October 23, 2015

WATERFIX Comments
P. O Box 1919
Sacramento, CA 95812

Via email: WATERFIXComments@icfi.com

Subject: City of Antioch comments on the Draft Bay Delta Conservation / WaterFix Plan and associated Draft Recirculated Environmental Impact Report and Environmental Impact Statement (DREIR/SDEIS)

Dear WATERFIX/WaterFix:

The City of Antioch ("City") is submitting the following comments on the Bay-Delta Conservation Plan/California WaterFix and associated RDEIR and SDEIS (referred to cumulatively as the "WaterFix").

The City has reviewed the WaterFix project documents and found that not only are there continued significant adverse impacts to the City, but also that these documents continue to be legally, factually, and scientifically flawed as described in detail within the documents attached to this cover letter. It continues to be clear that the Proposed WaterFix Project will result in substantial impacts to the City's water supply, the City's financial condition, and the quality of life of the City's residents. The City does not believe that the environmental impact analysis meets the fundamental purposes of CEQA and it is the City's position that WaterFix (and proposed Alternative 4A in particular) must be mitigated to avoid severe adverse impacts to the City.

Antioch has pre-1914 appropriative water rights. The City of Antioch, located along the San Joaquin River in the western portion of the Sacramento and San Joaquin River Delta ("Delta"), is one of the oldest towns in California. Since the 1860s, Antioch has obtained all or part of its freshwater supply directly from its intake on the San Joaquin River (and from the tributary flow of the Sacramento River) pursuant to a pre-1914 appropriative water right with a priority of at least 1868.[1] Troublingly, the WaterFix determines that the City's use of its own water rights is sporadic.[2] This conclusion is in fact absolutely false and the Department of Water Resources knows this is false. The City's water rights are used to the fullest extent possible each year that water quality permits. While the number of days the City has been able to use its water rights have declined over the past 100 years, these water rights remain critical

[1] Antioch has vested adjudicated pre-1914 water rights to water from the San Joaquin River as well as to the tributary flow of the Sacramento River via Georgiana and Three Mile Sloughs. This was determined as a matter of law by the California Supreme Court. Note also that information presented demonstrates that waters at Antioch prior to about 1918 were historically fresh, not saline.

[2] The RDEIR states that "the use of seasonal intakes at these locations is largely driven by acceptable water quality, and thus has historically been opportunistic. Opportunity to use these intakes would remain, and the predicted increases in bromide concentrations at Antioch and Mallard Slough would not be expected to adversely affect MUN beneficial uses, or any other beneficial use, at these locations." [See, for example, 4.3.4-9 of Chapter 4]

and necessary to the City's ability to provide drinking water to its population of over 100,000. The City has a present contract with DWR that compensates the City for the purchase of substitute water due to the water quality impacts of the State Water Project. However, that contract reimburses for only 1/3 of cost to purchase water and expires in 2027. If the City's ability to take water is further reduced due to adverse impacts from the WaterFix project, there could be significant financial impacts to City.

The WATERFIX project has not been defined, modeled, or evaluated adequately. The WaterFix project has not modeled the actual proposed project, and there are significant differences between what has been modeled and the actual project as proposed (e.g., tidal marsh area); proposed project operations have not yet been adequately defined; and the sensitivity analyses relies only on CALSIM and does not carry through to DSM2. The proposed baseline is also incorrect. As a result, it is not possible to determine the full nature and extent of potential project impacts. Prior environmental analysis indicated that the construction of large areas of tidal marsh would end up decreasing salinity in the Western Delta, but tidal marsh restoration is not part of the present proposed project, and so, actual salinity will likely be higher than modeled salinity.

The WATERFIX project will decrease the City's ability to use water at the City's intake. It is without question that the WaterFix project will further impact the City's ability to provide a reliable water supply to its citizens. As shown in **Appendix A** DWR's model runs describing the proposed project show significant increases in salinity at the City's drinking water intake, and DWR's modeling shows conclusively that most salinity impacts are due to the project and not to sea level rise or other factors.

The WATERFIX project will cause significant impacts to recreation and the City's economy. As presently proposed, the WaterFix project will result in increased salinity in the western Delta, including at Antioch. Antioch's unique historic and cultural legacy within the Delta has been as a freshwater location for well over 100 years. Antioch is known as the gateway to the western Delta providing freshwater boating, recreation, and fishing. The WATERFIX has a detrimental effect on this sector of Antioch's economy. The Project fails to adequately address the long-term impacts of the WaterFix Project on recreation and fishing at Antioch. Further, the Project fails to address any impacts that will be caused by higher salinity to public trust resources at Antioch, such as impacts to aesthetics, aquatic plant and wildlife, and navigation. See **Appendix B** for further details.

The WATERFIX Project analysis is technically deficient. As noted in **Appendix A**, the DREIR/SDEIS analysis has several significant flaws and cannot be used to assess the significance of the impacts that will be caused by the project. The DREIR/SDEIS uses a baseline model run that is not representative of existing conditions and that results in underestimating the impacts of the project. As a result, the City anticipates that impacts due to WATERFIX could even be worse than the impacts described as "DREIR/SDEIS.

In addition, the WaterFix project broadly concludes that there will be no harm to downstream water rights users based upon faulty and incomplete modeling and promises to conform to state mandated water quality standards. However, as described in the attached documents, the relied upon modeling is flawed. The modeling performed is for a different alternative (Alternative 4 from the original WATERFIX project, rather than Alternative 4a which

is the preferred alternative for the WaterFix Project). The Applicants have not updated to model the current project, and there are significant differences (e.g., amount of tidal restoration, salinity compliance points, etc.) between the model runs and the preferred alternative. The RDEIR fails to provide adequate detail as to how the project will operate. Project operations are proposed to be determined during an "adaptive management" process, but this process is not adequately described as to how it will work, or within what bounds. The WaterFix project underestimates the impacts of the preferred alternative because it continues to use the incorrect baseline condition, which the City and others have previously pointed out. Therefore, relying on the present modeling to demonstrate a "no harm/no injury" project impact is insufficient to meet the standards required to approve the DREIR/SDEIS and the WaterFix Project.

As before additional details on these comments, plus additional legal comments, are provided in **Appendices A** and **B** that accompany this letter.
Appendix A = technical comments
Appendix B = legal comments

No mitigation is detailed to address impacts at Antioch. As noted above, the WaterFix projects fails to adequately address the project's impacts on water quality and water flow in the Delta. This leads to the incorrect conclusion that the project will not have significant impacts to the City and its water supply, and so, no mitigation is proposed. However, as described in detail in the attached technical appendices, the project will in fact have a broad and adverse impact on the City's water supply. If the project is approved, there is a critical need to mitigate that project's impacts to the City's water supply to over 100,000 citizens.

The WATERFIX project will result in unacceptable impacts to the City. In summary, our review of the WaterFix project, associated environmental documents, and the model results describing the proposed project indicate that the impacts of the RDEIR cannot be determined from the modeling analysis or documentation provided to date. Contrary to the conclusions in the RDEIR, our analysis indicates Project will result in unacceptable impacts to the City and its over 100,000 residents. No mitigation is envisioned to address these impacts. As a result, the changes induced by the WaterFix project are expected to result in serious detrimental impacts to the City's water supply, financial condition, and quality and way of life.

The City appreciates the opportunity to provide comments and requests that the WaterFix project in its present form be withdrawn and reworked substantially. The City looks forward to working with all parties and agencies responsible for the preparation of the WaterFix Project as our comments are addressed. The City would welcome any opportunity to discuss how the project might be mitigated to eliminate adverse impacts to the City.

Sincerely,

Steve Duran
City Manager

Appendix A Technical comment letter

Appendix B: Legal comment letter
(Appendices by Regular Mail to Recipient Only)

cc: Felicia Marcus, State Water Resources Control Board
John Laird, California Secretary of Natural Resources
Senator Dianne Feinstein
Senator Barbara Boxer
Congressman John Garamendi
Congressman Jerry McNerney
Senator Steve Glazer
Senator Lois Wolk
Assemblymember Susan Bonilla
Assemblymember Jim Frazier
Contra Costa County Board of Supervisors
Antioch City Council
Antioch City Attorney
Ron Bernal, Public Works Director/City Engineer
Matt Emrick, Attorney
Susan Paulson, Exponent
Walter Bishop, Bishop Consulting
City Manager Gustavo Vina, City of Brentwood
City Manager Bryan Montgomery, City of Oakley
General Manager Jerry Brown, Contra Costa Water District,
General Manager Patricia Corey, East Contra Costa Irrigation District
General Manager Mike Yeraka, Diablo Water District

Appendix A

Technical Comments on the Draft Bay Delta Conservation Plan (BDCP)

Exponent®

EXTERNAL MEMORANDUM

TO: WATERFIX Comments (WATERFIXComments@icfi.com)
P.O. Box 1919
Sacramento, CA 95812

FROM: Susan Paulsen, Ph.D., P.E.

DATE: October 27, 2015

PROJECT: 1405064.000

SUBJECT: Technical Comments on the Draft Bay Delta Conservation Plan (BDCP) and Associated Draft Environmental Impact Report and Environmental Impact Statement (RDEIR/SDEIS)

On behalf of the City of Antioch (the City), Exponent is pleased to submit comments on the Bay-Delta Conservation Plan (BDCP) and the associated Partially Recirculated Draft Environmental Impact Report / Supplemental Environmental Impact Statement (RDEIR/SDEIS) during the public review period.

The City's analysis of the impacts of the RDEIR/SDEIS relies heavily on the City's prior analyses of the modeling of Alternative 4, which was conducted in 2013 by DWR, and which forms the basis for the current RDEIR/SDEIS. We have referred to those prior comments, which are attached to the City's comment package in Attachments A and B, rather than repeat our concerns with the 2013 modeling exercise in their entirety here.

In addition, the City of Antioch has been working closely with other Delta agencies and reserves the right to rely on all other comments submitted, including those of the Contra Costa Water District (CCWD) and the City of Brentwood.

Antioch's water rights. The City is located along the San Joaquin River in the western portion of the Sacramento and San Joaquin River Delta (Delta). Since the 1960s, Antioch has obtained all or part of its freshwater supply directly from its intake on the San Joaquin River,[1] pursuant to

[1] Much of the water in the western Delta (including the City's water supply) comes from the Sacramento River. Historically, significant amounts of Sacramento River water flowed into the San Joaquin River east of Antioch at Three Mile and Georgiana Sloughs. Sacramento River water also reaches Antioch where the river merges with the San Joaquin River just west of the City, and via tidal action.

a pre-1914 appropriative water right with a priority of 1867.[2] Contrary to incorrect statements contained in the RDEIR/SDEIS, Antioch continues to obtain much of its water supply from its own diversion facility.[3] Antioch has a substitute water agreement with the Department of Water Resources (DWR) that partially compensates the City for water purchases from the CCWD. That agreement currently has a 15-year term, which will end at approximately the same time the BDCP is anticipated to begin operations.[4]

The Proposed Project was not modeled. The RDEIR/SDEIS identifies Alternative 4A, also known as the "WATERFIX," as the preferred alternative. However, Alternative 4A was not explicitly modeled. Instead, the environmental impacts of Alternative 4A were assessed using modeling of Alternative 4 (first presented in the 2013 Draft RDEIR/SDEIS) and a limited sensitivity analysis.

Although the RDEIR/SDEIS states that "Lead agencies have determined that they may reasonably rely on modeling conducted for Alternative 4 to accurately predict the environmental effects of Alternative 4A,"[5] the differences between Alternative 4 and Proposed Project Alternative 4A are significant, as shown in Table 1. As detailed below, three of the differences between the models—the amount of tidal restoration, the salinity objective compliance location, and the operation of the Suisun Marsh salinity control gates—have direct and immediate impacts on the salinity levels predicted to occur at Antioch's intake. In addition, salinity within the Delta often behaves in a non-linear fashion, such that without being modeled, it is not possible to reliably infer the effects of multiple changes in model assumptions on model output.

In summary, the differences between Alternative 4A and Alternative 4 are significant enough that the environmental impacts of Alternative 4A cannot be determined based on the existing modeling, as detailed below.

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[2] Antioch has vested pre-1914 water rights to water from the San Joaquin River, as well as to the tributary flow of the Sacramento River via Georgiana and Three Mile Sloughs. This was determined as a matter of law by the California Supreme Court in the case of *Town of Antioch v. Williams Irrigation District et al*. (1922) 188 Cal. 451,455.

[3] The City of Antioch uses water from its intake as its main source of supply when salinity at the intake is below specified thresholds. The 2013 EIR/EIS stated that Antioch's intake is "seasonal" and used "infrequently" (EIR/EIS Chapter 8 at p. 8-185, lines 13-14), which is not true. Rather than address the impact of reduced water quality on the City's ability to use water at its intake, the 2015 RDEIR/SDEIS states, for example (see p. 4.3.4-10), that "the use of seasonal intakes at Antioch and Mallard Island is largely driven by acceptable water quality, and thus has historically been opportunistic, and opportunity to use these intakes would remain. Thus, these increased bromide concentrations would not be expected to adversely affect MUN beneficial uses, or any other beneficial use, at these locations." Thus, it appears that the RDEIR/SDEIS both misrepresents the facts with respect to Antioch's use of its intake, and further downplays the effect of any worsening of water quality on the City's ability to use its intake.

[4] On October 29, 2013, the term of the agreement between the State of California and the City of Antioch was extended through September 30, 2028.

[5] See *New Alternatives: Alternatives 4A, 2D and 5A* (Chapter 4 of the Bay Delta Conservation Plan/California Waterfix RDEIR/SDEIS) at page 4.1-43, lines 17–19 ("Physical Modeling").

Table 1. Comparison of modeled conditions and conditions of proposed project Alternative 4A

Condition	Model Parameters for Alternative 4 (2013)	Proposed Project Alternative 4A (2015)
CEQA baseline	Existing conditions (EBC1)	Existing conditions (EBC1)
NEPA baseline	NAA ELT	NAA ELT
Sea level rise	15 cm (ELT)	15 cm (ELT)
Fall X2	Included	Included
Conservation measures/ Environmental commitments	25,000 acres of tidal restoration of wetlands (at ELT), and 65,000 acres at LLT	Up to 59 acres of tidal wetland restoration
Yolo Bypass Restoration	8,000 acres of restoration included	0 acres
EcoRestore	No separate project — Alternative 4 included restoration commitment	Separate project, not modeled
Salinity objective compliance location	Three Mile Slough	Emmaton
Suisun marsh salinity control gates	Not operated	Operated

The appropriate timeframes for the Proposed Project were not evaluated. The RDEIR/SDEIS indicated that two baselines were used in the current analysis: the "Existing Conditions" baseline defined in the 2013 Draft EIR/EIS was used for the CEQA impact analysis, and the "No Action Alternative Early Long-Term" (NAA-ELT) scenario was used for the NEPA impact analysis. The impacts of the proposed project were evaluated quantitatively only in the Early Long-Term (ELT) timeframe. Long-term impacts of the proposed project were evaluated only qualitatively, even though the 2013 EIR did evaluate Alternative 4 (the 2013-proposed project) for a Late Long-Term (LLT) timeframe quantitatively, and even though the project documents note that the project "would continue indefinitely."[6] As detailed below, the City's consultants previously evaluated water quality impacts for the LLT using DSM2 model runs provided by DWR, and those model results at LLT (see Attachment B) showed significant water quality impacts at LLT, which would have significant impacts on the City's ability to utilize its intake. Because the project "would continue indefinitely," a quantitative analysis of the long-term impacts of the project is needed.

[6] The RDEIR/SDEIS states, on p. 4.1-42, "The same 'Existing Conditions' baseline defined in the Draft EIR/EIS applies to Alternatives 4A, 2D, and 5A, for the purposes of the CEQA impact analysis… Because Alternatives 4A, 2D, and 5A, contemplate a shorter permit period for project implementation than the other alternatives, the new "No Action Alternative Early Long-Term" (No Action Alternative ELT) is used as the NEPA point of comparison for these alternatives. The No Action Alternative ELT is described and analyzed in Section 4.2. However, because the project would continue indefinitely, the analysis qualitatively examines impacts at the Late Long-Term timeframe for Alternative 4A, 2D, and 5A, but does not make a CEQA or NEPA conclusion based off the No Action Alternative LLT baseline" (emphasis added).

The baseline condition used to evaluate the BDCP Proposed Project is flawed and inappropriate. The RDEIR/SDEIS indicated that two baselines were used in the current analysis: the "Existing Conditions" baseline defined in the 2013 Draft EIR/EIS was used for the CEQA impact analysis, and the "No Action Alternative Early Long-Term" (NAA-ELT) scenario was used for the NEPA impact analysis. The 2013 Draft EIR/EIS used a model run previously called "EBC1" to simulate the existing condition, and the 2015 RDEIR/SDEIS continues to use the same "Existing Conditions" model run (i.e., "EBC1").

As noted by the City and its technical consultants in prior documentation (see Attachment A), the EBC1 existing conditions scenario used to evaluate project impacts is flawed and does not accurately represent existing conditions with respect to salinity at Antioch. By contrast, a second existing conditions model run, called "EBC2," was also conducted and was available for use at the time the 2013 Draft EIR/EIS was prepared, and more accurately represents existing conditions.[7] The primary difference between EBC1 and EBC2 is whether Delta outflows are managed to achieve the Fall X2 provision (hereafter referred to as "Fall X2") of the 2008 U.S. Fish and Wildlife Service Biological Opinion (the "2008 BiOp"): the EBC1 scenario does <u>not</u> operate to Fall X2, whereas the EBC2 scenario <u>does</u> operate to Fall X2.

As described in the City's prior comments, the City's consultants obtained from DWR the modeling results from the Delta Simulation II (DSM2) model, which was used to simulate hydrodynamics and water quality throughout the Delta for a range of model scenarios. Model results for EBC2 agree well with salinity measurements made near Antioch. By contrast, the EBC1 scenario (the 2015 and 2013 "Existing Conditions" scenario) showed poor agreement, particularly in the fall of 1974, 1975, 1978, 1980, 1984, and 1986, or 6 out of the 17 years modeled, when modeled salinity values were significantly greater than measured salinity values.[8]

To further illustrate the impacts of selecting a biased and incorrect baseline, Table 2 shows the conditions that were modeled for each scenario and the number of usable days[9] for each scenario. For example, the incorrect "Existing Conditions" baseline (EBC1) predicts that, for the modeled time period of 1974-1991, usable water will be available for 148.6 days, while the correct "Existing Conditions" baseline (EBC2) predicts that usable water will be available for

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[7] The March 2013 Revised Administrative Draft used both EBC1 and EBC2, while both the 2013 Draft EIR/EIS and the 2015 RDEIR/SDEIS use only the EBC 1 scenario, which has been renamed as the "existing conditions" scenario.

[8] Note that the time period evaluated in the RDEIR/SDEIS appears to have changed. Whereas the 2013 EIR/EIS evaluated the full modeled period, the current 2015 RDEIR/SDEIS appears to have evaluated a shorter time period, as indicated on p. ES-26: "Chloride modeling results were updated: New calculation of exceedances of the 150 mg/L chloride objective were prepared based on calendar years 1976-1990 of the original modeled results (i.e., 15 years instead of 16) because the objective applies on a calendar year basis." The City's prior analysis evaluated model results provided by DWR for the 1974–1991 time period.

[9] Consistent with the City's Agreement with DWR, water at the City's intake was defined as usable when salinity is below 250 ppm chloride, equivalent to an electrical conductivity of about 976 µS/cm. This conversion was made using the relationship between chloride concentration and EC for "normal" years in Guivetchi (1986). See Attachment C for detail.

163.9 days; thus, the incorrect choice of the baseline conditon means that the number of usable days is underpredicted by about 15.3 days per year (more than 9%), or about 245 days during the simulation period. The failure to implement a Fall X2 condition in the "Existing Conditions" model runs artificially biases the model results with respect to the current condition at Antioch's intake, and in effect gives the Proposed Project an unwarranted "free pass" for 245 days during the 16-year period.

Failing to include Fall X2 in the Existing Conditions scenario makes the baseline condition appear to be more saline than it actually is, so that the potential impacts of the BDCP appear to be significantly smaller than they would be with an appropriate baseline.

Table 2. Description of available baseline scenario model runs, together with DSM2 model results showing the number of days Antioch will be able to use water at its intake under EBC1, EBC2, and NAA ELT scenarios (1974–1991) by year type

Year Type	EBC1 2015 CEQA Baseline Existing Condition Does not include Fall X2 No sea-level rise	EBC2 "Correct" Existing Condition Includes Fall X2 No sea-level rise	NAA_ELT NEPA baseline condition in 2015 RDEIR/SDEIS Includes Fall X2 15-cm sea-level rise
	Model Results (number of usable days)		
All years	148.6	163.9	154.5
Critical years	55.7	63.5	58.8
Dry years	122.5	145.2	133.3
Above- and below-normal years	177.1	188.1	170.9
Wet years	245.5	264.8	257.4

* Salinity threshold 976 µS/cm.

Operations of the Proposed Project, Alternative 4A, are not defined. The RDEIR/SDEIS states that Operations Scenario H3+, which is bounded by Operations Scenarios H3 and H4 from the 2013 Alternative 4, is representative of the operations proposed under Alternative 4A. As with Alternative 4 Operations Scenarios H3 and H4, the operations scenario described for the Proposed Project includes both Fall X2 operations and criteria for spring outflow, bounded by the criteria associated with H3 and H4.

However, these operations will be modified via the use of an Adaptive Management and Monitoring Plan (AMMP). The AMMP is to be implemented to develop additional science during the course of project construction and operation, to inform and improve conveyance facilities operational limits and criteria, and the AMMP is anticipated to result in modifications to operations of the North Delta bypass flows, South Delta export operations, head of the Old

River barrier operations, spring Delta outflows, and the Rio Vista minimum flow standard in January through August.[10] No operational "limits" are provided in the RDEIR/SDEIS that would inform the City regarding how the project may be operated, and no additional model runs are provided that would indicate the water quality impacts that may result from modified operations. Thus, the operational conditions described for Alternative 4A are essentially unconstrained, providing an undefined degree of flexibility that can be expected, based on model runs for Alternative 4 Operations Scenarios H1 and H2 (which do not include Fall X2) to result in significant impacts to water quality at Antioch's intake.

Further, the criteria for some operational parameters, such as winter and summer outflow, are worded vaguely: "Flow constraints established under D-1641 will be followed if not superseded by criteria listed above."[11] It is difficult to discern the proposed water operations flow criteria with this lack of clarity in description.

Particularly noteworthy to the City is the fact that the very limited discussion of operational flexibility that does exist indicates that operations will be modified based solely on impacts to fish species, including critically important operations parameters for both spring outflow (to be managed for longfin smelt)[12] and Fall X2 (to be managed for delta smelt).[13] No mention is made of the importance of spring outflow and Fall X2 to water quality in the western Delta, and no indication is given that operations would be constrained to avoid a worsening of water quality in the western Delta.

As detailed below, operations criteria are vitally important as a determinant of water quality at Antioch's intake. For this reason, the City requests that project proponents make a direct and binding commitment to operate the project in such a manner that water quality degradation in the western Delta is limited to the range evaluated in the RDEIR/SDEIS, or else full mitigation of any potential impacts from such operations.

The Adaptive Management and Monitoring Program (AMMP) is undefined, and is likely to have adverse environmental impacts, including impacts to water quality. The AMMP is included within the RDEIR/SDEIS as a means to accommodate flexibility in the proposed project that is required due to the "considerable scientific uncertainty… regarding the Delta

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[10] RDEIR/SDEIS at p. ES-18.

[11] RDEIR/SDEIS at p. 4.1-10, regarding the operations parameter "winter and summer outflow."

[12] For example, p. 4.1-9 of the RDEIR/SDEIS indicates that, for spring outflow, "To ensure maintenance of longfin smelt abundance, initial operations will provide a March-May average outflow bounded by the requirements of Scenario H2, which are consistent with D-1641 standards, and Scenario H, which would be scaled to Table 3-24 in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS… Adjustments to the criteria above and these outflow targets may be made using the Adaptive Management Process and the best available scientific information available [*sic*] regarding all factors affecting longfin smelt abundance."

[13] For example, p. 4.1-9 of the RDEIR/SDEIS indicates that "September, October, November implement the USFWS (2008) BiOp Fall X2 requirements. However, similar to spring Delta outflow and consistent with the existing RPA adaptive management process, adjustments to these outflow targets may be made using the Adaptive Management and Monitoring Program described below and the best available scientific information regarding all factors affecting delta smelt abundance."

ecosystem, including the effects of CVP and SWP operations and the related operational criteria."[14] It is well established that there is substantial uncertainty in the Delta ecosystem, and an adaptive management strategy is necessary. However, an adaptive management strategy should not be used as a means to circumvent project planning.

Proposed Project Alternative 4A relies heavily on the AMMP to dictate changes in operation of water conveyance facilities, habitat restoration, and other factors during project construction and operation. The AMMP is a central component of Alternative 4A, yet remains almost wholly undefined. Beyond an introduction to basic principles of adaptive management, there is little discussion of how the AMMP will be implemented, nor does it appear that there will be a review process for the considerable changes that may be recommended as a result of the AMMP. Although the AMMP is described as a means of making adjustments to operations criteria, there is no discussion of how this iterative process will occur. In addition, no operational boundaries are defined with regard to its potential application of the AMMP within Alternative 4A.[15]

The RDEIR/SDEIS indicates that "collaborative science and adaptive management will, as appropriate, develop and use new information and insight gained during the course of project construction and operation to inform and improve… the operation of the water conveyance facilities under the Section 7 biological opinion and 2081b permit…".[16] As with the discussion of project operations, the RDEIR/SDEIS appears to indicate that the only factor that will be considered in modifying operations will be impacts to fish. The City is concerned that an AMMP focused solely on fish will fail to consider the potentially substantial water quality impacts that could be induced by even modest changes to project operations.

Considering the previous discussion, it is unreasonable and without foundation for the RDEIR/SDEIS to state, "For the purposes of analysis, it is assumed that the Collaborative Science and Adaptive Management Program (AMMP) developed for Alternative 4A would not, by itself, create nor contribute to any new significant environmental effects."[17]

Even given concerns with the modeling analysis, it is clear that water quality impacts are significant. As noted throughout these comments, there are significant differences between the 2013 Alternative 4 (which was modeled) and the Proposed Project (2015 Alternative 4A, which

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[14] RDEIR/SDEIS at p. 4.1-18, line 17.

[15] See also the September 30, 2015, report of the Delta Independent Science Board, which noted at p. 5, "There is a very general and brief mention of the steps in the adaptive management process in Section 4 (p. 4.1-6 to 4.1-7), but nothing more about the process… We did not find examples of how adaptive management would be applied to assessing—and finding ways to reduce—the environmental impacts of project construction and operation… To be effective in addressing unexpected outcomes and the need for mid-course corrections, an adaptive-management team should evaluate a broad range of actions and their consequences from the beginning, as plans are being developed, to facilitate the early implementation and effectiveness of mitigation activities." The Delta Independent Science Board report is attached to the City's comments as Attachment D.

[16] RDEIR/SDEIS at p. 4.1-18.

[17] RDEIR/SDEIS at p. 4.1-18.

was not modeled). However, the 2013 EIR/EIS identified "significant and unavoidable" impacts with respect to chloride concentrations in the western Delta as a result of the implementation of Alternative 4 (the 2013 Proposed Project).[18] Even though the current RDEIR/SDEIS envisions that Alternative 4A would use preliminary project operations based on Operations Scenarios H3 and H4 (which would have lesser impacts on salinity than Operations Scenarios H1 and H2), these scenarios were part of the original project modeling, and thus, the basis for a shift from "significant and unavoidable impacts" to "no significant impacts" is unclear. (In fact, effects on chloride concentrations are listed as "LTS," or "less than significant," for Alternative 4 in the RDEIR/SDEIS Executive Summary,[19] even though the same alternative was determined, using the same model runs, to have "significant and unavoidable" impacts to salinity in the western Delta in 2013; the basis for this change relative to findings for Alternative 4 in the 2013 EIR/EIS is also unclear.)

As noted in previous comments (see Attachment A), the severity of impacts at Antioch's intake is concealed, because the RDEIR/SDEIS presents model results as daily, monthly, or yearly averages. Antioch's use of its intake does not rely on average salinity, but rather, on salinity measured at each instant in time. Thus, it is only through a detailed examination of model results that Antioch can evaluate the water quality impacts that the Proposed Project is expected to induce.

In addition, the sensitivity analyses performed in support of the RDEIR/SDEIS appear to indicate significant increases in chloride concentrations in the western Delta, including at Antioch, under certain conditions. For example, the Supplemental Modeling for New Alternatives indicates that the Proposed Project (Alternative 4A, Operations Scenario H3) would cause increases in chloride concentrations at Antioch relative to the existing condition run (which, as noted above, is biased toward higher-than-actual salinity) in drought years during the months of March (19% higher), April (+25%), May (+22%), June (+11%), July (+6%), August (+20%), and September (+14%). Similarly, in all year types during the 1976–1991 simulation period, salinity would increase in the months of March (+9%), April (+16%), May (+9%), June (+2%), and August (+9%). Even relative to the No Action Alternative-Early Long Term, salinity would increase at Antioch in nearly all of these months by as much as +15% (in August of drought years).[20]

In addition to increases in chloride concentrations (i.e., salinity), the City is concerned about increases in bromide concentrations that will be caused by the Proposed Project. The RDEIR/SDEIS notes that "multiple interior and western Delta assessment locations would have an increased frequency of exceedance of 50 µg/L, which is the CALFED Drinking Water Program goal for bromide as a long-term average applied to drinking water intakes… These locations [include] San Joaquin River at Antioch… Similarly, these locations would have an increased frequency of exceedance of 100 µg/L, which is the concentration believed to be

[18] See prior comments submitted by the City in Attachment A, and p. 8-429 of the 2013 EIR/EIS.

[19] RDEIR/SDEIS at p. ES-43.

[20] See RDEIR/SDEIS Appendix B at p. B-94.

sufficient to meet currently established drinking water criteria for disinfection byproducts… The greatest increase in frequency of exceedance of 100 µg/L would occur at Franks Tract (6% increase) and San Joaquin River at Antioch (4-5% increase depending on operations scenario)."[21] Appendix B to the RDEIR/SDEIS presents the results of sensitivity studies showing estimated bromide concentrations at Antioch for "periods of historically acceptable water quality for withdrawal." The sensitivity studies show that bromide concentrations would increase significantly at Antioch; for example, in February through April of wet and above-normal year types, model analyses indicate that bromide concentrations are expected to increase from below the 100-µg/L threshold for both the Existing Conditions and the No Action Alternative-ELT scenarios to levels well above the 100-µg/L threshold for Alternative 4 Operations Scenarios H3 and H4, respectively.[22] Yet the RDEIR/SDEIS concludes that impacts due to bromide are "less than significant."[23] This conclusion is not credible.

Two differences between the model runs and the Proposed Project will have particularly significant impacts on salinity at Antioch's intake, and these are not disclosed in the RDEIR/SDEIS. The first is the impact of tidal marsh restoration. The model runs for the Proposed Project include 25,000 acres of tidal marsh restoration at the ELT timeframe and 65,000 acres of tidal marsh restoration at the LLT timeframe, but this restoration is not part of the Proposed Project (Alternative 4A includes only "up to 59 acres" of marsh restoration; see Table 1). Model runs were conducted in 2013 as part of the 2013 EIR/EIS process to evaluate the impact of tidal marsh restoration on salinity levels within the Delta; those model runs determined that tidal marsh restoration under ELT conditions is expected to <u>decrease</u> tidally averaged EC (surrogate for salinity) by 5.49% at Antioch, compared to the base case.[24] By contrast, because the proposed Alternative 4A ELT does <u>not</u> include 25,000 acres of the tidal marsh, it is reasonable to assume that salinity levels at Antioch during the subject time period would be at least 5% higher than disclosed in the RDEIR/SDEIS. This inaccuracy in predicted salinity levels would apply to bromide as well. Thus, salinity and bromide impacts that are disclosed in the RDEIR/SDEIS are almost certainly underestimated because of the failure to

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[21] RDEIR/SDEIS at p. 4.3.4-9. The RDEIR/SDEIS discussion regarding bromide states (incorrectly) that "the use of seasonal intakes at these locations is largely driven by acceptable water quality, and thus has historically been opportunistic. Opportunity to use these intakes would remain, and the predicted increases in bromide concentrations at Antioch and Mallard Slough would not be expected to adversely affect MUN beneficial uses, or any other beneficial use, at these locations."

[22] See RDEIR/SDEIS Appendix B at p. B-87. Note that two methods were used to evaluate bromide concentrations (the "mass-balance modeling approach" and the "EC to chloride and chloride to bromide" modeling approach), and results from the two methods differ. However, 18 of 24 entries in Tables Br-5 and Br-6 at RDEIR/SDEIS Appendix B at p. B-87 show predicted bromide concentrations for Alternative 4, Scenarios H3 and H4 (ELT) greater than 100 µg/L, with the highest value of 178 µg/L; only 6 of 24 entries for either the Existing Conditions or No Action Alternatives show concentrations greater than 100 µg/L. Despite differences in results obtained using the two methods, it is clear that bromide concentrations are expected to increase significantly and to exceed applicable thresholds a much greater percentage of the time.

[23] RDEIR/SDEIS at p. ES-43.

[24] See Figure 6-26 in the 2013 Draft BDCP EIR/EIS Appendix 5A, Section D, Attachment 2, which presents the percent increase in tidally averaged EC for the ELT scenario compared to baseline for September 2002.

conduct model runs that accurately represent the limited tidal marsh restoration contemplated by the Proposed Project.

A second major concern with the modeling is the treatment of the Suisun Marsh Salinity Control Gates. The RDEIR/SDEIS indicates that "Modeling of all alternatives assumed no operation of the Suisun Marsh Salinity Control Gates, but the project description for all alternatives now assumes continued operation of the Salinity Control Gates, consistent with assumptions included in the No Action Alternative."[25] Chapter 2 of the RDEIR/SDEIS states that a sensitivity analysis was conducted to evaluate the impacts of operational Suisun Marsh Salinity Control Gates on EC (a surrogate for salinity) under Existing Conditions and the No Action Alternative for several locations in the Marsh and for several months. The sensitivity analysis found that operating the Suisun Marsh Salinity Control Gates resulted in freshening (lower salinity) within the Suisun Marsh. However, model results describing predicted salinity in the western Delta were not provided, to our knowledge, anywhere within the RDEIR/SDEIS. Our evaluation of those model runs indicates that salinity at Antioch is higher when the Suisun Marsh Salinity Control Gates are operated. If actual Suisun Marsh Salinity Control Gate operations had been modeled, salinity values at Antioch would almost certainly be higher than disclosed in the RDEIR/SDEIS. Once again, salinity and bromide impacts in the RDEIR/SDEIS have been underestimated because of the failure to conduct model runs that included operation of the Suisun Marsh Salinity Control Gates.

Summary. In summary, it is difficult if not impossible to assess the impacts of the Proposed Project on water quality at Antioch, because the Proposed Project was not modeled, and because there are major differences between the model runs used to assess impacts and the Proposed Project. Even so, our analysis of the modeling indicates that the Proposed Project will have significant impacts on water quality at Antioch's intake, and these impacts are not disclosed in the RDEIR/SDEIS.

The modeling performed to support the Proposed Project used an inaccurate baseline condition; because the CEQA "Existing Conditions" model run does not include Fall X2 operations, the baseline is not representative of current conditions and results in worse water quality in the western Delta than actually occurs, thereby masking the impacts of the Proposed Project. These comments have been provided before but have not been addressed to date, despite the fact that an accurate "Existing Conditions" model run was conducted by DWR and has been available for use since at least 2013.

In addition, certain features of the proposed project that were not evaluated (e.g., the model runs include 25,000 acres of tidal marsh restoration that is not part of the Proposed Project, and the model runs did not simulate operation of the Suisun Marsh Salinity Control Gates) are expected to result in significantly higher salinity in the western Delta than is shown in the model runs.

Finally, the Proposed Project operations are not defined, and the Adaptive Management and Monitoring Program (AMMP) that will be used to modify project operations has not been

[25] RDEIR/SDEIS Chapter 2 at p. 2-8, lines 30-32.

defined. There appear to be no constraints that would be imposed on project operations, and modifications to operations appear to be designed to protect fish species, without consideration of water quality impacts. As detailed in prior comments, and as is apparent from existing model runs, even small changes in project operations can cause significant impacts to water quality in the western Delta, including at Antioch's intake.

Attachment A

Technical Comments on the BDCP and Associated EIR/EIS Letter Prepared by Flow Science Incorporated

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July 17, 2014

BDCP Comments
Ryan Wulff, NMFS
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Via email: BDCP.Comments@noaa.gov

Subject: Appendix A to the City of Antioch Comment Letter
Technical comments on the Draft Bay Delta Conservation Plan (BDCP) and associated Draft Environmental Impact Report and Environmental Impact Statement (EIR/EIS)

Dear Mr. Wulff:

On behalf of the City of Antioch (the City), Flow Science is pleased to submit comments on the Bay-Delta Conservation Plan (BDCP) and Associated Environmental Impact Report/Environmental Impact Statement (EIR/EIS) during the public review period. These technical comments constitute **Appendix A** to the City's comment letter.

SUMMARY OF TECHNICAL COMMENTS

Flow Science has reviewed the BDCP Plan and EIR/EIS, and has evaluated the impacts that are likely to occur at the City of Antioch. Flow Science's key findings regarding the technical analysis presented in the EIR/EIS can be summarized as follows:

- The baseline condition ("Existing Conditions") scenario used to evaluate project impacts is flawed and inappropriate, and does not accurately represent current salinity conditions at Antioch. Use of an incorrect baseline conditions results in an understatement of the impacts of the BDCP Proposed Project.
- The BDCP Proposed Project will cause salinity at Antioch to increase significantly, and will significantly reduce the City's ability to use its intake to supply water within its service area. Contrary to assertions in the EIR/EIS, these impacts will result from the Proposed Project and not from sea level rise.

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- The BDCP Proposed Project assumes a change in water quality standards that has not yet happened and that would require State Water Board action. Given that historical, natural salinity in the western Delta was far lower than current levels, Antioch believes that changes in water quality standards would be inappropriate and detrimental to the health of the Delta.
- Because project operations have not been clearly defined, it is not possible to determine with any certainty the impacts of the Proposed Project.
- Mitigation for the significant impacts that are expected to occur at Antioch is not detailed within the EIR/EIS. The EIR/EIS finds that water quality impacts are "considered to remain significant and unavoidable." Despite statements in the EIR/EIS that the assistance provided by BDCP proponents is intended to "fully offset" increased treatment or delivery costs, the BDCP and EIR/EIS suggest no concrete measures that will be implemented to accomplish this.

Additional detail is provided below and in **Appendix C** to the City's comment letter.

BACKGROUND

As detailed in the City's comment letter, the City is located along the San Joaquin River in the western portion of the Sacramento and San Joaquin River Delta (Delta). Since the 1860s, Antioch has obtained all or part of its freshwater supply directly from its intake on the San Joaquin River[1] pursuant to a pre-1914 appropriative water right with a priority of 1867.[2]

Contrary to incorrect statements contained in the EIR/EIS, Antioch continues to obtain much of its water supply from its own diversion facility.[3] Antioch has a substitute

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[1] Much of the water in the western Delta (including the City's water supply) comes from the Sacramento River. Historically, significant amounts of Sacramento River water flowed into the San Joaquin River east of Antioch at Three Mile and Georgiana Sloughs. Sacramento River water also reaches Antioch where the river merges with the San Joaquin River just west of the City.

[2] Antioch has vested pre-1914 water rights to water from the San Joaquin River as well as to the tributary flow of the Sacramento River via Georgiana and Three Mile Sloughs. This was determined as a matter of law by the California Supreme Court in the case of Town of Antioch v. Williams Irrigation District et al. (1922) 188 Cal. 451,455.

[3] The City of Antioch uses water from its intake as its main source of supply when salinity at the intake is below specified thresholds. Although the EIR/EIS states that Antioch's intake is "seasonal" and used "infrequently" (EIR/EIS Chapter 8 at p.8-185, lines 13-14), this is not true.

water agreement with the Department of Water Resources (DWR) that partially compensates the City for water purchases from Contra Costa Water District (CCWD). That agreement presently has a 15-year term, which will end at approximately the same time the BDCP is anticipated to begin operations.[4]

Because of its position in the western Delta and its legacy as a fresh water Delta town, the City is also particularly concerned with the ecological health of the Delta, the City's long-term viability as a recreational destination, and the potential significant adverse impacts of urban decay resulting from the BDCP.

DETAILED TECHNICAL COMMENTS RELATED TO WATER QUALITY IMPACTS

The baseline condition used to evaluate the BDCP Proposed Project is flawed and inappropriate. A modeling study was used to delineate the potential effects of the proposed BDCP project on salinity at locations throughout the Delta, including at Antioch's drinking water intake in the western Delta. Our review of the impacts to water quality (Chapter 8 of the EIR/EIS) indicates that two different baseline scenarios were used—the "Existing Conditions" scenario was used to represent baseline for the CEQA evaluation, and the "No Action Alternative" (NAA) was used to represent baseline for the NEPA evaluation. The main differences between these two scenarios appear to be (a) whether Delta outflows are managed to achieve the Fall X2 provision (hereafter referred to as "Fall X2") of the 2008 US Fish and Wildlife Service Biological Opinion (the "2008 BiOp"); and (b) whether the impacts of sea level rise are included. The Existing Conditions scenario does <u>not</u> include Fall X2 or sea level rise, while the No Action Alternative includes both. As detailed below, failing to include Fall X2 in the Existing Conditions scenario makes the baseline condition appear to be more saline than it actually is, so that the potential impacts of the BDCP appear to be significantly smaller than they would with an appropriate baseline.

As noted in prior comments submitted by the City and its consultants to the BDCP and to the State Water Resources Control Board (SWRCB)[5], the western Delta historically exhibited freshwater conditions. In 1928, "Carquinez Strait marked

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[4] On October 29, 2013, the term of the agreement between the State of California and the City of Antioch was extended through September 30, 2028.

[5] See **Appendix D** to the City's comment letter.

approximately the boundary between salt and fresh water under natural conditions," and "[p]rior to diversions for irrigation, Suisun Bay was brackish in the late summer and salt water may have penetrated as far as Antioch, but only for a few days at a time in years of lowest run-off"[6]. Such conditions no longer exist, as saline water is now common at Antioch. However, historic salinity conditions should be considered when assessing the impacts of proposed actions on the fish and wildlife that live in the Delta and that were historically adapted to fresher conditions.

The City asserts that Fall X2 should be included in both baseline conditions, including the Existing Conditions. Legally, the 2008 BiOp represents the requirement to operate to achieve Fall X2, and predates the NOP for the BDCP. Technically, and as discussed further below and in **Appendix C** to the City's comments, simulated water quality is more representative of measured (historic) data with the inclusion of Fall X2.

Antioch and its consultants have received from DWR modeling results[7] obtained from the Delta Simulation Model II (DSM2) model, which was used to simulate hydrodynamics and water quality throughout the Delta for a range of model scenarios. These model runs included two scenarios that were representative of "existing conditions." The "existing biological conditions 1" (EBC1) scenario included current sea levels but not Fall X2, while the "existing biological conditions 2" (EBC2) scenario included current sea levels and Fall X2. The March 2013 Revised Administrative Draft made use of both EBC1 and EBC2, while the current BDCP EIR/EIS utilizes only EBC1, which is renamed as the "Existing Conditions" scenario. Model results for the EBC2 scenario agree well with salinity measurements made near Antioch (see **Figure 1**, **Appendix C**), while the EBC1 scenario showed poor agreement, particularly in the fall of 1974, 1975, 1978, 1980, 1984, and 1986, or 6 out of the 17 years modeled. The plots of EBC1 shown in **Appendix C** are consistent with Figures 5C.A-104 through 5C.A.-107 of Attachment 5C.A to Appendix 5C of the Draft BDCP (confirming that EBC1 is the "Existing Conditions" scenario defined in the EIR/EIS), which show substantial increases in salinity in the western Delta in the fall of 1978, 1980, 1984, and 1986. These periods

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[6] Means, Thomas. "Salt Water Problem: San Francisco Bay and Delta of Sacramento and San Joaquin Rivers. San Francisco, CA: Thos. H. Means, Consulting Engineer - 1928. p. 57.

See also CCWD, 2010, Historical Fresh Water and Salinity Conditions in the Western Sacramento-San Joaquin Delta and Suisun Bay: A summary of historical reviews, reports, analyses and measurements; Technical Report WR10-001, available at http://www.ccwater.com/salinity/HistoricalSalinityReport-2010Feb.pdf.

[7] Flow Science Incorporated received modeling results from DWR via mailed hard-drives in January 2012, April 2013, and May 2013.

of higher salinity are not consistent with field measurements, further confirming that the omission of Fall X2 from the Existing Conditions scenario is not technically appropriate to represent the existing water quality in the Delta.

The data contained in Appendix 8G of the EIR/EIS show a significant difference in chloride concentrations in the San Joaquin River at Antioch between the Existing Conditions and the No Action Alternative (NAA) scenarios. Specifically, the average chloride concentrations are higher under the Existing Conditions, particularly in the late summer and fall. Table C1-1 shows that the mean chloride concentration is higher under the Existing Conditions scenario than under the NAA scenario by 447 mg/l and 382 mg/l in October and November, respectively. Because there are two significant differences between these scenarios—i.e., Fall X2 and sea level rise—the data do not indicate which of these factors is responsible for the differences in simulated salinity levels.

Generally, the impact of a project is determined by comparing the Proposed Project scenario and the Existing Conditions scenario, and the impacts of non-project factors are determined by comparing the NAA scenario and the Existing Condition scenario. Here, we cannot make the latter comparison, as the Existing Conditions and No Action Alternative scenarios are not on common ground regarding Fall X2. In order to determine the impacts of sea level rise alone, the NAA scenario must be compared to the EBC2 scenario, since both the NAA scenario and the EBC2 scenario include operations to meet Fall X2. Once the impact of sea level rise has been determined, the impacts of BDCP could be more accurately delineated.

While the EBC2 scenario was not provided in the December 9, 2013 DRAFT BDCP and EIR/EIS, it was previously provided to Flow Science by DWR. **Figure 3** of **Appendix C** shows that, from September through November of above normal, below normal, and wet years, the availability of usable water at Antioch is higher under the EBC2 scenario than under the Existing Conditions (EBC1) and NAA scenarios; this is expected, as EBC2 includes Fall X2. These same plots also show that usability is greater under the NAA than under Existing Conditions (EBC1). Thus, the exclusion of Fall X2 (Existing Conditions) decreases usability <u>more</u> than sea level rise (captured in the NAA) during the fall of above normal, below normal, and wet years. This comparison highlights the importance of Fall X2, and further supports that it should be included in the CEQA baseline scenario.

As the City has noted in prior comments on the BDCP process and in testimony to the SWRCB, salinity levels in the western Delta, including at Antioch's intake, will be

substantially higher if Fall X2 is not included in the Existing Conditions model runs. (See **Appendix D** to the City's comments.) The exclusion of Fall X2 from the Existing Conditions will increase the salinity simulated under this condition and thus downplay the impacts of the BDCP Proposed Project on salinity in the western Delta; in fact Table Cl-28 in Appendix 8G of the EIR/EIS shows that annual mean chloride concentrations decrease relative to Existing Conditions (i.e., EBC1) for all Operational Scenarios, which is misleading—relative to EBC2, mean annual usability decreases at Antioch for all year types under Scenarios Alt4-H1 and Alt4-H2. Ultimately, the use of the Existing Conditions scenario without Fall X2 would be neither legally nor technically appropriate, and misrepresents the anticipated impacts of the BDCP project.

In summary, Flow Science's analysis shows that the "Existing Conditions" scenario used to represent baseline conditions in the EIR/EIS does not accurately represent current conditions because it does not include Fall X2. Even though model scenario EBC2, which does include Fall X2, was used in prior drafts of the EIR/EIS and was made available to Flow Science and others as early as 2012, it was not used in the CEQA analysis. Because the incorrect existing conditions baseline scenario was used in the CEQA analysis, impacts to the City of Antioch have been underestimated significantly.

Thus, Antioch requests that Fall X2 be included in all modeling scenarios used to describe baseline conditions.

Please note that, because the City asserts that the Existing Conditions scenario is an inappropriate baseline, the impacts of BDCP in this comment letter will be assessed compared to the EBC2 and the No Action Alternative scenarios.

The BDCP will cause salinity at Antioch to increase and will reduce the City's ability to use its intake significantly. Appendix 8G of the EIR/EIS shows the predicted impact to chloride concentrations in the San Joaquin River at Antioch, both in terms of the monthly and daily mean concentration and in terms of compliance with the Bay-Delta Water Quality Objective (250 mg/l as a daily average). However, these metrics do not describe Antioch's ability to use the water[8], as its ability depends only on the instantaneous chloride concentration and not on daily or monthly averages. Thus, the

[8] The 1968 Agreement defines "usable river water" as occurring when the "chloride ion content in the surface zone at slack current after daily higher high tide (HHT) is 250 parts per million [ppm] or less." Throughout these comments, "usable water" is the term applied to water with a chloride content of 250 ppm or less.

potential impacts described in Appendix 8G significantly underestimate the impacts to Antioch.

To determine the actual impacts to the City's municipal water supply, Antioch and its consultants evaluated salinity impacts using DSM2 model results obtained from DWR. Specifically, Flow Science assessed the instantaneous salinity concentration (i.e., model results at 15-minute intervals) to determine how the BDCP Proposed Project is predicted to impact the usability of water at the City's intake. Flow Science compared the percent of time that water can be diverted under the worst-case project conditions (Scenario Alt4-H1) to the EBC2 scenario and to the No Action Alternative. (As noted above, the EBC2 scenario is most representative of existing conditions and should be used as the baseline for CEQA analysis of the BDCP project.)

The increased salinity in the western Delta that is predicted to occur due to the BDCP Proposed Project will significantly impact Antioch's ability to use water. However, the severity of this impact is concealed in the EIR/EIS because model results are presented in the form of annual, monthly and daily averages. For example, Table Cl-28 of the EIR/EIS shows that, under worst-case operations and evaluated as a long-term average, compliance with the chloride objective will decrease by only 2% (the difference between Scenario Alt4-H1 and the No Action Alternative). However, as demonstrated below and in **Appendix C** to the City's comments, the decrease in usable water will be far more severe. On an annual basis, the impacts to usability at Antioch are significant. Over the 17 years modeled, the availability of usable water decreased by 6%, or 9.2 days per year on average as a result of BDCP Proposed Project Scenario Alt4-H1. The availability of usable water is expected to decrease even more during wet years; in these years, usability could decrease by 12%, or over 28 days per year. Importantly, and as detailed in **Appendix C**, these changes result from the BDCP Proposed Project alone, not from sea level rise.

The BDCP Proposed Project is simulated to have the most significant impacts during the fall months, where on average the availability of usable water at Antioch may decrease by up to 64% (**Appendix C**) with Operational Scenario Alt4-H1 relative to the No Action Alternative (i.e., without the impacts of non-project factors such as sea level rise). Evaluating results by month indicates potentially even greater effects. Under all year types, usability during September is simulated to decrease from 5.3 days to 0.8 days, an 85% decrease. The largest loss of usable days is predicted to occur in October, and totals 6.6 days on average.

Breaking the results down by year type also shows significant impacts during the fall months. For example, excluding wet years, the availability of usable water under Operational Scenario H1 from September through November is predicted to decrease from 13.1 to 1.7 days[9], a loss of 11.4 days relative to the NAA; in non-wet years, there are only 0.3 to 3 days of usability in the fall under Proposed Operational Scenario Alt4-H1. The percent difference is most significant during critical and dry years, at 97% and 93% of usable days lost, respectively, in the September through November time period (**Table 4, Appendix C**). The most significant losses are simulated to occur during dry and wet years, when 23.0 and 22.7 days of usable water, respectively, are anticipated to be lost over this three-month period. Thus, the impacts of the BDCP Proposed Project to the City of Antioch, especially during the fall, are much greater than reported in the EIR/EIS.

The modeling performed to assess the water quality impacts of BDCP assumes full implementation of restoration measures—that is, 65,000 acres of tidal marsh restoration. This amount of tidal restoration is expected to occur in year 2060 and beyond, if at all. None of the model results characterizes the potential impacts of restoration on salinity in the years prior to 2060. Because the tidal marsh restoration will be phased, there will be several intermediate conditions during which the hydrodynamics may differ significantly from both the current conditions and the conditions under full tidal marsh restoration. Depending on the design and location of restoration efforts, and the sequence in which restoration is conducted, the volume of water that "sloshes" into and out of the Delta on every tidal cycle may be increased, thus increasing salinity in the western Delta.

Although the City's primary concern is with salinity at its intake, the City would like to incorporate by reference the comments of others that suggest that concentrations of other water quality constituents (e.g., bromide, mercury) may increase as a result of implementation of the Proposed Project. The City is concerned with any degradation of water quality at its intake. In addition, changes in water quality may affect the treatment options available to the City.

[9] These numbers are the arithmetic averages of the non-wet years (i.e., critical, dry, above and below normal years) from **Table 4**, **Appendix C**

The BDCP Proposed Project assumes a change in water quality standards that has not yet happened and that would require State Water Board action. One aspect of the Proposed Project (represented by Scenarios H1 through H4) is the proposed change of "water quality requirements criteria" in the Delta. The Draft BDCP document states that the BDCP operations "include water operations in accordance with State Water Board D-1641 related to north Delta and western Delta agricultural and municipal and industrial requirements, except that the Sacramento River compliance point for the agreement with the North Delta Water Agency would be moved from Emmaton to Threemile Slough" (p. 3-188, emphasis added). Moving the compliance point landward by about 2.5 miles (the approximate distance from Emmaton to Threemile Slough), as proposed, would allow salinity in the western Delta to increase and thus would further impair Antioch's ability to use the water for municipal purposes. Further, the 2008 BiOps include requirements to meet Fall X2 under certain conditions, as described above, and two of the operational scenarios (Scenarios Alt4-H1 and Alt4-H2) eliminate the Fall X2 requirement; eliminating the Fall X2 requirement would also allow salinity to increase still farther in the western Delta.

Given the fact that historical, natural salinity in the western Delta has been far lower than current levels, and given the serious impacts that may occur to Antioch's water supply and to the ecosystem if salinity is allowed to increase further, Antioch asserts that such a change in water quality standards would be inappropriate. For this reason, the BDCP EIR/EIS should be amended to include scenarios that do not involve changes in water quality standards.

Because project operations have not been clearly defined, it is not possible to determine the impacts of the Proposed Project. Under the Proposed Project as described in the Plan and EIR/EIS, Delta outflow requirements in the spring and fall would be determined using a decision tree. There are four possible combinations of spring and fall outflow criteria, which define four operational scenarios (H1 through H4). Model runs were performed for each of these scenarios, as any of the four may be used each year. However, the decision tree that describes Operational Scenario H—specifically, what "triggers" each operational scenario—has not been defined in the Draft BDCP nor in the EIR/EIS and is "subject to a new determination by the fish and wildlife agencies" (p 3-207). Regarding spring outflows, the EIR/EIS states that "uncertainty exists regarding the mechanism through which higher Delta outflow improves the production and survival of early life stages of longfin smelt. Results of [future] investigations, including those directly related to the decision-tree process, will continue

to be revealed and considered in the coming years" (p 3-208). However, neither the future studies nor their potential outcomes are discussed.

Regarding fall outflows, the EIR/EIS presents two hypotheses: first, that the fall habitat objective will be accomplished by providing flows necessary to position X2 in or near Suisun Bay in wet years; alternatively, that the new shallow-water habitat areas created through restoration of tidal communities (CM4) could accomplish this objective with lower outflows during the fall. Additional "scientific research to test each of these hypotheses will be conducted before initial operations of the north Delta facility" (p 3-208). Ultimately, neither the spring nor the fall portions of the outflow decision tree have been determined for the proposed BDCP project; thus, the potential impacts of the project cannot be determined with confidence.

Mitigation for water impacts is not provided. Chapter 8 of the EIR/EIS proposes mitigation measures for each foreseeable impact. For chloride (a surrogate for salinity), however, the proposed mitigation strategy consists entirely of additional study, with actions to be taken if identified. Because salinity in the western Delta originates primarily from the ocean, with salty water brought into the estuary by tidal action, Antioch and its consultants know of no such actions that would directly mitigate the impacts of the project on salinity in the western Delta, and none are identified in the EIR/EIS. In fact, the EIR/EIS states that, "because the effectiveness of [Mitigation Measure WQ-7] to result in feasible measures for reducing water quality effects is uncertain, this impact is considered to remain significant and unavoidable" (p, 8-429, emphasis added).

At the same time, and contrary to assertions that impacts are significant and unavoidable, the EIR/EIS expresses BDCP proponents' commitment to "assisting in-Delta municipal, industrial, and agricultural water purveyors that will be subject to significant water quality effects … The assistance provided by the BDCP proponents is intended to fully offset any increased treatment or delivery costs attributable to CM1" (p. 3B-42, emphasis added). For municipal users, the proposed assistance includes providing funding assistance to acquire alternative in-basin water supplies, storage, conjunctive uses, or develop water transfers; develop water supply connections to SWP facilities or BDCP intertie; or develop demand management and/or conservation/recycling projects to extend available water supplies.

However, the methods to "fully offset" any water quality impacts as a result of CM1 may require changes to contracts already in place between DWR and municipal

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agencies. For example, California Department of Water Resources (DWR) has agreement contract with the City in which it has agreed to reimburse the City for *only* one-third of the cost it incurs to import water when water quality at its diversion point is unusable, as specified by formulae contained in the agreement. The EIR/EIS does not reference this contract, nor how it will distinguish BDCP CM1 impacts to water quality (for which the City should be fully compensated) from other instances of water quality degradation (for which the City should be reimbursed one-third, per the Antioch-DWR contract).

Antioch requests that BDCP proponents specify how they intend to identify and to fully offset the impacts of BDCP CM1 in a manner that is fair and just to all parties.

* * *

Please contact me at (626) 304-1134 or al@flowscience.com if you have any questions regarding these comments. We appreciate the opportunity to submit these comments, and we look forward to seeing these comments addressed in the final EIR/EIS for the BDCP.

Sincerely,

REGISTERED PROFESSIONAL ENGINEER
ALASTAIR T. PRESTON
No. C 77904
EXP. 6/30/15
CIVIL
STATE OF CALIFORNIA

Al Preston, Ph.D., P.E.
Project Engineer

Reviewed by:

E. John List, Ph.D., P.E.
Principal

Attachment B

Analysis of Water Quality Impacts to Antioch — Evaluation of DSM2 Modeling Performed in Support of the BDCP Proposed Project by Flow Science Incorporated

As detailed in **Appendix A** to the City of Antioch's comments on the BDCP and associated EIR/EIS, Flow Science has conducted a detailed review of hydrodynamic and water quality modeling performed by DWR to characterize the potential impacts of the BDCP Proposed Project on water quality at the City of Antioch's drinking water intake. This document (**Appendix C** to the City's comments) provides additional detail regarding Flow Science's technical analysis.

DSM2 model results were provided by DWR to Flow Science via hard drive in January 2012, April 2013, and May 2013. Flow Science analyzed these model results in order to assess the effects of the proposed BDCP project on salinity and usability of water at Antioch. The following analyses indicate that a technically inappropriate simulation was used for the baseline condition in the ADEIR, and that the proposed BDCP project is simulated to have significant impacts on the ability of Antioch to draw and use water from the San Joaquin River.

DATA SOURCES

The DSM2 simulation results used in the analyses are listed in **Table 1**. Each simulation used hydrology from WY1975-WY1991. Results for electrical conductivity (EC) at Antioch (RSAN007) were extracted on a 15-minute basis and used for Flow Science's evaluation. In addition to the model results, measured conductivity data[1] were obtained for RSAN008, located approximately one mile from the Antioch intake.

Table 1: DSM2 Simulations

Name	Scenario	Sea Level Rise (SLR) (cm)	Fall X2	Notes
Existing Condition (EBC1)[1]	baseline	0	No	Referred to as EBC1 in April 2013 EIR/EIS.
EBC2[2]	baseline	0	Yes	Not used in December 2013 EIR/EIS.
NAA[2]	No Action	15[4], 45	Yes	
Alt4-H1[3]	Low Outflow	15[4], 45	No	Proposed project can operate within (and beyond) the space defined by these four scenarios.
Alt4-H2[3]	Spring High Outflow	15[4], 45	No	
Alt4-H3[3]	Evaluated Starting Ops.	15[4], 45	Yes	
Alt4-H4[3]	High Outflow	15[4], 45	Yes	

1. Received from DWR on May 6, 2013.

[1] http://www.water.ca.gov/iep/products/data/dssnotice.cfm (accessed 3/7/2012).

2. Received from DWR in January 2012.
3. Received from DWR in April 2013.
4. Results for SLR = 15 cm are not presented here.

ANALYSES

Baseline in EIR/EIS should incorporate Fall X2 provisions

The December 2013 EIR/EIS uses the "Existing Conditions" simulation for baseline purposes. As indicated in **Table 1,** the "Existing Conditions" simulation does not include Fall X2 provisions. By contrast, the "EBC2" simulation (a simulation used in the March 2013 Draft BDCP document, and received by Flow Science from DWR in January 2012) does include Fall X2.

The DSM2 modeling performed to evaluate water quality impacts of the proposed project simulated electrical conductivity (EC), which is a measure of salinity. **Figure 1** presents daily average simulated EC at Antioch for both Existing Conditions (Ex. Cond./EBC1) and EBC2, along with historical measured EC data. Simulation results were compared with historical measured EC. As shown in **Figure 1**, the exclusion of Fall X2 (i.e., the Ex. Cond./EBC1 simulation) results in EC at Antioch that is not representative of historical conditions. Specifically, salinity in the fall of 1974, 1975, 1978, 1980, 1984, and 1986 is substantially overestimated in simulation EBC1, when Fall X2 is excluded.

By contrast, the EBC2 simulation shows good agreement with measured EC at Antioch, indicating that the inclusion of Fall X2 into any baseline scenario is necessary in order to accurately represent current (pre-project) conditions at Antioch. In summary, the EBC2 scenario is the appropriate baseline model simulation for CEQA purposes, and EBC1 does not accurately represent current conditions and should not be used as the CEQA baseline for the BDCP project.

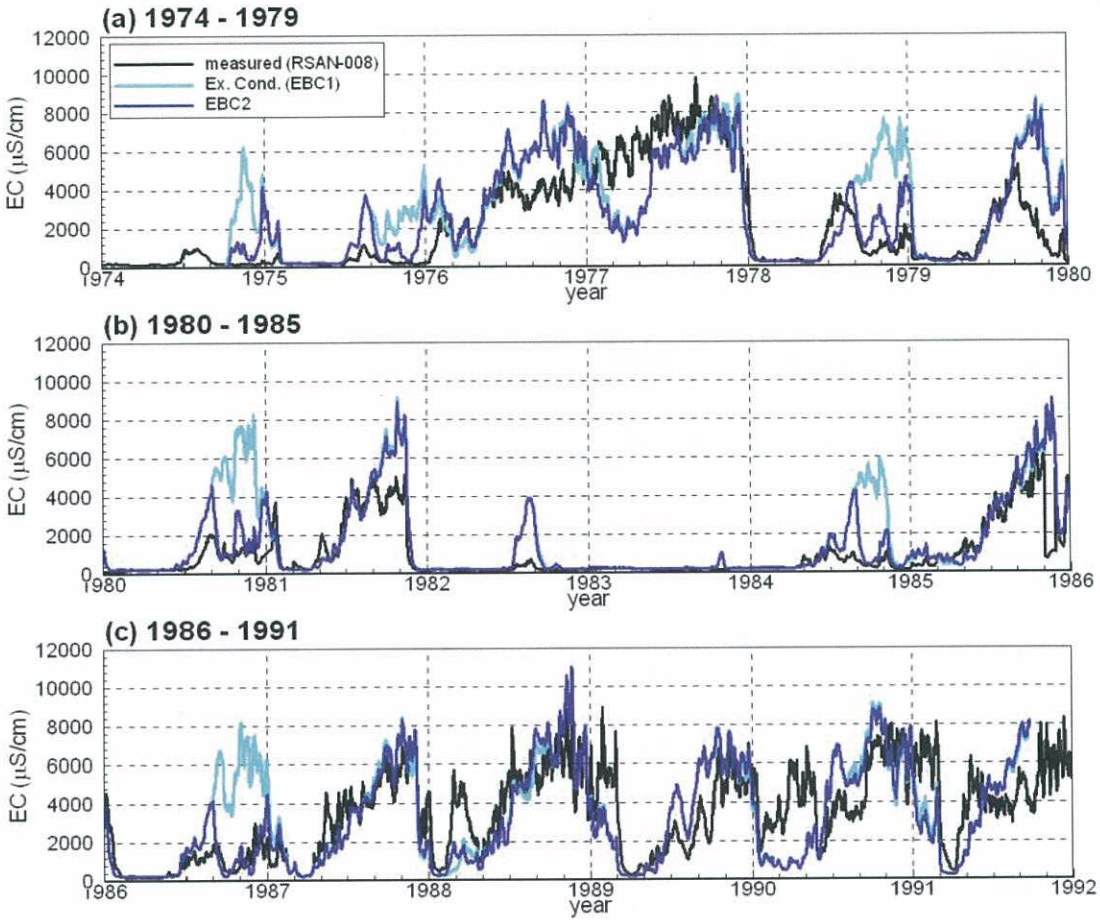


Figure 1. Measured and simulated daily average electrical conductivity (EC) at Antioch. Measured data are from station RSAN-008, located approximately one mile upstream from Antioch's intake. DSM2 simulations (EBC1 and EBC2) were provided by DWR.

BDCP Salinity Impacts at Antioch

In the December 2013 EIR/EIS, the preferred project is represented by the four Alt4 simulation scenarios listed in **Table 1**, with each scenario representing different operating regimes as determined by a "decision-tree" process that has yet to be explicitly defined. The H1 and H2 scenarios do not include Fall X2, whereas the H3 and H4 scenarios do include Fall X2 (**Table 1**).

To evaluate the anticipated impacts of the Proposed Project on salinity at Antioch, Flow Science plotted model results for salinity at Antioch using the EBC2 scenario, the NAA scenario, and the four Alternative 4 (Alt4) scenarios that represent the BDCP Proposed Project. Flow Science's evaluation focused on the EBC2 scenario (the most accurate representation of current conditions because it includes Fall X2), the NAA scenario (which includes both Fall X2 and anticipated sea level rise), and the Alt4 scenarios. The NAA scenario can be compared to the EBC2 scenario to examine the impact of sea level rise (SLR) alone on salinity at Antioch (i.e., without the BDCP Proposed Project). The BDCP Alt4 scenarios can then be compared to the NAA scenario to tease out the difference between increased salinity due to SLR and increased salinity due to the BDCP Proposed Project.

As shown below, the inclusion or exclusion of Fall X2 in the operating rules to be followed by the Proposed Project will have a substantial impact on the salinity at Antioch. DWR's model results indicate that the BDCP project may result in a substantially lower usability of water at Antioch, particularly in the fall months.

Figure 2 plots the percent of time that the salinity at Antioch is less than the usable threshold[2] in each month as computed from the DSM2 simulations for the simulation period 1975-1991[3]. Since the Ex. Cond. (EBC1) simulation is not an appropriate baseline (see above), the effect of sea level rise (SLR) was assessed by comparing the EBC2 and NAA simulations, and the effect of the proposed BDCP project (independent of SLR) was assessed by comparing the NAA and the four Alt4 scenario simulations.

Impact of Sea Level Rise. Comparison of the EBC2 simulation to the NAA simulation indicates that a SLR of 45 cm results in decreased usability in all months except July and October, when the usability under the NAA scenario is slightly higher than under the EBC2 scenario. As a long-term average over the simulation period, a SLR of 45 cm is predicted to result in a 15-day-per-year decrease in usability (i.e., Antioch

[2] Consistent with Antioch's agreement with DWR (first signed in 1968 and extended on October 29, 2013,), the usable threshold is 250 ppm as chloride (Cl^-), which corresponds to an EC of 976 µS/cm. This conversion was made using the relationship between chloride concentration and EC for "normal" years in Guivetchi (1986).

[3] Computed using the 15-minute DSM2 output at Antioch (RSAN007).

will be able to use their intakes 15 days less on average each year, see **Table 2**); as **Figure 2** shows, the decrease in usability is spread relatively uniformly over the year. The impact of sea level rise is most significant during dry years, when it accounts for over 26 days of usability lost, or a 19% decrease in usability.

Table 2. Annual usability at Antioch under EBC2 and the No Action Alternative for the entire simulation period and for different year types within the simulation period

Year Type	# of Usable Days Per Year Under EBC2	# of Usable Days Per Year Under NAA	Usable Days Lost Per Year	Percent Decrease
All Years	163.7	148.5	15.2	9%
Critical Years	63.1	55.6	7.5	12%
Dry Years	144.6	117.9	26.7	19%
Above & Below Normal Years	188.1	177.7	10.4	6%
Wet Years	264.8	248.5	16.3	6%

Impact of BDCP. Figure 2 also shows that, relative to both EBC2 and NAA, BDCP Scenario Alt4-H1 is predicted to result in a significant decrease in usability, particularly during the fall months. The average decrease in usability during the fall months, relative to the NAA, for the entire 17-year simulation period is presented in **Table 3**. On average during the September-November timeframe, simulation results anticipate that usability will decrease by 15.3 days. Simulated usability is almost completely lost during September, which corresponds to an 85% decrease. The largest predicted number of days lost (6.6 days) in one month occurs in October. Note that these impacts of the proposed BDCP project are due entirely to the project, as the effect of SLR has been accounted for by comparing results from Scenario Alt4-H1 to the NAA scenario, which incorporates SLR.

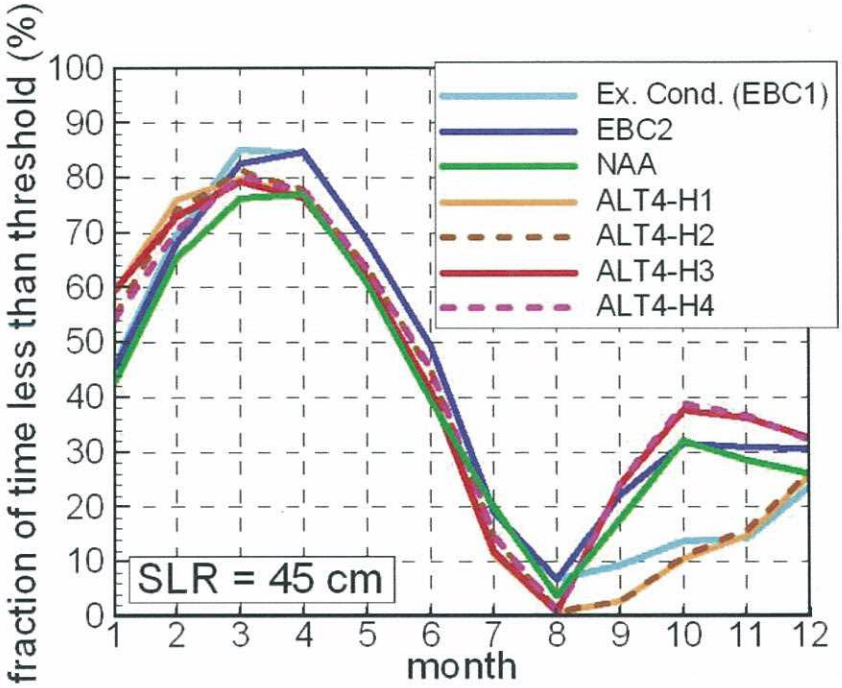


Figure 2. Percent of time water at Antioch's intake can be used for supply (i.e., when the simulated salinity is less than usable threshold at Antioch) by month as computed from DSM2 model results for the simulation period 1975-1991. SLR is zero for Ex. Cond. (EBC1) and EBC2, and 45 cm for all other simulations. Note that Fall X2 provisions are included in EBC2, NAA, Alt4-H3, and Alt4-H4.

Table 3. Decrease in usability at Antioch during the fall months simulated to occur as a result of implementation of the BDCP project (Scenario Alt4-H1)

Month	# of Usable Days/Year Under NAA	# of Usable Days/Year Under Alt4 (Operational Scenario H1)	Usable Days Lost/Year[1]	Percent Decrease[1]
September	5.3	0.8	4.5	85%
October	9.9	3.3	6.6	67%
November	8.5	4.4	4.1	48%
Sept-Nov	23.8	8.5	15.3	64%

[1]Results reflect changes resulting from BDCP project only, and not changes due to SLR. That is, BDCP project simulations with SLR = 45 cm were compared with NAA simulation, which also includes SLR = 45 cm.

Breaking the results down by year type (instead of presenting results in aggregated fashion) reveals that usability is almost completely lost during fall months of all year types except wet years. Also, the predicted salinity impacts, as expressed in terms of the number of days lost, are greatest during dry and wet years. These results are presented graphically in **Figure 3** and numerically in **Table 4**.

Figure 3 shows that usability under scenarios Alt4-H1 and Alt4-H2 during September through November is always less than 10%, and generally less than 5%, for all year types except for wet years. The number of usable days during the September-November simulation period (excluding wet years) ranges from 0.3 to 3 under Scenario Alt4-H1.

Figure 3 shows that the number of usable days during the fall months decreases significantly under Scenario Alt4-H1 compared the NAA, especially in dry and wet years. During dry and wet years, simulated usability decreases by 23 and 22.7 days in the fall, respectively. The largest percent decrease in usability occurs in critical and dry years, when usability decreases by 97% and 93%, respectively. These model results indicate that, in wet and dry year types, the City of Antioch would need to find alternative water supplies (because water at its intake would be unusable) for an additional 23 days in the fall months of each year, likely at significant cost.

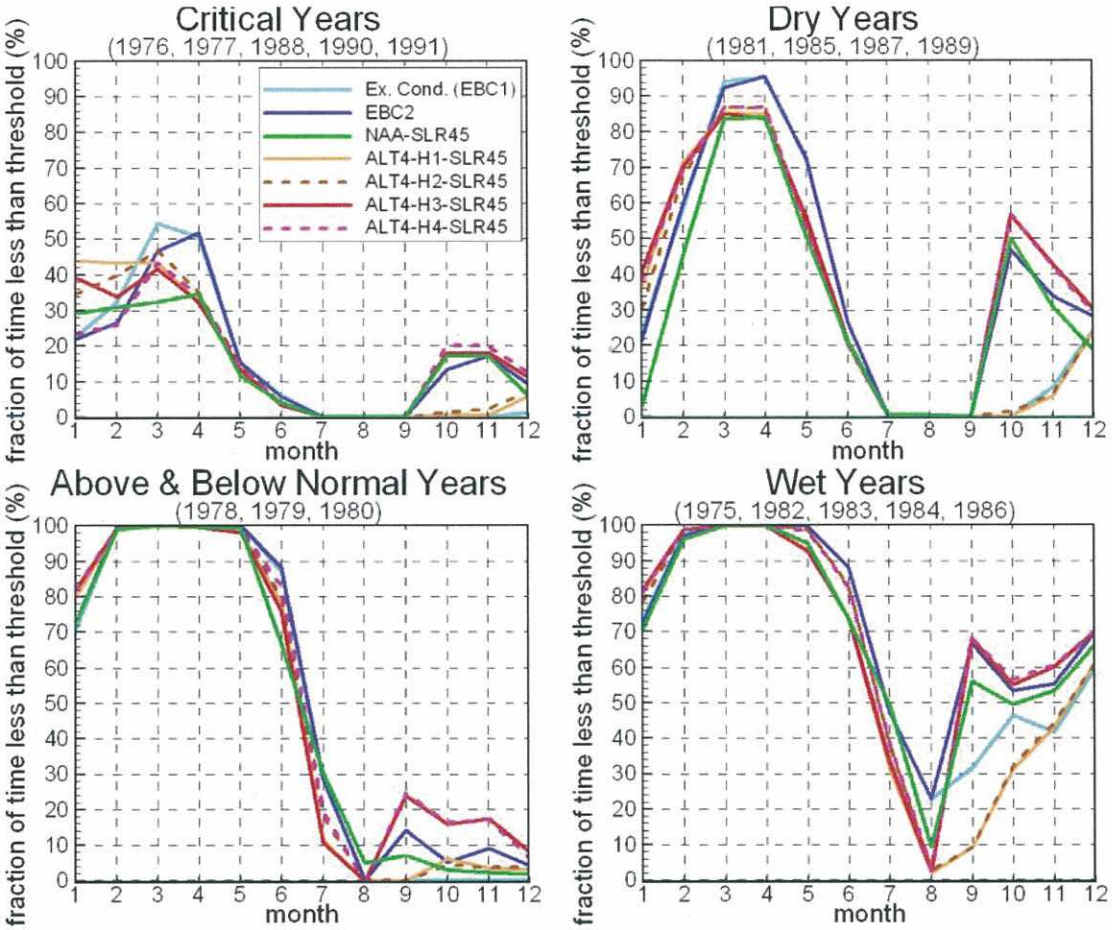


Figure 3. Percent of time water at Antioch's intake can be used for supply (i.e., when the simulated salinity is less than usable threshold at Antioch) by month and by year type as computed from DSM2 model results. SLR is zero for Ex. Cond. (EBC1) and EBC2, and 45 cm for all other simulations.

Table 4. Decrease in usability at Antioch in the Fall (September – November) predicted to occur as a result of the BDCP project scenario Alt4-H1 by year type

Year Type	# of Usable Days/Year Under NAA	# of Usable Days/Year Under Alt4 (Operational Scenario H1)	Usable Days Lost/Year[1]	Percent Decrease[1]
All Years	23.8	8.5	15.3	64%
Critical Years	10.6	0.3	10.3	97%
Dry Years	24.8	1.8	23.0	93%
Above & Below Normal Years	3.8	3.0	0.8	23%
Wet Years	48.1	25.4	22.7	47%

[1]Results reflect changes resulting from BDCP project only, and not changes due to SLR. That is, BDCP project simulations with SLR = 45 cm were compared with NAA simulation, which also has SLR = 45 cm.

Finally, the model results were used to compute the number of days of usable water over the entire simulation period, as an annual average. As **Table 5** indicates, model results show that the BDCP Proposed Project is simulated to cause a significant decrease in annual usability – 9.2 days per year – over all years. The loss is most significant during wet years, when more than 28 days of usability are lost; the highest percent decrease also occurs during wet years.

Table 5. Annual usability at Antioch under EBC2, No Action Alternative, and BDCP project scenario Alt4-H1 by year type

Year Type	# of Usable Days/Year Under NAA	# of Usable Days/Year Under Alt4 (Operational Scenario H1)	Usable Days Lost	Percent Decrease
All Years	148.5	139.3	9.2	6%
Critical Years	55.6	56.4	-0.8	-1%
Dry Years	117.9	115.6	2.2	2%
Above & Below Normal Years	177.7	175.0	2.7	2%
Wet Years	248.5	219.7	28.8	12%

[1]Results reflect changes resulting from BDCP project only, and not changes due to SLR. That is, BDCP project simulations with SLR = 45 cm were compared with NAA simulation, which also has SLR = 45 cm.

Attachment C

Agreement between the State of California and the City of Antioch

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

AMENDMENT NO. 1
TO THE APRIL 11, 1968 AGREEMENT BETWEEN
THE STATE OF CALIFORNIA
AND
THE CITY OF ANTIOCH

THIS AMENDMENT is made and entered into this 29th day of October, 2013, between the Department of Water Resources of the State of California (DWR), and the City of Antioch (City).

AGREEMENT

1. The 1968 Agreement between DWR and the City is amended as follows:

   Article 1 is amended to read in its entirety: "The term of this agreement shall begin on the first day of October 1968, and shall continue in effect until terminated by either party by written notice to the other party given at least 12 months prior to the effective date of such termination. The effective date of termination shall be the last day of a year (September 30) and no termination shall be effective prior to September 30, 2028."

   Article 3 is amended to read: "V is the total quantity of water in acre-feet introduced into the City's transmission facilities, including water diverted by the City and substitute water purchased by the City, for delivery within the City's service area, which shall be the most expansive of the Antioch City Boundary or Antioch Urban Growth Boundary or Antioch Sphere of Influence ("SOI") as shown on Exhibit "A" attached hereto and by this reference made a part hereof from 8:00 a.m. on December 9, to 8:00 a.m. on July 6."

   Article 4 is amended to read: "Such measurements will be made at such intervals as shall reasonably be necessary and as mutually agreed upon. DWR and the City have negotiated and agreed that such measurements will be made at slack current, which shall be deemed to occur two hours after daily higher high tide, effective January 1, 2013."

   Exhibit A is replaced with attached map "City of Antioch Boundary, SOI, and Urban Growth Boundary" as created by the Contra Costa County Community Development, GIS group on 7/13/2009.

2. The parties waive any and all claims either one may have against the other for past actions or activities arising out of this 1968 Agreement.

3. The existing Tolling Agreement, effective May 22, 2013, terminates upon the date of full execution of this Amendment.

4. All other provisions of the 1968 Agreement, except those modified by this Amendment, remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto, by their authorized representatives, have executed this Amendment No. 1 to the to the April 11, 1968 Agreement between the State of California and the City of Antioch, which Amendment becomes effective on the date first set forth above.

Approved as to legal form
and sufficiency

for _____
Chief Counsel
Department of Water Resources

Date 10/28/13

STATE OF CALIFORNIA
DEPARTMENT OF WATER
RESOURCES

_____
Mark W. Cowin
Director

Date 10/29/13

Approved as to legal form
and sufficiency

Lynn Lacy Nerland
Name

City Attorney
Title

Date 10-22-13

CITY OF ANTIOCH

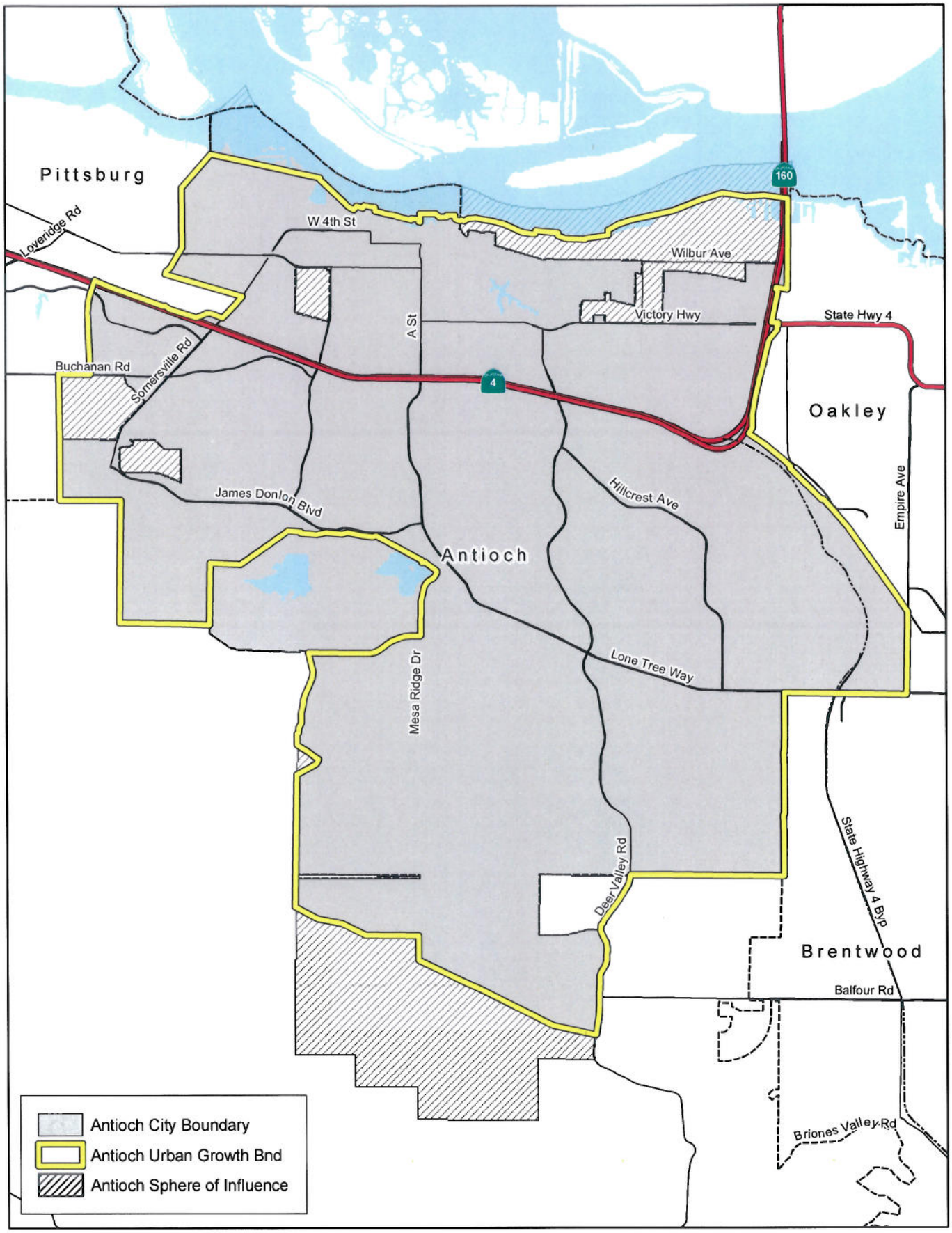
Jim Jakel
Name

City Manager
Title

Date 10-22-13

Exhibit A

City of Antioch Boundary, SOI, and Urban Growth Boundary



Map created 7/13/2009
by Contra Costa County Community Development, GIS Group
651 Pine Street, 4th Floor North Wing, Martinez, CA 94553-0095
37:59:48.455N 122:08:35.384W

This map was created by the Contra Costa County Community Development Department with data from the Contra Costa County GIS Program. Some base data, primarily City Limits, is derived from the CA State Board of Equalization's tax rate areas. While obligated to use this data the County assumes no responsibility for its accuracy. This map contains copyrighted information and may not be altered. It may be reproduced in its current state if the source is cited. Users of this map agree to read and accept the County of Contra Costa disclaimer of liability for geographic information.

Miles
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AGREEMENT

THIS AGREEMENT made this 11th day of April, 1968, between the STATE OF CALIFORNIA, acting by and through its Department of Water Resources, hereinafter referred to as the "State" and the CITY OF ANTIOCH, a municipal corporation, hereinafter referred to as the "City",

WITNESSETH:

WHEREAS, for over 100 years water has been diverted from the San Joaquin River for municipal and industrial use in and around the area which is now in the corporate limits of the City, and

WHEREAS, since 1904 such water has been diverted at a pumping plant located near the foot of A Street and has been treated and distributed to users by the City, and

WHEREAS, the City diverts such water whenever the chloride ion content in the surface zone at slack current after daily higher high tide (HHT) is 250 parts per million or less, hereinafter called "usuable river water", and

WHEREAS, the average number of days per water year (October 1 to September 30, hereinafter referred to as "year") that usable river water has been available to the City at said point of diversion is 208 and the median period of said availability is from December 9 to July 5, both days inclusive, and

WHEREAS, during each day usable river water has been and will in the future be available to the City the quantity thereof has been and will be adequate to meet the water requirements of

the City during such day, and

WHEREAS, in the future the average number of days per year that usable river water will be available to the City will be caused to decrease, and such decrease will be due in part to operation of the State Water Resources Development System, as defined in Section 12931 of the Water Code, and

WHEREAS, it is contemplated that the Contra Costa Canal, supplemented by the Kellogg Unit or other facilities to be constructed by the Bureau of Reclamation, will meet the City's future water requirements which are not met by usable river water. If such facilities are not constructed by the Bureau of Reclamation, water supply facilities will have to be constructed by another agency or agencies to meet the City's future requirements including a substitute water supply equal to the City's water deficiency entitlement as defined in this agreement.

NOW, THEREFORE, the parties agree as follows:

1. The term of this agreement shall begin on the first day of October 1968, and shall continue in effect until terminated by either party by written notice to the other party given at least 12 months prior to the effective date of such termination. The effective date of termination shall be the last day of a year (September 30) and no termination shall be effective prior to September 30, 2008.

2. The State shall reimburse the City in a manner hereinafter provided for any decrease in availability to the City of usable river water during the term of this agreement caused by

operation of the State Water Resources Development System. Such decrease in availability of usable river water is hereinafter referred to as the City's "water deficiency entitlement".

3. The quantity of the City's water deficiency entitlement shall be determined for each year during the term of this agreement by the formula

$$E = \frac{(208-D)}{3} \quad \frac{(V)}{208}$$

where E is the City's water deficiency entitlement for such year in acre-feet, D is the number of days during such year that usable river water is available to the City in the San Joaquin River at its pumping plant, and V is the total quantity of water in acre-feet introduced into the City's transmission facilities for delivery within the City's service area as shown on Exhibit "A" attached hereto and by this reference made a part hereof from 8:00 a.m. on December 9, to 8:00 a.m. on July 6: Provided, That $\frac{V}{208}$ shall not exceed the maximum diversion rate of the City's San Joaquin River diversion facility in acre-feet/day as such facility exists in such year. If in any year D exceeds 208, the City shall have no water deficiency entitlement for such year and the amount of such excess shall offset any water deficiency entitlement of the City for an equal number of days in the next succeeding year or years when D is less than 208.

4. For the purpose of computing the City's water deficiency entitlement, the City at no cost to the State, shall provide:

(a) A covered facility or facilities wherein

the State can install devices to measure the chloride ion content of water in the San Joaquin River at or in the vicinity of the City's pumping plant,

(b) Sufficient power to operate all necessary measuring devices, and

(c) Sufficient right-of-way to such facilities to enable the State to install, service, remove, and take readings from any such devices.

The size of such facilities and the amount and type of power to be supplied shall be as mutually agreed upon.

The State shall be responsible for the actual measuring of the chloride ion content; all such measurements will be made available to the City.

Such measurements will be made at such intervals as shall be reasonably necessary and as mutually agreed upon.

The City shall have the right, at its expense, to verify the accuracy of the State's measurements and any inaccuracy thus disclosed shall be corrected by the State.

5. Each year during the term of this agreement that the City has a water deficiency entitlement it shall purchase substitute water from a project or projects constructed by an agency or agencies to supply the supplemental water requirements of an area including the City. For the purposes of this agreement, substitute water shall be deemed to have been purchased during the period beginning at 8:00 a.m. on December 9 and ending

at 8:00 a.m. on July 6 of such year and the price paid by the City for substitute water shall be deemed to be the average price per acre-foot paid by the City for all untreated water purchased by it for introduction into its water transmission facilities during said period.

6. Each year during the term of this agreement that the City purchases substitute water for its water deficiency entitlement, the State will pay the City an amount of money computed in accordance with the formula $M = E (C_w + C_e - 4.90)$ where M is the amount in dollars to be paid by the State, E is the City's water deficiency entitlement for such year determined in the manner provided in Section 3 hereof, C_w is the amount per acre-foot paid by the City for substitute water delivered to the City as provided in Section 5 hereof, and C_e is the average amount (if any) per acre-foot paid by the City for electric energy to transport substitute water from the point of delivery thereof to the City to a storage reservoir or treatment plant operated by the City. The State shall pay said amount to the City not later than October 31 of the following year. Such payments are hereby determined to be reasonable costs of the annual maintenance and operation of the State Water Resources Development System and shall be disbursed from the California Water Resources Development Bond Fund pursuant to subsection (b) (1) of Section 12937 of the Water Code.

7. The City, in consideration of the payments by the State herein provided,

releases the State from any liability due to

any change in regimen of flows of water in the Delta or the San Joaquin River and the effects of such changes caused by operation of the State Water Resources Development System: Provided, That nothing herein shall be deemed to be a release of State liability resulting from the utilization by the State of any facilities for removal of drainage water from the San Joaquin Valley.

8. The obligations of the State herein shall not be affected by any modification of the City's facilities to divert river water, except as provided in Section 3 hereof.

9. Nothing herein shall be deemed to be a release or waiver of any right of the City to purchase supplemental water supplies from the State with the priorities established by Water Code Sections 11460, 12201 to 12204 inclusive, and 12931.

10. State agrees that other municipal and industrial entities in the Delta will not be granted compensation for damages caused by the State Water Resources Development System under substantially more favorable terms than those used to Compensate the City hereunder.

IN WITNESS WHEREOF, the parties hereto have executed this agreement by their respective officers thereunto duly authorized on the date first above written.

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

By W. Gianelli
Director

Approved as to legal form
and sufficiency:

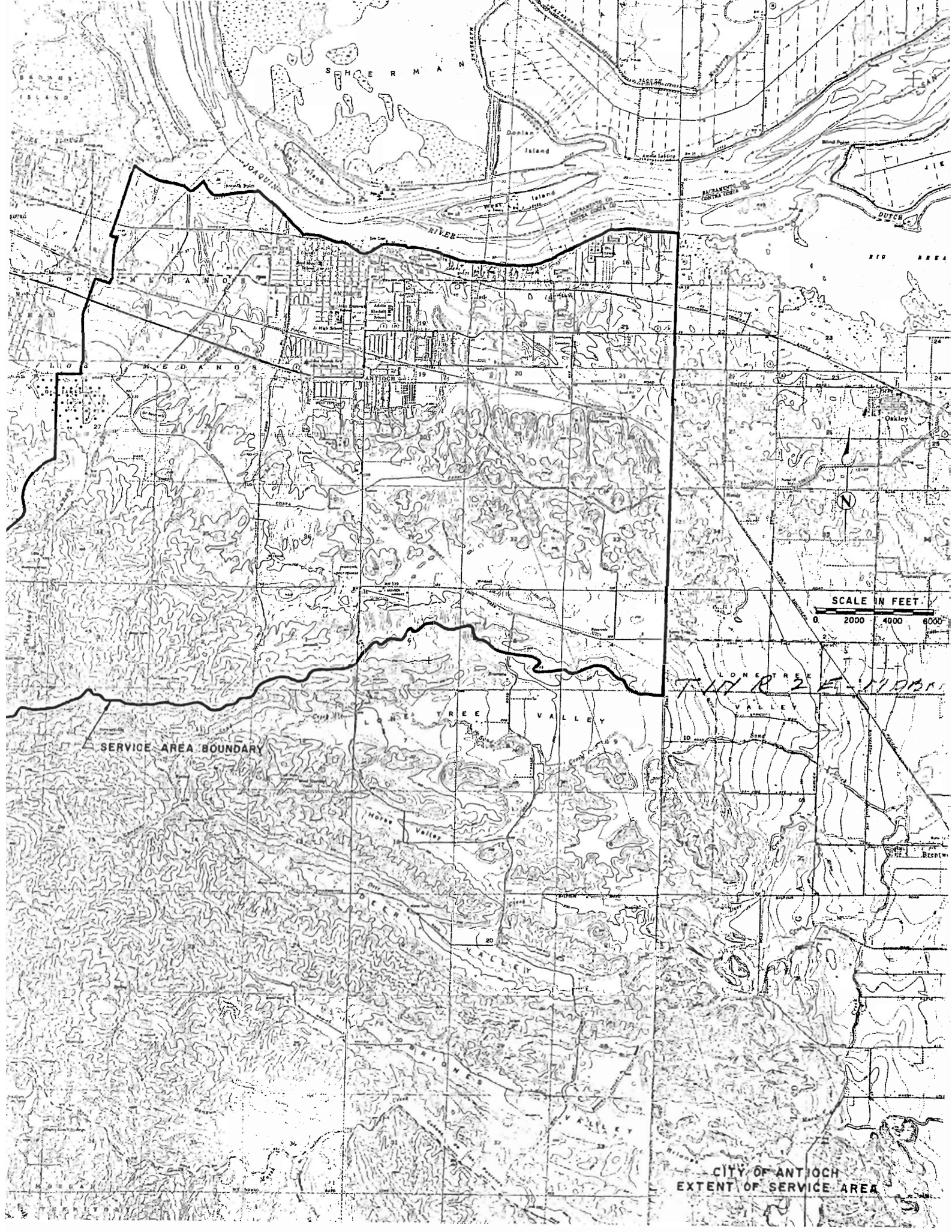
By R. G. Turner
Chief Counsel

CITY OF ANTIOCH

By John Lopez
Mayor

ATTEST:

Jean Trashbaugh
City Clerk


SHERMAN
ISLAND
Donlan Island
West Island
JOAQUIN
RIVER
SACRAMENTO CO.
CONTRA COSTA CO.
DUTCH
BIG
LOS MEDANOS
ANTIOCH
Oakley
SCALE IN FEET
0 2000 4000 6000
LONE TREE VALLEY
SERVICE AREA BOUNDARY
Horse Valley
DEER VALLEY
BRIONES VALLEY
CITY OF ANTIOCH
EXTENT OF SERVICE AREA

Attachment D

Review by the Delta Independent Science Board of the Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement

980 NINTH STREET, SUITE 1500
SACRAMENTO, CALIFORNIA 95814
HTTP://DELTACOUNCIL.CA.GOV
(916) 445-5511

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Joy Zedler, Ph.D.

September 30, 2015

To: Randy Fiorini, Chair, Delta Stewardship Council
Charlton Bonham, Director, California Department of Fish and Wildlife

From: Delta Independent Science Board

Subject: Review of environmental documents for California WaterFix

We have reviewed the partially Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement for the Bay Delta Conservation Plan/California WaterFix (herein, "the Current Draft"). We focused on how fully and effectively it considers and communicates the scientific foundations for assessing the environmental impacts of water conveyance alternatives. The review is attached and is summarized below.

The Current Draft contains a wealth of information but lacks completeness and clarity in applying science to far-reaching policy decisions. It defers essential material to the Final EIR/EIS and retains a number of deficiencies from the Bay Delta Conservation Plan Draft EIR/EIS. The missing content includes:

1. Details about the adaptive-management process, collaborative science, monitoring, and the resources that these efforts will require;
2. Due regard for several aspects of habitat restoration: landscape scale, timing, long-term monitoring, and the strategy of avoiding damage to existing wetlands;
3. Analyses of how levee failures would affect water operations and how the implemented project would affect the economics of levee maintenance;
4. Sufficient attention to linkages among species, landscapes, and management actions; effects of climate change on water resources; effects of the proposed project on San Joaquin Valley agriculture; and uncertainties and their consequences;
5. Informative summaries, in words, tables, and graphs, that compare the proposed alternatives and their principal environmental and economic impacts.

The effects of California WaterFix extend beyond water conveyance to habitat restoration and levee maintenance. These interdependent issues of statewide importance warrant an environmental impact assessment that is more complete, comprehensive, and comprehensible than the Current Draft.

Review by the Delta Independent Science Board of the

Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement

September 30, 2015

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EXPECTATIONS FOR IMPACT ASSESSMENT OF CALIFORNIA WATERFIX

The Sacramento – San Joaquin Delta presents interconnected issues of water, biological resources, habitat, and levees. Dealing with any one of these problem areas is most usefully considered in light of how it may affect and be affected by the others. The effects of any actions further interact with climate change, sea-level rise, and a host of social, political, and economic factors. The consequences are of statewide importance.

These circumstances demand that the California WaterFix EIR/EIS go beyond legal compliance. This EIR/EIS is more than just one of many required reports. Its paramount importance is illustrated by the legal mandate that singles it out as the BDCP document we must review.

It follows that the WaterFix EIR/EIS requires extraordinary completeness and clarity. This EIR/EIS must be uncommonly complete in assessing important environmental impacts, even if that means going beyond what is legally required or considering what some may deem speculative (below, p. 4). Further, the WaterFix EIR/EIS must be exceptionally clear about the scientific and comparative aspects of both environmental impacts and project performance (p. 9).

These reasonable expectations go largely unmet in the Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement Draft (herein, "the Current Draft"). We do not attempt to determine whether this report fulfills the letter of the law. But we find the Current Draft sufficiently incomplete and opaque to deter its evaluation and use by decision-makers, resource managers, scientists, and the broader public.

BACKGROUND OF THIS REVIEW

The Delta Reform Act of 2009, in §85320(c), directs the Delta Independent Science Board (Delta ISB) to review the environmental impact report of the Bay Delta Conservation Plan (BDCP) and to provide the review to the Delta Stewardship Council and the California Department of Fish and Wildlife. On May 14, 2014, we submitted our review of the BDCP's Draft Environmental Impact Report/Draft Environmental Impact Statement (herein, the "Previous Draft"), which had been posted for review on December 9, 2013. This review[1] contained three main parts: an extended summary, detailed responses to charge questions from the Delta Stewardship Council, and reviews of individual chapters. Although the Previous Draft considered vast amounts of scientific information and analyses to assess the myriad potential environmental impacts of the many proposed BDCP actions, we concluded that the science in the Previous Draft had significant gaps, given the scope and importance of the BDCP.

The proposed BDCP actions have now been partitioned into two separate efforts: water conveyance under California WaterFix[2] and habitat restoration under California EcoRestore[3]. Environmental documents in support of California WaterFix (the Current Draft) were made available for a 120-day comment period that began July 10, 2015. The Current Draft focuses on three new alternatives for conveying Sacramento River water through the Sacramento – San

[1] http://deltacouncil.ca.gov/sites/default/files/documents/files/Attachment-1-Final-BDCP-comments.pdf
[2] http://www.californiawaterfix.com/
[3] http://resources.ca.gov/ecorestore/

Joaquin Delta. One of them, Alternative 4A, is the preferred alternative, identified as California WaterFix.

The Delta Stewardship Council asked us to review the Current Draft and to provide our comments by the end of September 2015. We are doing so through this report and its summary, which can be found in the cover letter.

The review began in July 2015 with a preliminary briefing from Laura King-Moon of California Department of Water Resources (three Delta ISB members present). The Delta ISB next considered the Current Draft in a public meeting on August 13–14 (nine of the ten members present)[4]. The meeting included a briefing on California EcoRestore by David Okita of California Natural Resources Agency and a discussion of the Current Draft and California WaterFix with Cassandra Enos-Nobriga of California Department of Water Resources (DWR) and Steve Centerwall of ICF International.

The initial public draft of this review was based on our study of Sections 1-4 of the Current Draft and on checks of most resource chapters in its Appendix A. This public draft was the subject of a September 16 meeting that included further discussions with Cassandra Enos-Nobriga[5] and comments from Dan Ray of the Delta Stewardship Council staff. Additional comments on that initial draft were provided by DWR in a September 21 letter to the Delta ISB chair[6]. These discussions and comments helped clarify several issues, particularly on expectations of a WaterFix EIR/EIS.

This final version of the review begins with a summary in the cover letter. The body of the report continues first with a section on our understanding of major differences between the BDCP and California WaterFix. Next, after noting examples of improvement in the Current Draft, we describe our main concerns about the current impact assessments. These overlap with main concerns about the Previous Draft, which we revisit to consider how they are addressed in the Current Draft. Finally, we offer specific comments on several major Sections and Chapters.

DIFFERENCES BETWEEN THE BDCP AND CALIFORNIA WATERFIX

The project proposed in the Current Draft differs in significant respects from what was proposed as the BDCP in December 2013. Here we briefly state our understanding of some main differences and comment on their roles on this review:

- The time period for permitting incidental take under Section 7 of the federal Endangered Species Act (ESA) and Section 2081(b) of the California Endangered Species Act (CESA) is substantially less than the 50 years envisioned as part of a Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) in BDCP. As a result, the science associated with many impacts of climate change and sea-level rise may seem less relevant. The permitting period for the project proposed in the Current Draft remains in place unless environmental baseline conditions change substantially or other permit requirements are not met. Consequently, long-term effects of the proposed project remain important in terms of operations and expected benefits (p. 8).

[4] http://deltacouncil.ca.gov/docs/delta-isb-meeting-notice-meeting-notice-delta-isb/delta-independent-science-board-isb-august-13

[5] Written version at https://s3.amazonaws.com/californiawater/pdfs/63qnf_Delta_ISB_draft_statement_-_Enos_-_FINAL.pdf

[6] http://deltacouncil.ca.gov/docs/response-letter-dwr

- In this shortened time frame, responsibility for assessing WaterFix's effects on fish and wildlife would fall to resource agencies (National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife). Other impacts would be regulated by a variety of federal and state agencies (Current Draft Section 1).
- The proposed habitat restorations have been scaled back. The Current Draft incorporates elements of 11 Conservation Measures from BDCP to mitigate impacts of construction and operations. Most habitat restoration included in the Previous Draft has been shifted to California EcoRestore. Our review of the Previous Draft contained many comments on the timing of restoration, species interactions, ecological linkages of conservation areas, locations of restoration areas and the science supporting the efficiency and uncertainty of effective restoration. Some of these comments apply less to the Current Draft because of its narrower focus on water conveyance.
- There remains an expected reliance on cooperative science and adaptive management during and after construction.
- It is our understanding that the Current Draft was prepared under rules that disallow scientific methods beyond those used in the Previous Draft. The rules do allow new analyses, however. For example, we noticed evidence of further analyses of contaminants, application of existing methods (e.g. particle tracking) to additional species (e.g., some of the non-covered species), and occasional selection of one model in place of the combined results of two models (e.g., fish life cycle models SALMOD and SacEFT).

IMPROVEMENTS ON THE PREVIOUS DRAFT

A proposed revamping of water conveyance through the Sacramento-San Joaquin Delta involves a multitude of diverse impacts within and outside of the Delta. Unavoidably, the EIR/EIS for such a project will be complex and voluminous, and preparing it becomes a daunting task in its own right. The inherent challenges include highlighting, in a revised EIR/EIS, the most important of the changes.

The new Sections 1 through 4 go a long way toward meeting some of these challenges. Section 1 spells out the regulatory context by discussing laws and agencies that establish the context for the Current Draft. Section 2 summarizes how the Previous Draft was revised in response to project changes and public input. Section 3 describes how the preferred alternative in the Previous Draft (Alternative 4) has been changed. Section 4 presents an impressive amount of detailed information in assessing the sources of habitat loss for various species and discussing how restoration and protection can mitigate those losses. Generally comprehensive lists of "Resource Restoration and Performance Principles" are given for the biological resources that might be affected by construction or operations. For example, page 4.3.8-140 clearly describes a series of measures to be undertaken to minimize the take of sandhill cranes by transmission lines (although the effectiveness of these measures is yet to be determined).

Section 4 also contains improvements on collaborative science (4.1.2.4, mostly reiterated in ES.4.2). This part of the Current Draft draws on recent progress toward collaborative efforts in monitoring and synthesis in support of adaptive management in the Delta. The text identifies the main entities to be involved in an expected memorandum of agreement on a monitoring and adaptive-management program in support of the proposed project.

Appendix A describes revisions to the resource chapters of the Previous Draft. Track-changed versions of the chapters simplify the review process, although this was not done for the

key chapter on aquatic resources (p. 17). We noticed enhanced analyses of contaminants and application of methods such as particle tracking to additional species, including some of the non-covered taxa; a detailed treatment of *Microcystis* blooms and toxicity; more information about disinfection byproducts; improved discussion of vector control arising from construction and operational activities; and revised depiction of surficial geology. Potential exposure of biota to selenium and methylmercury is now considered in greater detail. Evaluations will be conducted for restoration sites on a site-specific basis; if high levels of contaminants cannot otherwise be addressed, alternative restoration sites will be considered (page 4.3.8-118). Incidentally, this is a good example of adaptive management, although it is not highlighted as such. Explanations were provided for why the nitrogen-to-phosphorus ratio was not specifically evaluated, why dissolved vs. total phosphorus was used in the assessment, and how upgrades to the Sacramento Regional Wastewater Treatment Plant would eventually affect phosphorus concentrations.

CURRENT CONCERNS

These and other strengths of the Current Draft are outweighed by several overarching weaknesses: overall incompleteness through deferral of content to the Final EIR/EIS (herein, "the Final Report"); specific incompleteness in treatment of adaptive management, habitat restoration, levees, and long-term effects; and inadequacies in presentation. Some of these concerns overlap with ones we raised in reviewing the Previous Draft (revisited below, beginning on p. 10).

Missing content

The Current Draft lacks key information, analyses, summaries, and comparisons. The missing content is needed for evaluation of the science that underpins the proposed project. Accordingly, the Current Draft fails to adequately inform weighty decisions about public policy. The missing content includes:

1. Details on adaptive management and collaborative science (below, p. 5).
2. Modeling how levee failures would affect operation of dual-conveyance systems (below, p. 7). Steve Centerwall told us on August 14 that modeling of the effects of levee failure would be presented in the Final Report.
3. Analysis of whether operation of the proposed conveyance would alter the economics of levee maintenance (below, p. 7).
4. Analyses of the effects of climate change on expected water exports from the Delta. “[A]n explanation and analysis describing potential scenarios for future SWP/CVP system operations and uncertainties [related to climate change] will be provided in the Final Report” (p. 1-35 of the Current Draft).
5. Potential impacts of climate change on system operations, even during the shortened time period emphasized in the Current Draft (below, p. 8 and 11).
6. Potential effects of changes in operations of the State Water Project (SWP) and Central Valley Project (CVP), or other changes in water availability, on agricultural practices in the San Joaquin Valley (p. 12).
7. Concise summaries integrated with informative graphics (below, p. 9 and 13). The Current Draft states that comparisons of alternatives will be summarized in the Final Report (p. 1-35).

While some of the missing content has been deferred to the Final Report (examples 2, 4, and 7), other gaps have been rationalized by deeming impacts “too speculative” for assessment.

CEQA guidance directs agencies to avoid speculation in preparing an EIR/EIS[7] . To speculate, however, is to have so little knowledge that a finding must be based on conjecture or guesswork. Ignorance to this degree does not apply to potential impacts of WaterFix on levee maintenance (example 3; see p. 7) or on San Joaquin Valley agriculture (example 6; p. 12).

Even if content now lacking would go beyond what is legally required for an EIR/EIS, providing such content could assist scientists, decision-makers, and the public in evaluating California WaterFix and Delta problems of statewide importance (above, p. 1).

Adaptive management

The guidelines for an EIR/EIS do not specifically call for an adaptive-management plan (or even for adaptive management). However, if the project is to be consistent with the Delta Plan (as legally mandated), adaptive management should be part of the design.

The Current Draft relies on adaptive management to address uncertainties in the proposed project, especially in relation to water operations. The development of the Current Draft from the Previous Draft is itself an exercise in adaptive management, using new information to revise a project during the planning stage. Yet adaptive management continues to be considered largely in terms of how it is to be organized (i.e., coordinated with other existing or proposed adaptive-management collaborations) rather than how it is to be done (i.e., the process of adaptive management). Adaptive management should be integral with planned actions and management—the Plan A rather than a Plan B to be added later if conditions warrant. The lack of a substantive treatment of adaptive management in the Current Draft indicates that it is not considered a high priority or the proposers have been unable to develop a substantive idea of how adaptive management would work for the project.

There is a very general and brief mention of the steps in the adaptive management process in Section 4 (p. 4.1-6 to 4.1-7), but nothing more about the process. We were not looking here for a primer on adaptive management. Rather, we expected to find serious consideration of barriers and constraints that have impeded implementation of adaptive management in the Delta and elsewhere (which are detailed in the Delta Plan), along with lessons learned on how adaptive management can be conducted overcome these problems.

The Current Draft contains general statements on how collaborative science and adaptive management under California WaterFix would be linked with the Delta Collaborative Science and Adaptive Management Program (CSAMP) and the Collaborative Adaptive Management Team (CAMT). These efforts, however, have taken place in the context of regulations and permits, such as biological opinions and biological assessments required under the Endangered Species Act. We did not find examples of how adaptive management would be applied to assessing—and finding ways to reduce—the environmental impacts of project construction and operations.

Project construction, mitigation, and operations provide many opportunities for adaptive management, both for the benefit of the project as well as for other Delta habitat and ecosystem initiatives, such as EcoRestore. To be effective in addressing unexpected outcomes and the need for mid-course corrections, an adaptive-management management team should evaluate a broad range of actions and their consequences from the beginning, as plans are being developed, to facilitate the early implementation and effectiveness of mitigation activities.

[7] https://s3.amazonaws.com/californiawater/pdfs/bo0lx_Delta_ISB_Draft_Statement_&_Response_Letter_-_Enos_-_FINAL.pdf

The Current Draft defers details on how adaptive management will be made to work: "An adaptive management and monitoring program will be implemented to develop additional scientific information during the course of project construction and operations to inform and improve conveyance facility operational limits and criteria" (p. ES-17). This is too late. If adaptive management and monitoring are central to California WaterFix, then details of how they will be done and resourced should be developed at the outset (now) so they can be better reviewed, improved, and integrated into related Delta activities. The details could include setting species-specific thresholds and timelines for action, creating a Delta Adaptive Management Team, and capitalizing on unplanned experiments such as the current drought[8]. Illustrative examples could use specific scenarios with target thresholds, decision points, and alternatives. The missing details also include commitments and funding needed for science-based adaptive management and restoration to be developed and, more importantly, to be effective.

The protracted development of the BDCP and its successors has provided ample time for an adaptive-management plan to be fleshed out. The Current Draft does little more than promise that collaborations will occur and that adaptive management will be implemented. This level of assurance contrasts with the central role of adaptive management in the Delta Plan and with the need to manage adaptively as climate continues to change and new contingencies arise.

Restoration as mitigation

Restoration projects should not be planned and implemented as single, stand-alone projects but must be considered in a broader, landscape context. We highlighted the landscape scale in our review of the Previous Draft and also in an earlier review of habitat restoration in the Delta[9]. A landscape approach applies not just to projects that are part of EcoRestore, but also to projects envisioned as mitigation in the Current Draft, even though the amount of habitat restoration included (as mitigation) in the Current Draft has been greatly reduced. On August 13 and 14, representatives of WaterFix and EcoRestore acknowledged the importance of the landscape scale, but the Current Draft gives it little attention. Simply because the CEQA and NEPA guidelines do not specifically call for landscape-level analyses is not a sufficient reason to ignore them.

Wetland restoration is presented as a key element of mitigation of significant impacts (example below in comments on Chapter 12, which begin on p. 18). We noticed little attention to the sequence required for assessing potential impacts to wetlands: first, avoid wetland loss; second, if wetland loss cannot be avoided, minimize losses; and third, if avoidance or minimization of wetland loss is not feasible, compensate. Much of the emphasis in the Current Draft is on the third element. Sequencing apparently will be addressed as part of the permitting process with the US Army Corps of Engineers (USACE) for mitigation related to the discharge of dredged or fill material.[10] However, it is difficult to evaluate the impacts on wetlands in advance of a clarification of sequencing and criteria for feasibility.

Mitigation ratios

Restoring a former wetland or a highly degraded wetland is preferable to creating wetlands from uplands[11]. When an existing wetland is restored, however, there is no net gain of

[8] http://deltacouncil.ca.gov/docs/adaptive-management-report-v-8
[9] http://deltacouncil.ca.gov/sites/default/files/documents/files/HABITAT%20RESTORATION%20REVIEW%20FINAL.pdf
[10] Letter from Cassandra Enos-Nobriga, DWR, September 21, 2015.
[11] http://www.nap.edu/openbook.php?isbn=0309074320

area, so it is unclear whether credits for improving existing wetlands would be considered equivalent to creating wetlands where they did not recently exist.

In view of inevitable shortcomings and time delays in wetland restorations, mitigation ratios should exceed 1:1 for enhancement of existing wetlands. The ratios should be presented, rather than making vague commitments such as "restore or create 37 acres of tidal wetland…." The Final Draft also needs to clarify how much of the wetland restoration is out-of-kind and how much is in-kind replacement of losses. It should examine whether enough tidal area exists of similar tidal amplitude for in-kind replacement of tidal wetlands, and whether such areas will exist with future sea-level rise. We agree that out-of-kind mitigation can be preferable to in-kind when the trade-offs are known and quantified and mitigation is conducted within a watershed context, as described in USACE's 2010 guidance for compensatory wetland mitigation.[12] Since then, many science-based approaches have been developed to aid decision-making at watershed scales, including the 2014 Watershed Approach Handbook produced by the Environmental Law Institute and The Nature Conservancy[13].

Restoration timing and funding

To reduce uncertainty about outcomes, allow for beneficial and economical adaptive management, and allow investigators to clarify benefits before the full impacts occur, mitigation actions should be initiated as early as possible. Mitigation banks are mentioned, but are any operational or planned for operation soon? The potential for landowners to develop mitigation banks could be encouraged so restoration could begin immediately, engendering better use of local knowledge, financial profit, and local support for the project. We are told that the timing of mitigation will be coordinated with other review processes that are currently ongoing.[6]

Levees

A comprehensive assessment of environmental impacts should relate California WaterFix to levee failure by examining the consequences each may have for the other. The interplay between conveyance and levees is receiving additional attention through the Delta Levee Investment Strategy.

On the one hand, the Current Draft fails to consider how levee failures would affect the short-term and long-term water operations spelled out in Table 4.1-2. A rough estimate was proposed under the Delta Risk Management Study[14] and another is part of a cost-benefit analysis for the BDCP[15]. The Final Report should provide analyses that incorporate these estimates.

On the other hand, the Current Draft also fails to consider how implementing the project would affect the basis for setting the State's priorities in supporting Delta levee maintenance. This potential impact is illustrated by a recent scoring system of levee-project proposals that awards points for expected benefits to "export water supply reliability"[16]. Further efforts to quantify these benefits have been recommended as part of a comprehensive risk assessment that

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[12] http://www.sac.usace.army.mil/Portals/43/docs/regulatory/Guidelines_for_Preparing_a_Compensatory_Mitigation_Planf.pdf

[13] https://www.eli.org/sites/default/files/eli-pubs/watershed-approach-handbook-improving-outcomes-and-increasing-benefits-associated-wetland-and-stream_0.pdf

[14] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Delta_Seismic_Risk_Report.pdf

[15] http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Draft_BDCP_Statewide_Economic_Impact_Report_8513.sflb.ashx

[16] http://www.water.ca.gov/floodsafe/fessro/docs/special_PSP14_final.pdf

would guide the Delta Levees Investment Strategy[17]. Public safety, a focus of the Delta Flood Emergency Management Plan,[18] is just one asset that levees protect. The Current Draft does not evaluate how the proposed project may affect estimates of the assets that the levees protect.

The Current Draft cites levee fragility mainly as a reason to build isolated conveyance for Sacramento River water (examples, p. 1-1, 1-7, 1-9). In a similar vein, the California WaterFix website states, "Aging dirt levees are all that protect most of California's water supplies from the affects [*sic*] of climate change. Rising sea levels, intense storms, and floods could all cause these levees to fail, which would contaminate our fresh water with salt, and disrupt water service to 25 million Californians"[19]. Neither the Previous Draft nor the Current Draft, however, provides a resource chapter about Delta levees. Such a chapter would be an excellent place to examine interacting impacts of conveyance and levees.

Long-term effects

With the shortened time period, several potential long-term impacts of or on the proposed project no longer receive attention. While these effects may not become problematic during the initial permit period, many are likely to affect project operations and their capacity to deliver benefits over the long operational life of the proposed conveyance facilities. In our view, consideration of these long-term effects should be part of the evaluation of the science foundation of the proposed project.

The No-Action alternative establishes the baseline for evaluating impacts and benefits of the proposed alternative(s). It is therefore important to consider carefully how the baseline is established, as this can determine whether particular consequences of the alternatives have costs or benefits. Climate change, for example, is considered under the No-Action alternative in the Current Draft, as is sea-level rise. Climate change is expected to reduce water availability for the proposed northern intakes, and both climate change and sea-level rise are expected to influence tidal energy and salinity intrusion within the Delta[20]. Changes in water temperature may influence the condition of fishes that are highly temperature-dependent in the current analyses. These environmental effects, in turn, are likely to influence environmental management and regulation; from the standpoint of water quality they may even yield environmental benefits if agricultural acreage decreases and agricultural impacts are reduced.

Rather than consider such effects, however, the Current Draft focuses on how the proposed project would affect "the Delta's resiliency and adaptability to expected climate change" (Current Draft section 4.3.25). Quite apart from the fact that "resiliency" and "adaptability" are scarcely operational terms, the failure to consider how climate change and sea-level rise could affect the outcomes of the proposed project is a concern that carries over from our 2014 review and is accentuated by the current drought (below, p. 11).

The Current Draft states that "Groundwater resources are not anticipated to be substantially affected in the Delta Region under the No Action Alternative (ELT) because surface water inflows to this area are sufficient to satisfy most of the agricultural, industrial, and municipal water supply needs" (p. 4.2-16). This conclusion is built on questionable assumptions; the current drought illustrates how agriculture turns to groundwater when surface-water availability diminishes. Groundwater regulation under the recently enacted Sustainable

[17] http://deltacouncil.ca.gov/docs/delta-levee-investment-strategy/dlis-peer-review-technical-memorandum-31
[18] http://www.water.ca.gov/floodmgmt/hafoo/fob/dreprrp/InterdepartmentalDraftDFEMP-2014.pdf.
[19] http://www.californiawaterfix.com/problem
[20] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0024465

Groundwater Management Act (SGMA) can also be expected to have long-term effects on the proposed project—effects that the Current Draft does not assess. Ending of more than a million acre-feet of overdraft in the southern Central Valley under the SGMA is likely to increase demand for water exports from the Delta in the coming decades. The Current Draft discusses the potential effects of the project on groundwater (for example, in Sections 4.3.3 and 5.2.2.3), but we found only two brief, descriptive mentions of SGMA in the 235 pages of Section 5. The implications of prolonged droughts (e.g., on levee integrity) and of the consequences of SGMA receive too little attention in the Current Draft.

The Current Draft suggests that unnamed "other programs" that are "separate from the proposed project" will use elements of the Previous Draft to implement long-term conservation efforts that are not part of California WaterFix (Current Draft, p. 1-3). The Final Report should provide assurances that such other programs will step in, and could go further in considering their long-term prospects.

Informative summaries and comparisons

According to guidance for project proponents, "Environmental impact statements shall be written in plain language and may use appropriate graphics so that decision-makers and the public can readily understand them" (Code of Federal Regulations, 40 CFR 1502.8). Far-reaching decisions should not hinge on environmental documents that few can grasp.

This guidance applies all the more to an EIR/EIS of the scope, complexity, and importance of the Current Draft. It demands excellent comparative descriptions of alternatives that are supported by readable tables and high-quality graphics, enumeration of major points, well-organized appendices, and integration of main figures with the text. For policy deliberations, the presentation of alternatives should include explicit comparisons of water supply deliveries and reliabilities as well as economic performance. For decision-makers, scientists, and the public, summaries of impacts should state underlying assumptions clearly and highlight major uncertainties. The Current Draft is inadequate in these regards.

The Previous Draft provided text-only summaries for just the two longest of its resource chapters (Chapters 11 and 12). A fragmentary comparison of alternatives was buried in a chapter on "Other CEQA/NEPA required sections" (part 3 of Chapter 31) but fell far short of what was needed. Both the Previous and Current Drafts have been accompanied by a variety of outreach products for broad audiences (e.g., the descriptive overview of the BDCP Draft EIR/EIS[21]). These products do little to compensate for the overall paucity of readable summaries and comparisons in the Previous and Current Drafts.

For over three years, the Delta ISB has been specifically requesting summaries and comparisons: first in June 2012[22], then in June 2013[23], and again in a review of the Previous Draft in May 2014 (footnote 1, p. 1). Appallingly, such summaries and comparisons remain absent in the Current Draft. The generally clear writing in Sections 1 through 4 shows that the preparers are capable of providing the requested summaries and comparisons. Prescriptions in CEQA and NEPA in no way exclude cogent summaries, clear comparisons, or informative graphics. And three years is more than enough time to have developed them.

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[21] Highlights+of+the+Draft+EIS-EIR+12-9-13.pdf

[22] http://deltacouncil.ca.gov/sites/default/files/documents/files/DISB_Letter_to_JMeral_and_DHoffman-Floerke_061212.pdf

[23] http://deltacouncil.ca.gov/sites/default/files/documents/files /DISB%20Comments%20on%20Draft%20BDCP%20Document.doc_.pdf

On August 14, 2015, representatives of California WaterFix assured us that this kind of content would eventually appear, but only in the Final Report. That will be far too late in the EIR/EIS process for content so critical to comprehending what is being proposed and its potential impacts.

PRIOR CONCERNS AND THEIR RELEVANCE TO THE CURRENT DRAFT

The Delta ISB review of May 14, 2014 emphasized eight broad areas of concern about the scientific basis for the Previous Draft. Each is summarized below, followed by a brief appraisal of how (or whether) the concern has been dealt with in the Current Draft. While the reduced scope of the proposed project has reduced the relevance of some issues, particularly habitat restoration and other conservation measures, other concerns persist.

Our persistent concerns include the treatment of uncertainty, the implementation of adaptive management, and the use of risk analysis. These topics receive little or no further attention in the Current Draft. We also found few revisions in response to points we raised previously about linkages among species, ecosystem components, or landscapes; the potential effects of climate change and sea-level rise; and the potential effects of changes in water availability on agricultural practices and the consequent effects on the Delta. Our previous comments about presentation also pertain.

Effectiveness of conservation actions

Our 2014 review found that many of the impact assessments hinged on optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration.

This is arguably less of a concern now, given the substantially shorter time frame of the revised project and narrower range of conservation actions designed for compensatory restoration. Nonetheless, the Current Draft retains unwarranted optimism, as on page 4.3.25-10: “By reducing stressors on the Delta ecosystem through predator control at the north Delta intakes and Clifton Court Forebay and installation of a nonphysical fish barrier at Georgiana Slough, Alternative 4A will contribute to the health of the ecosystem and of individual species populations making them stronger and more resilient to the potential variability and extremes caused by climate change.” A scientific basis for this statement is lacking, and an adaptive or risk-based management framework is not offered for the likely event that such optimism is unfulfilled.

Is it feasible for even the reduced amounts of mitigation and restoration to be completed within the time period proposed? Perhaps yes. Is it feasible that these actions will mitigate impacts over the long term? This is more problematic. To be effective, mitigation actions should deal with both the immediate and long-term consequences of the project. The proposed permitting should allow for monitoring long enough to assess the effectiveness of habitat restoration measures, which will need to extend beyond the initial permitting period.

Uncertainty

The 2014 review found the BDCP encumbered by uncertainties that were considered inconsistently and incompletely. We commented previously that modeling was not used effectively enough in bracketing uncertainties or exploring how they may propagate or be addressed.

In the Current Draft, uncertainties and their consequences remain inadequately addressed, improvements notwithstanding. Uncertainties will now be dealt with by establishing "a robust program of collaborative science, monitoring, and adaptive management" (ES 4.2). No details about this program are provided, so there is no way to assess how (or whether) uncertainties will be dealt with effectively. Although sensitivity modeling was used to address the effects of changes in the footprint and other minor changes of the revised project, full model runs were not carried out to assess the overall effects of the specific changes. Consequently, modeling that would help to bracket ranges of uncertainties or (more importantly) assess propagation of uncertainties is still inadequate.

Many of our prior concerns about uncertainties pertained to impacts on fish. If those uncertainties have now been addressed in Chapter 11, they are difficult to evaluate because changes to that chapter have not been tracked in the public draft (below, p. 17).

There are also uncertainties with the data generated from model outputs, although values are often presented with no accompanying error estimates. This situation could be improved by presenting results from an ensemble of models and comparing the outputs.

Effects of climate change and sea-level rise on the proposed actions

Our 2014 review stated concerns that the Previous Draft underestimated effects of climate change and sea-level rise across the 50-year timeline of the BDCP. With the nominal duration shortened substantially, most of the projected impacts of climate change and sea-level rise may occur later. But climate-related issues remain.

First, the Current Draft is probably outdated in its information on climate change and sea-level rise. It relies on information used in modeling climate change and sea-level rise in the Previous Draft, in which the modeling was conducted several years before December 2013. The absence of the climate-change chapter (Chapter 29) in the Previous Draft from Appendix A in the Current Draft indicates that no changes were made. In fact, the approaches and assumptions in the Current Draft remained unchanged from the Previous Draft in order to ensure consistency and comparability across all the Alternatives, even though newer scientific information had become available.[6] Yet climatic extremes, in particular, are a topic of intense scientific study, illustrated by computer simulations of ecological futures[24] and findings about unprecedented drought[25]. The Current Draft does not demonstrate consideration of recently available climate science, and it defers to the Final Report analysis of future system operations under potential climate and sea-level conditions. In fact, the Current Draft generally neglects recent literature, suggesting a loose interpretation of "best available science."

Second, climate change and sea-level rise are now included in the No-Action Alternative, as they will transpire whether or not WaterFix moves forward. A changed future thus becomes the baseline against which Alternative 4A (and the others) are compared. Changes in outflow from the Delta due to seasonal effects of climate change and the need to meet fall X2 requirements are considered in Section 4.3.1. The difference in outcomes then depends on assumptions about the facility and operations of Alternative 4A and the other Alternatives. Sensitivity analyses indicate that the impacts of the different Alternatives are generally similar in comparison to the No Action Alternative under the range of climate projections considered.[6] Thus, "Delta exports would either remain similar or increase in wetter years and remain similar

[24] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0024465

[25] Cook, B.I., Ault, T.R., and Smerdon, J.E., 2015, Unprecedented 21st century drought risk in the American Southwest and Central Plains: *Science Advances*, v. 1, doi:10.1126/sciadv.1400082.

or decrease in the drier years under Alternative 4A as compared to the conditions without the project." (p. 4.3.1-4). Such an inconclusive conclusion reinforces the need to be able to adapt to different outcomes. Simply because the Alternatives are expected to relate similarly to a No Action Alternative that includes climate change does not mean that the Alternatives will be unaffected by climate change.

Interactions among species, landscapes, and the proposed actions

The Previous Draft acknowledged the complexities produced by webs of interactions, but it focused on individual species, particular places, or specific actions that were considered in isolation from other species, places, or actions. Potential predator-prey interactions and competition among covered and non-covered fish species were not fully recognized. Confounding interactions that may enhance or undermine the effectiveness of proposed actions were overlooked. In our 2014 review we recommended describing and evaluating the potential consequences of such interactions, particularly in Chapters 11 (Fish and aquatic resources) and 12 (Terrestrial resources).

The Current Draft recognizes that mitigation measures for one species or community type may have negative impacts on other species or communities, and mitigation plans may be adjusted accordingly. But the trade-offs do not seem to be analyzed or synthesized. This emphasizes the need for a broader landscape or ecosystem approach that comprehensively integrates these conflicting effects.

Effects on San Francisco Bay, levees, and south-of-Delta environments

In 2014 we pointed to three kinds of impacts that the Previous Draft overlooked: (1) effects on San Pablo Bay and San Francisco Bay in relation to Delta tides, salinity, and migratory fish; (2) effects of levee failures on the proposed BDCP actions and effects of isolated conveyance on incentives for levee investments; and (3) effects of increased water reliability on crops planted, fertilizers and pesticides used, and the quality of agricultural runoff. The Current Draft responds in part to point 1 (in 11.3.2.7) while neglecting point 2 (above, p. 7) and point 3.

On point 3: Although the Current Draft considers how the project might affect groundwater levels south of the Delta (7.14 to 7.18), it continues to neglect the environmental effects of water use south of (or within) the Delta. Section 4.3.26.4 describes how increased water-supply reliability could lead to increased agricultural production, especially during dry years. Elsewhere, a benefit-cost analysis performed by ICF and the Battle Group[26] calculated the economic benefits of increased water deliveries to agriculture in the Delta. The Current Draft does not fully consider the consequences of these assumptions, or of the projections that the project may enhance water-supply reliability but may or may not increase water deliveries to agriculture (depending on a host of factors). We have been told that to consider such possibilities would be "too speculative" and that such speculations are explicitly discouraged in an EIR/EIS. Yet such consequences bear directly on the feasibility and effectiveness of the project, and sufficient information is available to bracket a range of potential effects. Our previous concerns are undiminished.

The impacts of water deliveries south of the Delta extend to the question of how each intake capacity (3,000, 9,000, or 15,000 cfs) may affect population growth in Southern

[26] Hecht, J., and Sunding, D., Draft Bay Delta Conservation Plan statewide economic impact report, August 2013.

California. Section 4.4.1-9 treats the growth-enabling effects of alternative 2D lightly, saying that additional EIS review would be needed for future developments.

Implementing adaptive management

In the Previous Draft, details about adaptive management were to be left to a future management team. In our 2014 review we asked about situations where adaptive management may be inappropriate or impossible to use, contingency plans in case things do not work as planned, and specific thresholds for action.

Although most ecological restoration actions have been shifted to California EcoRestore (p. 5), we retain these and other concerns about adaptive management under California WaterFix. If the mitigation measures for terrestrial resources are implemented as described, for example, they should compensate for habitat losses and disturbance effects of the project. The test will be whether the measures will be undertaken as planned, be as effective as hoped, and continue long enough to fully mitigate effects. This is where adaptive management and having contingency plans in place becomes critically important. It is not apparent that the mitigation plans include these components.

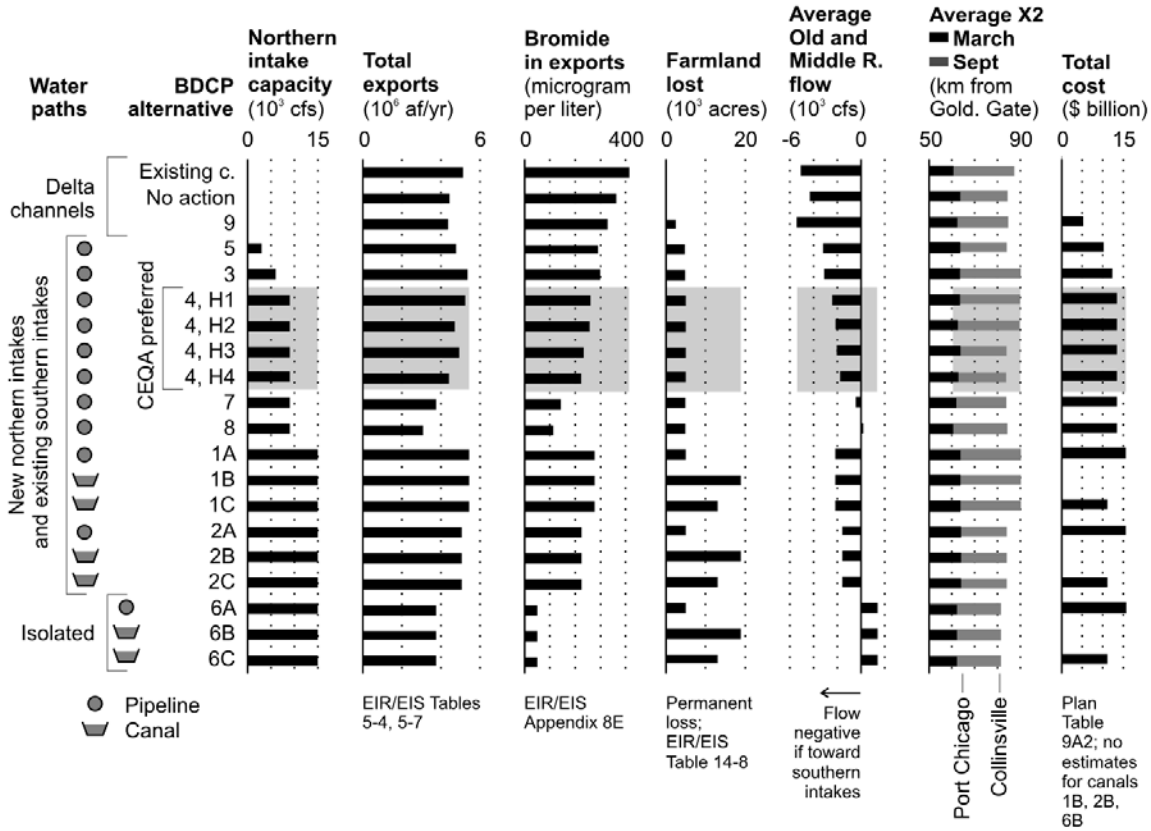
Reducing and managing risk

Our 2014 review advised using risk assessment and decision theory in evaluating the proposed BDCP actions and in preparing contingency plans. We noticed little improvement on this issue, just a mention that it might be considered later. This is not how the process should be used.

Comparing BDCP alternatives

The Previous Draft contained few examples of concise text and supporting graphics that compare alternatives and evaluate critical underlying assumptions. Rudimentary comparisons of alternatives were almost entirely absent. The Current Draft retains this fundamental inadequacy (p. 9).

Our 2014 review urged development and integration of graphics that offer informative summaries at a glance. We offered the example reproduced below. If the Current Draft contains such graphics, they would need to be ferreted out from long lists of individual pdf files. Because they are not integrated into the text where they are referenced in the Current Draft, the figures cannot readily illustrate key points.



COMMENTS ON INDIVIDUAL SECTIONS AND CHAPTERS

This final section of the review contains minimally edited comments on specific points or concerns. These comments are organized by Section or Chapter in the Current Draft. Many are indexed to pages in the section or chapter named in the heading.

Alternatives 4A, 2D, and 5A (Section 4)

It is good that the proposed alternatives are seen as flexible proposals, as it is difficult to imagine that any proposal for such a complex and evolving system could be implemented precisely as proposed. Some initial and ongoing modifications seem desirable, and unavoidable.

The operating guidance for the new alternatives seems isolated from the many other water management and environmental activities in and upstream of the Delta likely to be important for managing environmental and water supply resources related to Delta diversions. While it is difficult to specify detailed operations for such a complex system, more details on the governance of operations (such as the Real Time Operations process) would be useful. The operational details offered seem to have unrealistic and inflexible specificity. Presentations of delivery-reliability for different alternatives remain absent. Environmental regulations on Delta diversions have tended to change significantly and abruptly in recent decades, and seem likely to change in the future. How sensitive are project water supply and environmental performance to changes in operating criteria?

The collaborative science ideas seem philosophically attractive, but are not given much substance. Monitoring is mentioned, but details of organization, intent, and resources seem

lacking. Adequate funding to support monitoring, collaborative science, and adaptive management is a chronic problem. Section ES.4.2 states that "Proponents of the collaborative science and monitoring program will agree to provide or seek additional funding when existing resources are insufficient." This suggests that these activities are lower in priority than they should be.

The three new alternatives, 4A, 2D, and 5A, seem to have modest changes over some previous alternatives, with the exception of not being accompanied by a more comprehensive environmental program. In terms of diversion capacities, they cover a wide range, 3,000 cfs (5A), 9,000 cfs (4A), and 15,000 cfs (2D). The tables comparing descriptions of the new alternatives to previous Alternative 4 are useful, but should be supplemented by a direct comparison of the three new alternatives.

The new Sustainable Groundwater Management Act (SGMA) seems likely to increase demands for water diversions from the Delta to the south to partially compensate for the roughly 1.5-2 maf/year that is currently supplied by groundwater overdraft.

The State seems embarked on a long-term reduction in urban water use, particularly outdoor irrigation. Such a reduction in urban water use is likely to have some modest effects on many of the water-demand and scarcity impacts discussed.

The climate change analysis of changes in Delta inflows and outflows is useful, but isolating the graphs in a separate document disembodies the discussion. The fragmentation of the document by removing each Section 4 figure into a separate file is inconvenient for all, and makes integrated reading practically impossible for many.

The details of the alternative analyses seem mostly relevant and potentially useful. Much can be learned about the system and the general magnitude of likely future outcomes from patient and prolonged reading of this text. An important idea that emerges from a reading of the No Action Alternative is that the Delta, and California water management, is likely to change in many ways with or without the proposed project. The No Action and other alternatives also illustrate the significant inter-connectedness of California's water system. The range of impacts considered is impressive, but poorly organized and summarized.

The discussion of disinfection by-product precursor effects in Delta waters is improved significantly, but could be made more quantitative in terms of economic and public-health impacts.

The discussion on electromagnetic fields is suitably brief, while the tsunami discussion could be condensed.

The effects of the likely listing of additional native fish species as threatened or endangered seems likely to have major effects on project and alternative performance. These seem prudent to discuss, and perhaps analyze.

Is Alternative 2D, with 15,000 cfs capacity, a serious alternative? Does it deserve any space at all?

Table 4.1-8 implies that tidal brackish/*Schoenoplectus* marsh. Should some of this be considered tidal freshwater marsh?

The dynamics of the Delta are largely determined by water flows. The Current Draft acknowledges that water flows and salinity will change in complex ways. There are statements about how inflows, outflows, and exports will change in Alternative 4A in relation to baseline (No-Action) conditions (p. 4.3.8-13). What is the scientific basis on which these changes will be managed? Will models be used? What confidence should we have in current projections? Have the effects of droughts or deluges been considered?

4.3.7-10, line 13: Text on disturbing sediments and releasing contaminants needs to add nitrogen and phosphorus to the concerns.

Water quality (Chapter 8)

8-3, line 13: *Microcystis* is singled out as a cyanobacterium that can (but doesn't always) produce the toxin, myrocystin; however, there are other cyanobacteria that sometimes produce other toxins. Different genera can differ in the nutrient that limits their blooms (see 2014 letter by Hans Paerl in Science 346(6406): 175-176). For example, *Microcystis* blooms can be triggered by N additions because this species lacks heterocysts, while toxin-producing *Anabaena* blooms can be triggered by P additions, because *Anabaena* has heterocysts and can fix N. The frequently repeated discussion of cyanobacteria blooms needs to be updated. Also cite Paerl on page 8-45 line 8. Ditto on page 8-103 and 8-106 line 34.

8-8. In our earlier comments, we recommended that carbon be separated into its dissolved and particulate forms for consideration of water quality impacts because dissolved organic carbon (DOC) is the form most likely to react with chloride and bromide and result in formation of disinfection by-products. The section on bromide focuses on interactions with total organic carbon (TOC), rather than DOC. Carbon is primarily considered with respect to formation of disinfection by-products but carbon plays a central role in the dynamics of the Delta, affecting processes such as metabolism, acidity, nutrient uptake, and bioavailability of toxic compounds. Carbon cycling determines ecosystem structure and function in aquatic systems. It also modifies the influence and consequences of other chemicals and processes in aquatic systems. Dissolved organic carbon (DOC), for example, influences light and temperature regimes by absorbing solar radiation, affects transport and bioavailability of metals, and controls pH in some freshwater systems. Respiration of organic carbon influences dissolved oxygen concentrations and pH.

8-18, line 12 says that salt disposal sites were to be added in 2014; were they?

8-19 and 8-20: "CECs" is not defined and seems to be used incorrectly. Change "CECs" to "EDCs" on page 8-19 and to "PPCPs" on page 8-20.

8-21, line 18-19: Such a statement should be qualified. The conclusion that marine waters are N-limited and inland waters are P-limited is outdated. Recent papers, including the above, find more complex patterns.

8-22, lines 18 and 30: Choose either "cyanobacteria" or "blue-green algae;" using both will confuse readers who may perceive them as different.

8-23, lines 15-16: Say how the N:P ratio changed composition, not just that it did change composition.

8-23 through 8-25: Uncertainties (e.g., standard deviation or standard error of the mean) associated with the mean concentrations of DOC should be presented. It is impossible to interpret differences between the values that are presented without knowledge of the variation around the mean values (e.g., without knowledge of variation around the mean, it is difficult to evaluate whether DOC concentrations at south vs. north-of-Delta stations and Banks headworks differ from one another; 3.9 to 4.2 mg/L vs. 4.3 mg/L).

8-65, line 12: Specify if DO is for daytime or night, and for surface, bottom or mid-water column.

8-75, line 6: The failure to consider dissolved P (DP) should be addressed; there is much greater uncertainty. The adherence of some P to sediment does not prevent considerable

discharge of P as DP. Also on page 8-95 line 40, qualify predictions due to lack of consideration of DP.

8-82, line 4-5: It seems unlikely that current levels of *Microcystis* growth in the Delta are dependent on the exclusive uptake of ammonia. Temperature is one of the primary factors driving *Microcystis* blooms and global warming could promote bloom occurrence. Consider revising this section to, "Because it seems unlikely that current levels of *Microcystis* growth in the Delta are dependent on the exclusive uptake of ammonia, the frequency, magnitude and geographic extent of *Microcystis* under future scenarios is difficult to predict."

8-105, line 8: Would total nitrogen be dominated by nitrate just by increasing ammonia removal? Depending on redox and microbiota, why wouldn't nitrate be converted to ammonium?

A lot of attention is given to factors controlling *Microcystis* blooms in this chapter but little attention is given to its toxicity. Just as factors controlling blooms are not fully understood, the regulating factors of cellular toxin contents remain poorly understood. As a result, the impact of blooms on the environment can vary (e.g., large blooms of non-toxic or low toxin organisms may have impacts on environmental variables such as nutrient uptake and dissolved oxygen consumption while small blooms of highly toxic organisms could impact food webs) [see: Ma et al. (2015) Toxic and non-toxic strains of *Microcystis aeruginosa* induce temperature dependent allelopathy toward growth and photosynthesis of *Chlorella vulgaris*. Harmful Algae 48: 21–29].

Fish and aquatic resources (Chapter 11)

We found individual conclusions or new analyses difficult to identify in this key chapter because changes to it were not tracked in the public version of the Current Draft and there was no table of contents that could have assisted in side-by-side comparison with the Previous Draft.

Effects of temperature

We noticed more emphasis on temperature concerning the fish 'downstream' impacts (but without tracked changes this becomes difficult to document).

The main temperature variable used expresses the percentage of time when monthly mean temperatures exceed a certain rate or fall within a certain boundary. The biological impact, however, is difficult to assess with these numbers. If all of the change occurred just during operations or just during one day, the biological impact could be much different than a small change every day (provided by using means). Graphs of changes and listing of extreme highs and lows during a model run would have more biological meaning. Also, comparisons were made using current baseline conditions and did not consider climate change effects on temperatures.

Fish screens

It is unclear how (and how well) the fish screens would work. The description of fish screens indicates that fish >20 mm are excluded, but what about fish and larvae that are <20 mm, as well as eggs? Table 11-21 seems out of date, because some fish screens appear to have been installed, but data on their effects are not given. Despite the lack of specific data on how well screens function, the conclusion that there will be no significant impact is stated as certain (e.g., page 1-100 line 38).

Here, as in many other places, measures are assumed to function as planned, with no evidence to support the assumptions. The level of certainty seems optimistic, and it is unclear whether there are any contingency plans in case things don't work out as planned. This problem persists from the Previous Draft.

Invasive plants

Cleaning equipment is mentioned, but it is not specifically stated that large machinery must be cleaned before entering the Delta. Section 4.3.8-358 says equipment would be cleaned if being moved within the Delta. Cleaning is essential to reduce transfer of invasive species; a mitigating measure is to wash equipment, but it must also be enforced.

Weed control (fire, grazing) is suggested, but over what time frame? It may be needed in perpetuity. That has been our experience at what is considered the world's oldest restored prairie (the 80-yr-old Curtis Prairie, in Madison, WI).

Weed invasions can occur after construction is completed; how long will the project be responsible for weed control? 3-5 years won't suffice.

4.3.8-347. Herbicides are prescribed to keep shorebird nesting habitat free of vegetation, but toxic effects of herbicides on amphibians etc. are not considered.

4.3.8-354. Impacts of invasive plants seem underestimated. Impact analysis implies that the project disturbance area is the only concern, when dispersal into all areas will also be exacerbated. At the Arboretum, a 1200-ac area dedicated to restoration of pre-settlement vegetation, invasive plants are the main constraint. A judgment of no significant impact over just the disturbance area is overly optimistic.

4.3.8-356. Does not mention need to clean equipment to minimize import of seeds on construction equipment.

Cryptic acronym and missing unit

Figure 2: SLR x year: y axis lacks units; reader has to continue on to table 11-20 to find that it is cm.

Terrestrial biological resources (Chapter 12)

Effects on wetlands and waters of the United States (WOTUS)

Page 12-1, line 18-19 says: "Under Alternatives 2D, 4 , 4A , and 5A, larger areas of non-wetland waters of the United States would be filled due to work in Clifton Court Forebay; however, the Forebay would ultimately expand by 450 acres and thus largely offset any losses there." Is the assumption that, acre for acre, all jurisdictional waters are interchangeable, whether of different type or existing vs. created? The literature does not support this assumption.

The text argues that the wetlands would be at risk with levee deterioration, sea-level rise, seismic activity, etc. But the solution is for "other programs" to increase wetlands and riparian communities. What if this project causes the problem, e.g. via vibration?

CM1 alternative 4A would fill 775 acres of WOTUS (491 wetland acres); Alt 2D would fill 827 (527 wetland) + 1,931 ac temporary fill at Clifton Court Forebay; Alt 5A would fill 750 (470 wetland). That's a lot of area. The timing and details of mitigation measures are not provided. References to the larger Delta Plan suggest that compensations would come at unknown times. Piecemeal losses such as indicated here: "Only 1% of the habitat in the study area would be filled or converted" (Chapter 12, line 29, page 12-22) is how the US has lost its historical wetlands. What are the overall cumulative impacts of wetland losses in the Delta? What is the tipping point beyond which further wetland losses must be avoided? The proposed project is one part of the broader array of management actions in the Delta and should be considered in that broader context.

Habitat descriptions

How will mudflats be sustained for shorebirds? Exposed mud above half-tide can become vegetated rapidly. In the Delta, the bulrush *Schoenoplectus californicus* tolerates nearly continuous tidal submergence.

Are soils clayey enough for the proposed restoration of up to 34 acres of vernal pool and alkali seasonal wetland near Byron? These areas will need to pond water, not just provide depressions.

12-243, line 18: How would adding lighting to electrical wires eliminate any potential impact to black rails? This mitigation is overstated.

Several of the species accounts (e.g., bank swallow) indicate that there is uncertainty about how construction or operations will impact the species. In most cases, monitoring is proposed to assess what is happening. But to be effective, the monitoring results need to be evaluated and fed into decision-making, as visualized in the adaptive-management process. There is little explicit indication of how this will be done or funded.

Land use (Chapter 13)

Alternative 4A would allow water diversion from the northern Delta, with fish screens, multiple intakes, and diversions limited to flows that exceed certain minima, e.g., 7000 cfs. This would reduce flood-pulse amplitudes and, presumably, downstream flooding. How does this alter opportunities for riparian restoration? Which downstream river reaches are leveed and not planned to support riparian restoration? Where would riparian floodplains still be restorable?

Over what surface area does the pipeline transition to the tunnel? At some point along the pipeline-tunnel transition, wouldn't groundwater flow be affected?

Up to 14 years of construction activities were predicted for some areas (e.g., San Joaquin Co.); this would have cumulative impacts (e.g., dewatering would affect soil compaction, soil carbon, microbial functions, wildlife populations, and invasive species). What about impacts of noise on birds; e.g., how large an area would still be usable by greater sandhill cranes?

State how jurisdictional wetlands have been mapped and how the overall project net gain or net loss of wetland area has been estimated. If mitigation consists only of restoration actions in areas that are currently jurisdictional wetlands, then there would be an overall net loss of wetland area due to the project. A mitigation ratio >1:1 would be warranted to compensate for reduced wetland area. This was also a concern for Chapter 12.

Up to 277 ac of tidal wetlands are indicated as restorable; text should indicate if these are tidal freshwater or tidal brackish wetlands (or saline, as is the typical use of "tidal wetlands").

13-19. On the need to store removed aquatic vegetation until it can be disposed: there are digesters for this purpose, and they might be efficient means of mitigation if management of harvested aquatic plants will be long-term. A waste product could be turned into a resource (methane fuel).

13-19, line 12: Text says that "predator hiding spots" will be removed. What are these?

13-19, line 20: What are the E16 nonphysical fish barriers? An electrical barrier?

13-20, line 19: Boat-washing stations are mentioned; would these discharge pollutants (soap, organic debris?)

Appendix B

Legal Comments on the WATERFIX Project

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Oct. 24, 2015

WATERFIX Comments
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Via email: WATERFIXComments@icfi.com

Subject: **Appendix B** to the City of Antioch's WATERFIX/Calif. WATERFIX RDEIR/SDEIS comment letter

Dear Calif. WATERFIX:

Thank you for allowing me to submit the following comments on the Bay-Delta Conservation Plan/California WATERFIX Projects and associated RDEIR and SDEIS (referred to cumulatively as the "WATERFIX" or "Project") on behalf of the City of Antioch (City).[1]

Legal Comments on the WATERFIX Project

1. Inappropriately Deferred Studies. Operational Scenarios and Impacts:

The WATERFIX Project indicates that certain studies and certain operational aspects of the Project remain incomplete and will be analyzed at some unknown point in the future:

a. The recent Change Petition for the WATERFIX Project submitted to the SWRCB references additional studies regarding the operation and design of the project that are

1 The comments in this letter are based in part on the technical comments on WaterFix modeling and water quality impacts set forth in Appendix A to Antioch's WaterFix comments. In reviewing the following comments, it must be considered that Antioch has adjudicated pre-1914 appropriative water rights with a priority of at least 1868. Antioch was able to use its water rights prior to the 1920s year-round, and 208 to 225 days or more a year on average since the 1930s and often year around..

as yet uncompleted (see pg. 14 of the original *Supplemental Information Attachment* attached to this letter/appendix as **Ex. B-1**). Because these studies will "inform design and operation of the diversion structures," we conclude that the proposed Project and the DREIR are currently incomplete.

b. Adaptive management and operating scenarios for the Project are indicated to be developed at a later time, thus improperly deferring a critical aspect of the project.[2] It is impossible to know the full extent of water quality and flow impacts on the City's water supply and Delta public trust resources without this critical information being fully disclosed and analyzed in the Project's description and environmental impact analysis.

The fact that these details of Project design and operation are currently unknown or not yet disclosed indicates that the Project's description and impact analysis are incomplete, because all the potential impacts of the Project to water users and to fish and wildlife remain unknown and therefore undisclosed at this time. See generally CEQA Guidelines 15121, 15126, 15126.2. The uncertainty of such future operational impacts in relation to the City's superior water rights for domestic purposes (a City of over 100,000), renders the Project unreasonable per se under the California Constitution and Water Code section 100. See generally *In re Waters of Long Valley Creek Stream System* (1979) 25 Cal.3d 339 [creating uncertainty with respect to the exercise of water rights is unreasonable].

2. The DSEIR/SDEIS fails to properly inform the public of potential environmental impacts

Put simply, the environmental documents are very difficult to read – and Chapter 4 of the DREIR/RDEIS in particular. The documents cite and incorporate portions of the prior DEIR/DEIS from the prior Bay-Delta Conservation Project by reference only, and so the public is forced to go back and forth between the main document and numerous appendixes –

2 As noted by the Delta Independent Science Board in comments submitted to the Delta Stewardship Council on September 30, 2015 and in the DSC's WaterFix Comments:. "There is a very general and brief mention of the steps in the adaptive management process in Section 4 (p. 4.1-6 to 4.1-7), but nothing more about the process… We did not find examples of how adaptive management would be applied to assessing—and finding ways to reduce—the environmental impacts of project construction and operations… The current draft defers details on how adaptive management will be made to work: 'An adaptive management and monitoring program will be implemented to develop additional scientific information during the course of project construction and operations to inform and improve conveyance facility operational limits and criteria' (p. ES-17). This is too late." The City agrees.

including the prior chapters of the original DEIR/DEIS. The discussion of the new alternatives including the new preferred project alternative is over 2,000 pages long, containing complex hydrologic scenarios, dense technical and science based discussions, and citations to outside documents (e.g. D-1641). While the City recognizes that this technical information may be important to the content of the documents and impact analysis, one of the fundamental requirements of CEQA is to "inform . . . the public of the significant environmental effect of the project." CEQA Guideline 15121. Further, "public participation" is an essential element of CEQA. CEQA Guideline 15201.

The City contends that the DREIR/RDEIS is not prepared in a manner to inform the public because as presently written it would be very difficult for a downstream landowner, recreational participant or water rights owner to determine any potential environmental impacts specific to them from reviewing Chapter 4 – without the assistance of a scientist, hydrologist, or hydrologic modeler. The City is aware that others have similar concerns about the complexity and readability of this document (see for example Delta Independent Science Board comments submitted to the Delta Stewardship Council on September 30, 2015). The discussion needs to include readable summaries and clear explanations of potential impacts.

The State Water Resources Control Board ("SWRCB") has accumulated specific information on the majority of large in-Delta water users this past spring downstream of the Project in database form, and the Department of Water Resources has already used this information in its Amended Change Petition Application for the Project. The environmental documents should additionally use this information (perhaps in a series of tables) to specifically identify potential impacts to specific water users identified in this information. It is hard to imagine a better way to inform specific water users of anticipated impacts from the Project. In fact, Antioch contends that such specific water rights information and reference to specific impacts to those individual rights is required in order to proceed under the Change Petition submitted to the SWRCB. Water Code 1702; *Lester v. Doetsch* (1935) 7 Cal.App.2d 551, 555.

3. The DSEIR/SDEIS contains factually incorrect statements regarding Antioch's use of its water rights

The WATERFIX environmental documents yet again incorrectly conclude that the City only occasionally uses its own water rights and that such use has been "historically

opportunistic (see for example Chap. 4, 4.3.21-3. In fact, the City maximizes the use of those rights when water quality is sufficient for municipal use. The City pumps potable water from the Delta every day when it is not too saline to do so, which has been approximately 208 to 225 days per year since the 1930s – and nearly year around in many years. [3]

The City contends that this improper conclusion has invalidly impacted the preparer's view of the potential impacts to the City's water supply. As discussed in more detail in Antioch's Appendix A of its WATERFIX Comments, the Project will have potential adverse impacts to the City's water rights and water supply by reducing Delta outflow and increasing salinity. Antioch's water rights are senior in priority to the rights for water to be diverted pursuant to the WATERFIX Project. And yet, the RDEIR/SDEIS fails to adequately analyze the Projects' impacts to the City's water rights or to propose any mitigation.

. The RDEIR/SDEIS also fails to properly recognize that the source of Antioch's water supply includes the tributary flow of the Sacramento River via Georgiana and Three Mile Sloughs. Without acknowledging the correct facts and without understanding the nature and scope of the City's water rights, it is simply not possible for the RDEIR/SDEIS to have adequately analyzed the impacts of WATERFIX operations on the City's water rights and water supply.

4. The DSEIR/SDEIS relies on faulty modeling in determining impacts and thresholds of significance

As further explained in the City's technical Appendix A, the modeling that was performed to evaluate the potential impacts of the project did not model the proposed project (i.e., the 2015 Alternative 4A), but a prior and significantly different preferred project proposal (i.e., the 2013 Alternative 4). As additionally detailed in Appendix A, the "sensitivity analyses" that were performed to assess the potential impacts of the actual proposed project were wholly inadequate. In effect, the proposed project has not been evaluated at all, and it is not possible to assess the impacts of the proposed project using the modeling analysis provided by the project proponents.

3 Prior to the early 1930s and the advent of significant upstream diversions on both the Sacramento and San Joaquin Rivers, the City could pump potable water year around every year except in the most severe drought years. See the City's prior comments on the BDCP which are included with these comments.

The SDEIR/DSEIS uses certain standards set by applicable regulatory agencies as thresholds of significance for impacts to downstream beneficial uses (e.g. D-1641). Even assuming that the use of such regulatory standards somehow meets the requirements of Water Code section 1702 in determining downstream impacts, these thresholds are rendered useless by the application of the defective modeling used.

5. The DSEIR/SDEIS fails to properly identify and analyze impacts on beneficial uses downstream of the Project.

Both CEQA (e.g. *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 655) and Water Code Section 1702 require that the WATERFIX Project properly analyze impacts (flow, water quality) on beneficial uses downstream of the proposed new changed diversion locations. Specifically, a change in the location of a diversion such as that anticipated by the Project must identify and avoid impacts to specific impacted beneficial uses – especially uses with superior rights. *Lester v. Doetsch* (1935) 7 Cal.App.2d 551, 555.[4]

The RDEIR/SDEIS fails to meet these requirements. As noted above, the RDEIR/SDEIS does not identify all beneficial uses downstream of the Project nor identify and analyze potential impacts to such uses from the Project. As also noted, the identity of the majority of large downstream beneficial uses is available from the SWRCB, and the DWR has used this information in its Amended Change Petition application. And yet, this information is absent from the Project's environmental documents. Without knowing the nature, claimed legal right, amount of diversion and season of diversion and specific location of downstream diversions, it is not possible to know the Project's impacts on such diversions.

To the extent some downstream beneficial uses such as Antioch's are identified in the environmental documents, the analysis is based on mistaken facts (e.g. that the City only infrequently uses its diversion) and flawed modeling analysis as discussed in the City's Appendix A.

In sum, the Project fails to meet the requirements of CEQA and Water Code Section 1702 and the Project's potential impacts to downstream beneficial uses are in fact unknown.

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4 The City contends that diverting water out of the Delta for junior water rights used primarily for agricultural purposes in a manner that will adversely impact the City's senior domestic use water rights is unreasonable. See for example *Joslin v. Marin*

6. The DSEIR/SDEIS fails to properly explain how the Project will meet the Co-Equal goals of the Delta Reform Act and comply with the Delta Plan.

Public Resource Code section 29702 sets forth the dual/co-equal goals of providing a more reliable water supply and "protecting, restoring, and enhancing the Delta ecosystem." Section 29702 provides further that achieving the co-equal goals shall include protecting and enhancing the "unique cultural, recreational, natural resource" values of the Delta. The WATERFIX fails to meet the co-equal goals as the requirements of section 29702 are applied to Antioch and the western Delta. As Antioch's comments indicate throughout this letter, the physical environment, the reliability of Antioch's water supply, and the unique cultural heritage of Antioch will all be potentially impacted by the WATERFIX Project. The Delta Reform Act's co-equal goals are legal requirements on the Project that, put simply, require improved water quality and supply reliability within the Delta – or at a minimum to not further degrade water quality and the physical environment at Antioch.

The RDEIR/SDEIS fails to provide any specific operational provisions or obligations to ensure that the co-equal goals are met during the course of the Project term. In fact, the Project documents appear to assume that the co-equal goals will be met via the operation and implementation of the Project alone, providing no assurances for in-delta water supply reliability. However, the Delta Reform Act does not limit water supply reliability to the Project alone, and protection of in-delta water supply reliability is a critical component of complying with the co-equal goals. Given the flaws in the modeling, it is not possible to determine if the Project can even meet the co-equal goals.

In addition, it is not clear how the WATERFIX Project will become part of the Delta Plan (or not) as originally anticipated under Water Code Section 85320 now that the Project (4a) is no longer a "habitat conservation plan" or "natural community conservation plan" or whether such compliance must be analyzed in light of the fact that some alternatives continue to propose a habitat conservation plan approach.

Municipal Water District (1967) 67 Cal.2d 132

7. The Project's long-term impacts are not properly considered.

The Project's environmental documents indicate a 15-year initial term but also specifically acknowledge that "the project will continue indefinitely" (see the DREIS p. 4.1-42). Obviously, given the expense of the Project, operations will continue will beyond the 15 year initial period. However, the long-term impacts of the project are mostly ignored. As the initial period will primarily involve project construction, the operational aspects and impacts of the Project will follow the initial term and are likely the impacts most in-Delta water users are concerned about.

The City believes that the environmental documents fail to comply with CEQA by ignoring the long-term impacts of the Project which are acknowledged by the Project documents to extend beyond the initial 15 year term. The City contends that this results in a failure to consider and mitigate potential long-term impacts of the project – especially on water flows and water quality. Given the absence of consideration of certain long-term operating scenarios and flaws in the modeling, it is simply impossible to know what the long-term impacts of the Project will be on in-delta beneficial uses.

8. The Project fails to properly consider all potential impacts resulting from certain land acquisitions potentially associated with the Project.

Recently Metropolitan Water District and Westlands Water District have indicated the potential of purchasing large parcels of property within the Delta. There has been concern that these acquisitions will be made, in part, to facilitate the project and to potentially avoid the requirements of Water Code Section 250. The City contends this could be improper piece-mealing and project segmenting if these property acquisitions will in any way be part of the Project. Additionally, the cumulative impacts analysis required by CEQA would necessitate a detailed evaluation of these projects. The Project should make clear whether any such proposed land acquisitions are related in any way to the Project.

9. The Project fails to address how it will comply with the requirements of the Delta Protection Act.

The RDEIR/SDEIS fails to explain how the Project meets the requirements of the Delta Protection Act of 1959 ("Act"). In fact, the RDEIR/SDEIS indicates that the WATERFIX

Project will not meet the objectives and requirements of the Act as discussed under the City's Technical Comments. As shown in Appendix A to the City's WATERFIX comment letter, the Proposed WATERFIX Project may increase salinity levels at Antioch's intake so significantly that the City's water rights and ability to divert its water supply will be impacted – all without any proposed mitigation for Antioch and its over 100,000 domestic water supply users.5

Water Code sections 12200 et seq. (the Delta Protection Act) were intended in part to ensure that water exports from the Delta do not deprive in-Delta users of water necessary for their beneficial uses and for salinity control. A similar water availability requirement is provided under Water Code section 85320(b)(2)(A). The RDEIR/SDEIS as presently proposed, however, fails to adequately analyze the amount of water available for export that would not result in adverse impacts to in-Delta uses – especially to in-Delta water rights with higher priority than the State Water Project (SWP) and Central Valley Project (CVP) export projects such as the City of Antioch.

10. The Project will adversely impact the City's present water substitution purchase agreement with the Department of Water Resources

Antioch and Department of Water Resources (DWR) have an agreement that requires the State to reimburse the City for impacts to the City caused by the existing State Water Project ("1968 Agreement"), however, there are critical issues relating to that Agreement in light of the proposed Project and its potential impacts:

- The 1968 Agreement has a remaining term of less than 15 years and the Project is anticipated to extend indefinitely;
- The Agreement is not based on the projected additional adverse impacts from the WATERFIX Project (which will continue beyond the agreement's 15 year term);

5 As discussed above and throughout the accompanying documents, the WATERFIX is subject to certain legal requirements regarding the adverse impacts to water quality in the Delta. An EIR is inadequate if '[t]he success or failure of mitigation efforts . . . may largely depend upon management plans that have not yet been formulated, and have not been subject to analysis and review within the EIR.' (*San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 670.) 'A study conducted after approval of a project will inevitably have a diminished influence on decision making. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA.' (*Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70.)

- The Agreement between Antioch and DWR does not obligate the federal government, and does not mitigate whatsoever for impacts from any CVP operations;
- The Agreement anticipates some continuing opportunity by the City to use its own water rights in many years and during certain times of any given year. However, based on the Project's flawed modeling it is not possible for the City to determine the impacts to the City's ability to use its own water rights under the Agreement. It is possible that such impacts could be so extensive as to eliminate the City's benefits under the 1968 Agreement.
- The analysis of the impacts from the WATERFIX Project (see City's Appendix A) indicate potential impacts to Antioch's primary substitute water source (Contra Costa Water District), which could impact the City's ability to purchase substitute water.

11. The Project will adversely impact the recreation and public trust resources in the Western Delta

Antioch's unique historic and cultural legacy within the Delta has been as a freshwater location for well over 150 years. Antioch is known as the gateway to the western Delta for its freshwater location and recreational opportunities. A portion of Antioch's economy is dependent on freshwater boating, recreation, and fishing. The City operates a municipal marina that is related to certain commercial uses and activities in the City. Many people have chosen to buy or rent homes in Antioch specifically because of the proximity to these freshwater boating, recreation and fishing activities or to simply to enjoy a lifestyle near a freshwater river environment.

While the RDEIR/SDEIS recognizes certain potential short-term impacts of construction on recreation and attempts to mitigate such impacts, the RDEIR/SDEIS fails to adequately address the *long-term* impacts of the WATERFIX on recreation, boating, and fishing at Antioch and provides no mitigation for such long-term impacts. Given the potential for higher salinity and lower outflow in the western Delta, such impacts could be substantial. For example, increased salinity will impact fish species and fishing opportunities; boating preferences; and recreation (e.g. waterskiing, wakeboarding).

Further, the RDEIR/SDEIS fails to address any impacts to public trust resources at Antioch from potential higher salinity such as impacts to aesthetics (from freshwater river to tidal marsh), aquatic plants and wildlife (Tule islands), and navigation (decreased outflow,

increased salinity). Without acknowledging such potential impacts, and given the flawed modeling, it is not possible to adequately analyze and potentially mitigate any impacts.

Finally, the project documents fail to provide any operating procedures or obligations to specifically protect or mitigate in-delta recreational and cultural resources or non-covered public trust uses (e.g. navigation, fishing, boating) from projected operational impacts – either short term or long term.

12. The Project's environmental documents fail to consider potential urban decay impacts related to the long-term operation of the Project

The RDEIR/SDEIS acknowledges certain potential impacts to in-Delta communities including but not limited to declining property values, declining economic stability in communities relying on recreation, and potential abandonment of structures and buildings (especially those near proposed construction). As noted above, the RDEIR/SDEIS also acknowledges potential short-term impacts to in-Delta recreation. And yet, there is almost no analysis within the RDEIR/SDEIS of any potential urban decay impacts within specified in-Delta communities and none with respect to Antioch.

When there is evidence that adverse effects caused by a project could result in a reasonably foreseeable indirect environmental impacts such as urban decay or deterioration (as here), then the CEQA lead agency is obligated to analyze these indirect environmental impacts. (*Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1182). In the present case, the RDEIR/SDEIS indicates potential significant changes in the environment within the western Delta, significant changes to the City's water supply, and acknowledges further potential physical impacts to local communities as noted above. The RDEIR/SDEIS, however, fails to analyze the potential for urban decay impacts within Delta communities including Antioch. And since protection and preservation of in-delta cultural resources is a requirement of the Delta Reform Act, the WATERFIX is legally required to mitigate potential adverse impacts.

Conclusion

The City appreciates the opportunity to submit these comments, and we look forward to seeing these comments addressed in the final RDEIR/SDEIS for the WATERFIX Project

Sincerely,

MATTHEW EMRICK

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section 85086 (c)(2), the exact flows proposed in Alternative 4(a) will be determined using science based adaptive management process.

IV. STATUTORY & REGULATORY INFORMATION

A. PROTECTIONS OF FISH AND WILDLIFE

The new points of diversion presented in this Petition will allow for flows and hydrodynamics that will reduce take of protected aquatic species, and will benefit aquatic species by virtue of locating the intakes upstream of habitats most utilized by certain protected species, including Longfin Smelt and Delta Smelt. The specific intake locations, configuration, and state-of-the-art fish screens were developed in collaboration with the Fishery Agencies.

To ensure the optimal design for the protection of fish in the Sacramento River, the Fish Facility Technical Team recommended twenty-two studies to inform design and to establish biological baseline conditions. This team adopted a work plan focusing on eleven pre-construction studies and three biological baseline conditions studies. Once completed, the results of these studies will be available for review by the State Water Board and others, and will be used to further inform design and operation of the diversion structures. Operations are constrained by Sacramento River bypass flow requirements and fish screen velocity rules to minimize entrainment and impingement.

1. Benefits to Fish Species

Approval of this Petition will enable DWR to construct and operate new conveyance facilities that improve conditions for endangered and threatened aquatic species in the Delta while at the same time improving water supply reliability, consistent with California law. Implementing a dual conveyance system would align water operations to better reflect natural seasonal flow patterns by creating new water diversions in the north Delta equipped with State-of-the-art fish screens, thus reducing reliance on south Delta