

Substantive Draft EIR/EIS Revisions

The following sections provide a brief overview of the substantives changes and conclusions provided in the RDEIR/SDEIS. These changes in approach were made both in the Draft EIR/EIS which appears in this RDEIR/SDEIS as Appendix A, *Revisions to the Draft EIR/EIS*; and they are also carried forward in the analysis for Alternatives 4A, 2D, and 5A (which appear in Section 4 of this RDEIR/SDEIS). Appendix A includes modified excerpts of text that originally appeared in the Draft EIR/EIS, with underlining showing new language and strikeout showing eliminated text. Appendix A does not include Draft EIR/EIS text that was not changed or that may be modified in the Final EIR/EIS in a non-substantive manner, and is focused primarily nonimpact analysis revisions to Alternative 4, though other BDCP alternatives are addressed for some of the resources for various reasons. To give readers the best possible sense of the context in which such text changes occur, Appendix A includes section headings before and after modified passages, so that readers can understand precisely where within Draft EIR/EIS chapters the revisions occur. For a visual representation of how the document is laid out and how various segments relate to one another, please see the *Document Review Road Map* at the front of this document.

2.1 Fish and Aquatic Habitat Analyses

Draft EIR/EIS Chapter 11, *Aquatic Resources*, provided substantial information about the potential effects of the alternatives on fish and their habitats in the Plan Area and in upstream areas used by the evaluated species. Since release of the Draft EIR/EIS, the chapter has been revised to address design changes associated with the proposed project, to incorporate the latest engineering assumptions and modeling procedures, and to respond to comments raised by the public. Several comments requested elaboration on the methods used to arrive at CEQA conclusions and NEPA effects determinations and on the effects of contaminants. Additionally, commenters requested analyses of the effects on downstream bays (i.e., San Francisco Bay), and that all analyses include a NEPA conclusion. Since release of the Draft EIR/EIS, additional information has been developed pertaining to the following: the use of reusable tunnel material (RTM) for restoration efforts; the construction effects of the modification to Clifton Court Forebay; and the construction of an operable barrier at Head of Old River. This section briefly describes the revisions and their effects on the impact analysis. These revisions serve to better articulate the analysis of effects, but do not change the level of significance or magnitude of the effects. Please refer to the references to review specific sections of the revised chapter.

2.1.1 Methods Used

Several commenters noted that the analytical approach for determining the effects on fish and aquatic resources of various operational aspects of the alternatives was difficult to understand. This was especially related to the presentation of impacts for certain fish species that relied on multiple modeling results as evidence for CEQA conclusions and NEPA effects determinations. To better explain the rationale and process applied to the development of the CEQA conclusions and NEPA effects determinations, the methods section has been updated (Chapter 11, *Fish and Aquatic Resources*, Section 11.3.2, in Appendix A) to more explicitly describe for each species life stage what

1 methods were used and how the various modeling results were weighted. This approach was applied
2 similarly for all alternatives. Additionally, information has been added to key impact analyses to
3 articulate the biological linkages between changes in the physical environment and biological effects.
4 Please refer to Chapter 11, *Fish and Aquatic Resources*, Section 11.3.2, in Appendix A.

5 **2.1.2 Effects Downstream of the Plan Area**

6 Chapter 11, *Fish and Aquatic Resources*, of the Draft EIR/EIS included a description of the potential
7 changes in sediment loading as a result of the creation of new points of diversion under Alternatives
8 1A through 8. This analysis was used to inform the impacts related to turbidity (water clarity) for
9 delta and longfin smelt. In summary, these impacts were deemed to be less than significant/not
10 adverse because there would be less than a 10% change in sediment loading and because
11 restoration actions could serve to increase turbidity in some areas. Additionally, as part of an
12 environmental commitment in Appendix 3B, *Environmental Commitments*, in this RDEIR/SDEIS
13 (similar to Avoidance and Minimization Measure [AMM] 6), sediments collected at the intake
14 facilities and RTM excavated during construction activities could be reintroduced into the Delta at
15 proposed restoration sites. (See in Appendix A of this RDEIR/SDEIS) Consequently, the overall effect
16 in the Plan Area/Delta was determined to be only a minor degradation. Based on comments
17 received from the public and additional study of the likely characteristics of RTM material, this
18 environmental commitment and its parallel AMM have been revised to describe the anticipated
19 feasibility of reuse of this material, as well as the applicable regulatory standards that any such
20 material would be required to meet prior to its beneficial reuse. For text revisions to this
21 commitment, please refer to Appendix A, *Draft EIR/EIS In-Text Chapter Revisions*, in this
22 RDEIR/SDEIS, which includes an expanded and modified version of Draft EIR/EIS Appendix 3B,
23 *Environmental Commitments*.

24 As part of this RDEIR/SDEIS, additional analyses have been conducted to take into account sea level
25 rise, restoration sediment demand, and the effects of the creation of new points of diversion in order
26 to better understand the magnitude of potential changes in sediment loading into the San Francisco
27 Bay and other areas downstream of the Plan Area (generally the Delta, Suisun Marsh, and Yolo
28 Bypass). A range of sediment demand from existing wetlands and restoration activities was
29 combined with the sea level rise assumptions to understand the rate at which restored areas would
30 act as sediment sinks in order to maintain elevation as sea levels rise. Relevant literature was used
31 to determine the overall contribution of sediments from the Delta to the Bay, and a range of volumes
32 of potential supplemental materials from both the diversion sediment collection process at the
33 north Delta diversions and the RTM was developed based on current engineering estimates. This
34 RDEIR/SDEIS includes an analysis of changes in sediment loading to the Bay for all of the
35 alternatives, with specificity to operations-related effects and restoration-related effects.

36 In addition to the sediment analysis, further analysis was undertaken to assess the consequences, if
37 any, of the relatively minor changes in operations proposed across alternatives compared with the
38 consequences already described in the Draft EIR/EIS. This new analysis evaluated the potential
39 changes in water quality, salinity, flows, temperatures, and other factors potentially affecting fish
40 habitat and behavior downstream of the Plan Area. The analyses indicated that these characteristics
41 would be essentially unchanged, especially given the highly dynamic tidal environment of the Bay
42 and its connection to the Delta. This analysis is included for Alternative 4A in Section 4.3.7, *Fish and*
43 *Aquatic Resources*, for Alternative 2D in Section 4.4.7, for Alternative 5A in Section 4.5.7, and for the

1 remainder of the alternatives in Chapter 11, *Fish and Aquatic Resources*, Section 11.3.5 in Appendix A
 2 of this RDEIR/SDEIS.

3 **2.1.3 Selenium and Mercury**

4 The analysis of selenium and mercury has been revised in three locations: revisions to Conservation
 5 Measure 12 *Methylmercury Management* and Avoidance and Minimization Measure 27 *Selenium*
 6 *Management* (see Appendix D); revisions to the CM4 tidal habitat contaminants analysis; and a new
 7 impact to specifically address effects of contaminants on fish as a result of change in operations (See
 8 Chapter 11, Impact AQUA-219 in Appendix A). Additional details on the mechanisms for
 9 mobilization of selenium and mercury into the food web and the potential for effects on aquatic
 10 resources have been added to the RDEIR/SDEIS, including details describing the uncertainties
 11 associated with the analytical methods. The conclusions regarding effects on water quality
 12 associated with BDCP water operations evaluated in Chapter 8, *Water Quality*, of the Draft EIR/EIS
 13 and the potential for effects on aquatic resources have been further evaluated, including details of
 14 the analytical methods, uncertainties and findings. This analysis is included as Impact AQUA-219,
 15 applicable to all alternatives in Chapter 11, *Fish and Aquatic Resources*, Section 11.3.5 in Appendix A.

16 In response to reviewers' concerns that proposed restoration in Yolo Bypass could be a significant
 17 source of mercury methylation, a comparison of existing sediment and water quality data to the
 18 modeled conditions following proposed restoration activities has been included. To address the
 19 potential for selenium mobilization resulting from BDCP restoration actions, AMM27 has been
 20 expanded with specific requirements included to reduce the potential for bioaccumulation in
 21 covered fish species. Updated water quality data have been integrated into the selenium
 22 quantitative modeling for water and fish tissue under BDCP water operations, and results have been
 23 updated in Chapter 11, as shown in Chapter 11, *Fish and Aquatic Resources*, Section 11.3.5 in
 24 Appendix A.

25 **2.1.4 NEPA Determinations**

26 A small number of NEPA determinations were, at the time of the Draft EIR/EIS, determined to be
 27 "uncertain," or no determination was made. These effects were related to effects of the alternatives
 28 on salmonid fish migrations through the project area, effects of outflow on delta smelt and longfin
 29 smelt, and contaminant effects on all species. As described above, substantial effort has been put
 30 forth to better understand and articulate the potential for selenium and mercury effects on fish as a
 31 result of both operations and restoration actions proposed under the alternatives. This effort has
 32 allowed a more certain determination for contaminants effects under NEPA, which have been
 33 determined to be not adverse across all alternatives:

- 34 • AQUA-8, Effects of contaminants associated with restoration measures on delta smelt
- 35 • AQUA-26, Effects of contaminants associated with restoration measures on longfin smelt
- 36 • AQUA-44, Effects of contaminants associated with restoration measures on Chinook salmon
 37 (winter-run ESU)
- 38 • AQUA-62, Effects of contaminants associated with restoration measures on Chinook salmon
 39 (spring-run ESU)
- 40 • AQUA-80, Effects of contaminants associated with restoration measures on Chinook salmon
 41 (fall-/late fall-run ESU)

- 1 • AQUA-98, Effects of contaminants associated with restoration measures on steelhead
- 2 • AQUA-116, Effects of contaminants associated with restoration measures on Sacramento
- 3 splittail
- 4 • AQUA-134, Effects of contaminants associated with restoration measures on green sturgeon
- 5 • AQUA-152, Effects of contaminants associated with restoration measures on white sturgeon
- 6 • AQUA-170, Effects of contaminants associated with restoration measures on Pacific lamprey
- 7 • AQUA-188, Effects of contaminants associated with restoration measures on river lamprey
- 8 • AQUA-206, Effects of contaminants associated with restoration measures on non-covered
- 9 aquatic species of primary management concern)

10 Regarding effects on salmonid migrations, uncertainty stemmed from contrasting model results for
 11 upstream flow conditions and effects of the north Delta diversion operations. Additional
 12 examination of modeling results, showing mixed conclusions for Alternative 4, indicates that it was
 13 modeling assumptions and not actual real-world changes in operations or criteria, that shifted the
 14 timing of releases from Lake Shasta, generating the mixed results for the upper Sacramento River.
 15 Additional coordination with NMFS and CDFW to develop the ability to make real-time adjustments
 16 to minimize effects on fish migrating past the intakes has resulted in greater confidence pertaining
 17 to migration effects. The analysis of Alternative 4A in Section 4.3.7, *Fish and Aquatic Resources*,
 18 Alternative 2D in Section 4.4.7 and Alternative 5A in Section 4.5.7 describe the analysis and
 19 determination of this effect, and the remainder of the alternatives are described in Chapter 11, *Fish*
 20 *and Aquatic Resources*, Section 11.3.5 in Appendix A.

21 **2.1.5 Clifton Court Forebay Modification, Head of Old River**

22 **Operable Barrier Construction, and Pile Driving**

23 **Effects**

24 The Draft EIR/EIS included relatively little discussion of the impacts on fish and aquatic resources
 25 from construction of the modified Clifton Court Forebay and the Head of Old River operable barrier
 26 under Alternatives 4. The main assumptions related to construction of these facilities were provided
 27 in Appendix 3C of the Draft EIR/EIS, and consideration and analysis of potential effects is provided
 28 in this RDEIR/SDEIS. The potential sources of effects on fish from these activities are similar to
 29 those discussed for construction of north Delta diversions and barge landing sites: temporary
 30 increases in turbidity; accidental spills; disturbance of contaminated sediments; underwater noise;
 31 fish stranding; in-water work activities; loss of spawning, rearing, or migration habitat; and
 32 predation. The impacts from construction of the modified Clifton Court Forebay and the Head of Old
 33 River operable barrier would be rendered less than significant by application of appropriate AMMs
 34 and mitigation measures.

35 The effects of underwater noise caused by pile driving were reassessed to account for changes in the
 36 proposed construction approach as outlined in Appendix 3C, *Construction Assumptions*, of the Draft
 37 EIR/EIS. While the in-water work windows of July through October were maintained (see Tables
 38 22B-1a through 22B-4d in Appendix 22B, *Air Quality Assumptions*, of the Draft EIR/EIS), the analysis
 39 was conducted assuming more concurrent pile-driving and without the use of attenuation
 40 structures. This analysis is included in Section 4.3.7, *Fish and Aquatic Resources* for Alternative 4A,

1 Section 4.4.7 for Alternative 2D, Section 4.5.7 for Alternative 5A, and Chapter 11, *Fish and Aquatic*
2 *Resources*, Sections 11.3.1.1 and 11.3.5, in Appendix A of the RDEIR/SDEIS for all other alternatives.

3 **2.1.6 Non-Covered Fish Entrainment at the North Delta** 4 **Diversion**

5 The Draft EIR/EIS did not include a detailed analysis of the potential entrainment effects on non-
6 covered aquatic species of primary management concern that have pelagic early life stages and
7 therefore may be particularly susceptible to entrainment at the proposed north Delta diversions
8 (i.e., egg and larval striped bass and American shad). An analysis has been included in this
9 RDEIR/SDEIS to assess the potential for effects on these species because much of their spawning
10 could occur upstream of the proposed north Delta intake locations, thus potentially subjecting eggs
11 or larvae to entrainment. The analysis examines particle tracking model results from the
12 Sacramento River upstream of the north Delta diversions. This impact analysis, and discussion of its
13 relevance, is included in Chapter 11, Section 11.3.5, Impact AQUA-201, in Appendix A, and is
14 applicable to all of the alternatives.

15 **2.2 Water Quality Revisions**

16 Chapter 8, *Water Quality*, of the Draft EIR/EIS evaluates effects on water quality from construction
17 and operation of the proposed water conveyance facility (CM1) for Alternatives 1A, 1B, 1C, 2A, 2B,
18 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9. Water quality impacts from other conservation measures (CM2–
19 CM21) for these alternatives are evaluated at the programmatic level. Chapter 8 has been revised
20 since release of the Draft EIR/EIS to address design changes associated with the proposed project, to
21 include additional analysis, to make clarifications and correct errors, to update analyses based on
22 more recent water quality data and/or criteria, and to respond to comments raised by local, state,
23 and federal agencies and the public. Water quality constituent sections that received the most
24 updating were electrical conductivity, chloride, selenium, bromide, and *Microcystis*. Additionally, an
25 assessment of constituent effects downstream of the Plan Area (i.e., in San Francisco Bay) was
26 added. Several other modifications and additions were made to the assessments for mercury,
27 nutrients, trace metals, and dissolved oxygen. This section briefly describes the revisions to Chapter
28 8 and their effects on the impact analyses and impact determinations. Please refer to the document
29 links to review specific sections of the revised chapter.

30 Additionally, three new alternatives – Alternative 2D, 4A, and 5A – were evaluated for effects on
31 water quality from construction and operation of the water conveyance facility (CM1) and from
32 other Environmental Commitments (CM 3, 4, 6, 7, 9–12, 15, and 16). The Alternatives evaluated in
33 Chapter 8 discussed above contain many similarities to each other from a water quality perspective,
34 and thus are often grouped together in the following discussion. The three new alternatives are also
35 very similar to each other, but from a water quality perspective, are fundamentally different than
36 the Alternatives evaluated in Chapter 8 that are discussed above, in that they contain substantially
37 less tidal restoration acreage. Although this section is focused on describing changes made in
38 Chapter 8 from the Draft EIR/EIS, differences between the alternatives assessed in Chapter 8 and
39 the three new alternatives are highlighted where appropriate.