

1 *[Note to reviewers: This is the initial draft of Chapter 4 for review by the Steering Committee.*  
2 *The purpose of this chapter is to describe the BDCP covered activities under the eventual*  
3 *permits and authorizations for DWR/SWP Contractors, USBR/CVP Contractors, Mirant*  
4 *Corporation and the BDCP Management Entity.]*

## 5 **Chapter 4 Description of Covered Activities**

### 6 **4.1 Introduction**

7 A key component of the BDCP is to provide regulatory authorization for activities that result in  
8 take of covered species. These “covered activities” involve otherwise lawful actions and projects  
9 that could result in take of covered species incidental to such actions and projects. Below is a  
10 brief summary of the covered activities; a detailed description of BDCP covered activities are  
11 provided in subsequent sections of this chapter. BDCP covered activities are divided into four  
12 groupings based on the future authorized/permitted entities:

- 13 • Department of Water Resources and SWP Contractors
- 14 • U.S. Bureau of Reclamation and CVP Contractors
- 15 • Mirant Corporation
- 16 • BDCP Management Entity

17 The CVP and the SWP are two major inter-basin water storage and delivery systems that divert  
18 and re-divert water from the southern portion of the Sacramento-San Joaquin Delta (Delta). Both  
19 the CVP and SWP include major reservoirs upstream of the Delta, and transport water via natural  
20 watercourses and canal systems to areas south and west of the Delta. The CVP also includes  
21 facilities and operations on the Stanislaus and San Joaquin rivers. The major facilities on these  
22 rivers are New Melones and Friant Dams, respectively.

23 The Projects are permitted by the California State Water Resources Control Board (SWRCB) to  
24 store water during wet periods, divert water that is surplus to the Delta, and re-divert Project  
25 water that has been stored in upstream reservoirs. Both Projects operate pursuant to water right  
26 permits and licenses issued by the SWRCB to appropriate water by diverting to storage or by  
27 directly diverting to use and re-diverting releases from storage later in the year. As conditions of  
28 their water right permits and licenses, the SWRCB requires the CVP and SWP to meet specific  
29 water quality, quantity, and operational criteria within the Delta. Reclamation and DWR closely  
30 coordinate the CVP and SWP operations, respectively, to meet these conditions.

31 Industrial diversions in the BDCP Planning Area include the Mirant Corporation power plants at  
32 Pittsburg and Antioch (i.e., the Pittsburg Power Plant and the Contra Costa Power Plant).  
33 Mirant's generating units burn natural gas and are designed to be cooled by water from the San  
34 Joaquin-Sacramento River Delta. As described below, Mirant's operations are constrained by (1)  
35 its Clean Water Act National Pollution Discharge Elimination System (NPDES) permits and  
36 specifically by Clean Water Act section 316(b) of the federal Clean Water Act; (2) incidental  
37 take permits issued by the National Marine Fisheries Service and Fish and Wildlife Service  
38 pursuant to the Endangered Species Act; (3) a Memorandum of Understanding with the  
39 California Department of Fish and Game authorizing incidental take of species listed under the

1 California Endangered Species Act; and (4) regulatory requirements imposed by federal and state  
2 energy agencies.

3 The BDCP Management Entity will be responsible for implementing the entirety of the  
4 Conservation Strategy which includes actions that could result in incidental take and would  
5 require ESA coverage.

6 *Department of Water Resources and State Water Project Contractors*

7 DWR and the SWP contractors covered activities are those activities associated with delivering  
8 water supplies from the SWP's Delta facilities. These activities can be broken into three  
9 categories: 1) operation of existing and new Delta facilities needed for water transport and  
10 delivery for Project purposes; 2) construction of new facilities; and 3) maintenance, monitoring  
11 and other associated ongoing activities.

12 *U.S. Bureau of Reclamation and CVP Contractors*

13 The activities identified for federal actions by Reclamation are not "covered activities" for the  
14 purposes of the ESA Section 10(a)(1)(b) permit. Reclamation's activities are subject to ESA  
15 Section 7 and Reclamation is seeking authorization under ESA Section 7 for their actions.

16 Reclamation and CVP contractors covered activities are those activities associated with  
17 delivering water supplies from the CVP's Delta facilities. These activities include: 1) operation  
18 of existing CVP Delta facilities to convey and deliver water for project purposes; 2) associated  
19 maintenance and monitoring activities; and 3) in-Delta conveyance improvements. By law, the  
20 CVP is operated in coordination with the California SWP. In addition, Reclamation or the CVP  
21 Contractors are expected to enter into an agreement with DWR to provide for wheeling of CVP  
22 water through the new isolated conveyance facility.

23 There are other CVP and SWP activities occurring upstream and outside the legal Delta, such as  
24 reservoir operations and water deliveries, which affect the availability of water in the Delta for  
25 the CVP and SWP. These other activities are not proposed as covered activities under the  
26 BDCP.

27 *Mirant Corporation*

28 Mirant's Covered Activities are those activities associated with the generation of power at its  
29 Pittsburg and Contra Costa Power Plants (together the Delta Plants). These activities can be  
30 divided into two categories: (1) current power generation activities and water intake and  
31 discharge flows associated with those activities; and (2) recurrent maintenance activities required  
32 to ensure continued operation of those existing facilities.

33 *BDCP Management Entity*

34 Although the purpose of the BDCP Conservation Strategy is to conserve species and natural  
35 communities in the Delta, there are conservation actions that could result in take of covered  
36 species and therefore require authorization as covered activities. The BDCP Management Entity  
37 will be conducting conservation measures, monitoring, and adaptive management described in  
38 Chapter 3 *Conservation Strategy* that would be covered activities.

1 **4.2 DWR and SWP Contractors Existing Facilities Operations**  
2 **and Maintenance**

3 Operation activities include the daily operation of the water diversion, conveyance, and delivery  
4 systems, and appurtenant facilities within the BDCP Planning Area that deliver SWP water. A  
5 description of these facilities is provided below.

6 *Clifton Court Forebay*

7 Water for the SWP is diverted into Clifton Court Forebay (CCF) and pumped at Banks Pumping  
8 Plant (Banks). Clifton Court Forebay is a 31,000-acre-foot regulatory reservoir located in the  
9 southwestern edge of the Delta, about 10 miles northwest of the City of Tracy. Inflows to the  
10 Forebay from surrounding channels are controlled by radial gates, which are generally operated  
11 based on the tidal cycle to reduce approach velocities, prevent scour in adjacent channels, and  
12 minimize water level fluctuation in the south Delta by taking water in through the gates at times  
13 other than low tide. When a large head differential (difference in water surface elevation) exists  
14 between the outside and the inside of the gates, theoretical inflow can be as high as 15,000 cfs  
15 for a short time. However, existing operating procedures limit inflows to a maximum rate of  
16 12,000 cfs. This prevents water velocities from exceeding 3 feet per second (ft/sec), which helps  
17 to control erosion and prevents damage to SWP facilities. While instantaneous flows may reach  
18 the levels just described, the maximum daily pumping rate at Banks is controlled by a  
19 combination of the State Water Resources Control Board water rights permits, applicable  
20 environmental, regulatory, and operational constraints, and permits issued by the Corps that  
21 regulate the rate of diversion of water into CCF for pumping at Banks. This diversion rate is  
22 normally restricted to 6,680 cfs as a three-day average inflow to CCF and 6,993 cfs as a one-day  
23 average inflow to CCF. CCF diversions may be greater than these rates between December 15  
24 and March 15, when the inflow into CCF may be augmented by one-third of the San Joaquin  
25 River flow at Vernalis when those flows are equal to or greater than 1,000 cfs. Additionally, the  
26 SWP has a permit to export an additional 500 cfs between July 1 and September 30. to replace  
27 pumping foregone for the benefit of Delta fish species, making the summer limit effectively  
28 7,180 cfs.

29 See Chapter 3 *Conservation Strategy* for a description of the operations of the above facilities for  
30 the near- and long-term.

31 *Harvey O. Banks Pumping Plant*

32 The Banks Pumping Plant is in the south Delta, about 8 miles northwest of Tracy and marks the  
33 beginning of the California Aqueduct. By means of 11 pumps, including two rated at 375-cfs  
34 capacity, five at 1,130-cfs capacity, and four at 1,067-cfs capacity, the Banks Pumping Plant  
35 provides the initial lift of water 244 feet into the aqueduct. The nominal capacity of the Banks  
36 Pumping Plant is 10,300 cfs. The pumps can be operated at full capacity to enable diversions to  
37 utilize power in off-peak periods.

38 See Chapter 3 *Conservation Strategy* for a description of the operations of the above facilities for  
39 the near- and long-term.

1 **Barker Slough Pumping Plant and North Bay Aqueduct**

2 The Barker Slough Pumping Plant diverts water from Barker Slough into the North Bay  
3 Aqueduct (NBA) for delivery in Napa and Solano Counties. The NBA intake<sup>1</sup> is located  
4 approximately 10 miles from the mainstem Sacramento River at the end of Barker Slough. The  
5 maximum pumping capacity is 175 cfs (pipeline capacity). During the last few years, daily  
6 pumping rates have ranged between 0 and 140 cfs. Each of the 10 NBA pump bays is  
7 individually fitted with a positive barrier fish screen consisting of a series of flat, stainless steel,  
8 wedge-wire panels with a slot width of 3/32 inch. This configuration is designed to exclude fish  
9 25 millimeters (mm) or larger from being entrained. The bays tied to the two smaller units have  
10 an approach velocity of about 0.2 ft/sec. The larger units were designed for a 0.5-ft/sec approach  
11 velocity, but actual approach velocity is about 0.44 ft/sec. The screens are routinely cleaned to  
12 prevent excessive head loss, thereby minimizing increased localized approach velocities.

13 **4.2.1 State Water Project Diversions**

14 The amount of water delivered by the SWP in any year has been and will continue to be variable,  
15 but in any year, will be equal to the amount of water that is hydrologically available and that can  
16 be diverted under current contractual rights consistent with the terms and conditions of the  
17 BDCP and existing permits and regulations. SWP “project water” is water made available for  
18 delivery to the contractors by the project conservation and transportation facilities included in the  
19 system. Under existing contract conditions, DWR is obligated to make 4.173 MAF/year of water  
20 available to its contractors, except under certain conditions specified in the contract, including  
21 shortage of supply availability, under which a lesser amount may be made available. This  
22 quantity may be exceeded if DWR determines surplus water is available above and beyond that  
23 needed to satisfy all regulations, permits, and operational requirements.

24 **4.2.2 Drought Water Bank and Other Water Deliveries**

25 The California Water Code requires the State to allow the use of SWP facilities to convey non-  
26 Project water as long as the conveyance will not interfere with SWP operations. During dryer  
27 years conveyance capacity is available in SWP facilities for other entities to transfer water. Non-  
28 Project water for Drought Water Banks, the Environmental Water Account, Dry Water Purchase  
29 Programs, and individual transfers have been conveyed through SWP facilities in the past and  
30 are expected in the future. SWP facilities are also used to support groundwater banking  
31 programs, such as the Semitropic Water Banking and Exchange Program.

32 **4.2.3 Other Delta Facilities Operations**

33 In addition to the water supply-related facilities described above, DWR manages other in-Delta  
34 facilities the operation of which are included as part of the BDCP Covered Activities.

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<sup>1</sup> Solano County Water Agency is currently working with DWR to study the potential relocation of the NBA intake and, depending upon the outcome of that study, the covered activities described here may change.

1     **John E. Skinner Delta Fish Protective Facility**

2     The John E. Skinner Delta Fish Protective Facility is located at the head of the Intake Channel  
3     that connects Clifton Court Forebay to the Banks Delta Pumping Plant. The Skinner Fish  
4     Facility screens fish away from the pumps. Large fish and debris are directed away from the  
5     pumps by a 388-foot-long trash boom. Smaller fish are diverted from the intake channel into  
6     bypasses by a series of metal louvers, while the main flow of water continues through the louvers  
7     and toward the pumps. These fish pass through a secondary system of screens and pipes into  
8     seven holding tanks, where they are later counted and recorded. The salvaged fish are then  
9     returned to the Delta in oxygenated tank trucks.

10    **Temporary Barriers In The South Delta**

11    The existing South Delta Temporary Barrier Project consists of the annual installation and  
12    removal of temporary barriers at the following locations:

- 13       • Middle River near Victoria Canal, about 0.5 mile south of the confluence of  
14       Middle River, Trapper Slough, and North Canal;
- 15       • Old River near Tracy, about 0.5 mile east of the Delta-Mendota Canal intake;
- 16       • Grant Line Canal near Tracy Boulevard Bridge, about 400 feet east of the Tracy  
17       Boulevard Bridge; and
- 18       • At the Head of Old River (in Old River near its divergence from the San Joaquin  
19       River).

20  
21    These barriers will likely continue to be implemented in the near-term in coordination with  
22    BDCP near-term conservation measures. Continued implementation will be evaluated based on  
23    performance and need.

24    The barriers on Middle River, Old River near Tracy, and Grant Line Canal are tidal control  
25    facilities composed of rock and gated culverts designed to improve water levels and circulation  
26    for agricultural diversions and are in place during the growing season.

27    A rock barrier may be installed during the Fall at the Head of Old River to improve flow quality  
28    for salmon migration in the San Joaquin River. The barrier is installed at the direction of the  
29    Department of Fish and Game. The objective of the barrier is to improve dissolved oxygen  
30    levels by reducing the amount of flow diverted into Old River and, therefore, keeping more flow  
31    moving downstream in the San Joaquin River.

32    A non-physical or physical (rock) barrier may also be installed at the Head of Old River in the  
33    Spring. This barrier is designed to discourage downstream migrating salmonids from entering  
34    the south Delta where they would be exposed the effects of the export pumps, and to keep them  
35    in the mainstem San Joaquin River, where their probability of survival is higher. The barrier  
36    may utilize acoustics, light, a bubble curtain, rock, or other options to discourage fish passage.

37

1 **4.2.4 Maintenance and Monitoring Activities**

2 ***Maintenance Activities***

3 Maintenance and replacement means those routine activities that maintain the capacity and  
4 operational features of the existing water diversion and conveyance facilities described above  
5 including Harvey O. Banks Pumping Plant, Clifton Court Forebay, Barker Slough/North Bay  
6 Aqueduct, and John E. Skinner Fish Facility. Operations, maintenance and replacement  
7 activities include canal maintenance, placement of riprap for bankline protection and erosion  
8 control; vegetation management and weed control; O&M of electrical power supply facilities;  
9 and routine maintenance as needed to ensure continued operations and replacement of facility or  
10 system components when necessary to maintain system capacity and operational capabilities.

11 ***Monitoring Activities***

12 Monitoring activities for the operation of the SWP are included under BDCP Covered Activities.  
13 This includes water quality and other SWP monitoring activities. For fishery and other  
14 biological monitoring activities see section 4.10 below. The Department’s Division of  
15 Operations and Maintenance conducts monitoring of chemical, physical and biological  
16 parameters to evaluate conditions of concern for drinking water, recreation, and fish and wildlife.

17 **4.3 U.S. Bureau of Reclamation and CVP Contractors**  
18 **Existing Facilities Operations and Maintenance**

19 The CVP’s Delta Division includes the Delta Cross Channel (DCC), the Contra Costa Canal and  
20 Pumping Plants, Contra Loma Dam, Martinez Dam, the Jones Pumping Plant (formerly Tracy  
21 Pumping Plant), the Tracy Fish Collection Facility (TFCF), and the Delta Mendota Canal  
22 (DMC). The DCC is a controlled diversion channel between the Sacramento River and  
23 Snodgrass Slough. The Contra Costa Water District (CCWD) diversion facilities use CVP water  
24 resources to serve district customers directly and to operate CCWD’s Los Vaqueros Project. The  
25 Jones Pumping Plant diverts water from the Delta to the head of the DMC.

26 ***Delta Cross Channel***

27 The DCC is a gated diversion channel in the Sacramento River near Walnut Grove and  
28 Snodgrass Slough. Flows into the DCC from the Sacramento River are controlled by two 60-foot  
29 by 30-foot radial gates. When the gates are open, water flows from the Sacramento River  
30 through the cross channel to channels of the lower Mokelumne and San Joaquin Rivers toward  
31 the interior Delta. The DCC operation improves water quality in the interior Delta by improving  
32 circulation patterns of good quality water from the Sacramento River towards Delta diversion  
33 facilities.

34 Reclamation operates the DCC in the open position to (1) improve the transfer of water from the  
35 Sacramento River to the export facilities at the Banks and Jones Pumping Plants, (2) improve  
36 water quality in the southern Delta, and (3) reduce salt water intrusion rates in the western Delta.  
37 During the late fall, winter, and spring, the gates are often periodically closed to protect  
38 out-migrating salmonids from entering the interior Delta. In addition, whenever flows in the

1 Sacramento River at Sacramento reach 20,000 to 25,000 cfs (on a sustained basis) the gates are  
2 closed to reduce potential scouring and flooding that might occur in the channels on the  
3 downstream side of the gates.

#### 4 *C.W. Jones Pumping Plant*

5 The CVP and SWP use the Sacramento River, San Joaquin River, and Delta channels to  
6 transport water to export pumping plants located in the south Delta. The CVP's Jones Pumping  
7 Plant, about five miles north of Tracy, consists of six available pumps. The Jones Pumping Plant  
8 is located at the end of an earth-lined intake channel about 2.5 miles in length. At the head of the  
9 intake channel, louver screens (that are part of the TFCF) intercept fish, which are then collected,  
10 held, and transported by tanker truck to release sites far away from the pumping plants.

11 Jones Pumping Plant has a permitted diversion capacity of 4,600 cfs with maximum pumping  
12 rates typically ranging from 4,500 to 4,300 cfs during the peak of the irrigation season and  
13 approximately 4,200 cfs during the winter non-irrigation season until construction and full  
14 operation of the proposed DMC/California Aqueduct Intertie. The winter-time constraints at the  
15 Jones Pumping Plant are the result of a DMC freeboard constriction near O'Neill Forebay,  
16 O'Neill Pumping Plant capacity, and the current water demand in the upper sections of the  
17 DMC.

#### 18 *Tracy Fish Collection Facility*

19 The TFCF is located in the south-west portion of the Sacramento-San Joaquin Delta and uses  
20 behavioral barriers consisting of primary and secondary louvers to guide entrained fish into  
21 holding tanks before transport by truck to release sites within the Delta. The original design of  
22 the TFCF focused on smaller fish (<200 mm) that would have difficulty fighting the strong  
23 pumping plant induced flows since the intake is essentially open to the Delta and also impacted  
24 by tidal action.

25 The primary louvers are located in the primary channel just downstream of the trashrack  
26 structure. The secondary louvers are located in the secondary channel just downstream of the  
27 traveling water screen. The louvers allow water to pass through onto the pumping plant but the  
28 openings between the slats are tight enough and angled against the flow of water in such a way  
29 as to prevent most fish from passing between them and instead enter one of four bypass  
30 entrances along the louver arrays.

31 There are approximately 52 different species of fish entrained into the TFCF per year; however,  
32 the total numbers are significantly different for the various species salvaged. Also, it is difficult  
33 if not impossible to determine exactly how many safely make it all the way to the collection  
34 tanks awaiting transport back to the Delta. Hauling trucks used to transport salvaged fish to  
35 release sites inject oxygen and contain an eight parts per thousand salt solution to reduce stress.  
36 The CVP uses two release sites, one on the Sacramento River near Horseshoe Bend and the other  
37 on the San Joaquin River immediately upstream of the Antioch Bridge.

#### 38 *Contra Costa Water District Diversion Facilities*

39 Contra Costa Water District (CCWD) diverts water from the Delta for irrigation and M&I uses  
40 under CVP contract; under its own permit and license at Mallard Slough; and under its own Los

1 Vaqueros water right permit at Old River near State Route 4. CCWD's system includes intake  
2 facilities at Mallard Slough, Rock Slough, and Old River near State Route 4; the Contra Costa  
3 Canal and shortcut pipeline; and the Los Vaqueros Reservoir. CCWD will be adding a fourth  
4 diversion point on Victoria Canal (the Alternative Intake Project, described below) to help meet  
5 its water quality goals. The Rock Slough intake facilities, the Contra Costa Canal, and the  
6 shortcut pipeline are owned by Reclamation, and operated and maintained by CCWD under  
7 contract with Reclamation. Mallard Slough Intake, Old River Intake and Los Vaqueros  
8 Reservoir are owned and operated by CCWD. Take authorization for operation of the facilities  
9 under BDCP would be provided to Reclamation, CCWD is not a permit applicant under BDCP.

10 The Rock Slough Intake is located about four miles southeast of Oakley, where water flows  
11 through a trash rack into the earth-lined portion of the Contra Costa Canal. This section of the  
12 canal is open to tidal influence and continues for four miles to Pumping Plant 1, which has  
13 capacity to pump up to 350 cfs into the concrete-lined portion of the canal. Prior to completion  
14 of the Los Vaqueros Project in 1997, this was CCWD's primary diversion point. Pumping Plant  
15 1 is not screened; Reclamation, in collaboration with CCWD, is responsible for constructing a  
16 fish screen as authorized by CVPIA and required by the 1993 FWS BO for the Los Vaqueros  
17 Project.

18 In the late summer and fall months, CCWD releases water from Los Vaqueros Reservoir to blend  
19 with higher-salinity direct diversions from the Delta to meet CCWD water quality goals.

#### 20 **4.3.1 Central Valley Project Diversions**

21 The volume of water delivered by the CVP is and will continue to be variable, but in any year  
22 will be equal to the amount of water that is hydrologically available and that can be diverted  
23 under current contractual rights consistent with the terms and conditions of the BDCP and  
24 existing permits and regulations. Reclamation delivers water transported through facilities in the  
25 Delta to senior water rights contractors, long-term CVP water service contractors, refuges and  
26 waterfowl areas, and temporary water service contractors south of the Delta. The total volume  
27 under contract, including Level 2 refuge supplies, is approximately 3.3 MAF. Additionally, the  
28 CVP is mandated to provide Level 4 refuge water totaling approximately 100,000 AF.  
29 Moreover, in wet hydrologic conditions when CVP storage is not available, water is made  
30 available under temporary contracts. The volume of water available for conveyance through the  
31 Delta is a result of hydrologic conditions, upstream reservoir operations, upstream demands,  
32 regulatory constraints on CVP operations, and from transfers of water from upstream water users  
33 to south of Delta water users.

#### 34 **Associated Maintenance and Monitoring Activities**

##### 35 *Maintenance Activities*

36 Maintenance and replacement means those routine activities that maintain the capacity and  
37 operational features of the existing water diversion and conveyance facilities described above  
38 including the Delta Cross Channel, C.W. Jones Pumping Plant, Tracy Fish Collection Facility,  
39 and Contra Costa Diversion Facilities. Operations, maintenance and replacement activities  
40 include canal maintenance, placement of riprap for bankline protection and erosion control;  
41 vegetation management and weed control; O&M of electrical power supply facilities; and routine

1 maintenance as needed to ensure continued operations and replacement of facility or system  
2 components when necessary to maintain system capacity and operational capabilities.

### 3 *Monitoring Activities*

4 Monitoring activities refers to those actions necessary for monitoring water quality and fisheries  
5 as conditioned by water rights permits and biological opinions, and those actions undertaken as a  
6 result of the CVPIA and agreements. This includes routine daily, annual or other periodic  
7 sampling of water quality constituents as well as trawls for various fish species in the Delta.  
8 Reclamation supports and participates in the Interagency Ecological Program through which  
9 significant monitoring efforts are implemented. Reclamation operates and maintains more than  
10 20 monitoring stations in the Delta which provide near-realtime water quality data. As  
11 conservation strategies are implemented, the nature of, and requirements for, monitoring would  
12 be expected to change.

## 13 **4.4 Coordinated Operations**

### 14 **Joint Point Of Diversion Operations**

15 SWRCB D-1641 granted Reclamation and DWR the ability to use/exchange each Project's  
16 diversion capacity capabilities to enhance the beneficial uses of both Projects. The SWRCB  
17 conditioned the use of Joint Point of Diversion (JPOD) capabilities based on a staged  
18 implementation and conditional requirements for each stage of implementation. The stages of  
19 JPOD in SWRCB D-1641 are:

- 20 • Stage 1 – for water service to Cross Valley Canal contractors, Tracy Veterans Cemetery  
21 and Musco Olive, and to recover export reductions taken to benefit fish.
- 22 • Stage 2 – for any purpose authorized under the current Project water right permits.
- 23 • Stage 3 – for any purpose authorized up to the physical capacity of the diversion  
24 facilities.

25 Each stage of JPOD has regulatory terms and conditions which must be satisfied in order to  
26 implement JPOD.

27 In general, JPOD capabilities will be used to accomplish four basic CVP-SWP objectives:

- 28 • When wintertime excess pumping capacity becomes available during Delta excess  
29 conditions and total CVP/SWP San Luis storage is not projected to fill before the spring  
30 pulse flow period, the project with the deficit in San Luis storage may elect to use JPOD  
31 capabilities.
- 32 • When summertime pumping capacity is available at Banks Pumping Plant and CVP  
33 reservoir conditions can support additional releases, the CVP may elect to use JPOD  
34 capabilities to enhance annual CVP south of Delta water supplies.
- 35 • When summertime pumping capacity is available at Banks or Jones Pumping Plant to  
36 facilitate water transfers, JPOD may be used to further facilitate the water transfer.

- During certain coordinated CVP/SWP operation scenarios for fishery entrainment management, JPOD may be used to shift CVP-SWP exports to the facility with the least fishery entrainment impact while minimizing export at the facility with the most fishery entrainment impact.

## Transfers

Water passing through the Delta associated with water transfers is a covered activity. California Water Law and the CVPIA promote water transfers as important water resource management measures to address water shortages provided certain protections to source areas and users are incorporated into the water transfer. Transfers requiring export from the Delta are done at times when pumping and conveyance capacity at the CVP or SWP export facilities is available to move the water. Additionally, operations to accomplish these transfers must be carried out in coordination with CVP and SWP operations, such that the capabilities of the Projects to exercise their own water rights or to meet their legal and regulatory requirements are not diminished or limited in any way. Exports for transfers would have to be consistent with the terms of any applicable biological opinions and could not infringe upon the capability of the Projects to comply with the terms of the opinions.

Also in the past, CVP and SWP contractors have independently acquired water and arranged for pumping and conveyance through SWP facilities. State Water Code provisions grant other parties access to unused conveyance capacity, although SWP contractors have priority access to capacity not being used by the DWR to meet SWP contract amounts.

## Suisun Marsh Facilities Operations

*[Note to reviewers: This section on Suisun Marsh facilities may be subject to change since BDCP includes water operations conservation measures that address the salinity control facility. Additionally, BDCP habitat restoration measures would alter the environment in Suisun Marsh and Bay. Such changes will need the attention of the SWRCB for resolution.]*

Since the early 1970's, the California Legislature, SWRCB, Reclamation, DFG, Suisun Resource Conservation District (SRCD), DWR, and other agencies have worked to preserve beneficial uses of Suisun Marsh in mitigation for perceived impacts of reduced Delta Outflow on the salinity regime. Early on, salinity standards were set by the State Water Resources Control Board (SWRCB) to protect alkali bulrush production, a primary waterfowl plant food. The most recent standard under Water Right Decision 1641 acknowledges that multiple beneficial uses deserve protection.

A contractual agreement between DWR, Reclamation, DFG and SRCD contains provisions for DWR and Reclamation to mitigate the effects on Suisun Marsh channel water salinity from the SWP and CVP operations and other upstream diversions. The Suisun Marsh Preservation Agreement (SMPA) requires DWR and Reclamation to meet specified salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements. In addition to the contractual agreement, SWRCB Water Rights Decision 1485 codified salinity standards in 1978, which have been carried forward to SWRCB Water Rights Decision 1641.

1 Maintenance activities for existing facilities include: levee repairs, vegetation removal, fish  
2 screen cleaning or installation of new screens, mechanical repairs, structural repairs, removal or  
3 replacement of monitoring and compliance stations (can involve in-water work)  
4 and instrumentation installation on or near existing facilities. The existing facilities are:

- 5       ▪ Suisun Marsh Salinity Control Gates (SMSCG);
- 6       ▪ Morrow Island Distribution System (MIDS);
- 7       ▪ Roaring River Distribution System (RRDS);
- 8       ▪ Goodyear Slough Outfall (GYS); and
- 9       ▪ Various salinity monitoring and compliance stations throughout the Marsh.

## 10 **4.5 Mirant Energy Water Use**

11 Mirant's Covered Activities are those activities associated with the generation of power at its  
12 Pittsburg and Contra Costa Power Plants (together the Delta Plants). These activities can be  
13 divided into two categories: (1) current power generation activities and water intake and  
14 discharge flows associated with those activities; and (2) recurrent maintenance activities required  
15 to ensure continued operation of those existing facilities. The Pittsburg Power Plant is located on  
16 the southern shore of Suisun Bay near Pittsburg, California (refer to Figure 2.1 in Chapter 2), and  
17 the Contra Costa Power Plant is located 12 miles upstream on the southern bank of San Joaquin  
18 River near Antioch, California (refer to Figure 2.1).

19 Additionally, Mirant's operations are constrained by (1) its Clean Water Act National Pollution  
20 Discharge Elimination System (NPDES) permits and specifically by Clean Water Act section  
21 316(b) of the federal Clean Water Act; (2) incidental take permits issued by the National Marine  
22 Fisheries Service and Fish and Wildlife Service pursuant to the Endangered Species Act; (3) a  
23 Memorandum of Understanding with the California Department of Fish and Game authorizing  
24 incidental take of species listed under the California Endangered Species Act; and (4) regulatory  
25 requirements imposed by federal and state energy agencies. These independent regulatory  
26 constraints may alter Mirant's Covered Activities for the purposes of the BDCP in both the short-  
27 term and long-term.

### 28 **Existing Plants Operation**

29 Mirant's Delta Plants have a total generating capacity of 2,090 gross megawatts (1,985 net  
30 megawatts). Mirant's generating units burn natural gas and are designed to be cooled by water  
31 from the San Joaquin-Sacramento River Delta. Cooling water is drawn into the plants through  
32 9.5 mm (3/8 inch) screens, pumped to condensers, used to cool spent steam and then discharged  
33 immediately back into the San Joaquin-Sacramento Delta. Source waters for the Delta Plants'  
34 cooling water systems are characteristic of this part of the Bay-Delta that separates the upstream,  
35 freshwater Delta from the downstream, saltwater bays.

1 **Pittsburg Power Plant**

2 The Pittsburg Power Plant (PPP) consists of seven natural gas-fired generating units, four of  
 3 which have been retired. PPP Units 5&6 were built in 1960 and 1961, respectively, and generate  
 4 a total of 660 gMW of power. PPP Unit 7 was built in 1972 and generates 740 gMW. Cooling  
 5 water for the PPP is withdrawn from Suisun Bay through two adjacent shoreline intake  
 6 structures. Units 5&6, both once-through cooled units, are each serviced by two variable  
 7 frequency circulating water pumps (CWP) that withdraw water from the Units 5&6 intake  
 8 structure. Each pump has a maximum design flow of 115.6 million gallons per day (MGD)(354.7  
 9 acre-feet(AF)/day) or 231.1 MGD (709.3 AF/day) per unit (Table 4.1). The approach water  
 10 velocity in front of the bar racks can range from 0.5 to around 0.2 feet per second depending on  
 11 how much electric generation is needed and the number of the variable frequency pumps in  
 12 operation. Unit 7, which is equipped with two mechanical-draft cooling towers and a large  
 13 cooling water canal, withdraws make-up water through the Units 1-7 intake structure. Unit 7’s  
 14 closed-cycle system uses up to 43.6 MGD (133.9 AF/day) of make-up water.

15 In addition to the Units 5-7 cooling water intake requirements, the PPP withdraws water from the  
 16 Units 1-4 intake structure for station water supplies, for intermittent intake screen washing, and  
 17 for fire suppression purposes. At maximum operation, these additional uses account for  
 18 approximately 43.6 MGD (133.7 AF/day). The total current design flow for all PPP operations is  
 19 approximately 549.4 MGD (1,686.2 AF/day)(Table 4. 1).

**Table 4.1. Total PPP design maximum flows by subsystem**

	<i>Flow (GPM)</i>	<i>Flow (MGD)</i>	<i>Flow (AF/Day)</i>
Circulating Water Pumps			
Unit 5	160,500	231.1	709.3
Unit 6	160,500	231.1	709.3
<b>Subtotal</b>	<b>321,000</b>	<b>462.2</b>	<b>1,418.6</b>
Continuous Pumps			
Unit 7 Make-up Water Pump	30,300	43.6	133.9
Station Service Pumps(1)	27,000	38.9	119.3
Jockey Pump (Fire Suppression)	20	0.03	0.1
<b>Subtotal</b>	<b>57,320</b>	<b>82.5</b>	<b>253.3</b>
Intermittent Pumps			
Units 1-4 Screenwash Pumps (2)	6,750	0.04	0.1
Units 5&6 Screenwash Pumps (3)	5,400	3.9	11.9
Fire Suppression-Main Pump (4)	2,000	0.7	2.2
Fire Suppression-Auxiliary Pump (4)	0	0	0
<b>Subtotal</b>	<b>14,150</b>	<b>4.6</b>	<b>14.3</b>
<b>Total</b>	<b>392,470 GPM</b>	<b>549.4 (MGD)</b>	<b>1,686.2(AF/Day)</b>

*Notes:*

1. Since the retirement of Units 1-4 in 2004, one of the six station service pumps operates 24 hours per day (6.5 MGD).
2. Since the retirement of Units 1-4 in 2004, two of the three screenwash pumps are still operated about 1 hour/week for maintenance (0.04 MGD).
3. Design flows for pumps are reported. Two of the three pumps typically operate for a total of 90 minutes per day (3.9 MGD).
4. The fire suppression pumps are always available for emergency situations. The normal operating flows are based on testing each pump up to one hour per week to assure pump reliability and occasionally to flush the header system. Flows are calculated assuming the main pump is used for 25% of the year.

1 **Contra Costa Power Plant**

2 The Contra Costa Power Plant (CCPP) consists of seven natural gas-fired generating units, five  
 3 of which have been retired. Units 6&7 were built in 1964 and generate a total of 690 gross  
 4 megawatts (gMW) of power. Units 6&7 are equipped with once through cooling which utilizes  
 5 water withdrawn from the San Joaquin River. Units 6&7 are each serviced by two variable  
 6 frequency circulating water pumps (CWP) that each have a maximum design flow of 152,800  
 7 gpm, or 220 MGD (675 AF/day) (Table 4.2). The total design flow for both Unit 6 and Unit 7 is  
 8 approximately 305,600 gpm, or 440 MGD (1,351 AF/day). The approach water velocity in front  
 9 of the bar racks can range from 0.6 to around 0.2 feet per second depending on much electric  
 10 generation is needed and the number of the variable frequency pumps in operation.

11 In addition to the Unit 6 and Unit 7 cooling water intake requirements, the CCPP utilizes water  
 12 for station water supplies, for intermittent intake screen washing, and for fire suppression  
 13 purposes. At maximum operation, these additional uses account for approximately 22 MGD  
 14 (67.5 AF/day). The total current design flow for all CCPP operations is approximately  
 15 462 MGD (1,418 AF/day) (Table 4.2).

**Table 4.2. Total CCPP design maximum flows by subsystem**

	<i>Flow (GPM)</i>	<i>Flow (MGD)</i>	<i>Flow (AF/Day)</i>
Circulating Water Pumps			
Unit 6	152,800	220	675.3
Unit 7	152,800	220	675.3
<b>Subtotal</b>	<b>305,600</b>	<b>440</b>	<b>1,351</b>
Continuous Pumps			
Station Service Pumps	12,000	17.28	53
Jockey Pump (Fire Suppression)	20	0.03	0.1
<b>Subtotal</b>	<b>12,020</b>	<b>17.31</b>	<b>53.1</b>
Intermittent Pumps			
Units 6&7 Screenwash Pumps (1)	5,400	3.9	11.9
Fire Suppression (Main Pump) (2)	2,000	0.72	2.2
<b>Subtotal</b>	<b>7,400</b>	<b>4.6</b>	<b>14.1</b>
<b>Total</b>	<b>325,020 GPM</b>	<b>462 MGD</b>	<b>1,418 AF/Day</b>
<i>Notes:</i>			
1. Assumes that all three screenwash pumps operate for two hours every four hours per day.			
2. The fire suppression pumps are always available for emergency situations. The normal operating flows are based on testing each pump up to one hour per week to assure pump reliability and to occasionally flush the header system. Flows are calculated assuming the main pump is used for 25% of the year.			

16 **Variable Frequency Drive (VFD) Circulating Water Pump Operations**

17 The circulating water pumps at CCPP Units 6&7 and PPP Units 5-6 are mixed flow vertical  
 18 centrifugal pumps equipped with A-C induction motor drives. The drives have been modified to  
 19 utilize VFD controls, as well as to operate at full rated speed. The VFD controls provide a  
 20 means to vary drive speed by varying frequency. For a centrifugal pump, flow is proportional to  
 21 pump speed. Therefore as frequency and drive/pump speed are reduced, pump flow is also  
 22 reduced proportionally (i.e., 50% pump speed => 50% pump flow).

23 When operating in VFD mode, the circulating water pump speed/flow is typically at its  
 24 minimum level when the unit is at minimum load. The minimum circulating water pump  
 25 speed/flow is limited by both the pump and motor design and the system head requirements. For

1 PPP Units 5&6 and CCPP Units 6&7 minimum flow is 50% of design and minimum load is  
 2 ~25–45 MW. As unit load increases, pump speed and flow are increased in accordance with unit  
 3 conditions. Maximum circulating water speed/flow, 95–100% of design, is typically reached at  
 4 ~90–145 MW for PPP Units 5&6 and CCPP Units 6&7. River water temperature, tide,  
 5 condenser vacuum, steam flow, etc., all have an effect on circulating water flow requirements.

6 **Current Actual Operational Cooling Water Flows**

7 Actual flow rates at the Delta Plant have steadily decreased in recent years to be consistently  
 8 substantially below all maximum permitted flow limits. Capacity utilization rates (the ratio  
 9 between the annual net generation of power and the total net capability of the facility to generate  
 10 power) at the Plants have steadily declined over the last five years, and intake flows have  
 11 correspondingly decreased. For example, the combined 2008 total flow for CCPP Units 6 & 7  
 12 and PPP Units 5 & 6 of 32,863 MG (0.11 million AF) was more than 75% lower than the  
 13 comparable figure in 2004 and was 92% less than the comparable figure in 2001. See Table 4.3.  
 14 While the California Independent System Operator (CAISO) requires that the Delta Plants be  
 15 available at any time during the year, the Delta Plants are primarily used during California’s peak  
 16 energy demand periods, particularly in the crucial summer months. The Plants’ water intake  
 17 spiked in 2001 when California’s unprecedented energy crisis required almost continual  
 18 operation to meet electrical demand. Despite this unique circumstance, the overall use of cooling  
 19 water during the last 20 years shows that water intake has been steadily decreasing, but has been  
 20 sharply reduced since 2001. See Figure 4.1.

**Table 4.3. Electrical capacity utilization and cooling water flows for CCPP and PPP from 2004 to 2008.**

Plant/Year	Capacity Utilization (MWh/(MW Capacity * hours of generation)			Combined Annual Cooling Water Flows (MG/yr)	Combined Annual Cooling Water Flows (million AF/yr)
	Unit 6	Unit 7		Units 6&7	Units 6&7
<b>CCPP</b>					
2004	4.1	21.7		60,926	0.19
2005	1.2	10.1		29,874	0.09
2006	0.8	3.9		15,641	0.05
2007	1.4	3.3		12,879	0.04
2008	1.9	3.4		18,004	0.06
<b>PPP</b>	<b>Unit 5</b>	<b>Unit 6</b>	<b>Unit 7</b>	<b>Units 5&amp;6</b>	<b>Units 5&amp;6</b>
2004	24.0	20.8	9.5	71,751	0.22
2005	12.5	7.3	1.8	34,710	0.11
2006	7.7	5.3	1.4	25,112	0.08
2007	2.7	2.6	0.8	11,562	0.04
2008	2.3	2.4	0.8	14,859	0.05

21 **Discharge Flows (including Stormwater)**

22 In addition to once-through cooling flows, Mirant discharges process wastewater and stormwater  
 23 (quantity and quality of discharges are subject to permits issued by the State Water Resources  
 24 Control Board and San Francisco and Central Valley Regional Water Quality Control Boards).

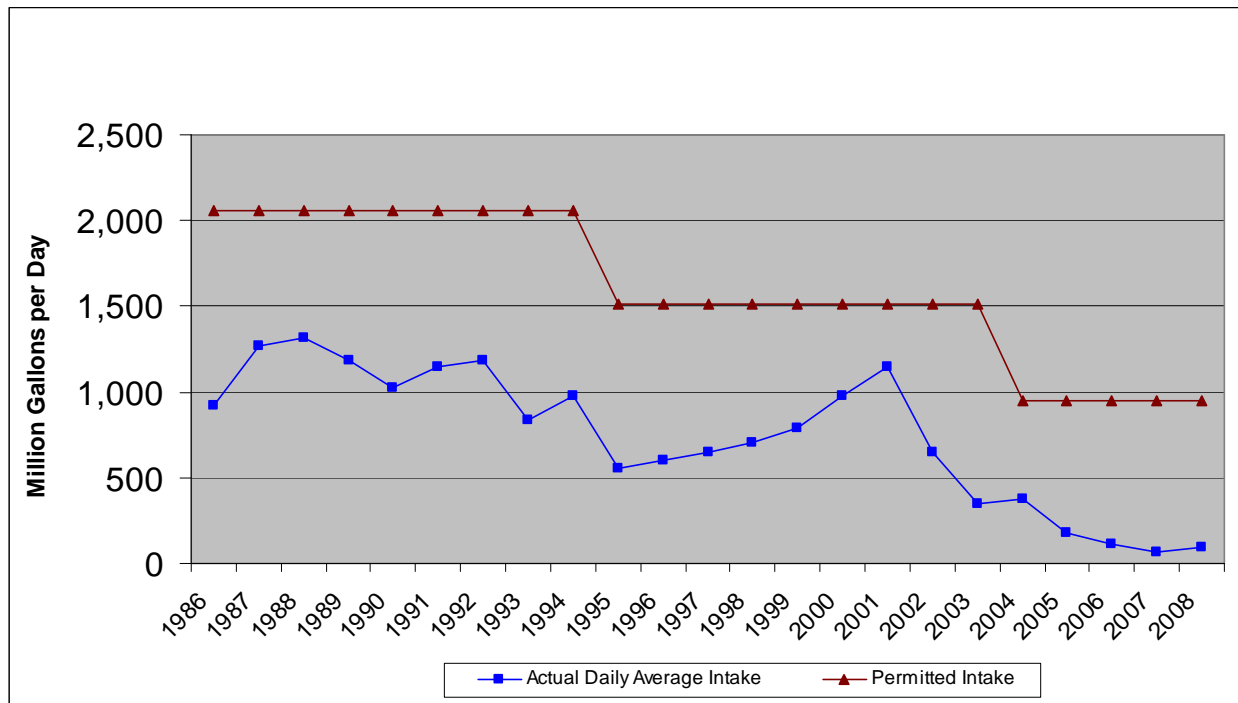


Figure 4.1. Average daily flows (MGD) of the CCPP and PPP from 1986 through 2008.

1 **Recurrent Plant Maintenance and Modification Activities and Monitoring Activities**

2 **Maintenance Dredging, Equipment Maintenance and Modifications, and Levee**  
 3 **and Flood Control Maintenance**

4 Maintenance and modification activities include those routine activities that maintain the  
 5 capacity and operational features of the existing power generation facilities at the Delta Plants  
 6 described above. These activities include periodic maintenance dredging in front of and in the  
 7 plant cooling water intake structures to remove naturally occurring accumulated sediments to  
 8 ensure that the approach velocity of cooling water entering the intake structure remains relatively  
 9 uniform across the intake screen and as close to design levels as possible and to prevent undue  
 10 damage to the facility from sediment in the cooling water and the related abrasion and wear of  
 11 power plant equipment, such as condenser tubes and circulating water pumps. Dredging is also  
 12 sometimes required around the docks and in the discharge outfalls to remove the sediment build  
 13 so that these structures can function and operate as designed. These activities also include  
 14 recurrent equipment maintenance and modifications (such as shoreline and pier maintenance,  
 15 maintenance and repair of all improvements, infrastructure, roads, electrical facilities,  
 16 underground linear facilities, vegetation management, etc.), as well as modifications to existing  
 17 facilities and infrastructure as needed to ensure continued power generation; levee maintenance  
 18 (such as placement of riprap for shoreline protection and erosion control) as needed to protect  
 19 the power generation facilities; and flood control maintenance (such as maintenance of Willow  
 20 Creek at the PPP) as needed.

1 **Aquatic Studies & Covered Species Monitoring**

2 Mirant is conducting, and will recurrently conduct, aquatic and covered species studies and  
3 monitoring, specifically involving data collection in the vicinity of the plants, in front of the  
4 intake and outfall structures, and within the cooling water system.

5 **4.6 New Water Facilities Construction, Operations and**  
6 **Maintenance**

7 **4.6.1 Isolated Conveyance Facility Construction and Operations**

8 *[Note to reviewers: While this write-up describes an eastside canal conveyance, alternatives*  
9 *including an all tunnel option are being evaluated and the Steering Committee will be briefed on*  
10 *that review in the next several weeks. A change in the conveyance approach may result in a*  
11 *major change to this section.]*  
12

13 A new conveyance facility would be constructed. This isolated conveyance facility would be a  
14 conveyance system designed and operated to improve protections for fish by bringing water from  
15 the Sacramento River to the existing water export pumping plants in the south Delta. The new  
16 facility includes an isolated conveyance canal for Sacramento River water diverted from multiple  
17 fish-screened intakes located from north of Freeport to Hood. The open unlined canal also will  
18 improve protections for water supplies from flood, earthquake, and sea level rise. The canal  
19 would follow an alignment around the eastern side of the Delta to a new forebay located adjacent  
20 to and south of the existing Clifton Court Forebay. Water would be conveyed to the existing  
21 Banks and Jones pumping plants serving the SWP and CVP, respectively.

22 The system design would include:

- 23 • A new geographic location for the CVP and SWP intake facilities on the Sacramento  
24 River
- 25 • Intake facilities equipped with fish screens, pumping plants, and pipelines
- 26 • A canal to convey flows from intake locations
- 27 • Eight inverted culvert siphons to convey flow under existing sloughs and a railroad
- 28 • Four tunnels to convey flow under rivers and floodways
- 29 • An intermediate pumping plant
- 30 • A new regulating forebay adjacent to the existing Clifton Court Forebay

31 Other facilities to support the function of the proposed facility include new bridges to connect  
32 existing roads and highways over the canal, improvements to local drainage systems affected by  
33 the project and other utilities improvements. More detail on specific features of the conveyance  
34 facility is provided in Appendix XX.

35 A description of operations is provided in Chapter 3 *Conservation Strategy*. The operations of  
36 these facilities are also covered activities. Covered Activities include all operations under the

- 1 initial authorized operational criteria and under any changes to operations within the authorized
- 2 adaptive management range.
- 3 The facilities are summarized below in Table 4.4.

**Table 4.4. Summary of Conveyance Facility Physical Characteristics**

<i>Feature Description</i>	<i>Approximate Characteristics</i>
<b>Overall Project</b>	
Potential Export Capacity (cfs)	15,000
Overall Length (miles)	49
<b>Intake Facilities</b>	
<i>Sacramento River</i>	
Number of In-River-Screened Intakes	5
Flow Capacity at Each Intake (cfs)	3,000
<b>Intake Pumping Plants / (included with Intake Facilities)</b>	
<i>Sacramento River</i>	
One Pumping Plant with Sedimentation Basin per Intake (each)	5
Six Pumps per Intake plus one spare, Capacity per Pump (cfs)	500
Total Dynamic Head (ft)	21
Total Electric Load (MW)	35 MW
<b>Isolated Conveyance Canal</b>	
Type	Unlined
Top Width (approximate maximum, ft)	700 (location-specific)
Invert Width (ft)	340
Depth (bottom to water surface)	23.5
Side Slopes (H:V)	3:1, 8:1
Average Permanent Right-of-Way Width (ft)	1,400
<b>26-foot × 26-foot Culvert Siphons</b>	
Stone Lake Drain, length (ft)	1,700
Beaver Slough, length (ft)	1,800
Hog Slough, length (ft)	1,900
Sycamore Slough, length (ft)	2,000
White Slough, length (ft)	2,300
Disappointment Slough, length (ft)	2,400
BNSF Railroad, length (ft)	1,500
Middle River, length (ft)	2,400
<b>Tunnel Siphons</b>	
<i>Sacramento River pipe tunnel connecting Intake #1 to start of canal, maximum flow 3,000 cfs</i>	
Tunnel Length (ft)	1,900
Number of Tunnel Bores, Number of Shafts (total)	1, 2
Tunnel Finished Inside Diameter (ft)	20
<i>Lost Slough/Mokelumne River Tunnel</i>	
Tunnel Length (ft)	5,400
Number of Tunnel Bores; Number of Shafts (total)	2, 4
Tunnel Finished Inside Diameter (ft)	33
<i>San Joaquin River Tunnel</i>	
Tunnel Length (ft)	2,700
Number of Tunnel Bores; Number of Shafts (total)	2, 4
Tunnel Finished Inside Diameter (ft)	33
<i>Old River Tunnel</i>	
Tunnel Length (ft)	1,700
Number of Tunnel Bores; Number of Shafts (total)	2, 4
Tunnel Finished Inside Diameter (ft)	33
<b>Intermediate Pumping Plant</b>	
<i>In Reach 11, North of BNSF Railroad Crossing</i>	
Number of Pumps, Capacity per Pump (cfs)	15 at 1,000 2 at 500
Total Dynamic Head (ft)	31

**Table 4.4. Summary of Conveyance Facility Physical Characteristics**

<i>Feature Description</i>	<i>Approximate Characteristics</i>
Total Electric Load (MW)	50
<b>New Forebay (Byron Tract Forebay)</b>	
Type	Unlined
Water Surface Area (acres)	630
Active Storage Volume (acre-ft)	4300
<b>Power Requirements</b>	
Total Conveyance Electric Load (MW)	93
<i>Notes:</i> BNSF = Burlington Northern and Santa Fe Railroad cfs = cubic feet per second ft = feet/foot H:V = horizontal to vertical ratio MW = megawatt	

1

## 2 **4.6.2 In-Delta Conveyance Improvements**

3 *[Note to reviewers: The Two-Gates Demonstration Project is under consideration by Reclamation and*  
 4 *will be addressed under a separate regulatory process from BDCP. If this project is carried forward, it*  
 5 *will be included in BDCP and a description will be provided by Reclamation.]*

## 6 **4.6.3 Fremont Weir Gates Construction and Operations**

7 This includes the construction and operations of the Fremont Weir Operable Gates (long-term),  
 8 i.e., new operable gates on the Fremont Weir that will allow for the control of the timing,  
 9 duration, and frequency of inundation of the Yolo Bypass during non-flood stage periods of the  
 10 Sacramento River.

## 11 **4.7 Habitat Restoration, Enhancement, and Management** 12 **Activities**

13 Habitat restoration, enhancement, and management activities include all actions that may be  
 14 undertaken by the Management Entity to implement the physical habitat conservation measures  
 15 described in Section 3.4.2, *Physical Habitat Conservation Measures*. Types of actions necessary  
 16 to implement habitat restoration and enhancement conservation measures are anticipated to  
 17 include, but are not limited to:

- 18 • Grading, excavation, and placement of fill material;
- 19 • Breaching, modification, or removal of existing levees and dikes and construction of new  
 20 levees and dikes;
- 21 • Modification, demolition, and removal of existing infrastructure (e.g., buildings, roads,  
 22 fences, electric transmission and gas lines, irrigation infrastructure);
- 23 • Construction of new infrastructure (e.g., buildings, roads, fences, electric transmission  
 24 and gas lines, irrigation infrastructure);
- 25 • Removal of existing vegetation and planting/seeding of vegetation;

- 1 • Controlling the establishment of non-native vegetation to encourage the establishment of  
2 target native plant species; and
- 3 • Control of non-native predator and competitor species (e.g., feral cats, rats, and non-  
4 native foxes)

5 Habitat management actions include all activities undertaken by the Management Entity to  
6 maintain the intended functions of protected, restored, and enhanced habitats over the term of the  
7 BDCP. Habitat management actions are anticipated to include, but are not limited to:

- 8 • Minor grading, excavation, and filling to maintain infrastructure and habitat functions  
9 (e.g., levee and dike maintenance; grading or placement of fill to eliminate fish stranding  
10 locations);
- 11 • Maintenance of infrastructure (e.g., buildings, roads, fences, electric transmission and gas  
12 lines, irrigation infrastructure, fences);
- 13 • Maintaining vegetation and vegetation structure (e.g., grazing, mowing, burning,  
14 trimming); and
- 15 • Ongoing control of terrestrial and aquatic non-native plant and wildlife species.

16 The scope of the physical habitat actions provided for under the BDCP is presented in Table 4.5.  
17 The extent of the habitat and natural communities conservation actions set out in this section reflects  
18 both an assessment of the long-term conservation needs of individual covered species (i.e., habitat  
19 function, quantity, connectivity, and distribution), and an analysis of existing and future constraints  
20 that could affect habitat conservation, including land surface subsidence, habitat values, and land use.

21 A primary conservation goal of the BDCP is to restore 80,000 acres of tidal marsh and associated  
22 aquatic estuarine habitats, riparian habitat, and new floodplain for the benefit of fish, wildlife, and  
23 plants and ecosystem processes in the Delta and Suisun Marsh. The BDCP physical habitat  
24 conservation program is organized geographically across the northern, eastern, southern and  
25 western regions of the Delta. It is also organized by habitat type, and temporally into near-term  
26 and a long-term implementation phases. The schedule for protection, enhancement, and restoration  
27 of physical habitat is described in Chapter 6, *Implementation Plan*. Protection, enhancement, and  
28 restoration of other natural communities and habitats would be undertaken in both the near-term  
29 and long-term implementation periods as described in Chapter 6, *Implementation Plan*. In the  
30 near-term, prior to completion of the isolated conveyance facility, the BDCP targets for habitat  
31 restoration include 14,000 acres of tidal marsh and associated aquatic estuarine habitat and 1,300  
32 acres of riparian forest and scrub habitat. Within 15 years, the goal is for tidal marsh and  
33 associated aquatic estuarine habitat restoration to reach 25,000 acres and riparian restoration to  
34 reach 2,300 acres and the addition of 1,000 acres of new season floodplain habitat. By year 40, the  
35 BDCP goal is to have established 65,000 acres of tidal marsh and associated aquatic estuarine  
36 habitats, 5,000 acres of riparian habitat, and 10,000 acres of new floodplain.<sup>2</sup>

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<sup>2</sup> The 10,000 acre target for new floodplain restoration does not include floodplain habitat enhanced in the Yolo Bypass under WOCML2.

**Table 4.5. Extent of BDCP Natural Communities and Habitat Types Conserved Over the Term of the BDCP**

Conserved Natural Community/Habitat Type	Extent of Each Natural Community and Habitat Type Conserved			
	Protected	Enhanced (acres except as noted in table)	Restored	Total
Seasonally Inundated Floodplain	[To come.]	2,000-6,000 cfs <sup>1</sup>	10,000 acres	[To come.]
Freshwater Tidal Marsh and Brackish Tidal Marsh	[To come.]	[To come.]	65,000 acres	[To come.]
Channel Margin	[To come.]	20 linear miles	[To come.]	[To come.]
Riparian	[To come.]	[To come.]	5,000 acres	[To come.]
Agricultural	[To come.]	[To come.]	[To come.]	[To come.]
Grassland	[To come.]	[To come.]	[To come.]	[To come.]
Natural Seasonal Wetland	[To come.]	[To come.]	[To come.]	[To come.]
Managed Seasonal Wetland	[To come.]	[To come.]	[To come.]	[To come.]
Nontidal Perennial Aquatic	[To come.]	[To come.]	[To come.]	[To come.]
Nontidal Permanent Emergent Marsh	[To come.]	[To come.]	[To come.]	[To come.]
<b>Total</b>	[To come.]	[To come.]	[To come.]	[To come.]

*Notes:*

1. This represents the extent of increased inflow into the existing Yolo Bypass floodplain that would be provided with operation of a modified Fremont Weir to increase the duration and frequency of seasonally inundated floodplain habitat. The conditions under which this increased inflow would be provided are described in conservation measure WOCML2 in Section 3.4.1.

1

2 In the near-term BDCP implementation period, actions to restore tidal marsh and riparian

3 habitats will likely be directed at the Cache Slough, West Delta, and Suisun Marsh Restoration

4 Opportunity Areas (ROAs) (see Figure 3.1). The initial focus on these ROAs reflects the

5 anticipated productivity benefits that may be achieved in the near-term prior to changes to the

6 existing through Delta conveyance system. These near-term elements of the habitat program will

7 parallel adjustments in water management and flow regimes that are designed together to realize

8 substantial improvements in aquatic productivity and function for covered species while the

9 structural long-term improvements are constructed. Following commencement of dual water

10 conveyance operations (i.e., the long-term BDCP implementation period), restoration of tidal and

11 riparian habitat would continue in these ROAs and would be expanded significantly into the

12 remaining ROAs in the south and eastern Delta. The restoration of physical habitat in tidal and

13 floodplain areas will not only benefit covered species by the expansion of rearing and spawning

14 habitat, but will also improve adjacent aquatic habitat through inputs of organic material and

15 nutrients and through influences on hydrodynamics of flow and tidal action in upstream and

16 downstream channels.

## 17 4.8 Activities to Reduce Contaminants

18 Activities to reduce contaminants that could result in incidental take may include such actions as:

- 19 ■ Coordinating with sanitation districts that discharge wastewater into waterways within or
- 20 just upstream of the Delta and Suisun Bay (hereafter, “local sanitation districts”) and the
- 21 Central Valley and San Francisco Regional Water Quality Control Boards (RWQCBs), to

1 evaluate the need and, if demonstrated to be necessary to protect covered fish species,  
2 reduce the levels of effluent-derived ammonia/um entering the Delta and Suisun Bay;

- 3     ▪ Coordinating with sanitation districts that discharge wastewater into or just upstream of  
4 waterways within the Delta and Suisun Bay (hereafter, “local sanitation districts”) and  
5 the Central Valley Regional Water Quality Control Board (CVRWQCB), to evaluate the  
6 need and, if demonstrated to be necessary to protect covered fish species, improve  
7 treatment processes at wastewater treatment facilities to reduce loads of endocrine  
8 disrupting compounds (EDCs) into the Delta and Suisun Bay;
- 9     ▪ Providing funding over the term of the BDCP to DWR and the Central Valley Regional  
10 Water Quality Control Board (CVRWQCB) to reduce the load of methylmercury  
11 entering the Delta and in-Delta sources in conformance with CVRWQCB’s Draft Total  
12 Maximum Daily Load (TMDL);
- 13     ▪ Reducing the load of pesticides and herbicides entering Delta waterways from in-Delta  
14 sources by implementing two related actions: (1) support efforts by the Central Valley  
15 Regional Water Quality Control Board (CVRWQCB) under its Irrigated Lands  
16 Regulatory Program to reduce inputs of toxics from agricultural return flows into the  
17 Delta, and (2) fund conservation easements, cost-sharing programs, and provide other  
18 positive incentives to groups of farmers, large individual farmers, reclamation districts,  
19 and irrigation/drainage districts to develop targeted voluntary agricultural chemical  
20 management plans or other actions to reduce the amounts of pesticides and herbicides  
21 reaching Delta waterways;
- 22     ▪ Providing funding to the Sacramento Stormwater Quality Partnership, and/or counties  
23 and cities whose stormwater contributes to Delta waterways (hereafter “stormwater  
24 entities”) under National Pollutant Discharge Elimination System (NPDES) MS4  
25 stormwater permits to implement actions from and in addition to their respective  
26 stormwater management plans; and
- 27     ▪ Coordinating with willing owners/managers of seasonal managed wetlands in the Delta  
28 and Suisun Marsh to improve quality of water released from these wetlands by  
29 implementing best management practices.

#### 30 **4.9 Activities to Reduce Predators and Other Sources of** 31 **Direct Mortality**

32 Activities to reduce predators and other sources of direct mortality that could result in incidental  
33 take may include such actions as:

- 34     ▪ Providing funding over the term of the BDCP to support implementation of actions to  
35 reduce the risk of future introductions of non-native aquatic organisms from recreational  
36 watercraft;
- 37     ▪ Funding the DFG Oil Spill Prevention and Response (OSPR) aquatic species monitoring  
38 program and a DFG volunteer invasive early detection network to increase non-native  
39 early detection capability in the Bay-Delta, and funding the DFG Invasive Species  
40 Program to support their rapid response program;

- 1     ▪ Funding the removal of Brazilian waterweed, water hyacinth, and other non-native  
2       submerged and floating aquatic vegetation from Delta waterways;
- 3     ▪ Funding development of a pilot program to reduce the size limits and increase the bag  
4       limits of recreational harvest of non-native predatory species in two specific locations in  
5       the Delta “hot spots”;
- 6     ▪ Providing funding to increase the enforcement of fishing regulations in the Delta and  
7       Bays to reduce illegal harvest of covered salmonids and sturgeon;
- 8     ▪ Providing funding to reduce entrainment at non-project diversions;
- 9     ▪ Reducing the effects of predators on covered fish species by conducting localized  
10       predator control using a variety of methods in locations in the Delta that are known to  
11       have high densities of predators (“predator hot spots”); and
- 12    ▪ Installing non-physical barriers at the junction of channels with low survival of  
13       outmigrating juvenile salmonids to deter fish from entering these channels.

#### 14    **4.10    Monitoring and Research Programs**

15    As described in Chapter 3, various types of monitoring activities will be conducted during BDCP  
16    implementation including preconstruction surveys, construction monitoring, compliance  
17    monitoring, effectiveness monitoring, and system monitoring. In addition, the BDCP  
18    Management Entity may undertake or contract focused research to develop information  
19    necessary to better inform BDCP implementation. Such monitoring and research activities could  
20    result in incidental take. Though individual instances of take are expected to be minor, there are  
21    likely to be many such instances over a long period of time.

#### 22    **4.11    Other Conservation Actions**

23    All other conservation actions, included in BDCP Chapter 3 *Conservation Strategy* that could  
24    result in incidental take, not described above are covered activities. Although take levels are  
25    expected to be low, other conservation actions that could result in take of covered species and  
26    therefore require authorization as covered activities are included. Examples of actions include:

- 27    ▪ Operating and maintaining an oxygen diffuser(s) in the Stockton Deep Water Ship  
28       Channel to increase dissolved oxygen concentrations between Turner Cut and Stockton to  
29       meet Total Maximum Daily Load (TMDL) objectives established by the CVRWQCB  
30       (2005) (above 6.0 mg/L from September 1 through November 30 and above 5.0 mg/L at  
31       all times);
- 32    ▪ Developing a study of, and draft regulations for limits on recreational and commercial  
33       splittail harvest;
- 34    ▪ Minimizing potential adverse effects of hatchery reared salmonids on wild salmonid  
35       stocks by supporting the accelerated development and implementation of Hatchery and

- 1 Genetic Management Plans (HGMPs) for all state Chinook salmon and steelhead  
2 hatcheries in the Central Valley of California;
- 3     ▪ Reducing harvest of wild stocks of Chinook salmon by producing a proposal by July  
4 2011 for a full-scale mark-select fishery program that may be implemented by the  
5 California Department of Fish and Game (DFG) and the Pacific Fishery Management  
6 Council (PFMC); and
- 7     ▪ Supporting: (1) the development of a delta and longfin smelt conservation hatchery by  
8 the USFWS to house a delta smelt refugial population and provide a source of delta and  
9 longfin smelt for supplementation or reintroduction, if deemed necessary by Fishery  
10 Agencies, and (2) the expansion of the refugial population of delta smelt and  
11 establishment of a refugial population of longfin smelt at the University of California,  
12 Davis Fish Conservation and Culture Laboratory to serve as a population safeguard in  
13 case of a catastrophic event in the wild.
- 14

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