwater management activities were initiated prior to recognizing that a regional aquifer system exists that extends over more than one county and that certain activities in one county could adversely impact another. Clearly the current ordinances, AB3030 plans, and local BMO activities, which were intended for localized groundwater management, are not well suited for management of a regional groundwater resource like that theorized of the Lower Tuscan aquifer system.[5]

c. The EA asserts that, "The potential for subsidence is small if the groundwater substitution pumping is small compared to overall pumping in a region." (p. 24) This is misleading at best, and incorrect at worst. The potential for subsidence in a given clay and slit deposit is small only when groundwater levels can be guaranteed to remain above the lowest water levels caused by past droughts. As more water is pumped from an aquifer because of increased usage of groundwater supplies, the potential for subsidence is increased, not decreased, and if existing pumping brings water levels near to their lowest historical lows, then substitution pumping indeed has the potential to induce subsidence.

[5] Butte County Department of Water and Resource Conservation, *Needs Assessment Tuscan Aquifer Monitoring, Recharge, and Data Management Project*,.2007.

The EA goes on stating, "The minimization measures in Section 3.2.2.3 require all groundwater substitution transfers to monitor for subsidence or provide a credible analysis why it would be unlikely." (p. 24) Subsidence is difficult (if not impossible) to detect in the short term. Elastic deformations that are recoverable upon aquifer recharge are readily detected by proper measurement techniques, but these reversible motions are not subsidence. Subsidence is by definition an irreversible mechanical response that permanently lowers the ground surface and that permanently decreases aquifer capacity. Because of the low permeability of soil deposits that are susceptible to subsidence, these permanent effects are commonly widely separated in time from the actual pumping that causes them to begin, and thus only long-term monitoring can accurately identify subsidence.

Or in simple terms, the absence of evidence of subsidence when pumping is initiated provides little or no evidence of whether subsidence is actually occurring. Only when irreversible damage is done over the long-term is the effect of groundwater extraction obvious.

Determining a credible basis for subsidence potential can be extremely difficult and expensive. Such an analysis would commonly require determination of historical low groundwater levels, the likelihood of future increases in groundwater extraction, and the composition of the subsurface layers that comprise the aquifer. If these tasks were easy, they would have been performed already, and the fact that the Bureau cannot provide credible evidence to rule out subsidence is an implicit admission that such credibility is difficult or impossible to obtain in practice.

The EA has responded to AquAlliance's proposal for real-time monitoring for land subsidence (AquAlliance, et. al, 2010). (EA at p. 24) We believed at the time that this would be a step forward that could reveal immediate subsidence problems. We have subsequently learned is that real-time subsidence monitoring is a misnomer. While it is possible to monitor ground surface elevation, performing this with due degree of precision is not easy or inexpensive in practice. And since such ground-surface monitoring often only provides real-time estimates of elastic (i.e., reversible) surface elevation changes, at best it yields only a hint of the potential damage that can occur in the long term.

Third-party independent verification, perhaps by scientists from the U.S. Geological Survey, should be incorporated by DWR and the Bureau into the Project description of the *2013 Water Transfer Program*. We applaud the initiation of a regional GPS network in the Sacramento Valley but remain concerned about the existing extensometers in the Sacramento Valley that measure land subsidence, and a Global Positioning System land subsidence network established by one county (*2010/2011 Water Transfer Program* EA at p. 13). The remaining responsibility is again deferred to the "willing sellers." Unfortunately, voluntary monitoring by pumpers does not strike us as a responsible assurance given the substantial uncertainties involved in regional aquifer responses to extensive groundwater pumping in the Sacramento Valley. Admonishing sellers not to cause problems is a deferral of responsibility by the Bureau and DWR.

There is a noticeable absence of discussion regarding delayed subsidence, which we broach above, that should also be monitored according to the findings of Dr. Kyran Mish, Presidential Professor, School of Civil Engineering and Environmental Science at the University of Oklahoma. Dr. Mish notes: "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)." (Mish 2008) 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." *Id.* "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." *Id.* (emphasis added).

The *2010/2011 Water Transfer Program* EA acknowledged the existence and cause of serious subsidence in one area of the valley. "The area between Zamora, Knights Landing, and Woodland has been most affected (Yolo County 2009). Subsidence in this region is generally related to groundwater pumping and subsequent consolidation of aquifer sediments," (EA p. 3-13). This fact alone illustrates the need for more extensive analysis throughout the export areas in an EIS.

d. The *2013 Water Transfer Program* EA fails to require streamflow monitoring. The 2009 DWB EA/FONSI deferred the monitoring and mitigation planning to "willing sellers," but even that requirement has been completely eliminated. We can't emphasize enough the importance of frequent and regular streamflow monitoring by either staff of the project agencies or a third, independent party such as the USGS, paid for by Project transfer surcharges mentioned above. It is clear from existing scientific studies and the EA that the Project may have significant impacts on the aquifers replenishment and recharging of the aquifers (EA at pp. 10 – 12, 27), so the *2013 Water Transfer Program* should therefore require extensive monitoring of regional streams. The radius for monitoring should be large, not the typical two to three miles as usually used by DWR and the Bureau. Though not presented for the Project's EA or the *2010-2011 Water Transfers Program*, the *Stony Creek Fan Aquifer Performance Testing Plan*, which is a much smaller project, recognized that there may be a drawdown effect on the aquifer by considering results from a DWR Northern District spring 2007 production well test (Water Transfer Program EA/FONSI p. 28). However, it did not assess the anticipated scope of that effect—or even what level of effect would be considered acceptable. Moreover, the results from that test well indicate that the recharge source for the solitary production well "is most likely from the foothills and mountains, to the east and north"—which at a minimum is more than fifteen miles away. (Stanton, Glenn-Colusa Irrigation District Aquifer Performance Testing Glenn County, California).

The Butte County Department of Water and Resource Conservation has identified streams that must be monitored to determine impacts to stream flows that would be associated with pumping the Lower Tuscan Aquifer. These "[s]treams of interest" are located on the eastern edge of the Sacramento Valley and include: Mill Creek, Deer Creek, Big Chico Creek, Butte Creek, and Little Dry Creek (The Butte County DWRC 2007). The department described the need and methodology for stream flow gauging:

> The objective of the stream flow gaging is to determine the volume of surface water entering into or exiting the Lower Tuscan Aquifer along perennial streams that transect the aquifer formation outcropping for characterization of stream-aquifer interactions and monitoring of riparian habitat. Measurement of water movement into or out of the aquifer will allow for testing of the accuracy of the Integrated Water Flow Model, an integrated surface water-groundwater finite differential model developed for the eastern extent of the Lower Tuscan aquifer.
>
> Two stream gages will be installed on each of five perennial streams crossing the Lower Tuscan Formation to establish baseline stream flow and infiltration information. The differences between stream flow measurements taking upstream and downstream of the Lower Tuscan Formation are indications of the stream-aquifer behavior. Losses or gains in stream volume can indicate aquifer recharge or discharge to or from the surface waters. *Id.*

As is evident in the following conclusory assertions, the draft EA/FONSI fails to define the radius of influence associated with the aquifer testing and thus entirely fails to identify potential significant impacts to salmon:

> An objective in planning a groundwater substitution transfer is to ensure that groundwater levels recover to their typical spring high levels under average hydrologic conditions. Because groundwater levels generally recover at the expense of stream flow, the wells used in a transfer should be sited and pumped in such a manner that the stream flow losses resulting from pumping peak during the wet season, when losses to stream flow minimally affect other legal users of water. (EA at p. 11.

As mentioned above, streamflow monitoring is not a requirement of the Project, which is unfathomable. Monitoring of flow on streams associated with the Lower Tuscan Formation is particularly important to the survival of Chinook salmon which use these "streams of interest" to spawn and where salmon fry rear. Intensive groundwater pumping would likely lower water table elevations near these streams of interest, decreasing surface flows, and therefore reducing salmon spawning and rearing habitat through dewatering of stream channels in these northern counties. This would be a significant adverse impact of the Project and is ignored by the Project's EA/FONSI.

A similar effect has been observed in the Cosumnes River, where "[d]eclining fall flows are limiting the ability of the Cosumnes River to support large fall runs of Chinook salmon,"

(Fleckenstein, et al 2004). This is a river that historically supported a large fall run of Chinook Salmon. *Id.* Indeed, "[a]n early study by the California Department of Fish and Game . . . estimated that the river could support up to 17,000 returning salmon under suitable flow conditions." *Id.*, citing CDFG 1957 & USFWS 1995. But "[o]ver the past 40 years fall runs ranged from 0 to 5,000 fish according to fish counts by the CDFG (USFWS 1995)," and "[i]n recent years, estimated fall runs have consistently been below 600 fish, according to Keith Whitener," (Fleckenstein, *et al*. 2004). Indeed, "[f]all flows in the Cosumnes have been so low in recent years that the entire lower river has frequently been completely dry throughout most of the salmon migration period (October to December)." *Id.*

Research indicates that "groundwater overdraft in the basin has converted the [Cosumnes River] to a predominantly losing stream, practically eliminating base flows…." (Fleckenstein, *et al*. 2004). And "investigations of stream-aquifer interactions along the lower Cosumnes River suggest that loss of base flow support as a result of groundwater overdraft is at least partly responsible for the decline in fall flows." *Id.* Increased groundwater withdrawals in the Sacramento basin since the 1950s have substantially lowered groundwater levels throughout the county." *Id.*

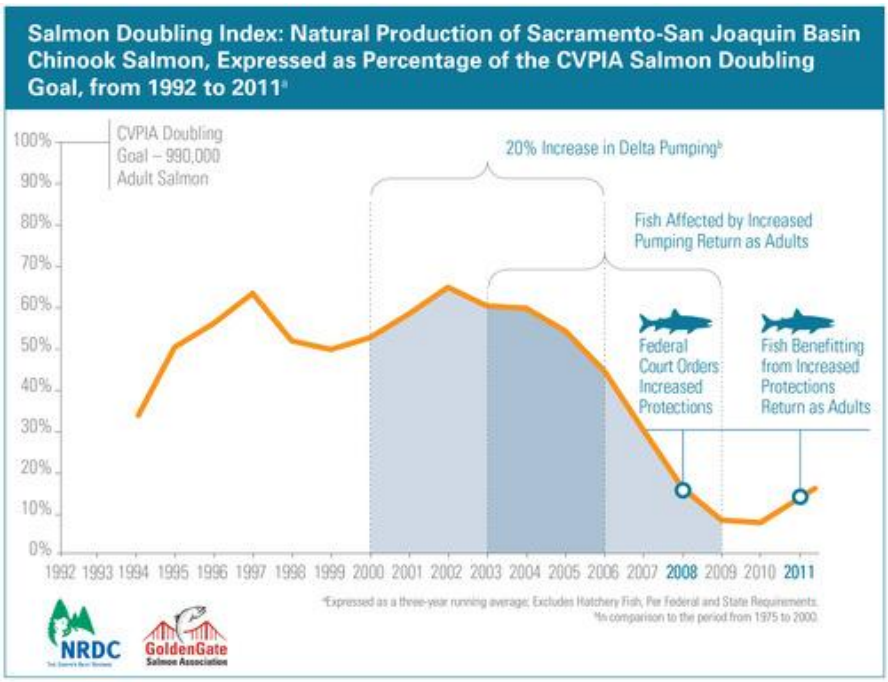
The draft EA acknowledges the potential for impacts to special status fish species from altered river flows and commits to maintaining flow and temperature requirements already in place (p. 12). AquAlliance would like to have greater assurance of a commitment considering, as noted above, that the Bureau and DWR fail to meet the X2 standard in the Delta regularly and repeatedly. The Bureau and DWR should make X2 compliance and streams of interest monitoring in real time part of their permit amendment applications to the SWRCB in June 2013. If stream levels are affected by groundwater pumping, then pumping would cease.

Unfortunately, the draft EA fails to anticipate possible stream flow declines in important salmon rearing habitat in the *2013 Water Transfer Program* area. Many important streams, such as Mud Creek, are located within the *2013 Water Transfer Program* and flows through probable Tuscan recharge zones, yet are not mentioned in the EA (also see comments above regarding Rock Creek). While a charged aquifer is likely to add to base flow of this stream, a de-watered aquifer would pull water from the stream. According to research conducted by Dr. Paul Maslin, Mud Creek provides advantageous rearing habitat for out-migrating Chinook salmon (1996). Salmon fry feeding in Mud Creek grew at over twice the rate by length as did fry feeding in the main stem of the Sacramento River. *Id.*

Another tributary to the Sacramento River, Butte Creek, also hosts spring-run Chinook salmon, a threatened species under the Endangered Species Act. 64 Fed. Reg. 50,394 (Sept. 16, 1999). Butte Creek contains the largest remaining population of the spring-run Chinook and is designated as critical habitat for the species. *Id*. at 50,399; 70 Fed. Reg. 52,488, 52,590-91 (Sept. 2, 2005). Additionally, Butte Creek provides habitat for the threatened Central Valley steelhead. *See* 63 Fed. Reg. 13,347 (Mar. 19, 1998); 70 Fed. Reg. at 52,518. While Butte Creek was mentioned in the *2010/2011 Water Transfer Program's* EA (p. 2-11, 3-4, 3-49, 3-57), it is only

mentioned for identification purposes in the Project's EA. In the *2010/2011 Water Transfer Program's* EA, the only protection afforded this vital tributary are statements that cropland idling will not occur adjacent to it, yet that was contradicted on page 3-19. The Bureau should not overlook the importance of rearing streams, and should not proceed with this Project unless and until adequate monitoring and mitigation protocols are established.

Existing mismanagement of water in California's rivers, creeks, and groundwater has already caused a precipitous decline in salmon abundance. There is no mention of the fall-run salmon numbers in the main stem Sacramento River or its essential tributaries despite the fact that their numbers dropped precipitously in 2007, 2008, and 2009 and have not come close to the numbers found over a decade ago. The graph below illustrates natural production of Sacramento-San Joaquin Basin Chinook salmon and is expressed as a percentage of the CVPIA Salmon Doubling Goal, from 1992 to 2011 as a three-year running average. The numbers exclude hatchery fish, which complies with federal and state requirements.



Graph courtesy of NRDC and Golden Gate Salmon

A May 15, 2013 article underscores the past and present impacts from Bureau and DWR mismanagement of the CVP and SWP.

> After two closed salmon fishing seasons in 2008 and 2009, and a token season in 2010, fishermen are fishing again, but we remain far below the abundant runs required by law," said Zeke Grader, executive director of Pacific Coast Federation of Fishermen's Association and GGSA board member. "Stronger Delta pumping restrictions are paying off but we have to finish the job and get these salmon runs rebuilt." The groups say these results are only "marginally

> better" than the 12 percent of salmon produced in 2011, when NRDC and GGSA released the first analysis of the Central Valley Chinook salmon population goals. The CPVIA specifically directs the U.S. Department of the Interior to protect, restore, and enhance fish in the Central Valley of California. That means rebuilding salmon populations from 495,000 to 990,000 wild adult fish by 2002, according to Grader. "This year our industry will only get a fraction of what our state and federal governments are supposed to be producing," said John McManus, executive director of GGSA. "We're having a hard time living on 22 percent of the legally required salmon population. Balance could be restored by reallocating a fairly small amount of water which would give us healthy salmon runs, healthy local food, healthy communities and a healthy economy." Central Valley Chinook salmon declined drastically from 2003 through 2010, reaching a record low of 7 percent of the required population level, according to McManus. This decline in the fishery corresponded with a 20 percent increase in water diversions from salmon habitat over levels from the preceding quarter century. The largest water exports from the Delta in California history took place from 2003 to 2006 and in 2011. Although the Central Valley salmon numbers have increased since the unprecedented collapse of 2008-2009, forecasts suggest 2013's salmon returns will again fall far below what the law requires. (Bacher)

The following chart provides a valuable summary that compliments the article and graph immediately above and demonstrates how the Bureau and DWR failure to meet required standards.

Year (Y)	Three-Year* Running Average as a Percentage of CVPIA Production Goal	Year (Y)	Three-Year* Running Average as a Percentage of CVPIA Production Goal
1994	32.05%	2004	59.26%
1995	49.82%	2005	53.80%
1996	55.57%	2006	44.15%
1997	62.85%	2007	29.85%
1998	51.38%	2008	15.90%
1999	49.29%	2009	8.04%
2000	52.13%	2010	7.41%
2001	57.88%	2011	13.25%
2002	64.33%		

*$(Y + Y_{Y-1} + Y_{Y-2})/3$

Table courtesy of Golden Gate Salmon Association

As noted above, the EA casually asserts that maintaining flow and temperature requirements in the main stem will be sufficient to protect aquatic species. (EA at pp. 12, 13, 20) We question that assurance and present factual data compiled by The Bay Institute in 2012 that contradicts the Bureau's conclusory statement. (TBI at pp. 7-12) The EA/FONSI also fails to consider the impacts of 190,906 AF of water transfers and groundwater substitution on the tributaries. How much additional pumping does the Project represent, given CVP and SWP contractual commitments, available reservoir supplies, and other environmental restrictions south of the Delta? The EA and DWR's missing environmental review are silent on this.

Unsupported assertions, that impacts to aquatic species will be below a level of significance, are arbitrary and capricious and lack foundational data. (EA at pp. 10, 12, 17) Habitat values are also essential to many other special status species that utilize the aquatic and/or riparian landscape including, but not limited to, giant garter snake, bank swallow, greater sandhill crane, American shad, etc. Where is the documentation of the potential impacts to these species?

In addition to the direct decline in the salmon populations is the reverberating indirect influence on the food chain that may significantly impact species such as killer whales.

3. The EA fails to address the significant unknown risks raised by the *2013 Water Transfer Program*'s proposed groundwater extraction.

The EA fails to identify and address the significant unknown risks associated with this Project. There are substantial gaps in scientists' understanding of how the aquifer system recharges.

The EA fails to reveal the scientifically known and unknown characteristics of the Lower Tuscan aquifer. Expert opinion and experience is offered by Professor Karin Hoover from CSU Chico who asserts that: "[T]o date there exists no detailed hydrostratigraphic analysis capable of distinguishing the permeable (water-bearing) units from the less permeable units within the subsurface of the Northern Sacramento Valley. In essence, the thickness and extent of the water-bearing units has not been adequately characterized." (2008 p. 1)

Though the Project fails to disclose the limitations in knowledge of the geology and hydrology of the northern counties, it was disclosed in 2008 in the EA for the *Stony Creek Fan Aquifer Performance Testing Plan* (Testing Plan EA). It revealed that there is also limited understanding of the interaction between the affected aquifers, and how that interaction will affect the ability of the aquifers to recharge. The Testing Plan EA provides:

> *The Pliocene Tuscan Formation lies beneath the Tehama Formation in places in the eastern portion of the SCF Program Study Area, although its extent is not well defined. Based on best available information, it is believed to occur at depths ranging between approximately 300 and 1,000 feet below ground surface. It is thought to extend and slope upward toward the east and north, and to outcrop in the Sierra Nevada foothills. The Tuscan Formation is comprised of four distinct units: A, B C and D (although Unit D is*

> *not present within the general project area). Unit A, or Upper Tuscan Formation, is composed of mudflow deposits with very low permeability and therefore is not important as a water source. Units B and C together are referred to as the Lower Tuscan Formation. Very few wells penetrate the Lower Tuscan Formation within the SCF Program study area.*

(The Testing Plan EA/FONSI at p. 23). The Tehama Formation, however, generally behaves as a semi-confined aquifer system and the EA contains no discussion of its relationship with the adjoining formations. Nor is there any discussion of the role of the Pliocene Tehama Formation as "the primary source of groundwater produced in the area," (DWR 2003).

The EA/FONSI fails to offer any in-depth analysis of the groundwater basins for both CVP and non-CVP groundwater substitution transfers, of the aquifers within the basins, and which strata in the aquifers in the basins will be most likely affected by the *2013 Water Transfer Program*'s proposed extraction of groundwater. This detailed information is also not found in the *Draft Technical Information for Water Transfers in 2013*. The *2010/2011 Water Transfer Program's* EA did disclose information about the Sacramento Valley Groundwater Basin, but there is no direct reference to this in the Project's EA. It must be emphasized that neither the Project nor the *2010/2011 Water Transfer Program's* EAs revealed any understanding of aquifer strata or hydrostratigraphy.

In addition, the Project's EA added the Anderson Cottonwood Irrigation District (ACID) to the CVP groundwater substitution transfers, which resides in a different groundwater basin. The Redding Basin is mentioned on page 21 of the EA, but nowhere is there a description of the basin, its potential sub-basins, strata, or hydrostratigraphy. What is presented are numerous conclusory statement attributed to ACID that assert that their part of the Project will not create impacts, but these are without demonstrable data and analysis. (EA at p. 23) The draft Project EA/FONSI fails to define the radius of influence associated with ACID's groundwater extraction and thus entirely fails to identify potential significant impacts to tributaries, domestic and agricultural wells, as well as possible special status species. The *Redding Basin Water Resources Management Plan Environmental Impact Report* determined that there was an existing deficit of water need with Shasta County in 2005 and a greater deficit would exist by 2030. (p. 1-6) This begs the questions, why is ACID transferring river water out of the Sacramento Valley and substituting groundwater that could be used for local needs, and why didn't the Bureau consider and present this information in the Project's EA? Liability is a crucial component of potential third party impacts. As noted in this paragraph, the Project's deficient EA does not reveal any information about the current status of the ground water basin, which indicates that there is not enough known about the aquifer to judge liability for damage from pumping. How will the Bureau and ACID rectify this for other ground water dependent users and the environment?

AquAlliance incorporates by reference the comments we submitted September 28, 2011 for the *Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration for the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project.*

Thousands of domestic wells are in the upper layers of the target area-of-origin aquifers, but they are not even considered in the EA. In addition, the EA provides no assessment of the interrelationship of varying basins, sub-basins, or strata in the target aquifers in the Sacramento Valley.

The EA fails to provide basic background information regarding the recharge of groundwater in the different basins and sub-basins. The Project's EA excludes disclosure of this crucial information, but the *2010/2011 Water Transfer Program's* EA states, "Groundwater is recharged by deep percolation of applied water and rainfall infiltration from streambeds and lateral inflow along the basin boundaries," (*2010/2011 Water Transfer Program's* EA p. 3-10). We asked in 2010 and ask again here, how did the Bureau conclude that applied water leads to recharge of the aquifer? Where are the supporting data? This claim is unsubstantiated by any of the work that has been performed to date. For example, the RootZone water balance model used by a consultant with Glenn Colusa Irrigation District, Davids Engineering, was designed to simulate root zone soil moisture. It balances incoming precipitation and irrigation against crop water usage and evaporation, and whatever is left over is assigned to "deep percolation." Deep percolation in this case means below the root zone, which is anywhere from a few inches to several feet below the surface, depending on the crop. There is absolutely no analysis that has been performed to ensure that applied water does, indeed, recharge the aquifer. For example, if the surface soils were to dry out, water that had previously migrated below the root zone might be pulled back up to the surface by capillary forces. In any case, the most likely target of the "deep percolation" water in the Sacramento Valley is the unconfined, upper strata of the aquifer and possibly the Sacramento River. The Project's EA has not demonstrated otherwise.

A public hearing concerning the Monterey Agreement was held in Quincy on November 29, 2007, hosted by DWR. At the hearing Barbara Hennigan presented the following testimony: "So for the issues of protecting the water quality, protecting the stream flow in the Sacramento, one of the things that we have learned is that the Sacramento River becomes a permanently losing stream at the Sutter Buttes. When I first started looking at the water issues that point was at Grimes south of the [Sutter] buttes, now it is at Princeton, moving north of the buttes. As the Sacramento becomes a losing stream farther and farther north because of loss of the Lower Tuscan Aquifer, that means that it [sic], there will be less water that the rest of the State relies on," (http://www.water.ca.gov/environmentalservices/docs/mntry_plus/comments/Quincy.txt). How and when will the Bureau and DWR address this enormously important condition and amplify the risk to not only to the Northstate, but the entire State of California?

4. The EA contains numerous errors and omissions regarding groundwater resources.

There are numerous errors, omissions, and negligence in addressing existing conditions before and with the Project in Section 3, Affected Environmental and Environmental Consequences.

The failure to address stated problematic conditions and the lack of accuracy in this section of so many elemental issues and facts raises questions about the content of the entire EA and FOSI. A partial list of statements and questions follows.

- On pages 15 and 21 of the EA, the Sierra Nevada [mountain range] and "Pacific Coast Range" are identified, but there is no mention of the southern Cascade Range that is a prominent geologic feature of the northern Sacramento Valley, the genesis of the Sacramento River, and a significant contributor to the hydrology of the region.
- We are so pleased that the Bureau added the McCloud and the Pit rivers as "major tributaries" to the Sacramento River, as we requested in comments for the *2010/2011 Water Transfer Program*, but we note that the Project's EA still fails to mention Battle, Mill, Big Chico, and Butte creeks, but now also excludes mention of Putah and Stony creeks in Section 3. These omissions again reflect an odd lack of understanding of the Cascade Range and the Sacramento River hydrologic region.
- The *2010/2011 Water Transfer Program's* EA states quite straightforwardly on page 3-12 that, "Surface water and groundwater interact on a regional basis, and, as such, gains and losses to groundwater vary significantly geographically and temporally. In areas where groundwater levels have declined, such as in Sacramento County, streams that formerly gained water from groundwater now lose water to the groundwater system through seepage." Both the *2010/2011 Water Transfer Program's* EA and the Project's EA fail to expand upon what was initiated in this quotation: What is the geographic extent of this far-reaching and hydrologically essential pre-project understanding and how that has changed already from the baseline that we continue to believe is the year 2000? This *alone* requires substantive environmental review under NEPA and CEQA.
- *Id.* Page 3-12. "Groundwater production in the basin has recently been estimated to be about 2.5 million acre-feet or more in dry years." What is the citation for this assertion?
- *Id.* Page 3-12. "Historically, groundwater levels in the Basin have remained steady, declining moderately during extended droughts and recovering to pre-drought levels after subsequent wet periods. DWR extensively monitors groundwater levels in the basin. The groundwater level monitoring grid includes active and inactive wells that were drilled by different methods, with different designs, for different uses. Types of well use include domestic, irrigation, observation, and other wells. The total depth of monitoring grid wells ranges from 18 to 1,380 feet below ground surface." As presented above, groundwater levels have been changing, historically. Since the Bureau and DWR have access to a monitoring grid, for NEPA and CEQA compliance, they must present current facts, not general statements that relate to social science.
- *Id.* Page 3-12. "In general, groundwater flows inward from the edges of the basin and south parallel to the Sacramento River. In some areas there are groundwater depressions associated with extraction that influence local groundwater gradients." Where are the groundwater depressions? How have they affected groundwater gradients? How will the Project exacerbate a negative existing condition?
- *Id.* Page 3-12. "Prior to the completion of CVP facilities in the area (1964-1971), pumping along the west side of the basin caused groundwater levels to decline. Following construction of the Tehama-Colusa Canal, the delivery of surface water and reduction in

groundwater extraction resulted in a recovery to historic groundwater levels by the mid to late-1990s." Please provide the citation(s).

- *Id.* Pg 3-15 "According to the SWRCB, there are no elevated concentrations of arsenic or selenium in the Sacramento Groundwater Basin." The GAMA domestic well Project, Tehama County Focus Area, 2009, Arsenic in Domestic and Public Wells indicates variable levels of arsenic in the cited basin. The study found that, "Fourteen percent of the wells [in the Tehema County focus area] had concentrations of both arsenic and iron above their associated CDPH MCLs or secondary MCLs."
- *Id.* Page 3-15. "The State Water Code (Section 1745.10) requires that for short term water transfers, the transferred water may not be replaced with groundwater unless the following criteria are met (SWRCB 1999)…"
    - No matter how the Bureau and DWR attempt to present the Project as a "short-term water transfer," it is factually one of a series of actions in multiple years by the agencies, sellers, and buyers without the benefit of comprehensive environmental analysis under NEPA and CEQA as AquAlliance revealed in comments for the *2010/2011 Water Transfer Program* EA/FONSI and the Project's EA/FONSI.
    - *Id.* Page 3-16. "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. These principles must be met for approval of water transfers." Without monitoring and mitigation plans presented for review, the public has no means with which to determine the effectiveness of lack of effectiveness of the Bureau's decision to defer all responsibility in the areas of origin onto the "willing sellers" and the unsuspecting public and environment. The Bureau, at minimum, must at least *disclose*
    - How the Project will prevent "[i]njury to other legal users of water" including the environment?
    - How the Project will prevent "[u]nreasonable effects on fish, wildlife or other in-stream beneficial uses of water?"
    - And how the Project will prevent "[u]nreasonable effects on the overall economy or the environment in the counties from which the water is transferred?"

The disclosures and analyses contained in the *2010/2011 Water Transfer Program* EA/FONSI, its appendices, and the Project's EA/FONSI are inadequate to satisfy the California Water Code requirements and the Bureau's requirements under the CVPIA and NEPA. DWR has clearly failed its obligations under CEQA by providing no disclosure or analysis at all.

E. Other resource impacts flowing from corrected chains of cause and effect are unrecognized in the EA and should be considered in an EIS instead.

Regarding surface water reservoir operations in support of the *2013 Water Transfer Program*, we have several questions and concerns:

- Regarding fisheries, do the Bureau and DWR intend to comply with the State Water Resources Control Board's Water Rights Orders 90-05 and 91-01 in order to provide temperature control at or below 56 degrees Fahrenheit for anadromous fish, their redds, and hatching wild salmonid fry, and to provide minimum instream flows of 3,250 cubic feet per second (cfs) between September 1 and February 28, and 2,300 cfs between March 1 and August 31? How will the Bureau and DWR comply with Fish and Game Code Section 5937—to keep fish populations below and above their dams in good condition, as they approve transfers of CVP water from willing CVP and non-CVP contractors to willing buyers? Please reflect on our comments and fish population data above, which demonstrate that the SWP and CVP have a horrendous record since 2000 keeping fish alive, let alone thriving or recovering.
- Regarding public health and safety, the *2010/2011 Water Transfer Program's* EA negligently denies the potential for impacts (p.3-1) and the Project's EA doesn't even bring up the topic. Fluctuating domestic wells can lead to serious contamination from heavy metals and non-aqueous fluids. Additionally, there are numerous hazardous waste plumes in Butte County, which could easily migrate with the potential increased groundwater pumping proposed for the Project. Because the Bureau fails to disclose basic standards for the mitigation and monitoring requirements, it is unknown if hazardous plumes in the areas of origin will be monitored or not. Please note the attached map from the State Water Resources Control Board (2008) that highlights areas vulnerable to groundwater contamination throughout the state. A significant portion of both the areas of origin and the receiving areas are highlighted. When the potential for serious health and safety impacts exists, NEPA and CEQA require that this must be disclosed and analyzed.

In general, the *2013 Water Transfer Program* EA/FONSI—and by logical implication, DWR's actions—consistently avoids full disclosure of existing conditions and baseline data, rendering the Bureau's justifications for the *2013 Water Transfer Program* at best incoherent, and at worst, dangerous to groundwater dependent communities and businesses, domestic well owners, and vulnerable fisheries in tributary streams of the Sacramento River hydrologic region.

F. The *2013 Water Transfer Program* is likely to have a cumulatively significant impact on the environment.

The draft EA/FONSI 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. These are plans that the Bureau, together with DWR, sellers, and other have pursued and developed for many years. Indeed, one of the plans—the short-term phase of the Sacramento Valley Water Management

Program—is the subject of an ongoing scoping process for a Programmatic EIS that has not yet been completed.[6]

In assessing the significance of a project's impact, the Bureau 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).

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

As provided in details below, instead of assessing the cumulative impacts of the proposed action as part of the larger program that even the Bureau has recognized should be subject to a programmatic EIS (but for which no programmatic EIS has been completed), the Bureau has attempted to separate this program and approve it through another inadequate EA. Further, the Bureau has failed to take into account the cumulative effects of other groundwater and surface water projects in the region, the development of "conjunctive" water systems, and the anticipated further integration of Sacramento Valley surface and ground water into the state water system.

The Bureau's attempts to frame the *2013 Water Transfer Program* as an isolated *de minimis* project is a shell game, whereby an analysis of the cumulative impacts of individual actions is avoided in direct contravention of NEPA. *See Blue Mountains Biodiversity Project v. United States Forest Service*, 161 F.3d 1208, 1215 (9th Cir. 2008).

G. The Environmental Assessment Fails to Meet the Requirements of NEPA.

Even if an EIS was not clearly required here, which we believe it is, the draft EA/FONSI prepared by the Bureau violates NEPA on its own. As discussed above, the draft EA does not provide the analysis necessary to meet NEPA's requirements and to support its proposed finding of no significant impact. Further, as outlined above, the draft document fails to provide a full and accurate description of the proposed Project, its purpose, its relationship to myriad other water transfer and groundwater extraction projects, its potentially significant adverse effects on salmon

[6] *Id* page 3.

critical habitat in streams of interest that are tributaries to the Sacramento River, and an assessment of the cumulative environmental impacts of the *2013 Water Transfer Program* when considered together with past, present, and reasonably foreseeable projects, plans, and actions of not only the Bureau and DWR, but also with the past, present, and reasonably foreseeable projects, plans, and actions of others.

Additionally, the draft EA/FONSI fails to provide sufficient evidence to support its assertions that the *2013 Water Transfer Program* would have no significant impacts on the human or natural environments, so neither decision makers nor the public are fully able to evaluate the significance of the *2013 Water Transfer Program*'s impacts. These informational failures complicate AquAlliance's efforts to provide meaningful comments on the full extent of the potential environmental impacts of the Project and on appropriate monitoring and mitigation measures. Accordingly, many of the AquAlliance's comments include requests for additional information.

1. The EA Fails to Consider a Reasonable Range of Alternatives.

NEPA's implementing regulations call for analysis of alternatives is "the heart of the environmental impact statement," 40 C.F.R. §1502.14, and they require an analysis of alternatives within an EA. *Id.* §1408.9. The statute itself specifically requires federal agencies to:

> *study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning available uses of resources.*

42 U.S.C. §4332(2)(E). Here, because the Bureau's EA considers only the proposed Project and a "No Action" alternative, the EA violates NEPA.

The case law makes clear that an adequate analysis of alternatives is an essential element of an EA, and is designed to allow the decision maker and the public to compare the environmental consequences of the proposed action with the environmental effects of other options for accomplishing the agency's purpose. The Ninth Circuit has explained that "[i]nformed and meaningful consideration of alternatives … is … an integral part of the statutory scheme." *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988) (holding that EA was flawed where it failed adequately to consider alternatives). An EA must consider a reasonable range of alternatives, and courts have not hesitated to overturn EAs that omit consideration of a reasonable and feasible alternative. *See People ex rel. Van de Kamp v. Marsh*, 687 F.Supp. 495, 499 (N.D. Cal. 1988); *Sierra Club v. Watkins*, 808 F.Supp. 852, 870-75 (D.D.C. 1991).

Here, there are only two alternatives presented: the No Action and the Proposed Action. The lack of *any* alternative action proposal is unreasonable and is by itself a violation of NEPA's requirement to consider a reasonable range of alternatives.

Even more significantly, there are numerous other alternative ways to ensure water is allocated reliably when California experiences dry hydrologic years. We described several elements of

reasonable alternatives above. These are the alternatives that should have been presented for the Bureau's draft EA/FONSI on the *2013 Water Transfer Program* to comply with NEPA. 42 U.S.C. § 4332(2)(E).

2. The EA Fails to Disclose and Analyze Adequately the Environmental Impacts of the Proposed Action

The discussion and analysis of environmental impacts contained in the EA is cursory and falls short of NEPA's requirements, because it lacks a clear and well-described narrative for the proposed *2013 Water Transfer Program*. Please recall that the EA doesn't contain a "purpose" statement. This obscures realistic chains of cause and effect, which in turn prevent accurate and comprehensive accounting of environmental baselines and measurement of the DWB's potential impacts. NEPA's implementing regulations require that an EA "provide sufficient evidence and analysis for determining whether to prepare an [EIS]." 40 C.F.R. §1508.9(a). For the reasons discussed above, the EA fails to discuss and analyze the environmental effects of the water transfers and groundwater substitution proposed by the *2013 Water Transfer Program*. The Bureau must consider and address the myriad environmental consequences that are likely to flow from this proposed agency action.

Along with our significant concerns about the adequacy of the proposed monitoring, the draft EA/FONSI also fails to explain what standards will be used to evaluate the monitoring data, and on what basis a decision to modify or terminate the pumping would be made. In light of the document's silence on these crucial issues, the draft EA/FONSI's conclusion that there will not be significant adverse impacts withers quickly under scrutiny.

3. The EA Fails to Analyze Cumulative Impacts Adequately.

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). Indeed, "[d]etail is required in describing the cumulative effects of a proposed action with other proposed actions." *Id.* The very cursory cumulative effects discussion in the EA plainly fails to meet this standard.

As discussed throughout these comments, the proposed Project does not exist in a vacuum, is another transfer program in a series of many that have also 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 *2013 Water Transfer Program* is also only one of several proposed and existing projects that affect the regional aquifers. The existence of these numerous related projects makes an adequate analysis of cumulative impacts especially important.

4. The Bureau Has Segmented the Project Over Many Years

The Bureau's participation in planning, attempting to execute, and sometimes executing the following programs, plans and projects has circumvented the requirements of NEPA. DWR's failure to conduction comprehensive environmental review has segmented a known project for decades, which means that the Bureau is also failing to comply with state law as the CVPIA mandates. (EA at p. 10) Such segments include:

- The Sacramento Valley Water Management Agreement was signed in 2002 and the need for a programmatic EIS/EIR was clear and the process was initiated, but never completed.[7]
- Sacramento Valley Integrated Regional Water Management Plan (2006).
- The Sacramento Valley Water Management Plan. (2007)
- The Stony Creek Fan Partnership Orland Project Regulating Reservoir Feasibility Investigation.
- GCID's *Stony Creek Fan Aquifer Performance Testing Plan* to install seven production wells in 2009 that will extract 26,530 AF of groundwater as an experiment.
- GCID's Lower Tuscan Conjunctive Water Management Program (Bureau provided funding).
- GCID's water transfers in 2008 and in 2010.
- California Drought Water Bank for 2009.
- The Bureaus of Reclamation's 2010/2011 Water Transfer Program of 395,910 af of CVP and non-CVP water with 154,237 AF of groundwater substitution (EA/FONSI p. 2-4 and 3-107) and
- The planned 2012 water transfers of 76,000 af of CVP water all through ground water substitution.
- The Bureaus of Reclamation's 600,000 AF, North-to-South Water Transfer Program. EIS/EIR pending.
- The Bay Delta Conservation Plan.

5. The Bureau Has Failed to Consider the Cumulative Impact of Other Groundwater Development and Surface Water Diversions Affecting the Region

In addition to the improper segmentation evident by the Project EA/FONSI and the long list of projects and plans in Section 4 above, the assessment of environmental impacts is further deficient because the Bureau has failed to consider the cumulative impacts of the proposed groundwater extraction when taken in conjunction with other projects proposed for the development of groundwater and surface water.

[7] *Id* p. 3

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 Project EA including, but not limited to, the following:

- 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).

We briefly describe some of their key elements here.

a) Stony Creek Fan Conjunctive Water Management Program. The SCF Aquifer Plan is part of and in furtherance of the Stony Creek Fan Conjunctive Water Management Program ("SCF Program"). This program is being carried out by GCID, Orland-Artois and Orland Unit Water Association.

The long-term objective of the SCF Program is the development of a "regional conjunctive water management program consisting of a direct and in-lieu recharge component, a groundwater production component, and supporting elements…" (SVWMA: Project 8A Stony Creek Fan Conjunctive Water Management Program
("SVWMA Project 8A"), at 8A-1). The potential supply from such a program was estimated at 50,000 af per year to 100,000 af per year. *Id.*

The SCF Program has three phases: (1) a feasibility study; (2) a demonstration project; and (3) project implementation. Phase I of the SCF Program has already been completed. The SCF Aquifer Plan described in a draft EA/FONSI is part of Phase II of the larger SCF Program. Phase III of the SCF Program will implement the program's goal of integrating test and operational production wells into the water supply systems for GCID, Orland-Artois, and Orland Unit Water Association for long-term groundwater production in conjunction with surface water diversions.

The Bureau is well aware of the SCF Program, but declined to analyze the environmental effects of the program as a whole, and simply considered the effects of an isolated component of the larger program. Indeed, the Bureau awarded a grant to GCID to fund the SCF Program. The Bureau's grant agreement states that the SCF Program "target[s] the Lower Tuscan Formation and possibly other deep aquifers in the west-central portion of the Sacramento Valley … as the source for all or a portion of the additional groundwater production needed to meet [the SCF Partners'] respective integrated water management objectives." BOR Assistance Agreement No.

06FG202103 at p. 2. The agreement further provides that "[a]dditional test wells and production wells will be installed within the Project Area." *Id.*

b) The SCF Program is a Component of the Sacramento Valley Water Management Program. The Sacramento Valley Water Management Program (Phase 8) ("SVWMP") also includes the SCF Program as one of its elements. (SVWMA Project 8A at pp. 8A-1 to 8A-13).

The SVWMP recognizes that the SCF Program "has the potential to improve operational flexibility on a regional basis resulting in measurable benefits locally in the form of predictable, sustainable supplies, *and improved reliability for water users' elsewhere in the state*." *Id.* at p. 8A-2 (emphasis added). By piecemealing this program improperly and analyzing only the small component of the SCF Program, the Bureau has failed to assess the environmental impacts associated not just with the anticipated conjunctive use of the groundwater, but also the effect of the anticipated export of water to other regions of the state.

Additionally, ten years ago, on August 5, 2003, the Bureau published a notice in the Federal Register announcing its intention to prepare a programmatic EIS to analyze the short-term phase of the SVWMP. 68 Fed. Reg. 46218, 46219 (Aug. 5, 2003). Like the SVWMP, this "Short-term Program" for which the Bureau stated its intent to conduct a programmatic EIS included implementation of the SCF Program. *Id.* at 46219, 46220.

c) The SCF Program is Also a Component of the Sacramento Valley Integrated Regional Water Management Program. The Bureau has been working with GCID and others to realize the Sacramento Valley Integrated Regional Water Management Program ("SVIRWMP"). SVIRWMP is comprised of a number of sub-regional projects, including the SCF Program. *See* SVIRWMP, Appendix A at A-5; BOR Assistance Agreement No. 06FG202103. Here again, even though the SCF Aquifer Plan is clearly a necessary component of the SCF Program – which is in turn a component of the SVIRWMP – the draft EA/FONSI failed to even acknowledge, let alone assess, the cumulative impacts of these related projects.

Most obviously, the draft EA wholly fails to assess the impact of the Bureau'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 stated purpose of the Phase 8 Settlement and the SVRWMP are 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.

Less obvious, but certainly available to the Bureau, are the numerous implementation projects that Phase 8 signatories are pursuing, such as Glenn Colusa Irrigation District's (GCID) 2008 proposal to divert groundwater pumped from private wells to agricultural interests in the District. *See* Attach. (GCID Proposed Negative Declaration, GCID Landowner Groundwater Well Program for 2008-09). Additionally, the draft EA does not consider the cumulative effect of the Lower Tuscan Integrated Planning Program, a program funded by the Bureau that will "integrate the Lower Tuscan formation aquifer system into the management of regional water supplies." Grant Agreement at p. 4. This program, as described by the Bureau, will culminate in the presentation of a proposed water management program for the Lower Tuscan Formation for approval and implementation by the appropriate authorities. Clearly, the cumulative impact of this program and the *2013 Water Transfer Program*'s proposed groundwater extraction should have been assessed.

d) There are serious concerns raised by the *2012 Water Transfer Program* to engage in conjunctive management of groundwater and surface water that are not even mentioned, let alone addressed, in the Project EA. For example, in 1994, following seven years of low annual precipitation, Western Canal Water District and other irrigation districts in Butte, Glenn and Colusa counties exported 105,000 af of water extracted from the Tuscan aquifers to buyers outside of the area. This early experiment in the *conjunctive use* of the groundwater resources – conducted without the benefit of environmental review – caused a significant and immediate adverse impact on the environment (Msangi 2006). Until the time of the water transfers, groundwater levels had dropped but the aquifers had sustained the normal demands of domestic and agricultural users. The water districts' extractions, however, lowered groundwater levels throughout the Durham and Cherokee areas of eastern Butte County (Msangi 2006). The water level fell and the water quality deteriorated in the wells serving the City of Durham (Scalmanini 1995). Irrigation wells failed on several orchards in the Durham area. One farm never recovered from the loss of its crop and later entered into bankruptcy. Residential wells dried up in the upper-gradient areas of the aquifers as far north as Durham.

Finally, with the myriad projects and programs that are ignored in the *2010/2011 Water Transfer Program's* EA and the Project's EA that have never been analyzed cumulatively, only the *2010/2011 Water Transfer Program's* EA discloses that there could be a *devastating* impact to groundwater: "The reduction in recharge due to the decrease in precipitation and runoff in the past years in addition to the increase in groundwater transfers would lower groundwater levels. Multi-year groundwater acquisition under cumulative programs operating in similar areas of the Sacramento Valley could further reduce groundwater levels. Groundwater levels may not fully recover following a transfer and may experience a substantial net decline in groundwater levels over several years. This would be a substantial cumulative effect," (EA p. 3-108). While the honesty is refreshing, the lack of comprehensive monitoring, mitigation, and project cessation mechanisms is startling. It is also noteworthy that this admission is not included in the Project's EA. This alone warrants the preparation of an EIS.

Here again, the current document does not discuss or analyze these potential impacts, their potential scope or severity, or potential mitigation efforts. Instead, it relies on the existence of local ordinances, plans, and oversight with the monitoring and mitigation efforts of individual "willing sellers" to cope with any adverse environmental effects. However, as we have shown above, for example, the Glenn County management plan is untested, does not provide adequate protection and monitoring, and relies on "voluntary" enforcement of the region's important groundwater resources. To further clarify the inadequacy of relying on local plans and ordinances, Butte County's Basin Management Objectives have no enforcement mechanism and Butte County's Chapter 33, while it requires CEQA review for transfers that include groundwater, has never been tested. There is thus very limited local protection for groundwater within a county, and no authority or mechanism to influence pumping in a different county from a shared groundwater basin.

6. The *2013 Water Transfer Program* is likely to serve as precedent for future actions with significant environmental effects.

As set forth above, this Project is part of a broader effort by the Bureau and DWR to develop groundwater resources and to integrate groundwater into the state system. For these reasons, the *2013 Water Transfer Program* is likely to "establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration" (40 C.F.R. §1508.27(b)(6)), and should be analyzed in an EIS.

7. The *2013 Water Transfer Program* has potential adverse impacts for a threatened species.

As the Bureau of Reclamation is 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 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. (Draft Recovery Plan for the Giant Garter Snake ("DRP") 1). 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 can be 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 Project's EA failure to discuss GGS is arbitrary and capricious. 1) Either the EA assertion on page 12 is incorrect stating that, "Idling rice fields would reduce the use of farm equipment…" in reference to emissions to air or the EA is failing to disclose impacts to GGS from fallowing. If there are plans to fallow, there will be potentially significant impacts to GGS and if fallowing won't occur, emissions to air will not be reduced as claimed. Please clarify this. 2) Moving on, GGS depend on more than rice fields in the Sacramento Valley.[8] "The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat…" (Id at p. 3) What analysis has occurred that removes GGS from consideration for potential significant impacts? If the 2013 Water Transfer Program will only use groundwater substitution to make river water sales possible, how will that affect streams, wetlands, and emergent, herbaceous wetland vegetation? How will it be monitored?

The Bureau's Biological Assessment for the 2009 DWB disclosed that one GGS study in Colusa County revealed the "longest average movement distances of 0.62 miles, with the longest being 1.7 miles, for sixteen snakes in 2006, and an average of 0.32 miles, with the longest being 0.6 miles for eight snakes in 2007." (BA at p.16) However, in response to droughts and other changes in water availability, the GGS has been known to travel up to 5 miles in only a few days,

[8] **Programmatic Consultation with the U.S. Army Corps of Engineers**
404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California

but the impacts on GGS survival and reproduction from such extreme conditions are unknown due to the deficiency in data and analysis.

Flooded rice fields, irrigation canals, streams, and wetlands in the Sacramento Valley can be used by the giant garter snake for foraging, cover and dispersal purposes. The Bureau's 2009 Biological Assessment acknowledged the failure of Bureau and DWR to complete the Conservation Strategy that was a requirement of the 2004 Biological Opinion. (BA at p. 19-20) To date it is still not done. What possible excuse delayed this essential planning effort?

The *2010/2011 Water Transfer Program* also proposed to delete or modify other mitigation measures previously adopted as a result of the EWA EIR process to substantially reduce significant impacts, but without showing they are infeasible. For example, the Bureau and DWR proposed to delete the 160 acre maximum for "idled block sizes" for rice fields left fallow rather than flooded and to substitute for it a 320 acre maximum. (See 2003 Draft EWA EIS/EIR, p. 10-55; 2004 Final EWA EIS/EIR, Appendix B, p. 18, Conservation Measure # 4.) There is no evidence to support this change. In light of the agencies failure to complete the required Conservation Strategy mentioned above and the data gathered in the Colusa County study, how can the EA suggest that doubling the fallowing acreage is in any way biologically defensible? The agencies additionally propose to delete the mitigation measure excluding Yolo County east of Highway 113 from the areas where rice fields may be left fallow rather than flooded, except in three specific areas. (See 2004 Final EWA EIS/EIR, Appendix B, p. 18, Conservation Measure # 2.) What is the explanation for this change? What are the impacts from this change?

Deleting these mitigation measures required by the EWA approval would violate NEPA and CEQA's requirements that govern whether, when, and how agencies may eliminate mitigation measures previously adopted under NEPA and CEQA. (See *Napa Citizens for Honest Government v. Napa County Board.*

The *2010/2011 Water Transfer Program* failed to include sufficient safeguards to protect the giant garter snake and its habitat. The EA concluded, "The frequency and magnitude of rice land idling would likely increase through implementation of water transfer programs in the future. Increased rice idling transfers could result in chronic adverse effects to giant garter snake and their habitats and may result in long-term degradation to snake populations in the lower Sacramento Valley. In order to avoid potentially significant adverse impacts for the snake, additional surveys should be conducted prior to any alteration in water regime or landscape," (p. 3-110). To address this significant impact the Bureau proposed relying on the 2009 DWB Biological Opinion, which was a one-year BO. The expired BO highlighted the Bureau and DWR's avoidance of meeting federal and state laws stating, "This office has consulted with Reclamation, both informally and formally, approximately one-half dozen times over the past 8 years on various forbearance agreements and proposed water transfers for which water is made available for delivery south of the delta by fallowing rice (and other crops) or substituting other crops for rice in the Sacramento Valley. Although transfers of this nature were anticipated in our biological opinion on the environmental Water Account, that program expired in 2007 and, to

our knowledge, no water was ever made available to EWA from rice fallowing or rice substitution. The need to consult with such frequency on transfers involving water made available from rice fallowing or rice substitution suggests to us a need for programmatic environmental compliance documents, including a programmatic biological opinion that addresses the additive effects on giant garter snakes of repeated fallowing over time, and the long-term effects of potentially large fluctuations and reductions in the amount and distribution of rice habitat upon which giant garter snakes in the Sacramento Valley depend," (p.1-2). AquAlliance agrees with the U.S. Fish and Wildlife Service that programmatic environmental compliance is needed under the Endangered Species Act, NEPA, CEQA, and the California Endangered Species Act.

It is conspicuously noticeable that GGS are not mentioned even if fallowing is not used although the statement from the EA on page 12 leaves some confusion. Increased groundwater extraction will impact the aquatic and terrestrial environment that GGS depend upon. The Bureau should also prepare an EIS because the *2013 Water Transfer Program* will, in combination with all its past and reasonably foreseeable plans, programs, and projects, likely have significant environmental effects on the Giant Garter Snake, a listed threatened species under the federal Endangered Species Act and California Endangered Species Act. 40 C.F.R. §1508.27(b)(9).

In addition to GGS, as discussed above, unsupported assertions, that impacts to aquatic species will be below a level of significance, ring hollow and lack foundational data (EA at pp. 10, 12, 17). Habitat values are also essential to many other special status species that utilize the aquatic and/or riparian landscape including, but not limited to, giant garter snake, bank swallow, greater sandhill crane, American shad, and more. Where is the documentation of the potential impacts to these species?

II. Purpose and Need Issues of the *2013 Water Transfer Program*

A. The Purpose and Need Section of the EA/FONSI fails to specify the policy framework upon which the *2013 Water Transfer Program* is based.

As mentioned many times, the Project's EA/FONSI fails to provide a statement of purpose, and the need statement on page 4 is cursory at best. Avoiding the requirements of NEPA, and for DWR – CEQA, for the *2013 Water Transfer Program* does not reflect the actual environmental effects of the proposal—which are similar to the proposed 1994 Drought Water Bank and for which a final Program Environmental Impact Report was completed in November 1993. In 2000, the Governor's Advisory Drought Planning Panel report, *Critical Water Shortage Contingency Plan* promised a program EIR on a drought-response water transfer program, but it was never undertaken. Twice in recent history, the state readily acknowledged that CEQA review for a major drought water banking program was appropriate. So, the 2009 DWB Notice of Exemption and complete avoidance of CEQA review for the *2013 Water Transfer Program* reflects an ongoing end-run around established water law and CEQA.

We question the merits of and need for the *2013 Water Transfer Program* itself. The need for transfers reflects less on the type of water year than on the failures by the Agencies to pursue a sensible water policy framework, given that California has a Mediterranean climate with major fluctuations in precipitation and long periods of drought (Anderson, 2009). AquAlliance believes that the Agencies continue to avoid the inconvenient truths about California's climate, the current and future needs from climate change, and go too far to help a few junior water right holders. The Project intends to directly benefit the areas of California whose water supplies are the least reliable by operation of state water law. Though their unreliable supplies have long been public knowledge, local, state, and federal agencies in these areas have failed to stop blatantly wasteful uses and diversions of water and to pursue aggressive planning for regional water self-sufficiency.

The EA/FONSI fails to provide a statement of purpose and the need statement on page 4 is cursory at best. At a minimum, a purpose statement must be presented in the EA and clearly identified. The purpose and need statements should also include specific criteria and a delineation of priorities that the Project must adhere to, but they are absent.

The EA/FONSI makes no attempt to place the *2013 Water Transfer Program* into the context of the 2009 California Water Plan that the state most recently completed, which contains many recommendations for increasing regional water self-sufficiency, but it appears that this plan is largely on the shelf now. Pursuing watershed self-sufficiency would be a proactive and sustainable through the many types of water years, which is why many coastal communities are aggressively meeting this challenge. It is distressing to see that the Bureau and the state of California resist such as strategy and continue to pursue multi-year, serial, "temporary" water transfers and large engineering projects that are prohibitively costly and low in water and environmental benefits. This is not a sustainable water policy for California.

The missing purpose section and weak need sections of the Project's EA/FONSI, the *2010/2011 Water Transfer Program, and the 2009 Governor's drought emergency declaration* cry out for a cogent policy framework. What is the state doing to facilitate regional water self-sufficiency for these areas with the least reliable water rights and how is the Bureau assisting or motivating such action? Instead, the state and federal response to another dry year falls back on the continuation of multi-year, serial, "temporary" water transfers.

B. The *2013 Water Transfer Program* is not needed because the state's current allocation system—in which the federal Bureau of Reclamation participates—wastes water profligately.

The incentive from the state's lax system of regulation of California's State Water Project and Central Valley projects is to deliver the water now, and worry about tomorrow later. Indeed, the State Water Resources Control Board (SWRCB) has been AWOL for decades. In response to inquiries from the Governor's Delta Vision Task Force in 2009, the SWRCB acknowledged that

while average runoff in the Delta watershed between 1921 and 2003 was 29 million acre-feet annually, the 6,300 active water right permits issued by the SWRCB is approximately 245 million acre-feet. In other words, **water rights on paper are 8.4 times greater than the real water in California streams diverted to supply those rights on an average annual basis.** *And the SWRCB acknowledges that this "water bubble" does not even take account of the higher priority rights to divert held by pre-1914 appropriators and riparian water right holders, of which there are another 10,110 disclosed right holders.* Many more remain undisclosed.

Like federal financial regulators failing to regulate the shadow financial sector, subprime mortgages, Ponzi schemes, and toxic assets of our 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 the 2011 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 systematic failure of governance by the State Water Resources Control Board, the Department of Water Resources and the U.S. Bureau of Reclamation, filed with the Board on April 21, 2011 (attached).

We question the Bureau and DWR's desire for the Project, since reservoir levels throughout California are quite decent and groundwater is and will be necessary to support river and stream flows, aquatic and terrestrial species, and economic activity in the areas origin as California grapples with unpredictable, but well known, precipitation patterns and climate change. Don Pedro Reservoir on the Tuolumne River is at 98 percent of historic average. (CDEC, May 20, 2013)[9] The CVP's Millerton is at 99% and Folsom is at 90%. *Id* These two reservoirs must provide water to the agricultural San Joaquin River Exchange Contractors first, and they have among the most senior rights on that river. Rice growers in the Sacramento Valley are receiving full deliveries from the CVP's Shasta reservoir (88% of historic average) and their Yuba River water supplies. *Id* The CVP's own New Melones Reservoir on the Stanislaus River, which contributes to Delta water quality as well as to meeting eastern San Joaquin Valley irrigation demands, is at 91 percent of normal for this time of year. *Id*

Moreover, the SWP's terminal reservoirs at Pyramid (104 percent of average) and Castaic (93 percent of average) Lakes are slightly above and below normal levels for this time of year, presumably because DWR has been releasing water from Oroville (96% historic average) for delivery to these reservoirs. *Id*

We acknowledge that the snowpack is very poor this year.[10] The fact that reservoirs of the CVP and SWP with more senior responsibilities in the water rights hierarchy are doing so well, but

[9] http://cdec.water.ca.gov/cdecapp/resapp/getResGraphsMain.action

[10] http://cdec.water.ca.gov/snow/

admittedly there is so little to refill them, certainly suggests caution for deliveries. Still, given what is known, these reservoir levels indicate that most major cities and most Central Valley farmers are very likely to have enough water for this year. The demands by junior water rights holders, who expect to receive little water this year, do so because of the low priority of their water service contracts within the Central Valley Project—their imported surface supplies are therefore less reliable in dry times. It is the normal and appropriate functioning of California's system of water rights law that makes it so.

The efforts of the Bureau and DWR to initiate water sales from the Sacramento, Feather, and Yuba rivers with groundwater substation are only intended to benefit the few western San Joaquin Valley farmers whose contractual surface water rights have always been less reliable than most—and whose lands are the most problematic for irrigation. Since these growers have chosen to harden demand by planting permanent crops, a very questionable business decision, will the Bureau please explain why this "tail" in water rights is wagging the dog? Compounding the insanity of growing perennial crops in a desert is the result where in excess of 1 million acres of irrigated land in the San Joaquin Valley and the Tulare Lake Basin are contaminated 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 *2013 Water Transfer Program* would exacerbate pumping of fresh water from the Delta, which has already suffered from excessive pumping over the last 12 years. Pumped exports cause reverse flows to occur in Old and Middle Rivers and can result in entrainment of fish and other organisms in the pumps. Pumping can shrink the habitat for Delta smelt as well, since less water flows out past Chipps Island through Suisun Bay, which Delta smelt often prefer. AquAlliance shares the widely held view that operation of the Delta export pumps is the major factor causing the Pelagic Organism Decline (POD) and in the deteriorating populations of fall-run Chinook salmon. The State Water Resources Control Board received word in early December that the Fall Midwater Trawl surveys for September and October 2012 showed horrendous numbers for the target species. The indices for longfin smelt, splittal, and threadfin shad reveal the lowest in history.[11] Delta smelt, striped bass, and American shad numbers remain close to their lowest levels. *Id*

New capital facilities should be avoided to save on costly, unreliable, and destructive water supplies that new dams and massive, 40-foot diameter "peripheral tunnels" represent. Moreover, these facilities would need new water rights; yet the most reliable rights in California are always the ones that already exist—and of those, they are the ones that predate the California State Water Project and the federal Central Valley Project. We should apply our current rights far more efficiently—and realistically—than we do now. California should instead pursue a "no-

[11] http://www.dfg.ca.gov/delta/data/fmwt/Indices/index.asp

regrets" policy incorporating aggressive water conservation strategies, careful accounting of water use, research and technological innovation, and pro-active investments.[12]

III. General Comments

1. Where are the materials required in the Criteria Checklist for Complete Written Transfer Proposals, Appendix 1 of the 1993 *Interim Guidelines for Implementation of the Water Transfer Provisions of the Central Valley Project Improvement Act (Title XXXIV of Public Law 102-575)*? In particular, where are the following: "Comprehensive ground-water basin study or evaluation of ground-water supplies demonstrating transfer will have no significant long-term adverse impacts on ground-water conditions, inter-related surface streams, or other ground-water supplies in Project service area; OR Comprehensive evaluation of the potential impact on ground-water supplies accompanied by an adopted ground-water management plan?"
   (3) Location map of ground-water well(s) to be utilized.
   (4) Drillers log for ground-water well(s) to be utilized.
   (5) Provide location of other ground-water wells in Project service area.
   (6) Identify and document area(s) normally irrigation by wells."
2. How is the EA cumulative total for transfers, 190,906 AF, reached (p. 29)? The direct Project impacts are listed as 37,505 AF (EA at p. 9), the non-CVP groundwater substitution is 92,806, non-CVP reservoir water is 95,000, and other non-CVP water is 3,100 (EA at p. 31). It would help the public understand the proposed Project if the total quantity of water involved in the Project wasn't so opaque.
3. The following paragraph in the EA raises numerous questions and concerns.
   "Reclamation approves transfers consistent with provisions of state law and/or the CVPIA that protect against injury to third parties as a result of water transfers. Several important CVPIA principles include requirements that the transfer will not violate the provisions of Federal or State law, will have no significant adverse effect on the ability to deliver CVP water, will be limited to water that would have been consumptively used or irretrievably lost to beneficial use, will have no significant long-term adverse impact on groundwater conditions, and will not adversely affect water supplies for fish and wildlife purposes. Reclamation will not approve any transfer of water for which these basic principles have not been adequately addressed." (EA at p. 10)
   a. How is water for the Project considered, "[c]onsumptively used or irretrievably lost to beneficial use," with groundwater substitution in the Sacramento Valley? Page 4 of the *Interim Guidelines for Implementation of the Water Transfer Provisions of the Central Valley Project*

[12] See especially, Pacific Institute, *More with Less: Agricultural Water Conservation and Efficiency in California, A Special Focus on the Delta*, September 2008; Los Angeles Economic Development Corporation, *Where Will We Get the Water? Assessing Southern California's Future Water Strategies*, August 2008, and Lisa Kresge and Katy Mamen, *California Water Stewards: Innovative On-farm Water Management Practices*, California Institute for Rural Studies, January 2009.

Improvement Act (Title XXXIV of Public Law 102-575) define irretrievable loss to beneficial use as "[d]eep percolation to an unusable groundwater aquifer (e.g., saline sink or a groundwater aquifer that is polluted to the degree that water from the aquifer cannot be directly used." The groundwater basins that are part of the Project do not fit this definition.

b. The groundwater pumped for the Project is a substitute and would not have been used consumptively except for the sale of river water. This violates section H of the *Interim Guidelines for Implementation of the Water Transfer Provisions of the Central Valley Project Improvement Act (Title XXXIV of Public Law 102-575)* (p. 4)

If the Project is approved, it flies in the face of CVPIA requirements.

4. Shasta County is not listed in the Affected Environment section although Anderson Cottonwood Irrigation District is participating in the proposed Project (EA at p. 21). If the Bureau intended to identify the counties by groundwater basin, the EA must call out the Redding Basin and Shasta County.

IV. Conclusion

The Bureau's *2010/2011 Water Transfer Program's* EA/FONSI stated on page 3-16:

> *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.*

The current Project's EA/FONSI presents this differently:

- "Reclamation approves transfers consistent with provisions of state law and/or the CVPIA that protect against injury to third parties as a result of water transfers." (EA at p.12)
- "[w]ill not adversely affect water supplies for fish and wildlife purposes." (EA at p.12)
- Adds, "[w]ill have no significant long-term adverse impact on groundwater conditions…" (EA at p. 12)
- Omits, "[n]o unreasonable effects on the overall economy or the environment in the counties from which the water is transferred." 2020/2011 Water Transfer Program EA at p. 3-16)

We unreservedly state to you that the two draft EA/FONSIs, since the *2010/2011 Water Transfer Program's* EA/FONSI is incorporated by reference, appear to describe a project, since they are quite similar, that would fail all of the tests required by the CVPIA and state law as currently described. The *2010/2011 Water Transfer Program* had and the *2013 Water Transfer Program* clearly has the potential to affect the human and natural environments, both within the

Sacramento Valley as well as in the areas of conveyance and delivery. It is entirely likely that injuries to other legal users of water, including those entirely dependent on groundwater in the Sacramento Valley, will occur if this project is approved. Groundwater, fishery and wildlife resources are also likely to suffer harm as instream users of water in the Sacramento Valley as well as terrestrial habitat upon which fishery and wildlife resources depend. And the economic effects of the proposed Project are at best poorly understood through the EA/FONSI. To its credit, at least the Bureau studied the proposed project, while DWR has completely avoided CEQA, thereby enabling the agency to ignore these potential impacts outside a courtroom.

Taken together, the Bureau and DWR treat these serious issues carelessly in the EA/FONSI, the *Draft Technical Information for Water Transfers in 2013* and in DWR's specious avoidance of CEQA review. In so doing, the Agencies deprive decision makers and the public of their ability to evaluate the potential environmental effects of this Project and violate the full-disclosure purposes and methods of both the National Environmental Policy Act and the California Environmental Quality Act.

Sincerely,

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

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RECIRC2575.

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Option Agreement Between Glenn-Colusa Irrigation District, Bureau of Reclamation, and the San Luis & Delta-Mendota Water Authority for 2008 Operations

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

February 2008

PURPOSE AND NEED

Introduction

The Bureau of Reclamation, Glenn-Colusa Irrigation District (GCID), and the San Luis & Delta-Mendota Water Authority (SLDMWA) have negotiated an agreement entitled *Option Agreement Between Glenn-Colusa Irrigation District, Bureau of Reclamation, and the San Luis & Delta-Mendota Water Authority for 2008 Operations* (Agreement). The Agreement provides that GCID will forbear diversion of up to 85,000 acre-feet of Sacramento River water that GCID otherwise is entitled to under the terms of its Sacramento River Settlement Contract No. 14-06-200-855A (Settlement Contract) with Reclamation and which GCID would have diverted during 2008 for use on lands within its Settlement Contract service area. The forbearance shall be undertaken in a manner that allows Reclamation to deliver the forborne water supply as Central Valley Project (CVP) water to SLDMWA. The term of the Agreement will be from the date of execution of the Agreement through and including February 28, 2009, or if the option under the Agreement is terminated by April 21, 2008, then this Agreement shall expire immediately thereafter.

The Agreement enables Reclamation to implement Section 3406d(1) of the Central Valley Project Improvement Act, which requires the Secretary of the Department of the Interior to diversify sources of supply to minimize adverse effects upon CVP contractors from delivery of Level II refuge water supplies south of the Sacramento-San Joaquin Delta (Delta).

GCID has completed California Environmental Quality Act (CEQA) compliance documents for its proposed action (to be appended to the Final Environmental Assessment) (EA) and are incorporated by reference.

Purpose and Need Statement

The purpose of the Federal action is to diversify sources of supply to minimize adverse effects upon CVP contractors from delivery of Level II refuge water supplies south of the Delta. The need for the proposed forbearance is to provide additional water supplies for CVP purposes, including delivery of CVP water to SLDMWA for irrigation of crops within SLDMWA's contractors' existing service areas.

The annual CVP allocation for south-of-Delta contractors is described in terms of a percentage of the total contracted supply under CVP south-of-Delta water service contracts for irrigation and municipal and industrial uses (Contract Total). This transaction is needed because the CVP south-of-Delta irrigation allocation for water service contractors for 2008 is anticipated to be as low as 30 to 60 percent of the CVP Contract Total. By comparison, the projected long-term average allocation of CVP irrigation water south of the Delta is approximately 65 percent of Contract Total, and a recent historic average is 76.4 percent over the past 5 years, with a variation between 50 and 100 percent. The potential reduction in 2008 water allocation is further

exacerbated due to lower-than-average CVP carryover storage and Federal court-mandated actions for delta smelt protection. This water purchase would assist in acquiring an amount of water for the participating south-of-Delta CVP water service contractors to help make up for the reduced water allocations. None of the purchased water would be made available to supplement water under settlement or exchange contracts, as these do not share in the allocation shortages imposed on the water service contractors.

ALTERNATIVES

Enter into an Agreement with the Glenn-Colusa Irrigation District and the San Luis & Delta-Mendota Water Authority (Reclamation's Proposed Action)

Reclamation proposes to enter into an agreement with GCID and SLDMWA whereby GCID would forbear a portion of their base supply and CVP water, which would then be picked up by Reclamation as CVP water to be used for project purposes.

No Action Alternative

Reclamation would not enter into the agreement with GCID and SLDMWA and, therefore, would not provide any of the benefits of CVP storage.

DESCRIPTION OF THE PROPOSED ACTION

Forbearance of Water

GCID agrees to forbear the diversion of a portion of the Sacramento River water that it otherwise is entitled to under the terms of its Settlement Contract with Reclamation and which it would have diverted during 2008 for use on lands within its Settlement Contract service area. GCID would make this water available in accordance with a surface water forbearance program undertaken by GCID in cooperation with landowners who voluntarily decide to participate in the program. The forborne water would be deemed to be comprised of Base Supply and CVP water in the same ratio as these types of water bear to each other in Schedule A of the Settlement Contract. This forbearance would be undertaken in a manner that allows Reclamation to deliver the forborne water supply as CVP water to SLDMWA. Water made available would be delivered to Reclamation at the intake of the GCID's Hamilton City pumping plant at river mile 206 on the Sacramento River, with control of such water accruing to Reclamation at its upstream reservoirs or upon export in the Delta.

Under the proposal, Reclamation would operate the project so as to deliver water made available as a result of GCID's forbearance of diversions to SLDMWA, or its contractors, at the locations identified in their respective water service contracts. During balanced conditions in the Delta (as

defined in the Coordinated Operations Agreement), Reclamation would, to the extent possible, directly divert the water forborne as additional CVP water at Jones or Banks Pumping Plants (assuming there is unused pumping capacity and all conditions necessary for joint point of diversion are met), or would, to the extent that operational conditions upon the Sacramento River permit, back the forborne water into Reclamation's upstream storage so that it can be released and diverted in the Delta at a later time when export capacity becomes available. During excess conditions in the Delta and when the CVP reservoir release is controlled by a downstream flow objective, Reclamation would, to the extent possible, store water forborne in an upstream CVP reservoir for later release and diversion in the Delta. Such operational conditions would be identified by Reclamation's Central Valley Operations office, which would keep daily records of the volume of the forborne water as it becomes available for export and/or storage. Forborne water made available under conditions that do not permit its diversion from the Delta and/or storage in upstream reservoirs would be considered lost. Water backed into storage pursuant to this proposal would be delivered to SLDMWA as soon as possible after its storage in an upstream reservoir. SLDMWA would pay for such storage at the rate determined by Reclamation. Water stored in an upstream CVP reservoir pursuant to this forbearance proposal would be the first water to spill. Water not spilled and carried over to the following year would be available to SLDMWA as supplemental water to be pumped at the Delta facilities when there is pumping capacity.

Quantities of Water to be Forborne

GCID would make up to 85,000 acre-feet of water available for sale as a result of cropland idling and crop shifting and groundwater substitution programs. The forborne water would be made up of up to 82,500 acre-feet of water made available from cropland idling or crop shifting actions by GCID's landowners and up to 2,500 acre-feet of water made available from groundwater substitution attributable to pumping from two electric wells owned by GCID. The sources of this water would be a portion of GCID's base supply and CVP water under its Settlement Contract. Base supply diverted by GCID under the terms of its Settlement Contract is pursuant to pre-1914 appropriative claims to water by GCID for diversions from the Sacramento River. CVP water available to GCID under the terms of its Settlement Contract is pursuant to post-1914 appropriative claims to water by Reclamation for diversions from the Sacramento River.

The main source of water from idled land is expected from rice fields because rice accounts for about 90 percent of the water use in GCID.

The total diversions by GCID, including the amount of water made available by forbearance as determined under this proposal and any amount of water that may be transferred under its Settlement Contract during the April through October contract period, would not exceed GCID's total Contract Amount as specified in its Settlement Contract. Table 1 below provides the expected monthly schedule that water would be made available by GCID through crop shifting/cropland idling and groundwater substitution and the source (Evapo-Transpiration Rate of Applied Water (ETAW), fallowing, or groundwater).

Table 1
Water Availability Schedule

	May	June	July	Aug	Sept	Oct	Nov	Total
ETAW (%)	15	22	24	24	15			100
Fallowing (AF)	12,375	18,150	19,800	19,800	12,375			82,500
Groundwater			500	500	500	500	500	2,500
Total	12,875	18,650	20,300	20,300	12,875	500	500	85,000

Central Valley Project Location

The CVP area, defined by the region in which the water is generated for transfer, is within the GCID boundaries and situated within Glenn and Colusa Counties (see attached Figures 1 and 2). The precise location of the lands involved in the project would depend upon the actual landowners who voluntarily choose to participate in the forbearance program for 2008. Because participation in the forbearance program would be offered to all eligible growers, GCID anticipates a wide dispersal of acreage enrolled in the program. Adequate water levels would be maintained by GCID in laterals and drains associated with the idled lands to avoid any potential wildlife impacts associated with dewatered conveyances. The two GCID-owned wells that would be used for groundwater substitution are depicted in Figure 1. The lands to be fallowed are shown in Figure 3 (attached).

The SLDMWA region stretches from the city of Tracy in San Joaquin County at the north to Highway 41 and Kettleman City in Kings County to the south. On the east, the region is generally bound by the San Joaquin River and to the west by the Coast Range. The region also encompasses parts of Monterey, San Benito, Santa Clara, and Santa Cruz Counties. The areas participating in this project are expected to include Del Puerto, Pacheco, Panoche, San Luis, San Benito County, and Westlands Water Districts and water service contractors in Fresno, Kings, Merced, San Benito, San Joaquin, and Stanislaus Counties. A map of the SLDMWA illustrating its external and internal boundaries, including those of the participating districts, can be found in Figure 4.

The Contract Total for the participating districts would be 1,681,453 acre-feet as set forth in Table 2 below:

Table 2
Contract Totals by Water District

	CONTRACT TOTAL ACRE-FEET
Del Puerto	140,210
Pacheco	10,000
Panoche	94,000
San Luis	125,080
San Benito County	43,800
Westlands (including assignments)	1,268,363
TOTAL	1,681,453

Methods of Making Water Available

No new construction or improvements to facilities owned or operated by Settlement Contractors would be necessary for the production and forbearance of this water. The point of delivery for the Settlement Contractors would be at a variety of different locations on the Sacramento River as identified in their respective Settlement Contracts.

Groundwater

The up to 2,500 acre-feet of water made available through groundwater substitution would be equal to the quantity of groundwater pumped and would be measured with totalizing flow meters installed by or under the direction of GCID. GCID would, to the greatest extent practicable, make such groundwater available during balanced conditions in the Delta. Water made available by groundwater pumping during excess conditions in the Delta would not be accrued in upstream storage or exported by Reclamation.

Cropland Idling and Crop Shifting

To forbear from taking surface water deliveries from GCID, GCID's landowner participants may voluntarily choose to idle acreage or substitute different crops that use less water. GCID anticipates that rice acreage would comprise most of the crop acreage, if not all, that would be involved as part of the forbearance program. To provide for an assessment for environmental impacts and to address concerns regarding potential economic impacts, GCID would not allow more than 20 percent of the total acreage within GCID that was served with surface water deliveries from GCID during the 2007 irrigation season to be idled as part of the project. In this regard, approximately 125,000 acres were planted within GCID and served with surface water deliveries from GCID during the 2007 irrigation season. The proposed ETAW for rice culture is 3.3 acre-feet per acre, which is consistent with the recent ETAW rates used for water transfers in the Sacramento Valley based on cropland idling of rice acreage (California Water Plan Update, Bulletin 160-05. December 2005). Therefore, if up to 20 percent of GCID's 2007 acreage is idled under the forbearance program (125,000 x .20 = 25,000 acres), the water made available for transfer by idling rice would be up to 82,500 acre-feet of water (25,000 acres x 3.3 acre-feet/acre).

GCID would also allow for crop shifting under this forbearance program; however, it is expected that no more than 1,000 acres would involve landowners who voluntarily choose to cultivate different crops having lower water demand. In these cases, the difference between the ETAW of the higher and lower water demand crops would be used to calculate water made available. The ETAW values that have been assigned to various croplands that may be idled or shifted under the proposed project are identified below in Table 3.

Table 3
Estimated ETAW Values for Various Crops
for Use in the 2008 Irrigation Season Forbearance Program

Crop	ETAW
Rice	3.3
Tomato	1.8
Safflower	.7
Wheat	.5
Corn	1.82
Sunflower	1.43
Alfalfa	3.0
Melon	1.12
Bean	1.52
Onion	1.1
Vine Seed	1.12
Sudan Grass	3.0
Walnut	3.0
Almond	3.0
Oats	.5
Pumpkin	1.1
Pasture	3.3
Cotton	2.8
Milo	1.65
Silage	1.8
Carrots	1.1

The typical growing season for rice culture is April through October, although surface water is generally applied only from May through September. The potential ETAW demand across these months is shown in Table 1 with the corresponding water production expectations, assuming that there is enough participation in the program to produce 82,500 acre-feet of water made available from cropland idling/crop shifting and 2,500 acre-feet of water from groundwater substitution.

The total diversions by GCID, including the amount of water made available by forbearance as determined under this proposal and any amount of water that may be transferred under their

Settlement Contracts during the April through October contract period, would not exceed GCID's total Contract Amount as specified in its Settlement Contract.

Water would be made available by GCID to SLDMWA at the point of delivery in accordance with the preceding schedule. SLDMWA would make arrangements under existing contractual agreements with Reclamation for SLDMWA's conveyance of the transferred water through the Delta, pumping the water into the California Aqueduct or the Delta-Mendota Canal, and the ultimate delivery of the water into the SLDMWA service area. In the near term, additional restrictions are anticipated as a result of interim operational remedies to be imposed by the United States District Court, Eastern District of California in *NRDC* v. *Kempthorne*, which will govern CVP and State Water Project (SWP) operations for the protection of the delta smelt (*Hypomesus transpacificus*). Conclusion of the current consultation on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP) with the U.S. Fish and Wildlife Service (Service) and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries Service), is expected to provide new biological opinions during 2008 for delta smelt, salmon, and green sturgeon that would replace the court's order regarding CVP/SWP operation. As a result, water may not be able to be transferred in certain months due to environmental restrictions on CVP/SWP pumping.

Reclamation and the California Department of Water Resources (DWR) estimate that approximately 20 percent of the water transferred through the Delta would be necessary to enable the maintenance of water quality standards, which are based largely upon the total amount of water moving though the Delta system. This percentage of water is known as *carriage water*. Additionally, DWR may assess against SLDMWA a 3 percent system loss due to evaporation and other losses for water received at the Banks pumping plant and transported through the SWP. Accordingly, the 85,000 acre-feet of water made available by GCID to Reclamation and SLDMWA at the point of delivery would actually yield to SLDMWA up to approximately 65,450 acre-feet (based on transfer of direct forgone crop water consumption only). At the end of the irrigation season, the amount of carriage water actually required would be calculated by Reclamation and DWR and assessed against SLDMWA. Depending upon the hydrologic year type and other operational constraints, the actual amount of carriage water assessed against SLDMWA for the transfer would vary somewhat from this estimate.

Use of Water by the San Luis & Delta-Mendota Water Authority

Upon the effective date of the Agreement, GCID would convey to SLDMWA an option to purchase up to 85,000 acre-feet of water made available by GCID during the 2008 irrigation season. The deadline for SLDMWA to exercise its option to request GCID to make water available is April 21, 2008. If SLDMWA exercises its option, SLDMWA would take delivery of this water using existing conveyance facilities operated within parameters typical for CVP deliveries. This water would be used to irrigate lands that were under irrigation over the last 3-year period: 2005 through 2007. The acquired supplies would provide additional resource options to the participating SLDMWA irrigation water service contractors to mitigate potential

dry-year water shortage conditions and water supply reductions due to remedial Delta operations for delta smelt mitigation in 2008. Given Delta carriage losses to be charged against the 85,000 acre-feet, the actual delivered amount is expected to be approximately 68,000 acre-feet, or substantially less than 5 percent of Contract Total south-of-Delta supplies for CVP water service contractors in general, and approximately 4 percent for the participating districts. Given the overall uncertainty as to the 2008 allocation, the exact total irrigation water supply to the participating water service contractors cannot presently be determined, but it is highly unlikely it would exceed 65 percent. If it did exceed 65 percent, it would be a maximum incremental increase for the 1-year term of approximately 4 percent. Any amount of water that may be transferred under the Agreement would not exceed the respective Contract Totals specified in the CVP water service contracts of any SLDMWA members that received such water. Accordingly, any water made available under the Agreement would not represent a dependable long-term increase in supply.

ENVIRONMENTAL CONSEQUENCES

Hydrology and Water Quality

No Action Alternative

No changes to existing water resources would occur under the no action alternative.

Reclamation's Proposed Action Alternative

The proposed action would not involve any discharges and thus would not have an adverse impact upon water quality or result in degradation of water quality. Minor improvements in water quality may be expected, as flows below Hamilton City would be increased by roughly 2 to 3 percent. No adverse water quality impacts in the Delta are expected, as all water quality related to pumping restrictions at the export pumps would be maintained during diversion of the CVP water at either the Tracy or Banks pumping plants. As rice lands are generally underlain by impermeable clays (a necessary condition to rice culture), little percolation of water would normally occur; insignificant amounts of groundwater recharge would be affected by cropland idling. Additionally, since only the ETAW value of water applied to the crop would be forborne, the remainder of the applied water would remain in the system for other users. Moreover, GCID has agreements in place with junior water rights holders on the Colusa Drain (Drain) to maintain water quality in the Drain.

The proposed project would not alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river. Minor reductions in drainage from idled fields would result, but these would not increase erosion, siltation on- or off-site, or the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. Water levels in the Drain would not be affected, as they are tightly controlled through the management of weirs to prevent flooding of fields on the western side of the Drain. The water made available would be maintained within the Sacramento River and the existing CVP and/or SWP conveyance and

storage systems. In addition, there are no ground-disturbing activities associated with the proposed project.

The proposed project would not create or contribute runoff water. Therefore, no impacts relating to storm water drainage systems would occur with CVP implementation.

All facilities which would be utilized are existing facilities designed according to standard engineering design practices to limit the potential for exposure of people or property to water-related hazards such as flooding. Therefore, no impact relating to flooding would occur with the proposed project.

Temporary storage of up to 82,500 acre-feet of water in Shasta Reservoir would not significantly affect hydrology/water quality. Compared to the capacity of the Shasta Reservoir (about 4.5 million acre-feet) and related water management activities, this is, for practical purposes, a very minor amount of water in any event, and the reservoir currently has several hundred thousand acre-feet of unused storage space late in the 2008 rainy season. Any effect of storing this water would be discountable. Under no circumstance would use of CVP facilities be allowed that would adversely affect any CVP purposes (including water supply, flood control, and environmental requirements).

Biological Resources/Endangered Species

No Action Alternative

No changes in existing agricultural patterns or modifications in the amount or timing of water deliveries, which could affect biological resources or endangered species, would occur under the no action alternative.

Proposed Action Alternative

Biological resources potentially affected by the proposed project are in most cases different in the GCID service area and the Sacramento River conveyance corridor from the water delivery area within the SLDMWA. However, adverse affects are not expected in any of these areas.

Wildlife in General

The proposed project would result in the idling of up to approximately 25,000 acres of rice fields. Rice fields in the CVP area serve as foraging habitat for many waterfowl species. However, implementation of the proposed project would not interfere substantially with the foraging of native resident or migratory waterfowl because other foraging habitat is abundant, both locally and regionally. Because the proposed project would not convert any agricultural lands to non-agricultural land uses, the only change would be a 1-year increase in the time between planting of rice in the CVP farmlands and a minor reduction in the acreage of rice lands available to waterfowl for foraging in 2008. This reduction in foraging acreage is less than significant based upon the regional abundance of flooded foraging habitat. Therefore, a less-than-significant impact would result to potential wildlife corridors for waterfowl, which include

the CVP acreage. Therefore, Reclamation's Proposed Action Alternative is unlikely to adversely affect waterfowl (enter into an agreement with GCID and SLDMWA).

The proposed project would slightly increase flows during July through September in the lower Sacramento River as a result of reduced diversions at Hamilton City. Because of the relatively large volume of summer flows in the Sacramento River, changes in flows resulting from the proposed project would be small, and effects on fish in the Sacramento River would be negligible. Therefore, the proposed action is unlikely to adversely affect the movement of any native resident or migratory fish species under Reclamation's Proposed Action Alternative (enter into an agreement with GCID and SLDMWA).

No non-drainage facility-related wetlands are located within the boundaries of the project site, and, as previously noted, the water levels and the water quality in the Drain would be maintained. Therefore, no impacts to wetlands would occur from the proposed project. Any riparian areas along service or drainage canals within the CVP boundaries would not be adversely impacted by the proposed project activities, as water levels would be maintained near levels which would otherwise occur.

Threatened or Endangered Species

While multiple special-status species are present in the SLDMWA service area, the project provides for an incremental water supply to an existing agricultural area to partially make up shortages from the ordinary supply available through the CVP and subject to the terms of existing CVP contracts. The action would not involve conversion of any land fallowed and untilled for 3 or more years. It would not change the land use patterns that affect existing available habitats for bald eagle (*Haliaeetus leucocephalus*), vernal pool tadpole shrimp (*Lepiderus packardi*), vernal pool fairy shrimp (*Branchinecta lynchi*), Longhorn fairy shrimp (*Branchinecta longiantennal*), conservancy fairy shrimp (*branchinecta conservation*), Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), Central California steelhead trout (*Oncorhynchus mykiss*), South Central California steelhead trout (*Oncorhynchus mykiss-CCC-ESU*), California tiger salamander (*Ambystoma claiforniense*),California red-legged frog (*rana aurora draytonii*), Blunt-nosed leopard lizard (*Gabelia sila*), giant garter snake (*Thamnophis gigas*), Tipton kangaroo rat (*dipodomys nitratoides nitratoides*), riparian woodrat (*Neotoma Fuscipes riparia*), riparian brush rabbit (*sylvilagus bachmani riparius*), giant kangaroo rat (*Dipodomys ingens),* or San Joaquin kit fox (*Vulpes macrotis mutica*), all of which are possible or present within portions of the SLDMWA service area. For the same reasons, the proposed project will not affect migratory corridors of the San Joaquin kit fox, critical habitat for the vernal pool invertebrates described above, riparian habitat of the riparian woodrat or riparian brush rabbit, and will not change the pattern of cultivated or fallowed fields that do have some value to listed species of birds protected by the Migratory Bird Treaty Act. Due to the lack of natural waterways within the species' range in the SLDMWA service area and the limitations in Delta export capacity and water quality restrictions implemented through various regulatory programs affecting water management in that service area, there would be no effects on listed fish species. Therefore, no adverse affects would occur within the SLDMWA service area.

The proposed action would not adversely affect listed species in GCID's service area dependent upon the water-filled irrigation ditches and drains, as GCID would maintain water levels in the irrigation ditches and has contractual agreements to maintain water quality in the Drain. The habitat value of the lands subject to idling within GCID, which varies seasonally under normal use, would be affected some, but the percentage change would be small. The greatest use of these lands by vertebrates arguably occurs in the fall and winter when wintering waterfowl forage or rest in flooded rice fields. Wildlife use during other periods is generally quite limited, as these lands are devoted to annual crops.

Several special-status wildlife species have the potential to occur within GCID and on the lands that would be idled or the agricultural waterways serving them: the giant garter snake (listed as state and federally threatened), the northwestern pond turtle (listed as a state species of special concern and Federal species of concern), and the Valley Elderberry Longhorn Beetle (VELB) (threatened). However, the waterways and ditch borders most important to these species would not be altered, as the ditches would remain watered. Additional species, primarily plants and animals found in vernal pools or other natural wetlands, may occur near some of the lands subject to idling, but such habitats would not be affected by the proposed action, as the hydrology in the natural and artificial waterways would remain unchanged. Also, the bald eagle, which may be present as a transient, would only be expected on these lands during the winter when water fowl, one of its sources of food, are present.

The special-status species in the Sacramento River and Delta would not be adversely affected, as the water levels in those systems would be slightly augmented. There would be no adverse affect on the Sacramento River winter-run Chinook salmon (listed as state and federally endangered), Central Valley spring-run Chinook salmon (listed as federally threatened), the delta smelt (listed as state and federally threatened), the Central Valley steelhead (listed as federally threatened), and the green sturgeon (listed as federally threatened).

Detailed species specific accounts follow.

Giant Garter Snake (Thamnopsis gigas)

The giant garter snake (GGS) may be found in agricultural wetlands such as rice fields and irrigation and drainage canals. These artificial wetlands and waterways can potentially be used for purposes such as ease of movement; protection from predators; warmth to aid metabolism, gestation, and digestion; and as a food source. (*Draft Recovery Plan for the Giant Garter Snake. 1999*). While the irrigation patterns throughout the Settlement Contractors' lands would be modified as a result of the proposed project, water levels in irrigation and drainage canals would be maintained within several inches of non-CVP operations, and no complete drying out of such conveyances would occur. As such, water conveyance systems would remain watered and available to the snake and other wildlife that utilize it. In this regard, the lands within GCID that are currently enrolled to participate in the forbearance program for 2008 are depicted on the map in Figure 3. GCID's extensive network of lateral and drainage canals is also depicted on this map. This map shows that all of these enrolled lands are within one-quarter mile or closer to GCID's canal network. This further serves to minimize any

potential adverse affects to the GGS by providing transportation corridors and foraging and cover areas in immediate proximity to the fallowed lands.

Flooded rice fields in the Sacramento Valley can be used by the GGS for foraging, cover, and dispersal purposes. The non-irrigated CVP fields would have little or no vegetation, retaining the open character that is currently present in fields that are between plantings or that otherwise have relatively little vegetative cover. The maximum increase in the percentage of land idled in this project would be 20 percent of the total amount of acreage within GCID served with surface water deliveries during the 2007 irrigation season. Accordingly, at least 80 percent of GCID's irrigable acreage would remain unaffected or would be subject to changed cropping selection that preserves the vegetated condition of the land. Lands taken out of production would be dispersed throughout GCID such that the contiguous nature of idled lands would be minimized, allowing for a mosaic of lands that could be utilized by the GGS throughout GCID's jurisdiction. The changes to agricultural fields that would occur under the proposed project could have minor and temporary indirect effects on the GGS through the decrease in potential cover and foraging areas as a result of the reduction in planted rice acreage. The 1-year duration of the proposed project minimizes any potential disruption to the GGS. Moreover, GCID, in consultation with the Service, has developed certain best-management operations and maintenance practices for agricultural lands that are within GGS habitat. GCID implements these measures on a voluntary basis in order to minimize any impacts to the GGS.

Therefore, Reclamation's Proposed Action Alternative (enter into an agreement with GCID and SLDMWA) would not cause a direct adverse or cumulative adverse effect on GGS in the study areas.

Northwestern Pond Turtle (Clemmys marmorata marmorata)

The northwestern pond turtle inhabits waters with little or no current. The banks of inhabited waters usually have thick vegetation, but basking sites such as logs, rocks, or open banks must also be present. Pond turtles lay their eggs in nests in upland areas including grasslands, woodlands, and savannas. Pond turtles could potentially be found in and along irrigation and drainage canals, but would not be residents of rice fields. The proposed project would not eliminate water from the conveyance canals within each service area. Therefore, the proposed project would not impact the northwestern pond turtle, either directly or indirectly.

Therefore, Reclamation's Proposed Action Alternative, i.e., to enter into an agreement with GCID and SLDMWA, would cause neither a direct adverse effect nor a cumulative adverse affect on the northwestern pond turtle in the study areas.

Chinook Salmon (Oncorhynchus tshawytscha), Delta Smelt (Hypomesus transpacificus), Steelhead (Oncorhynchus mykiss), and Green Sturgeon (Acipenser medirostris)

The Sacramento River south of GCID and the Delta form a migration corridor and provide seasonal rearing habitat for winter-run and spring-run Chinook salmon, steelhead, and green sturgeon. The Delta and lower Sacramento River also provide spawning and nursery habitat for

delta smelt. The proposed delivery of water to SLDMWA would be delivered through the Delta with timing similar to SLDMWA's typical CVP deliveries in conformance with all existing and pending requirements under the Endangered Species Act (ESA), including court orders, which govern CVP and SWP operations for the protection of Chinook salmon, delta smelt, green sturgeon, and steelhead.

The proposed action would not compromise the environmental regulations that specify minimum flow requirements for winter-run and spring-run Chinook salmon and steelhead. Required releases from Shasta Reservoir for the protection of fisheries would continue to be made. Flows in the lower reaches of the Sacramento River and much of the Delta would increase slightly. Diversions through the pumps in the Delta would occur under the requirements of the court's interim remedies order in *NRDC* v. *Kempthorne*, which will govern CVP and SWP operations for the protection of the delta smelt, pending the conclusion of the current consultation on the Long-Term CVP and SWP OCAP with the Service and the NOAA Fisheries Service. This consultation is expected to provide new biological opinions during 2008 for delta smelt, salmon, and green sturgeon that would replace the court's interim remedies order. SLDMWA's diversions of water made available under this proposed project would be undertaken in compliance with the new biological opinions. As such, there would be no direct or indirect impact from the proposed project on listed fish species in the Delta.

Therefore, Reclamation's Proposed Action Alternative (enter into an agreement with the Settlement Contractors and SLDMWA) is unlikely to adversely affect listed species.

Geology and Soils

No Action Alternative

No change from the existing pre-CVP conditions.

Proposed Action Alternative

Based upon readily-available soil map information, most of the CVP area is underlain by fine-textured, strongly-structured soils such as clay and silty clay. Such soils are susceptible to wind erosion but have a relatively low wind erodibility index. The National Resources Conservation Service's 2001 Annual National Resources Inventory found that wind erosion averaged 2.1 tons per acre on cropland.

Agricultural practices dominate over climatic variability in determining temporal variability in dust blowing off cropland in the Sacramento Valley. Farming operations that increase wind erosion and dust emissions include plowing, leveling, planting, weeding, seeding, fertilizing, mowing, cutting, baling, spreading compost or herbicides, and burning fields. These actions can be avoided when a field is left fallow for the season, resulting in a net reduction of wind erosion and dust.

The use of the soils for the proposed project is short-term and is in accordance with past farming practices. No significant impacts are expected from the proposed project.

Agricultural Resources/Land Use

No Action Alternative

Under the No Action Alternative (the typical benchmark), a small percentage of lands within GCID's service area would be rotated and temporarily removed from farm production for improvements such as land leveling, weed abatement, etc. When land is rotated, in almost all occasionss some water is applied to check the leveling actions and also to aid in weed eradication.

Proposed Action Alternative

Idled land for purposes of developing water for the proposed project would be above the typical amount of land typically not under production due to regular farming operational requirements. Within SLDMWA, the proposed activity would result in maintaining typical irrigation patterns and avoiding an increased amount of land idling during 2008 due to water shortages during that year. The amount of water supplementing the SLDMWA participating districts' CVP allocation will amount to a maximum, after deductions for Delta carriage losses, of approximately 68,000 acre-feet, representing approximately 4 percent of the Contract Total for the participating districts. This is an amount within the normal annual variability of such deliveries and less than the Contract Total that has been applied in some years. Therefore, the additional water will not be expected to significantly increase the farmed acreage.

Acreage within GCID's service area may be temporarily idled or cropping patterns shifted (or irrigated with groundwater) to generate the quantity of water identified under the proposed project. The quantity of water made available would be determined based upon the agreed-upon acreage and consumptive use schedule for the lands idled, irrigated with groundwater, or subject to crop shifting. The land idling and cropping changes are considered ongoing routine agricultural activities: the magnitude and intensity of which changes from year to year in response to various factors. No land use changes other than the intended temporary fallowing would result from this action and, because of the short-term duration of this activity (2008 only), this action would not act as an incentive for land use changes.

Cultural Resources

No Action and Proposed Action Alternatives

Reclamation's No Action and Proposed Action Alternatives would not affect cultural resources because the proposed project does not change land use or include construction of new facilities. Water use and land use would remain unchanged during the 1 year of the proposed project.

Indian Trust Assets

No Action and Proposed Action Alternatives

Reclamation's No Action and Proposed Action Alternatives would not affect any Indian Trust Assets (ITA) within the study areas. The Colusa and Cortina Rancherias' Indian lands closest to GCID's service area are approximately 3 and 7 miles, respectively, from GCID. There could be minor, temporary impacts from groundwater pumping to these ITAs. Modeling of groundwater pumping in recent environmental analyses, such as the Environmental Impact Statement for the renewal of the Sacramento River Settlement Contracts, indicated that even substantial groundwater pumping would only cause localized and temporary effects. However, Reclamation would require monitoring of the effects of groundwater pumping to verify this expected absence of impacts. Other actions identified in this EA, such as rice fallowing, will have no effect to the Cortina and Colusa Rancherias. Therefore, no permanent effects are expected.

Environmental Justice

No Action and Proposed Action Alternatives

The No Action or the Proposed Action Alternative would not disproportionately affect minority and low-income populations. Land idling activities and the associated remuneration would allow continued agricultural production and its workforce. Dry conditions may reduce some agricultural work, but by optimizing the use of the limited water resources, only temporary minor shifts of the location of some work would occur.

Cumulative Impacts

No Action Alternative

The condition of all environmental resources under the No Action Alternative would be identical to the existing pre-CVP conditions.

Proposed Action Alternative

Forbearance of surface water supplies by contractors in the Sacramento Valley through the Delta for consumptive uses and environmental purposes has been occurring for almost 10 years. The only demonstrable adverse impacts known to have occurred were some impacts to groundwater levels and individual well owners' water supplies during drought years as part of some early forbearance activities in Butte County, using groundwater substitution to generate the forborne water. Those effects have not occurred during more recent forbearance programs because of aggressive monitoring by a number of parties to prevent such effects. The estimated 2,500 acre-feet of groundwater substitution included in the proposed action would not result in an adverse cumulative effect on groundwater levels in the CVP area. During the groundwater pumping period, GCID will actively monitor surrounding wells and private wells to insure GCID's well pumping does not impact adjacent lands. If GCID determines that impacts may occur, or is notified by an adjacent landowner that impacts are occurring, GCID will reduce or eliminate the operation of its wells. However, as a result of GCID's water deliveries to

non-fallowed lands and canal seepage, it is expected that GCID will recharge the groundwater aquifer in excess of 100,000 acre-feet within its service area, thus, the groundwater pumping will be completely offset by groundwater recharge, which should not impact groundwater levels or pumping by others.

Because the project is of limited duration (1 year) and will represent only a minimum incremental increase in groundwater pumping from the basin during the 2008 irrigation season, no significant groundwater impacts are anticipated. Groundwater supply data collected as part of DWR Bulletin 160-05 indicates that approximately 1,200,000 acre-feet of groundwater is extracted from the Sacramento Valley portion of Butte, Colusa, Glenn, and Tehama Counties during a normal water year. The groundwater substitution component of this project is only 2,500 acre-feet, or less than one-half of 1 percent of the regional average annual groundwater extraction. In addition, GCID operated a much larger groundwater program during 1994: a dry year. In 1994, the groundwater program produced approximately 65,000 acre-feet of groundwater during the summer months, and there was significant additional pumping that occurred outside of GCID and in other nearby districts. Groundwater levels across the region declined approximately 30 feet during the pumping period; however, the water levels fully recovered during the fall of 1994 and the winter of 1995.

Within the SLDMWA service area, the slight increase in available surface supply from the project would have a potentially beneficial, but not significant, effect on groundwater table levels insofar as the supplemental supply replaces groundwater pumping. Because of water shortage and regulatory activities, users within the SLDMWA service area have implemented extensive water conservation and reuse activities. Therefore, the application of the supplemental water, representing an increment of approximately 4 percent of the Contract Total for the participating districts and of the south-of-Delta Contract Total for all CVP water service contractors, will not be expected to have any effect on groundwater.

Table 4 below summarizes the recent history of water transfers from the Sacramento Valley to other portions of California. Table 4 shows that the proposed transfers for 2008 that are reasonably foreseeable total 360,000 acre-feet. This represents less than 4.5 percent of total average agricultural water use in the Sacramento Valley and 1.9 percent of the average annual total water supply available in the Sacramento Valley from surface and groundwater resources for all uses. As such, and recognizing that no significant impacts have been noted for transfers within this order of magnitude, no significant impacts are expected within the Sacramento Valley as a result of the proposed project. Delta impacts are likewise not expected to be significant, as all of the water shown in Table 4, plus an additional 25,000 acre-feet in 2001 from a San Joaquin River transfer, was pumped in the Delta within existing biological constraints and without incident. Therefore, even if there were additional transfers beyond these levels, such transfers would probably need to be on the order of magnitude of several hundred thousand acre-feet more in order even to pose the potential for adverse effects on the environment.

Table 4
Recent Water Transfers (000s acre-feet)

Program	1991	1992	1993	1994	2001	2002	2003	2004	2005	2006	2007	2008 *
DWR Drought Water Banks Dry Year Programs	820	193	0	220	138	22	11	1	0	0	0	0
Environmental Water Act					80	142	70	120	5	5	125	70
Sacramento Valley Forbearance					160							85
Others						5						205
Totals	820	193	0	220	378	169	81	121	5	5	125	360

***** 2008 numbers are estimated transfers.

Given the chronic shortages in allocations of CVP irrigation water to south-of-Delta CVP water service contractors, the SLDMWA and its members have multiple programs to obtain supplemental supplies. These range from historic district-to-district transfers among CVP contractors in the area, reallocation agreements among SLDMWA members, transfers from the Exchange Contractors to CVP water service contractors, and other similar transfers to SLDMWA. Under the Proposed Action, the total of all such transfers will not exceed the total contract quantity under the participants' respective water service contracts. Reclamation retains the right to consent to any transfers utilizing CVP facilities and, therefore, can insure that any further transfers do not lead to cumulative impacts.

CONSULTATION AND COORDINATION

The CEQA document on which this Environmental Assessment was based was circulated through the State Clearinghouse and otherwise made available for public comment. Accordingly, Reclamation did not adopt a separate, redundant pubic review for this EA. The proposed GCID Negative Declaration/Initial Study (to be appended to the Final EA) pursuant to the CEQA was completed on March __, 2008.

During preparation of this document, the following agencies were coordinated with and/or assisted in preparing the document:

- U.S. Fish and Wildlife Service
- NOAA Fisheries Service
- Glenn-Colusa Irrigation District
- San Luis & Delta-Mendota Water Authority

Consultation

Reclamation has consulted with NOAA Fisheries Service pursuant to the ESA for this action. ESA consultation with the Service was completed for the proposed action on March __, 2008 (to be appended to the Final EA) with concurrence of Reclamation's finding that the proposed action is not likely to adversely affect the threatened delta smelt and threatened GGS.

NOAA Fisheries Service concurred with Reclamation's finding on March __, 2008 (to be appended to the Final EA) that the proposed action will not adversely affect the federally-listed endangered Sacramento River winter-run Chinook salmon, threatened Central Valley spring-run Chinook salmon, threatened Central Valley steelhead, or threatened green sturgeon or their critical habitat.

Initial Study and Proposed Negative Declaration for Western Canal Water District 2015 Water Transfer Program

Lead Agency: Western Canal Water District

For additional information regarding this document contact:

Ted Trimble, General Manager, Western Canal Water District
P.O. Box 190 Richvale, California 95974

February 2015

TABLE OF CONTENTS

SECTION 1
PROJECT DESCRIPTION

1.0 PROJECT INTRODUCTION AND BACKGROUND

The Western Canal Water District (WCWD) proposes to sell up to 35,442 acre-feet (af) of water to the participating member districts of the State Water Contractors Incorporated[1] or other South of Delta purchasers, including Central Valley Project contractors (collectively Buyers) during the 2015 irrigation season. Buyers are seeking up to approximately 194,000 af of transfer water from various willing sellers in the Sacramento Valley during the 2015 irrigation season. Purchasing this water would lessen potential water supply shortages to these Buyers that may occur as a result of dry hydrologic conditions and regulatory restrictions on pumping in the Delta.

As willing sellers, WCWD would make up to 35,442 af of water available to Buyers by idling cropland (i.e., non-irrigation of farmland by voluntary participants).

Water made available by crop idling within the boundaries of the WCWD would then be retained and stored by the Department of Water Resources (DWR) for delivery to Buyers.

Western Canal Water District

WCWD's entitlement to Feather River water is 295,000 acre-feet, subject to curtailment under a 1985 agreement with DWR. WCWD proposes to not divert a portion of its water from the Feather River under this one-year transfer, which would allow DWR to deliver a portion of the foregone water to Buyers through the State Water Project (SWP) or Central Valley Project (CVP). The WCWD boundaries encompass approximately 67,500 acres in the northern Sacramento Valley in Butte and Glenn Counties (Figure 1). Within the WCWD boundary are approximately 58,520 irrigable acres, of which approximately 53,700 acres are dedicated primarily to the production of rice.

The 1985 agreement with DWR (1985 Agreement) requires written approval from DWR before WCWD can transfer water outside the service area of WCWD. An agreement between DWR and the proposed water purchasers to store or transport the water through the SWP or CVP facilities may also be required to implement the transfer.

For the last five years, on average, less than 1% of the acreage dedicated to rice production in WCWD is fallowed for non-transfer purposes and temporarily removed from farm production so improvements such as weed abatement, land leveling, etc. can be made. In 2014, the last year a transfer occurred, 20% of rice land was idled due to the 2014 transfer.

The proposed project would idle up to 20% of the rice acreage in WCWD's service area that would otherwise be irrigated in 2015. Idling would occur within approximately 53,700 acres dedicated primarily

[1] The State Water Contractors, Inc. is an association of 27 public agencies that purchase water under contract from the California State Water Project. Depending on the hydrologic conditions existing in the spring of 2015, all or a portion of these agencies may elect to receive all or a portion of the water purchased. Currently, 13 members of the State Water Contractors, Inc. have expressed interest in purchasing water under WCWD's possible transfer. WCWD may also sell to other South of Delta purchasers, including one or more Central Valley Project contractors, or individual State Water Project contractors, or individual persons or entities within a CVP or SWP contractor service area with appropriate approvals necessary to accomplish such a transfer.

to rice production, so up to 10,740 acres could be idled under this program. The accepted Evapo-Transpiration Rate of Applied Water (ETAW)[2] for rice culture is 3.3 acre feet per acre per growing season, which is consistent with the recent ETAW rates used for water transfers in the Sacramento Valley based on crop idling of rice acreage (*California Water Plan Update. Bulletin 160-05*. December 2005). Thus, the water made available for transfer by reduced crop evapotranspiration for the projected idled acreage would be up to 35,442 acre feet (10,740 acres x 3.3 AF/acre).

Under the 1985 Agreement, WCWD's water entitlement is subject to curtailment under certain circumstances related to dry hydrologic conditions. If WCWD's entitlement is curtailed for the 2015 irrigation season pursuant to the 1985 Agreement, WCWD will not participate in any transfer.

1.1 Project Location

WCWD

The project area, from which the water for this transfer will be made available, is defined by the WCWD boundaries which encompass approximately 67,500 acres in the northern Sacramento Valley in Butte and Glenn Counties (Figure 1). Within the WCWD boundaries are approximately 58,520 irrigable acres, of which approximately 53,700 acres are dedicated primarily to the production of rice.

Land idled for the purpose of this transfer will be drawn from the irrigable acreage within WCWD's boundaries. Since the program will be offered to all eligible growers and it is anticipated that there will be more interest than WCWD desires to offer, a wide dispersal of acreage enrolled in the program is expected. WCWD will require program participants to disperse idled acreage and make clear to participants that large, contiguous blocks of idled land related to this program are undesirable. Dispersing the program acres throughout WCWD assures that adequate water levels will be maintained in transmission canals so that wildlife impacts otherwise associated with dewatering the canals will be avoided, as will impacts associated with habitat loss which might occur with large, contiguous blocks of fallowed land. Only cultivated rice land that is subject to regular, seasonal farming practices will be affected. Adjoining areas, non-rice land, other irrigated lands, drains, wetlands and waterfowl habitat will not be affected, as those areas will receive their normal entitlement and canals and drains will operate at normal operating capacity.

WCWD's proposed transfer will fully comply with DWR's Technical Information for Water Transfers in 2015, as applicable to land idling transfers.

1.2 Water Availability and Transfer

No new construction or improvements by WCWD, Buyers, or DWR would be necessary for the production and transfer of this water.

Water that would not be diverted would be available for transfer to Buyers through SWP facilities operated by DWR, including Lake Oroville, or transferred by DWR to CVP facilities. Water would accrue in storage on the basis of estimates of the amount of water that would have been consumed on the

[2] ETAW is defined as the portion of the total evapotranspiration that is provided by irrigation. The portion of evapotranspiration met by precipitation occurring during the growing seasons or stored as soil moisture within the root zone before the growing season does not qualify as transferable water. ETAW values used for water transfer calculations are based upon crop water demands reflecting average rainfall and evaporative demand.

idled land but for the program. That is, the water that would have been consumed in the process of crop use, would be available for transfer.

The portion of applied water, which would have normally returned to the Feather/Sacramento River system as tailwater or groundwater discharge to surface waters, would remain available for instream use and diversion by others and would not be transferred.

As the ETAW for rice culture in the Sacramento Valley is calculated at 3.3 acre feet per acre per growing season, each acre of idled rice production will make available for transfer 3.3 acre feet of water throughout the growing season.

The typical growing season for rice in California is May through September. The potential ETAW demand across these months is shown in Table 1.1 with the corresponding water production expectations based on WCWD providing the maximum amount of transfer water from fallowing 20% of its rice acreage.

TABLE 1.1

Water Production Schedule

	May	June	July	August	September	
ETAW in Percent	15	22	24	24	15	
Water Production In Acre Feet: WCWD	5316.3	7797.2	8506.1	8506.1	5316.3	
Total Production For Transfer in 2015 in Acre-Feet						35,442

During the implementation of the proposed project, water transferred by WCWD would be deemed transferred at WCWD's points of diversion on the Thermalito Afterbay and custody would then transfer to Buyers. As the operator of the SWP, depending on the hydrologic and regulatory conditions controlling SWP operations, DWR may be able to utilize Lake Oroville storage to facilitate the transfer during periods when Delta conditions prevent export of the transfer water. DWR would make every effort to use Lake Oroville to regulate the water in a manner which would allow for delivery of the water through the Sacramento-San Joaquin Delta, for export through the Banks or Barker Slough or Jones Delta Pumping Plants for ultimate delivery to Buyers.

When exporting water from the Delta DWR must comply with all current State and federal regulatory requirements in effect at the time of the export pumping, including numerous environmental standards, laws, biological opinions, interim and final court orders, and regulations relating to Delta inflow and outflow, Delta water quality, fish protection, environmental needs, water rights, and the needs of other legal users, including legal in-basin demands. These requirements include applicable SWRCB orders,

Army Corps of Engineers (Corps) permits, Biological Opinions and other regulatory constraints including any relevant judicial orders in effect at the time of the operation. They have established water quality and flow requirements and limits on the rate of export of water that can be pumped by the state and federal pumping plants. The proposed project does not increase Delta export rates beyond permitted limits.

Recent regulatory restrictions have been imposed on SWP operations which significantly reduce exports from the Delta. These restrictions include the United States Fish & Wildlife Service (USFWS) Biological Opinion for delta smelt issued in December 2008. In February 2009, additional restrictions were included in the Califronia Department of Fish & Wildlife CDFW Incidental Take Permit for longfin smelt and National Marine Fisheries Service (NMFS) Biological Opinion for anadromous fisheries and marine mammal species issued in June 2009. These restrictions are, in the view of the regulatory agencies, necessary to minimize the effects of pumping on fisheries populations currently and in the future in order to prevent jeopardy and protect listed fish species and habitat. The biological opinions and permits for these listed species include requirements that improve Delta aquatic habitat through export restrictions, changes in Delta flows, and land-based projects to restore fish habitat. In addition, requirements include improvements in handling of fish salvaged at the fish protection facilities and other measures to improve fish survival. Such requirements also improve the Delta ecosystem and provide benefits to other fish besides those listed under the state and federal endangered species acts. Litigation over the biological opinions resulted in federal district court decisions in 2010 and 2011 invalidating the USFWS Biological Opinion and NMFS Biological Opinion, respectively, but recent Ninth Circuit Court decisions partially reversed the district court decisions on these Biological Opinions, and upheld them. The SWP and CVP will be operated under these Biological Opinions or until any new biological opinions are completed.

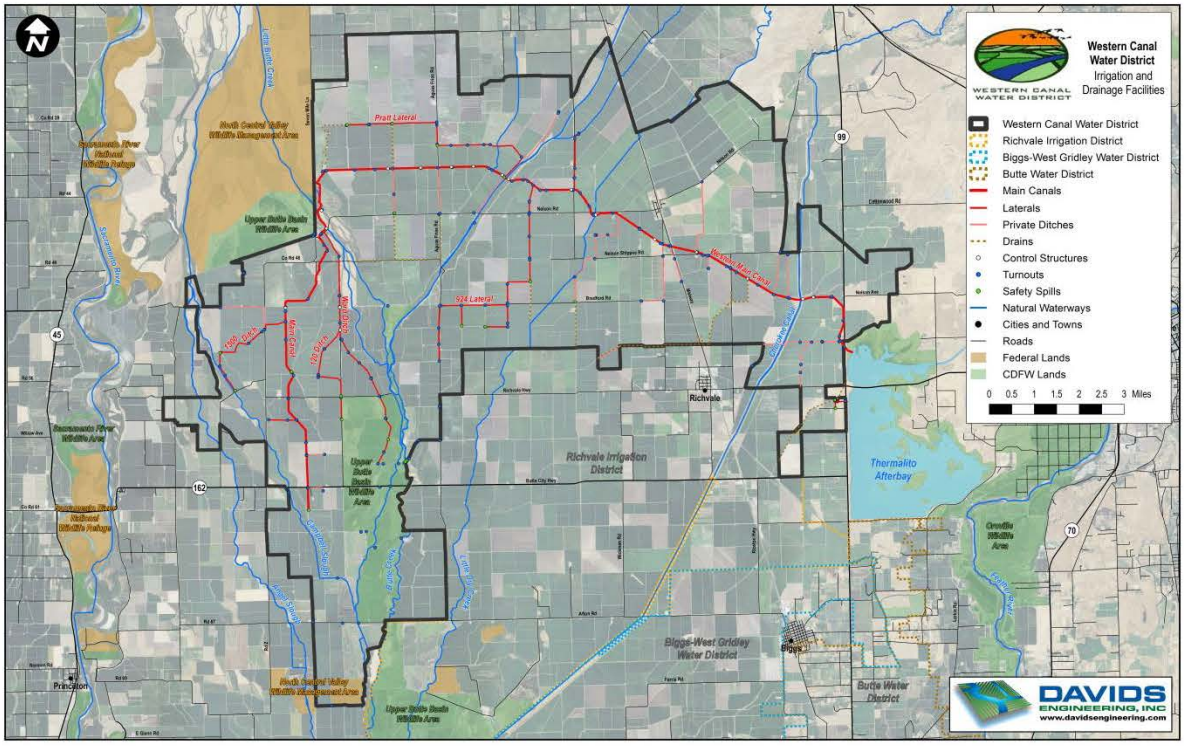
Operational restrictions likely will continue until long-term solutions to the problems in the Delta are implemented. These regulatory restrictions and hydrologic conditions substantially limit SWP and CVP operations during specific periods of the year. The current transfer period at Banks Pumping Plant (SWP) and Jones Pumping Plant (CVP) is typically limited to July through September. Additional restrictions could further limit either or both pumping plants' capacity for export of transfer water.

DWR estimates that approximately 20%-30% of the water transferred through the Delta would be necessary to enable the maintenance of water quality standards, which are based largely upon the total amount of water moving through the Bay-Delta system, known as "carriage water." Therefore, this transfer could yield up to approximately 24,809 acre feet [10,740 ac x 3.3 AF/ac less 30%] to Buyers. At the end of the irrigation season, the amount of carriage water actually required is calculated. Depending upon the hydrologic year type and other operational constraints, the actual amount of carriage water assessed for the transfer may vary somewhat from this estimate.

1.3 Use of Water by Buyers

It is contemplated that the Buyers will be required to purchase the water by April 24, 2015. If the water is purchased, Buyers would take delivery of this water in a manner physically identical to their typical SWP or CVP deliveries. One buyer may take 100% of the water WCWD makes available or a group of buyers may share on a pro-rata basis. The transfer water would provide additional resource options to Buyers to mitigate potential dry-year water shortage conditions in 2015. This water would represent backfilling of a shortfall of water normally and historically received into Buyers service areas. Accordingly, any water transferred under the proposed Project would not represent a dependable long-term increase in supply. As such, no adverse Project-specific impacts to Buyers' service areas due to the proposed transfer would occur.

Figure 1 – Project Location



SECTION 2
INITIAL STUDY

The following Initial Study, Environmental Checklist, and evaluation of potential environmental effects (see Section 3) were completed in accordance with Section 15063(d)(3) of the State CEQA Guidelines to determine if the proposed project could have any potentially significant impact on the physical environment.

An explanation is provided for all determinations, including the citation of sources as listed in Section 4. A "No Impact" or "Less-than-significant Impact" determination indicates that the proposed project will not have a significant effect on the physical environment for that specific environmental category. No environmental category was found to have a potentially significant adverse impact with implementation of the proposed project.

INITIAL STUDY AND ENVIRONMENTAL CHECKLIST FORM

1. Project Title: Western Canal Water District 2015 Water Transfer Program

2. Lead Agency Name and Address: Western Canal Water District
PO Box 190
Richvale, California 95974

3. Contact Person and Phone Number: Ted Trimble (530) 342-5083

4. Project Location: Refer to Section 1 (1.1) of the Negative Declaration

5. Project Sponsor's Name and Address: Western Canal Water District
PO Box 190
Richvale, California 95974

6. Description of Project: Refer to Section 1 of the Negative Declaration.

7. Surrounding land uses and setting: Agricultural/rural setting zoned for agricultural use.

8. Other agencies whose approval is required:

Buyers are all or some portion of the State Water Contractor, Inc.'s member agencies and/or San Luis and Delta Mendota Water Authority and its individual agencies or persons or entities within the CVP or SWP service area. Depending on the hydrologic conditions existing in the spring of 2015, all or a portion of these agencies may elect to receive all or a portion of water purchased.

California Department of Water Resources: Contract approval and CEQA compliance.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology /Soils
☐ Hazards/Hazardous Materials	☐ Hydrology / Water Quality	☐ Land Use / Planning
☐ Mineral Resources	☐ Noise	☐ Population / Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities / Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION:
On the basis of this initial evaluation:

☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Ted Trimble
Signature

February 3, 2015
Date

Ted Trimble
Printed Name

WCWD
For

SECTION 3
EVALUATION OF ENVIRONMENTAL IMPACTS

I. AESTHETICS – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion:

a,b,d) **No Impact.** As there would be no construction activities with project implementation, no potential aesthetic resources would be impacted or altered. In addition, there would be no new sources of light and glare added to the project site. Hence, there would be no impacts to aesthetics with the proposed project.

c) **Less-than-significant Impact.** The pattern of cropping in the area within WCWD's jurisdiction would be altered slightly, in that somewhat more land would be idled due to the implementation of the proposed project (i.e., up to 20% of total rice acreage). Idled land is a typical feature of the agricultural landscape in the WCWD's jurisdiction and would not differ substantially from the existing environmental setting. As such, there would be a less-than-significant impact to the existing visual character within the farmlands occurring in WCWD's jurisdiction. WCWD's proposed transfer would fully comply with the terms and conditions applicable to land idling transfers as set forth in DWR's Technical Information for Water Transfers in 2015.

II. AGRICULTURE RESOURCES: Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒

Discussion:

a-c) No Impact. As a single-year activity, the proposed project would not convert any farmland (Prime, Unique, Important or otherwise) to non-agricultural uses. The proposed activity would result in a reduction in the amount of farmland irrigation during the 2015 growing season and an increase in the amount of land idled for that year. Participation in the proposed project would be solely voluntary. Zoning, agricultural conversion and Williamson Act issues would not be changed. No impact to agricultural resources would occur with project implementation.

III. AIR QUALITY: Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Conflict with or obstruct implementation of the applicable Air Quality Attainment Plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☐	☐	☒

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion:

a-e) **No Impact.** The Project site is located in the Sacramento Valley Air Basin. To the extent less agricultural land would be cultivated, less air pollutant emissions would be emitted from normal farm practices (e.g., internal combustion engine emissions from tilling, seeding, pesticide application, etc.). These reductions in air emissions would be beneficial; however, such reductions (i.e., up to 20% of typical rice farming activities) would not be that noticeable within the Sacramento Valley Air Basin for the short project duration. Odors associated with farming activities may lessen to a minor degree, due to the decrease in farming activities during the growing season. Overall, there would be no impacts to the air basin with project implementation.

IV. BIOLOGICAL RESOURCES – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion:

a) Less than significant Impact. Several special-status wildlife species have the potential to occur within the project area: the giant garter snake (listed as state and federally threatened), the northwestern pond turtle (listed as a state species of special concern and federal species of concern), the winter-run Chinook salmon (listed as state and federally endangered), the spring-run Chinook salmon (listed as state and federally threatened), the delta smelt (listed as state and federally threatened), the longfin smelt (listed as state threatened), and the steelhead (listed as federally threatened), and the green sturgeon (listed as federally threatened).

Giant Garter Snake (*Thamnophis gigas*)

The giant garter snake can be found in agricultural wetlands such as irrigation and drainage canals. These artificial waterways can be used for purposes such as ease of movement; protection from predators; warmth to aid metabolism, gestation, and digestion and as a food source. (Draft Recovery Plan for the Giant Garter Snake. 1999.) While up to 10,740 acres of land may be idled throughout WCWD's jurisdiction as a result of the project, water levels in irrigation and drainage canals would be maintained at normal operating elevations and no drying of such conveyances would occur. As such, WCWD's water conveyance system would remain watered and available to the snake and other wildlife that utilize it.

Flooded rice fields in the Sacramento Valley can be used by the giant garter snake for foraging, cover and dispersal purposes. The non-irrigated project fields would have little or no vegetation, retaining the open character that is currently present in fields that are between plantings or that otherwise have relatively little vegetative cover. Because the maximum percentage of land idled for this project would be no more than 20% of the District's rice acreage, at least 80% of WCWD's rice acreage would remain unaffected. Lands taken out of production would be dispersed throughout the WCWD's jurisdiction such that the contiguity of idled lands would be minimized allowing for a mosaic of lands that could be utilized by the snake throughout WCWD's jurisdiction. The changes to agricultural fields that would occur under the proposed project could have minor and temporary effects on the giant garter snake through the decrease in potential cover and foraging areas as a result of the reduction in

planted rice acreage. The one-year duration of the program minimizes any potential disruption to the giant garter snake.

Crop idling conservation measures will be incorporated into the proposed 2015 water transfer program. These include:

The water sellers will ensure a depth of at least two feet of water is maintained in the major irrigation and drainage canals to provide movement corridors for giant garter snakes;

Water will not be purchased from a field fallowed during the immediately preceding two years; however, water may be purchased from the same parcel in successive years.

Water transfer actions will be limited so that no more than 20 % of rice fields are idled in any one County, parcels idled will be no more than 320 acres in size, and will be distributed across the landscape in a checkerboard pattern (idled parcels will not be adjacent to each other). Having the fallowed/idled rice acreage spread throughout the Sacramento Valley will help to assure that the total water conveyance system remains in its normal year wetted-up condition. The 320 acre blocks will not be located on opposite sides of a canal or other waterway, and will not be immediately adjacent to another fallowed parcel. The 20 percent limitation also helps alleviate potential socioeconomic effects and is based on California Water Code. California Water Code Section 1745.05 (b) states that: "The amount of water made available by land fallowing may not exceed 20 percent of the water that would have been applied or stored by the water supplier in the absence of any contract entered into pursuant to this article in any given hydrological year, unless the agency approves, following reasonable notice and a public hearing, a larger percentage."

In addition, WCWD will agree to voluntarily perform giant garter snake best management practices (BMPs), including educating all staff to recognize and avoid contact with giant garter snakes, clean only one side of a conveyance channel per year, provide rock-basking habitat in the system's water prisms, and raise flail mower blades to at least six inches above the canal operation and maintenance road surfaces.

An analysis of available research conducted by PMC (Appendix 1) on the abundance, distribution, movements, and habitat selection of giant garter snakes in the region suggests that population densities and abundance in the project study area are low due to poor habitat suitability. In addition, the checkerboard pattern of fallowing may result in more functionally available edge habitat for giant garter snakes, which is preferred by snakes in rice agriculture. The giant garter snakes' home range size and composition within rice agriculture have been reported to be smaller and less structurally diverse than in natural or constructed wetlands. As a result, it is anticipated that the available active ricelands would be adequate to support the estimated giant garter snake population in the project study area.

For example, the Butte County Regional Conservation Plan (Butte RCP) reports GGS densities in rice acreage as 0.036 snakes per acre. The Western Canal Water District (WCWD) 2015 water transfer proposal states that there are approximately 53,700 acres of rice agriculture in its district, which when multiplied by the reported density in the Butte RCP, results in the estimation that there are 1,933 snakes in the WCWD. Assuming each snake requires 13 hectares (32.1 acres) (Valcarcel 2011), the GGS population in the WCWD would require approximately 62,056 acres of habitat. This acreage could then be further classified into aquatic and terrestrial habitat based on the home range compositions reported by Valcarcel (2011). Assuming each GGS home range is composed of 40% terrestrial habitat and 60% aquatic habitat (includes aquatic and emergent habitat), the GGS population in the RID would require approximately approximately 37,234 acres of aquatic habitat and 24,822 acres of terrestrial habitat.

If 20% of the 53,700 acres of ricelands within the WCWD are fallowed, then approximately 42,960 acres would remain active. Based on these data, it is anticipated that an adequate amount of aquatic habitat would exist within the project study area to support the GGS population, due to the fact that these

calculations assume no overlap in GGS home range, and do not consider available canal/agricultural waterway habitat. As a result, it is anticipated that implementation of the proposed avoidance and minimization would reduce potential giant garter snake impacts to a less-than-significant level.

Northwestern Pond Turtle (*Clemmys marmorata marmorata*)

The northwestern pond turtle inhabits waters with little or no current. The banks of inhabited waters usually have thick vegetation, but basking sites such as logs, rocks, or open banks must also be present. Pond turtles lay their eggs in nests in upland areas, including grasslands, woodlands, and savannas. Pond turtles could be found in and along irrigation and drainage canals. The proposed project would not eliminate water from the conveyance canals within the WCWD's service area. Therefore the proposed project would not impact the western pond turtle.

Chinook Salmon (*Oncorhynchus tshawytscha*), Delta Smelt (*Hypomesus transpacificus*), Longfin Smelt *(Spirinchus thaleichthyes),* Green Sturgeon *(Acipenser medirostris* and Steelhead (*Oncorhynchus mykiss*)

The Sacramento-San Joaquin Delta is a migration corridor and seasonal rearing habitat for winter-run Chinook salmon and steelhead. It provides spawning and nursery habitat for Delta Smelt. Transfer water to the buyers would be delivered through the Sacramento-San Joaquin Delta with timing identical to the Buyers' typical SWP or CVP deliveries in conformance with all existing and pending requirements under the Endangered Species Act, including court orders, which govern SWP or CVP operations for the protection of Delta Smelt, and anadromous fishes and marine mammal species. The proposed transfer would not affect the regulatory or operational restrictions governing SWP or CVP operations. As such, there would be no impact from the proposed project on listed fish species in the Sacramento-San Joaquin Delta.

Western Yellow-billed Cuckoo

In the western United States, yellow-billed cuckoos breed in broad, well-developed, low-elevation riparian woodlands comprised primarily of mature cottonwoods (*Populus* spp.) and willows (*Salix* spp.). Western yellow-billed cuckoo are most successful in the type of broad riparian habitat that occurs in natural river systems, where the floodplain is still hydrologically connected to the river and allows for dynamic river processes and varying woodland age-stands across the landscape (78 FR 61622-61666).

This species is not associated with ricelands or the associated agricultural drainages and waterways; therefore, project-related impacts to western yellow-billed cuckoo will be less than siginificant.

Tricolored Blackbird

Tricolored blackbirds have three basic requirements for selecting their breeding colony sites: open accessible water; a protected nesting substrate including flooded or thorny /spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony.

There is five documented occurrences (California Natural Diversity Database 2015) within the District boundaries, all of which are associated with freshwater marsh habitat in drainages and other waterways. Tricolored blackbirds are not known to nest in ricelands and while some agricultural drainages and waterways in the District may contain suitable nesting substrates, the proposed idling program will maintain water in these features; therefore, impacts to this species are anticipated to be less than significant.

In sum, the proposed project would result in less-than-significant impacts to special status species because no wildlife would be directly affected by the idling activities and indirect impacts to habitat, such as a decrease in potential foraging and cover habitat for the giant garter snake, would be temporary (i.e, one year) and minimal.

b) **No impact.** The proposed action would have no effect on riparian or other sensitive habitats. All canals serving such areas would be in normal operations and all normal water deliveries thereto would be continued to those lands. Such areas may not participate in transfers, and all canals and drains adjacent to those lands will be in operation at normal operating levels. Therefore, there would be no impact to riparian or other sensitive habitats.

c) **No Impact.** No impacts to wetlands would occur from the proposed project due to continuation of normal deliveries to such lands during the Project; such lands are ineligible to participate in land idling transfers; and all canals and drains serving or transversing such areas will be operated at normal operating elevations throughout the Project.

d) **Less than significant Impact.**

Waterfowl
The proposed project would result in the fallowing of no more than 20% of rice fields within WCWD's jurisdiction. Rice fields in the project area serve as foraging habitat for many waterfowl species. However, implementation of the project would not interfere substantially with the foraging of native-resident or migratory waterfowl because other foraging habitat is abundant both locally and regionally. Because the proposed project would not convert any agricultural lands to non-agricultural land uses, the only change would be a one-year increase in the time between planting of rice in the project farmlands and a minor reduction in the acreage of rice lands available to waterfowl for foraging in 2015. This reduction in foraging acreage is less-than-significant based upon the regional abundance of flooded foraging habitat.

Fish Species
The proposed project may increase flows during July through September in the Feather and Sacramento Rivers resulting from the movement of transfer water. Such flow increases may have a beneficial effect on fishes in the river during the transfer period. Because of the relatively large volume of summer flows in the Sacramento River, changes in flows resulting from the water acquisition, even on a cumulative scale, would be small and effects on fish in the Sacramento River would be negligible. Therefore, there would be no adverse impact on the movement of any native resident or migratory fish species from the proposed project.

e,f) **No Impact.** The proposed project would not conflict with any local, regional or state policy, ordinance or conservation plan in effect for the area. Hence no impact to adopted habitat conservation plans would occur with project implementation.

V. CULTURAL RESOURCES – Would the proposed Action:

Issues and Determination:	*Less Than Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Less Than

Issues and Determination (continued):	*Less Than Potentially Significant Impact*	*Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Discussion:

a-d) **No Impact.** The proposed project does not involve any land alteration and thus no archeological or palentologic disturbances are possible within the proposed project's scope. In addition, with no construction activities proposed, there would be no disturbances to potential burial sites or cemeteries. Therefore, no impact to cultural resources would occur with project implementation.

VI. GEOLOGY AND SOILS – Would the proposed action:

Issues and Determination:	*Less Than Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒

	Less Than Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
i) Strong seismic ground shaking?	☐	☐	☐	☒
ii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iii) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on strata or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒

Issues and Determination (continued):	*Less Than Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion:

a) **No Impact.** No project facility falls within an Alquist-Priolo Earthquake Fault Zone, as presented in the most recent Division of Mines and Geology Special Publication 42. Hence, no impact relating to fault rupture zones would occur with project implementation.

b) **No Impact.** Based upon readily available soil map information, most of the project area is underlain by fine-textured, strongly structured soils, such as clay and silty clay. Such soils have a wind erodibility index of 86 (tons per acre per year) when in a dry, unvegetated condition (U.S Department of Agriculture 1993). Highly wind-erodible soils, such as fine sands and sands, have a wind erodibility index of 134-310. Therefore, the soils in the project area have a relatively low risk of wind erosion when left in a dry, unvegetated condition.

c) **No Impact.** Soils in the proposed project area consist of clays with a flat terrain. The proposed project would not result in instability of existing soils. The use of the soils for this short-term project is in accordance with past farming practices and no landslides, lateral spreading, subsidence, liquefaction or collapse have occurred, to date.

d) **No Impact.** Expansive soils are not known to occur within or on the proposed project site. Therefore, no impacts pertaining to expansive soils would occur with project implementation.

e) **No Impact.** The proposed project would not involve the use of septic tanks or alternative wastewater treatment disposal systems to handle wastewater generation. Therefore, no impacts would result with implementation of the proposed project.

VII. GREENHOUSE GAS EMISSIONS – Would the Proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant effect on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion:

a-b) **No Impact.** The proposed project would idle up to 20% of the rice acreage within WCWD's boundaries. While some field work, such as laser land leveling, may occur in idled fields by participating landowners, it is expected that substantially less field work will occur as a result of the proposed project than compared to no project conditions. By idling the land, less farm equiptment will be utilized and less greenhouse gas will be emitted. Further, the proposed action does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Overall, there would be no greenhouse gas emissions impacts with project implementation.

VIII. HAZARDS AND HAZARDOUS MATERIALS – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

Issues and Determination (continued) :	*Less Than Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion:

a-h) **No Impact.** The proposed project would not involve the transport or use of hazardous materials nor change any public exposure to hazards or hazardous materials beyond what is currently occurring with existing farming practices within WCWD's jurisdiction. Herbicide and pesticides use on rice lands would decrease by up to 20% from what is now occurring within WCWD's service area due to the idling for one year. This minor decrease in the use of such chemicals may be viewed as beneficial, but would not substantially affect the overall physical environment. Overall, there would be no hazardous impacts with project implementation.

IX. HYDROLOGY AND WATER QUALITY – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there should be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems?	☐	☐	☐	☒
	Less Than	*Less Than Significant*		

Issues and Determination (continued):	*Potentially Significant Impact*	*With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place housing within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation of seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion:

a) **No Impact.** The proposed project does not involve any discharges and thus would not violate water quality standards or waste discharge requirements. When exporting water from the Delta, DWR must comply with all current State and federal regulatory requirements in effect at the time of the export pumping, including numerous environmental standards, laws, and regulations relating to Delta inflow and outflow, Delta water quality, fish protection, environmental needs, water rights, and the needs of other legal users, including legal in-basin demands. These requirements include applicable SWRCB orders, Corps permits, Biological Opinions and other regulatory constraints including any relevant judicial orders in effect at the time of the operation. There are established water quality and flow requirements and limits on the rate of export of water that can be pumped by the state and federal pumping plants. The proposed project does not increase Delta export rates beyond permitted limits.

Recent regulatory restrictions have been imposed on SWP and CVP operations which significantly reduce exports from the Delta. These restrictions include the USFWS Biological Opinion for delta smelt issued in December 2008. In February 2009, additional restrictions were included in the CDFW Incidental Take Permit for longfin smelt and NMFS Biological Opinion for anadromous fisheries and marine mammal species issued in June 2009. Through litigation, the USFWS and NMFS Biological Opinions have been invalidated and the SWP and CVP will be operated under interim court orders until new biological opinions are completed. Operational restrictions will likely continue until new biological opinions are completed. These regulatory restrictions and hydrologic conditions substantially limit SWP and CVP operations during specific periods of the year. The current transfer period at the Jones and Banks Pumping Plants is typically limited to July through September. Additional restrictions could further limit Banks and Jones Pumping capacity for export of transfer water.

Hence, no impacts to water quality standards would occur with project implementation.

b) **No Impact.** As the proposed project would not extract groundwater supplies nor inject water into aquifers, there would be no project impacts resulting from substantial depletion of groundwater supplies or interference with groundwater recharge resulting in a net deficit in aquifer volume or lowering of local groundwater table level.

c-d) **No Impact.** The proposed project would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in

substantial erosion, siltation on- or off-site, or increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. The water transferred would be maintained within existing conveyance and storage systems of DWR. No drainage courses would receive transferred water from the proposed project. In addition, there are no construction activities associated with the proposed project. As such, no impacts relating to water drainage patterns would occur with project implementation.

e) **No Impact.** The proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems. Also refer to previous responses, (Items **c-d**). Hence, no impacts relating to storm water drainage systems would occur with project implementation.

f) **No Impact.** The proposed project would not result in degradation of water quality. Refer to previous responses, (Items **a-c**). Hence, no impacts to water quality would occur with project implementation.

g-i) **No Impact.** The proposed project would not expose people or property to water-related hazards such as flooding or impede or redirect flood flows. The proposed project would not involve constructing any housing. All facilities which would be utilized are existing facilities constructed according to standard engineering design practices to limit the potential for exposure of people or property to water-related hazards, such as flooding. Therefore, no impact relating to flooding would occur with the project implementation.

j) **No Impact**. The proposed project would not be subject to tsunami or seiche wave inundation because the project area is not situated near a large enough body of water. Also, the associated facilities are not subject to mudslides. As such, no impacts would result from project implementation with respect to tsunamis or seiches.

X. LAND USE AND PLANNING – Would the project:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural communities' conservation plan?	☐	☐	☐	☒

Discussion:

a-c) **No Impact.** The proposed project would not displace or divide an established community, as no new construction activities would occur with project implementation. Only existing facilities and equipment would be employed. Also, no zoning or land use changes would be required for the participating farmer to enter into an agreement to idle a portion of his or her farmlands. Idling of agricultural land is a typical agricultural practice. Refer to Item IV.f (Biological Resources) with regard to the question on conflicts with applicable habitat conservation plans. Overall, there would be no impacts to land use or planning with project implementation.

XI. MINERAL RESOURCES – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Discussion:

a, b) **No Impact.** As the area is currently used for agricultural purposes only, the one-year idling of some additional farmlands for a one-year period would not result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State. No impacts to mineral resources would occur with the proposed water transfer.

XII. NOISE – Would the proposed Action result in:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport of public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion:

a-f) No Impact. The proposed project does not involve the development or enhancement of any new noise emitting devices. In addition, there would be no construction activities associated with the proposed project. Only existing facilities and equipment would be utilized with the proposed water transfer. As such, no noise impacts would result with project implementation.

XIII. POPULATION AND HOUSING – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion:

a-c) No Impact. The proposed project would involve the movement of water in amounts that would not exceed existing CVP or SWP contractors' contractual amounts specified in each long-term water supply contract for water transported through the California Aqueduct or Delta Mendota Canal nor allow for a total amount of water to be transported that would exceed levels previously delivered in non-shortage years. Therefore, there would be no net increase in water supply. No housing would be constructed, demolished, or replaced as a result of the proposed project; no displacement of people and no substantial population growth would result. Therefore, no impacts to housing or population distribution would occur as a result of the proposed water transfer.

XIV. PUBLIC SERVICES – Would the proposed Action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒

Police protection?	☐	☐	☐	☒

Issues and Determination (continued):	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion:

a) No Impact. The proposed project neither creates any new demand for public services nor alters existing public facilities. The proposed water transfer would occur within existing water conveyance facilities. Hence, no impacts to public services or facilities would occur with project implementation.

XV. RECREATION – Would the proposed action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion:

a,b) No Impact. The proposed project would neither create nor alter demand for recreational services. The proposed project would involve the movement of water in amounts that would not exceed existing entitlements for water transported through the California Aqueduct or Delta Mendota Canal nor allow for a total amount of water to be transported that would exceed levels previously delivered in non-shortage years. As such, there would be no net increase in recreational opportunities and no impacts to recreational facilities or activities would occur with project implementation.

XVI. TRANSPORTATION / TRAFFIC – Would the proposed action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒
b) Exceed, either individually of cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Discussion:

a-g) No Impact. The proposed project does not create any new demand for any mode of transportation services as it would involve existing facilities and to forebear water for water supply purposes. Also, there are no construction activities associated with the proposed project (such as movement of trucks). Therefore, no transportation impacts would occur with project implementation.

XVII. UTILITIES AND SERVICE SYSTEMS – Would the proposed action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion:

a-g) **No Impact**. The proposed project would not place additional demands on nor affect public utilities, particularly wastewater treatment facilities, water facilities, and storm drain systems in the area. No new or expanded water entitlements would be necessary. That is, the proposed project would involve the movement of pre-existing entitlements of water. No solid waste disposal or disposal facilities would be needed for the proposed project. Therefore no impacts to existing utilities and conveyance systems would occur with project implementation.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE -
Would the proposed action:

Issues and Determination:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion:**a-b) Less Than Significant Impact.** As previously discussed, the proposed project has the potential to degrade the environment in some resource areas (biological resources and aesthetics). However, as noted above, these impacts are not significant individually or cumulatively. The proposed project would occur through existing facilities with no new construction. As such, implementation of the proposed project would have no significant impacts. As discussed below, water transfers from the Sacramento Valley through the Delta for consumptive uses and environmental purposes south of the Delta have been occurring on a large scale for over a decade. Examples include:

DWR Water Purchase Programs:

The first large scale water transfer program in California was the 1991 Emergency Drought Water Bank (1991 DWB). The 1991 DWB was established in response to projected critical water supply shortages following 4 years of drought conditions. The 1991 DWB team purchased water from willing sellers in the Delta, Sacramento Valley and Feather River basin areas. Water was made available through crop idling, groundwater substitution and reservoir storage release. The 1991 DWB team executed over 300 contracts with water agencies and individuals to purchase water for critical statewide needs. Water from the 1991 DWB was allocated to 12 municipal and agricultural water users. Drought water banks were implemented again in 1992 and 1994, acquiring water primarily from groundwater substitution.

DWR implemented Dry Year Purchase Programs in 2001 and 2002 in response to dry conditions and reduced SWP and CVP allocations. In 2001 DWR purchased water from willing sellers in northern California from a combination of crop idling, groundwater substitution and reservoir storage release, for delivery to eight water agencies throughout the State to help offset water shortages. In 2002, DWR acquired water made available through groundwater substitution from Yuba County Water Agency (YCWA) and its member units and provided it to four SWP contractors.

DWR implemented a drought water bank in 2009 after a series of three dry years, acquiring about 76,600 acre-feet of transfer water from a combination of crop idling, groundwater substitution and reservoir storage release. An additional 200,000 acre-feet of cross-Delta transfers were executed independently by water agencies and exported through SWP and CVP facilities. Since 2009, DWR has facilitated water transfers by conveying transfer water through SWP facilities; however, it has not acted as a purchaser or broker.

Federal Water Acquisition Programs:

The Central Valley Project Improvement Act of 1992 (CVPIA) amended previous authorizations of the CVP to include fish and wildlife protection, restoration, and enhancement as project purposes having equal priority with agriculture, municipal and industrial, and power purposes. A major feature of CVPIA is that it requires acquisition of water for protecting, restoring, and enhancing fish and wildlife populations. To meet water acquisition needs under CVPIA, the U.S. Department of the Interior (Interior) has developed a Water Acquisition Program (WAP), a joint effort by Reclamation and the FWS. The major purposes of the WAP are acquisition of water to meet optimal refuge demands and support instream flows. Additional information on Reclamation's water transfer programs is contained in the CVP Water Transfer Program Fact Sheet which can be accessed at http://www.usbr.gov/mp/PA/water/docs/CVP_Water_Transfer_Program_Fact_Sheet.pdf and the CVPIA Water Acquisition Program Background Information Sheet, November 2003 USDOI which can be accessed at http://www.usbr.gov/mp/cvpia/3406b3_wap/info/index.html.

Environmental Water Account:

The Environmental Water Account (EWA) was established in 2000. The purpose of the EWA program was to provide protection to at-risk native fish species of the Bay-Delta estuary by supporting environmentally beneficial changes in SWP and CVP operations. EWA funds were used to acquire alternative sources of water, called the "EWA assets," which the EWA agencies used to replace the SWP and CVP water that was not exported from the Delta because of the voluntary fish actions. The EWA program ended in December 2007.

Yuba River Accord Transfers:

In 1989, the State Water Resources Control Board (SWRCB) received a complaint regarding fishery protection and water right issues on the Lower Yuba River. The SWRCB held hearings on the issues raised in this complaint and in 1999 issued a draft decision. At the request of YCWA and the CDFW, subsequent hearings were postponed in order to provide the parties an opportunity to reach a proposed settlement regarding instream flows and further studies. The parties failed to reach agreement on a settlement and the SWRCB held additional hearings in the spring of 2000. A draft decision was issued in the fall of 2000 and was adopted as Decision 1644 on March 1, 2001.

Subsequent litigation led to withdrawal of Decision 1644 and issuance of Revised Decision 1644 (RD-1644) in July, 2003. These decisions established revised instream flow requirements for the Lower Yuba River and required actions to provide suitable water temperatures and habitat for Chinook salmon and steelhead and to reduce fish losses at water diversion facilities.

After the issuance of RD-1644, the parties involved in the SWRCB proceedings expressed a desire to further negotiate the instream flow, flow fluctuation, and water temperature issues on the Lower Yuba River. The parties engaged in a collaborative, interest-based negotiation with numerous stakeholders, reaching a series of agreements now known as the Lower Yuba River Accord (Accord). These negotiations resulted in the agreements outlined below and the SWRCB approval of the flow schedules and water transfer aspects of the Accord on March 18, 2008 with Water Right Order 2008-0014. Several technical revisions to the Order were adopted as part of Water Right Order 2008-0025 on May 20, 2008.

Surface water releases are made available for transfer under the Accord based on the difference between a baseline release rate (the interim flow schedules defined in RD-1644 and in Water Right Order 2008-0014) and the Fisheries Agreement flow schedules. The baseline releases (interim flow schedule in RD-1644) are based on the Yuba River Index as defined in RD-1644. The flow schedules in the Fisheries Agreement are determined based on the North Yuba River Index independent from the Yuba River Index. (There are also some conditions when the YCWD-

CDFW agreement or the current FERC license control the baseline flows.) As a result, there can be a wide range of possible transfer amounts under the various hydrologic conditions that can occur in the Yuba River watershed in any year.

Groundwater substitution water is made available by individual landowners within seven of the eight YCWA member units that are signatories to the Accord. YCWA reduces its surface diversions to those member units from the Yuba River and regulates storage in Bullards Bar Reservoir to accrue and release the groundwater substitution water on a schedule to allow the releases to be exported in the Delta.

Finally, in recent history, individual SWP and CVP contractors have purchased water transfer supplies on an as-needed basis to supplement shortages to water supplies.

There have been no known demonstrable adverse impacts resulting from these recent water transfers, which have complied with all applicable environmental regulations governing Delta operations. There have been no impacts in any one year when the various transfers are considered cumulatively, nor has there been any impacts when considering the various transfers cumulatively over the last decade. WCWD's proposed transfer is one of several transfers in the Sacramento River Basin likely to occur in 2015. This project proposes to sell Buyers up to 35,442 acre-feet of water to meet some of their needs in the event of a shortfall. In total, up to approximately 194,000 acre-feet of potential transfers from all sellers in the Sacramento River watershed could be purchased by CVP and/or SWP contractor buyers (see Table XVIII-1, below). This represents about 0.9% of the average annual total water supply available in the Sacramento Valley from surface and groundwater resources for all uses and 2.4% of total average agricultural water use in the Sacramento Valley. WCWD has participated in past land idling transfers in 2014, 2012, 2010 and 2009. No adverse impacts were claimed or noted as part of WCWD's past transfers. As such, and recognizing that no individual or cumulatively significant impacts have been noted for past transfers at or exceeding this order of magnitude, no significant impacts (individually or cumulatively) are expected as a result of the proposed project. Delta impacts are likewise not expected to be significant as all the water shown in Table XVIII-1 was pumped in the Delta within existing biological constraints without incident.

Table XVIII-1*

Program	2006	2007	2008	2009	2010	2011	2012	2013	2014	Potential 2015
DWR Drought Water Banks/Dry Year Programs	0	0	0	74	0	0	0	0	0	0
Environ Water Acct	0	147	60	60	60	0	0	0	0	0
Others (CVP, SWP, Yuba, inter alia)	0	0	173	140	243	0	190	210	198	194
Totals (TAF)	0	147	233	274	303	0	190	210	198	194

*Table reflects gross AF purchased prior to 20% Delta carriage loss (i.e., actual amounts pumped at Delta are 20% less)

Additionally, several special-status wildlife species, including the winter-run Chinook salmon (listed as state and federally endangered), the spring-run Chinook salmon (listed as state and federally threatened), the delta smelt (listed as state and federally threatened), the longfin smelt (listed as state threatened), the steelhead (listed as federally threatened), and the green sturgeon (listed as federally threatened), have the potential to be impacted by the water transfers from the Sacramento Valley, but the impacts are not expected to be significant, for the following reasons:

Chinook Salmon (*Oncorhynchus tshawytscha*), Delta Smelt (*Hypomesus transpacificus), Longfin Smelt (Spirinchus thaleichthyes),Green Sturgeon(Acipenser medirostris)* and Steelhead (*Oncorhynchus mykiss*)

The Sacramento-San Joaquin Delta is a migration corridor and seasonal rearing habitat for winter-run Chinook salmon and steelhead. It provides spawning and nursery habitat for Delta Smelt. Transfer water to the Buyers would be delivered through the Sacramento-San Joaquin Delta with timing identical to the Buyers' typical SWP or CVP deliveries in conformance with all existing and pending requirements under the Endangered Species Act, including court orders, which govern SWP and CVP operations for the protection of Delta Smelt, and anadromous fishes and marine mammal species. The proposed transfer would not affect the regulatory or operational restrictions governing SWP or CVP operations. As such, there would be no impact from the proposed project on listed fish species in the Sacramento-San Joaquin Delta.

c) No Impact. The negative declaration assesses the potential impacts of the proposed project. There would be no construction activities associated with the proposed water transfer. Typical farming practices with the idling of land would comply with applicable health and safety requirements. Therefore, the proposed project would not cause substantial adverse effects on human beings, either directly or indirectly.

SECTION 4
REFERENCES

The following documents were used in the preparation of this Negative Declaration:

California Department of Water Resources. *California Water Plan Update. Bulletin 160-05*. December 2005.

State of California, 2007. *California Environmental Quality Act, CEQA Guidelines. Amended July 11, 2006.*

U.S. Department of Agriculture, Soil Conservation Service. 1993. *U.S. Department of Agriculture Soil Conservation Service national soil survey handbook. November. Washington, DC.*

U.S. Fish and Wildlife Service. 1999. Draft Recovery Plan for the Giant Garter Snake (Thamnophis gigas). U.S. Fish and Wildlife Service, Portland, Oregon. ix+192 pp.

http://www.dfg.ca.gov/hcpb/species/ssc/ssc.shtml

http://endangered.fws.gov/wildlife.html#Species

Technical Information for Water Transfers in 2015 (DWR, Bureau of Reclamation)

Reporting and monitoring results from transfers occurring within the past 10 years

Draft EIS/EIR for proposed 10 year transfer by Bureau of Reclamation and San Luis & Delta Mendota Water Authority

2014 GGS Biological Assessment

Joyce Hunting, Summer L. Pardo, And Leslie S. Parker, 2015. *Analysis of Potential Impacts to Giant Garter Snake (Thamnophis gigas) Resulting from Riceland Fallowing for Water Transfers in the Northern Sacramento Valley of California*.

SECTION 5
LIST OF PREPARERS

Ted Trimble, General Manager, Western Canal Water District

Dustin C. Cooper, Attorney, Minasian Law Firm

Peter C. Harman, Attorney, Minasian Law Firm

Summer Pardo, Senior Biologist, PMC

AQUALLIANCE
DEFENDING NORTHERN CALIFORNIA WATERS

December 1, 2014

Mr. Brad Hubbard
United States Bureau of Reclamation
2800 Cottage Way, MP-410
Sacramento, CA 95825
bhubbard@usbr.gov

Ms. Frances Mizuno
San Luis & Delta Mendota Water Authority
842 6th Street
Los Banos, CA 93635
frances.mizuno@sldmwa.org

Subject: Comments on the *Draft Environmental Impact Statement/Environmental Impact Report Long Term North-to-South 2015-2024 Water Transfer Program*

Dear Mr. Hubbard and Ms. Mizuno:

AquAlliance, California Sportfishing Protection Alliance ("CSPA"), and Aqua Terra Aeris submit the following comments and questions for the Bureau of Reclamation ("Bureau") and the San Luis Delta Mendota Water Authority's ("SLDMWA") ("Lead Agencies") *Draft Environmental Impact Statement* ("EIS") and *Environmental Impact Report* ("EIR") ("EIS/EIR"), for the 2015-2024 *Long Term North-to-South Water Transfer Program* ("Project" or "*2015-2024 Water Transfer Program*").

AquAlliance exists to sustain and defend northern California waters. We have participated in past water transfer processes, commented on past transfer documents, and sued the Bureau twice in the last five years. In doing so we seek to protect the Sacramento River's watershed in order to sustain family farms and communities, enhance Delta water quality, protect creeks and rivers, native flora and fauna, vernal pools and recreational opportunities, and to participate in planning locally and regionally for the watershed's long-term future. The *2015-2024 Water Transfer Program* is seriously deficient and should be withdrawn. If the Bureau and DWR are determined to purse water transfers from the Sacramento Valley, AquAlliance requests that the agencies regroup and prepare an adequate programmatic EIS/EIR.

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., 2014. Comments and recommendations on U.S. Bureau of Reclamation and San Luis & Delta-Mendota Water Authority Draft Long-Term Water Transfer DRAFT EIS/EIR, Prepared for AquAlliance. ("Custis," Exhibit A)
- ECONorthwest, 2014. Critique of Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report Public Draft, Prepared for AquAlliance. ("EcoNorthwest," Exhibit B)
- Mish, Kyran D., 2014. Comments for AquAlliance on Long-Term Water Transfers Draft EIR/EIS. ("Mish," Exhibit C)
- Cannon, Tom, Comments on Long Term Transfers EIR/EIS, Review of Effects on Special Status Fish. Prepared for California Sportfishing Protection Association. ("Cannon," Exhibit D)

In addition, we renew the following comments previously submitted, attached hereto, as fully bearing upon the presently proposed project and request:

- *2009 Drought Water Bank* ("DWB"). (Exhibit F)
- *2010-2011 Water Transfer Program*. (Exhibit G)
- *2013 Water Transfer Program*. (Exhibit G)
- *2014 Water Transfer Program*. (Exhibit G)
- C-WIN, CSPA, AquAlliance Comments and Attachments for the Bay Delta Conservation Plan's EIS/EIR. (Exhibit H)
- AquAlliance's comments on the Bay Delta Conservation Plan's EIS/EIR. (Exhibit H)
- CSPA's comments on the Bay Delta Conservation Plan's EIS/EIR. (Exhibit H)

I. The EIS/EIR Contains an Inadequate Project Description.

A "finite project description is indispensable to an informative, legally adequate EIR." *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192. CEQA defines a "project" to include "the whole of an action" that may result in adverse environmental change. CEQA Guidelines § 15378. A project may not be split into component parts each subject to separate environmental review. *See, e.g., Orinda Ass'n v. Board of* Supervisors (1986) 182 Cal.App.3d 1145, 1171; *Riverwatch v. County of San Diego* (1999) 76 Cal.App.4th 1428. Without a complete and accurate description of the project and all of its components, an accurate environmental analysis is not possible. *See, e.g., Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 829; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 533; *City of Santee v. County of San Diego* (1989)214 Cal.App.3d 1438, 1450; *Blue Mountains Biodiversity Project v. United States Forest Service*, 161 F.3d 1208, 1215 (9th Cir. 2008).

As discussed, below, and in the expert reports submitted by *Custis*, *EcoNorthwest*, *Cannon*, and *Mish* on behalf of AquAlliance, the EIS/EIR fails to comport with these standards.

a. <u>The Project / Proposed Action Alternative Description Lacks Detail Necessary for Full Environmental Analysis.</u>

i. Actual transfer buyers, sellers, modes, amounts, criteria, market demands, availability, and timing, are undisclosed.

The Proposed Action Alternative is poorly specified and needs additional clarity before decision-makers and the public can understand its human and environmental consequences. The Lead Agencies tacitly admit that they have no idea how many acre-feet of water may be made available, by what mechanism the water may be made available (fallowing, groundwater substitution, or crop changes), or to what ultimate use (public health, urban, agricultural) the water may be put.

Glenn Colusa Irrigation District is listed as the largest potential seller, but its General Manager, Thad Bettner, asserted publicly on October 7, 2014 that the district hadn't committed to the 91,000 AF found in Table ES-2 (Potential Sellers). GCID subsequently sent the Bureau a letter that states that GCID plans to pursue its own Groundwater Supplemental Supply Program and that, "It is important for Reclamation to understand that GCID has not approved the operation of any District facilities attributed to the LTWTP Action/Project that is presented in the draft EIR/EIS." [1] The letters continues stating that, "It is important to underscore that GCID would prioritize pumping during dry and critically dry water years for use in the Groundwater Supplemental Supply Program, and thus wells used under that program would not otherwise be available for the USBR's LTWTP." First, these public and written comments contradict the EIS/EIR on page 3.8-37 where it states that, "The availability of supplies in the seller service area was determined based on data provided by the potential sellers." Second, the largest potential seller in the *2015-2024 Water Transfer Program* is seemingly unable or unwilling to participate in the groundwater substitution component during dry and critically dry years. In addition, GCID has stated that "it will not participate in a groundwater substitution transfer, and for land idling reduce the acreage from 20,000 acres to no more than 10,000 acres." [2] Similarly, the Sacramento Suburban Water District received $2 million from the Governor's Water Action Plan to move groundwater to member agencies that have been "[h]eavily dependent on Folsom reservoir," according to John Woodling of the Sacramento Regional Water Authority. [3] Woodling continues that, "During these dry times, the groundwater basin really is our insurance

[1] GCID October 14, 2014.
[2] GCID November 6, 2014 Board Meeting Item #6.
[3] Ortiz, Edward 2014. *Region's water districts split $14 million for drought relief*. Sacramento Bee November 7, 2014.

policy," (*Id*). Knowing that smart water managers are very aware of this fact, why would Sacramento Suburban Water District turn around and propose to sell 30,000 AF of water to the out-of-region buyers through groundwater substitution transfers during the Project's "[d]ry and critically dry years"? In short, the EIS/EIR has no way of knowing what transfers may occur, and when.

It is also not possible to determine with confidence just how much water is requested by potential urban and agricultural buyers and how firm the requests are. What are SLDMWA's specific requests for agricultural or urban uses of Project water? What are the SLDMWA's present agricultural water demands for the 850,000 acres that it serves? Left to guess at the possible requests for water, we look at the 2009 DWB where there were between 400,000 and 500,000 AF of presumably urban buyer requests alone (which had priority over agricultural purchases, according to the 2009 DWB priorities) and a cumulative total of less than 400,000 AF from willing sellers. It is highly possible, based on the example during the 2009 DWB, that many buyers are not likely to have their needs addressed by the *2015-2024 Water Transfer Program.* How would this affect the project objectives and purpose? How would this affect variable circumstances for other proposed transfers?

The EIS/EIR also fails to address the ability and willingness of potential buyers to pay for Project water given the supplies that may be available. Complaints from agricultural water districts were registered in the comments on the Draft Environmental Water Account EIS/EIR and reported in the Final EIS/EIR in January 2004 indicating that they could not compete on price with urban areas buying water from the EWA. Given the absence of priority criteria, will agricultural water buyers identified in Table ES-1 have the ability to buy water when competing with urban districts? Moreover, since buyers are not disclosed in the EIS/EIR for non-CVP river water, these further effects on water market conditions and competition between agricultural and urban sectors is impossible to evaluate. Who are the buyers that may request non-CVP river water, and what are their maximum requests? That DWR is not the CEQA lead agency further complicates the evaluation of competition for water in the EIS/EIR.

Nor does the *2015-2024 Water Transfer Program* prevent rice growers (or other farmers) from "double-dipping," but actually encourages it. Districts and their growers have opted to turn back their surface supplies from the CVP and the State Water Project and substitute groundwater to cultivate their rice crop—thereby receiving premiums on both their CVP contract surface water as well as their rice crop each fall when it goes to market. There appear to be no caps on water sale prices to prevent windfall profits to sellers of Sacramento Valley water — especially for crops with high market prices, such as rice.

The EIS/EIR is inadequate because it fails to identify and analyze the market context for crops as well as water that would ultimately influence the size and scope of the *2015-2024 Water*

Transfer Program.[4] The Project's sellers and buyers are highly sensitive to the influences of prices—prices for water as well as crops such as rice, orchard and vineyard commodities, and other field crops. It is plausible that crop idling would occur more in field crops, while groundwater substitution would be more likely for orchard and vineyard crops. However, high prices for rice—the Sacramento Valley's largest field crop— undermines this logic and leads to substantial groundwater substitution. These potential issues and impacts should be recognized in the EIS/EIR because crop prices are key factors in choices potential water sellers would weigh in deciding whether to idle crops, substitute groundwater, or decline to participate in the Project altogether.

To enable a more complete and discrete project description, the EIS/EIR should propose criteria other than price alone to manage allocation of state water resources. The EIS/EIR should consider some priority criteria as was included in the 2009 Drought Water Bank EA/FONSI (p. 3-88). Do both authorizing agencies, the Bureau and DWR, lack criteria to prioritize water transfers? Are transfers approved on a first-come first-serve basis, as generated by market conditions alone? What is the legal or policy basis to act without providing priority criteria? A lack of criteria fails to encourage regions to develop their own water supplies more efficiently and cost-effectively without damage to resources of other regions. If criteria will be applied, these need to be disclosed and analyzed in the EIS/EIR.

Additional uncertainty caused by the incomplete project description includes:

- How many of the proposed transfers would be one year in duration, multi-year, or permanent. How will the duration of any agreement be determined? The duration of a transfer agreement will have dramatic effects on the water market as well as the environmental impact analysis.
- The EIS/EIR purports to be a 10 year project, but is there an actual sunset date, since it continues serially in multiple years? Could any transfer be approved in the next 10 years that would extend beyond 2024?
- The proposed program provides no way to know what ultimate use transferred water will be put to; nor does the EIS/EIR provide any way to know what activities may occur on idled cropland. The EIS/EIR assumptions on these points are inherently incomplete and fail to support any discrete environmental analysis.

In sum, the proposed program provides no way to know which transfers may or may not occur, individually or cumulatively. The lack of a stable and finite project description undermines the entire EIS/EIR. As discussed further, below, description of the environmental setting, evaluation of potentially significant impacts, and formulation of mitigation measures, among other issues, all are rendered unduly imprecise, deferred, and incomplete, subject to the theoretical transfers taking shape at some, unknown, future time.

[4] EcoNorthwest (Exhibit B).

ii. Historic transfer data is excluded.

Absent from the DEIS/EIR are any of the required monitoring reports from previous transfer projects. *See, e.g., Citizens for East Shore Parks v. State Lands Commission* (2010) 48 Cal.App.4th 549; *Communities for a Better Environment v. South Coast Air Quality Mgmt. Dist.* (2010) 48 Cal.App.4th 310. Without the required monitoring reports, the public is left in the dark regarding this new proposal to sell up to 600,000 AF annually over a 10 year period. No information is provided regarding the impacts to downstream users, wells near production wells, the Sacramento River and its tributaries, refuges, water quality, special status species and the San Francisco Bay Delta Estuary from past CVP transfers or cumulatively including non-CVP water transfers in the area of origin. For example, groundwater substitution transfers and transfers that result in reduced flows in combination with below normal water years are known to have to have the potential for significant impacts on water quality, fish, wildlife and the flows in the Sacramento River and its tributaries. Providing all such documentation of the terms, conditions, effects, and outcomes of prior transfers is integral to understanding the proposed Project.

b. <u>The Proposed Project is in Fact a Proposed Program.</u>

The lack of any stable, discrete, project description, at best, renders the proposed project a "program," rather than any specific project itself. "[A] *program* EIR is distinct from a *project* EIR, which is prepared for a specific project and must examine in detail site-specific considerations." *Center for Sierra Nevada Conservation v. County of El Dorado* (2012) 202 Cal.App.4th 1156, 1184. As discussed further, below, this EIS/EIR does not and cannot complete site-specific and project-specific analysis of unknown transfers at unknown times. Buyers and sellers have "expressed interest," but no specific transfers or combination of transfers are proposed, and we don't know which may be proposed or ultimately approved.

Put differently, the EIS/EIR project description is not simply inadequate: the EIS/EIR fails to propose or approve any project at all. Instead, the EIS/EIR should be recharacterized and revised as a program EIS/EIR. Indeed, agency documents have referred to this program, as such, for years. (E.g., Federal Register /Vol. 75, No. 248 /Tuesday, December 28, 2010 /Notices *Long-Term North to South Water Transfer Program, Sacramento County, CA*; Final EA/FONSI for 2010-2011 Water Transfer Program.[5]) And other external sources also support the proposition that this EIS/EIR does not and cannot review and approve specific transfers:

> "Each transfer is unique and must be evaluated individually to determine the quantity and timing of real water made available." (BDCP DEIR at 1E-2.)
>
> "Although this document seeks to identify in the best and most complete way possible the information needed for transfer approval, to both expedite that approval and to

[5] http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=31781

> reduce participant uncertainty, each transfer is unique and must be considered on its individual factual merits, using all the information that is available at the time of transfer approval and execution of the conveyance or letter of agreement with the respective Project Agency in accordance with the applicable legal requirements. This document does not pre-determine those needs or those facts and does not foreclose the requirement and consideration of additional information." (Draft Technical Information for Preparing Water Transfer Proposals ("DTIPWTP") 2014.)

Indeed, the Bureau and DWR have known for over a decade that programmatic environmental review was and is necessary for water transfers from the Sacramento Valley. The following examples highlight the Bureau and DWR's deficiencies in complying with NEPA and CEQA.

a. The Sacramento Valley Water Management Agreement was signed in 2002, and the need for a programmatic EIS/EIR was clear at that time it was initiated but never completed.
b. In 2000, the Governor's Advisory Drought Planning Panel report, *Critical Water Shortage Contingency Plan* promised a program EIR on a drought-response water transfer program, but was never undertaken.
c. Sacramento Valley Integrated Regional Water Management Plan (2006).
d. The Sacramento Valley Water Management Plan (2007).
e. The CVPIA mandates the Bureau contribute to the State of California's *long-term* efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, among other things. (EIS/EIR 1-10.)

Accordingly, the EIS/EIR should be revised to state that it does not and cannot constitute sufficient environmental review of any particular, as-of-yet-unknown, water transfer proposal; and instead be revised, restructured, and recirculated to provide programmatic policies, criteria, and first-tier environmental review.

c. <u>The EIS/EIR Improperly Segments Environmental Review of the Whole of this Program.</u>

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 *2015-2024 Water Transfer Program* is also only one of several proposed and existing projects that affect the regional aquifers.

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 actions would be implemented for a period of 10 years in areas of Shasta, Butte, Sutter, Glenn, Tehama, Colusa, Sacramento, Placer, and Yolo counties.[6]

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 the Bureau 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 . . . [7]

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[6] http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=788

[7] http://www.norcalwater.org/wp-content/uploads/2010/12/sac_valley_water_mgmt_agrmt_new.pdf

It is abundantly clear that the Bureau and SLDMWA are proposing a program through the present draft EIS/EIR 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 the Bureau 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, 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 the Bureau 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:

> 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.

d. <u>The Project Description Contains an Inadequate Statement of Objectives, Purpose, and Need.</u>

The lack of a stable project description/prosed alternative, as discussed, above, further obfuscates the need for the Project. Further, without programmatic criteria to prioritize certain transfers, the public is not provided with even a basic understanding of the need for the Project. The importance of this section in a NEPA document can't be overstated. "It establishes why the agency is proposing to spend large amounts of taxpayers' money while at the same time causing significant environmental impacts... As importantly, the project purpose and need drives the process for alternatives consideration, in-depth analysis, and ultimate selection. The Council on Environmental Quality (CEQ) regulations require that the EIS address the "no-action" alternative and "rigorously explore and objectively evaluate all reasonable alternatives." Furthermore, a well-justified purpose and need is vital to meeting the requirements of Section 4(f) (49 U.S.C. 303) and the Executive Orders on Wetlands (E.O. 11990) and Floodplains (E.O. 11988) and the Section 404(b)(1) Guidelines. Without a well-defined, well-established and well-

justified purpose and need, it will be difficult to determine which alternatives are reasonable, prudent and practicable, and it may be impossible to dismiss the no-build alternative" [8]

With the importance of a Purpose and Need statement revealed above, the Project's version for purposes of NEPA states that, "The purpose of the Proposed Action is to facilitate and approve voluntary water transfers from willing sellers upstream of the Delta to water users south of the Delta and in the San Francisco Bay Area. Water users have the need for immediately implementable and flexible supplemental water supplies to alleviate shortages," (p. 1-2). Noticeably missing from this section of the EIS/EIR is a statement about the Bureau's purpose and need, not the buyers' purpose and need. The omission of *any* need on the Bureau's part for this Project highlights the conflicts in the Bureau's mission, deficiencies in planning for both the short and long term, and the inadequacy of the EIS/EIR that should provide the public with the basis for the development of the range of reasonable alternatives and the identification and eventual selection of a preferred alternative. The *Reclamation's NEPA Handbook* (2012) stresses that, "The need for an accurate (and adequate) purpose and need statement early in the NEPA process cannot be overstated. This statement gives direction to the entire process and ensures alternatives are designed to address project goals." (p.11-1)

For purposes of CEQA, the Project Objectives (p. 1-2) go on to state that,

> SLDMWA has developed the following objectives for long-term water transfers through 2024:
>
> • Develop supplemental water supply for member agencies during times of CVP shortages to meet existing demands.
>
> • 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.
>
> Because shortages are expected due to hydrologic conditions, climatic variability, and regulatory requirements, transfers are needed to meet water demands.

But merely asserting that there are "demands" from their member lacks context, specificity, and rigor. It also fails to mention the need of the non-member buying agencies involved in the Project.

Some context for the policy failures that lead to the stated need for the Project must be presented. First, the hydrologic conditions described on pages ES-1, 1-1, and 1-2 almost always

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[8] Federal Transportation and Highway Administration, 1990. *NEPA and Transportation Decisionmaking: The Importance of Purpose and Need in Environmental Documents.* http://www.environment.fhwa.dot.gov/projdev/tdmneed.asp

apply to the entire state, including the region where sellers are sought, not just the areas served by SLDMWA and non-member buyers as presented here. Second, SLDMWA has chronic water shortages due to its contractors' junior position in water rights, risks taken by growers to plant permanent crops, and serious long-term overdraft in its service area. Where is this divulged? Third, SLDMWA or its member agencies have sought to buy and actually procured water in many past water years to make up for poor planning and risky business decisions, which violates CEQA's prohibition against segmenting a project to evade proper environmental review.[9] The habitual nature of the transfers is acknowledged on pages ES-1 and 1-1 stating, "In the past decades, water entities have been implementing water transfers to supplement available water supplies to serve existing demands, and such transfers have become a common tool in water resource planning." (See Table 1 for an attempt at documenting transfers since actual numbers are not disclosed in the EIS/EIR).

The Bureau and DWR's facilitation of so-called "temporary" annual transfers in 12 of the last 14 years is illustrated in Table 1 (2014 transfer totals have not been tallied to date).

Table 1. The table is based on one from Western Canal Water District's Negative Declaration for a 2010 water transfer.

Past Water Transfers from the Sacramento Valley Through the Delta in TAF Annually*													
Water Year Type **	Dry	Dry	AN	BN	BN	Wet	Dry	Critical	Dry	BN	Wet	BN	Dry
Program	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**[10]	**2009**	**2010**	**2011**	**2012**	**2013**
DWR Drought Water Bank/Dry Year Programs	138	22	11	0.5	0	0	0	0	74	0	0	0	0
Enviro Water Acct	80	145	70	120	5	0	147	60	60	60	0	60	60
Others (CVP, SWP, Yuba, inter alia)	160	5	125	0	0	0	0	173	140	243	0	190	210
Totals	**378**	**172**	**206**	**120.5**	**5**	**0**	**147**	**233**	**274*** **	**303**	**0**	**250**	**270**

*Table reflects gross AF purchased prior to 20% Delta carriage loss (i.e., actual amounts pumped at Delta are 20% less)
** Based on DWR's measured unimpaired runoff (in million acre-feet)
Abbreviations: AN - Above normal year type and BN - Below normal year type (http://cdec.water.ca.gov/cgi-progs/iodir/wsihist)
*** The *2015-2024 Water Transfer Program's* EIS/EIR contradicts the 274,000 AF total for 2009 on EIS/EIR page 1-16 that states that the CVP portion alone during 2009 was 390,000 AF.

The Project has become an extension of the so-called "temporary" annual transfers based on the demands of junior water rights holders who expect to receive little contract water during dry years. The low priority of their junior water service contracts within the Central Valley Project leaves their imported surface supplies in question year-to-year. It is the normal and appropriate function of California's system of water rights law that makes it so. Yet the efforts

[9] Laurel Heights Improvement Association v. Regents of the University of California, 1988, 47 Cal.3d 376
[10] The Environmental Water Account ended in 2007 (Bay Delta Conservation Plan Draft EIS/EIR 2013). The figures that continue in this row are based on a long-term contract with the Yuba County Water Agency to sell water.-

of the Bureau and DWR to oversee, approve, and facilitate water sales from the Sacramento, Feather, and Yuba rivers with fallowing and groundwater substation are only intended to benefit the few western San Joaquin Valley farmers whose contractual surface water rights have always been less reliable than most—and whose lands are the most problematic for irrigation. These growers have chosen to harden demand by planting permanent crops, a very questionable business decision, but the Bureau fails to explain why this "tail" in water rights is wagging the dog.

e. The Project Description does Not Include all Project Components.

i. Carriage water.

The EIS/EIR's description of and reliance on "carriage water" is completely uncertain, undefined, and provides no meaningful information to the public. The EIS/EIR states that "Outflows would generally increase during the transfer period because carriage water would become additional Delta outflow." (EIS/EIR 3.2-39.) The EIS/EIR also asserts that, " Carriage water (a portion of the transfer that is not diverted in the Delta and becomes Delta outflow) will be used to maintain water quality in the Delta." (EIS/EIR 2-29.) Elsewhere the EIS/EIR references 20% carriage losses for CCWD and SLDMWA in the EIS/EIR (3.2-39, 3.2-57-58, and B-6), while prior documents have used higher estimates:

> Historically, approximately 20-30% of the water transferred through the Delta would be necessary to enable the maintenance of water quality standards, which are based largely upon the total amount of water moving through the Bay-Delta system. This water, which is not available for delivery to Buyers, is known as "carriage water." Given historically dry conditions prevailing in 2014, DWR estimates that carriage losses could be higher.

(Biggs West Gridley 2014 Water Transfer Neg Dec, p. 4)(Exhibit I). A Bureau spreadsheet that documents the final transfer numbers for 2013 clearly demonstrates that the 30% figure was used for carriage losses. [11] The spreadsheet further reveals that there are additional water deductions that were made prior to delivery in 2013 for DWR Conveyance Loss (2%) and Warren Act Conveyance Loss (3%). When all the water deductions are tallied for stream depletion, carriage losses, and the two conveyance losses, the actual water available for delivery when groundwater substitution is used is 53%. This is not presented in the EIS/EIR, which allows the Lead Agencies to overestimate the amount of water that is delivered through the Delta to Buyers and therefore the economic benefits of the *2015-2024 Water Transfer Program*. What is lacking is any meaningful discussion of the need for, role, availability, and effect of carriage water and conveyance losses in any transfer in the EIS/EIR. Without such information it is not possible to determine the water quality and supply effects of the program.

[11] Bureau of Reclamation, 2013-12-17 2013 Total Pumpage (FINAL) nlw.xlsx (Exhibit J)

ii. Monitoring and production wells.

The identity and locations of all wells that will be used to monitor groundwater substitution transfer pumping impacts are unknown. The EIS/EIR must include proposed transfer well locations that are sufficiently accurate to allow for determination of distances between the wells and areas of potential impact. These are integral project features that must be disclosed in detail prior to any meaningful effects analysis.

In 2009, GCID installed four production wells to extract 26,530 AF of groundwater as part of its *Stony Creek Fan Aquifer Performance Testing Plan*. Other districts have also installed production wells, most with public funds, that have been used for past transfers such as Anderson/Cottonwood Irrigation District, Butte Water District, and RD-108. To the extent those wells and any others would be used in this project, they must be considered to be part of the whole of the action, and disclosed and analyzed herein.

i. "Other" transfers.

The EIS/EIR states that, "Other transfers not included in this EIS/EIR could occur during the same time period, subject to their own environmental review (as necessary)." (EIS/EIR 1-2.) In other words, not only is the EIS/EIR unclear precisely about which transfers are likely to occur and are analyzed in this EIR/EIR, it also leaves open-ended the prospect of some transfers not being covered by the EIS/EIR. This apparent piecemealing of transfer projects short-circuits comprehensive environmental review.

f. <u>The Project Description Fails to Include Sufficient Locations, Maps, and Boundaries.</u>

The project description must show the location of the project, its component parts, and the affected environmental features. CEQA Guidelines § 15124(a).

Maps are needed of each seller service area at a scale that allows for reasonably accurate measurement of distances between the groundwater substitution transfer wells and surface water features, other non-participating wells, proposed monitoring wells, fisheries, vegetation and wildlife areas, critical surface structures, and regional economic features. Maps with rates and times of stream depletion by longitudinal channel section are needed to allow for an adequate review of the Draft EIR/EIS conclusion of less than significant and reasonable impacts with no injury. These maps are also needed to evaluate the specific locations for monitoring potential impacts. Thus, detailed maps that show the locations of the monitoring wells and the areas of potential impact along with the rates and seasons of anticipated stream depletion are needed for each seller service area. These maps are also needed to allow for evaluation of the cumulative effects whenever pumping by multiple sellers can impact the same resource. The only maps provided by the Draft EIS/EIR that show the location of the groundwater substitution transfer wells, and the rivers and streams potentially impacted are the simulated drawdown Figures 3.3-26 to 3.3-31, which are at a scale of approximately 1 inch to 18 miles. The lack of maps with sufficient detail to see the relationship between the wells and the surface water

features prevents adequate review of the Draft EIS/EIR analysis to determine groundwater and surface water impacts.

Furthermore, figure 3.1-1, mapping the project area, is impossible to read and determine where each seller and buyer service area actually lies. Nor does the figure itself actually include many geographic points of reference used throughout the EIS/EIR. The EIS/EIR, for example, states that "Pelger MCW is located on the east side of the Sacramento River near Robbins (Figure 3.1-1.)" (EIS/EIR at 3.1-7.) But Robbins is not on the map, and the Pelger MCW is virtually impossible to locate on Figure 3.1-1. Similarly, the EIS/EIR states that the Sacramento River is impaired from Keswick dam to the Delta, but the EIS/EIR contains no description or map showing where Keswick dam is located, or any map enabling an understanding of the geographic scope of this water quality impairment. This problem repeats for literally dozens of existing environmental features described in the EIS/EIR. And, this problem is compounded by the unstable nature of the project description itself, leaving the EIS/EIR to string together multiple combinations of place names where transfers may or may not be imported or exported, and leaving the reader to continually search out secondary information to attempt to follow the EIS/EIR's terse and convoluted descriptions. A clear explanation, with visual aids, of the affected environment, including all local creeks and streams, and transfer water routes, is necessary to enable any member of the general public to grasp the potential types and locations of environmental impacts caused by the proposed program.

II. The EIS/EIR State Lead Agency Should be DWR, Not SLDMWA.

SLDMWA is not the proper Lead Agency for the Project. California Environmental Quality Act ("CEQA") Guidelines sections 15367 and 15051 require that the California Department of Water Resources ("DWR"), as the operator of the California Aqueduct and who has responsibility to protect the public health and safety and the financial security of bondholders with respect to the aqueduct, is the more appropriate lead agency. In *PCL v DWR*, the court found that DWR's attempt to delegate lead agency authority impermissibly insulated the department from "public awareness and possible reaction to the individual members' environmental and economic values."[12]

Pursuant to CEQA, ""lead agency" means the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment." (Public Res. Code § 21067.) As such, the lead agency must have authority to require imposition of alternatives and mitigation measures to reduce or avoid significant project effects, and must have the authority to disapprove of the project altogether. Here, the DWR clearly fits this description. As the EIS/EIR states, "[t]hese transfers require approval from Reclamation and/or Department of Water Resources (DWR)." (EIS/EIR 1-2.) Additionally, the

[12] *Planning and Conservation League et al. v Department of Water Resources* (2000) 83 Cal.App.4th 892, 907, citing Kleist v. City of Glendale (1976) 56 Cal. App. 3d 770, 779.

EIS/EIR reveals the obvious and long-standing relationship between the Bureau and DWR in facilitating surface water transfers. The Bureau and DWR have collaborated on each DTIWT publication, which provides specific environmental considerations for transfer proposals; are said to have "sponsored drought-related programs" together; have created the joint EIS/EIR for the Environmental Water Account ("EWA"); and "cooperatively implemented the 2009 Drought Water Bank."

SLDMWA should not serve as the lead agency. The *2015-2024 Water Transfer Program* has the potential to impact the long-term water supplies, environment, and economies in many California counties far removed from the SLDMWA geographic boundaries. With SLDMWA designated as the lead agency, and no potential sellers or source counties designated as responsible agencies, the process is unreasonably biased toward the narrow functional interests of SLDMWA and its member agencies. According to the EIS/EIR, the SLDMWA's role is to "[h]elp negotiate transfers in years when the member agencies could experience shortages." (EIS/EIR 1-1.) Helping to negotiate a transfer is a wholly different role than that of a lead agency with approval authority over a project. All of SLDMWA's purposes and powers are centered on providing benefit to member organizations,[13] and do not implement the Sustainable Groundwater Management Act.[14] Not only would SLDMWA be advocating on behalf of its members in this process, but nothing provided in the EIS/EIR suggests that it has authority to require mitigation measures or alternatives to reduce or avoid significant project impacts, for example, to groundwater resources in the seller service area, as such limitations would clearly be contrary to the specific interests of the SLDMWA members.

Importantly, DWR not only has jurisdiction over the SLDMWA transfers in ways that SLDMWA does not, but also DWR has review and approval authority over potential transfers outside of the SLDMWA altogether, including, for example, the East Bay Municipal Utilities District, as well as "[o]ther transfers not included in this EIS/EIR [that] could occur during the same time period, subject to their own environmental review (as necessary)." (EIS/EIR 1-2.) Environmental review of transfers should be unified and comprehensive, and cumulative across both geography and over time in a way that DWR and not SLDMWA can provide.

III. The EIS/EIR Fails to Completely and Accurately Describe the Affected Environmental Setting and Baseline Conditions.

A complete and accurate description of the existing and affected environmental setting is critical for an adequate evaluation of impacts to it. *See e.g. San Joaquin Raptor/Wildlife Rescue Ctr. v. County of Stanislaus* (1994) 27 Cal.App.4th 713; *Galante Vineyards v. Monterey Peninsula Water Mgmt. Dist.* (1997) 60 Cal.App.4th 1109, 1122; *County of Amador v. El Dorado County*

[13] SLDMWA JPA, para. 6, pp. 4-7.
[14] StAmant 2014. Letter to Bureau of Reclamation and SLDMWA re the 2015-2024 Water Transfer Program.

Water Agency (1999) 76 Cal.App.4th 931, 955; *Cadiz Land Co. v. Rail Cycle* (2000) 83 Cal.App.4th 74, 94.

As discussed, below, and in the expert reports submitted by *Custis*, *EcoNorthwest*, *Cannon*, and *Mish* on behalf of AquAlliance, the EIS/EIR fails to comport with these standards.

a. The EIS/EIR Fails to Describe Existing Physical Conditions.

i. Groundwater Supply

The EIS/EIR fails to provide a comprehensive assessment of the historic change in groundwater storage in the Sacramento Valley groundwater basin, and other seller sources areas within the proposed 10-year groundwater substitution transfer project. Historic change and current groundwater contour maps are critical to establishing an environmental baseline for the groundwater substitution transfers. The EIS/EIR uses SACFEM2013 simulations of groundwater substitution transfer pumping effects for WY 1970 to WY 2003, but the discussion of the simulation didn't provide specifics on how the model simulated the current conditions of the Sacramento Valley groundwater system or the potential impacts from the 10-year groundwater substitution transfer project based on current conditions. Again, The EIS/EIR relies on only modeling to consider impacts from the Project when it should disclose the results from actual monitoring and reporting for water transfer conducted in 12 of the last 14 years.

The EIS/EIR concludes that the Sacramento Valley basin's groundwater storage has been relatively constant over the long term, decreasing during dry years and increasing during wetter periods, but the EIR/EIS ignores more recent information and study (e.g. Brush 2013a and 2013b, NCWA, 2014a and 2014b). According to the BDCP EIS/EIR:

> Some locales show the early signs of persistent drawdown, including the northern Sacramento County area, areas near Chico, and on the far west side of the Sacramento Valley in Glenn County where water demands are met primarily, and in some locales exclusively, by groundwater. These could be early signs that the limits of sustainable groundwater use have been reached in these areas."

(BDCP EIS/EIR at 7-13.) The Draft EIS/EIR provides only one groundwater elevation map of the Sacramento Valley groundwater basin, Figure 3.3-4, which shows contours only from selected wells that omit many depths and areas. The Draft EIS/EIR doesn't provide maps showing groundwater elevations, or depth to groundwater, for groundwater substitution transfer seller areas in Sutter, Yolo, Yuba, and Sacramento counties. The DWR provides on a web site a number of additional groundwater level and depth to groundwater maps that the EIS/EIR should use to help complete its description of the affected environment.[15]

[15] http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/gw_level_monitoring.cfm#Well%20Depth%20Summary%20Maps

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 2013. (Id).

County Fall '04 - '13	Deep Wells (Max decrease gwe)	Deep Wells (Avg. decrease gwe)
Butte	-11.4	-8.8
Colusa	-31.2	-20.4
Glenn	-60.7	-37.7
Tehama	-19.5	-6.6

County Fall '04 - '13	Intermediate Wells (Max decrease gwe)	Intermediate Wells (Avg. decrease gwe)
Butte	-21.8	-6.5
Colusa	-39.1	-16.0
Glenn	-40.2	-14.5
Tehama	-20.1	-7.9

County Fall '04 - '13	Shallow Wells (Max decrease gwe)	Shallow Wells (Avg. decrease gwe)
Butte	-13.3	-3.2
Colusa	-20.9	-3.8
Glenn	-44.4	-8.1
Tehama	-15.7	-6.6

Below are the results from DWR's spring monitoring for Sacramento Valley groundwater basin from 2004 to 2014.

County Spring '04 - '14	Deep Wells (Max decrease gwe)	Deep Wells (Avg. decrease gwe)
Butte	-20.8	-14.6
Colusa	-26.9	-12.6
Glenn	-49.4	-29.2
Tehama	-6.1	-5.3

County Spring '04 - '14	Intermediate Wells (Max decrease gwe)	Intermediate Wells (Avg. decrease gwe)
Butte	-25.6	-12.8
Colusa	-49.9	-15.4
Glenn	-54.5	-21.7
Tehama	-16.2	-7.9

County Spring '04 - '14	Shallow Wells (Max decrease gwe)	Shallow Wells (Avg. decrease gwe)
Butte	-23.8	-7.6
Colusa	-25.3	-12.9
Glenn	-46.5	-12.6
Tehama	-38.6	-10.8

The DWR data clearly present a different picture of the condition of the Sacramento Valley groundwater basin over time than what is provided in the EIS/EIR. This must be corrected and considered in the NEPA and CEQA process.

The EIS/EIR omits other critical information needed to understand the project's impacts to area groundwater, including but not limited to:

- the distances between the transfer well(s) and surface water features;
- the number of non-participating wells in the vicinity of the transfer wells that may be impacted by the pumping; and,
- the distance between the transfer wells and non-participant wells that may be impacted by the transfer pumping, including domestic, public water supply and agricultural wells.

The EIS/EIR assumes that, "The groundwater modeling results indicate that shallow groundwater is typically deeper than 15 feet in most locations under existing conditions, and often substantially deeper." (3.8-32.) However, existing hydrologic condition documents clearly show Depth to Groundwater levels in shallow portions of the aquifer system that are <15' from the surface.

- The Chart titled **Depth to Water by Sub-Inventory Unit (SIU)** on **2014_10_Summary_Table.PDF** page 2/2 shows the Average Depth to Water (feet) in March through October 2014. 7 of 16 Sub-Inventory Units ("SIUs") in Butte County show average groundwater levels <15' from the surface at some time of the year. [16]
- November 2014 Adobe spreadsheets show numerous monitoring wells with water levels closer than 10' to the surface. The wells are located in Butte County SIUs designated under the county Basin Management Objective ("BMO") program. While some of the SIUs are corresponding to an Irrigation District primarily served by surface water, the Butte Sink, Cherokee, North Yuba, Angel Slough, Llano Seco and M&T SIUs have naturally occurring water levels <10'. All 3 pages show ground surface to water surface (feet). [17]

[16] https://www.buttecounty.net/wrcdocs/Programs/Monitoring/GWLevels/2014/2014_10_Summary_Table.pdf https://www.buttecounty.net/wrcdocs/Programs/Monitoring/GWLevels/2014/2014_10_Data_Summary_Update.pdf (Exhibit K)

[17] 2014 Monthly Groundwater Depth to Water- CASGEM: https://www.buttecounty.net/wrcdocs/Programs/Monitoring/GWLevels/2014/2014_10_Data_Summary_Update.pdf (Exhibit K)

- The January 2014 *BUTTE COUNTY DOMESTIC WELL DEPTH* **SUMMARY** shows the 10' Depth to Groundwater Contour lines in the lower portion of the map. [18]
- The January 2014 *COLUSA COUNTY DOMESTIC WELL DEPTH SUMMARY* shows the 10' Depth to Groundwater Contour lines in large portions of the county. [19]
- The January 2014 *GLENN COUNTY DOMESTIC WELL DEPTH SUMMARY* shows the 10' Depth to Groundwater Contour lines in the lower portion of the map. [20]

Dan Wendell of The Nature Conservancy, a panelist at a workshop held by the California Natural Resources Agency, the California Department of Food and Agriculture, and California EPA on March 24, 2014, presented a similar picture as the county summaries above, but also raised the alarm about the existing, significant streamflow losses from groundwater pumping and, even more significantly, how long it takes for those losses to appear:

> "The Sacramento Valley still has water levels that are fairly shallow," he said. "There are numerous perennial streams and healthy ecosystems, and the basin is largely within a reasonable definition of sustainable groundwater yield. However, since the 1940s, groundwater discharge to streams in this area has decreased by about 600,000 acre-feet per year due to groundwater pumping, and it's going to decrease an additional 600,000 acre-feet in coming years under 2009 status quo conditions due to the time it takes effects of groundwater pumping to reach streams. It takes years to decades, our work is showing."[21]

What areas in the Sellers' region were used to reach the EIS/EIR conclusion that "[i]ndicate that shallow groundwater is typically deeper than 15 feet"? What prevented the analysis from disclosing the many miles of riparian habitat in the Sacramento Valley that indicate that riparian forest vegetation remains healthy with groundwater levels shallower than 15 feet? As we presented above, there are many areas in the Sellers' region that have groundwater higher than 15 feet below ground surface.

In addition, the EIS/EIR fails to provide recharge data for the aquifers. Professor Karin Hoover, Assistant Professor of hydrology, hydrogeology, and surficial processes from CSU Chico, found

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[18] Butte County shallow Groundwater Contours: www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/WellDepthSummaryMaps/Domestic_BUTTE.pdf (Exhibit L)

[19] Colusa County shallow Groundwater Contours: www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/WellDepthSummaryMaps/Domestic_COLUSA.pdf (Exhibit M)

[20] Glenn County shallow Groundwater Contours: www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/WellDepthSummaryMaps/Domestic_GLENN.pdf (Exhibit N)

[21] http://mavensnotebook.com/2014/04/28/groundwater-management-workshop-part-1-sustainable-groundwater-management-panel/ (Exhibit O)

in 2008 that, "Although regional measured groundwater levels are purported to 'recover' during the winter months (Technical Memorandum 3), data from Spangler (2002) indicate that recovery levels are somewhat less than levels of drawdown, suggesting that, in general, water levels are declining." According to Dudley, "Test results indicate that the 'age' of the groundwater samples ranges from less than 100 years to tens of thousands of years. In general, the more shallow wells in the Lower Tuscan Formation along the eastern margin of the valley have the 'youngest' water and the deeper wells in the western and southern portions of the valley have the 'oldest' water," adding that "the youngest groundwater in the Lower Tuscan Formation is probably nearest to recharge areas." (2005). "This implies that there is currently no active recharge to the Lower Tuscan aquifer system (M.D. Sullivan, personal communication, 2004)," explains Dr. Hoover. "If this is the case, then water in the Lower Tuscan system may constitute fossil water with no known modern recharge mechanism, and, once it is extracted, it is gone as a resource," (Hoover 2008).[22]

ii. Groundwater Quality

The Draft EIS/EIR discusses the potential for impacts to groundwater quality by migration of contaminants as a result of groundwater substitution pumping, but provides only a general description of the current condition of groundwater quality. No maps are provided that show the baseline groundwater quality and known areas of poor or contaminated groundwater, or from all areas where groundwater pumping may occur. Groundwater quality information on the Sacramento Valley area is available from existing reports by the USGS (1984, 2008b, 2010, and 2011) and Northern California Water Association (NCWA, 2014c). Determination of groundwater quality prior to pumping is critical to avoiding significant adverse impacts, both to adjacent groundwater users impacted by migrating contaminants, as well as surface water potentially impaired by contaminated runoff from irrigated agriculture or other uses.

There are numerous hazardous waste plumes in Butte County, which could easily migrate with the potential increased groundwater pumping proposed for the Project. The State Department of Toxics Control and the Regional Water Resources Control Boards have a great deal of information readily available for all counties involved with the proposed Project. Fluctuating domestic wells can lead to serious contamination from heavy metals and non-aqueous fluids. Because the Bureau fails to disclose basic standards for the mitigation and monitoring requirements, it is unknown if hazardous plumes in the areas of origin will be monitored or not.

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[22] Spangler, Deborah L. 2002. *The Characterization of the Butte Basin Aquifer System, Butte County, California.* Thesis submitted to California State University, Chico; Dudley, Toccoy et al. 2005. *Seeking an Understanding of the Groundwater Aquifer Systems in the Northern Sacramento Valley: An Update;* Hoover, Karin A. 2008. *Concerns Regarding the Plan for Aquifer Performance Testing of Geologic Formations Underlying Glenn-Colusa Irrigation District, Orland Artois Water District, and Orland Unit Water Users Association Service Areas, Glenn County, California.* White Paper. California State University, Chico.

Please note the attached map from the State Water Resources Control Board (2008) that highlights areas vulnerable to groundwater contamination throughout the state. A significant portion of both the areas of origin and the receiving areas are highlighted. When the potential for serious health and safety impacts exists, NEPA and CEQA require that this must be disclosed and analyzed.

iii. Surface Water Flows

The EIS/EIR asserts that, under the no action/no project alternative, "Surface water supplies would not change relative to existing conditions. Water users would continue to experience shortages under certain hydrologic conditions, requiring them to use supplemental water supplies." (3.1-15.) It would be most helpful if the lead agencies would explain the geographic scope of this statement since the shortages could be experienced throughout the areas of origin, transmission, and delivery – as well as the entire State of California. The section continues with, "Under the No Action/No Project Alternative, some agricultural and urban water users may face potential shortages under dry and critical hydrologic conditions." Again, to what geographic areas is the EIS/EIR referring? The final sentence in the section reads, "Impacts to surface water supplies would be the same as the existing conditions." Without further elaboration or a reference that would further explain what exactly are the "existing conditions, mentioned" this is merely a conclusory assertion without the benefit of factual data. For example, existing conditions vary wildly in California weather patterns and agency allocations can as well. For example, in 2014 CVP Settlement Contractors were threatened with an unprecedented 40 percent allocation, which later became 75 percent when they cooperated with water transfers. Failing to disclose the wide range of natural and agency decisions that comprise the No Action/No Project alternative must be corrected and re-circulated in another draft EIS/EIR.

The EIS/EIR states that "[b]ecause of the interaction of surface flows and groundwater flows in riparian systems, including associated wetlands, enables faster recharge of groundwater, these systems are less likely to be impacted by groundwater drawdown as a result of the action alternatives;" therefore, "[t]hese systems are less likely to be impacted by groundwater drawdown as a result of the action alternatives." (EIS/EIR 3.8-32.) This flawed assumption has been readily discredited by USGS:

> There is more of an interaction between the water in lakes and rivers and groundwater than most people think. Some, and often a great deal, of the water flowing in rivers comes from seepage of groundwater into the streambed. Groundwater contributes to streams in most physiographic and climatic settings... Groundwater pumping can alter how water moves between an aquifer and a stream, lake, or wetland by either intercepting groundwater flow that discharges into the surface-water body under natural conditions, or by

> increasing the rate of water movement from the surface-water body into an aquifer. A related effect of groundwater pumping is the lowering of groundwater levels below the depth that streamside or wetland vegetation needs to survive. The overall effect is a loss of riparian vegetation and wildlife habitat. [23]

Lastly, the EIR/EIS presents the rivers and streams analyzed for impacts from the Proposed Action alternative with numerous omissions and conclusory remarks that are not supported. (3.8-49 – 3.8-51.) Examples include:

- *Table 3.8.3 Screening Evaluation Results for Smaller Streams in the Sacramento River Watershed for Detailed Vegetation and Wildlife Impact Analysis for the Proposed Action* fails to designate the counties of origin except for Deer and Mill creeks. Even readers familiar with the region need this basic information.
- Creeks with groundwater/surface water connections, but omitted from Tehama and Butte counties in Table 3.8.3 include, but are not limited to: Clear, Cottonwood, Battle, Singer, Pine, Zimmershed, Rock, Mud, and Big Chico.
- The modeling that is used to omit streams from analysis and to select and analyze other streams is completely inadequate to the task. Page D-3 has information about model resolution. It is normal to have five to ten nodes to resolve a feature of interest, but the nodal spacing is listed as ranging from 125 to 1000 meters, with stream node spacing around 500 meters (EIS/EIR p. D-3). This implies that spatial features smaller than about 2 kilometers cannot be resolved with this model. With the physical response of interest below the threshold of resolution even under the best of circumstances, then you have 100% margin of error, because the model cannot "see" that response.[24]

iv. Surface Water Quality

The baseline water quality data presented in the EIS/EIR is insufficient to accomplish any meaningful understanding of existing water quality levels throughout the project area. The EIS/EIR fails to show where each affected water body is, or disclose its existing beneficial uses, or numeric water quality objectives. Data that are presented is scattered, inconsistent, incomplete, often severely out of date, and often misleading. Further, the EIS/EIR fails to explain exactly where much of the presented water quality data comes from – indeed, failing to explain exactly where the affected environment is at all.

Many waterways are left out of this section entirely. The biological and vegetation effects of the program are discussed elsewhere in the EIS/EIR, and show that most would be impacted by the proposed program, but these waterways are not discussed in the EIS/EIR water quality section. Diminished flows can affect water quality in a variety of way, for example, causing

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[23] The USGS Water Science School. http://ga.water.usgs.gov/edu/gwdepletion.html

[24] Mish, p. 8. (Exhibit C)

higher temperatures, lower dissolved oxygen, or high sediment contamination or turbidity. Therefore, these affected waterways should be described and analyzed in the EIS/EIR water quality chapter.

In addition, the EIS/EIR only names the California Aqueduct, the Delta-Mendota Canal, and the San Luis Reservoir as affected waters within the buyer areas. Later, the EIS/EIR admits that increased irrigation in the buyers' areas may adversely impact stream water quality, but none of these rivers, streams, creeks, or any other potentially affected waterway of any kind, are described in the buyer project areas. (EIS/EIR 3.2-26.)

The EIS/EIR also fails to meaningfully describe the existing water quality in the affected environment. The EIS/EIR repeatedly misleads the public and decision-makers regarding the baseline conditions of waters within the project area by labeling them as "generally high quality." For example, the EIS/EIR states that "certain segments of the Sacramento River contain several constituents of concern, including Chlordane, dichlorodiphenyltrichloroethane, Dieldrin, mercury, polychlorinated biphenyls (PCBs), and unknown toxicity (see Table 3.2-1); however, the water quality in the Sacramento River is generally of high quality." What is the basis for this non-sequitur used here, and repeated throughout the existing environmental descriptions in the EIS/EIR? How do constituents of concern and unknown toxicity translate to generally high quality?

The remaining baseline information presented in the EIS/EIR contains significant gaps that preclude a meaningful understanding of the existing environmental conditions. In order to attempt to characterize the water quality in the affected environmental area, the EIS/EIR lists out beneficial uses, 303(d) impairments, and a variety of water quality monitoring data. The EIS/EIR presents almost no reference to existing numeric water quality objectives, and evaluation of potential breaches of those standards is therefore impossible.

Table 3.2-1 lists 303(d) impairments within the area of analysis. The table states the approximate mileage or acreage of the portion of each water body that is impaired, but fails to inform the public exactly where these stretches are located. For example, table 3.2-1 states that, within the Delta, approximately 43,614 acres are impaired for unknown toxicity, 20,819 acres are impaired for electrical conductivity, and 8,398 acres are impaired for PCBs; but without knowing which acres within the Delta this table describes, it is impossible to know whether transfer water will affect those particular areas. This problem repeats for all impairments listed in table 3.2-1.

The baseline environmental condition of the Delta is poorly described. The EIS/EIR states that:

> [e]xisting water quality constituents of concern in the Delta can be categorized broadly as metals, pesticides, nutrient enrichment and associated eutrophication, constituents associated with suspended sediments and turbidity, salinity, bromide, and organic

> carbon. Salinity is a water quality constituent that is of specific concern and is described below.

(EIS/EIR at 3.2-21.) The EIS/EIR provides no further information about "metals, pesticides, nutrient enrichment and associated eutrophication, constituents associated with suspended sediments and turbidity." These contaminants are each the focus of intensive regulation and controversy, and could cause significant adverse impacts if contaminated surface waters are transferred, but no meaningful baseline data of existing conditions is provided to facilitate an evaluation of the effects of the incremental changes caused by the proposed program.

The EIS/EIR provides scattered and essentially useless monitoring data to attempt to describe the existing water quality conditions in the program area. First, the EIS/EIR is unclear exactly what year or years it uses to constitute the baseline environmental conditions. Then, Tables 3.2-4 through 3.2-20 provide data from 1980 through 2014. Some tables average data, some use median data, some present isolated data, and none provide a comparison to existing numeric water quality objectives. Of all of the existing environmental baseline data provided, only table 3.2-15 provides any data regarding contamination caused by metals in the water column, and only for Lake Natoma from April to September of 2008. As a result, any contamination relating to any metals in any transfer water is essentially ignored by the EIS/EIR. Moreover, the scattershot data provided in the EIS/EIR does not provide the public with any information about the actual water quality of transfer water that may be used in any future project.

Table 3.2-21 presents mean data from "selected" monitoring stations throughout the Delta. The EIS/EIR states that "[s]ampling period varies, depending on location and constituent, but generally is between 2006-2012." (EIS/EIR 3.2-22.) EIS/EIR readers simply have no way to know what these data actually represent. Columns are labeled "mean TDS," "mean electrical conductivity," and "mean chloride, dissolved." Are these data averaged for the approximate period of 2006-2012? Were any data excluded? The EIS/EIR lists these monitoring stations, but doesn't explain where each is actually located, which should be mapped for ease of reference. Nor does the EIS/EIR state what the applicable water quality objective is at each monitoring point for each parameter; nor how often these water quality objectives were breached.

Figure 3.2-2 presents the monthly median chloride concentrations at selected monitoring sites, and misleadingly states that these median concentrations do not exceed the secondary MCL for chloride of 250 mg/L; but that comparison is irrelevant as the Bay-Delta Plan sets water quality objectives for chloride at 250 mg/day, not monthly mean.

Figures 3.2-3 through 3.2-5 show average electrical conductivity at selected monitoring stations, but the EIS/EIR fails to state the relevant water quality standard against which to compare these data, and fails to report the frequency and magnitude of exceedances, which

are numerous and great. When do exceedances occur, and how can the proposed program avoid transferring water from or into waterways with elevated EC?

The EIS/EIR fails to provide any discussion or analysis of how SWRCB Decision 1641 would be implemented. The EIS/EIR states that Decision 1641 "requires Response Plans for water quality and water levels to protect diverters in the south Delta that may affect the opportunity to export transfers." (EIS/EIR at 2-32.) Later, the EIS/EIR adds that Decision 1641 "require[s] that the Central Valley Project (CVP) and State Water Project (SWP) be operated to protect water quality, and that DWR and/or Reclamation ensure that the flow dependent water quality objectives are met in the Delta (SWRCB 2000)." (EIS/EIR 3.2-10.) Nowhere does the EIS/EIR actually identify what these requirements entail, nor analyze when they would or would not be met by any portion of the proposed program. D-1641 is among the most critical of water quality regulations controlling the proposed program, and the EIS/EIR must provide significantly more analysis of how it would propose to comply with these State Water Board standards. As discussed, below, compliance with D-1641 standards is far from certain.

Similarly, the EIS/EIR notes that "DWR has developed acceptance criteria to govern the water quality of non-Project water that may be conveyed through the California Aqueduct. These criteria dictate that a pump-in entity of any non-project water program must demonstrate that the water is of consistent, predictable, and acceptable quality prior to pumping the local groundwater into the SWP." (EIS/EIR at 3.2-10.) Again, however, the EIS/EIR fails to explain what these criteria require, and fails to provide any discussion of whether, when, or how these criteria could be met for each transfer contemplated by the program. This lack of information and analysis is insufficient to support informed public and agency environmental decision-making.

IV. The EIS/EIR Fails to Evaluate Inconsistency with Applicable Laws, Plans, and Policies.

a. State Water Policies.

The EIS/EIR should fully disclose the consolidated places of use for DWR and the Bureau, and what criteria might be applied for greater flexibility claimed for the consolidated place of use necessary for any given year's water transfer program, and what project alternatives could avoid this shift. Could the transfers be facilitated through transfer provisions of the Central Valley Project Improvement Act? Would the consolidation be a permanent or temporary request, and would the consolidation be limited to the duration of just the *2015-2024 Water Transfer Program*? How would the consolidated places of use permit amendments to the SWP and CVP permits relate to their joint point of diversion? Would simply having the joint point of diversion in place under D-1641 suffice for the purpose of the Project?

The EIS/EIR should better describe existing water right claims of sellers, buyers, the Bureau, and DWR. In response to inquiries from the Governor's Delta Vision Task Force, the SWRCB

acknowledged that while average runoff in the Delta watershed between 1921 and 2003 was 29 million acre-feet annually, the 6,300 active water right permits issued by the SWRCB is approximately 245 million acre-feet [25] (pp. 2-3). In other words, **water rights on paper are 8.4 times greater than the real water in California's Central Valley rivers and streams diverted to supply those rights on an average annual basis.** And the SWRCB acknowledges that this 'water bubble' does not even take account of the higher priority rights to divert held by pre-1914 appropriators and riparian water right holders (*Id.* p. 1). More current research reveals that 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 – 5.6 times more claims than there is available water. [26] Informing the public about water rights claims would necessarily show that buyers and the Agencies 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 *2015-2024 Water Transfer Program*. Otherwise the public and decision makers have insufficient information on which to support and make informed choices.

To establish a proper legal context for these water rights, the EIS/EIR should also describe more extensively the applicable California Water Code sections about the treatment of water rights involved in water transfers.

Like federal financial regulators failing to regulate the shadow financial sector, subprime mortgages, Ponzi schemes, and toxic assets of our 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 2011 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, the Department of Water Resources and the U.S. Bureau of Reclamation, filed with the Board on April 21, 2011. (Exhibit Q)

b. Public Trust Doctrine.

The State of California has the duty to protect the people's common heritage in streams, lakes, marshlands, and tidelands through the Public Trust Doctrine.[27] The Sacramento, Feather, and Yuba rivers and the Delta are common pool resources. DWR acknowledges this legal reality in

[25] SWRCB, 2008. Water Rights Within the Bay Delta Watershed (Exhibit P.)
[26] 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*. (Exhibit Q)
[27] *National Audubon Society v. Superior Court* (1983) 33 Cal 3d, 419, 441.

its publication, *Water Transfer Approval: Assuring Responsible Transfers*.[28] The application of the Public Trust Doctrine requires an analysis of the public trust values of competing alternatives, as was directed by the State Water Board in the Mono Lake Case. Its applicability to alternatives for the water transfers planned from the Sacramento, Feather, and Yuba rivers and through the Delta, where species recovery, ecosystem restoration, recreation and navigation are pitted against damage from water exports, is exactly the kind of situation suited to a Public Trust analysis, which should be required by the 2015-2024 Water Transfer Program. The act of appropriating water—whether for a new use or for a new method of diversion or of use— is an acquisition of a property right from the waters of the state, an act that is therefore subject to regulation under the state's public trust responsibilities. Groundwater pumping with adverse effects to public trust surface waters must also be considered.

c. Local General Plans and Ordinances.

The Draft EIS/EIR discusses only two county ordinances, the Colusa Ordinance No. 615 and Yolo Export Ordinance No. 1617, one agreement, the Water Forum Agreement in Sacramento County, and one conjunctive use program, the American River Basin Regional Conjunctive Use Program. Except for the brief discussion of the two ordinances, one agreement, and one conjunctive use program listed above, the Draft EIS/EIR doesn't describe the requirements of local GMPs, ordinances, and agreements listed in Tables 3.3-1 (page 3.3-8) and Table 3-1 (page 27). Thus, the actual groundwater substitution transfer project permit requirements, restrictions, conditions, or exemptions required for each seller service area by the Bureau, DWR, and one or more County GMP or groundwater ordinance will apparently be determined at a future date.

Additional information is needed on what the local regulations require for exporting groundwater out of each seller's groundwater basin. The Draft EIS/EIR needs to discuss how the local regulations ensure that the project complies with Water Code Sections 1220, 1745.10, 1810. 10750, 10753.7, 10920-10936, and 12924 (for more detailed discussion of these Water Codes see Draft EIS/EIR Section 3.3.1.2.2). Although the Draft EIS/EIR doesn't document, compare or evaluate the requirements of all local agencies that have authority over groundwater substitution transfers in each seller service area, the Draft EIS/EIR concludes that the environmental impacts from groundwater substitution transfer pumping by each of the sellers will either be less than significant and cause no injury, or be mitigated to less than significant through mitigation measures WS-1, and GW-1 with its reliance on compliance with local regulations.

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[28] California Department of Water Resources, *Water Transfer Approval: Assuring Responsible Transfers*, July 2012, page 3. Accessible online 16 February 2014 at http://www.water.ca.gov/watertransfers/docs/responsible_water_transfers_2012.pdf. In addition, the Delta Protection Act of 1959 also acknowledges this reality, California Water Code Sections 12200-12205. (Exhibit R)

As noted above, this conclusions is derived from information absent from the EIS/EIR and, even if there was information considered by the Lead Agencies, without any apparent analysis. Butte, Glenn, and Shasta counties represent counties with Sellers and all of them have the potential to be heavily impacted by activities in or adjacent to their jurisdictions. AquAlliance has examined their ordinances and found them insufficient to protect other users and the environment (Exhibits U, V, X). Sincere efforts at monitoring for groundwater levels and subsidence become meaningless if the monitoring infrastructure is scant and enforcement absent. The Butte County Department of Water and Resource Conservation also explains that local plans are simply not up to the task of managing a regional resource:

> Each of the four counties that overlie the Lower Tuscan aquifer system has their own and separate regulatory structure relating to groundwater management. Tehama County, Colusa, and Butte Counties each have their own version of an export ordinance to protect the citizens from transfer-related third party impacts. Glenn County does not have an export ordinance because it relies on Basin Management Objectives (BMOs) to manage the groundwater resource, and subsequently to protect third parties from transfer related impacts. Recently, Butte County also adopted a BMO type of groundwater management ordinance. Butte County, Tehama County and several irrigation districts in each of the four counties have adopted AB3030 groundwater management plans. All of these groundwater management activities were initiated prior to recognizing that a regional aquifer system exists that extends over more than one county and that certain activities in one county could adversely impact another. Clearly the current ordinances, AB3030 plans, and local BMO activities, which were intended for localized groundwater management, are not well suited for management of a regional groundwater resource like that theorized of the Lower Tuscan aquifer system.[29]

There is a possibility that a seller's groundwater substitution area of impact will occur in multiple local jurisdictions, which should results in project requirements coming from multiple local as well as state and federal agencies. The Draft EIS/EIR doesn't discuss the obstacles from cross jurisdictional impacts that are immense because groundwater basins cross county lines thereby eliminating authority. (*Id*) One obvious example is found with productions wells placed in Glenn County in the lower end of the Tuscan Aquifer Basin that may affect the up-gradient part of the aquifer in Butte and Tehama counties.

If the Project proceeds, each seller's project analysis should identify what future analyses, ordinances, project conditions, exemptions, monitoring and mitigation measures are required to ensure that each of the seller's project meets or exceed the goals of the Draft EIS/EIR.

V. The EIS/EIR Fails to Adequately Analyze Numerous Environmental Effects.

[29] Butte County Department of Water and Resource Conservation, *Needs Assessment Tuscan Aquifer Monitoring, Recharge, and Data Management Project*,.2007. (Exhibit S)

The EIS/EIR fails to include numerous required elements to support a meaningful analysis of the project's significant adverse impacts. First, the deficiencies in the incomplete and undefined project description, and incomplete description of existing environmental conditions, render any true impact analysis, or hard look at the project effects, impossible. *See, e.g., Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818; *San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.App.4th 645. Even the analysis provided, however, employs unsupported and inapplicable standards of significance. (CEQA Guidelines § 15064(b); *see, e.g., Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 896; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1111). The EIS/EIR fails to completely analyze the project's significant adverse impacts, and fails to support its conclusions with substantial evidence, failing to characterize the project effects in the proper context and intensity. (*Id.*; 40 C.F.R. § 1508.27(a); *City of Maywood v. Los Angeles Unified School Dist.* (2012) 208 Cal.App.4th 362, 391; *Laurel Heights Improvement Association v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 393; *Madera Oversight Coalition, Inc. v. County of Madera* (2011) 199 Cal.App.4th 48, 102 ("whether an EIR is sufficient as an informational document is a question of law subject to independent review by the courts.")

As discussed, below, and in the expert reports submitted by *Custis*, *EcoNorthwest*, *Cannon*, and *Mish* on behalf of AquAlliance, the EIS/EIR fails to comport with these standards.

a. Surface Water Flows.

The EIS/EIR fails to adequately analyze changes to all surface water flows as a result of the proposed project. While the EIS/EIR presents some level of streamflow drawdown analysis in its vegetation and biological resources section, that analysis is not taken into consideration with respect to affects to other water supply rights. This raises the specter of injury to senior water rights holders, and the EIS/EIR fails to provide sufficient information regarding where such rights are held and in what amounts, and where proposed transfers may interfere.

Streamflow depletion in the EIS/EIR is evaluated through modeling, but a closer look at the models employed shows significant omissions. First, because the rate of stream depletion is scaled to pumping rate and because the model documentation doesn't indicate the pumping locations, rates, volumes, times or durations that produced the pumped volumes shown in Figure 3.3-25, or the stream depletions shown in Figures B-5 and B-6 in Appendix B, it appears that the SACFEM2013 modeling did not simulate the maximum rate of stream depletion for the proposed 10-year project. Second, the available Delta export capacity was determined from CalSim II model results using only conditions through WY 2003, which fails to account for

current conditions, climate change conditions, and future conditions. (EIS/EIR 3.7-18.) The adequacy of CalSIM II has also been called into question. [30]

In addition, the Bay-Delta Conservation Plan establishes flow limits for the Delta that the EIS/EIR fails to consider. Instead, the EIS/EIR states that the proposed projects could decrease outflows by 0.3 percent in winter and spring, and provides a bare conclusion that this impact is less than significant. (EIS/EIR 3.2-39.) Just this year the Bureau of Reclamation and DWR requested a Temporary Urgency Change from the SWRCB, a modification to Delta flow objectives that were not being met, and D-1641 standards, in order to attempt to manage species protection.[31]

The EIS/EIR attempts to consider changes in available supplies for project participants, but fails to review what other water rights holders may be affected by diminished flows. This is especially important given the EIS/EIR's conclusion that transfers would be most needed in times of critical shortage.

The EIS/EIR also fails to disclose changes in flows as a result of tailwater and ag drainage, which could lead to significant streamflow impacts.

b. Water Quality.

i. The EIS/EIR improperly excludes substantial amounts of water from any meaningful impact evaluation.

The EIS/EIR fails to provide any evidence to support its proposition that "if the change in flow is less than ten cubic feet per second (cfs), it is assumed that there would be no water quality impacts as this is within the error margins of the model." (EIS/EIR 3.2-27.) First, the margin of error of the model has no bearing on actual water quality. Second, NPDES permits regularly regulate flows of less than 10 cfs. According to USGS, 10 cfs equals 6.46 million gallons per day (MGD). The EIS/EIR's assumption that a change in reservoir elevation of less than 1,000 acre feet could not possibly have significant impacts to water quality is similarly baseless. (EIS/EIR 3.2-27.) This amounts to approximately 325,800 gallons of water, more than enough to result in a noticeable difference in water quality. The Federal Clean Water Act is a strict liability statute providing no de minimis exceptions. By way of comparison, the City of Galt Wastewater Treatment Plant maintains flows at 4.5 MGD (NPDES Permit No. CA0081434), the City of Colusa Wastewater Treatment Plant maintains flows of approximately 0.7 MGD (NPDES Permit No. CA0078999), and each of these facilities has been assessed penalties for effluent exceedances by the Regional Water Board in recent years. The EIS/EIR's conclusion that flows equivalent to entire municipal wastewater treatment plants have no ability to compromise water quality standards is simply wrong.

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[30] Close, A., et al, 2003. A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations in Central California (Exhibit T)

[31] Letter from Mark W. Cowin to Tom Howard, April 9, 2014 (Exhibit U)

Similarly, the EIS/EIR provides the bare conclusion that:

> CVP and SWP reservoirs within the Seller Service Area would experience only small changes in storage, which would not be of sufficient magnitude and frequency to result in substantive changes to water quality. Any small changes to water quality would not adversely affect designated beneficial uses, violate existing water quality standards, or substantially degrade water quality. Consequently, potential effects on reservoir water quality would be less than significant.

(EIS/EIR 3.2-31.) The EIS/EIR simply provides no evidence or analysis in making this conclusion.

Lastly, the EIS/EIR provides no actual analysis of potential impacts to San Luis Reservoir as a result of lowering water levels in response to transfers. The EIS/EIR admits that "storage under the Proposed Action would be less than the No Action/No Project Alternative for all months of the year," and asserts that water levels would be lowered between 3%-6% as a result of the Project. (EIS/EIR 3.2-41.) The EIS/EIR then presents the bare conclusion that "These small changes in storage are not sufficient to adversely affect designated beneficial uses, violate existing water quality standards, or substantially degrade water quality." The EIS/EIR provides no basis for this determination, including no comparison of baseline environmental conditions to changes in contaminated runoff as a result of any particular water transfer.

ii. The EIS/EIR fails to provide any information with which to evaluate impacts from idled crop fields, or farmlands in buyers' areas.

The EIS/EIR assumes certain agricultural practices will occur at idle rice fields, when in reality, property owners would be free to re-purpose idled fields in countless and creative ways. (EIS/EIR 3-2.30.) For idled alfalfa, corn, or tomato cropland, the EIS/EIR assumes that property owners will put in place erosion control measures to conserve soil. While this may be a reasonable assumption for some farms, others, who may prefer to purse multi-year water transfers, may not have an interest in investing in soil conservation. In addition, the EIS/EIR fails to provide analysis of the degree of effectiveness of soil conservation measures where no groundcover is in place. (EIS/EIR 3.2-29.) If proven to be effective, the EIS/EIR should require the Lead Agencies to condition water transfers on these necessary mitigation measures, and provide monitoring and reporting to ensure their continued implementation. We recommend that the Bureau and DWR require, at a minimum, that local governments select independent third-party monitors, who are funded by surcharges on Project transfers paid by the buyers, to oversee the monitoring that is proposed in lieu of Bureau and DWR staff, and that peer-reviewed methods for monitoring be required. If this is not done, the Project's proposed monitoring and mitigation outline is insufficient and cannot justify the significant risk of adverse environmental impacts.

The EIS/EIR also states that increased erosion would not be of concern in Butte, Colusa, Glenn, Solano, Sutter, and Yolo counties, due to the prevalence of clay and clay loam soils. (EIS/EIR 3.2-29.) This bare conclusion does not provide any meaningful evaluation of the proposed program's impacts. Does the EIS/EIR really mean to assert that nowhere across six entire counties does soil erosion adversely impact water quality?

The EIS/EIR contradicts itself, stating:

> In cases of crop shifting, farmers may alter the application of pesticides and other chemicals which negatively affect water quality if allowed to enter area waterways. Since crop shifting would only affect currently utilized farmland, a significant increase in agricultural constituents of concern is not expected.

(EIS/EIR 3.2-30.) Would applications be altered, or remain the same? The EIS/EIR says both. In truth, due to the programmatic nature of this EIS/EIR, although it is a "project" not a "programmatic" document, one cannot know. This level of impact must be evaluated on a project-by-project basis, yet the Lead Agencies assertion that this is a "project" level EIS/EIR precludes additional CEQA and NEPA review.

The EIS/EIR concludes that water quality impacts in the buyer area would be less than significant, but provides no evidence or assurances whatsoever regarding the ultimate use of the purchased water would be. (EIS/EIR 3.2-41.) The EIS/EIR then considers only impacts resulting from increased crop irrigation, acknowledging that "[i]f this water were used to irrigate drainage impaired lands, increased irrigation could cause water to accumulate in the shallow root zone and could leach pollutants into the groundwater and potentially drain into the neighboring surface water bodies." (EIS/EIR 3.2-41.) The EIS/EIR then dismisses this possibility, assuming that buyers would only use water for "prime or important farmlands." Missing from this section is any analysis of water quality. What does the EIS/EIR consider to be prime or important farm lands? Do all such actual farms exhibit the same water quality in irrigated runoff? The EIS/EIR provides no assurances its assumptions will be met, and moreover, fails to explain what its assumptions actually are.

The EIS/EIR then again relies on an improper ratio comparison of the amount of transfer water potentially used in buyer areas, to the total amount of all water used in the buyers' areas. The EIS/EIR adds:

> The small incremental supply within the drainage-impaired service areas would not be sufficient to change drainage patterns or existing water quality, particularly given drainage management, water conservation actions and existing regulatory compliance efforts already implemented in that area.

(EIS/EIR 3.2-41.) Again, however, any comparison ratio of transferred water to other irrigation simply provides no analysis of what water quality impacts any individual transfer would have

after application on any individual farm. Moreover, if indeed a transfer is responding to a shortage, the transfer amount could actually constitute all or a majority of water usage for a particular site. Allusion to "existing regulatory compliance efforts" only suggests that regulatory compliance is not already maintained in each and every potential buyer farmland. There is no reasonable dispute that return flows from irrigated agriculture can often compromise water quality standards, but the EIS/EIR simply brushes this impact aside.

The EIS/EIR assumes that transfers may only occur during times of shortage (EIS/EIR 3.2-41), yet the proposed project itself is not so narrowly defined, and nothing in the Water Code limits transfers to circumstances where there has been a demonstrated shortfall in the buyer's area. As a result of this open-ended project description, the true water quality impacts in the buyers' areas are completely unknown.

iii. The EIS/EIR ignores numerous potentially significant sources of contamination to surface waters.

The EIS/EIR describes the existing environmental conditions of most of the water bodies within the potential seller areas to be impaired for numerous contaminants; and also provides sampling and monitoring data to show that in-stream exceedances of water quality objectives regularly occur. Yet, the EIS/EIR fails to ever discuss the impact of moving contaminated water from one source to another. For example, where a seller's water is listed as impaired for certain contaminants, any movement of that water to another waterbody will simply spread this impairment. The EIS/EIR provides no information with which to determine the actual water quality of the seller's water for any particular transfer, nor any evaluation or monitoring to determine whether moving these contaminants from one water to another would harm beneficial uses or exceed receiving water limits. The EIS/EIR should provide a more particularized review of potential contaminants and their impacts under the proposed project. For example, the EIS/EIR does not analyze water quality impacts from boron, but the BDCP EIS/EIR states, "large-scale, out-of-basin water transfers have reduced the assimilative capacity of the river, thereby exacerbating the water quality issues associated with boron." (BDCP EIS/EIR at 8-40.) Similarly, dissolved oxygen, among other forms of contamination, pose regular problems pursuant to D-1641. These potentially significant impacts must be disclosed for public and agency review.

What selenium and boron loads in Mud Slough and other tributaries to the San Joaquin River may be expected from application of this water to western San Joaquin Valley lands?

The EIS/EIR fails to disclose whether changes in specific conductivity as a result of the program would result in significant impacts to water quality. First, as noted above, the EIS/EIR presents scattered baseline data, much of which appears to show ongoing EC exceedances, but the EIS/EIR fails to disclose what Bay-Delta EC standards are, and the frequency and magnitude of baseline exceedances. Against this backdrop, the EIS/EIR then admits that program transfers would increase EC by as much as 4.3 percent. (EIS/EIR 3.2-39.) The EIS/EIR fails to disclose

whether these regular EC increases would exacerbate baseline violation conditions. In addition, the EIS/EIR only presents analysis for one monitoring location, whereas the Bay-Delta plan contains EC limits for over a dozen monitoring locations.

The EIS/EIR fails to disclose the extent to which program transfers could harm water quality by moving the "X2" location through the Delta. D-1641 specifies that, from February through June, the location of X2 must be west of Collinsville and additionally must be west of Chipps Island or Port Chicago for a certain number of days each month, depending on the previous month's Eight River Index. D-1641 specifies that compliance with the X2 standard may occur in one of three ways: (1) the daily average EC at the compliance point is less than or equal to 2.64 millimhos/cm; (2) the 14-day average EC is less than or equal to 2.64 millimhos/cm; or (3) the 3-day average Delta outflow is greater than or equal to the corresponding minimum outflow.

The EIS/EIR relies on an improper ratio approach to its impact evaluation of increased EC concentrations in the Delta Mendota Canal as a result of San Joaquin River diversions. (EIS/EIR 3.2-40.) The EIS/EIR admits that EC in the canal would increase as a result of these diversions, but fails to disclose by how much, or against what existing environmental conditions. Instead, the EIS/EIR compares the transfer amount, approximately 250 cfs, to the total capacity of the canal, about 4,000 cfs, to conclude that EC changes would not be significant. A comparison of the transfer amount to the total canal capacity simply provides no analysis of or information about EC concentrations.

The EIS/EIR fails to meaningfully evaluate potentially significant impacts to surface water quality as a result of groundwater substitution. First, the EIS/EIR provides an improper and misleading comparison, stating that

> The amount of groundwater substituted for surface water under the Proposed Action would be relatively small compared to the amount of surface water used to irrigate agricultural fields in the Seller Service Area. Groundwater would mix with surface water in agricultural drainages prior to irrigation return flow reaching the rivers. Constituents of concern that may be present in the groundwater could enter the surface water as a result of mixing with irrigation return flows. Any constituents of concern, however, would be greatly diluted when mixed with the existing surface waters applied because a much higher volume of surface water is used for irrigation purposes in the Seller Service Area. Additionally, groundwater quality in the area is generally good and sufficient for municipal, agricultural, domestic, and industrial uses.

(EIS/EIR at 3.2-21.) The EIS/EIR's threshold of significance asks whether any water quality objective will be violated, and this must be measured at each discharge point. In turn, any farm that substitutes surface water irrigation for groundwater irrigation must be evaluated against this threshold. The EIS/EIR fails to provide any evidence to support its conclusion that the dilution of the groundwater runoff into surface waters would avoid any significant water quality

impacts. On one hand the EIS/EIR asserts that groundwater is of good quality, and on the other hand, asserts that the overall quality would improve as it is mixed with surface water irrigation runoff: *which* source provides the better water quality in this arrangement? It is widely recognized that irrigated agricultural return flows can transport significant contaminants to receiving water bodies. In addition, the EIS/EIR simply assumes that contaminated groundwater would not be pumped and applied to agricultural lands, despite the fact that groundwater extractions may mobilize PCE, TCE, and nitrate plumes under the City of Chico,[32] and fails to disclose the existence of all hazardous waste plumes in the area of origin where groundwater substitution may occur. The assertion that "groundwater is generally good" throughout 6-10 counties is insufficient to provide any meaningful information against which to evaluate any particular transfer.

For "non-Project" reservoirs, the EIS/EIR provides one piece of additional information: modeling projections showing various rates of drawdown in table 3.2-24. The EIS/EIR then concludes that because water quality in these reservoirs is generally good, the reductions would not result in any significant water quality impacts. Again, the EIS/EIR provides no evidence or analysis to support this bare conclusion. Nor does the EIS/EIR present the beneficial uses of Collins Lake, nor Dry Creek, downstream of Collins Lake (see Table 3.2-2). The EIS/EIR does note that Lake McClure, Hell Hole Reservoir, and Camp Far West Reservoir maintain beneficial uses for cold water habitat and wildlife habitat, but fails to evaluate whether these beneficial uses would be impacted. Dissolved oxygen rates will decrease with lower water levels, and any sediment-based contaminant concentration, will increase. And the fact that drawdowns increase in already-critical years only heightens the water quality concerns.

The EIS/EIR repeatedly relies on dilution as the solution, with no actual analysis or receiving water assimilative capacity, and no regulatory authority. It is well-established law that a discharger may receive a mixing zone of dilution to determine compliance with receiving water objectives if and only if the permittee has conducted a mixing zone study, submitted to a Regional Board or the State Board for approval. (See, e.g., *Waterkeepers N. Cal. v. AG Indus. Mfg.*, 2005 U.S. Dist. LEXIS 43006 ["A dilution credit is a limited regulatory exception that must be preceded by a site specific mixing zone study"]; Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, 65 Fed. Reg. 31682 (May 18, 2000), 31701 ["All waters . . . are subject to the criteria promulgated today. Such criteria will need to be attained at the end of the discharge pipe, unless the State authorizes a mixing zone."]) The EIS/EIR entirely ignores Clean Water Act requirements for obtaining dilution credits, and, with no supporting evidence whatsoever, effectively and illegally grants dilution credits across the board. (See, EIS/EIR 3.2-31, 3.2-35, 3.2-36, 3.2-42, 3.2-59). For each instance in which the EIR/EIS wishes to apply dilution credit to its determination of whether water quality impacts will be significant, it must perform – with the approval of the State or Regional

[32] http://www.ci.chico.ca.us/capital_project_services/NitrateArea2NPh3U1-3.asp

Water Board – a mixing zone study considering the impacted waterbody and the specific types and quantities of the proposed pollutant discharge(s). Short of that, each time the EIS/EIR relies on dilution as the solution, it fails to analyze whether any contaminant in any waterbody in any amount could protect beneficial uses or exceed receiving water standards. The more Project water goes to south-of-Delta agricultural users than to urban users, the higher would be their groundwater levels, the more contaminated the groundwater would be in the western San Joaquin Valley and the more the San Joaquin River would be negatively affected from contaminated seepage and tailwater by operation of the Project.

c. Groundwater Resources.

The modeling efforts presented by the EIS/EIR fail to accurately capture the project's groundwater impacts. First, the SACFEM2013 simulations didn't evaluate the impacts of pumping the maximum annual amount proposed for each of the 10 years of the project. Second, because the groundwater modeling effort didn't include the most recent 11 years record, it appears to have missed simulating the most recent periods of groundwater substitution transfer pumping and other groundwater impacting events, such as recent changes in groundwater elevations and groundwater storage (DWR, 2014b), and the reduced recharge due to the recent periods of drought. Without taking the hydrologic conditions during the recent 11 years into account, the results of the SACFEM2013 model simulation may not accurately depict the current conditions or predict the effects from the proposed groundwater substitution transfer pumping during the next 10 years.

The Lead Agencies are making gross assumptions about the number, size, and behavior of all the surface water resources in the state, just to be able to coerce those assumptions into data that fits into the SACFEM2013 model. The assumptions are driving the modeling instead of the model (and science) driving accurate results. Appendix D is full of inaccurate statements and clear indications that this model is deficient. For example, it's advertised as a 3D model, but it's actually a collection of linked 2D models, and those are driven not by science, but by assumptions, e.g., the model can't calculate the location of the phreatic surface: it relies on assumptions and observations for that data, and that makes the model incapable of prediction.[33]

The Draft EIS/EIR should provide the time-drawdown and distance-drawdown hydraulic characteristics for each groundwater substitution transfer well so that non-participant well owners can estimate and evaluate the potential impacts to their well(s) from well interference due to the pumping the groundwater substitution transfer well(s). This analysis is not present in the EIS/EIR.

[33] Mish (Exhibit C) pp. 3 and 4).

The EIS/EIR wrongly assumes that stream depletion impacts from pumping occur only downstream from the point on the stream closest to the pumping well.[34] Any monitoring of the effects of groundwater substitution pumping on surface or ground water levels, rates and areas of stream depletion, fisheries, vegetation and wildlife impacts, and other critical structures needs to cover a much wider area than what is needed for a direct surface water diversion.

The EIS/EIR doesn't compare the known groundwater quality problem areas with the SACFEM2013 simulated drawdowns to demonstrate that the proposed projects won't draw in or expand the areas of known poor water quality. The EIS/EIR analysis doesn't appear to consider the impacts to private well owners. Pumping done as part of the groundwater substitution transfer may cause water quality impacts from geochemical changes resulting from a lowering the water table below historic elevations, which exposes aquifer material to different redox conditions and can alter the mixing ratio of different quality aquifer zones being pumped. Changes in groundwater level can also alter the direction and/or rate of movement of contaminated groundwater plumes both horizontally and vertically, which may expose non-participating wells to contaminants they would not otherwise encounter.

The EIS/EIR fails to evaluate any changes in the rate and direction of inter-basin groundwater flow. Inter-basin groundwater flow may become a hidden long-term impact that increases the time needed for recovery of groundwater levels from groundwater substitution transfer pumping, and can extend the impact from groundwater substitution transfer pumping to areas outside of the groundwater substitution transfer seller's boundary.

Finally, the EIS/EIR should evaluate how Project transfers could add to the already high water table in the western San Joaquin Valley? Impacts from a higher water table could include increased groundwater contamination, lower flood resistance, greater erosion, and loss of suitability of certain parcels to particular land uses.

d. <u>The SACFEM 2013 and CALSIM II Models are Inadequate.</u>

The comments herein are based largely on the attached work of Dr. Custis (Exhibit A) and Dr. Mish (Exhibit C), and we request specific responses to these attached works. The EIR/EIS fails to accurately estimate environmental effects likely to occur during water transfers. The SACFEM2013 model used to predict groundwater resources is flawed by being based on poor technology that is simply not up to the task of accurate large-scale modeling.

The SACFEM2013 model is only partially predictive, in that key aquifer responses are entered as input data instead of being computed as predictive quantities. The model requires considerable data manipulation to be used, and these manipulations are necessarily subject to interpretation. 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 model is not

[34] Custis (Exhibit A)

predictive in many important 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. As described in previous sections, both the model and the input data contain gross over-simplifications that compromise the ability to provide accurate estimates of real-world responses of water resources 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. 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. 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.

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. 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.

In contrast to the shortcomings of the model, the Bureau/DWR's DTIPWT seeks information on interactions between groundwater pumping and groundwater/surface water supplies at various increments of less than one and two miles. (DTIPWT at Appendix B.) Where the EIS/EIR fails to provide information at a level of detail required by BOR and DWR to determine whether significant impacts to water supplies may occur, the EIS/EIR fails to provide information needed to support a full analysis of groundwater and surface water impacts, and fails to support its conclusions with evidence.

CalSim II is a highly complex simulation model of a complex system that requires significant expertise to run and understand. Consequently, only a few individuals concentrated in the Department of Water Resources, U.S. Bureau of Reclamation and several consulting firms understand the details and capabilities of the model. State Water Resources Control Board (SWRCB) staff cannot run the model. To the extent CalSim II is relied upon, the EIR/EIS must be transparent and clearly explain and justify all assumptions made in model runs. It must explicitly state when findings are based on post processing and when findings are based on direct model results. And results must include error bars to account for uncertainty and margin of safety.

As an optimization model, CalSim II is hardwired to assume perfect supply and perfect demand. The notion of perfect supply is predicated on the erroneous assumption that groundwater can always be obtained to augment upstream supply. However, the state and federal projects have

no right to groundwater in the unadjudicated Sacramento River basin. Operating under this assumption risks causing impacts to ecosystems dependent upon groundwater basins in the areas of origin. The notion of perfect demand is also problematic, as it cannot account for the myriad of flow, habitat and water quality requirements mandated by state and federal statutes. Perfect demand assumes water deliveries constrained only by environmental constraints included in the code. In other words, CalSim II never truly measures environmental harm beyond simply projecting how to maximize deliveries without violating the incorporated environmental constraints. As a monthly time-step model, CalSim II cannot determine weekly, daily or instantaneous effects; i.e., it cannot accurately simulate actual instantaneous or even weekly flows. It follows that CalSim II cannot identify real-time impacts to objectives or requirements. Indeed, DWR admits, "CalSim II modeling should only be used in 'comparative mode,' that is when comparing the results of alternate CalSim II model runs and that 'great caution should be taken when comparing actual data to modeled data."[35]

The Department of Civil Engineering University of California at Davis conducted a comprehensive survey of members of California's technical and policy-oriented water management community regarding the use and development of CalSim II in California. Detailed interviews were conducted with individuals from California's water community, including staff from both DWR and USBR (the agencies that created, own, and manage the model) and individuals affiliated with consulting firms, water districts, environmental groups, and universities.

The results of the survey, which was funded by the CalFed Science Program and peer-reviewed, should serve as a cautionary note to those who make decisions based on CalSim II. The report cites that in interviewing DWR and USBR management and modeling technical staff: "*Many interviewees acknowledge that using CALSIM II in a predictive manner is risky and/or inappropriate, but without any other agency-supported alternative they have no other option.*"

The report continues that: "All users agree that CalSim II needs better documentation of the model, data, inputs, and results. CalSim II is data-driven, and so it requires numerous input files, many of which lack documentation," and "There is considerable debate about the current and desirable state of CalSim II's calibration and verification," and "Its representation of the SWP and CVP includes many simplifications that raise concerns regarding the accuracy of results." "The model's inability to capture within-month variations sometimes results in overestimates of the volume of water the projects can export from the Sacramento- San Joaquin Bay-Delta and makes it seem easier to meet environmental standards than it is in real operations." The study concluded by observing, "CalSim II is being used, and will continue to be used, for many other types of analyses for which it may be ill-suited, including in absolute mode."

[35] Answering Brief for Plaintiff-Intervenor-Appellee California Department of Water Resources, Appeal from the United States District Court for the Eastern District of California, No. 1:09-cv-407, Case: 11-15871, 02/10/2012, ID: 8065113, page 15

In sum, the relied-upon models fail to accurately characterize the existing and future environment, fail to assess project-related impacts at a level of detailed required for the EIS/EIR, and fail to support the EIS/EIR's conclusions regarding significance of impacts.

e. Seismicity.

The EIS/EIR reasoning that because the projects don't involve new construction or modification of existing structures that there are no potential seismic impacts from the activity undertaken during the transfers is incorrect. The project area has numerous existing structures that could be affected by the groundwater substitution transfer pumping, specifically settlement induced by subsidence. Although the seismicity in the Sacramento Valley is lower than many areas of California, it's not insignificant. There is a potential for the groundwater substitution transfer projects to increase the impacts of seismic shaking because of subsidence causing additional stress on existing structures.

The EIS/EIR fails to inform the public through any analysis of the potential effects excessive groundwater pumping in the seller area may have on the numerous known earthquake faults running through and about the north Delta area, and into other regions of Northern California. As recently detailed in a paper published by a well-respected British scientific journal, "[u]plift and seismicity driven by groundwater depletion in central California," excessive pumping of groundwater from the Central Valley might be affecting the frequency of earthquakes along the San Andreas Fault, and raising the elevation of local mountain belts. The research posits that removal of groundwater lessens the weight and pressure on the Earth's upper crust, which allows the crust to move upward, releasing pressure on faults, and rendering them closure to failure. Long-Term Water Transfer Agreements have impacted the volume of groundwater extracted as farmers are able to pump and then forego surface water in exchange for money. The drought has exacerbated the need for water in buyer areas, and depleted the natural regeneration of groundwater supply due to the scarcity of rain.

Detailed analyses of this seismicity and focal mechanisms indicate that active geologic structures include blind thrust and reverse faults and associated folds (e.g., Dunnigan Hills) within the Coast Ranges-Sierran Block ("CRSB") boundary zone on the western margin of the Sacramento Valley, the Willows and Corning faults in the valley interior, and reactivated portions of the Foothill fault system. Other possibly seismogenic faults include the Chico monocline fault in the Sierran foothills and the Paskenta, Elder Creek and Cold Fork faults on the northwestern margin of the Sacramento Valley.[36]

f. Climate Change.

[36] http://archives.datapages.com/data/pacific/data/088/088001/5_ps0880005.htm (Custis, Exhibit A)

The gross omissions and errors within the climate change analysis of the EIS/EIR fail to accurately describe the existing climatological conditions into which the project may be approved, fail to accurately describe the diminution of water and natural resources over recent and future years as a result of climate change, fail to integrate these changing circumstances into any future baseline or cumulative conditions, and fail to completely analyze or support the EIS/EIR conclusions regarding the project's potentially significant impacts.

i. The EIS/EIR Completely Fails to Incorporate Any Climate Change Information into its Analysis.

The EIS/EIR provides no analysis whatsoever of the extent to which climate change will affect the EIS/EIR assumptions regarding water supply, water quality, groundwater, or fisheries. Despite providing an overview of extant literature and study, all agreeing that California temperatures have been, are, and will continue to be rising, the entire EIS/EIR analysis of climate change interactions with the proposed project states:

> As described in the Section 3.6.1.3, changes to annual temperatures, extreme heat, precipitation, sea level rise and storm surge, and snowpack and streamflow are expected to occur in the future because of climate change. Because of the short-term duration of the Proposed Action (10 years), any effects of climate change on this alternative are expected to be minimal. Impacts to the Proposed Action from climate change would be less than significant.

(EIS/EIR 3.6-21 to 3.6-22; similarly, the EIS/EIR Fisheries chapter at 3.7-23 states: "Future climate change is not expected to alter conditions in any reservoir under the No Action/No Project Alternative because there will be limited climate change predicted over the ten year project duration (see Section 3.6, Climate Change/Greenhouse Gas).")

First, this "analysis" seriously misstates extant science by claiming that climate change impacts "are expected to occur in the future." The effects of climate change are affecting California's water resources at present, and have been for years. A 2007 DWR fact sheet, for example, states that "[c]limate change is already impacting California's water resources."[37] A more recent 2013 report issued by the California Office of Environmental Health Hazard Assessment states that "[m]any indicators reveal already discernible impacts of climate change, highlighting the urgency for the state, local government and others to undertake mitigation and adaptation strategies."[38] The report states that:

[37] http://www.water.ca.gov/climatechange/docs/062807factsheet.pdf (Exhibit AA)
[38] http://oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsSummaryAugust2013.pdf (Exhibit BB)

Climate is a key factor affecting snow, ice and frozen ground, streams, rivers, lakes and the ocean. Regional climate change, particularly warming temperatures, have affected these natural physical systems.

From October to March, snow accumulates in the Sierra Nevada. This snowpack stores much of the year's water supply. Spring warming releases the water as snowmelt runoff. Over the past century, spring runoff to the Sacramento River has decreased by 9 percent. Lower runoff volumes from April to July may indicate: (1) warmer winters, during which precipitation falls as rain instead of snow; and (2) earlier springtime warming.

Glaciers are important indicators of climate change. They respond to the combination of winter snowfall and spring and summer temperatures. Like spring snowmelt, the melting of glaciers supplies water to sustain flora and fauna during the warmer months. Glacier shrinkage results in earlier peak runoff and drier summer conditions—changes with ecological impacts—and contributes to sea level rise.

With warming temperatures over the past century, the surface area of glaciers in the Sierra Nevada has been decreasing. Losses have ranged from 20 to 70 percent.
. . .

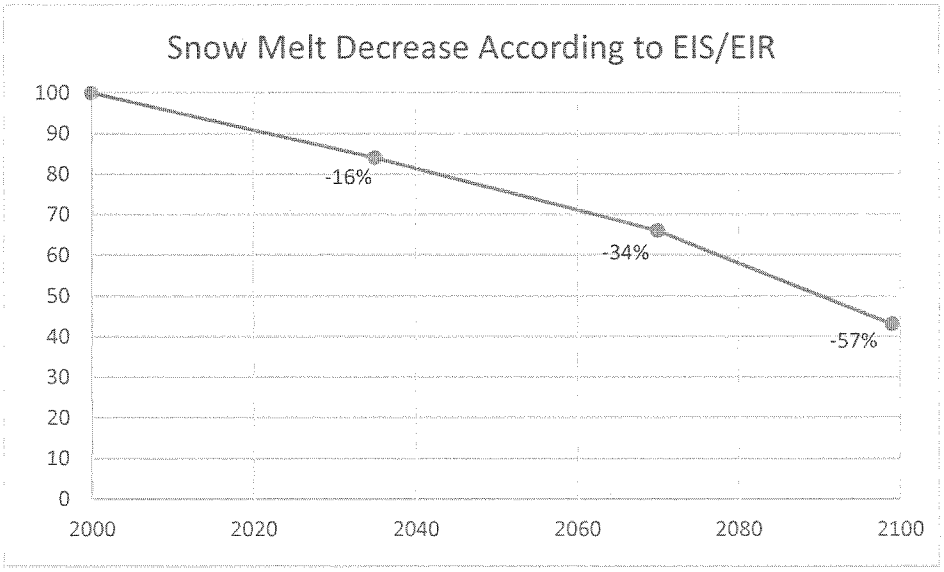
Over the last century, sea levels have risen by an average of 7 inches along the California coast.
. . .
Lake waters have been warming at Lake Tahoe, Lake Almanor, Clear Lake and Mono Lake since the 1990s. Changes in water temperature can alter the chemical, physical and biological characteristics of a lake, leading to changes in the composition and abundance of organisms that inhabit it.
. . .
Snow-water content—the amount of water stored in the snowpack—has declined in the northern Sierra Nevada and increased in the southern Sierra Nevada, likely reflecting differences in precipitation patterns.

Reduced runoff means less water to meet the state's domestic, agricultural, hydroelectric power generation, recreation and other needs. Cold water fish habitat, alpine forest growth and wildfire conditions are also impacted.

In addition, climate change threatens to reduce the size of cold water pools in upstream reservoirs and raise temperatures in upstream river reaches for Chinook, and climate change will reduce Delta outflows and cause X2 to migrate further east and upstream. (See, BDCP at 5.B-310, "Delta smelt may occur more frequently in the north Delta diversions area under future climate conditions if sea level rise [and reduced Sacramento River inflow below Freeport] induces movement of the spawning population farther upstream than is currently typical.")

And, the EIS/EIR "[f]igure 3.6-1 shows the climate change area of analysis," excluding all of the Sierra Nevadas except those within Placer County, and excluding all of Sacramento County. (EIS/EIR 3.6-2.)

Instead of accounting for these factors in its environmental analysis, the EIS/EIR takes the obtuse approach of relying only on "mid-century" and year 2100 projections to cast climate change as a "long-term" and "future" problem. (See, e.g., EIS/EIR 3.6-10.) First, the U.S. Department of Interior and the California Resources Agency clearly possess better information regarding past, present, and on-going changes to water supplies as a result of climate change than presented in the EIS/EIR, and such information must be incorporated. Second, even the information presented could be more fully described, and where appropriate, extrapolated, to support any meaningful analysis. Presumably these studies and reports provide more than one or two future data points, and instead show curved projections over time. For example, the EIS/EIR states that "[i]n California, snow water equivalent (the amount of water held in a volume of snow) is projected to decrease by 16 percent by 2035, 34 percent by 2070, and 57 percent by 2099, as compared to measurements between 1971 and 2000." (EIS/EIR 3.6-11.) Are these the only three data points provided by the study? Unless the EIS/EIR assumes that the entire percent decreases will be felt exclusively in years 2035, 2070, and 2099, these data should be extrapolated, as follows, to approximate the snow melt decrease over the project term:



From this it is apparent that snow melt will decrease over the project term. This provides just one example, but the EIS/EIR itself should include meaningful analysis of climate change effects upon annual temperatures, extreme heat, precipitation, evaporation, sea level rise, storm surge, snowpack, groundwater, stream flow, riparian habitat, fisheries, and local economies over the life of the project.

Nine years ago, in 2005, then California Governor Arnold Schwarzenegger stated "[w]e know the science. We see the threat. And we know the time for action is now."[39] Here, in contrast, the EIS/EIR says, let's wait another ten years. This is simply unacceptable.

ii. The EIS/EIR Completely Ignores Increased GHG Emission in the Buyer Areas.

The EIS/EIR impact evaluation of increased GHG emissions in the buyer areas consists of a series of incomplete characterizations and unsupported conclusion. First, the EIS/EIR states: "Water transfers to agricultural users . . . could temporarily reduce the amount of land idled relative to the No Action/No Project Alternative." (EIS/EIR 3.6-22.) This is in part true, but understates the impact, as there is no guarantee that the newly-supported land-uses would either be temporary, or agricultural. Second, the EIS/EIR states that "farmers may also pump less groundwater for irrigation, which would reduce emissions from use of diesel pumps." This too is entirely speculative, and also contradicts the earlier implication that transfer water would only go to idled cropland. Third, the EIS/EIR summarily concludes that, "[t]he total amount of agricultural activity in the Buyer Service Area relative to GHG emissions would not likely change relative to existing conditions and the impact would be less than significant." This again contradicts the EIS/EIR earlier statement that a water transfer could result in less idled cropland; and also defies logic and has no support in fact to suggest that increasing provision of a scarce resource would not induce some growth. At a bare minimum, the EIS/EIR should use its own estimated GHG reduction rates achieved as a result of newly idled cropland in the sellers' service area as means of measuring the estimated GHG emission increases caused by activating idled cropland in the buyers' service areas.

iii. The EIS/EIR Threshold of Significance for GHG Emissions is Inappropriate.

The EIS/EIR reviews nearly a dozen relevant, agency-adopted, thresholds of significant for GHG emissions, and chooses to select the single threshold that sits a full order of magnitude above all others. The chosen threshold is unsupported in fact or law, and creates internal contradiction within the EIS/EIR. The CEQA Guidelines state that:

> A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:
> . . .
> Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

[39] United Nations World Environment Day Conference, June 1, 2005, San Francisco; see also, Executive Order S-3-05.

> The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

(CEQA Guidelines § 15064.4.) Numerous Air Districts within the affected area have established GHG thresholds of significance that the EIS/EIR improperly chooses not to apply. The EIS/EIR argues that these Air District thresholds are meant to apply to stationary sources, an exercise that "would be overly onerous and is not recommended." (EIS/EIR 3.6-18.) This must be rejected. The EIS/EIR fails to provide any reason to believe that Air District regulations would not and should not be applied to activities occurring within each respective Air District. The CEQA Guidelines require the lead agency to use "a threshold of significance that the lead agency determines applies to the project;" here, the lead agency has not determined that the local Air District thresholds do not apply to the project activities; rather, it has determined that this evaluation would be too onerous. So instead, the EIS/EIR chooses to apply the threshold of significance adopted by the Antelope Valley Air District and the Mojave Desert Air District, each of which would clearly have latitude to adopt lax air quality thresholds owing to the lack of use intensity within each district. With (hopefully) no transfer water heading to the Mojave Desert, the lead agency has no basis to determine that the Mojave Desert Air District's thresholds of significance "applies to the project." The EIS/EIR also notes that the same threshold has been adopted by USEPA for Clean Air Act, Title V permits. But the Title V standard also applies to stationary sources, which the EIS/EIR says are inapplicable. Does any project element require a Title V permit? In short, the EIS/EIR fails to evaluate the project against any threshold of significance that was adopted either (1) for the benefit of an individual air district in which project activities would occur, or (2) for the benefit of regional or statewide GHG emission goals. The EIS/EIR's unsupported grab of the most lax standard it could find, with no bearing on the project whatsoever, must be rejected.

g. Fisheries.

AquAlliance shares the widely held view that operation of the Delta export pumps is the major factor causing the Pelagic Organism Decline ("POD") and in the deteriorating populations of fall-run Chinook salmon. In 2012, the State Water Resources Control Board received word in early December that the Fall Midwater Trawl surveys for September and October showed horrendous numbers for the target species. The indices for longfin smelt, splittal, and threadfin shad reveal the lowest in history.[40] Delta smelt, striped bass, and American shad numbers remain close to their lowest levels (*Id*). The 2013 indices were even worse and the 2014 indices are also abysmal (*Id*). Tom Cannon declared in June 2014 that water transfers have been and will remain devastating to Delta smelt during dry years.[41] "In my opinion, the effect of Delta operations this summer [2014] of confining smelt to the Sacramento Deepwater ship channel

[40] http://www.dfg.ca.gov/delta/data/fmwt/Indices/index.asp. (Exhibit CC)
[41] Cannon 2014. Declaration for Preliminary Injunction in AquAlliance and CSPA v. United State Bureau of Reclamation. (Exhibit DD)

upstream of Rio Vista due to adverse environmental conditions in the LSZ that will be exacerbated by the Transfers, both with and without relaxed outflow standards, with no evidence that they can emerge from the ship channel in the fall to produce another generation of smelt, is significant new information showing that the Transfers will have significant adverse impacts on Delta smelt." Mr. Cannon's October report observes that "habitat conditions have been very poor and the Delta smelt population is now much closer to extinction with the lowest summer index on record."

As Mr. Cannon's comments highlight, attached and fully incorporated as though stated in their entirety, herein, the EIS/EIR has inaccurately characterized the existing environment, including the assumption that delta smelt are not found in the Delta in the summer transfer season, when in fact during dry and critical years when transfers would occur, most if not all delta smelt are found in the Delta; and fails to fully assess the significant and cumulative effects to listed species in multiyear droughts when listed fish are already under maximum stress, which effects could be avoided by limiting transfers in the second or later years of drought.

The *2015-2024 Water Transfer Program* would exacerbate pumping of fresh water from the Delta, which has already suffered from excessive pumping over the last 12 years. Pumped exports cause reverse flows to occur in Old and Middle Rivers and can result in entrainment of fish and other organisms in the pumps. Pumping can shrink the habitat for Delta smelt (*Hypomesus transpacificus*) as well, since less water flows out past Chipps Island through Suisun Bay, which Delta smelt often prefer.

The EIS/EIR should also evaluate whether Project effects could alter stream flows necessary to maintain compliance with California Fish and Game Code Section 5937. A recent study issued from the University of California, Davis, documents hundreds of dams failing to maintain these required flows.[42] Both the timing and volumes of transfer water must be considered in conjunction with 5937 flows.

h. Vegetation and Wildlife.

i. The EIS/EIR reaches faulty conclusion for Project and cumulative impacts.

Section 3.8.5, *Potentially Significant Unavoidable Impacts*, declares that, "None of the alternatives would result in potentially significant unavoidable impacts on natural communities, wildlife, or special-status species." Regarding cumulative biological impacts of the proposed Project (Alternative 2), the EIS/EIR concludes, "Long-term water transfers would not be cumulatively considerable with the other projects because each of the projects would have little or no impact flows [sic] in rivers and creeks in the Sacramento River watershed or the vegetation and wildlife resources that depend on them," (p. 3.8-92). This is a conclusory

[42] https://watershed.ucdavis.edu/files/biblio/BioScience-2014-Grantham-biosci_biu159.pdf. (Exhibit EE)

statement without supporting material to justify it, only modeling that has been demonstrated in our comments as extremely deficient.

The EIS/EIR actually discloses there are very likely many significant impacts from the proposed project on terrestrial and aquatic habitat and species. Examples from Chapter 3.8 include:

- "The lacustrine natural communities in the Seller Service Area that would be potentially impacted by the alternatives include the following reservoirs: Shasta, Oroville, New Bullards Bar, Camp Far West, Collins, Folsom, Hell Hole, French Meadows, and McClure," (p. 3.8-10)
- "The potential impacts of groundwater substitution on natural communities in upland areas was considered potentially significant if it resulted in a consistent, sustained depletion of water levels that were accessible to overlying communities (groundwater depth under existing conditions was 15 feet or less). A sustained depletion would be considered to have occurred if the groundwater basin did not recharge from one year to the next," (p. 3.8-33).
- "In addition to changing groundwater levels, groundwater substitution transfers could affect stream flows. As groundwater storage refills during and after a transfer, it could result in reduced availability of surface water in nearby streams and wetlands," (p. 3.8-33).

It should also be noted that the 2008 U.S. Fish and Wildlife Service (USFWS) and 2009 National Marine Fisheries Service (NMFS) biological opinions did not evaluate potential impacts to in-stream flow due to water transfers involving groundwater substitution. How these potential impacts may adversely affect biological resources in the areas where groundwater pumping will occur, including listed species and their habitat, were also not included.[43] To reach the conclusion that the Project "would not be cumulatively considerable with the other projects" based only on modeling fails to provide the public with meaningful analysis of probable impacts.

ii. <u>The 2015-2024 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

[43] California Department of Fish and Game. 2013. COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT (2013 DRAFT EA) AND FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR THE 2013 CENTRAL VALLEY PROJECT (CVP) WATER, p.4. (Exhibit FF)

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 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. (Draft Recovery Plan for the Giant Garter Snake ("DRP") 1). 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 can be 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.

If fallowing (idling) occurs, there will be potentially significant impacts to GGS and this is acknowledged on page 3.8-69: "Giant garter snakes have the potential to be affected by the Proposed Action through cropland idling/shifting and the effects of groundwater substitution on small streams and associated wetlands." The Lead Agencies use language found in a 1997 Programmatic Biological Opinion (as well as the 1999 Draft Recovery Plan) to explain that GGS depend on more than rice fields in the Sacramento Valley. "The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3)

upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters." [44]

Even with the explanation above, that clearly illustrates the importance of upland habitat to GGS, the EIS/EIR concludes that idling or shifting upland crops "[a]re not anticipated to affect giant garter snakes, as they do not provide suitable habitat for this species" (p. 3.8-69). The EIS/EIR is internally contradictory and fails to provide any evidence to support its conclusion that GGS will not be impacted by idling or shifting crops in upland areas. In support of the importance of upland acreage to GGS, a Biological Opinion for Gray Lodge found that, "Giant garter snakes also use burrows as refuge from extreme heat during their active period. The Biological Resources Division (BRD) of the USGS (Wylie et al_ 1997) has documented giant garter snakes using burrows in the summer as much as 165 feet (50. meters) away from the marsh edge. Overwintering snakes have been documented using burrows as far as 820 feet (250 meters) from the edge of marsh habitat," (1998).[45]

More pertinent background information that is lacking in the EIS/EIR is found in the Bureau's Biological Assessment for the 2009 DWB that disclosed that one GGS study in Colusa County revealed the "longest average movement distances of 0.62 miles, with the longest being 1.7 miles, for sixteen snakes in 2006, and an average of 0.32 miles, with the longest being 0.6 miles for eight snakes in 2007." (BA at p.16) However, in response to droughts and other changes in water availability, the GGS has been known to travel up to 5 miles in only a few days, and the EIS/EIR should evaluate impacts to GGS survival and reproduction under such extreme conditions

As the EIS/EIR divulges, flooded rice fields, irrigation canals, streams, and wetlands in the Sacramento Valley can be used by the giant garter snake for foraging, cover and dispersal purposes. The Bureau's 2009 and 2014 Biological Assessments acknowledge the failure of the Bureau and DWR to complete the Conservation Strategy that was a requirement of the 2004 Biological Opinion (BA at p. 19-20). Research was finally initiated "since 2009," but is nowhere near the projected 10-year completion date. The unnecessary delay hasn't daunted the agencies pursuit of transfers that affect GGS despite the absence of the following information that the U.S. Fish and Wildlife Service has explicitly required since the 1990s:

- GGS distribution and abundance.
- Ten years of baseline surveys in the Sacramento Valley
- Five years of rice land idling surveys in the Sacramento Valley Recovery Unit and the Mid-Valley Recovery Unit.

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[44] Programmatic Consultation with the U.S. Army Corps of Engineers
404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California

[45] http://www.usbr.gov/mp/nepa/documentShow.cfm?Doc_ID=15453

This Project and all North-to-South and North-to-North transfers should be delayed until the Bureau and DWR have completed the Conservation Strategy they have known about for at least a decade and a half.

The Bureau and DWR continue to allow an increase in acres fallowed (2013 *Draft Technical Information for Preparing Water Transfer Proposals* ("DTIPWTP")) since the *2010/2011 Water Transfer Program* first proposed to delete or modify other mitigation measures previously adopted as a result of the Environmental Water Account ("EWA") EIR process. The EWA substantially reduced significant impacts for GGS, but without showing that they are infeasible, the Bureau and DWR proposed to delete the 160 acre maximum for "idled block sizes" for rice fields left fallow rather than flooded and to substitute for it a 320 acre maximum. (See 2003 Draft EWA EIS/EIR, p. 10-55; 2004 Final EWA EIS/EIR, Appendix B, p. 18, Conservation Measure # 4.) There was no evidence in 2010 to support this change nor has there been any provided to the present time. In light of the agencies failure to complete the required Conservation Strategy mentioned above and the data gathered in the Colusa County study, how can the EIS/EIR suggest (although it is not presented in the document, but in the agencies *Draft Technical Information for Preparing Water Transfer Proposals* papers) that doubling the fallowing acreage is in any way biologically defensible? The Lead and Approving Agencies additionally propose to delete the EWA mitigation measure excluding Yolo County east of Highway 113 from the areas where rice fields may be left fallow rather than flooded, except in three specific areas. [46] (See 2004 Final EWA EIS/EIR, Appendix B, p. 18, Conservation Measure # 2.) What is the biological justification for this change and where is it documented? What are the impacts from this change?

Deleting these mitigation measures required by the EWA approval would violate NEPA and CEQA's requirements that govern whether, when, and how agencies may eliminate mitigation measures previously adopted under NEPA and CEQA.

Additionally, the *2010/2011 Water Transfer Program* failed to include sufficient safeguards to protect the giant garter snake and its habitat. The EA for that two-year project concluded, "The frequency and magnitude of rice land idling would likely increase through implementation of water transfer programs in the future. Increased rice idling transfers could result in chronic adverse effects to giant garter snake and their habitats and may result in long-term degradation to snake populations in the lower Sacramento Valley. In order to avoid potentially significant adverse impacts for the snake, additional surveys should be conducted prior to any alteration in water regime or landscape," (p. 3-110). To address this significant impact the Bureau proposed relying on the 2009 Drought Water Bank ("DWB") Biological Opinion, which was a one-year BO. Both the expired 2009 BO and the 2014 BO highlighted the Bureau and DWR's avoidance of

[46] USBR and DWR, 2013. *Draft Technical Information for Preparing Water Transfer Proposals.*

meeting federal and state laws stating, "This office has consulted with Reclamation, both informally and formally, seven times since 2000 on various forbearance agreements and proposed water transfers for which water is made available ["for delivery south of the delta" is omitted in 2014] by fallowing rice (and other crops) or substituting other crops for rice in the Sacramento Valley. Although transfers of this nature were anticipated in our biological opinion on the environmental Water Account, that program expired in 2007 and, to our knowledge, no water was ever made available to EWA from rice fallowing or rice substitution. The need to consult with such frequency on transfers involving water made available from rice fallowing or rice substitution suggests to us a need for programmatic environmental compliance documents, including a programmatic biological opinion that addresses the additive effects on giant garter snakes of repeated fallowing over time, and the long-term effects of potentially large fluctuations and reductions in the amount and distribution of rice habitat upon which giant garter snakes in the Sacramento Valley depend," (p.1-2). And here we are in late 2014 still without that programmatic environmental compliance that is needed under the Endangered Species Act.

If the Project is or isn't approved, we propose that the Lead and Approving Agencies commit to the following conservation recommendations from the 2014 Biological Opinion by changing the word "should" to "shall":

> 1. Reclamation should [shall] assist the Service in implementing recovery actions identified in the Draft Recovery Plan for the Giant Garter Snake (U.S. Fish and Wildlife Service 1999) as well as the final plan if issued during the term of the proposed action.
> 2. Reclamation should [shall] work with the Service, Department of Water Resources, and water contractors to investigate the long-term response of giant garter snake individuals and local populations to annual fluctuations in habitat from fallowing rice fields.
> 3. Reclamation should [shall] support the research goals of the Giant Garter Snake Monitoring and Research Strategy for the Sacramento Valley proposed in the Project Description of this biological opinion.
> 4. Reclamation should [shall] work with the Service to create and restore additional stable perennial wetland habitat for giant garter snakes in the Sacramento Valley so that they are less vulnerable to market-driven fluctuations in rice production. The CVPIA (b)(1)other and CVPCP conservation grant programs would be appropriate for such work.

iii. <u>The EIS/EIR fails to accurately describe the uppermost acreage that could impact GGS.</u>

Page 3.8-69 claims that the Proposed Action "[c]ould idle up to a maximum of approximately 51,573 acres of rice fields," but the Lead and Approving Agencies are well aware that past

transfers have or could have fallowed much more acreage and that 20 percent is allowed per county under the *Draft Technical Information for Preparing Water Transfer Proposals* last written in 2013. Factual numbers for proposed water transfers that included fallowing and groundwater substitution in the last 25 years should be disclosed in a revised and re-circulated draft EIS/EIR. The companion data that should also be presented would disclose how much water was actually transferred each year by seller and delineated by acreage of land fallowed and/or groundwater pumped. This information should not only be disclosed in the EIS/EIR, but it should also be readily available on the Bureau's web site. In addition, the EIS/EIR should cease equivocating with usage of "could" and "approximately" and select and analyze a firm maximum acreage of idled land, which would provide the public with the ability to consider the impacts from a most significant impact scenario.

"In 1992, Congress passed the Central Valley Project Improvement Act (Act, or CVPIA), which amended previous authorizations of the California Central Valley Project (CVP) to include fish and wildlife protection, restoration, enhancement, and mitigation as project purposes having equal priority with power generation, and irrigation and domestic water uses." [47] The *2015-2024 Water Transfer Program* fails to take seriously the equal priority for, "[f]ish and wildlife protection, restoration, enhancement, and mitigation."

i. Economics.

Our comments are based largely upon the *EcoNorthwest* report produced for AquAlliance, attached and fully incorporated as though stated in their entirety, herein. Once again, the lack of relevant baseline information and discrete project description thwarts any ability to effectively analyze the project, and the lack of any market analysis of water prices, and prices for agricultural commodities, relegates the EIS/EIR to unsupported conclusions about the likely future frequency and amounts of water transfers and their environmental and economic consequences. The EIS/EIR further relies on obsolete data for certain key variables and ignores other relevant data and information. For example, the analysis assumes a price for water that bears no resemblance to the current reality. Growers and water sellers and buyers react to changing prices and market conditions, but the EIS/EIR is silent on these forces and how they would influence water transfers.

The EIS/EIR underestimates negative impacts on the regional economy in the sellers' area, acknowledging that negative economic impacts would be worse if water transfers happen over consecutive years, but estimating impacts only for single-year transfers, ignoring the data on the frequency of recent consecutive-year transfers.

As discussed, below, the EIS/EIR's inadequate evaluation and avoidance of subsidence will result in additional unaccounted-for economic costs. Injured third parties would bear the costs

[47] U.S. Department of Interior. *10 Year of Progress: Central Valley Project Improvement Act 1993-2002.* http://www.waterrights.ca.gov/baydelta/docs/exhibits/SLDM-EXH-03B.pdf (Exhibit GG)

of bringing to the sellers' attention harm caused by groundwater pumping, and the ability of parties to resolve disputes with compensation is speculative. The EIS/EIR is silent on these and other ripple cost effects of subsidence.

The EIS/EIR ignores the environmental externalities and economic subsidies that water transfers support. The EIS/EIR lists Westlands Water District as one of the CVP contractors expressing interest in purchasing transfer water. The environmental externalities caused by agricultural production in Westlands WD are well documented, as are the economic subsidies that support this production. To the extent that the water transfers at issue in the EIS/EIR facilitate agricultural production in Westlands WD, they also contribute to the environmental externalities and economic subsidies of that production, but the EIS/EIR is silent on these environmental and economic consequences of the water transfers.

j. Cultural Resources.[48]

The EIS/EIR fails to adequately provide evidence that water transfers, which draw down reservoir surface elevations at Central Valley Project (CVP) and State Water Project (SWP) reservoirs beyond historically low levels, could not potentially adversely affect cultural resources. The EIS/EIR states that the potential of adverse impacts to cultural resources does exist:

> *3.13.2.4 Alternative 2: Full Range of Transfers (Proposed Action)*
> Transfers that draw down reservoir surface elevations at CVP and SWP reservoirs beyond historically low levels could affect cultural resources. The Proposed Action would affect reservoir elevation in CVP and SWP reservoirs and reservoirs participating in stored reservoir water transfers. Water transfers have the potential to affect cultural resources, if transfers result in changing operations beyond the No Action/No Project Alternative. Reservoir surface water elevation changes could expose previously inundated cultural resources to vandalism and/or increased wave action and erosion (p. 3.13-15).

This passage states that the Long Range Water Transfers undertaking may have the potential to affect cultural resources if the water transfers lowered reservoir elevations enough to expose cultural resources. The first step for analysing this would require conducting research for past studies and reports with site specific data for the CVP and SWP reservoirs. The EIS/EIR states:

> 3.13.1.3 Existing Conditions
> This section describes existing conditions for cultural resources within the area of analysis. *All data regarding existing conditions were collected through an examination of archival and current literature pertinent to the area of analysis.* Because action

[48] Comments in this section are based on the work of Bill Helmer, prepared for AquAlliance on the 2014 Long-Term Water Transfers EIS/EIR

> alternatives associated with the project do not involve physical construction-related impacts to cultural resources, no project specific cultural resource studies were conducted in preparation of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (EIS/EIR, p. 3.13-13, emphasis added).

However, there are no references listed for all the data collected which were "pertinent to the area of analysis." Also, the EIS/EIR states on p. 3.13-15 cited above that the lowering of the reservoir water elevations due to water transfers may affect cultural resources. Obviously, such an impact does not need to "[i]nvolve physical construction-related impacts to cultural resources," so this rationale for not conducting specific cultural resource studies contradicts its own assertion.

Instead of conducting a cultural resources study which locates historic resources and traditional cultural properties (with the use of a contemporary Native American ethnological study), and then assesses the amount of project-related water elevation changes which may affect these resources, the EIS/EIR merely stated that their Transfer Operations Model was used to show that the project's "Impacts to cultural resources at Shasta, Oroville and Folsom reservoirs would be less than significant," (3.13-15, 3.13-16). A chart on page 13.3-15 shows that the proposed project is projected to decrease reservoir elevations at the "critical" level in September by 0.5 ft. at Shasta Reservoir, 2.4 ft. at Lake Oroville, and 1.5 ft. at Folsom Reservoir. (There is no source for this chart, and the reader has to guess that it may be from the Transfer Operations Model. The definitions of the various categories in the chart are also unexplained).

Based upon the findings shown on the chart, it is stated:

> The reservoir surface elevation changes under the Proposed Action for these reservoirs would be within the normal operations and would not be expected to expose previously inundated cultural resources to vandalism or increased wave action and wind erosion. Impacts to cultural resources at Shasta, Oroville and Folsom reservoirs would be less than significant (p. 3.13-15).

However, there is no evidence to show that a project-related reservoir drop of 2.4 ft. at Lake Oroville will not uncover cultural resources documented in *The Archaeological and Historical Site Inventory at Lake Oroville, Butte County*,[49] and expose them "to vandalism or increased wave action and wind erosion," thus adversely affecting these resources. This study states that there are 223 archaeological and/or historic sites recorded in the water level fluctuation zone of Lake Oroville (p. 12). Where is the Cultural Study which shows that lowering Lake Oroville 2.4 ft. due to water transfers *will not* expose specific archaeological sites or traditional cultural properties?

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[49] Prepared for the California Department of Water Resources by the Archaeological Research Center, Sacramento, and the Anthropological Studies Center, Rohnert Park, 2004. (Exhibit HH
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Without an inventory of the cultural resources which may be uncovered by the project-related drop in reservoir elevation for all the affected reservoirs, the numbers in the chart on page 13.3-15 mean nothing. The numbers in the chart provide no evidence that the project may or may not have an adverse effect on cultural resources. In contrast, substantial documentation of cultural resources in these areas exists.[50] The threat of potential project-related impacts to cultural resources triggers a Section 106 analysis of the project under the requirements of the National Historic Preservation Act, which "[r]equires Federal agencies to take into account the effects of their undertakings on historic properties" [36 CFR 800.1(a)].

Although the issue here is the raising of the Shasta Reservoir water levels, cultural impacts related to water levels at the Shasta Reservoir has been an ongoing issue for the Winnemem Wintu Tribe. The Winnemem Wintu Tribe and all tribes within the project area (Area of Potential Effects) need to be consulted by federal and state agencies. A project-specific cultural study under CEQA is also required under *15064.5. Determining the Significance of Impacts to Archaeological and Historical Resources.* Consultation with federally recognized tribes and California Native American tribes is required for this project.

k. Air Quality.

The EIS/EIR fails to analyze the air quality impacts in all these regions, especially with regard to the Buyers Service Area. Moreover, Appendix F – Air Quality Emissions Calculations exclude portions of the Sellers Service Area in Placer and Merced Counties. Conversely, there was not data supplied in Appendix F concerning the air quality impacts from the water transfers that would affect the Bay Area AQMD counties (Alameda, Contra Costa, Santa Clara), a Monterey Bay Unified APCD county (San Benito) and San Joaquin APCD counties (San Joaquin, Stanislaus, Merced, Fresno and Kings). Consequently, air quality impacts in the Buyers and Sellers Service Areas are unanalyzed and the EIS/EIR conclusions are not supported by evidence.

The EIS/EIR attempts to classify which engines would be subject to the ATCM based on whether an agricultural engine is in an air district designated in attainment for particulate matter and ozone, and is more than a half mile away from any residential area, school or hospital (aka

[50] Folsom Reservoir: http://online.wsj.com/articles/SB10001424052702304419104579322631095468744
Lake Oroville-
http://www.latimes.com/local/la-me-lake-oroville-artifacts-20140707-story.html#page=1 (Exhibit II)
Shasta Reservoir
http://www.winnememwintu.us/2014/09/09/press-release-dam-the-indians-anyway-winnememwar-dance-at-shasta-dam/ (Exhibit JJ)

sensitive receptors). (See p. 3.5-14). The EIS/EIR claims that the engines in Colusa, Glenn, Shasta and Tehama (part of Sellers Service Area) are exempt from the ATCM. However, 17 CCCR 93115.3 exempts in-use stationary diesel agricultural emissions not only based on the engines being remote, but all also "provided owners or operators of such engines comply with the registration requirements of section 93115.8, subdivisions (c) and (d), and the applicable recordkeeping and reporting requirement of section 93115.10," which the EIS/EIR ignores. Furthermore, the EIS/EIR fails to present any data about the "tier" the subject agricultural diesel engines fall into. While the EIS/EIR identifies the tiers and concomitant requirements for replacement or repowering, it fails to provide any analysis or evidence evaluating whether the engines being used to pump water are operating within the permissible timeframes, depending on the tier designation.

The EIS/EIR analyzes the assessment methods based on existing emissions models from the regulation, diesel emissions factors from USEPA Compilation of Air Pollutant Emission Factors (for Natural gas fired reciprocating engines and gasoline/diesel industrial engines) and CARB Emission Inventory Documentation (for land preparation, harvest operations and windblown dust); and CARB size fractions for particulate matter. None of these references is directly on point to diesel powered water pumps and the emissions caused thereby. Moreover, the EIS/EIR provides absolutely no information as to why these models are appropriate to serve as the basis for thresholds of significance.

The analysis provided in the EIS/EIR is less than complete. Here the "Significance Criteria" were only established and considered for the "sellers in the area of analysis where potential air quality impacts from groundwater substitution and crop idling transfers could occur." (See p. 3.5-25) But that is only half the equation. The unconsidered air quality impacts include what and how increased crop production and vehicle usage would affect the air quality in the Buyers Service Area. Data and evidence of those impacts were not even considered.

In establishing the significance criteria, the EIS/EIR utilized known thresholds of significance from the air districts in the Sellers Service Area that had published them. For the other districts in the Sellers Service Area, the EIS/EIR made the assumption that "[t]he threshold used to define a 'major source' in the [Clean Air Act] CAA (100 tons per year [tpy])" could be "used to evaluate significance." (See p. 3.5-26). There are several flaws with this over broad application of the "major source" threshold. First, agricultural pumps and associated agricultural activity are not typically considered "major sources," especially when compared to major industrial sources. Second, the application of the major source threshold runs counter to the legal requirement that "[u]pwind APCDs are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts," as announced as a requirement of the California Clean Air Act. (See p. 3.5-11). Finally, the 100 tpy threshold is wildly disproportionate to the limits set in nearby or adjoining air district and covering the same air basin. For example, the Butte AQMD considers significance thresholds for

NOx, ROGs/VOCs and PM10 to be 137lbs/day (25 tpy); Feather River AQMD considers significance thresholds for NOx and VOCs to be 25lbs/day (4.5 tpy) and 80 lbs/day (14.6 tpy) for PM10; Tehama APCD considers significance thresholds for NOx, ROGs/VOCs and PM10 to be 137 lbs/day (25 tpy); Shasta AQMD considers significance thresholds for NOx, ROGs/VOCs and PM10 on two levels – Level "B" is 137 lbs/day (25 tpy) and Level "A" is 25lbs/day (4.5 tpy) and 80 lbs/day (14.6 tpy) for PM10; and Yolo AQMD considers significance thresholds for ROGs/VOCs and NOx to be 54.8 lbs/day (10 tpy) and 80 lbs/day (14.6 tpy) for PM10. Clearly, there is a proportional relationship between these thresholds of significance. In contrast, the EIS/EIR, with substantial evidence to the contrary, assumes that the threshold of significance for those air districts who have not published a *CEQA Handbook* should be 100 tpy, or an increase by magnitudes of 4 to 20 times more than similarly situated Central Valley air districts.

"When considering a project's impact on air quality, a lead agency should provide substantial evidence that supports its conclusion in an explicit, quantitative analysis whenever possible." (See Guide to Air Quality Assessment in Sacramento County, Sacramento Metropolitan Air Quality Management District, 2009, Ch. 2, p. 2-6). Importantly, the EIS/EIR provides no basis, other than an assumption, as to why the major source threshold of significance from the CAA should be used or is appropriate for assessing the significance of the project impacts under CEQA or NEPA. The use of the CAA's threshold of significance for major sources is erroneous as a matter of law. (See *Endangered Habitats League v. County of Orange* (2005) 131 Cal.App.4th 777, 793 ("The use of an erroneous legal standard [for the threshold of significance in an EIR] is a failure to proceed in the manner required by law that requires reversal.")) Lead agencies must conduct their own fact-based analysis of the project impacts, regardless of whether the project complies with other regulatory standards. Here, the EIR/EIS uses the CAA threshold without any factual analysis on its own, in violation of CEQA. (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109; citing *CBE v. California Resources Agency* (2002) 103 Cal.App.4th 98, 114; accord *Mejia v. City of Los Angeles* (2005 130 Cal.App.4th 322, 342 ["A threshold of significance is not conclusive . . . and does not relieve a public agency of the duty to consider the evidence under the fair argument standard."].) This uncritical application of the CAA's major source threshold of significance, especially in light of the similarly situated air district lower standards, represents a failure in the exercise of independent judgment in preparing the EIS/EIR.

VI. The EIS/EIR Fails to Adequately Analyze Numerous Cumulative Impacts.

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).)

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, the Bureau 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).

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

As discussed, below, and in the expert reports submitted by *Custis*, *EcoNorthwest*, *Cannon*, and *Mish* on behalf of AquAlliance, the EIS/EIR fails to comport with these standards for cumulative impacts upon surface and groundwater supplies, vegetation, and biological resources; and, the

baseline and modeling data relied upon by the EIS/EIR that does not account for related transfer projects in the last 11 years.

a. Recent Past Transfers.

Because the groundwater modeling effort didn't include the most recent 11 years record (1970-2003), it appears to have missed simulating the most recent periods of groundwater substitution transfer pumping and other groundwater impacting events, such as recent changes in groundwater elevations and groundwater storage (DWR, 2014b), and the reduced recharge due to the recent periods of drought. Without taking the hydrologic conditions during the recent 11 years into account, the results of the SACFEM2013 model simulation may not accurately depict the current conditions or predict the effects from the proposed groundwater substitution transfer pumping during the next 10 years.

f. In 2009, the Bureau approved a 1 year water transfer program under which a number of transfers were made. Regarding NEPA, the Bureau issued a FONSI based on an EA.
g. In 2010, the Bureau approved a 2 year water transfer program (for 2010 and 2011). No actual transfers were made under this approval. Regarding NEPA, the Bureau again issued a FONSI based on an EA.
h. The Bureau planned 2012 water transfers of 76,000 AF of CVP water all through groundwater substitution.[51]
i. In 2013, the Bureau 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.
j. The Bureau and SLDMWA's 2014 Water Transfer Program proposed transferring up to 91,313 AF under current hydrologic conditions and up to 195,126 under improved conditions. This was straight forward, however, when attempting to determine how much water may come from fallowing or groundwater substitution during two different time periods, April-June and July-September, the reader was left to guess.[52]

[51] USBR 2012. Memo to the Deputy Assistant Supervisor, Endangered Species Division, Fish and Wildlife Office, Sacramento, California regarding Section 7 Consultation.

[52] The 2014 Water Transfer Program's EA/MND was deficient in presenting accurate transfer numbers and types of transfers. The numbers in the "totals" row of Table 2-2 presumably should add up to 91,313. Instead, they add up to 110, 789. The numbers in the "totals" row of Table 2-3 presumably should add up to 195,126. Instead, they add up to 249,997. Both Tables 2-2 and 2-3 have a footnote stating: "These totals cannot be added together. Agencies could make water available through groundwater substitution, cropland idling, or a combination of the two; however, they will not make the full quantity available through both methods. Table 2-1 reflects the total upper limit for each agency."

These closely related projects impact the same resources, are not accounted for in the environmental baseline, and must be considered as cumulative impacts.

b. Yuba Accord

The relationship between the Lead Agencies is not found in the EIS/EIR, but 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." [53]

In a Fact Sheet produced by the Bureau, it provides some numerical context and more of DWR's involvement 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." [54] However, 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 substitution. (YCWA-1, Appendix B, p. B-97.)." [55]

Potential cumulative impacts from the Project and the YCWA Long-Term Transfer Program from 2008 - 2025 are not disclosed or analyzed in the EIS/EIR. The *2015-2024 Water Transfer Program* could transfer up to 600,000 AF per year through the same period that the YCWA Long-Term Transfers are potentially sending 200,000 AF into and south of the Delta. How these two projects operate simultaneously could have a very significant impact on the environment and economy of the Feather River and Yuba River's watersheds and counties as well as the Delta. The involvement of Browns Valley Irrigation District and Cordua Irrigation District in both long-term programs must also be considered. This must be analyzed and presented to the public in a revised drat EIS/EIR.

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[53] Bureau of Reclamation, 2013. *Storage, Conveyance, or Exchange of Yuba Accord Water in Federal Facilities for South of Delta Central Valley Project Contractors*.
[54] Bureau of Reclamation, 2013. *Central Valley Project (CVP) Water Transfer Program Fact Sheet*.
[55] State Water Resources Control Board, 2008. ORDER WR 2008 - 0025

Also not available in the EIS/EIR is disclosure of any issues associated with the YCWA transfers that have usually been touted as a model of success. The YCWA transfers have encountered troubling trends for over a decade that, according to the draft Environmental Water Account ("EWA") EIS/EIR, are 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[56] 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 EIS/EIR. What is found in the EIS/EIR 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 is not defined (pp, 3.3-69 to 3.3-70). This is a very significant impact that isn't addressed individually or cumulatively.

c. BDCP

The EIS/EIR fails to include the Bay Delta Conservation Plan ("BDCP") in the Cumulative Impacts section and in any analysis of the *2015-2024 Water Transfer Program*. Although we acknowledge that BDCP could not possibly be built during the 10-Year Water Transfer Program's operation, the EIS/EIR misses the point that the *2015-2024 Water Transfer Program* is a prelude to what comes later with BDCP. This connection is entirely absent. If the Twin Tunnels (the facilities identified in "Conservation Measure 1") are built as planned with the capacity to take 15,000 cubic feet per second ("cfs") from the Sacramento River, they will have the capacity to drain almost two-thirds of the Sacramento River's average annual flow of 23,490 cfs at Freeport[57] (north of the planned Twin Tunnels). As proposed, the Twin Tunnels will also increase water transfers when the infrastructure for the Project has capacity. This will occur during dry years when State Water Project ("SWP") contractor allocations drop to 50 percent of Table A amounts or below or when Central Valley Project ("CVP") agricultural allocations are 40 percent or below, or when both projects' allocations are at or below these levels (EIS/EIR Chapter 5). With BDCP, North to South water transfers would be in demand and feasible.

Communication regarding assurances for BDCP indicates that the purchase of approximately 1.3 million acre-feet of water is being planned as a mechanism to move water into the Delta to make up for flows that would be removed from the Sacramento River by the BDCP tunnels. [58] There is only one place that this water can come from: the Sacramento Valley's watersheds. It is well know that the San Joaquin River is so depleted that it will not have any capacity to contribute meaningfully to Delta flows. Additionally, the San Joaquin River doesn't flow past the proposed north Delta diversions and neither does the Mokelumne River.

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[56] 2012. *The Yuba Accord, GW Substitutions and the Yuba Basin*. Presentation to the Accord Technical Committee. (pp. 21, 22).

[57] USGS 2009. http://wdr.water.usgs.gov/wy2009/pdfs/11447650.2009.pdf Exhibit KK)

[58] Belin, Lety, 2013. E-mail regarding Summary of Assurances. February 25 (Department of Interior). (Exhibit LL)

As discussed above, the EIS/EIR also fails to reveal that the *2015-2024 Water Transfer Program* is part of many more programs, plans and projects to develop water transfers 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. BDCP is one of those plans that the federal agencies, together with DWR, SLDMWA, water districts, and others have been pursuing and developing for many years.

d. Biggs-West Gridley

The *Biggs-West Gridley Water District Gray Lodge Wildlife Area Water Supply* Project, a Bureau project, is not mentioned anywhere in the Vegetation and Wildlife or Cumulative Impacts sections. [59] This water supply project is located in southern Butte County where Western Canal WD, Richvale ID, Biggs-West Gridley WD, and Butte Water District actively sell water on a regular basis, yet impacts to GGS from this project are not disclosed. This is a serious omission that must be remedied in a recirculated draft EIS/EIR.

e. Other Projects

Court settlement discussions between the Bureau and Westlands Water District over provisions of drainage service. Case # CV-F-88-634-LJO/DLB will further strain the already over allocated Central Valley Project with the following conditions:

k. A permanent CVP contract for 890,000 acre-feet of water a year exempt from acreage limitations.
l. Minimal land retirement consisting of 100,000 acres; the amount of land Westlands claims it has already retired (115,000 acres) will be credited to this final figure. Worse, the Obama administration has stated it will be satisfied with 100,000 acres of "permanent" land retirement.
m. Forgiveness of nearly $400 million owed by Westlands to the federal government for capital repayment of Central Valley Project debt.
n. Five-Year Warren Act Contracts for Conveyance of Groundwater in the Tehama-Colusa and Corning Canals – Contract Years 2013 through 2017 (March 1, 2013, through February 28, 2018).

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

a. The DWR Dry Year Purchase Agreement for Yuba County Water Agency water transfers from 2015-2025 to SLDMWA.[60]

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[59] http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=15381

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

b. GCID's *Stony Creek Fan Aquifer Performance Testing Plan* to install seven production wells in 2009 to extract 26,530 AF of groundwater as an experiment that was subject to litigation due to GCID's use of CEQAs exemption for research.
c. Installation of numerous production wells by the Sellers in this Project many with the use of public funds such as Butte Water District,[61] GCID, Anderson Cottonwood Irrigation District,[62] and Yuba County Water Authority [63] among others.

VII. The EIS/EIR Fails to Develop Legally Adequate Mitigation Measures.

CEQA requires that the lead agency consider and adopt feasible mitigation measures that could reduce a project's adverse impacts to less than significant levels. Pub. Resources Code §§ 21002, 21002.1(a), 21100(b)(3), 21151, 22081(a). An adequate environmental analysis in the EIS/EIR itself is a prerequisite to evaluating proper mitigation measures: this analysis cannot be deferred to the mitigation measure itself. *See, e.g., Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. Moreover, mitigation measures must A mitigation measure is inadequate if it allows significant impacts to occur before the mitigation measure takes effect. *POET, LLC v. State Air Resources Board* (2013) 218 Cal.App.4th 681, 740. An agency may not propose a list of measures that are "nonexclusive, undefined, untested and of unknown efficacy." *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 95. Formulation of mitigation measure should generally not be deferred. CEQA Guidelines § 15126.4(a)(1)(B). If deferred, however, mitigation measure must offer precise measures, criteria, and performance standards for mitigation measures that have been evaluated as feasible in the EIR, and which can be compared to established thresholds of significance. *E.g., POET, LLC v. State Air Resources Board* (2013) 218 Cal.App.4th 681; *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260; *Sacramento Old City Association v. City Council* (1991) 229 Cal.App.3d 1011; CEQA Guidelines § 15126.4(a)(1)(B); *Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, 1275. Economic compensation alone does not mitigate a significant environmental impact. *See* CEQA Guidelines § 15370; *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1122. Where the effectiveness of a mitigation measure is uncertain, the lead agency must conclude the impact will be significant. *Citizens for Open Govt. v. City of Lodi* (2012) 70 Cal.App.4th 296, 322; *Fairview Neighbors v. County of Ventura* (1999) 70

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

[62] "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

[63] 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;

Cal.App.4th 238, 242. An EIR must not only mitigate direct effects, but also must mitigate cumulative impacts. CEQA Guidelines § 15130(b)(3).

Under NEPA, "all relevant, reasonable mitigation measures that could improve the project are to be identified," including those outside the agency's jurisdiction,[64] and including those for adverse impacts determined to be less-than-significant (40 C.F.R. § 1502.16(h)).

As discussed, below, and in the expert reports submitted by *Custis*, *EcoNorthwest*, *Cannon*, and *Mish* on behalf of AquAlliance, the EIS/EIR fails to comport with these standards.

The EIS/EIR illegally defers the development of and commitment to feasible mitigation measures to reduce or avoid a whole host of potentially significant project impacts. The EIS/EIR relies on mitigation measures WS-1 and GW-1 to reduce or avoid significant project effects through the entire environmental review document, not just for surface and ground water supplies, but also for impacts to vegetation, subsidence, regional economics, . (3.7-26, 3.7-56, 3.10-37, 3.10-51.) Unfortunately, these mitigation measures fail all standards for CEQA compliance, deferring analysis of the impact in question to a future time, including no criteria or performance standards by which to evaluate success, and failing to demonstrate that the measures are feasible or sufficient.

But the precise relationship of these mitigation measures is unclear. For example, the EIS/EIR relies on GW-1 to mitigate impacts to vegetation and wildlife as a result of stream flow loss; why doesn't the EIS/EIR consider the streamflow mitigation measure for this impact?

a. Streamflow Depletion.

WS-1 requires that a portion of transfer water be held back to offset streamflow depletion caused by groundwater substitution pumping, but fails to include critical information to ensure that any such mitigation measure could work. First, it is not clear that any transfer release and the groundwater substitution pumping would simultaneously occur, in real time. If groundwater pumping causes streamflow depletion at any time other than exactly when the transfer is made, then the transfer deduction amount will not avoid streamflow drawdown. And, indeed, it is well known that streamflow depletion can continue, directly and cumulatively, after the transfer activity ends. (E.g., figures B-4, B-5 and B-6 in Draft EIS/EIR Appendix B).

Next, the EIS/EIR fails to include any meaningful information to determine whether the applicable "streamflow depletion factor" to be applied to any single transfer project will mitigate significant impacts.

The EIS/EIR provides that "The exact percentage of the streamflow depletion factor will be assessed and determined on a regular basis by Reclamation and DWR, in consultation with buyers and sellers, based on the best technical information available at that time." (EIS/EIR at

[64] http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm

3.1-21.) More information is required. It is unclear whether WS-1 considers the cumulative volume of water pumped for each groundwater substitution transfers, or the instantaneous rate of stream depletion caused by the pumping. Any factor must be the outcome of numerous measured variables, such as the availability of water to capture, the rate and duration of recharge, the streambed sediment permeability, the duration of pumping, the distance between the well and stream, and others; but the EIS/EIR fails to provide any means of evaluating these various factors. How good must the "best technical information available at that time" be? What is the likelihood it will be available, what constraints does this face, and what requirements are in place to ensure that sufficient information is obtained? Why hasn't this information been analyzed in the EIS/EIR? What roles do the buyers and sellers have in reaching this determination?

Moreover, the EIS/EIR fails to identify the threshold of significance below which significant impacts would not occur. WS-1 purports to avoid "legal injury," 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. Groundwater Overdraft.

The EIS/EIR illegally defers formulation and evaluation of mitigation measure GW-1 in much the same way as WS-1. In reliance on GW-1, the EIS/EIR goes so far as to defer the environmental impact analysis that should be provided now, as part of the EIS/EIR itself. Moreover, GW-1 fails to include clear performance standards, criteria, thresholds of significance, evaluation of feasibility, analysis of likelihood of success, and even facially permits significant impacts to occur. And importantly, GW-1 does not, in fact, reduce potentially significant impacts to less-than-significant levels, but rather, attempts to monitor for when significant effects occur, then purports to provide measures to slow the impact from worsening.

GW-1 begins by referencing the *DRAFT Technical Information for Preparing Water Transfer Proposals* ("DTIPWTP")(Reclamation and DWR 2013) and Addendum (Reclamation and DWR 2014). First, it is worth noting that this document is in DRAFT form, as have all such previous iterations of the Technical Information for Preparing Water Transfer Proposals, leaving any guidance for a final mitigation measure uncertain. Second, the DTIPWTP itself requires a project-specific evaluation of then-existing groundwater and surface water conditions to determine potentially significant impacts to water supplies; but this is exactly the type of impact analysis that must occur now in the self-described project EIS/EIR before any consideration of mitigation measures is possible. Even still, the exact scope of future environmental review is unclear as well. "Potential sellers will be required to submit well data," but the EIS/EIR does not explain what data or why. (EIS/EIR at 3.3-88.)

GW-1 next requires potential sellers "to complete and implement a monitoring program," but a monitoring program itself cannot prevent significant impacts from occurring. " The monitoring

program will incorporate a sufficient number of monitoring wells to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place.' (EIS/EIR 3.3-88.) Again, this should be done now, for public review, to determine the significance of project impacts before the project is approved. Moreover, the EIS/EIR fails to provide any guidance on what constitutes "a sufficient number of monitoring wells." GW-1 then requires monitoring data no less than on a monthly basis, but common sense suggests that significant groundwater pumping could occur in less than a month's time. GW-1 requires that "Groundwater level monitoring will include measurements before, during and after transfer-related pumping," but monitoring after transfer-related pumping can only show whether significant impacts *have* occurred; it cannot prevent them. Yet this is exactly what the EIS/EIR proposes: "The purpose of Mitigation Measure GW-1 is to monitor groundwater levels during transfers to avoid potential effects. If any effects occur despite the monitoring efforts, the mitigation plan will describe how to address those effects." (EIS/EIR 3.3-91.) Hence, GW-1 only requires elements of the mitigation plan to kick in after monitoring shows significant impacts, which are extremely likely to occur given the fact that monitoring alone amounts to no mitigation or avoidance measure.

Even still, the proposed mitigation plans don't mitigate significant impacts. The mitigation plan includes the following requirements: "Curtailment of pumping until natural recharge corrects the issue." This, of course, could take years and is acknowledged in the EIS/EIR (p. 3.1-17 and 18), and really amounts to no mitigation of the significant impact at all. "Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer." In what amount, at what time, as decided by who? Monetary compensation is not always sufficient to cover damages to business operations. "Curtailment of pumping until water levels raise above historic lows if non-reversible subsidence is detected (based on local data to identify elastic versus inelastic subsidence)." It does not follow that any water level above the *historic lows* avoids or offsets damage from non-reversible subsidence. -only admits that irreversible subsidence may occur. Finally, "[o]ther actions as appropriate" is so vague as to be meaningless. (EIS/EIR 3.3-90.)

The wholesale deferral of these mitigation measures is particularly confusing since the lead agencies should already have monitoring and mitigation plans and evaluation reports based on the requirements of the DTIPWTP for past groundwater substitution transfers, which likely were undertaken by some of the same sellers as the proposed 10-year transfer project. The Draft EIS/EIR should provide these existing Bureau approved monitoring programs and mitigation plans as examples of what level of technical specificity is required to meet the objectives of GW-1.

The DTIPWRP doesn't add any additional monitoring or mitigation requirements for subsidence, stating that areas that are susceptible to land subsidence may require land surface elevation surveys, and that the Project Agencies will work with the water transfer proponent to develop a mutually agreed upon subsidence monitoring program. The monitoring locations in "strategic" locations are similarly deferred with no guiding criteria.

Lastly, groundwater quality monitoring only appears to be required after a transfer has begun, which again is too late to prevent any significant impact from occurring. (EIS/EIR 3.3-89.)

Mitigation measure GW-1 calls for stopping pumping after significant impacts are detected and then waiting for natural recovery of the water table. This might not be in time for groundwater dependent farms or riparian trees (cottonwoods & willows) to recover from the impact or could greatly extend the time to recovery. In the meantime, riparian-dependent wildlife including Swainson's hawks would be without nesting habitat, migration corridors, and foraging areas. The mitigation measure should require active restoration of important habitat such as riparian and wetland, not natural recovery. Recovery to an arbitrary water level is not necessarily the same as recovery of wildlife habitat and populations of sensitive species.

The water level monitoring in the mitigation measure should give explicit quantitative criteria for significant impact. Stating that a reduction in flow or GW level is "within natural variation" and therefore not significant is deceptive. The natural variation includes extreme cases and the project should not be allowed to add an additional increment to an already extreme condition. The extremes are supposed to be rare, not long-term and chronic. For example, Little Chico Creek may be essentially dry at times but it is not totally dry and that may be all that allows plants and animals to persist until wetter conditions return. If everything dies because the creek becomes totally dry due to the project, then it may never recover.

VIII. The EIS/EIR Fails to Analyze a Reasonable Range of Alternatives.

The EIS/EIR 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.

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)).

a. No Environmentally Superior Alternative is Identified.

The EIS/EIR 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. (EIS/EIR 2-39.) First, 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."[65] CEQA provides that "[i]f the 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 EIS/EIR fails to identify whether the "no project" alternative is environmentally superior to each other alternative. If that is the case, the EIS/EIR must then identify the next most environmentally protective or beneficial alternative. Here, the EIS/EIR presents evidence that Alternative 3 and Alternative 4 each would lessen the environmental impacts of the proposed project. The EIS/EIR 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.

The EIS/EIR 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 EIS/EIR 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.

b. Feasible Alternatives to Lessen Project Impacts are Excluded.

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

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

should 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 implementable and flexible" alternative that is part of the Purpose and Need section (p.1-2). 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 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 (p.1-2). 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 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.

While it is laudable that EBMUD customers have cut water use by 20 percent over the last decade,[66] 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 (p.1-2). 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

[66] https://www.ebmud.com/water-and-wastewater/latest-water-supply-update

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. [67] 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.

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 (p.1-2). 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.

IX. 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 EIS/EIR 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.

a. Groundwater Depletion.

As discussed, above, the EIS/EIR 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 EIS/EIR require sellers to propose mitigation measures, which are as of yet undefined. As a result, significant and irretrievable impacts to groundwater are fully permitted by the proposed project.

b. Subsidence.

Here, again, the EIS/EIR suffers the same flaw of only catching and proposing to mitigate

[67] http://www.usbr.gov/mp/cvpia/3408h/

subsidence after it occurs. But damages caused by subsidence can be severe, permanent, and complicated. The EIS/EIR does not purport to avoid these impacts, nor possibly mitigate them to less than significant levels. Instead, the EIS/EIR provides for "Reimbursement for modifications to infrastructure that may be affected by non-reversible subsidence." This unequivocally provides for significant and irreversible impacts to occur.

c. 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 Y), and how will purchased water be used and conserved? Should agricultural water users be able to buy Project water, how will DWR and the Bureau 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.

X. The EIS/EIR Fails to Adequately Evaluate Growth-Inducing Impacts.

The EIS/EIR gives short shrift to the growth inducing impact analyses required under both CEQA and NEPA by absolutely failing to realize or by obfuscating the obvious: these types of Long-Term Water Transfers inherently lead to economic and population growth. Not only are the amount of water sales and types of water sales unknown to the Lead Agencies and the public, but once water is sold and transferred to the buyer agency, there are no use limitations or priority-criteria imposed on the buyer. Whether agricultural support or municipal supply, hydraulic fracturing, industrial use, or onward transfer, the potential growth inducing impacts, both economically and physically are limitless. And once agencies and communities are hooked on buying water to sustain economic conditions or to support development and population growth, while drought conditions continue or are exacerbated, unwinding the clock may prove impossible.

Growth inducing impacts are addressed in Section 15126.2(d) of the CEQA Guidelines, and the Council on Environmental Quality NEPA Sections 1502.16(b) and 1508.8(b). CEQA Section 15126.2(b) requires an analysis of a project's influence on economic or population growth, or increased housing construction and the future developments' associated environmental impacts. The CEQA Guidelines define growth inducing impacts as "...the ways in which the

proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Under NEPA, indirect effects as declared in Section 1508.8(b) include reasonably foreseeable growth inducing effects from changes caused by a project.

A project may have characteristics that encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. CEQA Guidelines section 15126.2(d) admonishes the planner not to assume that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment. Included here are projects that would remove physical obstacles to growth, such as provision of new water supply achieved through Long Term Water Transfers. Removal of a barrier such as water shortages may lead to the cultivation of crops with higher-level water dependency and higher profit margins at market, or may supplement perceived and actual advantages of living in population-dense locales, leading to increased population growth.

The EIS/EIR states that direct growth-inducing impacts are typically associated with the construction of new infrastructure while projects promoting growth, like increased water supply in dry years, could have indirect growth inducing effects. Claiming that growth inducing impacts would only be considered significant if the ability to provide needed public services is hindered, or the potential for growth adversely affects the environment, the EIS/EIR then incorrectly concludes that the proposed water transfer from willing sellers to buyers, to meet existing demands, would not directly or indirectly affect growth beyond what is already planned. But the EIS/EIR does not describe "what is already planned," nor how binding such plans would be.

Similar to the drought period in the late 1980's and early 1990's, urban agencies demand was approximately 40 percent of the transfer market. During that drought period, dry-year purchases were short term deals, intended to offset lower deliveries. However, this time around most of the transfer water is available to support longer-term growth, not solely to make up for shortfalls during droughts. Under current law, urban water agencies must establish long-term water supply to support new development, and long term transfers can provide this necessary evidence.[68]

Adding to these concerns is the increase in fracking interests throughout the state, requiring large-scale water demand to extract oil and gas, run by companies with the financial ability to influence water rights through payment. While one county directly south of the boundary involving this proposed transfer agreement recently banned fracking, other counties in

[68] California Senate Bills 221 and 610, entered into law, 2001: requires agencies with over 5000 service connections and those with under 5000 service connections to demonstrate at least 20 years of available water supply respectively, for projects in excess of 500 residential units, or equivalent in combined residential and other demand (large service agencies), or for projects demanding least 10 percent growth in local water needs (small service agencies).

California are either involved in the practice of fracking, have yet to ban the practice, or have no interest in a fracking ban. Notably, the Monterey Shale Formation that stretches south through central California is in the buyer-area of the water districts served by this potential Long-Term Water Transfer Agreement. Without use limitations upon water transfers proposed within this agreement, water transferred under this plan may well be used for fracking

The EIS/EIR inappropriately fails to evaluate or disclose these reasonably foreseeable growth-inducing impacts.

XI. Conclusion

Taken together, the Bureau, SLDMWA, and DWR treat these serious issues carelessly in the EIS/EIR, the *Draft Technical Information for Water Transfers in 2013*, and in DWR's specious avoidance of CEQA review. In so doing, the Lead and Approving Agencies deprive decision makers and the public of their ability to evaluate the potential environmental effects of this Project and violate the full-disclosure purposes and methods of both the National Environmental Policy Act and the California Environmental Quality Act. For each of the foregoing reasons, we urge that the environmental review document for this project be substantially revised and recirculated for public and agency review and comment before any subject project is permitted to proceed.

Sincerely,

B. Vlamis

Barbara Vlamis, Executive Director
AquAlliance

Bill Jennings, Executive Director
California Sportfishing Protection Association

Jason Flanders
Aqua Terra Aeris Law Group