

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2010-0016

In the Matter of Water Quality Certification for the

**DEPARTMENT OF WATER RESOURCES
OROVILLE FACILITIES**

FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 2100

SOURCES: Feather River

COUNTY: Butte

WATER QUALITY CERTIFICATION FOR FEDERAL PERMIT OR LICENSE

BY THE BOARD:

1.0 Introduction

The Department of Water Resources (DWR) has filed with the Federal Energy Regulatory Commission (Commission) for a New License to operate the Oroville Facilities (Commission Project #2100). The Oroville Facilities (Project) were developed as part of the State Water Project (SWP), which includes water storage, water delivery, and hydroelectric systems. As part of the SWP the Project is operated for flood control, power generation, recreation, fish and wildlife, and to meet regulatory requirements in the Sacramento-San Joaquin Delta. The original license for the Project was issued by the Commission on February 11, 1957, with an effective date of February 1, 1957, and expired on January 31, 2007. The Project is currently operating under an annual license which extends the terms of the original license. The Project is located on the Feather River near the City of Oroville in Butte County. The Project includes the following: Oroville Dam and Reservoir with storage of 3.5 million-acre-feet and surface area of 15,180 acres; Hyatt Pumping-Generating Plant with a capacity of 645 megawatts (MW) at a maximum flow of 16,950 cubic feet per second (cfs); Thermalito Diversion Pool and the Thermalito Diversion Pool Power Plant with a capacity of 3 MW at 615 cfs; Thermalito Forebay and Thermalito Pumping and Generating Plant with a capacity of 114 MW at a maximum flow of 17,400 cfs; and the Thermalito Afterbay.

Construction of the Project began in 1961 and was completed in 1968. The Project, along with other water development projects and historic mining activity, has contributed to altered hydrology and geomorphology of the Feather River, and impacted water quality and anadromous fisheries. Oroville Dam blocks access to 66.9 miles of high quality habitat for anadromous fish. Anadromous fish are now restricted to the Lower Feather River and can seasonally experience high water temperatures and unnatural flows. The Lower Feather River is designated as critical habitat for Central Valley spring-run Chinook and steelhead, under the federal Endangered Species Act (ESA). The Feather River Fish Hatchery was opened in 1967 to mitigate for the loss of habitat from the construction of Oroville Dam.

Hatchery operations have impacted the genetics of spring-run Chinook. In 1999 the Central Valley Spring-run Chinook Evolutionary Significant Unit (ESU) was listed as threatened under the federal ESA. National Oceanic and Atmospheric Administration (NOAA) Fisheries concluded that the hatchery produces spring-run Chinook salmon that are genetically more similar to fall-run. In March of 1998, naturally spawned Central Valley steelhead was listed as threatened under the Federal Endangered Species List (ESA). In 1999 the Central Valley spring-run Chinook Evolutionary Significant Unit (ESU) was listed as threatened on the California ESA.

2.0 State Water Quality Standards

The Federal Clean Water Act (33 U.S.C. §§ 1251-1387) was enacted “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” (33 U.S.C. § 1251(a).) Section 101 of the Clean Water Act (33 U.S.C. § 1251 (g)) requires federal agencies to “co-operate with the State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.”

Section 401 of the Clean Water Act (33 U.S.C. §1341) requires every applicant for a federal license or permit which may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the Clean Water Act, including water quality standards and implementation plans promulgated pursuant to section 303 of the Clean Water Act (33 U.S.C. § 1313). Clean Water Act section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the Clean Water Act and with any other appropriate requirement of state law. Section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the project. The State Water Resources Control Board (State Water Board) Executive Director may issue a decision on a water quality certification application. (Cal. Code Regs., tit. 23, § 3838, subd. (a).)

The California Regional Water Quality Control Boards have adopted, and the State Water Board has approved, water quality control plans (basin plans) for each watershed basin in the State. The basin plans designate the beneficial uses of waters within each watershed basin, and water quality objectives designed to protect those uses pursuant to Section 303 of the Clean Water Act. (33 U.S.C. § 1313.) The beneficial uses together with the water quality objectives that are contained in the basin plans constitute State water quality standards.

The Water Quality Control Plan for the Central Valley-Sacramento and San Joaquin River Basins (Basin Plan) lists the existing beneficial uses designated for Lake Oroville as municipal and domestic supply, irrigation, power generation, contact and non-contact recreation, freshwater habitat (cold and warm), spawning habitat (cold and warm), and wildlife habitat. Beneficial uses for the Feather River from the fish barrier dam to the Sacramento River are municipal and domestic supply, irrigation, contact and non-contact recreation, canoeing and rafting, migration (cold and warm), freshwater habitat (cold and warm), spawning habitat (cold and warm), and wildlife habitat. Protection of the instream beneficial uses identified in the Basin Plan requires maintenance of adequate instream flows as well as effluent limitations and other limitations on discharges of pollutants from point and nonpoint sources to the Feather River and its tributaries.

3.0 Settlement Agreement for the Licensing of the Oroville Facilities

After consultation with state and federal resources agencies, tribes, local governments, non-governmental agencies (NGOs), and the public, and upon approval of the Commission, DWR chose to use the Alternative Licensing Process (ALP) for the relicensing of the Project. The reason for using the ALP is to expedite the relicensing process through extensive collaboration and preparation of an Applicant Prepared Environmental Assessment (APEA). A collaborative group composed of interested parties and regulatory agencies, including State Water Board staff, was formed to scope issues, design studies, review study reports, identify potential resource actions, and provide guidance to DWR on the application for new license and process documents. A settlement group was later formed to negotiate a Settlement Agreement (SA). A Settlement Agreement (SA) was finalized in March of 2006 for the purpose of resolving all issues that have or could have been raised in connection with a new license.

Because the State Water Board must exercise its independent authority over any water quality certifications it issues, the State Water Board was not involved with and was not represented at the negotiations that resulted in the SA. While one of the State Water Board members, Arthur G. Baggett, and several State Water Board staff, participated in these negotiations, they acted in an independent capacity, not on behalf of the State Water Board. Mr. Baggett signed the Settlement Agreement as a recommendation to the California State Water Board, and not as a Party to the Settlement Agreement. Neither he nor staff that participated in the collaborative group or the settlement discussions has participated in State Water Board decision-making regarding the Oroville water quality certification, or shared confidential settlement communications with other board members or staff involved with the water quality certification.

The signatories to the SA (Parties) requested that the State Water Board accept and incorporate into the water quality certification, without material modification, the terms of the SA which are within the State Water Board's jurisdiction. However, the SA also contains a process to address water quality certification conditions that are inconsistent with the SA. Appendix A of the SA contains the Protection Mitigation and Enhancement (PM&E) measures recommended for inclusion in the Commission license. Appendix B contains the measures agreed to among the Parties but not recommended for inclusion in a new license. Per the terms of the SA, the Parties request that Appendix A of the SA be included in the water quality certification and a new license, and that Appendix B not be included in a new license issued by the Commission.

4.0 Water Quality Certification Conditions

The State Water Board reviewed the PM&E measures in both Appendices A and B of the SA to determine which of the measures are necessary for the operation of the Project to meet the water quality standards in the Basin Plan. The following measures from Appendices A and B, as amended herein, are necessary for the Project to protect the beneficial uses:

- A101 Lower Feather River Habitat Improvement Plan
- A102 Gravel Supplementation and Improvement Program
- A103 Channel Improvement Program
- A104 Structural Habitat Supplementation and Improvement Program Plan
- A105 Fish Weir Program
- A106 Riparian and Floodplain Improvement Program
- A107 Feather River Fish Hatchery Improvement Program
- A108 Flow/Temperature to Support Anadromous Fish
- A110 Lake Oroville Warm Water Fishery Habitat Improvement Program

A111 Lake Oroville Cold Water Fishery Improvement Program
A112 Comprehensive Water Quality Monitoring Program
A113 Monitoring of Bacteria Levels and Public Education
A114 Public Education Regarding Risks of Fish Consumption
A115 Oroville Wildlife Area Management Plan
A117 Protection of Vernal Pools
A118 Minimization of Disturbances to Nesting Bald Eagles
A119 Protection of Giant Garter Snake
A121 Protection of Red-Legged Frog
B104 Feather River Fish Hatchery Funding
B105 Gravel Supplementation
B108 Flow/Temperature to Support Anadromous Fish

The State Water Board has determined that certain measures as written in the SA are either not enforceable, will not protect the beneficial uses, or will not meet water quality standards in a timely manner. Beneficial uses currently impacted by the Project may not be reasonably protected if the proposed measure has a management plan with unclear or unenforceable standards, an excessively long period prior to implementation, or unspecified implementation dates. The State Water Board modified each measure to provide assurance that the beneficial uses will be reasonably protected.

This water quality certification will become part of the Commission's 30-to-50-year operating license for the Oroville Facilities. Certain changes in the physical environment, the regulatory environment, and the state of scientific understanding are anticipated during this time; however, the scope of such changes cannot be determined with sufficient specificity at the present time to determine that the project will be able to meet water quality standards throughout the license period or to determine what, if any, additional conditions would be required for it to do so. Therefore, some terms and conditions include reservations of authority and/or adaptive management provisions to address these future uncertainties.

Many of the SA measures require consultation with the Ecological Committee (EC). Appendix C of the SA defines the purpose and goal, committee membership, and details of committee decision-making procedures. The State Water Board supports consultation with agencies when developing plans or making decisions affecting resources over which agencies may have jurisdiction or expertise. It is not appropriate, however, to make the terms and conditions of Appendix C an enforceable condition of the water quality certification. The State Water Board recognizes and appreciates the expertise and dedication that the settlement parties can bring to decisions and planning for beneficial use and resource protection. However, only certain governmental entities are formally vested with the authority and responsibility to protect such uses and resources, and are publicly accountable for these duties. The centrality of these responsibilities to those government agencies ensures that they, or successor agencies, will be responsible for consultation throughout the term of a 30-to-50-year license. Each of the conditions in this water quality certification that includes consultation with agencies lists the specific agencies and alternately allows consultation with the EC as long as those agencies are members of the EC. The State Water Board hopes and expects that the parties will fulfill their contractual obligations and use the EC process described in the SA, as this process includes a broad range of parties that can bring valuable expertise to the various planning processes. Some certification conditions require the Licensee to submit plans to the State Water Board for modification and/or approval. Many of these plans will also be submitted to the Commission under the provisions of the SA. Where a condition requires the approval of a plan by both

agencies, Licensee should first submit the plan to the State Water Board and receive approval before submitting the approved plan to the Commission.

5.0 Rationale for the Water Quality Certification Conditions

When preparing the conditions in this certification, the State Water Board reviewed and considered the SA, the Explanatory Statement prepared by the Parties, the Commission's Environmental Impact Statement (EIS), DWR's Environmental Impact Report (EIR), and other information in the record. Each measure in the SA was evaluated as to whether it would protect the beneficial uses. Those measures that protect the beneficial uses are used as conditions with small modifications. Any conditions that require the development of a plan will require the plan to be reviewed, modified if necessary, and approved by the Deputy Director for Water Rights (Deputy Director). In addition, other regulatory agencies have specific authorities to approve plans and reports. The following describes the rationale used to develop each of the conditions in the water quality certification and generally describes how and why the SA measures were modified.

Lower Feather River Habitat Improvement Plan

Implementation of this program will be beneficial to coordinate all of the proposed measures to be implemented in the lower Feather River. The program will include the development of a single, comprehensive monitoring and adaptive management summary report. Considering the number of plans required, and the changes that may occur over time, this approach will be instrumental in ensuring compliance with water quality standards.

Gravel Supplementation and Improvement Program

Oroville Dam blocks 97 percent of sediment from passing downstream to the Lower Feather River, which has reduced spawning habitat. DWR will develop a Spawning Gravel Supplementation and Improvement Program designed to mitigate for the cumulative impacts of the reduced quantity and quality of spawning gravels available for steelhead and Chinook salmon. An increase in the quantity and quality of suitable spawning habitat is expected to reduce rates of redd superimposition and egg mortality, as well as reduce competition for spawning habitat, which should contribute to the reduction of pre-spawn mortality rates. Article B105 of the SA required DWR, upon execution of the SA, to begin obtaining all necessary permits for the supplementation and implement the provision. A102 requires DWR to develop a plan for gravel supplementation and improvement program throughout the term of the license for Commission approval within two years of license issuance. Article A102 of the SA states that "if and when the need arises, but not sooner than 10 years after license issuance, DWR shall prepare a gravel budget for supplementation activities in the High Flow Channel." The SA and the Explanatory Statement do not describe what information will be used to determine "if and when the need arises", nor do they describe when additional gravel supplementation will occur. Because this language is not enforceable, the State Water Board has modified the condition to require the submission of a study on the need for additional gravel to the Deputy Director for review and approval within eight years of license issuance. Consistent with the timeline to complete the initial supplementation of gravel, additional gravel supplementation must be completed within two years following submission of the study.

This measure is necessary to protect the cold freshwater, spawning, and migration beneficial uses of the Feather River.

Channel Improvement Program

The Oroville Facilities prevent passage of migratory fishes to historic spawning and rearing habitat. The quantity and quality of historic steelhead and spring-run Chinook spawning habitat was reduced after construction of the Project. Historic spawning habitat for steelhead would have been small streams or creeks, probably ranging between 5 and 75 cfs flow. Studies conducted by DWR identified small side channels in the lower Feather River as primary rearing habitat for juvenile steelhead. The SA includes a measure establishing a Channel Improvement Program. The Channel Improvement Program includes habitat improvement measures to increase the quality and complexity of salmonid spawning and rearing habitat in two existing side channels, Moe's Ditch and Hatchery Ditch. The SA also includes development of five additional side channel riffle/glide complexes over a five-year period, which will provide a minimum of 2,460 feet in length of new spawning and rearing habitat for Chinook salmon and steelhead. This measure is included in the certification to protect the cold freshwater, spawning, and migration beneficial uses of the Feather River.

Structural Habitat Supplementation and Improvement Program

The Oroville Facilities currently block downstream movement of large woody debris in the Lower Feather River. This has resulted in a reduction in structural habitat and habitat complexity in the lower Feather River, particularly in the Low Flow Channel (LFC). Studies conducted by DWR identified areas within the LFC that lack abundant quantities of large woody debris. The High Flow Channel (HFC) would also benefit from large woody debris. The objective for the Structural Habitat Supplementation and Improvement Program is to support the restoration and improvement of salmonid rearing habitat by providing instream cover and increasing the salmonid rearing habitat quality of shallow-edge habitats within riffles, glides, and pools, where appropriate along the lower Feather River. The primary target for these actions would be steelhead and spring-run Chinook salmon juveniles. This measure is necessary to protect the cold freshwater and spawning beneficial uses of the Feather River.

Fish Weir Program

The presence of Oroville Dam and other upper Feather River dams blocks passage of migratory fishes and causes spring-run and fall-run Chinook salmon to share spawning habitat in the Lower Feather River. Operation of the Project, including the Feather River Hatchery, has impacted the genetics of the federally and state listed threatened spring-run Chinook. Spring-run and fall-run Chinook have been genetically interbred (introgression – movement of genes from one species to another) affecting the genetic integrity of both races. Recent genetic studies have indicated that spring-run Chinook salmon in the Feather River are genetically more similar to fall-run Chinook salmon. Spring-run Chinook salmon are generally considered to begin their spawning a few weeks prior to the fall-run Chinook salmon.

The reduced amount of spawning habitat available in the lower river results in an increase of redd superimposition (subsequent spawning on top of an existing redd) resulting in increased rates of egg and alevin mortality. Early spawning fish, mostly spring-run Chinook, are more impacted by this productivity loss than later spawners. Increased competition for limited spawning habitat also contributes to increased rates of pre-spawn mortality.

The SA Fish Weir Program provides for two fish barrier weirs: Phase 1 will monitor the adult life history behavior of Chinook salmon (spring-run) and steelhead in the LFC (anadromous fish monitoring weir), and Phase 2 will spatially separate spring-run and fall-run in the LFC creating a dedicated spawning preserve to protect the spring-run and fall-run Chinook salmon.

The monitoring weir will be installed first to allow sufficient time to gather more information on the migration timing and abundance of adult spring-run and fall-run Chinook salmon and steelhead adults into the LFC. Counting spring-run, fall-run, and steelhead entering the LFC will provide the baseline data necessary to develop the segregation weir plan. The SA requires submittal of a Phase 2 Anadromous Fish Segregation Weir Plan within eight years of license issuance, and installation of the weir within 12 years of license issuance. In the Draft Biological Opinion (DBO) dated July 2, 2009, National Marine Fisheries Service (NMFS) includes terms and conditions that require DWR to install a fish segregation weir within 5 years of license issuance. NMFS requires DWR to consult on the location of the segregation weir. The weir is expected to reduce the interbreeding of spring and fall-run Chinook salmon and improve the genotype of the spring-run. NMFS requires DWR to minimize hybridization as a reasonable and prudent measure and states that take of spring-run will occur until they are segregated from fall-run in the LFC. To protect the beneficial uses and avoid the take of threatened Central Valley spring-run Chinook salmon, the water quality certification condition requires submittal of an Anadromous Fish Segregation Weir Plan within one year of license issuance. The Plan will include use of the monitoring weir, or an additional separate interim weir, to provide interim spatial and/or temporal segregation of Chinook salmon runs, and will include a timeline and study plan to implement such segregation within five years of license issuance consistent with the DBO. The condition also allows the Deputy Director to approve another implementation time frame consistent with the final Biological Opinion issued by NMFS.

Riparian and Floodplain Improvement Program

The Project has altered the hydrology and natural geomorphic processes along the Feather River and in the Oroville Wildlife Area. Oroville Dam blocks sediment recruitment from the upstream basin and has changed the high flow frequencies, altered peak flows, decreased winter flows, increased summer flows, and changed ramp down rates. Depletion of sediment load by 97 percent has reduced the formation of sediment benches, which affects riparian colonization and succession.

As part of the SA, DWR agreed to investigate and implement projects to improve riparian habitat and habitat for associated terrestrial and aquatic species and connect portions of the Feather River to its floodplain within the Oroville Wildlife Area. The purpose of this program is to improve riparian habitat and connect portions of the Feather River with its floodplain in the LFC and the HFC within the Oroville Wildlife Area. Projects will include excavation of Oroville Wildlife Area dredge tailings to remove or set-back non-flood levees to create vegetative benches along the Feather River channel. Higher priority will be given in the screening level analysis to those projects that maximize benefits for all species and habitats including restoring riparian vegetation and the riparian corridor, restoring habitat for terrestrial species (including special status species), reconnecting the river to its floodplain, and restoring/enhancing riparian and channel habitat for fish and other aquatic species. DWR and the California Department of Fish and Game will work with gravel operators to seek to reduce costs of gravel removal and earthwork components of the program.

Development of the floodplain habitat should result in an improvement in the quantity and quality of juvenile salmonid rearing habitat and high flow event velocity refuge for juvenile

salmonid rearing. This program should result in an incidental improvement in habitat for other wildlife as well. Article A106 in the SA includes the following four phases for implementation of the Riparian and Floodplain Improvement Program:

Phase 1 – Within one year of license issuance and in consultation with the consultees listed in A106(a) above, the Licensee shall develop, and submit to the Commission a screening level analysis of proposed riparian/floodplain improvement projects, including how flood/pulse flows may contribute to floodplain values and benefit fish and wildlife species. This phase shall include the identification of a Phase 1 recommended alternative. This phase shall also include an assessment of the gravel value and potential extraction processes in order to provide guidance on the scope, timing, and magnitude of the Program.

Phase 2 – Within four years of license issuance and in consultation with the consultees listed in A106(a) above, the Licensee shall initiate Phase 2 of the Program. Phase 2 shall begin with conducting a full scope and feasibility evaluation and development of an implementation schedule of the Phase 1 recommended alternative. Within six years of license issuance, the Licensee shall submit the Phase 1 recommended alternative and implementation schedule to the Commission for approval. Within eight years of license issuance, the Licensee shall complete the final design and commence construction and implementation of the approved alternative. Within 15 years of license issuance the Licensee shall fully implement this approved alternative.

Phase 3 – Within 15 years of license issuance and in consultation with the consultees listed in A106(a) above, the Licensee shall complete an evaluation of other potentially feasible projects and the identification of a Phase 3 recommended alternative. This phase shall include a reevaluation of how flood/pulse flows may contribute to floodplain values and benefit fish and wildlife species and shall include an assessment of the gravel value and potential extraction processes similar to the one completed in Phase 1.

Phase 4 – Upon Commission approval, and within 25 years of license issuance, the Licensee shall complete construction of the Phase 3 recommended alternative.

As described above, the first two phases of the project will be fully implemented within 15 years of license issuance, and the second two phases will be implemented within 25 years of license issuance. The abilities and limitations of gravel extraction will guide the scope, timeframe and magnitude of the program.

Feather River Fish Hatchery Improvement

The proposed measure in the SA includes funding, water temperature requirements, a hatchery management program, a conditional requirement for a water supply disinfection system, and a commitment to conduct a comprehensive facility assessment. The Feather River Fish Hatchery is currently operated by the California Department of Fish and Game in conjunction with DWR. Hatchery operations have been successful in meeting production goals under the current license. The Section B104 of the SA requires DWR to provide all necessary funding to the California Department of Fish and Game to implement the Feather River Fish Hatchery Program in Article 107, for the production of anadromous salmonids.

DWR will also be required to prepare a comprehensive management plan, including production goals, for the Feather River Fish Hatchery within two years of license issuance. The SA also includes a commitment from DWR to expand or improve the existing water disinfection system for the hatchery spawning and rearing area, if anadromous salmonids are passed upstream of the hatchery. The State Water Board has determined the operation of the hatchery is necessary to offset the impacts of reduced spawning habitat, and has included a condition in the water quality certification to require continued operation of the hatchery.

The SA measure includes two water temperature tables: Temperature targets are shown in Table 107A, and maximum temperatures that cannot be exceeded are shown in Table 107B. Table 107B temperatures are higher than temperatures in Table 107A. DWR is allowed 10 years to complete facilities modifications during which time temperatures in Table 107A are not requirements. The baseline temperature requirements in Table 107A are the equivalent to temperatures required by the 1983 Agreement between DWR and the California Department of Fish and Game and currently required by the Oroville license. Table 107A represents the upper limit of the 1983 agreement temperatures for the hatchery. Historic water temperatures have been sufficient for the hatchery to meet its production goals. However, DWR and the Agencies agreed that cooler temperatures would aid in managing disease outbreaks. Consistent with this approach, and understanding that it is supported by the California Department of Fish and Game, the water quality certification contains two sets of water temperature requirements. Upon license issuance DWR will be required to maintain water temperature for the hatchery below those in Table S7, of this certification. After facility modifications, but no later than 10 years after license, DWR will be required to meet the water temperature requirements in Table S7A. The water quality certification condition also includes the commitment in the SA to curtail pump-back operations, remove shutters on the Hyatt intake, and use the river valves (after refurbishment) up to a maximum of 1500 cfs.

In Section B108, DWR committed to begin studies for the refurbishment or replacement of the river valve after signing of the SA. Because implementation of this measure preceded license issuance, it was included in Appendix B of the Settlement Agreement. In the SA, DWR retains the ability to refurbish or replace the river valve as necessary at its sole discretion. In the past, DWR has used the river valve along with other operational measures to meet hatchery temperature requirements. Impacts of water temperature were evaluated in the Draft Environmental Impact Report with a model using Temperature Control Actions that include the use of the river valve. More recently, on July 22, 2009, an accident occurred that injured five personnel who were testing the valve after an April 2009 repair which was intended, at least partially, to increase the amount of water which could flow through the valve. In light of this incident, additional study is necessary to determine the appropriate conditions under which the river valve and supporting infrastructure may be safely used in the future. The SA anticipates that DWR will use the river valve, among other measures, for meeting the hatchery temperature requirements. The river valve also will benefit temperatures in the LFC. Access to cold water during certain years when Oroville water elevations are low is critical to protect listed species and beneficial uses. The accident has created uncertainty around the use of the river valve and the timelines for repair or refurbishment. Because of the importance of the river valve for temperature control a measure has been added to the water quality certification that requires a timeline be submitted within six months of license issuance that includes the steps necessary to finalize the repair or refurbishment of the river valve. The condition also allows DWR to propose an alternative method for meeting temperature requirements should use of the river valve prove unfeasible.

Flow/Temperature to Support Anadromous Fish

DWR's studies showed that water temperatures in the LFC and HFC were contributing stressors for anadromous salmonids. Studies also showed the higher flows would increase the amount of habitat for anadromous fish. Operation of the Oroville Facilities to meet the water temperature objectives and increase minimum flows will lower water temperatures in the LFC and HFC improving the quality and increasing the quantity of available coldwater fisheries habitat in the lower Feather River. The SA includes a measure that sets minimum flows in the LFC and HFC, establishes a process for facility modification to improve water temperatures in the LFC and HFC, requires consultation during dry years, and creates a notification process if DWR is unable to meet temperature requirements due to uncontrollable forces.

Minimum Flows - This measure requires an increased minimum flow from the current 600 cfs to a new minimum flow of 700 cfs in the LFC during most of the year, but increasing flow to 800 cfs during the Chinook salmon spawning season from September 9 through March 31. The volume of increased flows was determined from the results of instream flow investigations and spawning habitat utilization studies. Increasing the minimum instream flow in the LFC will reduce the high levels of redd superimposition. Higher flows should reduce competition for habitat, which potentially contributes to increased rates of Chinook salmon pre-spawn mortality. DWR determined that the maximum weighted usable area for Chinook salmon spawning would occur at approximately 800 cfs. The measure also includes specific requirements for minimum flows in the HFC. During dry years when the April 1 forecast is projected to drop below 733 feet under normal operations, the measure limits reduction of the minimum flow in the HFC to less than 25 percent. Normal operation is the operation of the State Water Project (SWP) based on standard factors such as hydrology, storage, routine maintenance and SWP obligations. Changes in operation that are a result of unusual events such as flood control releases, accidents, project failures, and major or unusual maintenance are not considered normal operation. The State Water Board has determined that these flows are appropriate to protect the beneficial uses.

Water Temperature - The SA agreement contains a complex set of measures that address improvements to water temperature in the Lower Feather River. The SA includes similar requirements as in the hatchery measure to improve water temperature in the LFC. Until facilities modifications are complete DWR will curtail pump-back operations, remove shutters on the Hyatt Intake, and increase flow releases in the LFC up to 1500 cfs to reduce water temperatures if necessary. The measure includes water temperature targets (Table 1) for the LFC at the Robinson Riffle (River Mile 61.6), near where the LFC meets the HFC. The water temperatures in Table 1 meet the terms of the 2004 National Marine Fisheries Service Biological Opinion which specifies that mean daily water temperatures shall not exceed 65°F from June 1 to September 30. The measure states that prior to facility modification, if DWR is unable to meet the Table 1 water temperature objectives by implementing the water temperature control actions, DWR will not be in violation of the license terms. After facility modification DWR will be required to meet the temperatures in Table 1. The SA does not include temperature targets or objectives for the HFC.

The SA requires DWR to submit a Feasibility Study and Implementation Plan for Facility Modification(s) to improve temperature conditions for spawning, egg incubation, rearing and holding habitat for anadromous fish in the LFC and HFC within three years of license issuance. This plan will recommend a specific alternative for implementation and will be prepared in consultation with the resource agencies.

The SA does not state when the facilities modifications will be completed, although the associated explanatory statements provides a 10-year timeline after license issuance for facilities development. Under the SA, there would be a testing period of at least five years in length to monitor water temperature and develop final water temperature requirements. The water temperatures in SA Table 2 would be modified, and would then become targets during a five-year testing period following completion of Facilities Modification(s). The proposed water temperature objectives for the HFC will be measured at the southern Commission project boundary. The SA identifies two main challenges associated with compliance with Table 2 water temperature objectives: the dynamic water temperatures in both the LFC and at the Thermalito Afterbay outlet and the proportional blending of these and the delay in time from the implementation of a water temperature control action to a water temperature change in the HFC. The parties believe these challenges require the development of final water temperature requirements after project modifications are completed and tested for five years.

Studies have shown it is unlikely that adult Chinook salmon can use the Feather River below the Thermalito Afterbay Outlet except as a migration corridor. Water temperature monitoring in 2002 and 2003 showed that the temperature of water released from Thermalito Afterbay was as much as 11.3°F higher than that of incoming water. DWR concluded that increased incidence of disease, developmental abnormalities, increased in-vivo egg mortality, and temporary cessation of migration could occur due to elevated water temperatures in some areas of the lower Feather River. Operation of the Project currently does not protect the cold-water beneficial uses. Populations of Sacramento/San Joaquin Valley Chinook salmon are at the lowest levels ever recorded. The State Water Board believes it is necessary to require more specific timelines in the water quality certification for completion of measures to improve water temperature so as to demonstrate protection of the cold water beneficial uses of the Feather River.

DWR completed a Reconnaissance Study of Potential Future Facility Modifications in December 2006. The report compares the benefits and costs of all of the potential water temperature improvements. In the EIS, Commission staff support a phased approach to meet water temperature objectives in the LFC and HFC. They state that the water temperature targets would become the license requirements 10 years after license issuance or upon completion of the facilities modifications. Commission staff state that even if DWR does not modify its facilities, the lower water temperatures would become requirements to ensure colder water in the Feather River.

Compliance with the water temperatures in the Tables 1 and 2 in the SA are necessary for the protection of cold freshwater, spawning, and migration beneficial uses of the Feather River. The State Water Board understands the complexities of designing, permitting, and constructing some of the proposed facilities modifications. However, the SA lacks the required level of assurances that the water temperatures will be reduced in a timely manner. To achieve compliance with the water quality standards, the water quality certification includes conditions that will assure water temperature objectives are met.

The water quality certification requires DWR to meet the water temperatures in Table 1 at Robinson Riffle. If DWR cannot meet these water temperature requirements, they must submit a plan within one year of license issuance to the Deputy Director for facility modification(s) that will allow compliance with the temperature requirements.

The plan must: include evidence showing that compliance is impossible or unreasonable using existing facilities; include interim measures to reduce water temperatures; and demonstrate compliance within 10 years of license issuance.

The water quality certification requires DWR to operate the project to protect the COLD beneficial use in the high flow channel, as measured in the Feather River at the downstream Project Boundary, to the extent reasonably achievable. Within one year of license issuance, DWR must submit a plan for project operations to reasonably protect COLD beneficial uses before facility modification. This interim plan must include a table of proposed interim temperature requirements, as well as interim measures to reduce water temperatures. Within five years, DWR must submit a long-term facility modification and operations plan which shall include a table of proposed temperature requirements to protect the COLD beneficial use within 10 years of license issuance.

Conference Year - The purpose of the “conference year” provision which relaxes the water temperature table requirements is to accommodate combinations of water year types and low reservoir storage conditions, when it is not possible to meet the water temperature goals with the available coldwater pool. This allowance is included in the water quality certification.

Habitat Expansion Agreement

Construction of the Oroville Facilities and Pacific Gas and Electric Company’s (PG&E) construction of other hydroelectric facilities on the upper Feather River tributaries blocked passage and reduced available habitat for ESA listed anadromous salmonids Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) (“spring-run”) and Central Valley steelhead (*O. mykiss*) (“steelhead”). The reduction in spring-run habitat resulted in spatial overlap with fall-run Chinook salmon and has led to increased redd superimposition, competition for limited habitat, and genetic introgression. Relicensing of hydroelectric projects in the Feather River basin has focused attention on the desirability of expanding spawning, rearing and adult holding habitat available for Central Valley spring-run and steelhead. The SA includes a habitat enhancement program to address the loss of habitat associated with both the Project and with upstream hydroelectric facilities owned by PG&E. The SA includes a habitat enhancement program with an approach for identifying, evaluating, selecting and implementing the most promising action(s) to expand such spawning, rearing and adult holding habitat in the Sacramento River Basin as a contribution to the conservation and recovery of these species. The specific goal of the Habitat Expansion Agreement (HEA) is to expand habitat sufficiently to accommodate an estimated net increase of 2,000 to 3,000 spring-run Chinook salmon for spawning.

Within two years of signing the Settlement Agreement, the Licensee will complete identification, evaluation and selection of habitat expansion action(s) using the Evaluation Criteria and Selection Criteria listed in the agreement. Potential habitat actions will occur in the Sacramento River basin and include, but are not limited to, dam removal, dam re-operation, flow and water temperature improvements, fish passage, and physical habitat improvements. Habitat expansion actions would be selected in consultation with National Marine Fisheries Service, U.S. Fish and Wildlife Service, State Water Board, U.S. Forest Service, and California Department of Fish and Game. Prior to approving the final HEA, National Marine Fisheries Service will initiate a 60-day consultation process with the parties to the HEA and the State Water Board.

Section 11.2.2 of the HEA contains specific allowances for withdrawal for all parties should the State Water Board either issue water quality certification that is materially inconsistent with the HEA, exercise any reserved authority relative to fish passage in a manner that is inconsistent with the HEA, or deny water quality certification.

The State Water Board concludes that in order to provide reasonable protection for the cold freshwater, spawning, and migration beneficial uses from the ongoing impacts the Project is having and will continue to have on those uses, expansion of habitat as envisioned in the HEA, to at least partially offset the loss of habitat caused by the Project, is necessary. The process provided for by the HEA is still underway, however, making it impossible for this certification to specify the locations for habitat expansion actions. In addition, while the State Water Board anticipates that DWR is likely to rely on the activities identified pursuant to the HEA to comply with this aspect of the water quality certification, it is preferable to establish a performance goal consistent with the HEA, instead of prescribing the HEA as the manner of compliance. This provides DWR with the flexibility to substitute some actions that are not included in the HEA for actions that are included, for purposes of complying with this water quality certification, without establishing any requirement that is inconsistent with the HEA. Therefore, the water quality certification requires that the Licensee submit a plan to the Deputy Director within two years of issuance of a new license by the Commission that will result in a net increase of spawning habitat for 2,000 to 3,000 spring-run Chinook salmon in the Sacramento River Basin. The water quality certification also reserves the authority to modify the condition if the goals of the habitat expansion plan are not met within the timelines in the plan, if Pacific Gas and Electric Company does not implement or participate in the plan, or if the DWR withdraws from the HEA before the approved, final habitat expansion plan is fully implemented.

Lake Oroville Warm Water Fishery Habitat Improvement Program

Angling for warm water game fish is an important component of the recreation that occurs at Lake Oroville. Through the Lake Oroville Warm Water Fishery Habitat Improvement Program, DWR will improve the warm water fish habitat in Lake Oroville that supports warm water game fish such as black bass and channel catfish. This is an improvement to a similar program that exists under the current license for the Project. This habitat improvement program is intended to increase and/or improve the structural complexity of the Lake Oroville fluctuation zone, which provides benefits to warm water fish that use these areas for spawning and rearing. This measure will protect the warm freshwater and spawning beneficial uses of Lake Oroville.

Lake Oroville Cold Water Fishery Improvement Program

Lake Oroville lacks suitable habitat to support self-sustaining populations of cold water sport fish, such as rainbow trout, brown trout, Chinook salmon, and coho salmon, which require cold, flowing water and clean gravels. Although some of Lake Oroville's tributaries have this habitat, they do not provide enough to support the cold water sport fishery at a level that is desirable to Lake Oroville anglers. Therefore, stocking hatchery fish is necessary to maintain these cold water fish populations.

Through the Lake Oroville Cold Water Fishery Improvement Program, DWR will stock cold water fish in Lake Oroville to improve the cold water sport fishery, which may increase recreational opportunities and tourism at the reservoir. This is an improvement of a similar program that exists under the current license for the Project. The State Water Board has determined this measure will benefit the cold freshwater beneficial uses of Lake Oroville.

Comprehensive Water Quality Monitoring Program

Water quality in Project waters is affected by many factors, including upstream tributaries and Project operations. Physical, chemical, and biological constituents contributed to Lake Oroville from upstream tributaries can settle from the water column in the reservoir arms. Water quality near the dam is indicative of water quality in the main body of the reservoir, and determines the quality of water released to the Feather River. The Comprehensive Water Quality Monitoring Program is intended to expand the program for data collection to document water quality conditions in Project-affected waters, including contributions from upstream sources, limnologic changes occurring within impoundments, pathogen levels at recreation sites, effects of Project operations on Feather River thermal regime, and long-term effects of the Project on water quality from present and future operations. DWR will develop and implement a comprehensive water quality monitoring program for surface waters within the Project area, through which DWR will track potential changes in water quality associated with the Project, and collect data necessary to develop a water quality trend assessment through the life of the license. Water quality monitoring will focus on the identification of those organic and inorganic constituent and physical parameter levels that may affect beneficial uses for surface waters.

The Comprehensive Water Quality Monitoring Program will include components to sample water chemistry, fish tissue bioaccumulation, recreation site pathogens and petroleum product concentrations, water temperatures, bioassays, and aquatic macroinvertebrate monitoring.

The State Water Board agrees that the development of a water quality monitoring plan is important to ensure the water quality affected by the project meets the water quality standards. DWR staff have observed and sampled cyanobacteria in Lake Oroville. The species of cyanobacteria identified can produce cyanotoxins that are harmful to humans, pets, and wildlife. The water quality certification includes conditions that the water quality monitoring plan includes cyanobacteria monitoring, testing for cyanotoxins, and procedures for protecting the public from cyanotoxins. The condition in the water quality certification improves enforceability of the monitoring plan described in the SA.

Pathogen Public Health Protection

DWR conducted monitoring for bacteria at recreation areas during 2002 and 2003. Samples from the North Forebay Recreation Area beach had consistently high fecal coliform levels that exceeded Department of Health Services (DHS) guidance and Basin Plan objectives. Results also showed that nearly every sample from two sites in the North Forebay, and many sites in the South Forebay, exceeded DHS and U.S. EPA criteria for enterococcus bacteria (Department of Water Resources, September 2004).

The measure in the SA requires DWR, in coordination with the appropriate public agencies, to perform monitoring of bacteria levels at swim areas. DWR will also be required, upon input from appropriate agencies, to notify the public if unsafe levels of bacteria are present in the water. DWR, in coordination with Parks and Recreation, will also place notices educating the public on sanitary measures to prevent contamination of the water. In addition, DWR, in consultation with the relevant public health agencies and state and regional water boards, will determine if a companion public education program designed to inform the public about potential sources of bacteria in the water is necessary.

The Comprehensive Water Quality Monitoring Program and Monitoring of Bacterial Levels and Public Education measures in the SA contained similar but conflicting requirements. The

monitoring elements have been combined in Condition S12. Condition S13 contains measures necessary to protect public health from exposure to pathogens in swimming areas.

The North Thermalito Forebay Recreation Area was developed to mitigate for the loss of recreational opportunities from the construction and operation of the Project. The design of the facility contributes to the high coliform levels. Condition S13 includes a requirement to assess the risk to swimmers at the North Forebay Recreation Area, and if necessary, to develop a plan to reduce the risk to swimmers.

Public Education Regarding Risks of Fish Consumption

Operation of the Project may contribute to the methylation of mercury resulting in an increase in the levels of mercury in fish tissue. The SA includes a measure that requires DWR, in consultation with the Office of Environmental Health Hazard Assessment (OEHHA), State Water Board, and Central Valley Regional Water Quality Control Board, to post notices at all boat ramps and other locations within the Project boundary notifying the public about health issues associated with consuming fish taken from within the Project waters.

Condition S14 requires DWR to provide funding to OEHHA for the development of additional fish tissue consumption advisories, should this be necessary based on additional data collection. The Condition also includes a reservation of authority to develop a methyl mercury management plan should research or data indicate the Project increases methylation rates.

Oroville Wildlife Area Management Plan

DWR will develop, in conjunction with the Departments of Fish and Game and Parks and Recreation, and in consultation with the U.S. Fish and Wildlife Service, a Management Plan for the Oroville Wildlife Area for Commission approval. The Proposed License Article identifies a number of required Plan elements. The Plan will be reevaluated every five years.

Protection of Vernal Pools

Vernal pools are seasonal wetlands that support a range of sensitive plant and insect species. Approximately 49 acres of vernal pools and ephemeral swales were mapped within the project area. Protection of these pools is necessary to protect the beneficial uses and prevent the take of threatened and endangered species.

Minimization of Disturbances to Nesting Bald Eagles

On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. Even though they are delisted, bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These Acts require some measures to continue to prevent bald eagle "take" resulting from human activities. Bald eagles are a water dependant species that feed on fish and waterfowl. Bald eagles may be sensitive to human disturbance. U.S. Fish and Wildlife Service may require conservation measures to protect Bald Eagles that include use restrictions in bald eagle territories. Measures to protect this species may require modification of other measures in this certification. This measure is included to allow the State Water Board to adequately balance all of the beneficial uses, minimize conflicts between uses, and prevent take.

Protection of Giant Garter Snake

Giant garter snake is a threatened species under both the federal and state Endangered Species Acts. The giant garter snake is endemic to the wetlands of California's Central Valley. Habitat for the giant garter snake primarily occurs in the Thermalito Forebay and Thermalito Afterbay and the Oroville Wildlife Area. Water level fluctuations at the Thermalito Afterbay, maintenance activities, and recreational development and use can adversely affect the habitat of the highly aquatic giant garter snake. Accordingly, DWR will implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect giant garter snakes within suitable habitat within the Project boundary. The State Water Board has determined that this measure will assist in protecting habitat and the rare, threatened, or endangered species beneficial use.

Protection of Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is a threatened species under the federal Endangered Species Act. The valley elderberry longhorn beetle is a riparian dependant species that bores into the stems of elderberry bushes. Inclusion of this measure is necessary to protect the rare, threatened, or endangered species beneficial use.

Protection of Red-Legged Frog

The California red-legged frog was federally listed as threatened in 1996, and a final Recovery Plan for the California red-legged frog was issued in 2003. The Oroville Facilities Project boundary is not included within any of the eight recovery units identified in the Recovery Plan, and no red-legged frogs were observed during the habitat surveys conducted in 2002 or during other relicensing field data collection activities. However, there is potentially suitable habitat for the red-legged frog within the Project boundary. DWR agrees to implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect the red-legged frog within the Project boundary. The State Water Board has determined this measure will assist in protecting habitat and the rare, threatened, or endangered species beneficial use.

Construction and Recharge of Brood Ponds

Waterfowl survival can be adversely affected by Thermalito Afterbay water level fluctuations, which increase the distance from emergent wetland cover and aquatic habitat. Existing brood ponds are designed to maintain a more stable water surface elevation than the Thermalito Afterbay and provide waterfowl cover adjacent to aquatic habitats that serve to reduce waterfowl brood losses. As water levels decrease within brood ponds (from evaporation, seepage, and evapotranspiration), the distance from aquatic habitat to brood cover increases within the pond. The SA requires DWR to develop, in conjunction with the California Department of Fish and Game and in consultation with the Ecological Committee and U.S. Fish and Wildlife Service, a plan to construct one new waterfowl brood pond every five years over a 20-year period, and maintain adequate water surface elevations. The State Water Board has determined this measure will assist in protecting the wildlife habitat beneficial use.

6.0 Findings

1. The State Water Board has reviewed and considered: (a) the Settlement Agreement for Licensing of the Oroville Facilities; (b) DWR's final FERC License Application; (c) comments on the final License Application by agencies and interested parties; (d) the

U.S. Forest Service Final 4(e) Conditions; (e) the FERC Environmental Impact Statement prepared pursuant to the National Environmental Policy Act; (f) DWR's application for water quality certification; (g) the Environmental Impact Report prepared by DWR; and (h) comments by agencies and interested parties. Further, the State Water Board has considered the Basin Plan, the existing water quality conditions, and project-related controllable factors.

2. As responsible agency under the California Environmental Quality Act (CEQA) the State Water Board has reviewed and considered the Environmental Impact Report (EIR) for this Project (State Clearinghouse Number 2001102011) prepared by DWR. A Notice of Determination for the EIR was filed with the State Clearinghouse on July 22, 2008. DWR determined the Project will not have a significant effect on the environment, and prepared a mitigation reporting and monitoring plan. CEQA requires that the responsible agency make one or more of a set of three findings whenever an EIR identifies a significant effect on the environment. These findings are set forth in section 21081 of the Public Resources Code: (1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment; (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency; (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report. (See also Cal. Code Regs., tit. 14, § 15091.) The findings identified one or more significant environmental effects of the project on water resources. CEQA requires responsible agencies to prepare a statement of overriding considerations which reflects the ultimate balancing of competing public objectives (including environmental, legal, technical, social, and economic factors) that the agency is required by law to carry out or approve. The State Water Board is concurrently adopting a Statement of Overriding Considerations for this Project, with the adoption of the certification ([Attachment B](#)). The State Water Board also prepared a Mitigation, Monitoring, and Reporting Plan ([Attachment A](#)).

The CEQA Mitigation, Monitoring and Reporting Plan, and Findings are included as Attachment A to this certification. The State Water Board will file a Notice of Determination within five days from the issuance of this certification.

3. On September 2, 2009, the State Water Board issued notice pursuant to section 3858 of title 23 of the California Code of Regulations that it intended to issue water quality certification after a 21-day notice period. On January 21, 2010, the State Water Board issued a draft water quality certification for public review.

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER BOARD CERTIFIES THAT THE OPERATION OF THE OROVILLE FACILITIES BY THE DEPARTMENT OF WATER RESOURCES, UNDER A LICENCE ISSUED BY THE COMMISSION, AS DESCRIBED IN ITS APPLICATIONS FOR WATER QUALITY CERTIFICATION, will comply with sections 301, 302, 303, 306 and 307 of the Clean Water Act, and with applicable provisions of state law, provided the Department of Water Resources complies with the following terms and conditions:

Specific Conditions

S1. Lower Feather River Habitat Improvement Plan

- a) Within three years of license issuance, the Licensee shall develop a comprehensive Lower Feather River Habitat Improvement Plan. The Plan shall provide an overall strategy for managing the various environmental measures developed for implementation within the areas integrated in the Plan, including the implementation schedules, monitoring, and reporting. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, California State Water Resources Control Board (State Water Board), and Central Valley Regional Water Quality Control Board (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall submit the Plan to the Deputy Director for Water Rights (Deputy Director) for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.
- b) The Licensee shall individually evaluate each of the programs and components of the Lower Feather River Habitat Improvement Plan to assess the overall effectiveness of each action within the Lower Feather River Habitat Improvement Plan. Each program or component may be updated or modified as appropriate to continue to best meet the Plan goals.
- c) The following programs and plans shall be included in the comprehensive Lower Feather River Habitat Improvement Plan:
 1. Gravel Supplementation and Improvement Program
 2. Channel Improvement Program
 3. Structural Habitat Supplementation and Improvement Program
 4. Fish Weir Program
 5. Riparian and Floodplain Improvement Program including the evaluation of pulse/flood flows
 6. Feather River Fish Hatchery Improvement Program
 7. Comprehensive Water Quality Monitoring Program
 8. Oroville Wildlife Area Management Plan
 9. Instream Flow and Temperature Improvement for Anadromous Fish.
- d) The Plan shall provide for and include:
 1. Coordination of implementation and monitoring activities agreed to in the individual components included in the comprehensive Plan;
 2. Coordination with any Project-specific biological opinions and Operations Criteria and Plan findings or recommendations;
 3. Annual reporting of monitoring results and activities, if appropriate, for the individual components to the consultees throughout the term of the license;
 4. The integration of the programs and plans listed in subdivision (c) above, including an evaluation of synergistic effects and an evaluation and consideration of predation management; and
 5. Development of a single, comprehensive monitoring and adaptive management summary report by the Licensee as set forth in (e) below.

- e) During the sixth year following license issuance and at five-year intervals for the duration of the license, the Licensee shall develop and submit a single, comprehensive monitoring and adaptive management summary report. The Lower Feather River Habitat Improvement Plan report shall be submitted to the consultees listed in S1(a) above for review and comment at least 60 days prior to filing the report with the Deputy Director. The comprehensive report shall include the results of each of the various components of each program during the implementation period. The report shall also include information on any proposed changes or updates to the individual plans or programs within the Lower Feather River Habitat Improvement Plan.

S2. Gravel Supplementation and Improvement Program

- a) Within two years of license issuance, the Licensee shall develop a Gravel Supplementation and Improvement Program Plan to address gravel management for the lower Feather River throughout the term of the license. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, the California Department of Fish and Game, and the State Water Board (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Deputy Director approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Deputy Director.
- b) The Licensee, in consultation with the consultees listed in S2(a) above, shall coordinate the gravel supplementation activities with the measures conducted within the Lower Feather River Habitat Improvement Plan.
- c) The Plan shall include a schedule to complete, within five years of license issuance, the supplementation of at least 8,300 cubic yards over the December 31, 2006 baseline of spawning gravels suitable for spring-run Chinook salmon or steelhead which shall be distributed over up to 15 locations in the LFC or HFC of the Feather River.
- d) The Plan shall provide for: (1) a physical assessment of the spawning riffles from River Mile 54.2 up to River Mile 67.2 of the Feather River; (2) a gravel budget for the LFC and, if necessary, portions of the HFC within the Project Boundary; (3) a strategy to augment existing gravel recruitment beyond the 8300 cubic yards referenced in subdivision (c) above in the LFC and HFC with gravel injections, placements, or other methods developed through site-specific investigations; (4) plans to monitor and evaluate the effectiveness of gravel augmentation, particularly the biological response of fish species to the gravel supplementation and enhancement activities; (5) an annual summary account of the activities conducted; and (6) coordination with other components of the license and the Lower Feather River Habitat Improvement Plan to enhance natural reproduction of steelhead and Chinook salmon.
- e) The Gravel Supplementation and Improvement Program Plan shall also include the following measures, criteria and timelines:

1. All work within the Ordinary High Water mark of the Lower Feather River shall take place during the months of June and July, or at other times as allowed by permit conditions to produce minimal impact to the target species (steelhead and Chinook salmon) and other river attributes (*i.e.* water quality).
 2. Gravel placement or riffle rehabilitation at the treated riffles shall, where feasible, cover the extent of naturally observed spawning areas, be within an area extending between river banks, and extend at least 50 feet upstream and 50 feet downstream of the riffle, and be a depth of at least one foot.
 3. Licensee shall monitor and replenish or rehabilitate gravel at individual sites every five years, as needed, for the term of the License. At five-year intervals after the initial supplementation period, the Licensee shall monitor and maintain a minimum of 10 riffle complexes in the LFC so that approximately 80 percent of the spawning gravels randomly sampled in riffle complexes shall be in the median size range preferred by Chinook salmon or steelhead. All work will be done in consultation with the consultees listed in S2(a) above. High flow events shall be defined in the Gravel Supplementation and Improvement Plan.
 4. The Licensee, in consultation with the consultees listed in S2(a) above, shall conduct a study on the need for additional gravel supplementation in the HFC of the Feather River (within the Project Boundary). The study shall be submitted to the Deputy Director for modification and approval within eight years of license issuance. If gravel supplementation will benefit spawning and rearing, it will begin within 10 years of license issuance. Gravel supplementation, if provided, shall include the staging of spawning gravel stockpiles, of up to 2,000 cubic yards, of a size distribution determined by study, below the Thermalito Afterbay Outlet.
- f) The Licensee shall prepare an annual summary report describing the activities completed pursuant to the Program and submit the report to the consultees listed in S2(a) above. Throughout the term of the license, the Licensee shall compile these annual reports at least once every five years in the Lower Feather River Habitat Improvement Plan Report.
- g) The Licensee, in consultation with the consultees listed in S2(a) above, shall reevaluate the Gravel Supplementation and Improvement Program Plan every five years after initial implementation. Every five years the Licensee shall submit for the Deputy Director's information a Lower Feather River Habitat Improvement Plan report that includes any Plan updates. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Gravel Supplementation and Improvement Program Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved.

S3. Channel Improvement Program

- a) Within one year of license issuance, the Licensee shall develop and file for Commission approval a Moe Ditch and Hatchery Ditch Plan to improve two existing side channels at the upstream end of the LFC, Moe's Ditch, and Hatchery Ditch, by modifying these channels to provide suitable discharge, velocity, depth, substrate, cover and riparian vegetation to support salmonid spawning and rearing. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and the California Department of Fish and Game (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Moe and Hatchery Ditch Plans copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Plan shall include a schedule to complete the improvements to Moe's Ditch and Hatchery Ditch within three years of license issuance. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.
- b) Within four years of license issuance, the Licensee shall develop and file for Commission approval a Channel Construction Plan to identify and construct, within 10 years of license issuance, five additional side channel riffle/glide complexes of not less than a cumulative total of 2,460 feet in length of new habitat. These side channels shall be located and designed to maximize quantity/quality of suitable salmonid attributes (depth, velocity, substrate, cover, and vegetation) while minimizing the potential for warming, stranding, and predation problems. The Plan shall be developed in consultation with the consultees listed in S3(a) above. The Licensee shall include with the filing of the Channel Construction Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Commission approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Commission.

- c) Maintenance activities shall be developed by the Licensee in consultation with the consultees listed in S3(a) above. Maintenance activities shall occur at least once every five years, or as often as necessary to maintain channel functions. High flow events shall be defined in the Channel Construction Plan.
- d) Licensee shall annually collect data appropriate for evaluating the effectiveness of the Channel Improvement Program and the achievement of the Channel Improvement Program objectives. The Licensee shall prepare an annual summary report describing monitoring and implementation activities completed pursuant to the Program and submit the report to the consultees listed in S3(a) above for review on an annual basis. Throughout the term of the License, the Licensee shall compile these annual reports every five years in the Lower Feather River Habitat Improvement Plan Report that is submitted to the Commission.
- e) The Licensee, in consultation with the consultees listed in S3(a) above shall reevaluate the Channel Construction Plan every five years after initial implementation. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations made in the course of such consultation, and an explanation as to why any comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Deputy Director. The Licensee shall include any Deputy Director approved revisions to the Plan into any updates to the Lower Feather River Habitat Improvement Plan set forth in Condition S1.

S4. Structural Habitat Supplementation and Improvement Program Plan

- a) Within two years of license issuance, the Licensee shall develop and file for Commission approval a Structural Habitat Supplementation and Improvement Program Plan to provide additional salmonid rearing habitat in the Lower Feather River by creating additional cover, edge, and channel complexity through the addition of structural habitat, including large woody debris, boulders, and other objects. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Within two years following Deputy Director approval of the Plan, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Deputy Director.
- b) The Plan shall contain the following elements:

1. Proposed locations for structural placements, including large woody debris, boulders, or other material. Large woody debris for this Program is defined as multi-branched trees at least 12 inches in diameter at chest height, and a minimum of 10 feet in length (with a preference for approximately 20 feet or longer), with approximately 50 percent of the structures containing intact rootwads. Large woody debris or other native materials shall be located within the river to maximize the instream benefit at the lowest minimum flow specified in Condition S8 with the rootwad (if attached) oriented upstream.
 2. Development and implementation of a strategy to map existing large woody debris, riparian habitat, and sources of riparian and large woody debris recruitment.
 3. Placement of a minimum of 2 pieces of large woody debris, boulders, or other appropriate material per riffle in the LFC and HFC from River Mile 54.2 to River Mile 67.2 of the Feather River for a total of between 50 and 500 pieces in locations that maximize benefits for salmonids. Additional large woody debris, boulders, or other material may be placed in glide, riffle or pool habitat where appropriate.
 4. Completion of a safety analysis, and any resulting necessary modifications to the Plan, prior to program implementation to ensure that issues relating to human safety are adequately addressed.
 5. Monitoring of the structural placements after major high flow events, or at least once every five years in the absence of a high flow event, to collect data appropriate for evaluating the effectiveness of the Program and its objectives. High flow events shall be defined in the Structural Habitat Supplementation Improvement Program Plan.
 6. Inclusion of specific maintenance criteria, including the interval for replacement of large woody debris or other structures. Replacement shall occur at a minimum of every five years.
- c) The Licensee shall annually collect data appropriate for evaluating the effectiveness of the Program and the achievement of the Program objectives. The Licensee shall prepare an annual summary report describing monitoring and implementation activities completed pursuant to the Program and submit the report to the consultees listed in S4(a) above for review on an annual basis. Throughout the term of the license, the Licensee shall compile these annual reports every five years in the Lower Feather River Habitat Improvement Plan Report that is submitted to the Commission.
- d) The Licensee, in consultation with the consultees listed in (a) above, shall reevaluate the Plan every five years after initial implementation. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why the comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Commission approval, the Licensee shall implement the Plan, including any changes required by the Commission. The Licensee

shall include any Commission and Deputy Director approved revisions to the Plan into any updates to the Lower Feather River Habitat Improvement Plan set forth in Condition S1.

S5. Fish Weir Program

- a) Within one year of license issuance, the Licensee shall develop and file for Deputy Director approval a Phase 1 Weir Construction and Operations Plan consistent with the Project biological opinion(s). The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Phase 1 Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.

Upon Commission and Deputy Director approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.

- b) The Phase 1 Plan shall include a schedule to install and operate a monitoring weir in the vicinity upstream of the Thermalito Afterbay Outlet within three years of license issuance.
- c) The Phase 1 Plan shall be designed to document run timing for spring-run and fall-run Chinook salmon and steelhead, and include design and safety analysis including boating compatibility, detailed engineering design, and a permitting process schedule. The Plan will include use of the monitoring weir, or an additional separate interim weir, to provide interim spatial and/or temporal segregation of Chinook salmon runs, and will include a timeline and study plan to implement such segregation within five years of license issuance. After issuance of a final Biological Opinion by the National Marine Fisheries Service, and upon the request of the Licensee, the Deputy Director may approve a different time frame for implementation of the weir. The time for implementation may not exceed the time required in the final Biological Opinion issued by the National Marine Fisheries Service. The Plan shall be a part of the Lower Feather River Habitat Improvement Plan.
- d) Licensee shall correlate data from the monitoring weir to carcass surveys or other existing population counts. The Licensee, in consultation with the consultees listed in S5(a) above, shall use the data collected in Phase 1 to develop recommendations to the Deputy Director and the Commission regarding Phase 2 as set forth below.
- e) Within eight years of license issuance, the Licensee shall develop and file for Commission approval a Phase 2 Anadromous Fish Segregation Weir Plan for the purpose of providing spatial separation for the spawning of spring-run and fall-run Chinook salmon. The Plan shall be developed in consultation with the consultees listed in S5(a) above. The Licensee shall include with the filing of the Phase 2 Plan copies of

the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Commission and Deputy Director approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.

- f) The Phase 2 Plan shall include a weir operations protocol, safety analysis including boating compatibility, detailed engineering design, and identification of the required permitting process. The Phase 2 Plan shall also evaluate the installation of an egg-taking station, if appropriate, to collect fall-run Chinook salmon eggs for transport to the Feather River Fish Hatchery.
- g) The Phase 2 Plan shall include a schedule to install and operate a Phase 2 anadromous fish segregation weir in the lower Feather River upstream of the Thermalito Afterbay Outlet within 12 years of license issuance.
- h) The Licensee shall annually collect data appropriate for evaluating the effectiveness of the Fish Weir(s) and Egg-Taking Station, and correlate this data to carcass surveys or other existing population counts. The Licensee shall prepare annual summary reports for Phase 1 and Phase 2 describing the monitoring results and provide these reports to the consultees listed in S5(a) above for review. Every five years the annual reports shall be compiled in the Lower Feather River Habitat Improvement Plan Report.
- i) The Licensee, in consultation with the consultees listed in S5(a) above, shall reevaluate the Program every five years after initial implementation. The Licensee shall provide all Plan updates to the Deputy Director for information. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the revised plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Commission and Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Commission and the Deputy Director. The Licensee shall include any Commission and Deputy Director approved revisions to the Plan into any updates to the Lower Feather River Habitat Improvement Plan set forth in Condition S1.

S6. Riparian and Floodplain Improvement Program

- a) Within six months of license issuance the Licensee shall develop and file for Deputy Director approval a Plan for a phased program to enhance riparian and other floodplain habitats for associated terrestrial and aquatic species. The Plan shall address the connection of portions of the floodplain habitat with the Feather River within the Oroville Wildlife Area and shall include a description of areas in which gravel extraction may take place, in anticipation of improving fish and wildlife benefits. The Plan shall also include a definition of high flow events. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Commission and Deputy Director approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.

- b) The Program set forth in the Plan shall be implemented in the following four phases:

Phase 1 – Within one year of license issuance and in consultation with the consultees listed in S6(a) above, the Licensee shall develop and submit to the Deputy Director a screening level analysis of proposed riparian/floodplain improvement projects, including how flood/pulse flows may contribute to floodplain values and benefit fish and wildlife species. This phase shall include the identification of a Phase 1 recommended alternative. This phase shall also include an assessment of the gravel value and potential extraction processes in order to provide guidance on the scope, timing, and magnitude of the Program.

Phase 2 – Within four years of license issuance and in consultation with the consultees listed in S6(a) above, the Licensee shall initiate Phase 2 of the Program. Phase 2 shall begin with conducting a full scope and feasibility evaluation and development of an implementation schedule of the Phase 1 recommended alternative. Within six years of license issuance, the Licensee shall submit the Phase 1 recommended alternative and implementation schedule to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Phase 1 recommended alternative and implementation schedule shall be deemed approved. Within eight years of license issuance, the Licensee shall complete the final design and commence construction and implementation of the approved alternative. Within 15 years of license issuance the Licensee shall fully implement this approved alternative.

Phase 3 – Within 15 years of license issuance and in consultation with the consultees listed in S6(a) above, the Licensee shall complete an evaluation of other potentially feasible projects and the identification of a Phase 3 recommended alternative. This phase shall include a reevaluation of how flood/pulse flows may contribute to floodplain

values and benefit fish and wildlife species and shall include an assessment of the gravel value and potential extraction processes similar to the one completed in Phase 1.

Phase 4 – Upon Deputy Director approval, and within 25 years of license issuance, the Licensee shall complete construction of the Phase 3 recommended alternative.

- c) The Licensee shall annually collect data appropriate for evaluating the effectiveness of the Program and the achievement of the Program objectives. The Licensee shall prepare an annual summary report describing monitoring and implementation activities completed pursuant to the Program and submit the report to the consultees listed in S6(a) above, for review on an annual basis. Throughout the term of the license, the Licensee shall compile these annual reports every five years in the Lower Feather River Habitat Improvement Plan Report that is submitted to the Commission.
- d) The Licensee, in consultation with the consultees listed in S6(a) above, shall reevaluate the Plan every five years after initial implementation. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Commission and Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.

S7. Feather River Fish Hatchery

Hatchery Operation

The Licensee shall ensure the continued operation of the Feather River Fish Hatchery in cooperation with the California Department of Fish and Game for the production of anadromous salmonids such as steelhead, fall-run Chinook salmon, spring-run Chinook salmon, as well as other salmonids that may be stocked as part of the license.

Water Temperature

Upon License issuance, the Licensee shall not exceed the water temperatures in Table S7. From April 1 through May 31 the water temperature shall not fall below 51 degrees Fahrenheit.

Table S7

September 1-September 30	56 °F
October 1 – May 15	55 °F
May 16 – May 31	59 °F
June 1 – June 15	60 °F
June 16 – August 15	64 °F
August 16 – August 31	62 °F

The temperatures in Table S7 shall be measured hourly year-round at the Feather River Fish Hatchery intake/aeration tower.

Upon facility modification as described in S7b, or after the first 10 years of operation under the License, whichever comes first, the Licensee shall not exceed the water temperatures in Table S7A. From April 1 through May 31 the water temperature shall not fall below 51 degrees Fahrenheit.

Table S7A

September 1-September 30	56 °F
October 1 – May 31	55 °F
June 1 – August 31	60°F

The temperatures in Table S7A are Maximum Mean Daily Temperatures and shall be calculated by adding the hourly temperatures achieved each day and dividing by 24. Water temperatures in Table S7A shall be measured year-round at the Feather River Fish Hatchery intake/aeration tower.

During Conference Years, as defined in Condition S8, the Licensee shall confer with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, and State Water Board to determine proper temperature and disease management goals.

- a) Within six months of license issuance, the Licensee shall submit a status report describing any progress towards repairing or refurbishing the river valve, and a list of temperature control actions being used or contemplated to meet the Table S7 water temperatures. Within one year of license issuance, the Licensee shall submit a schedule for repair or refurbishment of the river valve, or for implementation of a proposed alternative method for meeting water temperature requirements in Table S7, to the Deputy Director for approval. The schedule shall include the steps and time necessary to evaluate, design, and complete the repair or refurbishment of the river valve. If the Licensee proposes an alternative method for meeting temperature requirements, evidence must be submitted that the alternative method will provide equivalent water temperature control as the river valve. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the schedule shall be deemed approved.

- b) If the Licensee cannot meet the water temperature requirements in Table in S7A without facility modification(s), it shall within three years of license issuance, submit a long-term facility modification(s) and operations plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved.

Feather River Fish Hatchery Management Program

- a) Within two years of license issuance, the Licensee shall develop a management plan (Plan) for the Feather River Fish Hatchery. The Plan shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, the California Department of Fish and Game, State Water Board, and the Central Valley Regional Water Quality Control Board (consultees) and in coordination with the Feather River Technical Team. The Plan shall include a schedule to begin implementation of the Fish Hatchery Management Program (Program) within three years of license issuance. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Licensee shall submit the Plan to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Commission and Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.
- b) The development of this Program will include review and consideration of the recommendations for the Feather River Fish Hatchery put forth in the *Joint Hatchery Review Committee Final Report on Anadromous Salmonid Fish Hatcheries in California* (December 2001).
- c) Components of the Plan shall include:
 - 1) Hatchery and Genetics Management Plans for each anadromous fish species managed by the hatchery.
 - 2) Adaptive management protocols for hatchery production including egg taking, spawning, incubation, hatching, rearing, and stocking of fish.
 - 3) A methodology to implement appropriate form(s) of tagging or marking of the Feather River Fish Hatchery artificial propagation programs, along with recovery of these tags/marks.
 - 4) A methodology to study Feather River Fish Hatchery management effects on salmonids, and the interaction between in-river and hatchery-produced salmonids.
 - 5) A methodology to study the phenotypic or genotypic traits that may be lost due to management actions or the adverse effects of the facilities if existing literature on these subjects is insufficient.
 - 6) Development of a disease management methodology to reduce the incidence of disease outbreaks within the Feather River Fish Hatchery facilities and a plan to implement the methodology, as well as a requirement that the Licensee monitor and report to the consultees on disease and water quality issues. This component of the Plan shall include investigation of the mechanisms to control disease, including water supply disinfection, temperature control devices (e.g., chillers, shade screens, well water), chemical treatments, fish stress reduction methods (fish density manipulation, flow increases, aeration) and standards for acceptable loss.

- 7) A methodology to work with other Central Valley hatcheries to improve methods of integrating operations, marking and tag recovery, and data management.
 - 8) A methodology to minimize straying of salmonids produced at the Feather River Fish Hatchery.
 - 9) A methodology for the release of fish that evaluates full in-river release for the spring-run production, and in-river fall-run releases starting with 25 percent of the hatchery fall-run production, or other suitable amount to be determined by Licensee, in consultation with the consultees, and specifically the California Department of Fish and Game.
 - 10) A methodology to use the results of studies, monitoring, and other information, in order to make changes to the operations of the Feather River Fish Hatchery.
- d) Within one year of Plan approval by the Commission, the Licensee shall annually collect data appropriate for evaluating the effectiveness of the Program and the achievement of the Program objectives. The Licensee shall prepare an annual summary report describing monitoring and implementation activities completed pursuant to the Program and submit the report to the consultees listed in S7(a) above for review on an annual basis. Throughout the term of the license, the Licensee shall compile these annual reports every five years in the Lower Feather River Habitat Improvement Plan Report that is submitted to the Commission.
 - e) The Licensee, in consultation with the consultees listed above, shall reevaluate the Program/Plan ("Plan") every five years after initial implementation. When possible, the Plan shall be reevaluated concurrently with the renewal of the Hatchery and Genetics Management Plans. The Licensee shall provide all Plan updates to the Deputy Director for information. If any changes are recommended beyond the objectives, activities, or schedules identified in this article or the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Commission and Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.
 - f) The Licensee shall continue to use adaptive management practices for spring run salmonids until the Hatchery Genetics and Management Plans are developed and implemented.
 - g) The Licensee shall prepare an annual hatchery report beginning in the year following the calendar year the license is issued. The annual report shall contain, but not be limited to, the following information:
 1. The number of each species and/or run of fish taken, along with the number of adults, grilse, steelhead and half-pounders.

2. An estimate of the number of eggs for each species and/or run.
3. The number, size and species and/or run of all fish reared at the hatchery.
4. The number, size, and release location and date of each species stocked and/or transferred.
5. An annual summary of disease management activities, including the diseases detected, the species infected and the number of losses, treatment methods, etc.
6. The egg take and stocking goal used that year.
7. A description of any significant operational changes that may have occurred as a result of the adaptive management process.

Hatchery Water Supply Disinfection System

In the event that anadromous salmonids are passed upstream of the Feather River Fish Hatchery, the Licensee shall install a water disinfection system for the Feather River Fish Hatchery water supply prior to such passage. The system shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, State Water Board and Central Valley Regional Water Quality Control Board. Prior to installing the system, the Licensee shall develop and submit a plan to the Deputy Director for approval. The Licensee shall include with the filing copies of comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved.

Hatchery Annual Operation and Maintenance

Within two years of license issuance, the Licensee, in coordination with the California Department of Fish and Game, shall conduct a comprehensive facility assessment of the Feather River Fish Hatchery, and shall conduct such an assessment at least once every five years thereafter. The Licensee shall include all findings of the assessment in the Lower Feather River Habitat Improvement Plan Report filed with the Deputy Director as set forth in Condition S1.

S8. Flow/Temperature to Support Anadromous Fish

Minimum Flows and Temperature Requirements in the Low Flow Channel

- a) Upon license issuance, the Licensee shall release a minimum flow of 700 cfs into the Low Flow Channel (LFC). The minimum flow shall be 800 cfs from September 9 to March 31 of each year to accommodate spawning of anadromous fish, unless another minimum flow, recommended by the resource agencies as envisioned under the Settlement Agreement A108.1(a) is approved by the Deputy Director. The Deputy Director's evaluation of the impact of reduced flow will include its impact on anadromous fish as well as on other beneficial uses. If the Licensee receives such approval, it may operate consistent with the revised minimum flow. Within 30 days of receipt, the Licensee shall file such notice with the Commission for information.
- b) Licensee shall operate the Project to not exceed the water temperatures in Table S8 as measured at Robinson Riffle. If the Licensee demonstrates to the satisfaction of the Deputy Director that it cannot feasibly meet these water temperature requirements using

current facilities, it shall within one year of license issuance submit for Deputy Director approval an interim operations plan that includes measures to reduce water temperatures. While documentation is pending to demonstrate that the Licensee cannot meet Table S8 requirements, the Licensee shall not be considered in violation of this subsection if the Deputy Director determines that exceedence of Table S8 temperatures is due to limitations of existing facilities. Similarly, if the Deputy Director determines that the Licensee cannot feasibly meet Table S8 requirements using current facilities, exceedences of Table S8 temperatures that the Deputy Director determines to be due to the limits of the current facilities will not be considered violations of this subsection during the time period in which DWR is preparing, and the Deputy Director is reviewing, the interim operations plan. The Deputy Director may require modifications of the interim operations plan as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved.

- c) If the Licensee cannot meet the water temperature requirements in Table in S8 without facility modification(s), it shall within three years of license issuance, submit a long-term facility modification(s) and operations plan to the Deputy Director for approval. The plan must demonstrate compliance with Table S8 temperatures within 10 years of license issuance. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. If after facility modification(s) the Licensee demonstrates to the satisfaction of the Deputy Director that it cannot feasibly meet water temperatures in Table S8, it shall submit to the Deputy Director proposed alternative temperature requirements that provide reasonable protection of the COLD beneficial use. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the proposed requirements shall be deemed approved. Upon approval of the Deputy Director, the Licensee shall comply with the alternate temperature requirements.

Table S8
LFC Measured at Robinson Riffle
(all temperatures are in daily mean value (degrees F))

MONTH	Temperature
January	56
February	56
March	56
April	56
May 1-15	56-63*
May 16-31	63
June 1 – 15	63
June 16 – 30	63
July	63
August	63
September 1-8	63-58*
September 9 – 30	58
October	56
November	56
December	56

* Indicates a period of transition from the first temperature to the second temperature.

Minimum Flow and Temperature Requirements in the High Flow Channel

- d) Upon license issuance, the Licensee shall, based upon the April through July unimpaired runoff of the Feather River near Oroville of the preceding water-year (October 1 through September 30), maintain a minimum flow in the High Flow Channel (HFC) in accordance with the following schedule, provided that such releases will not cause Oroville Reservoir to be drawn down below elevation 733 feet (approximately 1,500,000 acre-feet).

Preceding April through July unimpaired runoff	Minimum Flow in HFC October – February	Minimum Flow in HFC March	Minimum Flow in HFC April - September
Percent of Normal			
55% or greater	1,700 cfs	1,700 cfs	1,000 cfs
Less than 55%	1,200 cfs	1,000 cfs	1,000 cfs

The preceding water-year's unimpaired runoff shall be reported in Licensee's Bulletin 120, "Water Conditions in California-Fall Report." The term "normal" is defined as the April through July 1911-1960 mean unimpaired runoff near Oroville of 1,942,000 acre-feet.

- e) If the April 1 runoff forecast in a given water-year indicates that Oroville Reservoir will be drawn to elevation 733 feet (approximately 1,500,000 acre-feet) under normal operation of the Project, then the minimum flows in the HFC may be reduced on a monthly average basis, in the same proportion as the respective monthly deficiencies imposed upon State Water Project deliveries to the State Water Contractors for agricultural use; however, in no case shall the minimum flow releases be reduced by more than 25 percent. If, between October 15 and November 30, the highest total 1-hour flow exceeds 2500 cfs, Licensee shall maintain a minimum flow within 500 cfs of that peak flow, unless such flows are caused by flood flows, an inadvertent equipment failure or malfunction.
- f) Upon license issuance, Licensee shall operate the project to protect the COLD beneficial use in the HFC, as measured in the Feather River at the downstream Project Boundary, to the extent reasonably achievable. Within one year of license issuance, Licensee shall submit a plan for project operations to reasonably protect COLD beneficial uses before facility modification to the Deputy Director for approval. This interim plan must include a table of proposed interim temperature requirements, as well as interim measures to reduce water temperatures. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. Within three years of license issuance, Licensee shall submit a long-term facility modification and operations plan to the Deputy Director for approval, which shall include a table of proposed temperature requirements to protect the COLD beneficial use within 10 years after license issuance. When submitting the plan to the Deputy Director, the Licensee shall also submit the plan to parties on the FERC service list (#2100) and post the plan on its web site. The Deputy Director may require modifications as part of the approval. If, within 120 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved.

Conference Years Actions

- a) By May 1 of a Conference Year, the Licensee shall consult with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, and State Water Board (consultees) and prepare a strategic plan that states the specific actions that it will take to manage the coldwater pool to minimize exceedances of Table S8 and the applicable water temperature requirements at the lower project boundary, consistent with its water supply and other legal obligations. After consultation, the Licensee shall submit the strategic plan to the Deputy Director for approval and to the Commission for information. The Deputy Director may require modifications as part of the approval. If, within 30 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. The Licensee shall implement the approved strategic plan. As part of any strategic plan, the minimum flows shall be maintained.

- b) The Licensee shall inform the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game within 10 days of the initial determination of a Conference Year and subsequent updates of that year-type classification.
- c) A Conference Year is defined as any year in which the Oroville Temperature Management Index (OTMI) is equal to or less than 1.35 million acre-feet. OTMI is calculated by multiplying the total volume of stored water in Lake Oroville on May 1 by one half and adding to that calculation the projected May-through-September unimpaired Feather River flow at Oroville. The unimpaired Feather River flow at Oroville means the runoff that would be in the Feather River at Oroville if there were no human development on the Feather River. The amount of Feather River unimpaired flows used for calculating the OTMI will be the median value (with an exceedance probability of 50 percent) of May 1 forecast published in DWR Bulletin 120. As the actual amount of unimpaired flow after May 1 becomes available, the OTMI will be recomputed in the beginning of June, July, and August to account for the potential errors of the May 1 prediction. The OTMI will not be updated after the August 1 update.

Inability to Meet Temperature Requirements Due to Uncontrollable Forces

If the Licensee is unable to meet the temperature requirements in sections S7 and S8 of this certification due to an event or circumstance beyond its reasonable control, the Licensee shall file a notice within 10 days of such event or circumstance with the Deputy Director describing the event or circumstance causing the inability to meet those temperature requirements. Such notice shall include a statement of specific actions that the Licensee will take to address the event or circumstance and how it will manage the coldwater pool to minimize exceedances of Table S8 or of applicable temperature requirements at the lower project boundary, consistent with its water supply and other legal obligations. If the Deputy Director finds that there is a pattern of exceedances that could result in adverse impacts to fishery resources, it may require the Licensee to file a plan identifying any feasible measures that the Licensee may undertake, or modifications to other license requirements, to address the exceedances.

S9. Habitat Expansion

The Licensee shall implement the Habitat Expansion Agreement (“HEA”), in cooperation with PG&E, as provided in the HEA. The Licensee shall submit the habitat expansion plan to the Deputy Director at the same time it submits the plan to NMFS; and the State Water Board delegates to the Deputy Director the authority to review, modify as appropriate, and approve the plan. State Water Board staff will participate in the procedures under the HEA. The plan shall include a specific description of the circumstances when the plan will be deemed to be implemented.

This condition does not change the respective obligations which the HEA assigns to the Licensee and PG&E, the procedures, or the schedule for implementation. This condition does not establish regulatory jurisdiction over any entity other than Licensee. This condition shall extinguish if the HEA terminates, or if State Water Board on recommendation from NMFS determines that the HEA has been implemented. If the HEA terminates before implementation under its terms, the State Water Board reserves its authority to require mitigation for the Project’s impacts on fish passage; and the State Water Board will undertake to exercise its reserved authority in coordination with NMFS.

S10. Lake Oroville Warm Water Fishery Habitat Improvement Program

- a) Within one year of license issuance, the Licensee shall develop and file with the Deputy Director for approval a Plan to improve the habitat of the warm water fishery in Lake Oroville, primarily for the benefit of spawning and rearing. The Licensee shall consult with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game (consultees) in developing this Plan. Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.
- b) The Plan shall provide for: (1) construction, operation, and maintenance of projects to improve warm water fishery habitat within the reservoir or fluctuation zone; (2) implementation of the Plan in seven-year intervals, except that the final interval may be adjusted as appropriate to coincide with license expiration; (3) the annual construction of an average of 15 habitat units; (4) specific habitat units to be constructed in the first interval and that, for each subsequent seven-year interval, the Licensee shall plan further habitat units in consultation with the Ecological Committee, including specifically the consultees; (5) a monitoring program, including angler creel surveys, electrofishing, and springtime snorkel surveys, to evaluate the success of the habitat improvement program; and (6) modification of habitat units based on monitoring results, need, or improvements in technology, within the cost limitations stated above.
- c) The Licensee shall file annually with the Deputy Director a compliance report for information. The annual compliance report shall describe all work performed on such habitat improvements during the previous calendar year. The annual report at the end of each seven-year interval shall describe all such work during that interval, including monitoring results.

S11. Lake Oroville Cold Water Fishery Improvement Program

- a) Within one year following license issuance, the Licensee shall develop and file with the Deputy Director for approval a Plan to provide a cold water fishery primarily for the purpose of recreational fishing. The Licensee shall consult with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and California Department of Fish and Game (consultees) in developing this Plan. Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.

- b) Any modification to the implementation measures not within the scope of the approved Plan must be filed with the Deputy Director for modification and approval.
- c) The Plan shall provide for: (1) the stocking of 170,000 yearling salmon or equivalents per year, plus or minus 10 percent; (2) identification of a primary source of salmonids for stocking in the lake; (3) addressing disease issues associated with the source or handling of salmonids; (4) identification of alternative sources of salmonids for stocking in the lake; (5) analysis of the feasibility of providing a disinfection system for hatchery water resources; and (6) a monitoring program.
- d) The Plan shall be reviewed and updated by the Licensee every 10 years. The Licensee shall consult with the consultees listed in S11(a) above, and then file the updated Plan with the Deputy Director for modification and approval. The Licensee shall include with the filing any comments, including recommendations made in the course of such consultation, and an explanation as to why any such comment was not adopted.
- e) The Licensee shall submit a monitoring report every two years for information with the Deputy Director, and shall include with the filing copies of the comments, including recommendations, made by the consultees, and an explanation as to why any such comment was not adopted.

S12. Comprehensive Water Quality Monitoring Program

- a) Within six months of license issuance, Licensee shall begin preparation of a Comprehensive Water Quality Monitoring Program (Program) to monitor water quality associated with the Project, and collect data necessary to develop a water quality trend assessment through the life of the Commission license. This Program shall be developed in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, State Water Board, the Central Valley Regional Water Quality Control Board, as well as Butte County Health Department (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Program will include components to sample water chemistry, fish tissue bioaccumulation, recreation site pathogens and petroleum product concentrations, water temperatures, bioassays, cyanobacteria/cyanotoxins, and aquatic macroinvertebrate monitoring. The Program shall use accepted methodologies for field sampling and laboratory analysis and shall be consistent with State of California's Surface Water Ambient Monitoring Program Quality Assurance Program Plan.
- b) Within nine months of license issuance, and following the consultation set forth in S12(a), the Program shall be submitted to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon approval by the Deputy Director, the Licensee shall implement the Program. The Licensee may at anytime, after consultation with consultees in S12(a), submit to the Deputy for approval changes to the Program. The Deputy Director may require modifications as part of the approval.

If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved.

- c) In each of the first five years of the Program, Licensee shall collect, analyze and compile the water quality data into annual reports. The annual reports shall be provided to the Deputy Director and the consultees listed in S12(a) above, and any other entity upon request, by May 30th of the following year. Following completion of all data collected for year five, the Licensee shall compile a summary report of the initial Program, which shall be provided to the Deputy Director, the consultees listed in S12(a) above, and any other entity upon request. A 45-day notice shall accompany the report, inviting all recipients to attend a water quality meeting, scheduled by the Licensee, to discuss the finding of the five-year data set. After consultation, the Licensee shall submit recommendations for a final Comprehensive Water Quality Monitoring Program to the Deputy Director, for approval prior to the Licensee's filing of the Program with the Commission. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of consultation with the consultees, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Program shall be deemed approved. Upon Deputy Director approval, the Licensee shall implement the Program. Water quality data shall be analyzed and compiled by the Licensee into five-year reports and distributed to the consultees listed in S12(a) above, and any other entity upon request.
- d) Within six months of Deputy Director approval of the final Comprehensive Water Quality Monitoring Program, Licensee shall begin implementation of the Water Chemistry Monitoring Plan component of the Program, including the following:
 1. In-situ Physical Parameters: The Licensee shall monitor between 15 and 20 locations four times each year (seasonally) for in-situ physical parameters necessary for determining water quality. In-situ data collected at each sampling location shall include water temperature, dissolved oxygen (DO), pH, specific conductivity, oxidation/reduction, and turbidity. Monitoring at Lake Oroville, the Diversion Pool at Oroville Dam, and one site within the Thermalito Afterbay shall include vertical profiles for temperature, DO, pH, oxidation/reduction, and specific conductivity collected at the Diversion Pool and Thermalito Afterbay at one meter intervals from surface to substrate and at Lake Oroville as follows: at one meter intervals from surface to 30 meters depth, at three meter intervals from 33 to 60 meters depth, at five meter intervals from 65 to 100 meter depth, and at ten meter intervals from 110 meters to substrate.
 2. Nutrients: The Licensee shall monitor between 15 and 20 locations two times each year (spring and fall), for nutrients necessary for determining water quality. Nutrient data collected at each sampling location shall include nitrate plus nitrite, ammonia, organic nitrogen, dissolved orthophosphate, and total phosphorus.

3. Metals: The Licensee shall monitor between 18 and 22 locations four times each year (seasonally), for metals necessary for determining water quality. The developed marinas (Bidwell and Lime Saddle) shall be included in the locations, along with sites to be specified in Lake Oroville, the Diversion Pool, Thermalito Forebay, Thermalito Afterbay, the LFC, Mile Long Pond, and the Feather River at the southern boundary of the Project. Additional monitoring shall occur at both marinas one time each month during the recreation season (June-September). Metals shall be analyzed and reported as total concentrations and dissolved fractions for aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, silver, zinc, and mercury; in addition, total hardness shall be analyzed for each sampling location.
 4. Minerals and Alkalinity: The Licensee shall monitor between 15 and 20 locations two times each year (spring and fall), for minerals and alkalinity necessary for determining water quality. Minerals data collected at each sampling location shall include calcium, sodium, potassium, magnesium, sulfate, chloride, boron, and alkalinity.
 5. Plankton: The Licensee shall monitor two locations, two times each year, for phytoplankton and zooplankton as part of the water quality assessment. The monitoring sites are Lake Oroville and Thermalito Afterbay.
- e) Within three years of Deputy Director approval of the final Program, Licensee shall begin implementation of the Fish Tissue Bioaccumulation Monitoring Plan component of the Program. The Licensee shall collect resident fish species from seven locations within project waters, one time every five years, beginning five years after license issuance, and analyze tissue for metals and organic compounds. Sampling strategy for target species, numbers of individuals, sampling locations, and analytical methods used shall be determined through Licensee consultation with the State Water Board, California Office of Environmental Health Hazard Assessment, Central Valley Regional Water Quality Control Board during development of the Comprehensive Water Quality Monitoring Program. Constituents to be analyzed include metals (arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, zinc, and mercury), and organic compounds (chlordane, chlorpyrifos, DDT isomers, dieldrin, hexachlorobenzene, and polychlorinated biphenyls).
- f) Within six months of Deputy Director approval of the Program, Licensee shall begin implementation of the Recreation Site Water Quality Monitoring Plan component of the Program, including the following:
1. Pathogens - The Licensee shall collect and analyze water samples for pathogens at 10 to 14 locations within project waters each summer season. Near-shore water samples shall be collected five times within a 30-day period at each location, and one time between June 15 and September 15. Potential sampling locations shall include developed beach areas, marinas, and boat launch areas along with high-use dispersed beach and shoreline locations in all waters affected by project operations.

Prior to April 30th each year, the Licensee, in consultation with the State Water Board, Central Valley Regional Water Quality Control Board, Butte County Health Department, and California Department of Parks and Recreation shall select the locations to be included in the upcoming seasonal sampling program. In addition, the Licensee shall collect and analyze water samples for pathogens from June 1 through September 30 at North Forebay recreation area, South Forebay recreation area, Loafer Creek recreation area, Monument Hill recreation area, Lime Saddle recreation area, Foreman Creek boat launch area, Stringtown boat launch area, and Mile Long Pond. Additionally, at the North Forebay recreation area, individual screening samples shall be collected monthly between June 1 and September 30. Laboratory analyses for pathogens shall include: total coliform, fecal coliform, e-coli, enterococcus, and streptococcus, or other pathogens of concern for public health protection identified during annual consultation.

2. Petroleum Products - The Licensee shall monitor six locations for petroleum products in project waters (Bidwell Marina, Lime Saddle Marina, Foreman Creek Boat-in Campground, Spillway Boat Ramp/Day Use Area, Oroville Dam, and Monument Hill). Water column samples shall be collected one time each month from June through September. Field sampling methods shall include both surface and bottom samples at each location. Samples shall be analyzed for Total Petroleum Hydrocarbons, and benzene.
 3. Soil Erosion - The Licensee shall inspect trails between May 1 and May 15 and following the summer recreation season to identify soil erosion and potential subsidence into reservoirs or flowing waterways.
- g) Within three months of Deputy Director approval of the Program, Licensee shall begin implementation of the Water Temperature Monitoring Plan to provide information that demonstrates compliance with the water temperature requirements in this certification. The Licensee shall site four permanent continuous temperature monitoring devices, one each at the following locations: (1) Feather River Hatchery aeration tower, (2) Robinson's Riffle, (3) Thermalito Afterbay Outlet, and (4) the Feather River adjacent to the most southern Project 2100 boundary. The permanent temperature gages shall be capable of providing real-time data to the hatchery operators and to the public via an internet-based medium such as the Department of Water Resources' California Data Exchange Center. The four permanent gages shall remain operational throughout the life of the license.
- h) The Water Temperature Monitoring Plan shall be designed and implemented to provide data necessary for additional modeling or study associated with facility modification(s). The Licensee shall install and collect temperature data from temporary continuous recording devices at appropriate locations to provide data necessary for additional modeling or study associated with facility modification(s).

- i) The Water Temperature Monitoring Plan shall be reviewed after five years, to determine if modifications to the Comprehensive Water Quality Monitoring Program are necessary for consistency with measures that may be implemented following decisions on water temperature management in the LFC and High Flow Channel. Continuous temperature monitoring will include both stream stations and reservoir stations, including vertical profile data collection adequate to evaluate changes in cold water pool and stratification in other deep water bodies within the Project boundary.
- j) Within three years of Deputy Director approval of the Program, Licensee shall implement the Water Quality Bioassay Monitoring Plan component of the Program. The Licensee shall collect water column samples from two locations in the LFC, four times in a single year (seasonally), every five years, beginning five years after license issuance, to conduct bioassay tests on aquatic organisms. Aquatic organisms to be used in bioassays will be *Ceriodaphnia* and Fathead minnow (*Pimephales promelas*).
- k) Within one year of Deputy Director approval of the Program, Licensee shall implement the Aquatic Macroinvertebrate Monitoring Plan component of the Program. The Licensee shall collect benthic macroinvertebrate samples from a minimum of seven stream locations during the fall index period one time every three years, beginning three years after license issuance. Field sampling, laboratory identification, and statistical analysis shall be consistent with the California Stream Bioassessment Procedures (California Department of Fish and Game) or Surface Water Ambient Monitoring Program (or successor program). A minimum of four sites shall be located in the LFC and one site in the High Flow Channel at the southern-most project boundary. Following construction of any side channel habitat created as part of the Lower Feather River Habitat Improvement Program, sampling sites representative of each channel shall be added to the monitoring program.
- l) Within six months of license issuance, the Licensee shall submit a plan to the Deputy Director for modification and approval to protect the public from harmful cyanobacteria. The plan shall include sampling locations, sampling methodology, and laboratory procedures to monitor for the presence of harmful cyanobacteria and cyanotoxins within Project waters. The plan shall include procedures for protecting the public from harmful levels of cyanotoxins. The plan shall be consistent with the Statewide Guidance for Blue-Green Algae.
- m) The Licensee, in consultation with the consultees listed in (a) above shall reevaluate the Program every five years after initial implementation. Any recommendations acceptable to the Licensee for changes to the Program shall be submitted to the Deputy Director for modification and approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. Upon Deputy Director approval, the Licensee shall implement the Program, including any changes required by the Deputy Director.

- n) The State Water Board reserves the authority to require Licensee to conduct studies and, if appropriate, develop a methyl mercury management plan. If ongoing or future research and monitoring data indicate that the reservoirs or other aspects of power operations increase mercury methylation rates, the Deputy Director may require Licensee to prepare and submit for approval a study plan, including studies, to identify: (1) DWR's contribution to the methyl mercury problem; (2) potential measures to reduce the amount of methylated mercury in the waters affected by Licensee's operations, as well as to protect human health; and (3) an evaluation of the feasibility of those measures. The Deputy Director may require modifications as part of the approval, and the Licensee shall implement the study plan as approved. If, based on the results of the study plan or other information, the Deputy Director determines that that DWR has contributed to the problem and there are appropriate and feasible measures that DWR could implement to reduce methyl mercury, Licensee shall develop an implementation plan for measures to reduce mercury and submit it to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. Upon approval by the Deputy Director, the Licensee shall implement the mercury management plan.
- o) The Deputy Director reserves jurisdiction to require a plan to address any Basin Plan violations identified in this monitoring which the Deputy Director finds the project causes or to which it significantly contributes.

S13. Pathogen Public Health Protection

- a) The Licensee shall promptly provide results from pathogen testing at recreation areas (collected per Condition S12) to the Butte County Health Department, California Department of Health Services, State Water Board and Central Valley Regional Water Quality Control Board and confer with them on additional measures that may be necessary to inform and educate the public about bacteria levels in Project waters. Such information shall be shared with the Recreation Advisory Committee at the next meeting.
- b) Upon direction from an appropriate agency, Licensee shall place notices notifying the public if unsafe levels of bacteria are present in the water. The Licensee shall also provide notices educating the public on sanitary measures designed to prevent or minimize contamination of water.
- c) The Licensee, in consultation with the Butte County Health Department, California Department of Health Services, State Water Board and Central Valley Regional Water Quality Control Board shall determine if a public education program is needed to inform visitors to the project about water quality and the risks associated with recreating in contaminated waters. If needed, the Licensee shall develop the public education program in consultation with the above agencies.
- d) The Licensee shall reevaluate these measures every five years. The Licensee shall file annually with the Deputy Director a compliance report for information.

- e) Within six months of license issuance, the Licensee shall submit a plan to protect public health at the North Forebay recreation area to the Deputy Director for approval. The plan shall include a schedule to evaluate the current risk to swimmers and other recreation users. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. If the Deputy Director determines based on this evaluation or other reliable information there is a risk to the public, the Licensee shall have one year to submit a plan to reduce pathogens to levels necessary to protect public health.

S14. Public Education Regarding Risks of Fish Consumption

- a) The Licensee shall develop a plan in consultation with the Office of Environmental Health Hazard Assessment, Central Valley Regional Water Quality Control Board, and Butte County Health Department, to advise the public regarding the risks associated with the consumption of contaminated fish. The plan shall include the collection and analysis of fish tissues and if necessary, the posting of consumption advisory notices at key locations. The plan shall be submitted to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. If the Deputy Director determines levels of metals or other constituents are at levels in fish tissue that may be hazardous to humans, based on results from the Fish Tissue Bioaccumulation Monitoring, the Licensee shall provide funding to the Office of Environmental Health Hazard Assessment for the development of additional fish tissue advisories and/or publishing of written materials notifying the public about health issues associated with consuming fish taken from within Project waters.
- b) The Licensee shall file annually with the Deputy Director a compliance report for information.

S15. Oroville Wildlife Area Management Plan

- a) Within two years of license issuance the Licensee shall develop and file for Deputy Director approval a management plan for the Oroville Wildlife Area (OWA), including the Thermalito Afterbay. The Plan shall be developed in conjunction with the California Department of Fish and Game and the California Department of Parks and Recreation, and in consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, State Water Board, and Central Valley Regional Water Quality Control Board (consultees). Consultation with the Ecological Committee complies with the consultation requirement, as long as the agencies listed are part of the Ecological Committee. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Commission and Deputy Director approval, and after obtaining all necessary permits, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.
- b) The Plan shall contain the following elements:

1. Conservation measures required by Final Federal Biological Opinions
 2. Resource actions included in this license that may affect the OWA
 3. Strategies to minimize current and future conflicts between wildlife and recreation
 4. Wildlife management goals and objectives
 5. Recreation management goals and objectives (Consistent with the recreation measures outlined in the Recreation Management Plan, the Recreation Advisory Committee shall have an opportunity to provide input.)
 6. Other best management practices, including fuel load management for the reduction of fire risk to nearby properties and human life
 7. Common elements of the Lower Feather River Habitat Improvement Plan
 8. Actions designed to improve conditions for special status species and their habitats
 9. An implementation schedule
 10. Monitoring and reporting requirements
 11. A provision for periodic updates to the Plan as needed
 12. Agency management and funding responsibilities
- c) The Licensee, in consultation with the California Department of Fish and Game and the consultees listed in S15(a) above, shall reevaluate the Plan every five years after initial implementation. Consistent with the recreation measures outlined in the Recreation Management Plan, the Recreation Advisory Committee shall have an opportunity to provide input. The Licensee shall provide all Plan updates to the Deputy Director for information. If any changes are recommended beyond the objectives, activities, or schedules identified in the Plan, the Licensee shall submit final recommendations in a revised plan to the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the revised plan shall be deemed approved. Upon Commission and Deputy Director approval, the Licensee shall implement the Plan, including any changes required by the Commission and Deputy Director.

S16. Protection of Vernal Pools

- a) The Licensee shall implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect the vernal pool invertebrate habitat within the Project boundaries.
- b) The Licensee shall evaluate the effectiveness of these conservation measures in accordance with the Biological Opinion. The Licensee, in coordination with U.S. Fish and Wildlife Service, shall evaluate and report to the Deputy Director information on the effectiveness of the conservation measures by June 21, 2010. The measures shall be reevaluated in the spring every other year thereafter in accordance with the Biological Opinion. If the conservation measures implemented are deemed to be unsuccessful in protecting the vernal pool habitat, the Licensee shall coordinate with the U.S. Fish and Wildlife Service to develop and implement additional or alternative conservation measures to protect the vernal pool habitat.

- c) Proposed modifications outside the scope of the Biological Opinion shall be filed with the Deputy Director for approval prior to implementation. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the filing shall be deemed approved.

S17. Minimization of Disturbances to Nesting Bald Eagles

- a) The Licensee shall include the conservation measures required by the U.S. Fish and Wildlife Service Final Federal Biological Opinion in any bald eagle management Plan(s). The Licensee shall file any bald eagle nest territory Plan(s) with the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Deputy Director approval, the Licensee shall implement the Plan(s), including any changes required by the Deputy Director. The Licensee shall evaluate the conservation measures in the Plan(s) according to the provisions of the Biological Opinion, and implement modifications deemed necessary accordingly. Proposed modifications outside the scope of the Biological Opinion shall be filed with the Deputy Director for consultation and approval prior to implementation.
- b) The Licensee shall develop additional management Plan(s) or amend the current Plan(s) if new bald eagle nest territories are identified within the Project boundary. The Plan(s) shall be developed or amended in consultation with the U.S. Fish and Wildlife Service. The Plan(s) shall be filed with the Deputy Director for approval. The Licensee shall include with the filing copies of the comments, including recommendations, made in the course of consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon Deputy Director modification or approval, the Licensee shall implement the Plan(s), including any changes required by the Deputy Director.

S18. Protection of Giant Garter Snake

- a) The Licensee shall implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect the giant garter snake within the Project Boundary.
- b) The Licensee shall evaluate the effectiveness of these conservation measures in accordance with the Biological Opinion. The Licensee, in coordination with the U.S. Fish and Wildlife Service, shall annually evaluate and report to the Deputy Director for information on the effectiveness of the conservation measures. If the conservation measures implemented are deemed to be unsuccessful in protecting the giant garter snake, the Licensee shall coordinate with U.S. Fish and Wildlife Service to develop and implement additional or alternative conservation measures to protect the giant garter snake. Proposed modifications outside the scope of the Biological Opinion shall be filed with the Deputy Director for approval prior to implementation. The Deputy Director may require modifications as part of the approval.

If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the filing shall be deemed approved.

S19. Protection of Valley Elderberry Longhorn Beetle

- a) The Licensee shall implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect the valley elderberry longhorn beetle within the Project Boundary.
- b) The Licensee shall evaluate the effectiveness of these conservation measures in accordance with the Biological Opinion. The Licensee, in coordination with the U.S. Fish and Wildlife Service, shall annually evaluate and report to the Deputy Director for information on the effectiveness of the conservation measures. If the conservation measures implemented are deemed to be unsuccessful in protecting the valley elderberry longhorn beetle, the Licensee shall coordinate with U.S. Fish and Wildlife Service to develop and implement additional or alternative conservation measures to protect the valley elderberry longhorn beetle. Proposed modifications outside the scope of the Biological Opinion shall be filed with the Deputy Director for approval prior to implementation. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the filing shall be deemed approved.

S20. Protection of Red-Legged Frog

- a) The Licensee shall implement conservation measures required by the U.S. Fish and Wildlife Service Final Biological Opinion to protect the red-legged frog within the Project Boundary.
- b) The Licensee shall evaluate the effectiveness of these conservation measures in accordance with the Biological Opinion. The Licensee, in coordination with the U.S. Fish and Wildlife Service, shall annually evaluate and report to the Deputy Director for information on the effectiveness of the conservation measures. If the conservation measures implemented are deemed to be unsuccessful in protecting the red-legged frog, the Licensee shall coordinate with U.S. Fish and Wildlife Service to develop and implement additional or alternative conservation measures to protect the red-legged frog. Proposed modifications outside the scope of the Biological Opinion shall be filed with the Deputy Director for modification and approval prior to implementation. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the filing shall be deemed approved.

S21. Construction and Recharge of Brood Ponds

- a) Within one year of license issuance, the Licensee shall develop and file for Deputy Director approval a Plan to construct four waterfowl brood ponds within the Thermalito Afterbay. The Plan shall be developed in conjunction with the California Department of Fish and Game and the Licensee shall consult with the Ecological Committee, including specifically the U.S. Fish and Wildlife Service, in developing the Plan. The Licensee shall include with the filing of the Plan copies of the comments, including recommendations, made in the course of such consultation, and an explanation as to why any such comment was not adopted. The Deputy Director may require modifications as part of the approval. If, within 60 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the Plan shall be deemed approved. Upon modification or approval by the Deputy Director, the Licensee shall implement the Plan, including any changes required by the Deputy Director.
- b) The Plan shall contain the following elements:
 1. Construction of one brood pond every five years over the 20-year period beginning upon issuance of this license. The ponds shall be constructed by creating a small earthen berm across an inlet in the Thermalito Afterbay.
 2. Maintenance of adequate water surface elevations within existing and future waterfowl brood ponds located within the Thermalito Afterbay by sufficiently filling the brood ponds no later than April 15 of each year. Once the brood ponds are filled, Licensee shall ensure that the water surface level of the ponds shall not fluctuate more than one foot throughout the primary waterfowl brooding season from April 15 through July 31.
 3. Monitoring of the ponds on a weekly basis to ensure that adequate water surface elevations are maintained during the period from April 15 through July 31.
 4. A requirement that the Licensee shall report to the California Department of Fish and Game's Oroville Wildlife Area Manager within 48 hours of discovering a fluctuation of more than one foot to report what the Licensee has done to remedy the situation or what the Licensee needs to further do to remedy the situation.
 5. Weekly inspection of the ponds from April 15 through July 31 of each year and maintenance as needed to ensure their structural integrity.
- c) The Licensee shall file an annual report with the Deputy Director for information on water elevation monitoring. In addition, the Licensee shall provide a copy of such annual report to California Department of Fish and Game and U.S. Fish and Wildlife Service.

S22. Timeline Extension Requests

Where the water quality certification conditions specify a schedule for compliance, Licensee may request from the Deputy Director an extension of the timeline specified, which may be granted upon a showing of good cause and due diligence.

General Conditions

- G1. The Deputy Director reserves the authority to modify the conditions of this water quality certification to incorporate load allocations developed in a Total Maximum Daily Load developed by the State Water Board or Central Valley Regional Water Quality Control Board.
- G2. This certification is contingent on compliance with all applicable requirements of the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, except as may be modified by the specific conditions of the certification.
- G3. Notwithstanding any more specific conditions in this certification, the Projects shall be operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act. The Licensee shall take all reasonable measures to protect the beneficial uses of waters of the Feather River.
- G4. The authorization to operate the Project pursuant to this certification is conditioned upon payment of all applicable fees for review and processing of the application for water quality certification and administering the State's water quality certification program, including but not limited to timely payment of any annual fees or similar charges that may be imposed by future statutes or regulations for the State's reasonable costs of a program to monitor and oversee compliance with conditions of water quality certification.
- G5. This certification does not authorize any act which results in the taking of a threatened or endangered species or any act, which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish & Game Code §§ 2050-2097) or the federal Endangered Species Act (16 U.S.C. §§ 1531 - 1544). If a "take" will result from any act authorized under this certification or water rights held by the Licensee, the Licensee shall obtain authorization for the take prior to any construction or operation of the Project. The Licensee shall be responsible for meeting all requirements of the applicable Endangered Species Act for the Projects authorized under this certification.
- G6. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

In response to a suspected violation of any condition of this certification, the State Water Board may require the holder of any federal permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In response to any violation of the conditions of this certification, the State Water Board may add to or modify the conditions of this certification as appropriate to ensure compliance.

- G7. Licensee must submit any change to the Oroville Facilities, including project operation, that would have a significant or material effect on the findings, conclusions, or conditions of this certification, to the Deputy Director for prior review and written approval. If such a change would also require submission to the Federal Energy Regulatory Commission, the change must first be submitted to the Deputy Director.
- G8. This certification is subject to modification upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing with § 3867).
- G9. The State Water Board reserves authority to modify this certification if monitoring results indicate that continued operation of the project would violate water quality objectives or impair the beneficial uses of the Feather River.
- G10. The State Water Board may add to or modify the conditions of this certification, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act.
- G11. The State Water Board may add to or modify the conditions of this certification as appropriate to coordinate the operations of this Project and other hydrologically connected water development projects, where coordination of operations is reasonably necessary to achieve water quality standards or protect beneficial uses of water.
- G12. The State Water Board shall provide notice and an opportunity for hearing in exercising its authority to add or modify any of the conditions of this certification.

G13. Notwithstanding any more specific conditions in this certification, Licensee shall comply with mitigation measures of the mitigation monitoring and reporting plan in Attachment A.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a water quality certification duly and regularly adopted at a meeting of the State Water Board held on December 15, 2010.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: Board Member Arthur G. Baggett, Jr. (Recused)
Board Member Dwight P. Russell (Recused)



Jeanine Townsend
Clerk to the Board