California Department of Fish and Game
Bay Delta Region
P.O. Box 47, Yountville, CA 94599

California Endangered Species Act
Incidental Take Permit No. **2081-2009-001-03**

Department of Water Resources
California State Water Project Delta Facilities and Operations

Authority: This California Endangered Species Act (CESA) Incidental Take Permit (Permit) is issued by the Department of Fish and Game (DFG) pursuant to Fish and Game Code sections 2081(b) and 2081(c), and California Code of Regulations, title 14, subdivision 3, chapter 6, article 1, commencing with section 783. CESA prohibits the take[1] of any species of wildlife designated as an endangered, threatened, or candidate species[2] by the Fish and Game Commission. DFG, however, may authorize the take of such species by permit if the conditions set forth in Fish and Game Code sections 2081(b) and 2081(c) are met. (See also Cal. Code Regs., tit. 14, § 783.4.)

Permittee:	**Department of Water Resources (DWR)**
Name and title of principal officer:	**Lester Snow, Director**
Contact person:	**Barbara McDonnell, (916) 376-9700**
Mailing address:	**PO Box 942836** **Sacramento, CA 94236-0001**

Effective Date and Expiration Date of Permit:
This Permit shall be executed in duplicate original form and shall become effective once a duplicate original is acknowledged by signature of the Permittee on the last page of the Permit and returned to DFG's Habitat Conservation Planning Branch at the address listed in the Notices section of this Permit. Unless renewed by DFG, this Permit's authorization to take the Covered Species shall expire on December 31, 2018.

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[1] Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill."

[2] "Candidate species" are species of wildlife that have not yet been placed on the list of endangered species or the list of threatened species, but which are under formal consideration for listing pursuant to Fish and Game Code section 2074.2.

Project Location and Description:

The proposed project (Project) is Permittee's on-going and long-term operation of the State Water Project (SWP) existing facilities in the Sacramento-San Joaquin Delta for the protection of longfin smelt.

Existing facilities in the Delta include Clifton Court Forebay (CCF), John E. Skinner Fish Facility (Skinner Facility), Harvey O. Banks Pumping Plant (collectively referred to as the Banks Pumping Plant Complex), and the North Bay Aqueduct (NBA) at Barker Slough. Facilities run in coordination with the Central Valley Project (CVP) are the Suisun Marsh Salinity Control Gates (SMSCG), Roaring River Distribution System (RRDS), Morrow Island Distribution System (MIDS), Goodyear Slough Outfall, and the South Delta Temporary Barriers Project (TBP). TBP has four rock barriers across south Delta channels (at Middle River near Victoria Canal, Old River near Tracy, Grant Line Canal near Tracy Boulevard Bridge, and the head of Old River near the confluence of Old River and San Joaquin River) which can be installed and removed during spring and fall. Other facilities of the SWP include Oroville Dam which is operated for flood control, recreation, other beneficial uses, and water supply and described in general terms below in SWP operations.

The SWP is operated to provide flood control and water for agricultural, municipal, industrial, recreational, and environmental purposes. Water from Oroville facilities and Sacramento-San Joaquin flows are captured in the Delta and conveyed to SWP contractors. Water is conserved in Oroville Reservoir and released to serve three Feather River area contractors, two contractors by the NBA, and is delivered to the remaining 24 contractors in the SWP service areas south of the Delta from the Harvey O. Banks Pumping Plant in the south Delta.

Facilities of the SWP are permitted by the California State Water Resources Control Board (SWRCB) to divert water in the Delta and re-divert water that is stored in upstream reservoirs. The Bureau of Reclamation (Bureau) operates the the Central Valley Project (CVP). The Bureau and Permittee coordinate the operations of the CVP and SWP to meet water quality, quantity, and operational criteria in the Delta set by the SWRCB and to meet Endangered Species Act (ESA) requirements for delta smelt, winter and spring-run Chinook salmon, steelhead and green sturgeon. In addition, DWR operates to a Public Notice from United States Army Corps of Engineers (USACE) for the operation of the CCF.

Banks Pumping Plant Complex

The SWP facilities in the southern Delta include CCF, Skinner Facility, and the Banks Pumping Plant. The CCF is a 31,000 af reservoir located in the southwestern edge of the Delta, about ten miles northwest of Tracy. The CCF provides storage for off-peak pumping, moderates the effect of the pumps on the fluctuation of flow and stage in adjacent Delta channels, and collects sediment before it enters the California Aqueduct. Diversions from Old River into CCF are regulated by five radial gates whose real-time operations are constrained by a scouring limit (i.e. 12,000 cfs) at the gates and by water level concerns in the south Delta for local agricultural diverters. When a large head differential exists between

the outside and the inside of the gates, theoretical inflow can be as high as 15,000 cfs for a very short time. However, existing operating procedures identify a maximum design flow rate of 12,000 cfs, to minimize water velocities in surrounding south Delta channels, to control erosion, and to prevent damage to the facility. The Skinner Facility is an elaborate system of louvers[3] and pipes that direct some water into holding tanks where some entrained fish are collected, placed in a truck, driven to the western Sacramento-San Joaquin Delta, and released in an effort to reduce the adverse impact of water export. These fish are described or characterized as "salvaged" and represent an index that is critical to evaluating the magnitude of fish entrainment and direct loss associated with the operations of the Banks Pumping Plant.

North Bay Aqueduct Intake at Barker Slough

The Barker Slough Pumping Plant diverts water from Barker Slough into the NBA for delivery to Napa and Solano Counties. Maximum pumping capacity is 175 cfs (pipeline capacity). During the past few years, daily pumping rates have ranged from 0 to 140 cfs. The current maximum pumping rate is 140 cfs because an additional pump is required to be installed to reach 175 cfs. The NBA intake is located approximately 10 miles from the main stem Sacramento River at the end of Barker Slough. Per salmon screening criteria, each of the ten NBA pump bays is individually screened with a positive barrier fish screen consisting of a series of flat, stainless steel, wedge-wire panels with a slot width of 3/32 inch. The bays tied to the two smaller units have an approach velocity of about 0.2 ft/s and the larger units have an approach velocity of approximately 0.44 ft/s. The screens are routinely cleaned to prevent excessive head loss, thereby minimizing increased localized approach velocities.

Suisun Marsh

Suisun Marsh contains several facilities including, the SMSCG, Roaring River Distribution System, Morrow Island Distribution System, and the Goodyear Slough Outfall. A contractual agreement between DWR, Reclamation, DFG and the Suisun Resource Conservation District (SRCD) contains provisions for DWR and Reclamation to mitigate the effects of SWP and CVP operations on salinity in Suisun Marsh. The Suisun Marsh Preservation Agreement requires DWR and Reclamation to meet salinity standards, and delineates monitoring and mitigation requirements. In addition to the contractual agreement, SWRCB Water Rights Decision 1641 requires specified salinity standards in the marsh.

Suisun Marsh Salinity Control Gates

The Suisun Marsh Salinity Control Gates are located on Montezuma Slough about 2 miles downstream from the confluence of the Sacramento and San Joaquin Rivers, near Collinsville. Operation of the SMSCG began in October 1988 as Phase II of the Plan of Protection for the Suisun Marsh. The facility, spanning the 465 foot width of Montezuma Slough, consists of a boat lock, a series of three radial gates, and removable flashboards.

[3] Unlike screens, these louvers are 'behavioral barriers' that only protect entrained fish that can swim away from them. The louvers are relatively ineffective at protection of fish < 20 mm long.

The objective of SMSCG operation is to decrease the salinity of the water in Montezuma Slough by restricting the flow of higher salinity water from Grizzly Bay into Montezuma Slough during incoming tides and retaining lower salinity Sacramento River water from the previous ebb tide. Operation of the gates in this fashion lowers salinity in Suisun Marsh channels and results in a net movement of water from east to west.

When Delta outflow is low to moderate and the gates are not operating, tidal flow past the gate is approximately +/- 5,000-6,000 cfs while the net flow is near zero. When operated, flood tide flows are arrested, while ebb tide flows remain in the range of 5,000-6,000 cfs. The net downstream flow in Montezuma Slough becomes approximately 2,500-2,800 cfs. The USACE permit for operating the SMSCG allows that it be operated between October and May to meet Suisun Marsh salinity standards. Historically, the gates have been operated as early as October 1, while in some years (e.g. 1996) the gates were not operated at all. When the channel water salinity decreases sufficiently below the salinity standards, or at the end of the control season, the flashboards are removed and the gates raised to allow unrestricted movement through Montezuma Slough.

As a result of studies on salmon movement and discussions with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), the boat lock portion of the gate is now held open, except to pass boat traffic, during SMSCG operation to allow for continuous salmon passage opportunity. With increased understanding of the effectiveness of the gates in lowering salinity in Montezuma Slough, salinity standards have been met with less frequent gate operation since 2006. This level of operational frequency (10 – 20 days per year) can generally be expected to meet future standards except during exceptional hydrologic conditions

Roaring River Distribution System

The RRDS was constructed during 1979 and 1980 as part of the Initial Facilities in the Plan of Protection for the Suisun Marsh. The system was constructed to provide lower salinity water to 5,000 acres of private and 3,000 acres of DFG managed wetlands on Simmons, Hammond, Van Sickle, Wheeler, and Grizzly Islands.

The RRDS includes a 40-acre intake pond that supplies water to Roaring River Slough. Water is diverted from Montezuma Slough through a bank of eight 60-inch-diameter culverts equipped with fish screens into the Roaring River intake pond on high tides to raise the water surface elevation in RRDS above the adjacent managed wetlands. Managed wetlands north and south of the RRDS receive water, as needed, through publicly and privately owned turnouts on the system. The intake to the RRDS is screened to prevent entrainment of fish larger than approximately 25 mm. After the listing of delta smelt, RRDS diversion rates have been controlled to maintain an average approach velocity below 0.2 ft/s at the intake fish screen. Permittee proposes to operate with approach velocities up to 0.7 fps for up to four weeks each October to provide for adequate filling of RRDS. Routine maintenance of the system is conducted by DWR and primarily consists of maintaining the levee roads and fish screens.

Morrow Island Distribution System

The MIDS was constructed in 1979 and 1980 in the south-western Suisun Marsh as part of the Initial Facilities in the Plan of Protection for the Suisun Marsh. The contractual requirement for the Reclamation and DWR is to provide water to ownerships so that lands may be managed according to approved local management plans. The system was constructed primarily to channel drainage water from the adjacent managed wetlands for discharge into Suisun Slough and Grizzly Bay. This approach increases circulation and reduces salinity in Goodyear Slough. The MIDS is used year-round, but most intensively from September through June. Reclamation and DWR continue to coordinate with FWS, NMFS, and DFG regarding fish entrainment at this facility.

Goodyear Slough Outfall

The Goodyear Slough Outfall was constructed in 1979 and 1980 as part of the Initial Facilities. The system was designed to reduce salinity by drawing Green Valley Creek flow south into Goodyear Slough and by draining water one-way from the lower end of Goodyear Slough into Suisun Bay on the ebb tide. The one-way flap gates at the Outfall close on flood tide keeping saltier bay water from mixing into the slough. The system creates a small net flow in the southerly direction overlaid on a larger, bi-directional tidal flow. The system provides lower salinity water to the wetland managers who flood their ponds with Goodyear Slough water.

South Delta Temporary Barriers Project

The South Delta Temporary Barriers Project consists of installation of four temporary rock barriers across south Delta channels. The barriers on Middle River, Old River near Tracy, and Grant Line Canal are flow control facilities designed to improve water levels for agricultural diversions. The head of Old River barrier is designed to reduce the number of out-migrating salmon smolts entering Old River. During the fall this barrier is designed to improve flow and dissolved oxygen conditions in the San Joaquin River for the immigration of adult fall-run Chinook salmon.

Species Subject to the Take Authorization Provided by this Permit:

This Permit covers the following species during the remainder of its candidacy period and beyond, in the event the Fish and Game Commission approves the petition to list the species as threatened or endangered at its March 2009 meeting:

Name	Status[4]
Fish	
1. longfin smelt (*Spirinchus thaleichthys*)	Candidate[5]

This species and only this species is hereinafter referred to as "Covered Species."

Impacts to Covered Species:

The Project is within the range of the Covered Species and will result in take of individuals of the species as well as temporary and permanent impacts to the Covered Species and its habitat. Incidental take of the Covered Species may occur as a result of mortality due to Project operations including entrainment/salvage (direct impacts), and as a result of increased habitat degradation and the Project's incremental contribution to cumulative impacts (indirect impacts) (Attachment A, Effects Analysis). Many factors likely affect the Covered Species including predation, contaminants, introduced species, entrainment, habitat suitability, food supply, aquatic macrophytes, and microcystis. The effects of many of these factors on the Covered Species are related to hydrodynamic conditions in the Delta. To the extent that hydrodynamic conditions of the Delta are directly affected by the Project operations, they are considered in DFG's evaluation of the impacts of the taking. To compensate for impacts, DWR will be required to uphold minimization and mitigation measures specified in this Permit. The Project's impacts on the Covered Species at specific facilities are described below in more detail.

The Banks Pumping Plant Complex

The entrainment of the Covered Species into CCF is a direct effect of Project operations as evidenced by adult, sub-adult, and larval longfin smelt collected during salvage operations in the Skinner Facility as early in the water year as December and as late as May. Larval longfin smelt, which were not identified or counted prior to 2008, are probably entrained from late December through April. Surviving larval longfin smelt reach juvenile size (20 mm) and are recognized in salvage from March through June, sometimes later. Many entrained longfin smelt are not salvaged at the Skinner Facility and are taken or otherwise lost at the Banks Pumping Plant Complex and the California Aqueduct.

Longfin smelt also may succumb to predation, to lethal temperatures in late spring and summer prior to entering the salvage facilities, and/or from entrainment due to screening inefficiencies. Moreover, many of the entrained longfin smelt salvaged are likely to die

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[4] Refers to status under CESA. Under CESA, a species may be on the list of endangered species, the list of threatened species, or the list of candidate species. All other species are "unlisted."

[5] The species status may change following the decision of the Fish and Game Commission to designate the species as threatened or endangered but if there is such a designation, the species will remain a Covered Species.

due to handling, transport, and predation at release sites. Longfin smelt salvage and presumably entrainment are highest during low outflow years (CDFG 2009, Effects Analysis). Thus, mortality associated with entrainment would be highest when the population already faces adverse recruitment conditions attributable to the low outflow. Salvage during successive years of low outflow declined along with longfin smelt abundance, so effects of OMR flows on salvage will vary across low outflow years (i.e., the same OMR flow conditions will on average result in less salvage as abundance declines over successive low outflow years).

Salvage operations are an important factor in minimizing entrainment loss and are the source of data to evaluate the magnitude of entrainment of the SWP operations. There are times when the Skinner Facility can not be operated to normal specifications due to operational (e.g. mechanical or electrical emergencies) or maintenance situations (hereafter referred to as 'outages'). These outages, depending on the time of year, significantly reduce or negate the ability to salvage fish from entrainment into Banks Pumping Plant and affect the ability to measure the entrainment and losses resulting from Project operations.

Salvage operations are adversely affected by (1) inability to salvage fish according to standard operating protocol, (2) aspects of louver maintenance, and (3) inability to properly salvage fish from the entire export flow (e.g., due to mechanical breakdown, low water conditions, and/or excessive debris conditions). Moreover, many salvaged longfin smelt likely die due to handling, transport, and predation at release sites.

Suisun Marsh Operations

Suisun Marsh Salinity Control Gates: Operation of the SMSCG began in October of 1988 as Phase II of the Plan of Protection for the Suisun Marsh. The objective of SMSCG operation is to decrease the salinity in Montezuma Slough for multiple beneficial uses. The gates restrict the flow of brackish water from Grizzly Bay into Montezuma Slough during incoming tides and facilitate the movement of low salinity Sacramento River water into Montezuma Slough during ebb tides. This results in a net downstream movement of Sacramento River water into Suisun Marsh. The SMSCG have a permit to operate September through May, but in recent years have only operated October through November. The SMSCG has the potential to affect adult longfin smelt by causing short-term delays in longfin smelt spawning migrations. DFG assumes that current operation of the boat locks in compliance with NMFS requirements for salmonid passage may avoid impacts to longfin smelt passage. Particle tracking results for 1992 versus 2008 show clearly that the transport of larval longfin smelt can be affected by SMSCG operation and current screening does not prevent entrainment of larval longfin smelt. However, the SMSCG are seldom operated when larval longfin are present.

Roaring River Distribution System: The RRDS was constructed in 1979 and 1980 as a component of the Initial Facilities in the Plan of Protection for the Suisun Marsh. The

RRDS has been screened to delta smelt standards to exclude adult longfin smelt, but does not exclude larval smelt.

Morrow Island Distribution System: The MIDS was constructed in 1979 and 1980 as a component of the Initial Facilities in the Plan of Protection for the Suisun Marsh. The MIDS is currently not screened and adult longfin smelt have been entrained at MIDS during their pre-spawn staging in the fall. The magnitude of entrainment effect of MIDS on longfin smelt is highly dependent on the fall flood-up schedule of landowners serviced by MIDS and the specifics of migration timing, both of which vary each year. Historically, the gates at MIDS have only been partially opened for fall flood-up which restricts the effects on fish entrainment.

North Bay Aqueduct

North Bay Aqueduct can convey up to about 175 cfs diverted from the Barker Slough Pumping Plant to supply water to Napa and Solano Counties. Maximum pumping capacity is 175 cfs (pipeline capacity). During the past few years, daily pumping rates have ranged from 0 to 140 cfs. The current maximum pumping rate is 140 cfs because an additional pump is required to be installed to reach 175 cfs. Winter diversions have historically averaged about 40 cfs and have seldom exceeded 80 cfs on a daily basis. Barker Slough Pumping Plant is located in Barker Slough, which is located in the northwest part of the Cache Slough system. Longfin smelt use the Cache Slough region as spawning habitat more during low outflow winter/springs when the low-salinity zone encompasses parts of the Delta. Migrating adult longfin smelt get to the Cache Slough region using the strong outflow signal and tidal currents of the Sacramento River and Yolo Bypass. Diversion of water from Barker Slough is lower during the winter which reduces longfin smelt larvae entrainment into the slough. Each of the ten NBA pump bays is individually screened with a positive barrier fish screen consisting of a series of flat, stainless steel, wedge-wire panels with a slot width of 3/32 inch. This configuration is designed to exclude fish approximately 25 mm or larger from being entrained. Entrainment and impingement of adult longfin smelt staging or spawning in Barker Slough should be minimal due to the screened diversion with fairly low approach velocities. Further, the flooding of Little Holland Tract and Liberty Island seems to have permanently decreased the NBA/Yolo Bypass flow ratio, greatly reducing the risk of false attraction flows toward the Barker Slough Pumping Plant during the longfin smelt spawning season.

Incidental Take Authorization:

DFG authorizes the Permittee, its employees, contractors, and agents to take Covered Species incidentally in carrying out the Project, subject to the limitations described in this section and the Conditions of Approval identified below. This Permit does not authorize take of Covered Species from activities outside the scope of the Project as described above, take of Covered Species resulting from violation of this Permit, or intentional take of Covered Species not authorized by this Permit.

Conditions of Approval:
Unless specified otherwise, the following measures shall pertain to all activities within the Project boundaries. DFG's issuance of this Permit and Permittee's authorization to take the Covered Species are subject to Permittee's compliance with and implementation of the following Conditions of Approval:

1. Permittee shall comply with all applicable state, federal, and local laws in existence on the effective date of this Permit or adopted thereafter.

2. Permittee shall implement and adhere to the measures in the Negative Declaration and Initial Study adopted by the Department of Water Resources on February 18, 2009.

3. Permittee shall fully implement and adhere to the conditions of this Permit within the time frames set forth in Attachment B, the Mitigation Monitoring and Reporting Program (MMRP) required for the Permit.

4. This Permit may require an amendment if there is any modification to the U.S. Fish and Wildlife Service (FWS) Delta Smelt Biological Opinion of the Operating Criteria and Plan for the Coordinated Operations of the CVP and SWP that the FWS issued on December 16, 2008 (2008 OCAP Biological Opinion) or if an unanticipated emergency condition, such as a drought, arises that imposes a serious threat to public health or safety. Permittee shall notify DFG of any modification of the 2008 OCAP Biological Opinion. Permittee may request amendment if there is any modification to the 2008 OCAP Biological Opinion. Permittee shall submit an application and supporting information to DFG if it requests an amendment due to emergency conditions in compliance with California Code of Regulations (CCR) section 783.6(c)(1) or due to any modification of the 2008 OCAP Biological Opinion. The Department will follow the amendment process outlined in CCR section 783.6(c) to determine whether any proposed amendment is major or minor and whether additional or modified measures are necessary.

5 Flow Measures:

The following Conditions (5.1 and 5.2) minimize take of the Covered Species and provide partial mitigation for the remaining take by: 1) minimizing entrainment; 2) improving estuarine processes and flow; 3) improving downstream transport of longfin smelt larvae; and 4) providing more water that is used as habitat (increasing habitat quality and quantity) by longfin smelt than would otherwise be provided by the Project.

5.1 This Condition is not likely to occur in many years. To protect adult longfin smelt migration and spawning during the December through February period,the Smelt Working Group (SWG) or DFG SWG personnel shall provide Old and Middle River (OMR) flow advice to the Water Operations Management Team (WOMT) and to Director of DFG (Director) weekly. WOMT shall provide weekly advice which may include information on other ecosystem and water supply considerations to the Director. The SWG will provide this advice when either: 1) the cumulative salvage

index (defined as the total longfin smelt salvage at the CVP and SWP in the December through February period divided by the immediately previous Fall Mid-Water Trawl (FMWT) longfin smelt annual abundance index[6]) exceeds five (5); or, 2) when a review of all abundance and distribution survey data and other pertinent biological factors that influence the entrainment risk of adult longfin smelt indicate OMR flow advice is warranted.

Based on SWG or DFG SWG personnel OMR flow advice, DFG shall make an OMR flow recommendation to WOMT and WOMT may accept, reject, or revise the recommendation. If WOMT accepts the recommendation, Permittee shall implement the required OMR flow. If WOMT rejects or revises the recommendation, the Director may require an OMR flow and Permittee shall implement the OMR flow required by the Director. Permittee shall ensure the OMR flow requirement is met by maintaining the OMR flow 14-day running average is no more negative than -5,000 cfs and the initial 5-day running average is no more negative than -6,250 cfs. The daily OMR flows used to compute both the 14-day and the 5-day averages shall be the "tidally filtered" values reported by U.S. Geologic Survey (USGS). During any time OMR flows restrictions for the FWS's 2008 Biological Opinion for delta smelt are being implemented, this condition (5.1) shall not result in additional OMR flow requirements for protection of adult longfin smelt.

Once spawning has been detected in the system, this Condition (5.1) terminates and 5.2 begins. Condition 5.1, including the OMR requirement, is not required or would cease if previously required when river flows are: 1) greater than 55,000 cfs in the Sacramento River at Rio Vista; or 2) greater than 8,000 cfs in the San Joaquin River at Vernalis, the Condition would not trigger or would cease if triggered previously. If flows go below 40,000 cfs in the Sacramento River at Rio Vista or 5,000 cfs in the San Joaquin River at Vernalis, the OMR flow in Condition 5.1 shall resume if triggered previously. In addition to river flows, the SWG or DFG SWG personnel review of survey data and other pertinent biological factors that influence the entrainment risk of adult longfin smelt may result in advice to WOMT and the Director and may result in a recommendation by DFG to WOMT to relax or cease an OMR flow requirement.

5.2 To protect larval and juvenile longfin smelt during the January through June period, the SWG or DFG SWG personnel shall provide OMR flow advice to the WOMT and to the Director weekly. WOMT shall provide weekly advice which may include information on other ecosystem and water supply considerations to the Director The OMR flow advice shall be an OMR flow between -1,250 and -5,000 cfs and be based on review of survey data, including all of the distributional and abundance

[6] The Fall Midwater Trawl (FMWT) Survey annual abundance index for longfin smelt is calculated as the sum of September through December monthly abundance indices, and is typically reported at about the same date as adult salvage begins in December. Early December salvage can be compared to September through November abundance as an approximation of the salvage index.

data, and other pertinent biological factors that influence the entrainment risk of larval and juvenile longfin smelt. When a single Smelt Larva Survey (SLS) or 20 mm Survey (20 mm) sampling period results in: 1) longfin smelt larvae or juveniles found in 8 or more of the 12 SLS or 20 mm stations in the central and south Delta (Stations 809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919) or, 2) catch per tow exceeds 15 longfin smelt larvae or juveniles in 4 or more of the 12 survey stations listed above, OMR flow advice shall be warranted.

Based on SWG or DFG SWG personnel OMR flow advice, DFG shall make an OMR flow recommendation to WOMT and WOMT may accept, reject, or revise the recommendation. If WOMT accepts the recommendation, Permittee shall implement the required OMR flow. If WOMT rejects or revises the recommendation, the Director may require an OMR flow and Permittee shall implement the OMR flow required by the Director. Permittee shall ensure the OMR flow requirement is met by maintaining the OMR flow 14-day running average no more negative than the required OMR flow and the 5-day running average is within 25 percent of the required OMR flow. The daily OMR flows used to compute both the 14-day and the 5-day averages shall be the "tidally filtered" values reported by USGS.

This Condition's OMR flow requirement is likely to vary throughout the January through June period based upon survey results, data analysis, and environmental factors. Based on prior analysis, DFG has identified three likely scenarios that illustrate the typical entrainment risk level and protective measures for larval longfin smelt over the period:

High Entrainment Risk Period – January through March
OMR range from -1,250 cfs to -5,000 cfs

Medium Entrainment Risk Period – April and May
OMR range from -2,000 cfs to -5,000 cfs

Low Entrainment Risk Period – June
OMR -5,000 cfs

When river flows are: 1) greater than 55,000 cfs in the Sacramento River at Rio Vista; or 2) greater than 8,000 cfs in the San Joaquin River at Vernalis, the Condition would not trigger or would be relaxed if triggered previously. Should the flows go below 40,000 cfs in the Sacramento River at Rio Vista or 5,000 cfs in the San Joaquin River at Vernalis, the Condition shall resume if triggered previously. In addition to river flows, the SWG or DFG SWG personnel review of all abundance and distribution survey data and other pertinent biological factors that influence the entrainment risk of adult longfin smelt may result in advice to WOMT and the Director and may result in a recommendation by DFG to WOMT to relax or cease an OMR flow requirement.

5.3 This Condition to protect larval longfin smelt shall apply January 15 through March 31 of dry and critically dry years, as defined in D-1641 for the Sacramento River. If the Water Year type changes after January 1 to below normal, above normal, or wet, Condition 5.3 will be suspended. If the Water Year type changes after January to dry or critical, Condition 5.3 shall apply The SWG or DFG SWG personnel shall provide Barker Slough Pumping Plant operations advice to the WOMT and to the Director weekly based on a review of the abundance and distribution survey data and other pertinent biological factors that influence the entrainment risk and detection of larval longfin smelt Station 716. WOMT shall provide weekly advice which may include information on other ecosystem and water supply considerations to the Director. The advice for Barker Slough Pumping Plant's maximum seven day average shall not exceed 50 cfs from January 15 through March 31 of each year after a 5 day notice period is provided by the Director. During the 5-day notification period, the rate of diversion at Barker Slough shall not increase. If WOMT accepts the recommendation, Permittee shall implement the required Barker Slough diversion rate. If WOMT rejects or revises the recommendation, the Director may require a Barker Slough diversion rate and Permittee shall implement the rate required by the Director. This restriction will be removed when larval longfin smelt are not longer detected at Stations 716.

6.0 Additional Minimization Measures

The following Conditions minimize take of the Covered Species by minimizing entrainment.

6.1 To minimize take of longfin smelt at MIDS diversion, in addition to any existing operating rules, DFG shall specify the average intake velocities by August 15 each year in order to adequately protect longfin smelt and, if appropriate, to allow DWR to meet contractual water delivery requirements. Permittee shall maintain this velocity from September 1 to December 31 each year to protect staging and spawning longfin smelt from entrainment until alternative operational criteria are developed from completion of the study below.

Permittee shall develop, fund, and conduct a study to confirm that this operation prevents or substantively reduces the entrainment of longfin smelt at MIDS. The study design must be submitted to DFG within 6 months of issuance of this Permit for DFG review and approval. Results of the study shall be provided to DFG as a written report within one year of the issuance of this Permit. If, based on study findings, DFG determines that this operation minimizes take of longfin smelt, Permittee shall operate to this restriction whenever longfin smelt are at risk of entrainment. If DFG determines that 3 fps does not adequately protect longfin smelt from entrainment, the Permittee shall consult with DFG to discuss other operating options that could achieve the required minimization and, after approval

by DFG, shall implement an effective take minimization alternative by September 1, 2010.

6.2 To ensure the minimization measures designed to minimize take of the Covered Species are effective, Permittee shall conduct maintenance, inspection and reporting at the Skinner Facility. Permittee shall submit a plan, within 3 months of Permit issuance, detailing the frequency, maintenance, inspection and reporting scope and schedule performed on fish protective equipment that may affect screening and salvage efficiencies. After the plan is approved by DFG, the Permittee shall adhere to the maintenance, inspection and reporting schedule described in the plan. Effectiveness monitoring requirements for these facilities is described below in Condition 8.

6.2.1 Permittee shall consult with DFG on projects and actions that will improve the survival rates of longfin salvage at the Skinner Facility. This consultation will produce a list of feasible actions and projects and a plan for implementation of the actions and projects identified within one year of the issuance of this Permit. Upon approval by DFG and compliance with any applicable law including California Environmental Quality Act (CEQA), this plan will be fully implemented.

6.3 During the November 1 to June 30 period, the Permittee shall ensure minimization measures to protect longfin smelt are achieved as follows: 1) salvage according to DFG and DWR protocol (see Skinner Fish Facility Operations Manual (v 2.0 October 19, 2005)) when exporting water via the Banks Pumping Plant; 2) timely reporting of unplanned salvage outages; and 3) consulting DFG to plan salvage outages:

6.3.1 Notification: For unplanned salvage outages greater than 1 hour, notify the DFG Salvage Biologist (see 6.3.1.1) by phone immediately. If discussion by phone isn't possible, leave a message detailing the source and estimated duration of the outage.

6.3.1.1 Salvage Biologist: (209) 948-7086; (209) 712-8550
Salvage Supervisor: (209) 948-7097; (209) 639-2686
Salvage Manager: (209) 948-3702

6.3.2 Consultation: For all planned salvage outages to be conducted for normal maintenance and repair work (e.g., predator clean-outs, normal maintenance procedures, repairs to valves and controls) contact the DFG Salvage Biologist at least 1 business day in advance of outages.

6.3.3 Export rates shall not increase during any outage period.

6.4 To ensure the minimization measures designed to minimize take of the Covered Species are effective, Permittee shall conduct inspection, maintenance and reporting on all of the fish screens at the NBA, RRDS, and Sherman Island diversions during November through June. Permittee shall submit a plan, within 3 months of Permit issuance, detailing the inspection, maintenance and reporting scope and schedule that cover the fish screen and any other components that may affect screening efficiency. After the plan is approved by DFG, the Permittee shall adhere to the maintenance, inspection and reporting schedule described in the plan. Effectiveness monitoring requirements for these facilities is described below in Condition 8.

7 Measures That Contribute to Full Mitigation

DFG has determined that permanent protection of inter-tidal and associated sub-tidal wetland habitat to enhance longfin smelt water habitat is necessary and required under CESA to fully mitigate the impacts of the taking on the Covered Species that will result with implementation of the Project. The following measures, when implemented in conjunction with the flow measures in Condition 5 above, will enhance the estuarine processes and open water habitat beneficial for longfin smelt and provide some additional habitat for longfin smelt in deeper areas. These measures, in conjunction with the flow measures which minimize and partially mitigate take, will fully mitigate take of longfin smelt from the proposed Project.

7.1 To improve overall habitat quality for longfin smelt in the Bay Delta Estuary, Permittee shall fund the acquisition, initial enhancement, restoration, long-term management, and long-term monitoring of 800 acres of inter-tidal and associated sub-tidal wetland habitat in a mesohaline part of the estuary. This condition is intended to provide benefits supplemental to the benefits resulting from the flow requirements described in Condition 5 above. The identification and development of the restoration sites, and development of site-specific management and monitoring plans shall be appropriate to improve habitat conditions for longfin smelt and shall be submitted to DFG for review and approval. The restoration efforts shall begin with the acquisition and planning for restoration of at least 160 acres within 2 years of issuance of this Permit. Subsequent restoration efforts shall restore at least 160 acres every 2 years and all restoration shall be completed by Permittee within 10 years. If longfin smelt are not listed by the Fish and Game Commission at the March 2009 meeting, the inter-tidal and sub-tidal wetland habitat restoration requirement shall be 20 acres for the period from February 23, 2009 to March 6, 2009 and shall be completed by December 31, 2010. These acreages are above and beyond any acres already under development or planned that are required for compliance with any existing CESA permits. Implementation of this may require separate CESA and CEQA consultations to evaluate, minimize and mitigate any restoration effects on other listed species

7.2 DFG's approval of the Mitigation Lands (Lands) must be obtained prior to acquisition and transfer by use of the Proposed Lands for Acquisition Form or by other means specified by DFG. As part of this Condition, Permittee shall:

7.2.1 Transfer fee title to the Lands, convey a conservation easement, or provide another mechanism approved by DFG over the Lands to DFG under terms approved by DFG. Alternatively, a conservation easement over the Lands may be conveyed to a DFG-approved non-profit organization qualified pursuant to California Government Code section 65965, with DFG named as a third party beneficiary under terms approved by DFG.

7.2.2 Provide a recent preliminary title report, initial Phase 1 report, and other necessary documents. All documents conveying the Lands and all conditions of title are subject to the approval of DFG, and, if applicable, the Department of General Services.

7.2.3 Reimburse DFG for reasonable expenses incurred during title and documentation review, expenses incurred from other state agency reviews, and overhead related to transfer of the Lands to DFG. DFG estimates that this Project will create an additional cost to DFG of no more than $3,000 for every fee title deed or easement processed.

7.3 All land acquired for the purposes of implementing this Condition shall be evaluated and all appropriative and riparian rights obtained with the land acquisition shall be recorded. All water rights obtained and not necessary for implementation of the long-term management and monitoring plan shall be transferred to in stream beneficial uses under Water Code Section 1707.

8. **Monitoring and Reporting:**

Permittee shall ensure that information is gathered and reported to ensure proper implementation of the Conditions of Approval of the Permit, that the intended physical results of these Conditions are achieved, and that appropriate and adequate information is gathered to evaluate the effectiveness of these actions on the targeted life stages of longfin smelt so that the actions can be refined, if needed.

8.1 Permittee shall fund its share of the Interagency Ecological Program to continue the following existing monitoring efforts, all of which are key to monitor the Covered Species response to Project operations and the Conditions of Approval of this Permit. These include sampling of the FMWT, Spring Kodiak Trawl, 20-mm Survey, Smelt Larval Survey, and Bay Study.

8.2 Permittee shall fund additional monitoring related to the extent of the incidental take of longfin smelt and the effectiveness of the minimization measures. Immediate needs include extension of the time period of the existing smelt larval

surveys into April to cover the period of larval presence in the system to measure the effectiveness of the OMR flow requirements for entrainment reduction of longfin smelt larvae. Funds required shall cover additional staff and equipment that are reasonably needed for such monitoring.

8.3 Permittee shall ensure essential information on salvage at the Skinner Facility continues to be collected and reported. This is both an essential trigger for some of the Conditions of Approval as well as an important performance measure of their effectiveness. In addition, information on daily OMR flows and daily salvage are essential to ensure that the Conditions of Approval are implemented effectively. Such information shall be included in an annual report for the WY (October 1 to September 30) to DFG, provided no later than December 1 of each year, starting in 2010.

8.3.1 As described in Condition 6.2, Permittee shall submit reports that document and describe the regular inspection and maintenance at the Skinner Facility performed on fish protective equipment that may affect screening and salvage efficiencies

8.3.2 The Permittee shall ensure the existing salvage monitoring and reporting program samples no less than 30 minutes for every 2 hours from December through June. If the presence of large number of fish or debris in the salvage will result in the significant loss of listed species in the salvage monitoring process, DWR shall operate to the existing protocols for such circumstances (see Skinner Fish Facility Operations Manual (v 2.0 October 19, 2005)).

8.4 Permittee shall develop and implement an effectiveness and performance monitoring program for the fish screens at the NBA, RRDS and Sherman Island diversions that covers the November through June period to ensure the minimization measures required by this Permit are successfully reducing incidental take of the Covered Species. Proper maintenance and performance is critical to ensure screen effectiveness and shall include all pertinent criteria necessary to determine the effectiveness of the screens. A draft plan shall be submitted to DFG for review and approval within 3 months of issuance of this Permit. As part of this plan development, the Permittee shall consult with DFG to determine if the RRDS screens need to be improved and if so to identify how. If improvements to the RRDS screens are identified, then the implementation of these improvements will be part of the program specified above.

8.5 Permittee shall develop and implement an effectiveness monitoring program for the Skinner Facility that covers the November through June monitoring period to ensure the minimization measures required by this Permit are successfully reducing incidental take of the Covered Species. A draft study plan shall be submitted to DFG for review and approval within 3 months of issuance of this

Permit. The Permittee shall continue to work and coordinate with DFG salvage staff to ensure as close to real time information sharing as feasible.

9 Funding Assurance

To the extent authorized under California law, Permittee shall fully fund all expenditures required to implement minimization and mitigation measures and to monitor compliance with and effectiveness of those measures, as well as all other related costs.

9.1 Permittee shall provide sufficient funding for perpetual management and monitoring activities on the required compensatory habitat lands (Lands) identified in Condition 7. To determine the amount sufficient to fund all monitoring efforts and the operations, maintenance and management on the Lands, the Permittee shall prepare a Property Analysis Record (PAR) or PAR-equivalent analysis prior to providing the funding for each approved Lands parcel. The Permittee shall submit to DFG for review and approval the results of the PAR or PAR-equivalent analysis. This analysis will be reviewed by the DFG to determine the appropriate first year management costs and long-term funding amount necessary for the in-perpetuity management of the Lands. As each parcel of the Lands is acquired and following DFG review and approval of the PAR, the funding shall be provided by Permittee.

9.2 Permittee may proceed with the Project before completing all of the required mitigation (including acquisition of Mitigation Lands), monitoring, and reporting activities only if Permittee ensures funding to complete those activities by providing funding assurance to DFG. Within 3 months after the effective date of this Permit, 20% of the funding assurance shall be provided. Additional 20% payment shall be provided at years 2, 4, 6 and 8. The funding assurance shall be provided in the form of a bond in the form of Attachment C or irrevocable stand-by letter of credit in the form of Attachment D or another form of funding assurance approved by the Director, demonstrating DWR's financial commitment through SWP secured funding sources. The funding assurance will be held by DFG or in a manner approved by DFG. The funding assurance shall allow DFG to draw on the principal sum if DFG, at its sole discretion, determines that Permittee has failed to comply with the Conditions 6, 7 and 8 of this Permit. The funding assurance (or any portion of such funding assurance then remaining) shall be released to the Permittee after all of the Permit Conditions have been met as evidenced by:

- Timely submission of all required reports;
- An on-site inspection by DFG; and
- Written approval from DFG.

Even if funding assurance is provided, the Permittee must complete the required acquisition, protection and transfer of all required Lands and record any required conservation easements no later than 10 years after the issuance of this Permit, as

specified in Condition 7. DFG may require the Permittee to provide additional Lands and/or additional funding to ensure the impacts of the taking are minimized and fully mitigated, as required by law, if the Permittee does not complete these requirements within the specified timeframe.

The funding assurance shall be in the amount of $2,400,000.00 based on the following estimated costs of implementing the Permit's mitigation, monitoring and reporting requirements. The Permittee shall notify the DFG upon furnishing each of the following financial assurances, or substantial equivalent approved by DFG:

a) Land acquisition costs for impacts to habitat, calculated at $1,500.00/acre for 800 acres: $1,200,000.00.

b) Costs of enhancing Lands, calculated at $250.00/acre for 800 acres: $200,000.00.

c) Endowment costs initially estimated at $1,000,000.00, or substantial equivalent approved by DFG.

Amendment:
This Permit may be amended without the concurrence of the Permittee if DFG determines that continued implementation of the Project under existing Permit conditions would jeopardize the continued existence of a Covered Species or that Project changes or changed biological conditions necessitate a Permit amendment to ensure that impacts to the Covered Species are minimized and fully mitigated. DFG may also amend the Permit at any time without the concurrence of the Permittee as required by law.

Stop-Work Order:
To prevent or remedy a potential violation of permit conditions, DFG will consult with Permittee to address the potential violation and will give Permittee a reasonable time to correct the potential violation and implement possible alternative actions before issuing a stop-work order. Director may issue Permittee a written stop-work order to suspend any activity covered by this Permit for an initial period of up to 25 days to prevent or remedy a violation of Permit conditions (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. Permittee shall comply with the stop-work order immediately upon receipt thereof. DFG may extend a stop-work order under this provision for a period not to exceed 25 additional days, upon written notice to the Permittee. DFG shall commence the formal suspension process pursuant to California Code of Regulations, Title 14, section 783.7 within five working days of issuing a stop-work order.

Compliance with Other Laws:
This Permit contains DFG's requirements for the Project pursuant to CESA. This permit does not necessarily create an entitlement to proceed with the Project. Permittee is responsible for complying with all other applicable state, federal, and local laws.

Notices:
The Permittee shall deliver the fully executed duplicate original Permit by first class mail or overnight or hand delivery to the following address:

Habitat Conservation Planning Branch
Attention: CESA Permitting Program
1416 Ninth Street, Suite 1260
Sacramento, CA 95814

Written notices, reports and other communications relating to this Permit shall be delivered to DFG by first class mail at the following addresses, or at addresses DFG may subsequently provide the Permittee. Notices, reports, and other communications shall reference the Project name, Permittee, and Permit Number (2081-2009-001-03) in a cover letter and on any other associated documents.

Original cover with attachment(s) to:
Charles Armor, Regional Manager
Bay Delta Region
PO Box 47
Yountville, California 94599
Telephone (707) 944-5517
Fax (707) 944-5553

Copy of cover without attachment(s) to:
Office of the General Counsel
Department of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
And:
Habitat Conservation Planning Branch
Department of Fish and Game
1416 Ninth Street, Suite 1260
Sacramento, CA 95814

Unless Permittee is notified otherwise, DFG's Regional Representative for purposes of addressing issues that arise during implementation of the Permit is:

Scott Wilson, Environmental Program Manager
Post Office Box 47
Yountville, California 94599
Telephone (707) 944-5584
Fax (707) 944-5563

Compliance with the California Environmental Quality Act:

DFG has adopted CEQA/CESA findings prior to approving this project. Those findings are attached hereto as Attachment E.

Findings Under CESA:

DFG has adopted CEQA/CESA findings prior to approving this project. Those findings are attached hereto as Attachment E

Attachments:

ATTACHMENT A	Effects Analysis
ATTACHMENT B	Mitigation Monitoring and Reporting Program
ATTACHMENT C	Bond Form
ATTACHMENT D	LOC Form
ATTACHMENT E	CESA/CEQA Findings

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME

on 23 Feb 09.

Charles Armor, Regional Manager
BAY DELTA REGION

ACKNOWLEDGMENT

The undersigned: 1) warrants that he or she is acting as a duly authorized representative of the Permittee, 2) acknowledges receipt of this Permit, and 3) agrees on behalf of the Permittee to comply with all terms and conditions of the Permit.

By: _____ Date: 2/23/09

Printed Name: Lester A. Snow Title: Director