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7
8 **BEFORE THE**
9 **CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**

10
11 HEARING IN THE MATTER OF
12 CALIFORNIA DEPARTMENT OF WATER
13 RESOURCES AND UNITED STATES
14 BUREAU OF RECLAMATION REQUEST
FOR A CHANGE IN POINT OF DIVERSION
FOR CALIFORNIA WATERFIX

TESTIMONY OF TIM STROSHANE

1 I, Tim Stroshane, policy analyst with Restore the Delta (RTD), do hereby declare:

2 **INTRODUCTION**

3 1. I am self-employed working as a consulting Policy Analyst with Restore the Delta. I
4 received a Bachelor's degree in Environmental Studies from the University of California, Santa Cruz
5 in 1981. My senior thesis addressed political and ecological issues associated with the proposed the
6 Peripheral Canal. After completing a Master's degree in City Planning from the University of
7 California, Berkeley in 1987, I worked with consulting firms in San Francisco and Berkeley,
8 performing economic, fiscal, financial, and land use studies and contributing to environmental
9 impact reports. I started in 1993 with the City of Berkeley, where I completed numerous complex
10 assignments in housing planning, finance, policy, and economics, and homeless services and policy.
11 Between 1998 and 2004, I wrote free-lance articles and published an online newsletter on California
12 water issues. During this time, I began reading everything I could about California water law and
13 history, including the law of water rights. Since 2008, I have consulted with the California Water
14 Impact Network, Environmental Water Caucus, and, most recently, RTD.

15 2. I further declare that I provided research and drafting assistance to Restore the Delta
16 witnesses Michael Machado, Barbara Barrigan-Parrilla, and Esperanza Vielma for their testimony
17 and presentations.

18 **SUMMARY**

19 3. In my testimony as part of Restore the Delta's case-in-chief, and in support of Restore
20 the Delta's Protest to the Petition before the Board, I present evidence that shows how the new
21 diversion facilities proposed in the Petition (which I will refer to as "Petition Facilities") fail to
22 reduce reliance on the Delta for California's future water needs despite state Water Code Section
23 85021's requirement of such a reduction.

24 4. In this testimony, I also present and discuss evidence addressing the following issue
25 prompts for Part 1 of the evidentiary hearing from the Notice of Petition and Public Hearing, dated
26 October 30, 2015, concerning the petition to change points of diversion to support the California
27 WaterFix project:

28 1. *Will the changes proposed in the Petition in effect initiate a new water right?*

- 1 2. *Will the proposed changes cause injury to any municipal, industrial or agricultural*
2 *uses of water, including associated legal users of water?*
3 a. *Will the proposed changes in points of diversion alter water flows in a manner*
4 *that causes injury to municipal, industrial, or agricultural uses of water?*
5 b. *Will the proposed changes in points of diversion alter water quality in a*
6 *manner that causes injury to municipal, industrial, or agricultural uses of*
7 *water?*
8 c. *If so, what specific conditions, if any, should the State Water Board include in*
9 *any approval of the Petition to avoid injury to these uses?*

10 **THE PETITION’S PURPOSE IS CONTRARY TO STATEWIDE POLICY**
11 **MANDATING REDUCED RELIANCE ON THE DELTA FOR CALIFORNIA’S**
12 **FUTURE WATER NEEDS.**

13 5. It is my understanding that the Delta Reform Act of 2009 (the Act) mandates that:
14 “*The policy of the State of California is to reduce reliance on the Delta in meeting California’s*
15 *future water supply needs through a statewide strategy of investing in improved regional supplies,*
16 *conservation, and water use efficiency.*” (C.W.C. Sec. 85021.)

17 6. This section of my testimony provides evidence that both the Bay Delta Conservation
18 Plan (BDCP) and California WaterFix documents failed to analyze the project’s compliance with
19 this policy. In addition, we present evidence that the purpose of the California WaterFix project is
20 intended to maintain present export levels of Delta water to meet California’s future water needs
21 and, with adjusted operational modeling assumptions, even increase total exports, contrary to the
22 state’s Delta policy.

23 7. Petition Facilities’ environmental documents provide no analysis of compliance with
24 this section of the Act. The BDCP contained no mention and therefore no policy analysis of whether
25 the proposed Conservation Measure 1 facilities complied with Water Code Section 85021.
26 (SWRCB-5, search of “85021” yielded no results.) The BDCP Draft Environmental Impact
27 Report/Statement mentions Water Code Section 85021 and its statement of reduced Delta reliance
28 but provides no analysis of compliance of the proposed project with this section of the Act.
(SWRCB-4, Appendix 1C, p. 1C.3-18; Appendix 3A, p. 3A-20 to -22, p. 3A-68, and p. 3A-149,
Table 3A-15; and Appendix 3D, pp. 3D-68 to -69.) The California WaterFix Recirculated Draft
Environmental Impact Report/Supplemental Draft Environmental Impact Statement similarly

1 mentions Water Code Section 85021 once but provides no analysis of the proposed project's
2 compliance with this section of the Act. (SWRCB-3, Appendix 3D, p. 3D-57.)

3 8. Petition Facilities' environmental documents state as among the project's purposes a
4 clear intent to maintain present export levels into the future and increase the reliability of delivery to
5 contractors from those exports:

6 Restore and protect the ability of the SWP [State Water Project] and CVP [Central
7 Valley Project] to deliver up to full contract amounts, when hydrologic conditions
8 result in the availability of sufficient water, consistent with the requirements of State
and federal law and the terms and conditions of water delivery contracts and other
existing applicable agreements.

9 (SWRCB-4, Chapter 2, p. 2-3:21-24 and p. 2-4:29-33; SWRCB-3, Chapter 1, p. 1-8:34-37 and p. 1-
10 9:33-37.)

11 9. Petition Facilities' environmental documents disclose modeling results indicating that
12 preferred scenarios will not result in significant change to long-term average SWP and CVP
13 deliveries. Deliveries for Alternative 4, Scenarios H3 and H4 of Conservation Measure 1 would
14 range between 4,019 thousand acre-feet (TAF) and 4,497 TAF, as compared with existing conditions
15 of about 4,658 TAF, and no action alternative scenarios (future conditions without Petition
16 Facilities) of between 4,043 to 4,305 TAF. (SWRCB-4, p. 7-53, Table 7-7; SWRCB-3, p. 4.3.3-7,
17 Table 4.3.3-1.) Alternative 4A (the Petition Facilities) is estimated to result in long-term average
18 deliveries of between 4,273 to 4,776 TAF. This alternative's range of deliveries includes existing
19 average deliveries and is higher than the range of deliveries anticipated for BDCP's Alternative 4
20 scenarios. (SWRCB-4, p. 7-53, Table 7-7; SWRCB-3, p. 4.3.3-7, Table 4.3.3-1.)

21 10. It is my understanding too that an independent modeling report provided to various
22 upstream and Delta water users¹ by MBK Engineers and Daniel Steiner (MBK/Steiner) found that
23 BDCP modeling results showed total exports increasing by 540 thousand acre-feet (TAF) over a No
24 Action Alternative base of 4.73 million acre-feet (MAF). (RTD-143, Attachment 1, p. 72.)
25 However, this report argued that several adjustments to operational assumptions were necessary to

26 _____
27 ¹ The entities funding this report were Contra Costa Water District, East Bay Municipal Utilities
28 District, Friant Water Authority, Northern California Water Association, North Delta Water Agency,
San Joaquin River Exchange Contractors Water Authority, San Joaquin Tributaries Authority, and
Tehama Colusa Canal Authority.

1 ensure that CalSIM II modeling results were more representative of how the CVP and SWP systems
2 would be operated with incorporation of Petition Facilities, including changes approved by DWR
3 and Reclamation for the 2013 baseline applied in the SWP Delivery Reliability Report and in this
4 report. (RTD-143, Attachment 1, p. 44-45.) Other changes were made to establish a meaningful and
5 reasonable “Future No Action Alternative” that included several additional revisions to CalSIM II
6 assumptions in the 2013 baseline. (RTD-143, p. 45.) Changes were also made to North Delta
7 Diversion Bypass Flow Criteria (RTD-143, p. 48) and to Delta Cross Channel Gate Reoperation in
8 October. (RTD-143, p. 49.) These changes were intended to make CalSIM II modeling more
9 closely approximate actual operations based on research by MBK/Steiner into known operator
10 behavior. (RTD-143, p. 44.) The independent modeling results showed that combined exports
11 would average 5.61 MAF annually for a “Future No Action” (FNA) alternative, indicating an
12 increase in exports for Alternative 4 of about 750 TAF. (RTD-143, p. 72.) This represents an
13 increase in exports with the Petition Facilities, with more apparently realistic operational
14 assumptions built into their modeling, averaging about 200 TAF annually. (RTD-143, p. 72.)

15 11. It is also my understanding that Petition Facilities would increase the capacity for and
16 occurrence of cross-Delta water transfers, which would continue, rather than reduce, reliance on the
17 Delta for California water contractors’ future water supply needs. Compared to present conditions,
18 Petition Facilities would provide additional capacity to move transfer water from upstream sources
19 across the Delta to export service areas. They would also provide a longer transfer window of time
20 than is allowed under current biological opinion and water quality restrictions. (SWRCB-3, p. 4.3.1-
21 9, lines 19-23.) Petition environmental documents also state:

22 As a result of avoiding those restrictions, transfer water could be moved at any time
23 of the year that capacity exists in the combined cross-Delta channels, the new cross-
24 Delta facility, and the export pumps, depending on operational and regulatory
constraints, including criteria guiding the operation of water conveyance facilities
under Alternative 4A.

25 (SWRCB-3, p. 4.3.1-9, lines 23-26.)

26 Identical language is provided for the Petition Facilities’ other two RDEIR/SDEIS
27 alternatives. (SWRCB-3, p. 4.4.1-9, lines 12-19; p. 4.5.1-9, lines 12-19.) Thus, in my opinion,
28 based on evidence provided here, the Petition Facilities’ stated purpose of maximizing the reliability

1 of contractual deliveries and its underlying purpose of providing additional water transfer capacity
2 are intended to maintain, rather than reduce, reliance on the Delta for California's future water
3 supply needs, contrary to Water Code Section 85021.

4 **THE PETITION IS IN EFFECT A NEW WATER RIGHT.**

5 12. The Board's Notice of Petition and Hearing contains prompts for Part 1 of the
6 hearing. (Notice of Petition and Hearing, p. 11.) This section of my testimony illustrates how the
7 changes proposed in the Petition (Petition for Change, August 25, 2015, Supplemental Information,
8 pp. 7-9; Addendum and Errata, September 11, 2015, p. 1) and in Petitioners' testimony (DWR-51,
9 pp. 8-9, 12-15; DWR-57, pp. 3-19, 23-24; DWR-61, pp. 16-19) will, in effect, initiate a new water
10 right, thereby, as I understand the application process, requiring a new water right application.

11 13. Petition Facilities are designed to isolate conveyance of fresh water from the lower
12 Sacramento River under the Delta (DWR-51), rather than convey by flow through existing Delta
13 channels to a different point of diversion. Such facilities are different in kind from the through-Delta
14 mode of conveyance described in SWP authorizing legislation, water rights permits, official
15 California water agency reports, and related documents planning for through-Delta water transfers.
16 Moreover, a project premised on isolated conveyance was voted down by the California electorate
17 on June 8, 1982.

18 14. To provide an overview, evidence provided in this section of my testimony will
19 address the Board's question whether the Petition is in effect a new water right. The essential effects
20 of the Petition Facilities are to change the method of diversion from the Sacramento River by
21 moving the points of diversion further upstream from the Delta Cross Channel and isolating water
22 diverted from those new points from the present "through-flow" method of diversion. This entirely
23 novel method of diversion is in effect a new water right. No part of the proposed method of
24 diversion is at present described or addressed by existing permits for the SWP and CVP. Nor are the
25 facilities contained in the Petition authorized by state or federal legislation.

26 15. Evidence in this section will also show that the three new diversion points differ
27 substantially from the single Hood diversion point described in existing SWP and CVP permits.
28 Existing SWP facilities are acknowledged as complete by DWR and as having put water to full

1 beneficial use by 2000. Existing CVP facilities are acknowledged as complete since 1990 and have
2 put water to full beneficial use since then. Evidence in this section also provides support for the
3 position that neither Petitioner has shown good cause to the State Water Board for time extensions
4 for their existing permits.

5 16. My testimony also provides evidence supporting an estimate of cold-stored water by
6 Petitioners. Since 2009, Petitioner Department of Water Resources has cold-stored about 8.9 million
7 acre-feet of unused appropriated water. Since 1990, Petitioner United States Bureau of Reclamation
8 has cold-stored about 25.3 million acre-feet of unused appropriated water. We will also show that
9 the Petition Facilities, as of the date my testimony was submitted, have neither fiscal appropriation
10 nor debt financing to support their construction and operation.

11 **Water Right Order 2009-0061 provides no precedent for approval of the Petition.**

12 17. Petitioner DWR provides testimony that the Petition does not change or expand the
13 quantity, timing, or source of water beyond that currently authorized in existing permits. (DWR-53,
14 p. 10.) Witness Maureen Sergent states that, in her opinion, “the limited change requested in the
15 California WaterFix (CWF) Petition for Change support[s] a determination by the State Water Board
16 that the CWF Petition, will not, in effect, initiate a new water right.” (*Id.*) Specifically she relies on
17 the Board’s Water Right Order 2009-0061 as indicative of how the Board should rule on the
18 question of whether the Petition is in effect a new water right.

19 18. It is my understanding that facts underlying the Board’s reasoning in Order 2009-
20 0061 differ from, and are inconsistent with, facts provided and relied upon by in the Petition before
21 the Board in this proceeding.

22 19. In Water Right Order 2009-0061 (Santa Cruz case), the City of Santa Cruz requested
23 to add to its water right a point of direct diversion from the San Lorenzo River near its Loch Lomond
24 reservoir to the point of diversion to storage it already had. The city’s change petition involved no
25 change of source waters; only water from the San Lorenzo River was involved. The City of Santa
26 Cruz wished to conform its direct diversion practice by filing the change petition so its direct
27 diversion complied with an updated water right. In matters like this, the Board saw such use of
28 change petitions as a matter of “enforcement.” (WRO 2009-0061, p. 18.)

1 20. Currently in the Delta, water passes from the Sacramento River through the Delta
2 Cross Channel, then mixes with waters of the Mokelumne River and eventually with the San Joaquin
3 River before flowing upstream into south Delta channels (due to the powerful draw of the Banks and
4 Jones pumping plants on Old and Middle Rivers). Water is rediverted at Banks and Jones pumping
5 plants for export to points south. These pumping plant redirection points in the San Joaquin River
6 system of the Delta are over 30 miles to the southwest of where Sacramento River inflows enter the
7 Delta. In contrast to the Santa Cruz case, multiple Delta river channels and water rights are involved
8 in SWP and CVP operations in order to accomplish this through-Delta flow.

9 21. Unlike the San Lorenzo River in the Santa Cruz case, the Bay Delta Estuary is a
10 complex body of water with many sources. These sources enter as Delta inflow from the
11 Sacramento and San Joaquin Rivers, as well as numerous smaller rivers, creeks, and sloughs, and
12 tidal flow reaching Delta channels from San Francisco Bay. Each of the three north Delta diversions
13 would remove and isolate Sacramento River water from the estuary for direct conveyance to SWP
14 and CVP export pumps. (DWR-57: p. 3:27-28; 4:1-2, 6-13; 16:19-20.)

15 22. Petitioners produced modeled hydrodynamic analyses of source fingerprinting of
16 water at various locations in the Delta. These analyses identify whether water has come from the
17 Sacramento River, tidal sources, or the San Joaquin River (as well as some other sources).

18 23. Source water fingerprinting model results indicate that the composition of water
19 sources will change significantly from those presently relied on under existing water rights permits
20 for the SWP and CVP. Sacramento River water as a share of water pumped at Banks and Jones
21 pumping plants will increase significantly. At Banks presently, Sacramento River water makes up
22 nearly 60 percent of Banks water in January, steadily decreasing to 20 percent in May, rising to just
23 over 30 percent in June. With the north Delta diversions in place, Banks Pumping Plant's
24 Sacramento River water shares are expected to increase to over 80 percent in January, 45 to 60
25 percent in May, and 45 to 55 percent in June. (RTD-130, p. 60, Figure 5; source data from SWRCB-
26 3, Appendix B, Section B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative], B-231-234
27 [Alternative 4A, Scenario H3], and B-253-256 [Alternative 4A, Scenario H4].)

1 24. San Joaquin River water will decrease significantly as a share of water at Banks and
2 Jones pumping plants, especially in the months of January through June. Without north Delta
3 diversions, the San Joaquin River's share at the Banks pumping plant would range from 25 percent
4 in January to 65 percent in May and 50 percent in June. With the north Delta diversions in place,
5 these pumped water shares at Banks decrease to 8 to 10 percent in January to 30 to 40 percent in
6 May and June. At the Jones pumping plant, without the north Delta diversions, the San Joaquin
7 River share of pumped water averages about 55 percent of January waters, rising to 87 to 88 percent
8 in April and May before decreasing to about 52 percent in June. With the north Delta diversions,
9 San Joaquin River water at Jones would comprise around 30 percent of pumped waters, decreasing
10 in February and March to about 23 percent, rising to nearly 35 to 40 percent in April and May,
11 before decreasing to between 20 and 30 percent in June. (RTD-130, p. 60, Figure 5; source data
12 from SWRCB-3, Appendix B, Section B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative],
13 B-231-234 [Alternative 4A, Scenario H3], and B-253-256 [Alternative 4A, Scenario H4].)

14 25. It is my understanding, based on this evidence, that this change to having more
15 Sacramento River water at the two pumping plants would improve water quality at the pumping
16 plants because the quality of San Joaquin River water is generally poorer than that of Sacramento
17 River water. The San Joaquin's high salt load is due partly to recirculation of present San Joaquin
18 River water exported to the San Joaquin River basin in the Delta Mendota Canal, as well as to salts
19 native to western San Joaquin Valley soils. (RTD-138, p. 34, Table 5, pp. 32-36.) In addition,
20 concentrations of a number of other pollutants are high in the San Joaquin, impairing the river's
21 water quality. (RTD-104, pp. 3-48 to 3-50, addressing salinity, nitrates, phosphates, ammonia, trace
22 metals, and pesticides.)

23 26. In contrast to the Santa Cruz case where the city wanted to bring its diversion
24 practices into compliance with its water rights permits to avoid enforcement proceedings by the
25 Board, the Petitioners do not divert any water at the proposed north Delta locations at or near this
26 time.

27 27. Finally, as noted above, Petition Facilities would increase capacity of the SWP/CVP
28 system to allow water transfers across the Delta (by routing them under, not through, Delta

1 channels). No such market-based transfer practices across or under an estuary were among the facts
2 relevant to the Santa Cruz case.

3 28. These physical facts significantly distinguish Petition Facilities from those considered
4 in the Santa Cruz case. In its Order for that case, the Board indicated to protestant Camp Pendleton
5 that it will evaluate change petitions on “a case-by-case basis in light of new insights or changed
6 circumstances...” (WRO 2009-0061, pp. 17-18.)

7 **Petition Facilities are described neither in authorizing legislation for the State Water**
8 **Project nor for the federal Central Valley Project.**

9 29. The Petition Facilities are not found in the enabling legislation of the SWP or CVP,
10 nor are they described in the projects’ water rights permits. For purposes of water rights licensing,
11 these two projects are now complete and have applied water to beneficial use throughout their
12 present service areas. There are no good causes for which SWRCB has reason to extend time on
13 these permits to enable further development of Central Valley and other watershed resources. It is
14 my opinion, based on evidence provided in this testimony, that the Petition’s Facilities would be a
15 new method of diverting water under the Delta, rather than through it as presently permitted, and the
16 Petition Facilities should be the subject of a new water right application.

17 30. The California Central Valley Project Act, enacted in 1933, defined no specific Delta
18 facilities. A 1959 amendment mentioned facilities for the Feather River and Sacramento-San
19 Joaquin Delta Diversion Projects. (Water Code [W.C.] Section 11260.) The amendment refers to
20 two reports produced in 1951 and 1955. The 1951 “Report on Feasibility of Feather River Project
21 and Sacramento-San Joaquin Delta Diversion Projects Proposed as Features of the California Water
22 Plan” describes only aqueduct diversions that have since become known as the South Bay Aqueduct,
23 the California Aqueduct, and the Coastal Branch. In the 1951 report, no facilities in, peripheral to,
24 nor under the Delta are described for Delta conveyance. (RTD-101, pp. 35-43.)

25 31. The 1955 report, “Financing and Constructing the Feather River Project,” describes a
26 “Delta Cross Channel” alignment that was never constructed, but its flow concepts are relevant here.
27 This facility was apparently conceived as the headworks of the Feather River Project Aqueduct. It
28 would “convey water flowing down the Sacramento River to the westerly channels of the San

1 Joaquin Delta, from which channels would flow to the intake channel to the project pumps.” It was
2 to begin on the Sacramento River just upstream of the town of Isleton and connect to Georgiana
3 Slough, which would be enlarged to its confluence with the Mokelumne River. From the
4 Mokelumne, water would flow across the San Joaquin to its Old River tributary, and Old River
5 would be dredged “to provide ample capacity for conveying water through it to the project intake
6 headworks at a point about three miles southeast of Byron.” (RTD-102, p. 4, column 2.) The
7 essential point is that the 1955 report described only through-Delta flow of waters derived from the
8 Feather River Project.

9 32. The Burns-Porter Act of 1959, approved by California voters in 1960, defined Delta-
10 related facilities of the State Water Project as including “Master levees, control structures, channel
11 improvements, and appurtenant facilities in the Sacramento-San Joaquin Delta for water
12 conservation, water supply in the Delta, transfer of water across the Delta, flood and salinity control,
13 and related functions.” (W.C. Section 12934(d)(2).) The Act contains no reference to either a
14 peripheral canal or a Tunnels-type facility with intakes in the north Delta along the Sacramento
15 River in the Legal Delta. The meaning of this description was addressed in Bulletin 76, December
16 1960:

17 One of the principal objectives of the State Water Resources Development System is
18 to conserve water in areas of surplus in the north and to transport water to areas of
19 deficiency to the south and west. The Delta is important in achieving this objective,
20 since it receives all of the surplus flows of Central Valley rivers draining to the ocean
21 during winter and spring months and is the last location where water not needed in
22 the Delta or upstream therefrom can conveniently be controlled and diverted to
23 beneficial use. Surplus water from the northern portion of the Central Valley and
24 north coastal rivers will be conveyed by the natural river system to the Delta, *where it
25 must be transferred through Delta channels to export pumping plants* without undue
26 loss or deterioration in quality. Aqueducts will convey the water from the Delta to
27 off-stream storage and use in areas of deficiency to the south and west.

28 (RTD-103, p. 10, emphasis added.)

33. Master levees, control structures, and related facilities were legislated to accomplish
the transfer of surplus waters provided from upstream reservoirs across and through the Delta to the
export pumps. Bulletin 76 offered four planning scenarios using “master levees, control structures,
channel improvements, and appurtenant facilities” in the Delta that would address legislative
purposes of water conservation, water supply in the Delta, transfer of water across the Delta, flood

1 and salinity control, and related functions. None of the facilities listed in Bulletin 76 included
2 features that would traverse the eastern periphery of the Delta, nor tunnel beneath the Delta to reach
3 the south Delta pumping plants. (RTD-103, p. 10, 29-30, 33-34, 37-38, 41-42.)

4 34. Petitioners' witness John Bednarsky described Petition Facilities differently than
5 those called for in Bulletin 76, stating that:

6 The new SWP water conveyance facilities proposed for the CWF would introduce
7 new operational flexibility into the SWP and CVP by enabling SWP or CVP water to
8 be diverted from the Sacramento River in the north Delta and conveyed to the south
9 Delta or to be directly diverted in the south Delta at existing SWP and CVP
10 facilities.... Water would flow from the intakes through north tunnels to an
Intermediate Forebay. From there, the water would flow by the force of gravity
through two 30-mile long, 40-foot diameter main tunnels to the south Delta. A new
pumping plant would lift water into the north cell of the redesigned Clifton Court
Forebay.

11 (DWR-57, p. 3:27-28, 4:1-2, 6-10.)

12 **Petition Facilities and points of diversion are not described in existing water rights.**

13 35. State Water Project permits (summarized in Notice of Petition and Hearing, p. 9,
14 Table 1) contain lists of physical features of the system, as well as numerous permit conditions
15 governing their use and performance. (SWRCB-6, SWRCB-7, SWRCB-8, SWRCB-9.) Lists of
16 physical features in each of these permits from 1972 and 2009 refer to "Delta water facilities" as one
17 of the points of diversion. Both lists provide the same township, range, and section location that
18 includes the Delta town of Hood, site of what would have been the point of diversion for the
19 proposed peripheral canal.

20 36. Permit Condition 16 (2009 amended permits of SWRCB-6, SWRCB-7, SWRCB-8,
21 and SWRCB-9) mentions the peripheral canal by name and specifies that the Permittee (DWR) shall
22 not impair vested rights of Delta lands by constructing the canal unless it has acquired rights to do so
23 by agreement or through exercise of eminent domain.

24 37. Central Valley Project permits (summarized in Notice of Petition and Hearing, p. 10
25 Table 2) also list physical features of the project as well as permit conditions governing their use and
26 performance. The CVP permits authorize northerly diversion or redirection within the Delta only at
27 the Delta Cross Channel, which is described as diverting project water near Walnut Grove on the
28 Sacramento River. The Delta Mendota Canal is described as "diversion point from Delta Cross

1 Channel...located on Old River.” The CVP permits’ descriptions of these two diversion points are
2 consistent across each permit and imply a continuity of flow through existing Delta channels as the
3 means by which water is transferred across the Delta under authority of Central Valley Project
4 permits. Neither a peripheral canal nor tunnel facilities are included among diversion points
5 specified in the CVP permits. (SWRCB-11 through SWRCB-20.)

6 38. Through-Delta transfer of water diverted initially at the Delta Cross Channel and later
7 at the Delta Mendota Canal has operated since 1951, when the Delta Mendota Canal went into
8 operation. The Canal was completed in 1952. (RTD-109, p. 17.) It has continued since the
9 California Aqueduct began drawing exports from the Delta in 1973.

10 39. The peripheral canal was the subject of Proposition 9, a ballot referendum submitted
11 to California voters in 1982. It was defeated by a vote of 63 to 37 percent of the electorate. (RTD-
12 139, p. 17.) The language of the ballot measure described the proposed canal as potentially being
13 constructed, operated, and financed as a joint-use facility with the United States (RTD-140, p. 37,
14 Section 11255), with an alignment “around the eastern and southern periphery of the delta”; Stage
15 One of the project would consist of “construction of the facility from the town of Hood to Shima
16 Tract...” Upon completion of Stage One, it was to be “operated for a period of two years to
17 establish fish screen and operational criteria.” (RTD-140, Section 11255(a).) This description
18 differs in its point of diversion at the town of Hood from the current Petition. The Petition’s three
19 new diversions are proposed near Clarksburg, Hood, and Courtland. None of them appear in
20 existing SWP or CVP permits. Exhibits DWR 331 and DWR-3, page 5, confirm that the three
21 proposed diversion points differ in location from the “Delta Water Facilities” diversion point in SWP
22 water rights permits. The latter diversion point is shown in Petition documents and submitted
23 exhibits at a location distinct from these proposed points. (Petition for Change, Supplemental
24 Information, August 25, 2015, “Doc No. 04-04-800-9710, Version Date 04 May 2015”; Addendum
25 and Errata, September 11, 2015, “Map 5 of 5 Delta Overview, Version Date 10 Sep 2015”; DWR-
26 331; DWR-3, p. 5.)

1 **These two projects are complete and have applied water to beneficial use throughout**
2 **their present service areas for many years since their facilities were completed.**

3 40. In its Notice of Petition, SWRCB stated the SWP had an ultimate deadline of
4 December 31, 2000, to complete construction, and of December 31, 2009, to put water to full
5 beneficial use with the completed facilities. Petition witness Maureen Sargent (DWR-53, p. 6) states
6 that DWR petitioned for time extensions for its water right permits in 2009. (DWR-313.)

7 41. The California State Water Project Atlas (SWP Atlas), June 1999, contains a
8 “timeline of development” that indicates the construction periods for initial facilities and subsequent
9 facilities of the SWP. This chart illustrates that initial facilities authorized by California voters in
10 Proposition 1 in November 1960 were all completed by 1973. DWR’s 2009 petition for time
11 extension confirms that “the initial conservation and transportation facilities were essentially
12 completed in 1973...” (RTD-118, supplemental information, p. 3, #9.) We summarize dates of
13 completion from this chart, described in SWP Atlas narratives for each facility, in RTD-116. (RTD-
14 115, p. 147; RTD-116.) “Subsequent facilities,” whose authorization has a more complex history,
15 appear from this chart and from SWP Atlas narratives to have been completed by 1997 (when the
16 Coastal Branch Phase 2 was completed). Bulletin 132-10, covering State Water Project activities for
17 2009, reports no significant construction of new facilities that would warrant extension of time on
18 water rights permits. The construction activities in the Bulletin include a variety of repairs,
19 maintenance, modification, and other activities to SWP facilities, none of which involve expansions
20 or new or altered facilities to expand application of water to more beneficial uses. These documents
21 provide substantial evidence that the State Water Project is complete for purposes of diverting,
22 storing, releasing and delivering water for beneficial use by its customers. (RTD-117, Tables 12-1
23 and 12-2.)

24 42. The CVP was described by the SWRCB in its Notice of Petition to have an ultimate
25 deadline of December 1, 1985 to complete construction, and of December 1, 1990 to put water to
26 full beneficial use by way of the completed facilities. The Bureau of Reclamation commissioned
27 histories of the Central Valley Projects. These histories report launch and completion dates for the
28 major facilities comprising each major division of the Central Valley Project ranging from 1950

1 through 1987. (RTD-114, multiple.) Often in these histories, descriptions of completion reflect the
2 ability of a conveyance facility to carry water for delivery to customers for beneficial use, or a dam
3 to safely store water for later beneficial use by customers. These histories provide substantial
4 evidence that the Central Valley Project is complete for purposes of diverting, storing, releasing and
5 delivering water for full beneficial use by its customers.

6 43. "Completion reports" are required from permittees by Water Code Section 1600 for
7 consideration by SWRCB before licensing permits. The authors of the above-mentioned histories
8 appeared to have relied on archival information for their work. Petitioners' archival files are likely
9 to contain documentation that contractors hired to construct facilities completed construction work in
10 a satisfactory manner.

11 44. The SWP reports performance of its deliveries from project operations in Bulletin 132
12 each year. It is my understanding that delivery data are evidence of having put water to beneficial
13 use. DWR itself states that its annual Bulletin 132 series reports how much water has been used by
14 the SWP. (RTD-118, p. 5.) In 2009, it reported the entire annual record of its deliveries since
15 operations began in 1962. Maximum Table A deliveries were 3.199 million acre-feet in calendar
16 year 2000. (RTD-117, p. xxxviii, Table H-1.) That same year, the SWP also delivered over 300,000
17 acre-feet of Article 21 unscheduled surplus water to municipal, industrial and agricultural customers.
18 (RTD-117, p. xxxviii, Table H-1.) DWR's 2009 time extension petition reported that maximum
19 diversion to storage at Lake Oroville was 2.488 million acre-feet in the 1977-78 water year. (RTD-
20 118, supplemental information, #5.)

21 45. The CVP reports its deliveries from project operations on its Central Valley
22 Operations web site. Between 1985 and 1990, the largest delivery of supply by the Central Valley
23 Project was 7.531 million acre-feet in 1990. (RTD-119, based on Petitioner Bureau's CVO data,
24 p. 3.)

25 46. Between 1973 and 2013, the SWP delivered on average 1.92 million acre-feet of
26 Table A supplies to its water contractors. Between 1985 and 2014, the CVP delivered an annual
27 average of 5.89 million acre-feet of project supplies to its contractors in the Sacramento Valley, the
28 Delta region, and the San Joaquin Valley.

1 47. Water Code Section 1396 requires that use of water for beneficial purposes for which
2 each project facility was constructed shall proceed with due diligence in accordance with the Water
3 Code and within the time period specified in the permits for the project. It is my opinion that the
4 exhibits cited herein from available public records support a finding that the SWP and CVP have
5 succeeded at completing their projects and putting water to full beneficial use.

6 **No good cause has been shown for SWRCB to extend time on these permits without**
7 **further cold-storing unused appropriated water.**

8 48. It is my understanding that water right permits are subject to the requirement that due
9 diligence must be exercised by a permittee in constructing and using their water facilities to put
10 water to full beneficial use. (Order WR 2009-0028-DWR, Point 15.)

11 49. Water Code Section 1398(a) allows the SWRCB to extend the development period of
12 water right permits for construction to be completed and to put water to full beneficial use, provided
13 the Permittees show good cause. Elsewhere, SWRCB has stated that Permittee must show good
14 cause in three ways, making a showing: (1) that due diligence has been exercised; (2) that failure to
15 comply with previous time requirements has been occasioned by obstacles which could not be
16 reasonably avoided; and (3) that satisfactory progress will be made if an extension of time is granted.
17 (Order WR 2009-0028-DWR, p. 3, see Points 15 through 20.)

18 50. As mentioned above, existing SWP permits include a “Delta Water Facilities” point
19 of diversion at Hood. DWR-331 illustrates the location of this point of diversion as distinct from the
20 three north Delta diversion points proposed in the Petition. No water has been diverted at this point
21 under the existing permits held by Petitioner DWR, nor was any water diverted at that point by the
22 deadline in the permits on December 31, 2009, since no construction of a diversion facility at that
23 point of diversion has been initiated by Petitioner. When the voters defeated the peripheral canal in
24 1982, this diversion point was included as part of that rejected project. Subsequent efforts to plan
25 and build the project eventually failed as well, as described below. Finally, we provide evidence in
26 this section of my testimony showing that the Petitioners have not demonstrated that satisfactory
27 progress would be made if a time extension were granted, or even if some form of water right
28 approval were granted by SWRCB.

1 51. Petitioners submitted petitions requesting extensions of time in 2009 for the CVP
2 (RTD-121) and SWP (RTD-118). The following testimony describes evidence of lack of diligence
3 that supports a finding of no or insufficient good cause for extensions of time for SWP and CVP
4 permits. We also note that protests of both time extension requests are still pending before the State
5 Water Resources Control Board. (Notice of Petition and Hearing, p. 9, footnote 11; p. 10, footnote
6 13.)

7 **State Water Project Time Extension Petition**

8 52. DWR submitted its most recent time extension request to SWRCB on December 31,
9 2009 for its SWP permits for the Feather River and Sacramento-San Joaquin Delta watersheds. The
10 petition sought an extension through December 31, 2015 to maximize beneficial use of water
11 through the SWP facilities. DWR argued in its time extension request that while it “*at times* diverted
12 the maximum rate allowed,” under its SWP permits, several factors have prevented DWR from
13 directly diverting, rediverting, or diverting to storage “the maximum amounts allowed *annually*”
14 under its SWP permits. These factors included hydrologic conditions in the Feather River and Delta
15 regions, regulatory restrictions on project operations, state and federal endangered species act
16 compliance requirements, increase of county of origin water usage that by law had to be supplied by
17 DWR, and the availability of alternative water supplies from “other agencies’ supplemental
18 sources.” (RTD-118, supplemental information, p. 2.) DWR also stated that passage of the Delta
19 Reform Act with its co-equal goals of habitat restoration in the Delta and increased water supply
20 reliability meant to DWR that “the implementation of the Delta Plan is likely to influence future
21 construction of SWP facilities and SWP water supply delivery,” adding that, “It is not possible at
22 this time to accurately predict what the ultimate diversions under the Feather River/Delta Permits
23 will be or a date at which the full permitted quantity will be put to beneficial use.” DWR did not list
24 or describe future SWP facilities at the time. DWR further cited the uncertainties created by the
25 above factors and concluded that

26 At the end of this period, DWR should be in a much better position to explain the
27 time, facilities, and operations that will be necessary to maximize the beneficial use
28 of water. Depending on circumstances in the future, at the conclusion of this five-
year period, DWR may need to petition for further extension of said permits.

1 (RTD-118, supplemental information, p. 2.)

2 53. In subsequent correspondence with me, DWR's attorney at the time acknowledged
3 that existing SWP facilities are complete:

4 Once DWR obtained the appropriate authorizations, including its water rights
5 permits, it diligently constructed the SWP, completing most of the major facilities by
6 the early 1970s. DWR has also been diligent in putting the water to beneficial use.
7 Since the SWP began operating, there has been a steady increase in SWP diversions
8 and deliveries, matching the increased demand in the SWP service area. It has only
9 been recently, that DWR deliveries have not continued to increase (when the water is
10 available). The leveling off (or decrease) of SWP diversions and deliveries, however,
11 is not the result of lack of facilities or demand. Instead, the steady or declining
12 diversions are the direct result of new and increased regulatory constraints.

9 (RTD-120, pp. 6-7.)

10 54. DWR's attorney further stated, "DWR does not expect an increase in historical
11 maximum diversions during the time period requested and thus there should not be changes caused
12 by approval of the time extensions." (RTD 120, p. 8.) Put another way, DWR was requesting time
13 extensions that, if granted by SWRCB, would result in little or no likelihood of achieving new
14 maximum amount of deliveries for beneficial use occurring during that ensuing six years ending
15 December 31, 2015.

16 **Central Valley Project Permits**

17 55. On June 29, 2009, USBR filed petitions requesting time extensions for all 32 of its
18 Central Valley Project permits, including the 11 permits that are part of the subject Petition here.
19 (RTD-121.) They requested additional time through 2030 to maximize full beneficial use of water
20 from their facilities. USBR acknowledged in its time extension petition that "Construction of works
21 necessary to put the full permitted quantities of water to beneficial use has been completed." (RTD-
22 121, Supplement to Petitions, p. 3, #11.) USBR further stated, however, that

23 ...it is not possible at this time to accurately predict future operations and diversion
24 levels at specific times during the extension period. Major uncertainties that include
25 possible future State Water Board actions involving additional conditions to CVP
26 permits, outcome of the Bay Delta Conservation Plan [...] process, as well as any
27 other future actions necessary for compliance with the Federal Endangered Species
28 Act, frustrate any attempt to make such predictions at this time. As a result,
Reclamation is unable to determine what the ultimate diversions under its CVP
permits will be. Reclamation will continue to put water diverted under its CVP
permits to beneficial use, including consumptive uses, as well as for environmental
and fisheries purposes. Reclamation will also continue to divert to storage in CVP
reservoirs in accordance with its permits. However, Reclamation is unable at this

1 time to provide any recommendation on permits that are ready for licensing, but may
2 do so in the future.

3 (RTD-121, Supplement to Petitions, p. 2, #5.)

4 56. It is my understanding that their water rights permits were granted by the SWRCB in
5 reliance on specific legislatively authorized facilities making up the unitary project, and, once those
6 facilities were completed and water put to beneficial use, the permits could be licensed. Petitioners
7 acknowledge that major facilities of both the SWP and CVP were completed and that water from
8 those facilities has been applied to beneficial use for many years now.

9 57. In Water Rights Order 2008-0045, SWRCB defines “cold storage” of water rights:

10 The requirement that an appropriation of water be completed within a reasonable time
11 with the exercise of due diligence is a long-standing principle of California water law
12 intended to protect the public interest by preventing “cold storage” of water rights.
13 By “cold storage” we mean a situation in which an appropriation is initiated, so that
14 the water that is subject to appropriation is not available to other parties who could
15 potentially put it to beneficial use, but the appropriator is not diligently pursuing
16 development of that water supply, so that the water remains unused, contrary to the
17 public interest.

18 (Water Rights Order Order WR 2008-0045, pp. 1-2.)

19 58. As noted, SWP and CVP time extension requests are still pending. We provide
20 evidence in this testimony of the extent of cold storage to support our contention that SWP’s and
21 CVP’s authorized and completed facilities do not warrant time extensions. The evidence we offer on
22 cold-stored water (that is, unused appropriated water) and lack of legislative and budgetary
23 authorization of the Petition Facilities supports licensing the SWP and CVP permits on one hand
24 while excluding Petition Facilities and new points of diversion from those permits on the other.

25 59. It is my understanding that cold-stored water under appropriative permits may be
26 estimated as the difference between the permits’ face amounts and the maximum deliveries from
27 permitted facilities, an estimate of unused appropriate water under the permits. As noted above,
28 SWP Table A deliveries were maximized at about 3.1 million acre-feet and have averaged about 1.9
million acre-feet in the 43 years since 1973. Face amounts reported by SWRCB for DWR’s water
rights in the Petition come to 13 million acre-feet. (RTD-129.) While the SWP is operated as a
coordinated whole, Feather River rights come to 10.4 million acre-feet of face amount and Delta
rights come to 2.67 million acre-feet. The difference between maximum deliveries and the face

1 amount of SWP permits is approximately 8.9 million acre-feet, an amount approximating unused
2 appropriated water under these permits. Since SWP's maximum deliveries occurred in 2000, and the
3 deadline for full beneficial use under the permits was 2009, and time extensions on these permits are
4 pending (and even lapsed), this estimated amount of cold-stored water has occurred for six years.

5 60. Maximum deliveries by USBR CVP facilities came to about 7.5 million acre-feet in
6 1990, and CVP deliveries during the 30 years between 1985 and 2014 averaged about 5.9 million
7 acre-feet. (RTD-119, p. 3.) Face amounts reported by SWRCB for USBR's water rights in the
8 Petition come to 32.8 million acre-feet, of which 6 million occur on the American River, 1.334
9 million on Clear Creek, 16.85 million on the Sacramento River, and 8.6 million on Trinity River.
10 (RTD-128.) The estimated difference for the CVP between face amount and maximum deliveries is
11 about 25.3 million acre-feet. This is the amount of water unused but appropriated by the Bureau of
12 Reclamation. Since maximum deliveries occurred in 1990, its deadline for putting water to full
13 beneficial use was also in 1990, and time extension petitions are pending, it is my understanding
14 based on that estimate that this amount of cold-stored water has occurred for 26 years.

15 **Failure to Obtain Authorization**

16 61. A precursor to the Petition Facilities, the Peripheral Canal as isolated conveyance
17 around the Delta, was defeated by the California electorate in June 1982, 63 to 37 percent. (RTD-
18 139, p. 17.)

19 62. Despite that rejection, a project designed to isolate conveyance of fresh water from
20 the lower Sacramento River around or under the Delta was in the planning stages by a number of
21 administrative agencies since at least 1998, beginning with the CalFED Bay-Delta Program. Failure
22 of the CalFED Bay-Delta Program and the California Bay-Delta Authority a decade ago led to
23 initiation of BDCP in 2006.

24 63. Over the next several years, the BDCP process considered several surface alignments
25 for canal conveyance around and through the Delta. Then in July 2012, the Brown Administration
26 announced a tunnels alignment in which diversions in the north Delta would be routed *under* Delta
27 lands and river channels before surfacing at Clifton Court Forebay not far from the town of Byron in
28

1 the south Delta. From there, water would be exported from the state-owned Banks pumping plant
2 and the federally-owned Jones pumping plant to south of Delta contractors of the SWP and CVP.

3 64. BDCP underwent environmental review under both the California Environmental
4 Quality Act and the National Environmental Policy Act between December 2013 and July 2014.
5 After receipt of thousands of public comments on the proposal, DWR announced in December 2014
6 a modification of the tunnels alignment and design. In spring 2015 DWR announced that it was
7 dropping all pretense of a habitat conservation plan and natural communities conservation plan
8 associated with the Tunnels project. DWR renamed the revised project “California WaterFix.” A
9 new revised draft environmental review document was released in July 2015, and public comments
10 on this proposal were submitted by October 30, 2015.

11 65. The Delta Reform Act of 2009 acknowledged that, had it been completed and
12 received regulatory approvals, the BDCP, with its Conservation Measure 1 Tunnels Project, would
13 be incorporated into the Delta Plan, subject to legislated performance criteria. (W.C. Section
14 85320.) But by April 2015, as noted, DWR and the Brown Administration removed all reference to
15 any habitat conservation plan and natural community conservation plan provisions from the tunnels
16 proposal. (DWR-51, p. 7:13-27, p. 8:1-11.) This project also has no legislative authorization. The
17 Delta Stewardship Council had previously assumed the tunnels of BDCP’s Conservation Measure 1
18 would be included in BDCP for incorporation into the Delta Plan pursuant to Water Code Section
19 85320. Instead, the Council determined in the summer of 2015 that it would have to amend the
20 Delta Plan to develop conveyance and restoration policies and that the Petition Facilities would be
21 evaluated as a covered action by the Council for its conformance with the Delta Plan. (RTD-123,
22 RTD-124, RTD-125, and RTD-126.) The project’s place in the Delta Reform Act has been
23 eliminated. The status of the Delta Plan is itself now on appeal in litigation.

1 **Failure to Obtain Financing**

2 66. The California WaterFix Project has its roots in BDCP planning begun in 2006.
3 (RTD-122.) At that time, water contractors², the DWR, the Bureau, fishery agencies³, and various
4 non-governmental organizations were among those signing on to plan BDCP. Signatories to the
5 Planning Agreement sought to plan for “covered activities” that included “conveyance elements” of
6 the SWP and CVP, as well as maintenance and facility improvements for the two projects. The
7 Planning Agreement also stated that the parties “agree they will work together to bring available
8 funding to the planning effort.” (RTD-122, p. 19, Section 8.1.)

9 67. Neither the BDCP nor the CWF has been authorized by the California State
10 Legislature or the United States Congress.⁴ The California Water Action Plan update for 2016
11 acknowledges the absence of financing for CWF, stating, “State and federal agencies will complete
12 environmental review documents, secure permits for construction and operation from state and
13 federal biological agencies, secure all necessary permits from other state and federal agencies,
14 finalize a financing plan, and complete the design of California WaterFix facilities.” (RTD-133, p.
15 9.) The 2015 Implementation report on the California Water Action Plan included only two
16 mentions of the CWF, and neither reference related to its financing or funding. No coherent funding
17 plan has been put forward by any party to the project’s planning agreements that clearly describes
18 CWF funding for planning purposes, nor how the project’s construction, operation, and maintenance
19 would be funded over the long-term. Environmental water groups have, through Public Records Act
20 and federal Freedom of Information Act requests, attempted to learn how CWF is funded.

21 68. In April 2013, DWR initiated a public negotiation process for extension of SWP
22 contracts. Contract extensions achieved through this process would be for another 50 years, through
23 the end of 2085. The initial phase of the process reached an “agreement in principle” in mid-2014

24 _____
25 ² As defined in Exhibit A of the original BDCP Planning Agreement (RTD-122), water contractors
26 included Metropolitan Water District of Southern California, Santa Clara Valley Water District
27 (SCVWD), Kern County Water Agency, Alameda County Zone 7 Water Agency, Westlands Water
28 District (WWD), and San Luis & Delta Mendota Water Authority (which as a joint powers authority
under the California Government Code includes among its members SCVWD and WWD).

³ Fishery agencies included the California Department of Fish and Game, United States Fish and
Wildlife Service, and the National Marine Fisheries Service.

⁴ Accessible at http://resources.ca.gov/california_water_action_plan/.

1 but sought delay in addressing BDCP financing until a subsequent contract amendment process
2 could be undertaken after Plumas and Butte Counties sought to include BDCP-related matters in the
3 contract extension scope, to which DWR responded “that this subject would be better addressed in a
4 separate negotiation for a BDCP/DHCCP amendment.” (RTD-134, pp. 5-6.) A separate SWP
5 contract amendments process begun in December 2014 for the proposed BDCP (now CWF) was
6 suspended in February 2015 and remains dormant.⁵ A first public negotiation meeting was held
7 December 10, 2014, but a second meeting scheduled for February 17, 2015, was postponed, with
8 DWR stating on its web site that “It will be rescheduled for a later date.” (RTD-141, PDF p. 2,
9 “Announcements.”)

10 69. Before the BDCP contract extension process was postponed, the City of Antioch, a
11 public agency that buys water from Contra Costa Water District (a Central Valley Project
12 contractor), commented that:

13 The purpose of these negotiations is to address the allocation of the costs associated
14 with the BDCP among State Water Project Contractors. This includes allocating
15 benefits such as water supply from implementation of the BDCP. This raises the
16 question of when a comparable Federal process with CVP contractors will begin.
17 How BDCP benefits will be shared between the Federal & State Projects needs to be
18 clearly identified as part of the negotiations for these Contract Amendments. The
19 public needs to understand the range of costs being assumed by its public water
20 agencies who are state contractors.

21 (RTD-135.)

22 70. The Santa Barbara County Flood Control and Water Agency also commented at that
23 time:

24 On many occasions, the District has asked that DWR address the legality of imposing
25 property taxes should the District’s financial backing be needed. To date DWR has
26 not responded to these concerns, nor has DWR given any indication that it will
27 respond, rather choose [*sic*] to ignore this issue. While through this current process,
28 that may work, it is important for DWR to understand that any amendment would
need to be approved by the District’s Board of Directors and as such this issue may
well have to be dealt with then.

If DWR desires to maintain that the District’s taxing authority is a financial guarantor
for BDCP bonds, then it seems very important that this question be answered not only
for the District but also for DWR to sell bonds presuming the taxing authority is
there.

⁵ The contract amendment website for BDCP is accessible as of August 8, 2016, at
<http://www.water.ca.gov/swpao/swpcontractamendmentforbdcp/index.cfm>.

1 (RTD-136.)

2 71. It is my understanding that these two letters bracket the major funding issues plaguing
3 CWF. On one hand, federal CVP contractors have yet to commit, nor has Congress acted to
4 authorize funding for planning, design, construction, operation, and maintenance of CWF. On the
5 other hand, neither SWP contractors nor the California Legislature have transparently authorized
6 state funds for these purposes. Planning for BDCP previously, and now CWF, has been made
7 possible, as far as the public can tell, from bonded debt issued by major water contractors (or their
8 joint powers authority coalitions) supporting the project, or by one of their joint powers authorities,
9 and through the questionable collection of property taxes under the State Water Project. Until either
10 state or federal contractors commit to funding their share of project costs, their counterpart (federal
11 or state contractors) cannot commit to funding. It is my understanding that the Joint Legislative
12 Audit Committee has assigned the California State Auditor to prepare an audit report on these
13 matters, to begin in the spring of 2017.

14 72. It is my understanding that the project's costs are high. Estimates in BDCP's 2014
15 environmental review presented the project's capitalized cost (including construction and annual
16 operating and maintenance) at about \$16,026,900,000. (SWRCB-5, Chapter 8, pp. 8-74 to 8-75,
17 Table 8-41.) This estimate did not include debt service requirements. BDCP's cost analysis
18 mentions bonds as a probable funding source, but no estimate of debt service is provided. (SWRCB-
19 5, Chapter 8, p. 8-78:11 to 8-79:16 and Table 8-43.)

20 73. State Water Project financing is structured through water service contracts between
21 DWR and each of the state water contractors. A recent DWR bond prospectus states that:

22 Generally, [DWR's] costs, including interest, of providing the facilities of the State
23 Water Project, including the Water System Projects, are payable by the Contractors
24 *whether or not water is delivered*. If a Contractor defaults under its Water Supply
25 Contract, the Department may, upon six months' notice, suspend water deliveries to
26 that Contractor. During such period, the Contractor remains obligated to make all
27 payments required by the Water Supply Contract. If a Contractor fails or is unable to
28 raise sufficient funds by other means to make Water Supply Contract payments, *the Contractor is required by the Water Supply Contract to levy a tax or assessment sufficient for such purpose....* If any affected Contractor defaults on payments under certain of [various] amendments [to account for recent construction works in the State Water Project], *the shortfall may be collected from non-defaulting affected Contractors*, subject to certain limitations.

1 (RTD-137, p. iv; emphasis added.)

2 74. These contractual requirements create obligations for each contractor to make
3 payments to DWR. Most water contractors, if not all, have used bond financing for local supply
4 systems they operate as well. Additional state obligations for Petition Facilities financing could
5 weaken the ability of retail and wholesale water contractors to afford their local debt obligations
6 under California Water Code Section 85021 to reduce their reliance on Delta sources of water
7 through investment in “improved regional supplies, conservation, and water use efficiency.”⁶
8 Ensuring they meet their bond obligations helps ensure they have good ratings should they wish to
9 issue new bonds or refinance prior issues. Their ability to levy and adjust water rates (upward or
10 downward) is critical to their ability to secure their water service contracts, which in turn provide the
11 necessary security to DWR to meet its obligations to bond holders. (RTD-127, p. 4; RTD-133, p. 9.)

12 **Conclusion**

13 75. My testimony provides evidence that both the costs and the uncertainty of financing
14 for the Petition Facilities raise serious questions regarding the ability of Petitioners and their water
15 contractors to avoid cold-storing of unused, appropriated water and to finance and construct their
16 facilities for the purpose of putting water to full beneficial use. The facilities in existing SWP and
17 CVP permits have all been legislatively authorized and financed and their construction completed.
18 Using these existing SWP and CVP facilities, Petitioners have put water to as full beneficial use as
19 they are capable. It is my opinion, based on evidence provided here, that the same level of diligence
20 cannot be attributed to the California WaterFix Petition.

21 **PETITION FACILITIES WOULD INJURE WATER RIGHT HOLDERS AND**
22 **OTHER LEGAL USERS OF DELTA WATER BY CAUSING FLOW**
ALTERATIONS THAT WOULD IMPAIR AND DEGRADE WATER QUALITY.

23 76. The Notice of Petition and Hearing poses for Part 1 of the hearing the questions:
24

25 ⁶ Water Code Section 85021 states in full: “The policy of the State of California is to reduce reliance
26 on the Delta in meeting California’s future water supply needs through a statewide strategy of
27 investing in improved regional supplies, conservation, and water use efficiency. Each region that
28 depends on water from the Delta watershed shall improve its regional self-reliance for water through
investment in water use efficiency, water recycling, advanced water technologies, local and regional
water supply projects, and improved regional coordination of local and regional water supply
efforts.”

- 1 2. *Will the proposed changes cause injury to any municipal, industrial or agricultural*
2 *uses of water, including associated legal users of water?*
3 2.a. *Will the proposed changes in points of diversion alter water flows in a manner that*
4 *causes injury to municipal, industrial, or agricultural uses of water?*
5 2.b. *Will the proposed changes in points of diversion alter water quality in a manner that*
6 *causes injury to municipal, industrial, or agricultural uses of water?*

7 77. In this section of my testimony, I first address conceptual and factual issues
8 associated with scenario proliferation and analysis in Petitioners' case in chief. From this discussion,
9 I settle for reliance on H3 and H4 scenarios for addressing Notice questions because they provide a
10 semblance of initial operating criteria that several of Petitioners' witnesses agree describe the likely
11 operation of Petition Facilities at this time. I acknowledge the possibility that completion of the
12 Petition's biological opinion early next year may contain changes to initial operating criteria.

13 78. Restore the Delta's case-in-chief relies on assessments of various risks to
14 environmental justice communities that are best obtained from as finite a project description as
15 possible. H3 and H4 operational scenarios appear to provide that range of risks. The risks we are
16 concerned with derive from alterations to Delta flows and, through causal relationships, alterations
17 to Delta water quality due to operation of Petition Facilities. Later parts of my testimony provide
18 evidence on flow and water quality changes, including some that are alleged by other experts to be
19 artifacts of potentially questionable modeling assumptions. This evidence supports our case in
20 chief's concerns with injury and harm to Delta environmental justice communities, the largest of
21 which reside in the city of Stockton.

22 79. Restore the Delta witnesses Michael Machado, Barbara Barrigan-Parrilla, Esperanza
23 Vielma, Ixtzel Reynoso, Roger Mammon, and Xuily Lo will testify to the public interest in
24 environmental justice for a range of beneficial uses of Delta water.

25 **While Petitioners' case in chief has proliferated modeling scenarios, the scenarios that**
26 **matter to environmental justice communities are those that directly describe a**
27 **proposed project in as distinct, stable, and finite manner as possible.**

28 80. It is my understanding, based on Petitioners' case in chief and subsequent
correspondence from California Water Research and Pacific Coast Federation of Fisherman's
Associations, that answers to each of these questions will depend greatly on the trustworthiness,

1 veracity, availability, and accuracy of Petitioners' modeling results and evidentiary basis provided to
2 this proceeding. While the analysis in this section of my testimony relies upon Petitioners' and
3 others' model results, Restore the Delta notes the limitations of modeling and model results
4 identified by a Petitioner witness (DWR-71, p. 4:16-27, 13:1-4) and potentially others (Pacific Coast
5 Federation of Fishermen's Association Subpoena duces tecum, served July 8, 2016).

6 81. It is my understanding that there is a proliferation of model versions. Petitioner
7 witness Armin Munevar states:

8 In an effort to maintain consistency while developing the CWF EIR/EIS, DWR used
9 the CalSim II 2010 version throughout the multiple-year development of the Draft
10 EIR/EIS and the RDEIR/EIS. At the request of the state and federal fisheries
11 agencies, the CalSim II 2015 version was used for the draft biological assessment.
12 This same model version is also used for the presentation of evidence in support of
13 this petition.

14 (DWR-71, p. 9:19-23.)

15 82. This means that the 2010 CalSim II version was used to model effects of California
16 WaterFix in the 2015 RDEIR/SDEIS, while just a few months later a new 2015 version of CalSIM II
17 was used for the same Petition Facilities in a different document, the draft January 2016 biological
18 assessment. Mr. Munevar states:

19 A comparison between the CalSim II 2010 and CalSim II 2015 update model results
20 show similar system-wide operations and leads to similar conclusions in terms of the
21 overall changes in water supply and Delta water quality associated with CWF
22 scenarios in comparison with the NAA.

23 (DWR-71, p. 9:26-28, 10:1.)

24 83. While Petitioners disclose the altered inputs for the 2015 model version (DWR-514,
25 p. 4, Table 3), they have not provided a direct analysis of 2010 model results compared with 2015
26 for Hearing Officers and Staff and Protestants to make informed, independent comparisons.

27 84. Restore the Delta's concern is that Petitioners' alteration of modeling used for BDCP
28 and now California WaterFix may preclude reliable and stable evaluation of their claims to not cause
injury to legal users of water. Such unstable factual bases may not offer substantial support for
findings in an order on the Petition. (California Water Research letters served June 9, June 10, June
15, and June 20, 2016; and PCFFA's *subpoena duces tecum* served July 8, 2016.)

1 85. If the Petitioners' modeling results submitted to date are deemed credible, then they
2 provide evidence supporting a conclusion that Petition Facilities would alter flows and water quality
3 in the Delta sufficient to cause harm to legal users of water, as well as cause water quality objective
4 violations and degradation. Testimony from other RTD witnesses will address which legal users of
5 water would be affected by such changes and provide descriptions of their use of and contact with
6 water in the Delta.

7 86. It is my understanding that these issues could be further complicated by Petitioners'
8 submission of modeling results in support of a new "boundary analysis." Petitioners' witness
9 Jennifer Pierre in her testimony described Petitioners' rationale for this boundary approach. Ms.
10 Pierre states in her written testimony:

11 The CWF presented to the State Water Board is Alternative 4A, the preferred
12 alternative from the RDEIR/SDEIS. Alternative 4A is described by initial operational
13 criteria that provides for a range of outflows. This range is described as initial
14 operational scenarios H3 and H4. However, prior to operation of the project, there
15 will be specific initial operating criteria as set forth in the CWF BiOp. These criteria
16 may change based on adaptive management. Since the BiOp has not been issued, and
17 DWR and Reclamation do not know the initial operational criteria the analytical
18 framework presented for Part 1 is a boundary analysis. The boundary analysis will
19 provide a broad range of operational criteria and the initial operating criteria [from
20 the Biological Opinion] will fall within this range. These boundaries are sufficiently
21 broad so as to assure the State Water Board that any operations considered within this
22 change petition proceeding have been evaluated with regard to effects on legal users
23 of water. These boundaries are described below as boundary 1 and boundary 2.
24 Exhibit DWR-114 provides an overview of this analytical framework. However,
25 these boundaries do not represent the proposed project.

26 (DWR-51, p. 10:3-16. Emphasis added.)

27 87. Elsewhere Petitioners state that "the CWF with the Initial Operational Criteria will be
28 adaptively managed in consultation with the Fisheries Agencies." (DWR-324, p. 6.) The Petition
states that: "As a component of the California WaterFix, an adaptive management and monitoring
program would be developed and implemented to use new information and insight gained during the
course of construction and operation of water conveyance facilities." (SWRCB-1, p. 18.) Ms.
Pierre's oral testimony similarly highlighted collaborative science and adaptive management as an
element of the Petition. (DWR-1, p. 2.) The scope of this element of the Petition includes (1)
operation of SWP/CVP facilities within the Delta under existing biological opinions, a section
2081(b) permit, and the new biological opinion and 2081(b) permit for CWF; (2) design of fish

1 facilities, including the intake fish screens; and (3) habitat restoration and non-operational mitigation
2 relative to in-Delta SWP/CVP operations under the existing biological opinions and section 2081(b)
3 permit and the new biological opinion and 2081(b) permit for CWF. (DWR-51, p. 15:12-21; DWR-
4 117, p. 1-2; SWRCB-3, p. 4.1-18.) Ms. Pierre further states that:

5 These investigations may lead to changes in the initial operating criteria prior to CWF
6 becoming operational, or at any time after operations commence. Collaborative
7 science and adaptive management will support the CWF by helping to address
8 scientific uncertainty, where it exists, and as it relates to understanding the benefits
9 and effects of the construction and operations of the new water conveyance facility
operations on species in conjunction with existing SWP/CVP Delta facilities.
Specifically, collaborative science and adaptive management will, as appropriate,
develop and use new information and insight gained during the course construction
and operation of the CWF...

10 (DWR-51, p. 15:1-3.)

11 88. It is my understanding that adaptive management, as defined in the 2009 Delta
12 Reform Act, is “a framework and flexible decision making process for ongoing knowledge
13 acquisition, monitoring, and evaluation leading to continuous improvements in management
14 planning and implementation of a project to achieve specified objectives.” (Cal. Water Code Sec.
15 85052.) Petitioners’ exhibit describing the Adaptive Management Framework for the California
16 Water Fix expands on this definition (DWR-117, pp. 2-3) and outlines current and planned efforts
17 (DWR-117, pp. 5-9), a conceptual framework for adaptive management activities (including an
18 organizational framework; DWR-117, pp. 9-15), and portions of the framework that appear to be
19 incomplete. The incomplete sections include discussions of tools and scientific support for listed
20 species and a funding plan for adaptive management. (DWR-117, pp. 15-16.) We note that adaptive
21 management does not extend to environmental justice issues. A search of DWR-117 revealed no
22 mention of the search term “environmental justice,” which is a key feature of Restore the Delta’s
23 case in chief. (RTD-152.)

24 89. Petitioners have stated that collaborative science and adaptive management are
25 important elements of the Petition and that the Petition Facilities are described by initial operating
26 criteria, which will be adjusted according to scientific results from collaborative science and
27 adaptive management processes at the stage of the Petition’s new biological opinion. Ms. Pierre
28 stated on cross-examination that the boundary framework represented in part the application of

1 adaptive management to initial operating criteria, and that it represents DWR’s recommendations for
2 a potential range of Petition permit conditions to the Board.

3 90. Petitioner witness John Leahigh states:

4 To the extent that recent drought conditions suggest future SWP/CVP operations may
5 require relaxing water quality standards to avoid exceedances, my testimony shows
6 that historical hydrology over the last several drought years are truly unprecedented.
7 Such extraordinary circumstances are best managed in the context of temporary
8 adjustments as occurred pursuant to the Water Board’s authority, as delegated to the
9 Executive Director, to approve temporary urgency change petitions (TUCPs).

10 (DWR-61, p. 8:3-8.)

11 91. Added to the abstract “boundary analysis” framework mentioned by Ms. Pierre, Mr.
12 Leahigh’s testimony suggests a project description for the Petition Facilities that is built on shifting
13 sands of unique waivers of water quality objectives too difficult to model.

14 92. It is also my understanding that the California Environmental Quality Act establishes
15 standards for legally sufficient environmental documents that support full disclosure of project
16 impacts and mitigations to the public and to decision-makers. Public decisions susceptible to this
17 requirement of CEQA include decisions on water rights petitions.

18 93. It is my understanding, based on my experience with CEQA, water projects, and
19 water rights, that accurate, stable, and finite project descriptions are the “sine qua non of any
20 informative and legally sufficient EIR.” (*County of Inyo v. City of Los Angeles*, 71 Cal.App.3d 185.)
21 The various ranges of modeled results put forward by the Petitioners fail to maintain, even if
22 accurate, a stable and finite project description of Petition Facilities and their “initial operating
23 criteria.” The varying operating criteria for the Boundary 1 and 2 framework, the lack of systematic
24 comparisons of modeling results between boundary analyses and H3-H4 scenarios, and the
25 RDEIR/SEIS’s Appendix C lead me to conclude that injury and harm should be assessed for
26 decision making purposes on initial operating criteria that, in an accurate, stable, and finite manner,
27 describe the Petition Facilities, as Ms. Pierre testified for Petitioners. (DWR-51.)

28 94. For this reason, I base the remainder of my testimony in this section in large measure
on H3 and H4 because these scenarios rely on initial operating criteria that describe the Petition
Facilities. It is operation of the Petition Facilities that has the potential to cause harm to legal

1 beneficial users of water in the Delta. RTD will want to revisit the initial operating criteria issue for
2 our case in chief when the biological opinion (BO) is released for Part 2 of this proceeding and new
3 initial operating criteria are put forward. The Board has expressed willingness to revisit some Part 1
4 issues in Part 2 once the new BO has come out with new initial operating criteria for the project.
5 RTD requests that new initial operating criteria should be one such issue the Hearing Officers allow
6 parties to this proceeding to revisit for Part 2 purposes.

7 **Modeling results available show several ways in which Petition Facilities would alter**
8 **flow in Delta Channels.**

9 95. Petitioners acknowledge that “there will be some changes in the streamflow regime
10 within the Delta due to the new NDD [north Delta diversions].” (DWR-324, p. 5.)

11 96. It is my understanding that there are four principal characteristics of flow alteration in
12 channels of the Legal Delta as a result of operation of Petition facilities. These include removal of
13 flow via diversion; occurrence of reverse flows; residence time of water; and the source composition
14 of Delta waters resulting from altered hydrodynamics (i.e., “source fingerprinting” model results).
15 Below, I explain from evidence how Petition Facilities will detrimentally affect flows in relation to
16 all four characteristics.

17 **Petition Facilities will remove fresh water from the Sacramento River.**

18 97. Modeling results indicate that flows in the Sacramento River downstream of the
19 Petition Facilities’ three north Delta diversions would decrease in every month on average.
20 (SWRCB-3, Figures 4.3.2-7 and 4.3.2-8; RTD-149; RTD-150; see also SWRCB-4, Figures 6-14 and
21 6-15 for analogous hydrography for BDCP.)

22 98. For the long-term monthly average changes represented in all water years, the
23 average percent change from existing conditions currently to operational effects of Alternative 4A,
24 Scenario H3 would be minus-twenty (-20) percent. This would be similar for the average percent
25 change from existing conditions to operational effects of Alternative 4A, Scenario H4 (minus
26 nineteen [-19] percent); the average percent change from the No Action Alternative (that is, future
27 conditions without the proposed Petition Facilities in operation) to Alternative 4A, Scenario H3
28

1 (minus twenty [-20] percent); and the average percent change from the No Action Alternative to
2 Alternative 4A, Scenario H4 (minus nineteen [-19] percent). (RTD-149, including charts, pp. 2-5.)

3 99. These alterations to flow are confirmed by modeling results for flow downstream of
4 Petition Facilities presented in Appendix B of the RDEIR/SDEIS. (SWRCB-3, Tables B.7-27
5 through B.7-30, pp. B-355 to B-362; RTD-149.) Results highlighted in red indicate modeled flow
6 results that are more than 5 percent lower than flows under the baseline flows employed in the
7 modeling. Most flow results in exhibits drawn from the California WaterFix RDEIR/SDEIS are
8 substantially reduced between the North Delta diversion facilities to Rio Vista under nearly every
9 operational scenario, every month, and nearly every water year type by the Petition facilities. RTD-
10 149 summarizes in one table and accompanying charts the mean monthly and annual flow decreases
11 the Petitioners' modeling estimates for the Sacramento River below the north Delta diversions.

12 100. Mean monthly flow decreases in the Sacramento River downstream of the north Delta
13 diversions would vary by operational scenario. The H3 operating scenario sees mean monthly flow
14 decreases ranging from -21 percent in March and June to -29 percent in August, compared to
15 existing conditions, and -21 percent (March) to -31 percent (September) compared with the future no
16 action scenario. The lowest mean monthly flow decrease is -13 percent in December, or about one-
17 eighth of baseline flow compared with existing flow conditions. (RTD-149.)

18 101. The H4 operating scenarios involved greater commitment in modeling criteria to
19 Delta outflows in spring and fall compared with H3 criteria. H4 scenarios see mean monthly flow
20 decreases exceeding -23 percent (November) in fall and summer months when Delta outflow
21 assumed commitments are lower. A fall X2 commitment results in flow decreases averaging -16
22 percent for September, still about one-sixth the flow of the Sacramento River in this reach compared
23 with existing conditions.

24 102. Independent modeling results by MBK Engineers and Daniel Steiner (MBK/Steiner)
25 examined flow alternatives between the north Delta diversions and Rio Vista and made specific
26 adjustments to model assumptions that I mentioned above in my testimony. (RTD-143,
27 Attachment 1, p. 44-49.) North Delta Diversions in this modeling effort show greater diversions
28 during July and other months because the BDCP Draft EIR/EIS modeling included artificially high

1 Sacramento River bypass flow requirements, resulting in excess Sacramento River flow into and
2 through the Delta. MBK/Steiner indicates a substantial excess of as much as 2,000 to 4,000 cfs in
3 July over the bypass requirement in 10 percent of years. (RTD-143, Attachment 1, p. 66, Figure 60,
4 comparing BDCP EIR/EIS and Independent Modeling exceedance curves.) Such excess flows
5 would exaggerate the amount of Delta outflow and through-flow that would occur, resulting in
6 reduced summer-time salinity incursion, but are not likely to reflect realistic operational treatment of
7 these flow conditions. (*Id.*) It is my understanding, based on the MBK/Steiner analysis, that this
8 likely understates the Petition Facilities' effects on salinity conditions in this reach of the
9 Sacramento River, if more efficient treatment of bypass flows is assumed.

10 103. A similar situation occurs for analysis of October flows below the North Delta
11 Diversion facility. MBK/Steiner states:

12 The most significant differences in flow changes occur in October, July, August, and
13 September. Changes in Sacramento River flow entering the Delta are a key indicator
14 of changes in interior Delta flows, water levels, and water quality.

14 (RTD-143, Attachment 1, p. 67.)

15 104. Another adjustment the independent modelers made to CalSIM II operational
16 assumptions affected the frequency of October surplus or excess flows at a time when the Delta is
17 frequently in balance (and flood flows are not naturally occurring). It is my understanding that
18 DWR's BDCP studies assumed that Delta Cross Channel (DCC) gates would be open for the entire
19 month of October, which would necessitate higher Sacramento River flows (and more upstream
20 reservoir releases) in order to meet the Rio Vista flow requirements than if DCC gates were closed.
21 (RTD-143, Attachment 1, p. 49; SWRCB-21, Table 3.) MBK Engineers/Steiner and Contra Costa
22 Water District (CCWD) each commented that closing DCC gates would make it possible for the
23 7,000 cfs North Delta Diversion summer bypass flow criteria to meet the weekly average flow
24 requirements for Sacramento River at Rio Vista. (RTD-143, Attachment 1, p. 49; RTD-154, pp. 14-
25 18.) MBK Engineers/Steiner stated:

26 The intent was to minimize surplus Delta outflow while meeting Delta salinity
27 standards and maintaining enough bypass flow to use the NDD facility for SOD
28 [south of Delta] exports. This is an approximation of what is likely to occur in real-
time operations under similar circumstances. Further gate closures may be possible
as salinity standards allow if operators decide to preserve upstream storage at the

1 expense of NDD diversions. This type of operation would require additional model
refinements.

2 (RTD-143, Attachment 1, p. 49.)

3 105. CCWD commented specifically on Petition Facilities modeling that “these flaws
4 remain in the RDEIR/SDEIS...” (RTD-154-p. 14.) Having analyzed these excess flows in October
5 for both the H3 and H4 operational scenarios in the early long term (as analyzed in the
6 RDEIR/SDEIS), as well as the late long term (as analyzed in the 2013 BDCP Draft EIR/EIS),
7 CCWD found that although excess October Delta outflow occurred less often in the late long-term
8 modeling results than in the early long term results, the frequency of occurrence in both early and
9 late scenarios “is also unrealistic.” (RTD-154, p. 15, Figure 3-3.) CCWD further commented that:

10 The excess Delta outflow simulated in Alternative 4/4A is due to the lack of a
11 coherent operations plan. In particular, operational requirements for the new project
12 facilities and modified operational criteria for the existing south Delta facilities were
13 specified for the operational model (CALSIM II) without recognizing that these new
criteria for the proposed BDCP/CWF would upset the operations of the larger water
supply system.

14 In this instance, the modeling projects that Water Quality Control Plan requirements
15 for flow in the Sacramento River at Rio Vista would cause releases from upstream
16 reservoirs that cannot be captured at the south Delta facilities and instead become
17 excess Delta outflow. This seldom happens in the No Action Alternative because
there are no OMR requirements in October under the No Action Alternative, so that
flow released to meet the Rio Vista requirements can be exported at the south Delta
facilities.

18 The project descriptions for the revised Alternative 4 and the new Alternative 4A
19 indicate [] that the south Delta facilities will be shut down for 14 days in October.
20 The 14-day shut-down requirement is modeled as a requirement for OMR to be
greater than –5,000 cfs for the entire month of October—even though there are no
OMR requirements in the project description for October. When OMR is regulated,
21 pumping at the CVP and SWP south Delta export facilities is limited. Since the
modeling assumes OMR is regulated for the entire month of October, the water
22 released from reservoirs to meet Rio Vista flow requirements cannot be fully captured
at the south Delta facilities.

23 In reality, the south Delta facilities would probably be able to capture the additional
24 flows for the 17 days during which export pumping is permitted. For the remaining
14 days when the south Delta export facilities are shut down, the CVP and SWP,
25 rather than increasing reservoir releases, are far more likely to limit the amount of
reservoir releases that flow out to the San Francisco Bay by closing the Delta Cross
26 Channel to meet Sacramento River flow requirements at Rio Vista flow requirements
without creating excess Delta outflow.

27 When the Delta Cross Channel gates are open, a portion of the Sacramento River
28 flow enters the central Delta, reducing flow in the Sacramento River downstream of
the Delta Cross Channel (Figure 3-4). To meet flow requirements in the Sacramento
River at Rio Vista, DWR and Reclamation have two options: (1) increase reservoir

1 releases to increase the Sacramento River flow entering the Delta, or (2) close the
2 Delta Cross Channel gates to increase the amount of flow that reaches Rio Vista
without increasing Sacramento River inflow.

3 The operational strategy to close the Delta Cross Channel to meet Rio Vista flows
4 without unnecessary reservoir releases has been implemented recently in November
5 of 2009 and in October of 2013 and 2014 (Reclamation, 2015). This is the realistic
6 operational strategy that should have been used in the modeling. Failure to model
7 this operational strategy, when it has in fact been implemented repeatedly in recent
years, biases the salinity results in the water quality impacts analysis, showing
reduced salinity with the project. In reality, when the Rio Vista flow requirements are
met by closing the Delta Cross Channel instead of by releasing flow from upstream
reservoirs, interior Delta salinity will increase with the project.

8 (RTD-154, p. 16.)

9 106. MBK/Steiner further analyzes flows just downstream of Hood and through both Delta
10 Cross Channel and Georgiana Slough. Their modeling for flows downstream of Hood (and therefore
11 below the North Delta Diversions) showed October flows in that area to be “about 2,000 cfs lower
12 than the BDCP modeling. The difference in this month is largely due to reoperation (closure) of the
13 cross channel gate to lessen the amount of Sacramento River flow at Hood necessary to maintain Rio
14 Vista flow requirements downstream of the cross channel gates.” (RTD-143, Attachment 1, p. 67.)

15 But the largest differences were found by MBK/Steiner in July and August:

16 The most substantial difference between the BDCP and independent modeling occurs
17 in July and August. The differences in these two months are primarily attributable to
18 model fixes that have occurred since the BDCP modeling was performed. In the
19 independent modeling, July flows are reduced on average about 7,500 cfs while
BDCP shows a reduction of about 3,300 cfs. In the independent modeling August
flows are reduced on average about 5,900 cfs while BDCP shows a reduction of about
3,900 cfs.

20 In the independent modeling September flows are reduced by about 6,100 cfs while
21 BDCP modeling shows a reduction of about 5,300 cfs. The independent modeling
22 shows Sacramento River flow entering the Delta to be about 7,000 cfs 50% of the
time, BDCP modeling show Sacramento River flow is about 8,000 cfs 50% of the
time.

23 (RTD-143, Attachment 1, p. 67.)

24 107. It is my understanding that flows through Delta Cross Channel and Georgiana Slough
25 account for most flows entering the central Delta from the Sacramento River. Alterations to flows in
26 the Delta Cross Channel and Georgiana Slough are further documented in detail by MBK/Steiner.

27 (RTD-143, Attachment 1, pp. 69-71.) As I understand the combined flow exceedance charts for all
28 months, flows in these two channels are definitely lower, with the MBK/Steiner flows for

1 Alternative 4 in the months of October, November, June, July, August, and about half of all
2 Septembers having the lowest path exceedance curve. (RTD-143, Attachment 1, p. 71, Figure 64.)
3 The months with the lowest flows in these two channels include October, July, and August, as stated
4 earlier. (*Id.*)

5 108. RTD-150 summarizes in one table and accompanying charts the mean monthly and
6 annual flow decreases the Petitioners' modeling predicts for the Sacramento River at Rio Vista, 21
7 miles downstream. It is my understanding that flow decreases are also modeled further downstream
8 of Georgiana Slough along the mainstem Sacramento River through the Delta. Compared with the
9 future no action condition, the north Delta diversions would also result in flow decreases in the
10 Sacramento River at Rio Vista ranging from -22 percent in October to -32 percent in September.
11 Summer and fall months would all see flow decreases exceeding winter and spring decreases. All
12 months, on average, see flow decreases in this reach of the Sacramento River compared with
13 existing conditions and a future no action scenario. These modeling results were presented in
14 Petitioners' RDEIR/SDEIS in 2015.

15 109. Based on my review and analysis of Petition Facilities modeling results, mean
16 monthly fresh water flow decreases in the Sacramento River at Rio Vista occur in all months.
17 (RTD-150.) Flow decreases for H3 are lowest in wetter winter months compared with existing
18 conditions, but flow decreases grow larger in the spring, reaching -31 percent in June and -39
19 percent in August. Fall season fresh water flow decreases range from -19 percent in September to -
20 38 percent in October and -24 percent in November, compared with existing conditions. Compared
21 with the future no action scenario for H3, commitments to spring outflow limit flow decreases to less
22 than -20 percent from December through May, but the months of June through November see flow
23 decreases ranging from -20 percent in June to -46 percent (nearly half) in September. (RTD-150.)

24 110. Based on my review and analysis of flow decreases in the Sacramento River at Rio
25 Vista for H4 modeled operations, there is a pattern similar to that of H3. (RTD-150.) All months
26 see flow decreases, with December through May decreases ranging from -1 percent in April to -11
27 percent in May. June through November flow decreases at Rio Vista range from -21 percent in
28 September to -39 percent in August, compared with existing conditions. Based on my review and

1 analysis of SWRCB-3, Appendix B, H4 modeled operations reveal a similar pattern relative to the
2 future no action scenario. All mean monthly flows decrease compared with the no action scenario.
3 The range between December and May is from -1 percent (April) to -10 percent (March), and flow
4 decreases grow during June through November, ranging from -27 percent in June to -47 percent
5 (again nearly half the river's flow at Rio Vista) in September. (RTD-150.)

6 111. Not only would flows immediately downstream of the Petition Facilities be reduced
7 substantially, CWF modeling results show that flows in the Sacramento River at Rio Vista, 21 miles
8 downstream from Courtland (a town in the vicinity of the Petition Facilities' farthest-downstream
9 intake) would also be reduced substantially by Petition Facilities' operation under nearly every
10 operational scenario, every month, and nearly every water year type. (SWRCB-3, Appendix B, pp.
11 B-355 through B-362; RTD-149; RTD-150.)

12 112. These model results show that Sacramento River flow alterations from Petition
13 Facilities operation would have regional effects, since flow reductions are identified in these results
14 at specific locations 21 miles apart. Flow reductions on such a scale would injure municipal,
15 industrial, and agriculture uses in between, as well as along various distributaries near to and
16 downstream of the north Delta diversions of the Petition Facilities. As the Sacramento River enters
17 the Legal Delta from the north at Freeport, it provides flows to three distributaries: Elk Slough near
18 Clarksburg, Sutter Slough at Courtland, and Steamboat Slough just south of Courtland.

19 **Reverse flows, or "upstream transport," would occur at times of reduced Delta inflow.**

20 113. The Sacramento River normally supplies flows to the Delta Cross Channel (when its
21 gates are open) and to Georgiana Slough just below Walnut Grove. Reduced Sacramento River flow
22 would result in less flow distributed to upstream and downstream distributaries. (SWRCB-5,
23 Chapter 5, Effects Analysis, Attachment 5C.A, Table C.A-24, p. 5C.A-119.) Reduced inflows to the
24 northern Delta would allow more tidal penetration upstream into Delta channels. At very low Delta
25 inflow from the Sacramento, north Delta diversions could result in reverse flow along the
26 Sacramento River, as far upstream as Freeport. (RTD-142, Exhibit D, pp. 29-32 [PDF pages 55-58];
27 SWRCB-5, Chapter 3, p. 3.3-143, lines 11-20.) East Bay Municipal Utilities District (EBMUD) and
28 Sacramento County Water Agency jointly operate the Freeport Regional Diversion Facility.

1 EBMUD has voiced concerns about reverse flows in the absence of habitat restoration undertaken
2 downstream. (RTD-143, Attachment 4, pp. 5-7; RTD-144, pp. 5-10.)

3 **Residence time of water would increase from operation of Petition Facilities.**

4 114. In the north, central, south, and west Delta areas, and in the Cache Slough region,
5 deprivation of 20 percent or more of mainstem Sacramento River flow would increase the residence
6 time of water relative to the no action alternative. In the north Delta, average seasonal residence
7 time of water is expected to increase from 38 to 41 days; in the west Delta, from 22 to 25 days; in
8 the eastern Delta from 36 to 45 days; in the south Delta from 16 to 25 days; and in the Cache Slough
9 region from 29 to 35 days on average. (RTD-130, Figure 4, p. 59; SWRCB-3, Table 8-60a, p. 8-82.)
10 Similar increases in residence times of water were reported in modeling results from Bay Delta
11 Conservation Plan effects analyses. (SWRCB-5, Table 5C.5.4-14, p. 5C.5.4-84.)

12 115. It is my understanding of Delta and Suisun Marsh hydrodynamics that lengthened
13 residence time of water can result in alterations to water quality such as warming water temperature;
14 increased partitioning and bioavailability of selenium from the water column, allowing it to enter
15 benthic food webs; and increased risk of harmful algal blooms releasing toxins into Delta waters.
16 Consequently, increased residence time of water can affect drinking water quality (as lack of flow
17 and slow mixing with tidal sources can increase salt concentrations); recreational beneficial uses
18 (especially water contact recreation); shellfish bioaccumulation of chemical toxins; subsistence,
19 commercial, and recreational fishing activity; and some industrial uses. Reduced mainstem flow of
20 Sacramento River water may also affect seepage to local groundwater sources, and poorer quality
21 Delta water could also affect the quality of subsurface groundwater sources of drinking water.

22 **Modeling results for Petition Facilities operation show water source fingerprinting at**
23 **various locations in the Delta will change significantly.**

24 116. My earlier discussion of source water fingerprinting model results is also relevant
25 here. From these results, it is my understanding that increases in the residence time of San Joaquin
26 River water in southern and central Delta channels will degrade water quality since the San Joaquin
27 River is known to have a worse water quality profile for salinity and other pollutant concentrations
28 than the Sacramento. (RTD-130, p. 60, Figure 5; source data from SWRCB-3, Appendix B, Section

1 B.4.2, pp. B-209 to B-212 [Charts for No Action Alternative], B-231-234 [Alternative 4A, Scenario
2 H3], and B-253-256 [Alternative 4A, Scenario H4].)

3 **Flow alterations will lead to water quality changes that will violate water quality**
4 **objectives and degrade water quality in the Delta.**

5 117. Petitioners acknowledge that “the operation of CWF has the potential to change flow
6 and water quality at some locations in the Delta...” (DWR-324, p. 6.)

7 **Reduced downstream flow and increased residence time of water and reverse flow**
8 **frequency would cause greater upstream incursion of tidal salts and influx of more**
9 **polluted San Joaquin River water.**

10 118. Petition Facilities would alter flows to such a degree that water quality would be
11 degraded to the point of injury to agricultural irrigation and drinking water uses in the Delta. From
12 my earlier testimony concerning excess flows above bypass requirements—and in relation to
13 whether modeling operations assumptions had the Delta Cross Channel closed or open during
14 October—through the Delta in October, as well as in summer months, it is my understanding that
15 flow alterations identified from modeling results (whether from Petitioners or from the MBK/Steiner
16 report) would be sufficient to alter salinity and water quality conditions in the Delta. Contra Costa
17 Water District commented on Petition Facilities’ flow and water quality modeling results that:

18 The unrealistic excess Delta outflow in October freshens the modeled interior Delta
19 salinity for many months. ...[E]xcess Delta outflow in October freshens the water at
20 CCWD’s Old River Intake in October and that the freshening effect is maintained
21 through December.... In contrast, during years without excess Delta outflow in
22 October, Alternative 4/4A H3 increases the salinity at CCWD’s Old River Intake in
23 October, November, and December.... Further, averaging salinity over all years ...
24 underestimates the impacts that would occur.

25 (RTD-154, p. 18, Figure 3-5; RTD-143, Attachment 1, pp. 66-71.)

26 119. Modeling results in the California WaterFix RDEIR/SDEIS reveal that salinity levels
27 for Petition alternatives would increase relative to both existing conditions and the No Action
28 Alternative in the Legal Delta and Suisun Marsh, often substantially throughout most spring and
summer irrigation seasons in each month that the facilities operated. (RTD-130, pp. 66-67,
Figure 11; SWRCB-3, , Appendix B, Table EC-8A, pp. B-134 and B-135.)

120. At Sacramento River at Emmaton, for instance, relative to existing conditions for
operational scenario H3, electrical conductivity was found to increase for all years in the modeled

1 16-year period by 5 percent in March, 10 percent in April, 12 percent in May, 7 percent in June, 21
2 percent in July, 27 percent in August, and 2 percent in September (which is already a low flow/high
3 salinity tendency). In drought years at Emmaton, these changes in salinity increase dramatically: 14
4 percent in March, 18 percent in April, 36 percent in May, 23 percent in June, 49 percent in July, 42
5 percent in August, and 20 percent in September. (SWRCB-3, Table EC-8A, Appendix B, page B-
6 134.) For operational Scenario H4 at Emmaton in all years relative to existing conditions, salinity
7 increases between 5 and 9 percent during March through June, but jumps to 33 percent in July, and
8 30 percent in August. During drought years, scenario H4 salinity relative to existing conditions
9 would increase 15 percent in March, 16 percent in April, 33 percent in May, 26 percent in June, 63
10 percent in July, 47 percent in August, and 18 percent in September. (SWRCB-3, Table EC-8B,
11 Appendix B, p. B-135.)

12 121. Percentage increases in salinity occur at several other locations during the irrigation
13 season relative to existing conditions, including the San Joaquin River at Jersey Point (April and
14 May in all years, March through June and September); South Fork Mokelumne River at Terminous
15 Island (all months in all years); San Joaquin River at San Andreas Landing (March through June,
16 August through September in all years and drought years); and San Joaquin River at Prisoners Point
17 (February through June, September in all years and drought years). Interior Suisun Marsh salinity is
18 projected to degrade significantly as well. (RTD-130, p. 68, Figure 12; source data from SWRCB-3,
19 Tables EC-4 through EC-7.)

20 122. Several water quality stations are sites for regulatory compliance with salinity
21 objectives of the present Bay-Delta Estuary Water Quality Control Plan. These stations include
22 Sacramento River at Emmaton, San Joaquin River at Prisoners Point, San Joaquin River at Vernalis,
23 and the interior South Delta salinity objectives at San Joaquin River/Brandt Bridge, Old River at
24 Middle River, and Old River/Tracy Boulevard Bridge. Modeling results indicate that there would be
25 substantial increases in the number of days when exceedances of salinity objectives occur.
26 (SWRCB-3, Table EC-1, Appendix B, page B-129.) At Emmaton, the percentage of days the
27 objective is exceeded would about triple from existing conditions to operational scenarios H3 and
28 H4 for the Petition Facilities, from 6 percent to 17 percent (H3) and 18 percent (H4). The

1 percentage of total days out of compliance would more than double, from 11 percent to 26 (H3) and
2 28 percent (H4). Over the 16-year modeled period, the number of days salinity objectives were
3 violated would increase from 233 under existing conditions to 563 (H3) and 600 (H4), out of a total
4 of nearly 2,200 compliance days in the modeled period. For San Joaquin River at Prisoners Point,
5 the percentage of total non-compliance days would also more than double from 10 percent to 20
6 (H3) and 23 percent (H4) of the applicable compliance days at that station.

7 123. The modeling results of this exhibit also show either no or only small improvements
8 in salinity conditions for most of the modeled stations, especially for San Joaquin River at Vernalis
9 and the interior South Delta stations listed previously. (SWRCB-3, Table EC-1, Appendix B, page
10 B-129.) This is because removal of fresh water at the north Delta Petition Facilities would reduce
11 fresh flows passing through the Delta Cross Channel at Walnut Grove, and less good quality fresh
12 water would pass through the intervening Delta channels to the Banks and Jones Pumping Plants.
13 The water that is removed will be replaced variously, in different locations in the Delta, by either
14 tidal flow from San Francisco Bay, flow from smaller east side streams, or from San Joaquin River
15 inflow, which is higher in salinity concentration than the Sacramento River. The major water quality
16 improvements of this isolation of flows into Petition Facilities are reserved for supplies reaching
17 Banks and Jones Pumping Plants via the underground tunnel facilities described in the Petition.
18 (SWRCB-3, Fingerprinting, Section B.4.2, pp. B-191 through B-256⁷; RTD-130, Figure 5, pp. 60-
19 61.)

20 124. Additionally, water quality degradation is identified in Petitioners' environmental
21 documents for boron, bromide, chloride, nitrates, dissolved organic carbon, methyl mercury (from
22 construction and habitat restoration disturbance), harmful algal blooms, and selenium. (RTD-130,
23 pp. 63-76; source data from SWRCB-3, Appendix B: Table Bo-3, p. B-71; Table Br-1, p. B-83;
24 Table Br-5, p. B-87; Tables Cl-6 through Cl-9, pp. B-93 through B-96; Tables N-4 and N-5, p. B-

25
26
27 ⁷ This modeling section summarizes the change in monthly composition of source waters at various
28 points in the Delta, including major public water agency diversion points including Banks and Jones
pumping plants. Compare especially Banks and Jones source composition with Contra Costa Water
District's intake at Rock Slough and Franks Tract.

1 162; Table DOC-1, p. B-171; Tables Se-5, Se-6, and Se-7, pp. B-185 through B-186; and Tables Hg-
2 5, p. B-147, and Hg-7, p. B-149; also, SWRCB-4, Appendix 8I for methyl mercury.)

3 **Degradation of surface water quality would affect the City of Stockton’s Delta Water**
4 **Supply Project intake for municipal beneficial uses.**

5 125. “Under natural conditions,” stated civil engineer and Delta expert Thomas Means in
6 1928, “the boundary between salt and fresh water was Carquinez Straits. In late summer, Suisun
7 Bay became brackish, but salt water penetrated as far as Antioch only rarely and then for but a few
8 days’ time.” (RTD-213, p. 17.) With “no large increase of cultivated land in the delta region,” the
9 increasingly salty waters in the Delta threatened agriculture and industry in the region. (RTD-213, p.
10 21.) Their incursion was due to upstream diversions of fresh water in the Sacramento Valley
11 reducing flow entering the Delta “to a small fraction of the flow under natural conditions.” (RTD-
12 213, p. 21.) The quality of water was found crucial to the economic, agricultural, and industrial
13 development and vitality of the San Francisco Bay estuary. Means described four relationships
14 between Delta water quality and local economic development:

15 First, [increased salinity] renders questionable the irrigation of permanent crops,
16 particularly such crops as are sensitive to salt; second, it has a tendency through the
17 percolation beneath the levees of sub-irrigating the adjoining land with saline water;
18 third, it reduces the value of lands through the fear of salinity; and fourth, it adds
19 expense and uncertainty to the question of domestic supply, for on most of the delta
20 the river is a source of domestic water.

21 (RTD-213, p.21.)

22 126. The City of Stockton draws water from the Delta for domestic and municipal use.
23 The City of Stockton obtained water right permit 21176 (Application 30531A) from the State Water
24 Resources Control Board on December 20, 2005, to divert a flow not to exceed 317 cubic feet per
25 second and 33,600 acre-feet per year from the San Joaquin River at the southwest tip of Empire
26 Tract. (RTD-225, p. 3, paragraph 5.) This permit required the City to complete its point of
27 diversion, raw water and treated water transmission pipelines, and its 30 million-gallon-per-day
28 (MGD) water treatment facility by December 31, 2015. Permit 21176 requires the City to complete
application of water to its authorized uses by December 31, 2020.

127. The City received its water supply permit (01-10-15P-001 for public water system
No. 3910012) on July 21, 2015 and is operating the diversion and treatment facility at this time to

1 deliver water to its north and south Stockton customers. (RTD-220, pp. 1-10.) The City's domestic
2 water supply system diverts raw water at the Delta Water Supply Project (DWSP) under permit
3 21176 for treatment at the new Water Treatment Facility, pumps four groundwater wells in south
4 Stockton and 13 in north Stockton, and purchases treated water from Stockton East Water District
5 and raw water from Woodbridge Irrigation District. (RTD-220, p. 4, 11-12.) The City's permit for
6 Delta water use constrains diversions between February 15 and June 15. During this period, the
7 City's purchase contract with Woodbridge Irrigation District (WID) provides an alternative source
8 during the City's Delta curtailment period in the period March 1 through July 30. From February 15
9 through March 15, Delta water pumping and Water Treatment production may not exceed 15 MGD.
10 (RTD-220, p. 26, Section 4.2.) From March 1 through March 15, WID water may be blended with
11 Delta water or WID water used exclusively from the WID source. (*Id.*) Between March 15 and May
12 21, no Delta water may be pumped, and the raw water needs of the plant must be met exclusively
13 from the WID source. (*Id.*) From May 21 to June 15, either Delta water or WID water may be used
14 exclusively to meet the raw water needs of the plant up to its capacity of 30 MGD. From June 15 to
15 July 30, either Delta water or WID water may be used exclusively to meet raw water needs of the
16 plan up to its capacity of 30 MGD, or a blend of the two sources may be used. (*Id.*) Between July
17 30 and February 15, the Delta water diversion may be used to meet the City's raw water needs up to
18 the plant's capacity of 30 MGD. (*Id.*)

19 128. The City of Stockton started operation of DWSP in 2012. The City may take delivery
20 of up to 17,500 acre-feet per year through its purchase contract with Stockton East Water District
21 (SEWD). (RTD-218, p. 5-1.) Currently, due to drought and a reduction in SEWD's supplies, the
22 City takes much less, about 5,634 acre-feet in 2015, and expects to receive 6,000 acre-feet in 2016
23 from SEWD's reservoir supplies of Stanislaus and Tuolumne River sources. The City's urban water
24 management plan states that Stockton will use approximately 6,000 acre-feet per year from SEWD.

25 129. The City of Stockton executed an agreement with WID in 2008 to purchase up to
26 6,500 acre-feet annually. This water originates from the Mokelumne River. Stockton anticipates
27 that its WID purchases will double to 13,000 acre-feet by 2025. (RTD-218, p. 5-12, Table 5-7;
28 RTD-226, p. 1.) In all, the City of Stockton's Municipal Utilities Department water supply portfolio

1 supplied 24,843 acre-feet of water during 2015 to its 47,000 domestic, municipal, and industrial
2 customers. The City claims as its total water rights or safe yield water supplies of up to 96,480 acre-
3 feet, nearly four times its 2015 deliveries. (RTD-218, p. 5-11, Table 5-6; RTD-225.) The City of
4 Stockton projects it will increase its DWSP diversions to 50,000 acre-feet by 2035. (RTD-226, p. 1;
5 RTD-218, p. 5-12, Table 5-7.)

6 130. The City of Stockton is concerned about the future reliability of water quality at its
7 DWSP intake and potential water treatment cost increases if Petition facilities are constructed and
8 operated. The City of Stockton alleges that Petitioners have failed to use data collected near the
9 City's Delta Water Supply Project (DWSP) for impact analysis of potential harm. (RTD-221, pp.
10 38-43.) Instead, Petitioners relied on a DWR monitoring station at Buckley Cove, nearly 10 miles
11 southeast of the City's DWSP diversion point. The City stated that "Buckley Cove cannot be
12 considered representative of the water quality available at the City's intake." (RTD-221, p. 38, 39.)

13 The City informed Petitioners:

14 The City has been collecting water quality data in the stretch of the San Joaquin River
15 near its intake for over 30 years. Despite being on notice about the City's significant
16 concerns about water quality effects in the area of its intake, the BDCP proponents
17 did not obtain or use any of this data in preparing the DEIR/EIS. Moreover, DWR
18 maintains a water quality station less than one-half mile from the City's intake. It
19 was unreasonable for the DEIR/EIS to not have used data from that water quality
20 station in order to more accurately evaluate impacts to the City's drinking water
21 supply. It is not possible for the project proponents or the City to determine how the
22 BDCP will affect water quality conditions at the City's intake until a Delta
23 Simulation Model run is conducted for our intake site proximity.

24 (RTD-221, p. 38.)

25 131. Contra Costa Water District (CCWD) noticed this assumption by the Draft BDCP
26 EIR/EIS in its 2014 comments because Petitioners applied this assumption not only to Stockton's
27 intake on the San Joaquin River but to CCWD's intakes at Rock Slough, Old River, and Victoria
28 Canal. (RTD-153, p. 70.) CCWD termed this assumption "inappropriate" and "unreasonable"
because the actual intakes and their presumably representative locations were up to 17 miles apart.
(RTD-153, p. 70-71, Figure 2-1.) Moreover, CCWD chose to locate new intakes further east in the
Delta to escape encroaching salinity from reduced Delta inflows:

[I]ndeed, it is the difference in salinity at different locations in the Delta interior that
drove CCWD's construction of its Old River intake and Middle River intake on
Victoria Canal (collectively "Old and Middle River intakes"). Even intakes that are

1 relatively close together such as CCWD's Old and Middle River intakes have very
2 different water quality because of the complexity of the hydrodynamics in the Delta.

3 (RTD-153, p. 70.)

4 132. CCWD's 2014 comments also directly criticized the attempt to use Buckley Cove as
5 "representative" in water quality conditions to the location of the City of Stockton's DWSP intake,
6 stating that "results from modeling of the No Action Alternative, performed for BDCP Draft
7 EIR/EIS and provided to CCWD by DWR [citation], illustrate that salinity at the City of Stockton's
8 intake differs significantly from salinity at...Buckley Cove. The quality of water at the Buckley
9 Cove is not representative of the City of Stockton's intake." (RTD-153, p. 72, Figure 2-2.) This
10 figure shows modeled salinity differences reflecting electrical conductivity results on the order of
11 300 to 600 microsemens per centimeter for a modeled period similar to the 1975 through 1977
12 drought. (*Id.*)

13 133. It is my understanding that differences in water quality at different locations in the
14 interior Delta can often be due to differences in source water. Some locations' source water is
15 dominated by water originating from the Sacramento River, while other locations are dominated by
16 San Joaquin River water; still other locations may be dominated by Bay waters. According to source
17 water analysis obtained by CCWD from DWR, Stockton's intake often receives greater than 70
18 percent of its water from the Sacramento River, while Buckley Cove seldom receives water from the
19 Sacramento. (RTD-153, pp. 73-74, Figure 2-4.)

20 134. Concerning bromide effects, the City of Stockton alleges that Petitioners chose
21 Buckley Cove as the monitoring station for modeling changes in bromide levels representative of the
22 City's DWSP intake. (RTD-221, p. 39.) The City expressed its concern that:

23 What would the bromide concentration level increases be at the City's Delta intake?
24 The BDCP must evaluate the effects of changes in bromide levels at or near the
25 City's intake on the San Joaquin River, including effects on consumers of water and
26 on City operations. Further, if treatment plant upgrades may be necessary due to
27 increased levels in bromide due to the BDCP, significant environmental and
28 economic impacts need to be evaluated and mitigated by the BDCP, not left to the
City to address.

(RTD-221, p. 40.)

1 135. It is also my understanding that evaluating a high bromide or salinity, but non-
2 representative water quality site between the No Action Alternative baseline conditions and Petition
3 Facilities' operational effects would overstate concentrations of salinity and bromide at the baseline
4 and, by doing so, could in turn minimize the change in salinity or bromide concentrations resulting
5 from Petition Facilities' effects.

6 136. CCWD also commented on carcinogens. Bromide is a precursor to the formation of
7 disinfection byproducts (which include bromate, bromoform, and other brominated trihalomethanes
8 [THMs], and halo acetic acids). All of these constituents are potentially harmful to human health
9 through municipal water supplies. (RTD-153, p. 56.) CCWD commented further that neither
10 environmental review of Petition Facilities is adequate, first because tallying just the number of days
11 the bromide objective is violated fails to disclose the magnitude of the excess bromide. The
12 magnitude is directly related to the level of health risk from bromide due to its contribution to
13 carcinogen production during the water treatment process. If the bromide analysis looks only at the
14 number of days a threshold is exceeded, or percent change in concentration, it obscures the human
15 health impact of the exceedance. (RTD-153, p. 57.) This increased human health risk is discussed
16 further in RTD witness Barbara Barrigan-Parrilla's testimony on environmental justice. (RTD-20.)

17 137. Similarly, CCWD stated that Petition Facilities' environmental reviews obscure
18 bromide concentration impacts by limiting its identification of significant bromide impacts to those
19 at Barker Slough/North Bay Aqueduct. (RTD-153, p. 57.) No other locations were analyzed,
20 although it is possible that significant bromide impacts would occur at other drinking water intakes
21 in the Delta, such as Stockton's.

22 138. Nitrosamines and harmful algal blooms were also identified in CCWD's comments as
23 potential human carcinogens if found in drinking water supplies above safe thresholds. (RTD-153,
24 pp. 60-65.) In particular, CCWD commented that operation of Petition Facilities would contribute to
25 physical factors that would contribute to the type of environment in which cyanobacteria (species
26 that can make up harmful algal blooms) thrive, such as: increased nutrients (such as ammonium),
27 increased tidal mixing contributing more salinity to Delta waters, increased residence time of water,
28 and increased water clarity. (RTD-153, pp. 63-64.)

1 139. As noted in my testimony above, Petition Facilities are expected to increase residence
2 times of water in Delta channels. CCWD commented that projected increases in residence time
3 would allow cyanobacteria blooms to thrive and last longer than they now do in the Delta. This
4 would be expected particularly in the south Delta, where south Delta exports at Banks and Jones
5 pumping plants will decrease as SWP and CVP operators “would likely preferentially use” the north
6 Delta intakes, which could result in a negative feedback loop where the north Delta intakes would be
7 used more and more in the event that higher residence times in the south contribute to longer-lasting
8 harmful algal blooms, exacerbating the impact. (RTD-153, p. 64-65.)

9 140. Concerning chloride effects, the City of Stockton alleges that the Petitioners failed to
10 address impacts from chloride to its DWSP intakes, preferring in the BDCP DEIR/EIS to defer
11 impact disclosure and possible mitigation to “some later date,” which the City called unacceptable.
12 (RTD-221, p. 41.)

13 **CWF poses adverse water quality effects to groundwater supplies for municipal**
14 **beneficial uses.**

15 141. Such water quality effects in Delta channels would affect groundwater, since surface
16 and groundwater supplies in the Delta are connected. The Delta area has a large pumpage
17 depression or “cone of depression” that causes an influx of water from the Delta to percolate to
18 underground water supplies. (RTD-145, p. 167, column 2.) United States Geological Survey
19 groundwater modeling estimates that Delta surface channels lose between 100 to over 500 acre-feet
20 per year to groundwater percolation. (RTD-145., pp. 171-172, Figure C19.) Surface water was also
21 found to recharge groundwater from Calaveras and Stanislaus rivers and Dry Creek. On average
22 there was a net lateral inflow to the groundwater system of 120,000 acre-feet between 1970 and
23 1993 (an estimated annual average of about 5,000 acre-feet per year). (RTD-146, p. 69, Section
24 2.3.4.4.) Generally, groundwater pumping rates in San Joaquin County in 2004 were found to
25 exceed the sustainable yield of the groundwater basin, estimated to be approximately 150,000 to
26 160,000 acre-feet. (RTD-146, p. 69, Section 2.3.6.) The eastern San Joaquin groundwater basin
27 management plan assumed that “all basin inflow in west Stockton is saline” because “accretions in
28 the western fringes of the Basin and the Lower San Joaquin River are undesirable due to elevated

1 salinity levels. Saline groundwater intrusion has forced the closure of several wells in the Calwater
2 service area.” (RTD-146, pp.69, Section 2.3.6.) The City of Stockton’s domestic water supply
3 permit from the State Water Resources Control Board shows that Stockton has nine inactive wells
4 and has destroyed another 17 wells. (RTD-220, pp. 13-14.) Increased west-to-east flow is
5 considered by San Joaquin County’s groundwater basin management plan to be “undesirable,” as
6 this water is typically higher in TDS and chloride levels and causes degradation of water quality in
7 the Basin. (RTD-146, p. 71, Section 2.3.7.) The plan further states:

8 Degradation of water quality due to TDS or chloride contamination threatens the
9 long-term sustainability of a very important water resource for San Joaquin County,
10 since water high in TDS and/or chloride is unusable for either urban drinking water
11 needs or for irrigating crops. Damage to the aquifer system could for all practical
12 purposes be irreversible due to saline water intrusion, withdrawal of groundwater
13 from storage, and potential subsidence and aquifer consolidation.

14 (RTD-146, p. 71, Section 2.3.7.)

15 142. The saline front of groundwater intrusion beneath south and downtown Stockton is
16 projected to move another 1.5 miles east by 2030, when future urban water demand is expected to
17 see a net increase among the cities of San Joaquin County of 146,600 acre-feet per year. (RTD-146.
18 p. 74, Figure 2-27, p. 75, Table 2-4; RTD-147, pp. 2-15 to 2-16, Figures 2-8 and 2-9, and p. 2-18,
19 Table 2-3.)

20 **Summary of Water Quality Degradation**

21 143. Increased groundwater percolation from Delta channels containing surface water that
22 is made more saline by operation of Petition Facilities would increase the risk that poorer DWSP
23 water quality would force Stockton and its other urban water supplier, California Water Service
24 Company, to rely more on groundwater sources to supply their customers. The potential effects of
25 this issue are taken up in more detail in Barbara Barrigan-Parrilla’s and Esperanza Vielma’s
26 testimony for Restore the Delta. (RTD-20 and RTD-40.)

27 144. There are many legal users of water in the north Delta, where major agricultural crops
28 include pears, vineyards, and other permanent deciduous crops which depend on good quality fresh
29 water supplies. Removal of 20 percent or more of the fresh water in this region of the agricultural
30 Delta will reduce fresh water supplies to farmers and cause injury to their water rights and crop

1 productivity when salts build up in soil horizons, which must be leached out. (RTD-148.) Available
2 salinity modeling from the RDEIR/SDEIS indicates that central Delta locations will see increased
3 salinity conditions as an effect of construction and operation of Petition Facilities. (See San Joaquin
4 River at Prisoners Point results in SWRCB-3, Tables EC-8A and 8B.) Increased salinity conditions
5 in affected parts of the Delta will mean agricultural uses will be injured by having either to accept
6 lower crop yields or shift to more salt-tolerant crops, or both. Either strategy will result in reduced
7 farm income, as Mr. Machado shows in his testimony (RTD-30), and reduced income and economic
8 activity for the Delta region as a whole. (RTD-20, RTD-40.)

9 **RECOMMENDATIONS**

10 **Deny the Change Petition.**

11 **The Petition violates California Water Code Section 85021, mandating reduced Delta**
12 **reliance for California’s future water needs.**

13 145. Evidence I provided herein supports a finding that the Petition Facilities, and their
14 currently known operating assumptions, would run contrary to Water Code Section 85021. The
15 Petition’s stated purpose is to maintain exports from the Delta for both contractual amounts and to
16 use a strategy to increase the capacity and occurrence of cross-Delta water market transfers.
17 Modeling results for BDCP Conservation Measure 1 and California WaterFix alternatives bear out
18 these purposes and strategies.

19 **Should the Board seek to consider the Petition, we recommend requiring a new**
20 **Petition, appropriately designated as a Petition for a new water right.**

21 146. Because operation of the Petition Facilities would in effect create a new water right,
22 the changes proposed in the Petition should require filing an application for a new water right by the
23 Permittees, which would have a more junior priority date. RTD respectfully urges the SWRCB to
24 suspend consideration of the Petition while it completes other higher priority tasks.

25 **Other Recommended Actions.**

26 147. The Notice of Petition and Hearing asks Part 1 parties: “What specific conditions, if
27 any, should the State Water Board include in any approval of the Petition to avoid injury to these
28 uses?” (Notice of Petition and Hearing, October 30, 2015, p. 11.)

1 **Because the projects now permitted are completed and have put water to as full**
2 **beneficial use as they are capable, we recommend that these existing permits be**
3 **licensed, excluding Petition Facilities.**

4 148. SWRCB should process licenses for the existing SWP and CVP permits and thereby
5 resolve the outstanding time extension requests that so many protested back in 2009 and 2010. The
6 California WaterFix project described in the subject Petition should be excluded from these licenses
7 since it is a new project.

8 **If the California WaterFix Project is filed with the State Water Board as a new water**
9 **right application, we recommend the following:**

10 149. This project's application priority should reflect the date it is officially filed and
11 determined to be complete by staff of the Division of Water Rights of the State Water Board.

12 150. If Petitioners file an application for a new water right for the California WaterFix
13 facilities, that application should be subject to water availability analysis in light of new flow criteria
14 and other water quality objectives for the Delta, updated findings on water availability in Central
15 Valley streams as part of the updated fully-appropriated streams order, and any new information
16 about the proposed facilities itself from both Petitioners, including the environmental documents
17 produced as part of the application.

18 151. An analysis I presented on behalf of California Water Impact Network, California
19 Sportfishing Protection Alliance, and AquAlliance to SWRCB in October (written) and November
20 2012 (oral) approximates part of what RTD thinks SWRCB must undertake. (RTD-131.) That
21 analysis employs flow criteria for Delta inflow and outflow based on SWRCB Delta flow criteria
22 (SWRCB-25), together with an inventory of major water right holders (i.e., those whose water right
23 claims have a combined face value exceeding 1,000 acre-feet). Those criteria called for 75 percent
24 of unimpaired flow on the Sacramento River between November and June, 60 percent of unimpaired
25 flow of the San Joaquin River between February and June, and 75 percent of unimpaired flow for
26 Delta outflow from January through June.

27 152. By applying those flow criteria, I established a "diversion cap" for each tributary
28 stream in the Delta's Central Valley watershed. From Sacramento River tributaries (including the
Trinity, which is connected via a diversion tunnel to Clear Creek) the diversion cap was 25 percent

1 of unimpaired flows—that is, up to 25 percent of unimpaired flow could be diverted for human
2 beneficial use; the rest of the flow (75 percent) was for instream beneficial uses. (RTD-131.)

3 153. My written analysis, in pertinent part, shows that, on the Trinity River, the USBR
4 could divert a range from 77 to 454 thousand acre-feet per year, depending on the hydrology. (RTD-
5 131, Table 3B, p. 15; and Figure 5, p. 19.) The Trinity River Record of Decision calls for a normal
6 year average of 647,000 acre-feet of unimpaired flow annually, but it has not yet been implemented
7 through a water right proceeding. (RTD-132, p. 12.) On the Sacramento River, riparian and senior
8 pre-1914 appropriative water right holders dominate the available flows under that river’s diversion
9 cap. USBR water rights, some of which date to 1927, would obtain no water under the diversion
10 cap, and none could be diverted to storage, while accommodating instream beneficial uses. (RTD-
11 131, Table 3B, p. 15 and Figure 6, p. 19)

12 154. On the Feather River, riparian and senior appropriators would dominate the available
13 flows under the diversion cap. DWR’s 1927, 1951, and 1956 water right claims to the Feather could
14 divert between just 7 to 236 thousand acre-feet across all the spectrum of unimpaired flows on that
15 river. (RTD-131, Table 3B, p. 15; and Figure 7, p. 21.)

16 155. Finally, on the American River, riparian and senior water right holders (some whose
17 claims date back to Gold Rush days) would divert flows under the river’s cap. USBR could divert
18 between 9 and 139 thousand acre-feet a year across the spectrum of unimpaired flows there. (RTD-
19 131, Table 3B, p. 15 and Figure 10, p. 22.)

20 156. At a minimum, any new water right application for the Petition Facilities must carry
21 over many conditions from DWR’s and USBR’s permits to ensure consistent protections for the
22 regional water rights of areas of origin and the Legal Delta. Our recommendations for conditions to
23 be applied to a Tunnels Facilities water right should include:

- 24 1) Standard permit conditions required by SWRCB, Conditions A through H.
- 25 2) An appropriate construction deadline, not to exceed 15 years (the RDEIR/SDEIS expects
26 it would take 14 years).
- 27 3) A deadline of no more than 5 years from the date of certification of construction
28 completion for full application of water diverted by the Petition’s facilities to full beneficial
use.

1 4) Carry-over of all area, county, and watershed of origin condition requirements, including
2 conditions 16, 23, 24, 25, 29, and 40 (as exemplified in SWP Permits 16478, 16479, 16481,
3 and 16482, as amended in 2009). These requirements must be applied as well to any
SWRCB amendment of CVP water rights now and in the future.

4 5) Requiring that total pumped diversions from all Delta diversions covered by the water
5 rights permits shall result in reduced reliance on the Delta for California's future water needs
6 by the completion date for California WaterFix project facilities. We strongly recommend
that the Board reserve jurisdiction over this matter.

7 **Further Recommendations**

8 157. Restore the Delta recommends that the Board undertake a proceeding that develops
9 appropriate flow criteria for the Bay-Delta Estuary WQCP, that addresses the conveyance flow
10 criteria required in the Delta Reform Act of 2009, and that also results in reduced export reliance on
11 the Delta for California's future water supply needs.

12 158. Restore the Delta recommends that the Board update its fully-appropriated streams
13 order 98-08 prior to issuing permits for the California WaterFix project to reflect all water rights
14 issued by the Board since its last fully-appropriated streams order in 1998. Such an update would
15 provide a necessary baseline of appropriated waters in Central Valley and Delta streams against
16 which water availability claims by the Petitioners should be evaluated.

17 159. Restore the Delta recommends that the Board, as a responsible agency under the
18 California Environmental Quality Act, require that any new water right application for the California
19 WaterFix facilities be accompanied by another recirculated EIR/EIS that has more relevant
20 information for purposes of water rights application review than is presently provided in the 2015
21 environmental documents on the Petition Facilities.

22 Thank you for the opportunity to provide this testimony.

23 DATED: August 30, 2016

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27
28
TIM STROSHANE