

**Attachment F**

CDFG response to the First Stage Consultation Package dated October 3, 2002



**DEPARTMENT OF FISH AND GAME**

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October 3, 2002

Ms. Angela Risdon  
Kilarc-Cow Creek Relicensing Project Manager  
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Dear Ms. Risdon:

**Pacific Gas and Electric Company's Kilarc-Cow Creek Hydroelectric Project  
Federal Energy Regulatory Commission (FERC) No. 606  
First Stage Consultation Response**

The California Department of Fish and Game has reviewed the June 24, 2002, First Stage Consultation Document (FSCD) prepared by the Pacific Gas and Electric Company (Licensee) for the Kilarc-Cow Creek Hydroelectric Project (Project), FERC No. 606. The Department has prepared this first stage consultation response pursuant to subsection 16.8(b) of Title 18, of the Code of Federal Regulations. We are providing comments on the Licensee's document and recommendations for studies to be conducted as part of the relicensing process.

The scope of this response addresses the Department's statutory authority and mission statement, the Project's FERC boundary, and the ecological relationships within the Old and South Cow Creek watersheds. In regard to its statutory authority, the Department is responding to the Licensee's document as a trustee agency, an agency with special expertise with regard to the State of California's fish and wildlife resources<sup>1</sup> (Fish and Game Code §1802) and pursuant to other statutory obligations. Two statutory authorities applicable to this Project are the California Endangered Species Act (CESA), (Fish and Game Code §2050 et seq.), and the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act, (Fish and Game Code §6900 et seq.). The directives of these Acts are consistent with the mission of the Department to ensure that fish and wildlife are preserved for use and enjoyment by the people of the State now and in the future.

<sup>1</sup>As used in this response "fish and wildlife resources" include all wild animals, birds, plants, fish, amphibians, and related ecological communities including the habitat upon which these species depend for their continued viability. (Fish and Game Code §711.2, 1802).

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Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any State listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. Spring-run chinook salmon have been documented in the Project area and are listed as threatened under both State and Federal Endangered Species Acts.

The Salmon, Steelhead Trout, and Anadromous Fisheries Program Act (Act) requires the Department to undertake major efforts to restore the State's salmon, steelhead trout, and anadromous fisheries. Specifically, the Act directs the Department to develop a plan and program to double the current natural production of salmon and steelhead trout resources in the State (Fish and Game Code §6902, subd. (a)), and to consult with public agencies whose policies or decisions affect the goals of such a program to determine if there are feasible means for those public agencies to assist the Department in achieving the goals of the program (Fish and Game Code §6920, subd. (b)). The Act also declares, as the policy of the State, that existing natural salmon and steelhead habitat shall not be diminished further without offsetting the impacts of lost habitat (Fish and Game Code §6902, subd. (c)). Pursuant to the Act, the Department assisted in the preparation of four planning documents: the Upper Sacramento River Fisheries and Riparian Habitat Management Plan (1989), the Central Valley Salmon and Steelhead Restoration and Enhancement Plan (1990), the Restoring Central Valley Streams: A Plan for Action (1993) and the Steelhead Restoration and Management Plan for California (1996). In an October 5, 1998, letter, the FERC accepted these four documents as comprehensive plans for the Sacramento River system below Shasta Dam under Section 10(a)(2)(A) of the Federal Power Act. The project footprint includes land and water resources which are part of the Department's comprehensive effort to maintain and restore anadromous fish populations in California's Central Valley. In addition to the State and Federal threatened spring-run chinook, Central Valley fall-run chinook, a State species of special concern, and Federal candidate species, and steelhead trout, a species listed as threatened under the Federal Endangered Species Act (16 U.S. Code Section 1530 et seq.) have been documented in the Project area. As a result, the most recent update to the comprehensive plans, the 2001 Restoration Plan for the Anadromous Fish Restoration Program (USFWS) includes the Project area within the watersheds targeted for high priority restoration actions.

The Project's FERC boundary includes two major branches of Cow Creek with approximately four miles of stream bypassed in both Old and South Cow creeks. The portion of South Cow Creek within the Project boundary is managed for anadromous and resident fish including fall-run and spring-run chinook salmon, steelhead, and rainbow trout. It is important to note a relatively recent revision of the Department's

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management objectives resulting from the reassessment of Whitmore Falls located approximately seven miles below the Project on Old Cow Creek. Based on Department experience with steelhead distribution above similar falls elsewhere in the State, Whitmore Falls is not an absolute barrier to anadromous fish. In the Department's opinion, the current extent of anadromy in Old Cow Creek is unknown at this time. Until such time that appropriate data indicate otherwise, the Department will take the conservative approach of managing the portion of Old Cow Creek within the Project boundary for both anadromous and resident fish including steelhead and rainbow trout. Further, given the apparent lack of absolute physical barriers between known steelhead habitat in Old Cow Creek and the Project, regardless of fish survey results, the Department intends to manage the subject area as restorable steelhead habitat for the foreseeable future.

#### Specific Study Comments and Requests

##### I. Hydrology

##### Authority and Rationale

Fish and Game Code Section 5937 reads in part, "The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around, or through the dam, to keep in good condition any fish that may be planted or exist below the dam." The Fish and Game Code defines "fish" as "wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn or ova thereof." (Fish and Game Code §45).

The bypassed reaches of the Project are not currently gauged. Existing flow data is limited to the amount which is diverted and the amount required to be bypassed. In the case of the Old Cow (or Kilarc) diversion, the main canal can handle up to 52 cubic feet per second (cfs). Over the past 20 years, the canal diverted an average of 32 cfs from Old Cow Creek as measured below the current required bypass release of 2 cfs. The amount released back to the creek is less than 6 percent of the average amount diverted for power production. In the case of the South Cow Creek Diversion, the main canal can handle 50 cfs and over the past 20 years, diverted an average of 32 cfs, again measured downstream of the bypass release. The bypass requirement on South Cow Creek, through the fish ladder, varies from 2 to 4 cfs (depending on water year type) or from 6 to 11 percent of the average amount diverted for power production.

The scientific rationale for the current bypass requirements is not provided in the FSCD which only notes that the flows were developed in 1984 in consultation with the Department. Given our current understanding of the ecological processes tied to hydrology, we cannot concur that flows of 2 to 4 cfs are protective of aquatic resources. Flows influence a wide range of fish habitat conditions including thermal refugia in critically hot months, the availability of edge habitat for newly emerged fry, and the timing of spawning activities. Hydrology also influences the composition of riparian vegetation and streambed substrate. The Department maintains that given the magnitude of the Project's diversions, such bypass flows have had and will continue to have significant impacts on the aquatic resources of Old and South Cow creeks. The Department requests that the Licensee establish the relationship between Project operations that influence stream hydrology and downstream aquatic and riparian habitat conditions (e.g., water quality, fish distribution and abundance, fluvial geomorphology, and vegetation distribution and abundance) utilizing current ecological principles and theory. An understanding of the relationships between flow and the natural resources will be an essential component of any new license application, which must include a bypass flow regime adequate to maintain and enhance the aquatic and riparian resources of Old and South Cow creeks.

#### Methodologies

The first step in determining an adequate bypass flow regime is synthesizing an unimpaired hydrograph to provide the ecological foundation for management decisions. The Department supports implementing a flow regime with seasonal variations patterned after the unimpaired hydrograph to help restore normative habitat conditions in a regulated system (see Stanford, et al., 1996). Determining the unimpaired hydrograph is a challenging task on this system, given the lack of gauges in bypassed channels and the added complexity of an adjudicated system. The Licensee proposes to summarize existing streamflow records for the Cow Creek Watershed (Study #1) and supplement this database with an estimate of the available flow (Study #2). It is not clear from the FSCD if actual flow measurements will be taken. Such field data will be essential to calibrate the proposed task of estimating flow from existing records. Year-round flow measurements are particularly relevant in the bypassed reaches since, from a hydrologic perspective, these are both the most heavily impacted portions of the Project and currently the least quantified. We recommend installation of a U.S. Geological Survey gauge in the bypassed reach of South Cow Creek as soon as feasible. It is our understanding that the gradient and sediment load of Old Cow Creek preclude installation of a permanent gauge in that reach. We would accept weekly use of hand held flow meters for as much of the 2002-03 water year as can be monitored without exposing field staff to hazardous conditions.

Once created, the unimpaired hydrograph will provide a basis for determining the impacts of the Project on the hydrology of Old and South Cow creeks as well as informing additional studies such as instream flow (#11), aquatic habitat (#9), and water quality (#4). To facilitate the first objective of understanding hydrologic Project impacts, the basic Project hydrology should be presented as the daily average flow (both unimpaired and actual) and segregated into the three standard water year classifications of wet, normal, and dry. Water years should be classified with an unimpaired flow of 125 percent or greater equaling a "wet" year; an unimpaired flow greater than 75 percent and less than 125 percent equaling a "normal" year; and an unimpaired flow of 75 percent or less equaling a "dry" year. To help understand the project effects on the magnitude, duration, and timing of flow, we recommend utilization of the "Indicators of Hydrologic Alterations" (IHA) method developed by Brian Richter of the Nature Conservancy. The IHA program should be run using the synthesized unimpaired and actual hydrology.

Once the unimpaired hydrograph is synthesized it should provide the range of flows to be addressed in the proposed "Physical Habitat Simulation" (PHABSIM) of the instream flow study (#11). The exact transect selection protocol for study #11 is not provided in the FSCD but should be representative of the variability both between and within different mesohabitat types (e.g., run, riffle, pool) to be statistically valid. We also recommend that the PHABSIM study include collection of at least two sets of velocity data. While a middle calibration flow may be used to reliably predict habitat available at lower flows, based on our experience, we question the reliability of using such flow data to extrapolate habitat estimates upwards.

In study #11 the FSCD proposes to model available habitat for the two resident trout species and "anadromous salmonids" on South Cow Creek but only for the resident trout species on Old Cow Creek. As presented previously, until appropriate fish sampling data reasonably establish the absence of steelhead in the Project area, the Department considers Old Cow Creek to be potential steelhead habitat. Given their special status (i.e., federally threatened), Central Valley steelhead trout habitat requirements will be an important factor in future flow management decisions not only in the currently occupied Project habitat (i.e., South Cow Creek) but also in the potential/restorable Project habitat (i.e., Old Cow Creek). Therefore, we recommend modeling of weighted usable area for anadromous salmonids in all portions of the Project, not just South Cow Creek.

As a final hydrology-related study, we request an investigation of the fluvial geomorphology of the Project area. While we are specifically concerned about the quality and quantity of spawning gravels throughout and below the Project, an understanding of general geomorphic processes which are essential to assessing

aquatic habitat health and designing effective stream restoration projects is also important. The FSCD's proposed Sediment Study (# 5) appears to be on a very broad scale utilizing existing records and aerial photographs. The proposed aquatic habitat study (#9) incorporates a Rosgen channel typing Level I component which should provide a broad characterization of stream type. We recommend expansion of this component to a Rosgen Level II analysis with field measurement of channel morphology (e.g., entrenchment, width/depth ratio, sinuosity, channel material and gradient) in representative reaches. This scale of information will permit development of license conditions addressing sediment management.

## II. Water Quality

### Authority and Rationale

The California Fish and Game Commission's policy on water provides, "The quantity and quality of the waters of the state should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife." (Policies adopted by the California Fish and Game Commission Pursuant to Section 703 of the Fish and Game Code, Water.) Based on the information provided in the FSCD, weekly water temperature maximums within the Project boundaries on Old Cow Creek can exceed 20° Celsius (C), the limit of acceptable temperatures for rainbow trout and well above the preferred range for steelhead (Bjornn, T.C., and Reiser, D.W., 1991, and Raleigh, R.F., et al., 1984). Water temperatures in South Cow Creek are even more compromised with average summer water temperatures exceeding the acceptable range for trout and maximums exceeding the lethal threshold for steelhead (24°C). Given the range of temperatures documented in both drainages over the past several years, determination of Project impacts on summertime water temperature will be essential.

### Methodologies and Applications

The Licensee proposes to implement a water temperature monitoring program (Study #4) using temperature recorders within the bypassed reaches of both creeks. We believe the proposed monitoring program will need to be expanded to accomplish the goal of determining Project impacts on water temperature. As a general rule of thumb, we recommend that temperature recorders be spaced at least every mile to provide an estimated rate of change in temperature per mile as well as absolute values. To be able to isolate Project impacts, it will be necessary to monitor water temperatures immediately above Project diversions as well as below the mixing zones created by Project discharges, not just within bypassed reaches. The FSCD states that in the Old

Cow Creek drainage a temperature recorder will be placed just downstream of a tributary named Glendenning Creek. As Glendenning Creek enters Old Cow Creek well below the downstream boundary of the Licensee's Project, we suspect this is a transcription error, with the Licensee meaning to monitor temperatures below the confluence with Canyon Creek instead. Regardless of the actual tributary name, we support the concept of bracketing significant tributaries within the bypass reaches to isolate their impact. This concept should also be expanded to include monitoring of any significant diversions within the bypassed reaches. Therefore, we recommend placement of recorders both above and below all Project diversions and discharges as well as non-Project diversions and tributaries in the respective creeks.

Once the Licensee establishes the existing rate of change in water temperature and isolates the impacts of the various diversions and tributaries, we recommend combining the data with the hydraulic information collected in Studies #1 and #2 to allow modeling of the daily water temperature minima, maxima, and means under a range of flows. The range of flows modeled should include, at a minimum, both those provided under current operations as well as those that would exist without the Project in order to be able to quantify Project impacts on water temperature.

### III. Aquatic Resources

#### Authority and Rationale

As stated previously, the Department is the trustee agency for the State's fish and wildlife resources and "fish" is broadly defined to include "wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn, or ova thereof" (Fish and Game Code §45). A comprehensive understanding of the existing aquatic community and habitat throughout the range of impact of the Project is necessary to establish a baseline that will allow the Department and other resource agencies to evaluate whether or not trustee objectives are being met. The baseline community composition should include anadromous and resident fish species as well as water-dependent reptiles and amphibians.

#### Methodologies and Applications

The FSCD's proposed Fish Population Study (#12) will not address the critical question of whether steelhead trout are currently utilizing the Old Cow Creek portion of the Project. Given the life history of steelhead and the presence of rainbow trout in Old Cow Creek, a sampling effort specifically targeting steelhead and capable of



distinguishing steelhead from rainbow trout will be necessary. Such an effort would likely include (1) focused sampling during the November through March steelhead spawning period (e.g., snorkeling for adults and surveys for redds), and (2) trapping of downstream migrants during the February through May out-migration with analysis of otolith microchemistry to positively identify steelhead progeny. Given the complexities of designing a steelhead sampling program, we recommend that the Licensee consult with the Department and the National Marine Fisheries Service on development of a protocol which will adequately address the question of steelhead presence in the Old Cow Creek portion of the Project. Meanwhile, the Licensee's proposed summer low flow sampling will provide no information on the presence or absence of steelhead.

As we indicated previously, until such time as data from a study specifically targeting steelhead and utilizing sampling protocols acceptable to the Department proves otherwise, we consider the Old Cow Creek portion of the Project to be potential steelhead habitat. Further, given the apparent absence of physical barriers between known steelhead habitat and the Project on Old Cow Creek, we would classify the habitat as restorable, even if it can be established to a reasonable degree of certainty that steelhead are not currently utilizing the Project area.

The Passage Barrier Study (#10) proposes to inventory and catalog potential fish passage barriers within the bypass reaches to compliment the general aquatic habitat study outlined in Study #9. We agree that unimpeded passage for both anadromous and resident fish is important but believe that the proposed study has too narrow a geographic scope. This Project provides fish passage at only one of the five diversions, namely the South Cow Creek diversion. The other four diversions represent potentially significant barriers and need to be evaluated for purposes of designing appropriate mitigation measures. The effectiveness of the South Cow ladder installed in 1984 has not been reevaluated since an initial study recorded

- adult steelhead did pass through the ladder
- no adult chinook salmon passed through
- "experimental" juvenile steelhead could pass downstream.

The current effectiveness of the passage facilities at the South Cow Creek diversion should be assessed for both anadromous and resident species under a range of flows including when the diversion is just beginning to spill (i.e., does this shallow curtain of flow create a false attraction and obscure the entrance to the ladder?) as well as during the summertime when elevated water temperatures may combine with low flow to impede passage.

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Summary

This completes our specific comments related to the FSCD prepared by the Licensee. We appreciate the opportunity to comment on the studies necessary for relicensing of the Kilarc-Cow Creek Hydroelectric Project. My staff are available to consult with the Licensee regarding design and review of specific studies. We look forward to working with the Licensee to relicense the Project. If you have any questions regarding the above comments and recommendations, please contact Environmental Scientist Annie Manji at the letterhead address or telephone (530) 225-3846.

Sincerely,



*Dr*  
DONALD B. KOCH  
Regional Manager

cc: See pages eleven and twelve

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## References

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