



Pacific Gas and  
Electric Company™

Annette Faraglia  
Chief Counsel, Hydro Generation  
Law Department

Mailing Address  
P.O. Box 7442  
San Francisco, CA 94120

Street/Courier Address  
Law Department  
77 Beale Street  
San Francisco, CA 94105

(415) 973-7145  
Fax: (415) 973-5520  
E-Mail: Annette.Faraglia@pge.com

October 21, 2020

***E-Filing***

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N. E.  
Washington, D.C. 20426

**RE: Upper North Fork Feather River Hydroelectric Project, FERC Project No. 2105**

Dear Secretary Bose:

On April 24, 2020, PG&E filed with the Federal Energy Regulatory Commission (FERC or Commission) a Petition for Declaratory Order Requesting Waiver of Water Quality Certification (Petition) for the Upper North Fork Feather River Project, FERC No. 2105 (Project). On July 16, 2020, in response to PG&E's Petition, the Commission issued a Declaratory Order on Waiver of Water Quality Certification (WQC) finding that the State Water Resources Control Board (SWRCB) had waived WQC.

Despite the fact that an application for WQC was not pending before the SWRCB at the time, on July 15, 2020, the SWRCB purported to issue a WQC for the Project. Prior to issuance of the WQC, PG&E had submitted three rounds of comments to the SWRCB objecting to draft and final conditions in the WQC and to the rationale provided in the Revised Draft Environmental Impact Report (RDEIR) prepared for purposes of complying with the California Environmental Quality Act. To ensure the Commission has an updated record of PG&E's position on the conditions included in the SWRCB's WQC, PG&E is submitting the following three enclosures:

1. PG&E Comments to SWRCB on Draft WQC dated June 15, 2020
2. PG&E Comments to SWRCB on Revised Draft EIR dated July 7, 2020
3. PG&E Comments to SWRCB on Final WQC dated August 14, 2020

As described in more detail in these enclosures, PG&E opposes Condition 6 (Water Temperature) and Condition 1 (Minimum Instream Flow), to the extent the latter implements Condition 6. These conditions should not be included in the new license for the Project because they do not address Project impacts identified in the record, they are inconsistent with the Settlement Agreement and FERC staff's recommendations in the Final Environmental Impact Statement (FEIS), and they do not allow FERC to balance multiple beneficial interests under Section 10(a) of the Federal Power Act (FPA). For example, the higher flows required by Conditions 6 and 1 are for the exclusive purpose of preserving cold water habitat, to the exclusion of hydroelectric uses, water uses, recreational uses, fish habitat in Lake Almanor and the economic impacts that would result from instituting a new flow regime and associated

adaptive management measures. Focusing exclusively on one beneficial use, and ignoring potential adverse effects on other identified beneficial uses, such as fish habitat in Lake Almanor, water recreation, and hydroelectric power, is inconsistent with Section 10(a) of the FPA. Further, the flows proposed in the Settlement Agreement and recommended by FERC staff in the FEIS are consistent with the SWRCB's 2018 Bay-Delta Plan as a Comprehensive Plan under Section 10(a).

In addition, a number of conditions, including Condition 12 (Fish Stocking), Condition 13 (Recreation Management Plan), Condition 14 (Whitewater Recreation Flows), Condition 16 (Roads), Condition 17 (Reintroduction of Anadromous Fish), and Condition 20 (Grebe Management Plan) should be removed or modified to ensure consistency with the Settlement Agreement and FERC staff's recommendations in the FEIS.

Any of the remaining WQC conditions FERC determines are consistent with Section 10(a) of the FPA should be modified before inclusion in the license: (1) to remove the SWRCB's approval authority so that the conditions are consistent with FERC's exclusive enforcement authority over license conditions; and (2) to align the notification periods to be consistent with the periods identified in the Settlement Agreement, the FEIS, or recommendations filed pursuant to Section 4(e) of the FPA or filed by agencies with jurisdiction over fish and wildlife resources. Finally, consistent with *Placer County Water Agency*, 171 FERC ¶ 62,118, at ¶ 49 (2020), the Commission should reject all of the administrative conditions included in the WQC (Conditions 21-44).

PG&E will prepare a more detailed summary of the conditions in the Final WQC that should be modified to be consistent with the FERC record. PG&E believes that FERC staff's recommendations in the FEIS, which are substantially consistent with the measures proposed in the 2004 Settlement Agreement, balance the need for hydropower generation, fish and wildlife (including habitat concerns, such as temperature), and recreation. At this time, PG&E would like to underscore the following technical issues that were not addressed by the SWRCB in response to PG&E's comments on the Draft WQC:

- The State Water Board's models used to evaluate the effect of various alternatives on temperatures in Lake Almanor and downstream reaches are inaccurate and do not support the conclusions in the RDEIR. First, the State Water Board relied on existing models for the region and used them for purposes beyond the models' functionality. While none of the models used by the State Water Board were available for a detailed review, PG&E experts found sufficient evidence in the available record to determine that the numerical modeling performed by the State Water Board was inappropriate and lacked technical rigor. The State Water Board applied simplified models that lacked the details necessary to accurately analyze the complex processes influenced by the spatial and temporal complexity of the Lake Almanor and UNFFR system. These models are also not detailed enough to correctly predict the changes to these systems under the evaluated alternatives. The changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence the Lake Almanor dynamics.
- Condition 6 is operationally infeasible, vague, and inappropriately supported by a model designed for a different purpose. Condition 6 requires actions that create significant uncertainty with respect to Project costs, requires implementation of undefined fisheries goals that are inconsistent with the management goals of State and federal fish and wildlife management

Ms. Kimberly D. Bose, Secretary

October 21, 2020

Page 3

agencies for special-status species, and is supported by water temperature models that were not designed for the purpose for which they are being used by the SWRCB. Condition 6 fails to reasonably protect beneficial uses in Lake Almanor and beneficial uses, other than cold freshwater habitat, in the North Fork Feather River. Specifically, Condition 6(A), Canyon Dam Supplemental Flows, would increase releases from Canyon Dam up to 250 cfs for the purpose of reducing water temperatures to below a threshold of 20°C throughout the lower reaches of the North Fork Feather River. However, these releases are intended to achieve fishery goals that have not been defined and will not be defined until after implementing the release schedule (see Condition 6(C), Fishery Performance Goals) using data collected under Conditions 7 and 8 (Water Quality and Lake Almanor Fishery, respectively). The SWRCB fails to recognize that setting specific metrics for fisheries under these conditions will be virtually impossible for PG&E given the highly dynamic nature of fish communities, even under steady state conditions.

- In many of the conditions in the Final WQC, the State Water Board has inserted process requirements that are unnecessary and burdensome, adding additional controls that would make PG&E's already agreed to requirements and beneficial improvements more difficult and expensive to implement.

If you have any questions concerning this matter, please contact PG&E's Senior Project Manager, Steve Bauman, at 415.973.7410.

Sincerely,



Annette Faraglia  
Chief Counsel, Hydro Generation

Enclosures

1. PG&E Comments to SWRCB on Draft WQC dated June 15, 2020
2. PG&E Comments to SWRCB on Revised Draft EIR dated July 7, 2020
3. PG&E Comments to SWRCB on Final WQC dated August 14, 2020

cc: **via Email:**

Allan Creamer (FERC)

Upper North Fork Feather River Service List, FERC Project No. 2105

**via U.S. Mail:**

Director, U.S. National Park Service

Director, U.S Department of Interior

Erica Niebauer Office of Regional Solicitor (U.S. Department of Interior)

Jennifer P. Carville, Advocate (Friends of the River)

Kent Connaughton, Supervisor (Lassen National Forest)

Mike Fitzwater, Secretary (Fall River Wild Trout Foundation)

# **ENCLOSURE 1**

**PG&E COMMENTS TO SWRCB ON DRAFT WQC  
DATED JUNE 15, 2020**

**BEFORE THE STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD**

**In the Matter of  
Water Quality Certification for the  
Upper North Fork Feather Hydroelectric  
Project License**

**FERC Project No. 2105**

**PACIFIC GAS AND ELECTRIC COMPANY'S  
COMMENTS ON THE DRAFT WATER QUALITY CERTIFICATION  
FOR THE UPPER NORTH FORK FEATHER RIVER  
HYDROELECTRIC PROJECT LICENSE**

Annette Faraglia  
Chief Counsel, Hydro Generation  
Law Department  
PACIFIC GAS AND ELECTRIC COMPANY  
77 Beale Street, B30A  
San Francisco, CA 94105  
Telephone: (415) 973-7145  
Email: [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com)

Dated: June 15, 2020

*Attorney for Pacific Gas and Electric Company*

**BEFORE THE STATE OF CALIFORNIA**  
**STATE WATER RESOURCES CONTROL BOARD**

**In the Matter of**  
**Water Quality Certification for the**  
**Upper North Fork Feather Hydroelectric**  
**Project License**

**FERC Project No. 2105**

**PACIFIC GAS AND ELECTRIC COMPANY'S**  
**COMMENTS ON THE DRAFT WATER QUALITY CERTIFICATION**  
**FOR THE UPPER NORTH FORK FEATHER RIVER**  
**HYDROELECTRIC PROJECT LICENSE**

**INTRODUCTION**

On May 15, 2020, without a pending application before it, the Executive Director of the State Water Resources Control Board (“State Water Board” or “Board”) issued a Draft Water Quality Certification (“WQC”), in anticipation of a final WQC pursuant to Section 401 of the federal Clean Water Act (“CWA”), 33 U.S.C. § 1341, to Pacific Gas and Electric Company (“PG&E”) for the Upper North Fork Feather River Hydroelectric Project License, Federal Energy Regulatory Commission (“FERC”) Project No. 2105 (“Project”). On May 15, 2020, the Executive Director also issued a Revised Draft Environmental Impact Report (“Revised DEIR”) pursuant to the California Environmental Quality Act (“CEQA”), Pub. Resources Code, § 21000, *et seq.* PG&E submits these comments on the Board’s Draft WQC and the conditions contained therein. PG&E will submit separate comments on the Revised DEIR by the deadline established by the State Water Board.

PG&E has no pending application for WQC before the State Water Board. PG&E submitted its first request for certification for the Project on October 9, 2002. The State Water Board has refused to take action on PG&E’s repeated requests for certification for almost 18 years.

On March 4, 2020, the State Water Board denied without prejudice PG&E’s most recent request for certification, and PG&E has not submitted another request with the Board. Instead, on April 24, 2020, PG&E filed with the Federal Energy Regulatory Commission (“FERC”) a Petition for Declaratory Order Requesting Waiver of Water Quality Certification for the Project (“FERC Petition”).

As described in these comments, PG&E objects to the State Water Board’s authority to issue the WQC for the Project because there is no pending request for certification and the Board has waived its authority to issue certification. In addition, PG&E opposes Condition 6 in its entirety because it is not necessary for the Project to comply with water quality requirements and is not supported by the Board’s record. PG&E also opposes a number of conditions in the Draft WQC, because they are inconsistent with State law and the CWA; operationally problematic, vague, or infeasible to implement; redundant of measures proposed in the Settlement Agreement, the U.S. Department of Agriculture, Forest Service’s (“USFS”) Section 4(e) conditions, or FERC staff’s recommendations in the Final Environmental Impact Statement (“FEIS”); or address issues that are subject to the management authority of federal and State fish and wildlife agencies and do not specifically address water quality issues associated with Project operations. While PG&E submits these comments to preserve its rights, PG&E reserves all rights and, by making this filing, does not waive any rights including, without limitation, the matters raised in the FERC Petition.

## **COMMENTS**

### **A. The State Water Board Lacks Authority to Issue a Final WQC**

The State Water Board lacks authority to issue a final WQC pursuant to CWA Section 401 because there is no pending request for WQC from PG&E. The State Water Board’s authority to

issue WQC derives from Section 401 of the CWA, which imposes three procedural requirements on a State with respect to WQC, none of which have been satisfied by the Board in this case.

First, the CWA grants a State authority to issue a WQC only in response to a *request* by an applicant. 33 U.S.C. § 1341(a); 23 California Code of Regulations (“CCR”) § 3835(d). In the absence of such a request, a State has no authority to issue a WQC pursuant to Section 401 of the CWA or State regulations. *See* 23 CCR §§ 3838; 3860 (application must be filed under 23 CCR, § 3855(b) before it can be considered by the State Board). Further, States have no separate or independent authority to issue a Section 401 WQC under State law. While Section 401(d) contemplates the inclusion of conditions derived from “appropriate requirement[s] of State law,” 33 U.S.C. § 1341(d), such conditions are valid only if included in a lawfully issued and valid WQC under the CWA. In this case, because there is no pending request for WQC before the State Water Board, the Board does not have the authority under State or federal law to issue a final WQC in this proceeding pursuant to Section 401 of the CWA.

Second, the CWA requires a State to comply with public notice procedures in the case of all applications for certification, 33 U.S.C. § 1341(a)(1) (a State “shall establish procedures for public notice in the case of all applications for certification.”), and requires a State to “immediately” notify the U.S. Environmental Protection Agency (“EPA”) Administrator “upon receipt of such application.” *Id.* at § 1341(a)(2); 23 CCR § 3835(c). Since PG&E did not file a request for certification after the Board’s March 4, 2020 denial without prejudice of PG&E’s prior request for certification, the Board could not have complied with public notice requirements and the Board could not have delivered a copy of such a request to the EPA Administrator.

Third, the CWA allows a State to issue a WQC for a period of up to one year after a request for certification has been submitted by an applicant for a federal license or permit. 33 U.S.C.

§ 1341(a). The one-year period, which can be initiated only by the filing of a request by an applicant, is critical because the period determines when a State must act on a request for certification and whether certification has been waived. *Hoopa Valley Tribe v. FERC*, 913 F.3d 1099 (D.C. Cir. 2019) (“*Hoopa*”). Without a pending request for certification on file, there is no mechanism to determine whether the Board has complied with the mandatory one-year deadline established by Congress in the CWA.

#### **B. The State Water Board Has Waived Its Authority to Issue WQC**

Section 401 of the CWA provides that its certification requirement “shall be waived” if a state certifying agency “fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request.” 33 U.S.C. § 1341(a)(1). In addition, in *Hoopa*, the U.S. Court of Appeals for the D.C. Circuit held that tolling schemes, like the repeated annual withdrawal and resubmittal of requests for WQC for the same federal application, as occurred here, violates the statutory language in Section 401 of the CWA. *Hoopa*, 913 F.3d at 1105. *Hoopa* also holds that FERC acts arbitrarily and capriciously when it fails to find waiver where State certifying agencies attempt to toll the one-year deadline through mechanisms like the withdrawal and resubmittal scheme. *Id.* at 1104.

The State Water Board has waived its authority to issue a WQC pursuant to Section 401 of the CWA because it failed to act on PG&E’s pending requests for certification for almost 18 years. PG&E filed its first request for WQC with the Board on October 9, 2002, and has responded to annual notifications from the State Water Board by withdrawing and resubmitting its requests for WQC for the same federal application for the Project. Thus, under the express terms of Section 401 of the CWA and *Hoopa*, the State Water Board has waived its authority under Section 401 to

issue WQC for the Project. PG&E's pending FERC Petition seeks confirmation of the Board's waiver.

Because the Board has waived its authority under Section 401 of the CWA, any recommended license measures filed with FERC by the Board must be supported by the FERC record and consistent with the Federal Power Act ("FPA") in order to be included in the license. Where applicable, PG&E's substantive comments below identify conditions or portions of conditions that are inconsistent with the FERC record for the Project and/or are incompatible with the FPA.

**C. Conditions in the WQC that Modify the Flow Regime Are Not Appropriate or Required Under Either the Federal or State Law**

The conditions in the Revised DEIR that modify the flow regime, particularly Condition 6 (Water Temperature Management Program) and Condition 1 (Minimum Instream Flows), should be modified by the Board to be consistent with the Settlement Agreement and recommended by FERC staff in the FEIS. These conditions in the Draft WQC do not address any Project impact identified in the record of this proceeding; the flows and other actions required by these conditions are not necessary for Project discharges to comply with the CWA or water quality standards; and the conditions are inconsistent with the Board's and FERC's mandate to balance the beneficial uses of a waterway.

**1. The Proposed Conditions Do Not Have a Nexus to the Impacts of the Project**

While certifying authorities are authorized under the Clean Water Act to assure compliance with water quality standards, the State Board authority is constrained by U.S. constitutional mandates, which allow the Water Board to impose conditions on a project only if there is a direct causal relationship or "nexus" between the condition and a public need or burden created by the proposed project. *Nollan v. Cal. Coastal Com*, 483 U.S. 825, 837 (1987); *see also*

CEQA Guidelines § 15126.4(a)(4). The proposed conditions must be “related both in nature and extent to the proposed development’s impact. *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994). CEQA expressly incorporates these U.S. Constitutional mandates requiring an “essential nexus” and rough proportionality between the condition and an impact caused by the proposed Project. See CEQA Guidelines § 15126.4(a)(4). Thus, the record in the proceeding must support this essential nexus. In addition, EPA regulations make clear that a State’s Section 401 authority is limited to assuring that a discharge from the activity will comply with water quality requirements (40 Code of Federal Regulations (“CFR”), § 121.3), and this authority does not allow conditioning to address environmental issues in the watershed that are unrelated to the impacts of the proposed Project.

The State has failed to show how many of the proposed conditions, which operate to establish a new flow regime, are necessary to address Project impacts and ensure Project compliance with applicable water quality standards and water quality objectives. As described more fully below, the proposed Project will decrease temperatures compared to current conditions, thereby improving fish habitat while preserving and protecting the beneficial uses of hydroelectric power and water recreation. Therefore, the conditions proposed in the WQC, particularly the new supplemental flow regime requirements, have no direct causal relationship to the impacts associated with this Project and therefore are not supported by the record in this proceeding.

2. Several Conditions Are Not Necessary to Comply with the CWA or Water Quality Standards

The State has failed to establish that many of the proposed conditions in the Draft WQC, particularly Condition 6, are necessary to meet applicable water quality standards and objectives. The Water Quality Control Plan for the Sacramento and San Joaquin River Basins (“Basin Plan”) (Central Valley Regional Water Board 2018) designates the beneficial uses to be

protected along with the water quality objectives necessary to protect those uses. As identified in the Basin Plan, the existing beneficial uses for the North Fork Feather River include, among others, hydropower generation, contact recreation, canoeing and rafting, cold freshwater habitat, and cold spawning habitat. The existing beneficial uses for Lake Almanor include hydropower generation, contact recreation, warm and cold freshwater habitat, warm spawning habitat, and wildlife habitat.

The Draft WQC identifies the following applicable water quality objectives for water temperature:

- a. At no time or place shall the temperature of intrastate waters be increased more than 5°F [2.8°C] above natural receiving water temperature; and,
- b. The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration does not adversely affect beneficial uses.

The record shows that Project operations comply with these water quality objectives and thus there is no justification for the temperature-related conditions proposed in the Draft WQC. With respect to the first objective, the proposed operation of the Project, with the measures proposed in the Settlement Agreement and recommended by FERC staff in the FEIS, will not increase water temperatures. On the contrary, the Project will lower temperatures based on the Settlement Agreement minimum instream flows (“MIF”), which were established with State Board guidance to specifically provide “cooler water temperatures” compared to current conditions. Thus, the Project will *decrease* water temperature in the North Fork Feather River compared to baseline conditions and will not adversely impact water temperature.

The State Board’s rationale for instituting a completely new flow regime to address temperature is premised solely on the fact that the Settlement Agreement identified temperature as

a subject that was not resolved by the Settlement Agreement. (Draft WQC, p. 2). While there was disagreement over the extent to which additional measures were necessary to address temperature in the North Fork Feather River, the Board’s rationale ignores the substantial measures agreed to by signatories to the Settlement Agreement that would decrease temperatures compared to existing conditions, including MIF and pulse flows releases from Canyon Dam. Notably, the rationale for Condition 6 did not identify any violation of the applicable water quality objectives stated above. Indeed, the Draft WQC fails to identify how the Project would increase temperatures and violate applicable water quality objectives.

Similarly, Condition 6 is not required to meet the second identified water quality objective because the MIF established in the Settlement Agreement will serve to benefit identified beneficial uses, including Cold Freshwater Habitat, Spawning for cold water fisheries by improving baseline conditions. The Draft WQC acknowledges that modeling “shows periods with little or no suitable habitat under baseline conditions.” Draft WQC, p. 12. The Project will improve baseline conditions by implementing the MIF from the Settlement Agreement, as recommended in the FEIS, which is targeted to improve suitable habitat in both the North Fork Feather River and Lake Almanor. Thus, the Project will not adversely affect beneficial uses for Cold Freshwater Habitat, and the State Board has failed to show how the new flow regime required by Condition 6 is necessary to comply with state water quality standards and objectives.

### **3. Several Conditions Are Inconsistent with the Requirement to Balance Beneficial Uses Under State and Federal Law**

The measures adopted in the Settlement Agreement and recommended by FERC staff in the FEIS were negotiated to ensure that FERC could satisfy its mandate under Section 10(a) of the FPA to balance *all* relevant beneficial uses. The Board has a parallel obligation under State law, which requires the State Board to consider a balance of interests when implementing water

quality objectives and mandates that “the waters of the state shall be regulated to attain the highest water quality which is *reasonable*, considering *all demands* being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. *See* California Water Code, § 13000.

The proposed conditions mandating higher flows focus exclusively on cold water habitat to the exclusion of hydroelectric uses, water uses, recreational uses, fish habitat in Lake Almanor and the economic impacts that would result from instituting a new flow regime and associated adaptive management measures. By focusing exclusively on one beneficial use, the State Board ignored potential adverse effects on *other* identified beneficial uses such as hydropower generation and water recreation. *See* Beneficial uses of North Fork Feather River, Central Valley 2009.

Moreover, since waiver of certification authority has occurred already, any conditions submitted to FERC as recommendations must be consistent with Section 10(a) of FPA, under which FERC must balance numerous competing beneficial uses when issuing a license. FERC staff's recommendations in the FEIS, which are substantially consistent with the measures proposed in the Settlement Agreement, balance the need for hydropower generation, fish and wildlife (including habitat concerns, such as temperature), and recreation. Accordingly, not only are the proposed flow regime conditions unnecessary to ensure compliance with water quality standards, they would serve to adversely affect other beneficial public interests, such as hydroelectric power and water recreation.

**D. Condition 6 is Operationally Infeasible, Vague, and Inappropriately Supported by a Model Designed for a Different Purpose**

Condition 6 requires actions that create significant uncertainty with respect to Project costs; requires implementation of undefined fisheries goals that are inconsistent with the management

goals of State and federal fish and wildlife management agencies with respect to special-status species; and is supported by water temperature models that were not designed for the purpose for which they are being used by the Board. For these reasons, Condition 6 should not be included in a final WQC or should be modified to be consistent with the measures in the Settlement Agreement.

1. Operational Uncertainty for the Life of the License

Condition 6 is vague and introduces significant uncertainty to PG&E's operations. For example, the elements of adaptive management are not defined appropriately, leaving PG&E with significant lack of clarity on operations, compliance objectives and the metrics needed to initiate consultation on modifications to these conditions (*see, e.g.* 6(B) Supplemental Flow Reduction). These uncertainties are exacerbated by lack of appropriate goals, and preemptive implementation of conditions (without FERC approval), combined with State Water Board's reserved authority to require further changes without specific criteria on when such changes would be considered. Such provisions are inconsistent with recently promulgated regulations, 40 C.F.R. Part 121 (pending effectiveness), wherein EPA determined that Section 401 "does not provide authority for [the Board] to unilaterally modify a certification, either through certification conditions that purport to authorize the [Board] to reopen the certification in the future or through any other mechanism."

*See Clean Water Act Section 401 Certification Rule*, Final Rule, pg. 255 (pre-publication version issued June 1, 2020) (available at: <https://www.epa.gov/cwa-401/clean-water-act-section-401-certification-rule>).

2. Condition 6 May Harm Existing Fisheries

Condition 6 imposes a water temperature goal of < 20°C throughout the lower reaches of the North Fork Feather River, without identifying any clear fishery goal or any source for this

requirement in the Basin Plan. As discussed above, the flow measures in the Settlement Agreement and recommended by FERC staff in the FEIS will reduce water temperatures in the North Fork Feather River compared to existing conditions, and thus will satisfy the stated temperature objective in the Basin Plan. By failing to articulate or discuss a fishery goal for the temperature threshold in Condition 6, the Board has ignored potential impacts to the existing fishery caused by increased summer releases from Canyon Dam up to 250 cfs, including adverse effects to the native fishery and special-status species in the North Fork Feather River and to water quality and the fishery of Lake Almanor.

As discussed herein, State law requires the Board to balance beneficial uses by providing for the *reasonable* protection of such uses. Condition 6 fails to reasonably protect beneficial uses in Lake Almanor and beneficial uses, other than cold freshwater habitat, in the North Fork Feather River. Specifically, Condition 6(A), *Canyon Dam Supplemental Flows*, would increase releases from Canyon Dam up to 250 cfs for the purpose of reducing water temperatures to below a threshold of 20°C throughout the lower reaches of the North Fork Feather River. However, these releases are intended to achieve fishery goals that have not been defined and will not be defined until after implementing the release schedule (see Condition 6(C) *Fishery Performance Goals*) using data collected under Conditions 7 and 8 (*Water Quality Monitoring* and *Lake Almanor Fishery Monitoring*, respectively). The Board fails to recognize that setting specific metrics for fisheries is extremely challenging given the highly dynamic nature of fish communities, even under steady state conditions. Numerous studies have shown that fisheries can vary by a factor of two from year to year (Carlander 1969) even when sampled at the same site, using the same methods, and without any modification of flows between years.<sup>1</sup>

---

<sup>1</sup> Accurate assessment in lacustrine environments are particularly troublesome due to the biases associated with various sampling techniques and the extremely limited proportion of the total population that can be

The State Water Board includes Condition 6 *without* any expectation that the program will be successful at reducing temperatures in the NFFR to < 20°C (see Condition 6(D) *Feather River Temperature Contingency Plan*). The 20°C threshold would be met within the UNFFR Seneca Reach under the minimum instream flow schedule included in the draft WQC and Settlement Agreement.

The State Water Board adds Condition 6 *without* a full assessment of its impacts to the existing fishery, yet *with* the understanding that if successfully implemented, the program could have adverse effects to the native fishery and special-status species. The existing fishery in the NFFR includes a coldwater fishery upstream of Belden Dam. Below Belden Dam, the fishery is composed primarily of transitional zone species (warmer water fish of the hardhead/ pikeminnow/ sucker assemblage), including special status species hardhead (CA and USFS Species of Concern) and foothill yellow-legged frog (CA Threatened). If the condition were to be successful at maintaining temperatures <20°C downstream through much of the Cresta Reach, the condition could result in adverse effects to the existing fishery (including special status fish and amphibians). Exhibit B describes these points in more detail as well as describes the existing fisheries in Lake Almanor and downstream reaches (Seneca, Belden, Rock Creek Dam, and Cresta Dam) of the NFFR.

### 3. The State Water Board Used Models For Purposes Beyond Their Functionality to Support Condition 6

The Board's assessment fails to support the Board's assertions that Condition 6 would protect the water quality and biological integrity of the recreational fishery in Lake Almanor because the models relied on by the Board were not designed to evaluate significant changes to

---

captured (Fischer, J.R 2012; Murphy and Willis 1996, including chapters by Hayes et al. 1996, Hubert 1996; Pope and Willis 1996). See full references in Exhibit B.

existing operations. PG&E does not take issue with all studies done in support of the new license, and acknowledges that some of these early studies were also used to evaluate the minimum instream flows (MIFs) defined under Condition 1, which PG&E has accepted as part of the Settlement Agreement. However, these MIFs represent relatively minor changes from the existing conditions, and these models were shown to reliably reproduce existing conditions. Therefore, the use of these models to evaluate MIFs (as presented in the FEIS) is appropriate as the Lake Almanor dynamics would not change significantly with these MIFs. In contrast, the changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence the Lake Almanor dynamics. PG&E's specific concerns with these models and their use for Condition 6 are summarized in this section.

The studies performed as part of the development of the Revised DEIR used simplified 1-dimensional (MITEMP<sup>2</sup>) and 2-dimensional (CE-QUAL-W2<sup>3</sup>) models. These models were based on assumptions and simplifications to achieve ease of use and faster computational times for use in particular cases where the waterbody has simplified geometry (long and narrow) and has limited spatially varying mixing (minimal flows from different sides). They were not designed to provide accurate results for predicting thermal profiles for physical modifications (e.g., thermal curtains as in Alternatives 1 and 2) within a large, geometrically-complex lake like Lake Almanor that exhibits spatial variability in temperatures. *See Exhibit C for a more-detailed explanation.*

The State Water Board used the existing models developed earlier by PG&E for different objectives and re-purposed them to support Condition 6. Because the SWRCB used these models in an inappropriate manner, the results are unreliable. This flawed approach is likely the reason for the “exceedance”-based evaluation approach the State Water Board employed, as the re-

---

<sup>2</sup> Massachusetts Institute of Technology’s Transient Temperature Prediction Model

<sup>3</sup> <http://www.ce.pdx.edu/w2/>

purposed models lacked the ability to develop a continuous thermal profile for the entire system under each alternative. This approach inappropriately matches temperature exceedance outflow temperatures to external conditions based on the definition of “normal,” “extreme,” etc., thus failing to capture a significant subset of conditions.<sup>4</sup> As a result, the Board did not account for spatial variability in temperature in Lake Almanor, overestimated cold water availability within Lake Almanor, and improperly assessed the temperature of water released from Canyon Dam for downstream temperature reduction (see Exhibit C). The Board’s flawed use of the models to require significant changes to PG&E operations is inappropriate because it has resulted in Condition 6, which imposes requirements that are well beyond the balancing of beneficial uses required under federal and State law and agreed to in the Settlement Agreement. The Board cannot fulfill its responsibilities to balance all beneficial uses by re-purposing models to use them in a manner for which they were not designed.

**E. Additional Conditions in the Draft WQC Are Beyond the Scope of the Board’s Authority**

The FPA preempts State authority over FERC-jurisdictional hydroelectric projects, except in very limited circumstances, such as a State’s authority over proprietary rights in water. *See* 16 U.S.C. § 821; *First Iowa Hydro-Electric Cooperative v. FPC*, 328 U.S. 152, 176 (1946). Section 401 of the CWA provides a narrow exception to FERC’s exclusive authority with respect to water quality issues. However, the Board’s authority over water quality issues is “not unbounded” because it is limited to imposing conditions related to effluent limitations and requirements of State law that address water quality issues. *See PUD No. 1 of Jefferson County v. Wash. Dept. of*

---

<sup>4</sup> For example, it suggests that the “50% exceedance outflow water temperature” (defined as “normal conditions”) at Canyon Dam only occurs under normal meteorological and “normal” year release schedule, when in fact these outflow water temperature levels could occur in dry and wet year conditions (see Exhibit C).

Ecology, 511 U.S. 700, 712 (1994); *see also* 40 C.F.R. § 121.3 (pending effectiveness) (the scope of a CWA section 401 certification is limited to assuring that a discharge from a Project will comply with specific water quality requirements applicable to point source discharges).

The State Water Board seeks to improperly expand its narrow authority over water quality issues by proposing conditions in the Draft WQC that are completely unrelated to water quality and that include procedural requirements contrary to FERC's exclusive authority to enforce any conditions included in the license, including conditions from a WQC, such as requirements for Board approval of plans, notification periods that are inconsistent with the Settlement Agreement and FERC staff's recommendations in the FEIS, and conditions that are inconsistent with other resource agency recommendations, including 4(e) conditions filed by the USFS and Settlement Agreement measures adopted by federal and State fish and wildlife agencies.

For example, the draft WQC provides that the Deputy Director can instruct PG&E to consult with State and federal agencies, and other stakeholders, but can order PG&E to implement changes or undertake new mitigation measures *without* securing FERC's approval. In addition, the State Water Board includes conditions that are not specifically tied to water quality, such as Condition 12 (Fish Stocking), Condition 13 (Recreation Management Plan), Condition 14 (Whitewater Recreation Flows), Condition 16 (Roads), Condition 17 (Reintroduction of Anadromous Fish), and Condition 20 (Grebe Management Plan). None of these conditions have any nexus to water quality and should be removed or modified to ensure consistency with the Settlement Agreement.

The Draft WQC also relies on an adaptive management strategy with unspecified goals and monitoring methods, and open-ended requirements for mitigation. The Draft WQC purports to give the State Water Board unlimited authority over many conditions and does not consider the

impact to other beneficial uses or to the fact that only FERC has the authority to approve and enforce any conditions in the license or plans required by the license. The open-ended nature of the mitigation requirements indicate that the State Water Board does not have sufficient evidence in its record to adopt the conditions included in the Draft WQC and frustrates FERC's ability to determine Project costs for the term of the license, which in turn affects whether the Project is economic and whether PG&E will accept the FERC license. The Settlement Agreement contained a variety of constraints designed to balance beneficial uses consistent with the Board's CEQA obligations and FERC's FPA obligations, and to allow PG&E to understand the cost of the license. The Draft WQC disregards all of the constraints on the range of adaptive management measures that were included in the Settlement Agreement and the Forest Service 4(e) conditions.

Furthermore, the Draft WQCs provisions with respect to maintaining the inspection schedule for Project works directly conflicts with FERC's exclusive authority over the safety of Project works and any requirements of the California State Division of the Safety of Dams ("DSOD") that are not inconsistent with FERC's authority. To our knowledge, the State Water Board has no expertise in this area and does not conduct such inspections on other hydroelectric projects. Duplication of this effort by the State Water Board could lead to conflicting requirements from the overlapping jurisdiction between FERC, DSOD and the State Board.

#### **F. Comments on Specific Conditions in the Draft WQC**

Additional comments on specific conditions in the Draft WQC are summarized in Exhibit A. PG&E intends to provide additional comments on the rationale statements in Section 5.0 as we complete our review and comments on the Revised Draft EIR for the Project, due July 7, 2020.

## CONCLUSION

PG&E objects to the issuance of an invalid final WQC when there is no pending request for a WQC before the State Water Board. The State Water Board's Condition 6, requiring release of supplemental flows, is based on unspecified and undeveloped goals that are intended to protect a coldwater fishery, in transitional fish communities downstream of the Project area, without consideration of potential impacts on special status species such as hardhead and foothill yellow-legged frog. In the event the State Water Board issues a final WQC for the purpose of submitting FPA Section 10(a) recommendations to FERC, PG&E requests that the conditions be modified to be consistent with the FPA and the record in the FERC proceeding. In addition, PG&E requests that the conditions discussed herein be modified to address the concerns, corrections and clarifications identified by PG&E.

If you have any questions about these comments, please contact Steve Bauman, Sr. Project Manager, at (415) 973-7410 or at [steve.bauman@pge.com](mailto:steve.bauman@pge.com). You may also contact me at (415) 973-7145 or [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com).

Respectfully submitted,



Annette Faraglia  
Chief Counsel, Hydro Generation

Dated: June 15, 2020

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 1 Condition 1. Minimum Instream Flows

### **1(A) Water Year Types**

The determination of the Water Year Type and associated notifications included in the Draft WQC are not consistent with those in the Settlement Agreement or other licenses in the Feather River Watershed.

### **1(C) Minimum Instream Flow Measurement and Dissemination**

Condition 1(C) requires public notice on the internet of all known events that will affect MIF releases, 30 days in advance, which is sometimes not feasible and is inconsistent with other PG&E projects in the Feather River Basin.

### 1(F) Highlight Footnote 10

#### **Overreach of State Water Board Resources Control Board (SWRCB) Authority**

Condition 1 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. There are separate notification requirements to the SWRCB that would generally be provided to FERC and all stakeholders. Additionally, Condition 1(F) and footnote 10 specify minimum inspection schedules and criteria of Project Works, which is under the authority of FERC and the California Division of Safety of Dams. See also PG&E's Comments regarding SWRCB authority.

## 2 Condition 2. Ramping Rates

### **2(A) Ramping Rates**

The Settlement Agreement allows variability in ramping rates (i.e., good faith effort) below Canyon Dam because of “gate size and other factors.” This flexibility is not incorporated in the draft WQC and is necessary for PG&E to meet the intended compliance.

### **2(B) Evaluation of Ramping Rates**

The 6-month timeframe to evaluate monitoring data and develop alternatives is not sufficient. This timeframe does not allow adequate time to assess monitoring results, and conduct necessary collaboration, or make alternative recommendations.

### **2(C) Belden Powerhouse Block Loading**

PG&E is currently engaged in consultation regarding Poe and Rock Creek-Cresta ramping rates. PG&E agrees that Belden block loading should be aligned with Poe and Rock Creek-Cresta ramping rates and is appropriately tied to the outcome of downstream requirements.

#### **Overreach of SWRCB Authority**

Condition 2 requires separate SWRCB approval and notifications, which disregards the Settlement Agreement process, which requires agreement of all parties to the Settlement Agreement. See also PG&E's Comments regarding additional concerns with SWRCB authority.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

### 3 Condition 3. Pulse Flows

#### **3(A) Pulse Flows**

This condition appears consistent with the Settlement Agreement and FERC recommendations in the FEIS, but lacks language establishing maximum volumes for pulse flow events, as was provided in the Settlement Agreement. The Settlement Agreement inherently provides some flexibility to explore different rates and durations to maximize the benefits of the pulse flows while not adversely affecting other beneficial uses including generation, Lake Almanor water surface elevations, and recreation.

The Settlement Agreement (Section 1.3.A) and USFS Section 4(e) Condition 25.3 both state: “No Pulse Flows are required in months where the Water Year Type forecast for that month indicates that the water year will be either Dry or CD.” PG&E supports pulse flow implementation as cited by these sources. Providing pulse flows during Dry Water Years would have the potential to impact beneficial uses related to downstream habitat, reservoir water surface elevations (Condition 4) and Water Quality (Condition 7). Additionally, members of the 2105 Licensing Group expressed concerns that too aggressive of a pulse flow schedule might have deleterious effects on spawning gravels and reproductive success of substrate-dependent organisms.

The Settlement Agreement includes biological, water quality, habitat, and gravel monitoring to inform the evaluation of the effectiveness of the Pulse Flows and any modification to the schedule, should it be warranted. PG&E commented on the FEIS in opposition of the pulse flows in Dry years. In PG&E’s December 12, 2005 comment letter to FERC on the FEIS, we note that the pulse flow plan contained in the Settlement Agreement is a more prudent plan than the FERC alternative (also included in the Draft Water Quality Certificate). PG&E maintains that the Pulse Flow schedule included in the Settlement Agreement, with pulse flow requirements implemented for Normal and Wet Water Year Types only, is appropriate to protect beneficial uses.

#### **Overreach of SWRCB Authority**

Condition 3 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. In Condition 3, this is specifically relevant when (1) a flow change is warranted, and (2) on proposed flow changes. The Settlement Agreement further establishes limits on these changes that are not included in the SWRCB condition. Additionally, Condition 3 gives SWRCB unilateral decision-making authority for future changes to license conditions or plans which is inappropriate and redundant with FERC. See also PG&E’s Comments regarding SWRCB authority.

### 4 Condition 4. Water Surface (Reservoir) Elevations

SWRCB states in Section 5.4 (rationale for Condition 4), that “the reservoir elevations required in Condition 4 are consistent with those in the Settlement Agreement;” however, the WQC Lake Almanor surface elevation requirements in Condition 4 are contradictory to the USFS 4(e) and Settlement Agreement conditions. The reservoir surface level requirement given in the USFS 4(e) condition and Settlement Agreement state that water elevations shall reach specified requirements “by May 31” and do not include minimum elevations between Sept and May, whereas the WQC

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

includes year-round minimum water surface elevations. Altering this condition to require water surface elevations to be maintained from September 1 – May 31 will severely limit the Licensee’s ability to manage the reservoir for non-recreational beneficial uses.

In Table 7, the specific gage referenced as Belden Forebay is not clear. Belden Forebay is measured at Gage NF-67.

**Overreach of SWRCB Authority**

Condition 4 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. Additionally, Condition 4 gives SWRCB unilateral decision-making authority for future changes to water surface elevation requirements, which is inappropriate and redundant with FERC. Section 3.5 of the Settlement Agreement (Multiple Dry Water Years) identifies a list of resource agencies and parties to be consulted during multiple dry water years, including SWRCB. See also PG&E’s Comments regarding SWRCB authority.

## 5 Condition 5. Gaging and Facilities Modifications

The description of Condition 5 specifies only NF-9, but does not name other gages to be included. The Settlement Agreement includes gages NF-2 and NF-70. The condition also references new gages, which are not anticipated as a part of the license or operation.

Regarding the facilities modifications portion of the plan described, the condition isn’t specific about which facilities are included or what is meant by this component.

Consultation requirements included in this condition and the burden of documenting consultation for a gaging plan with other agencies (Forest Service, CDFW, USFWS) is excessively burdensome for PG&E.

**Overreach of SWRCB Authority**

Condition 5 requires development of a Gaging and Facilities Modification Plan; however, PG&E’s gaging practices are supervised by the United States Geological Survey, who defines the standards and practices by which the gages are installed, maintained, and operated. If this plan were to be necessary, Condition 5 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E’s Comments regarding SWRCB authority.

## 6 Condition 6. Water Temperature Management

See PG&E’s Comments on the Draft WQC.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 7 Condition 7. Water Quality Monitoring

### **Overreach of SWRCB Authority**

Condition 7 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition authorizes the SWRCB to implement measures to unilaterally address water quality impacts, which is not appropriate in a FERC-licensed project, where FERC approval would also be required. See also PG&E's Comments regarding SWRCB authority.

## 8 Condition 8. Lake Almanor Fishery Monitoring

Accurately measuring thermally-induced mortality in the Lake Almanor coldwater fish population is not feasible. Other factors that may affect the fishery, and may not be project related, would need to be considered and would be difficult to isolate, including food production and prey competition, changes in coldwater refugia, seasonal distribution of fish, angling pressure, stocking programs, and disease. PG&E recommends removing the requirement to monitor the fish population in Lake Almanor.

### **Overreach of SWRCB Authority**

Condition 8 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 9 Condition 9. Gravel

### **Overreach of SWRCB Authority**

Condition 9 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 10 Condition 10. Lower Butt Creek Habitat

### **Overreach of SWRCB Authority**

Condition 10 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 11 Condition 11. North Fork Feather River Biological Resources Monitoring

### **Overreach of SWRCB Authority**

Condition 11 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 12 Condition 12. Fish Stocking

### **Overreach of SWRCB Authority**

Condition 12 requires an agreement with CDFW, which is the appropriate agency to handle issues such as fish stocking. Since it doesn't impact water quality, the SWRCB is not the appropriate agency to address fish stocking. See also PG&E's Comments regarding SWRCB authority.

## 13 Condition 13. Recreation Facilities Management

### **Overreach of SWRCB Authority**

Condition 13 generally references the Settlement Agreement, but expands the content of the Recreation Management Plan and inserts SWRCB authority with additional planning and reporting requirements, consultation with agencies, and SWRCB approval. Further, additional requirements with the SWRCB are assigned if recreational use increases and or the usage causes concerns for water quality. PG&E will consult with the SWRCB; however, FERC has approval authority, and PG&E is unaware of any authority granted to the SWRCB that would allow them to expand the Recreation Management Plan in the ways described in the Draft WQC.

Condition 13 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires that the Licensee develop in the Recreation Management Plan, water quality protection/monitoring prescriptions for proposed and existing construction and modification to recreation facilities. The Recreation Management Plan will not contain the details of construction or modification for each existing or proposed facility so specific water quality protection measures cannot be prescribed in the Plan. The design and construction planning phase of each facility is the place where specific water quality protections prescriptions will be made, in conjunction with relevant permitting requirements and design approvals. Licensee will include a provision in the Recreation Management Plan that commits each facility construction project to assess for and implement industry Best Management Practices for water quality/erosion protection as part of the design, authorization, and permitting process.

In general, all recreation site improvements or modifications will be consistent with Clean Water Act construction and operational requirements. SWRCB does not otherwise have authority over these resources. Recreation sites and their improvement is generally not within the authority of the SWRCB.

Condition 13 requires recreation monitoring; however, recreation monitoring authority rests with FERC and with the Forest Service where recreation sites are located on Forest Service lands. Identification of recreation use surveys that will be conducted as part of the Project and submittal of the associated results to SWRCB staff is inappropriate. Reporting of recreation monitoring results to SWRCB should not be required. This section should be deleted from the WQC, as

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

recreation monitoring is sufficiently covered in the Settlement Agreement. See also PG&E's Comments regarding SWRCB authority.

## 14 Condition 14. Whitewater Recreation Flows

### **Overreach of SWRCB Authority**

Condition 14 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 15 Condition 15. Aquatic Invasive Species

### **Overreach of SWRCB Authority**

Condition 15 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 16 Condition 16. Roads

Condition 16 is inconsistent with the Settlement Agreement and USFS 4e conditions, and requires actions beyond what was included in those agreements. The Road Management Plan is to address Forest Service and unclassified road rehabilitation and maintenance within the Project boundary. These Forest Service and unclassified roads must meet the FERC definition of a Project Road. Roads that are not used almost exclusively for Project purposes are not considered Project roads.

### **Overreach of SWRCB Authority**

Condition 16 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC's authority over the License resource management plans. Further, SWRCB approval is required separately of any modifications. PG&E will consult with stakeholders including the SWRCB, specifically as it pertains to assessing a road's impact on water quality; however, FERC has approval authority over the License Plans. See also PG&E's Comments regarding SWRCB authority.

## 17 Condition 17. Reintroduction of Anadromous Fish

### **Overreach of SWRCB Authority**

Condition 17 reserves SWRCB authority for study requirements, which is overly prescriptive. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 18 Condition 18. Annual Consultation Meetings

### **Overreach of SWRCB Authority**

Condition 18 is overly prescriptive of TRG activities including the notification in advance of meetings on the Licensee's webpage, which should be delegated to the TRG. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC's authority over the License resource management plans. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 19 Condition 19. Extremely Dry Conditions

### **Overreach of SWRCB Authority**

Condition 19 requires separate SWRCB consultation and notification, which is inappropriate as it is redundant with FERC. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 20 Condition 20. Grebes Management

### **Overreach of SWRCB Authority**

Condition 20 requires development of a Grebes Management Plan, which was not previously required in the Settlement Agreement or other stakeholder agreements, and does not have a nexus with water quality. See also PG&E's Comments regarding SWRCB authority.

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### **I. Introduction**

The draft WQC adds a new condition, Condition 6 (Water Temperature Management Program), which calls for increased summer releases (Condition 6(A) *Canyon Dam Supplemental Flows*) with the intent to protect the fishery downstream of the project-affected reaches by maintaining water temperatures < 20°C throughout most of the NFFR:

1. *without* defined fishery goals (see Condition 6(C) *Fishery Performance Goals*);
2. *without* any expectation that the program will be successful (see Condition 6(D) *Feather River Temperature Contingency Plan*); and
3. *without* a full assessment of its impacts to water quality and the existing fishery in the NFFR or Lake Almanor or on water quality in Lake Almanor, if successful; yet
4. *with* the understanding that if successfully implemented, the program could have adverse effects to the native fishery and special-status species and on the fishery in Lake Almanor.

#### **II. Condition 6(C) Fishery Performance Goals**

The supplemental flows are based on unspecified fishery goals to be developed during implementation of the new license (See Condition 6(C) Fishery Performance Goals). Implementing any condition without clear fishery goals is irresponsible. The intent of the condition is to provide “reasonable protection to cold freshwater species” in the NFFR far downstream into the Cresta Reach. However, the existing fishery composition is primarily warmer water, or native transitional-zone, fishes (i.e., hardhead-pikeminnow-sucker assemblage) below Belden Dam (Table B-1). Hardhead (*Mylopharodon conocephalus*, California Species of Special Concern and USFS Species of Conservation Concern) is the dominant fish species in the Rock Creek and Cresta reaches. Additionally, the lower reaches of the NFFR support breeding populations of foothill yellow-legged frogs (FYLF, *Rana boylii*, California Threatened), which also rely on warmer water to complete their life cycle. The intended outcome of Condition 6(C) is to change baseline conditions from a transitional-zone fishery to a coldwater fishery. The SWRCB fails to recognize the existing transitional zone fishery in this condition.

## Exhibit B

### Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery

**Table B-1: Fish species identified in recent surveys of waters in the NFFR (Data sources: UNFFR FERC FEIS; Stillwater Sciences 2005; Poe FLA).**

Assemblage and Species		Native/Introduced	Lake Almanor	NFFR Seneca Reach	NFFR Belden Reach	NFFR Rock Creek Reach	NFFR Cresta Reach	NFFR Poe Reach
Cold	Rainbow trout <i>Oncorhynchus mykiss</i>	N	X	X	X	X	X	X
	Brown trout (game fish) <i>Salmo trutta</i>	I	X	X	X			
	Chinook salmon <i>Oncorhynchus tshawytscha</i>	I <sup>1</sup>	X					
Cold or Transitional	Prickly sculpin <i>Cottus asper</i>	N	X	X	X	X	X	
	Riffle sculpin <i>Cottus gulosus</i>	N		X	X	X	X	X
Transitional	Sacramento sucker <i>Catostomus occidentalis</i>	N	X	X	X	X	X	X
	Sacramento pikeminnow <i>Ptychocheilus grandis</i>	N	X		X	X	X	X
	Hardhead <i>Mylopharodon conocephalus</i>	N			X	X	X	X
Warm	Sacramento perch <i>Archoplites interruptus</i>	N	X					
	Smallmouth bass <i>Micropterus dolomieu</i>	I	X			X	X	X
	Largemouth bass <i>Micropterus salmoides</i>	I	X					
	Brown bullhead	I	X					

## Exhibit B

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

Assemblage and Species	Native/Introduced	Lake Almanor	NFFR Seneca Reach	NFFR Belden Reach	NFFR Rock Creek Reach	NFFR Cresta Reach	NFFR Poe Reach
<i>Ameiurus nebulosus</i>							
Wakasagi (Japanese pond smelt) <i>Hypomesus nipponensis</i>	I	X					
Common carp <i>Cyprinus carpio</i>	I	X					X

<sup>1</sup> The Chinook salmon introduction into Lake Almanor is outside of their native range.

PG&E would expect the fishery performance goals to include reasonable protection to both coldwater and transitional-zone fish species, including special-status hardhead and FYLF (see *Temperatures Impacts*, below); however, Condition 6(A) presumes the goals will only include support of a coldwater fishery.

### **III. 6(D) Feather River Temperature Contingency Plan**

SWRCB acknowledges the likelihood for Condition 6(A) to be unsuccessful at maintaining temperatures < 20°C (see SWRCB RDEIR Section 5.5, *Water Quality*), and includes a separate contingency plan (Condition 6(D) *Feather River Temperature Contingency Plan*) to allow for future modifications. In fact, the goal of the contingency plan is to identify action(s) for achieving the (undefined) fisheries goals and improving habitat conditions altered by the diversion, storage, and use of water associated with Project operations.

### **IV. Potential Impacts to the Existing Fishery**

SWRCB finds limited impacts to the existing NFFR fishery in their RDEIR, citing the expectation that implementation of Condition 6(A) would likely be unsuccessful at completely maintaining temperatures < 20°C (see SWRCB RDEIR Section 5.5, *Water Quality*), and therefore, preferred habitat for transitional species would still be available. SWRCB does acknowledge the potential for adverse effects, including to the Lake Almanor coldwater fishery, and includes provisions that allow for future reductions of supplemental flows (Condition 6(B) *Supplemental Flow Reductions*) to minimize these potential effects. However, if the program were to be successful, SWRCB does not fully describe impacts, especially to the existing native fishery within the NFFR.

## Exhibit B

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### **a. Unspecified Impacts to Lake Almanor Fishery**

Section 5.6 of the draft WQC (*Rationale for Condition 6 – Water Temperature Management*) states that “Notwithstanding the modeling, it is uncertain whether the Proposed Project or any of the alternatives would adversely affect the fishery in Lake Almanor.” However, SWRCB acknowledges (Condition 6(B) *Supplemental Flow Reductions*) that “a decrease or suspension of the supplemental flows [may be] necessary to reasonably protect the cold freshwater beneficial uses of Lake Almanor and the North Fork Feather River.” It may not be possible to create a coldwater fishery in the downstream NFFR while simultaneously protecting the coldwater fishery in Lake Almanor during summer months.

Lake Almanor supports coldwater, warmwater, and transitional-zone fish populations (Table B-1). Stocking efforts by CDFW have recently focused on rainbow trout, brown trout, and Chinook salmon (SWRCB 2020) and PG&E financially supports an ongoing trout planting program in Lake Almanor. SWRCB’s water temperature modeling demonstrates that Condition 6, along with alternatives indicated in Condition 6(D) *Feather River Temperature Contingency Plan*, decrease the Lake Almanor coldwater habitat (See Exhibit C). For example, installation of a thermal curtain at the Prattville Intake would reduce available summer salmonid habitat in Lake Almanor, despite inducing only minor changes to water temperature and dissolved oxygen (Gast 2004). Jones and Stokes (2004) simulated the volume of salmonid habitat available during late summer stratification if a thermal curtain had been utilized, finding a 38% reduction in habitat relative to existing conditions. Though the effect of the thermal curtain on suitable habitat would be small during cool summers, habitat volume would be substantially reduced in hot summers as what little cool water available in Lake Almanor would be selectively removed (Gast 2004). Similarly, the effect of thermal curtains on habitat volume is seasonally dependent. The effect is small for a majority of the year (fall through spring) but is significant in late summer (August–September) when lake volume is at its minimum, under existing conditions, as a substantial portion of what little suitable coldwater that remains in the lake is removed at the intake. SWRCB found that any reduction of coldwater habitat in dry or critical dry years, whether via thermal curtains at Prattville and Caribou intakes (Alternative 2), supplemental releases from Canyon Dam (Alternative 3), or a combination of the two (Alternative 1), would have a significant impact on Lake Almanor aquatic habitat. The SWRCB goes on to require PG&E pay for additional stocking to mitigate the impact created by the condition.

With this condition, the draft WQC creates the potential for a future conflict of interest between the NFFR and the Lake Almanor coldwater fisheries that is not currently present, and which is insufficiently evaluated in the RDEIR. After implementing Condition 6, if a coldwater fishery becomes established in the lower reaches of the NFFR (e.g., Rock Creek and Cresta reaches) and impacts to Lake Almanor water quality and/or coldwater fishery that may trigger suspension of the supplemental flows (under Condition 6(B)) are observed, future changes to this condition could result in impacts to the future coldwater fishery. Nowhere does the SWRCB

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

clearly state its specific objectives in balancing these two resources so that the licensee and the public can understand what the SWRCB hopes to achieve, what the impacts seeking those objectives might be on these and other beneficial uses including water quality in Lake Almanor, recreation in Lake Almanor and the NFFR, water supply, power generation, and others. Nor does the SWRCB discuss the potential costs of the open-ended mitigation they stipulate forth under this condition.

The releases from Canyon Dam vary (see Condition 1, *Minimum Instream Flows*) and differences in water temperatures at the intake (due to the seasonal lowering of the reservoir water surface elevation and changing thermocline) will have a varying degree of effects on water temperatures downstream. There is a high level of variability and uncertainty involved with realized benefits of these releases downstream, but depletion of the coldwater habitat within Lake Almanor throughout the release period (June 15–September 15) is well understood (see Exhibit C).

PG&E does not support the requirement of supplemental flow releases prior to development of specific management goals, especially given an unachievable thermal threshold. However, given the dynamic nature of fish communities and populations, even in a static system, setting specific metrics will also be extremely challenging.

#### **b. Temperature Impacts**

Condition 6 would not protect, and may adversely affect, special-status fish and amphibian species in the NFFR. Increased flows would temporarily modify both temperature and physical habitat, which would adversely affect transitional-zone fishes, including hardhead and FYLF.

Hardhead currently reside in the NFFR downstream of Belden Dam. Optimal water temperatures for hardhead are 24–28°C (Moyle 2002). Where only colder temperatures are present, hardhead will move to the warmest water available (Moyle 2002; Cocherell et al. 2014). In areas with low water temperature and high flow, juvenile hardhead swimming performance is reduced (Fangue et al. 2015), potentially decreasing their survival rate. Similarly, Sacramento pikeminnow also favor warmer water (18–28°C), and although Sacramento suckers can tolerate a wide range of temperatures, their preferred range is 20–25°C (Moyle 2002).

Though intentional release of coldwater from the hypolimnion of Lake Almanor would benefit colder-water species, coldwater releases can have negative effects on species adapted to streams warming in summer (Catenazzi and Kupferberg 2017), including special-status species such as FYLF. FYLF populations have not been documented in the Seneca or Belden reaches; however, potentially suitable habitat exists. Known breeding populations in the Cresta and Poe reaches of the NFFR have been monitored annually since 2001, and breeding has been observed in the Cresta reach in the vicinity of the lowermost compliance gage for the 20°C requirement (NF-56 [USGS Gage No. 11404330]). Maintaining cooler water temperatures in

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

summer would have an adverse impact on FYLF by potentially limiting breeding and tadpole growth. Sierran populations of FYLF have been found to be most dense where mean summer maximum 30-day temperature is greater than 20.3°C, and density is reduced in Sierra foothill rivers below hydropower reservoirs where mean summer maximum 30-day temperature is below 20°C (Kupferberg et al. 2011a). Tadpoles from the Poe reach of the NFFR displayed a preference for temperatures between 21–25.8°C, and adult populations in regulated reaches of the NFFR were most dense where summer mean maximum 30-day water temperature was greater than 20°C. Where breeding does occur in cold streams, FYLF may be near their thermal niche limit, thereby reducing larval fitness and making extirpation of metapopulations likely (Catenazzi and Kupferberg 2017). Tadpole feeding and growth rates are lower in colder water, making them more prone to predation (Kupferberg et al. 2011a), and superior metamorph body condition is likewise associated with warmer streams (Wheeler et al. 2013).

#### **c. Spring and Summer Flow Fluctuations**

Releasing additional water during summer while tadpoles are present in the river would have additional adverse impacts on FYLF. Increased velocities may displace tadpoles. Pulse flows such as these, though more often related to hydropower production or recreation, are known to cause mortality of FYLF tadpoles. Tadpoles also utilize low-velocity areas to optimize the energy required for feeding (Kupferberg et al. 2011) and metamorphose by late summer (Kupferberg et al. 2012). In the Cresta Reach of the downstream Rock Creek-Cresta Project, summer pulse flows were unfavorable for the survival of both tadpoles and embryos, and mortality was lower in other reaches where flows were more stable (Kupferberg et al. 2012). The critical flow where tadpoles are flushed out of their habitat decreases with tadpole body mass and can be as low as 10 centimeters per second (cm/s) (Kupferberg et al. 2011b). Tadpoles are most susceptible to elevated flow in mid to late summer when supplemental flows would likely be implemented to maintain reduced water temperature (See Exhibit C, *Modeling*). Repeated tadpole exposure to subcritical flow (i.e., 5 to 10 cm/s when tadpoles are not flushed from their habitat) is also likely with the proposed supplemental flows, which would reduce tadpole growth and subsequently cause them to be more vulnerable to predation (Kupferberg et al 2011b).

In addition to directly impacting native fish and amphibians, flow fluctuations and artificially reduced temperatures have adverse impacts on the primary fish food source, benthic macroinvertebrates (BMIs). A seasonal flow fluctuations, even at magnitudes that do not cause scour or catastrophic drift, can reduce BMI recruitment by stranding them after eggs are laid at higher flows (Kennedy et al. 2016). Unstable daily water temperatures and elevated rates of flow change relative to a natural hydrograph are associated with reduced BMI diversity in Sierra Nevada rivers (Steel et al. 2018), and it has been broadly observed that reduced water temperatures below dams alters BMI communities (Olden and Naiman 2010), which can negatively impact native fish assemblages.

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### V. References

Bechtel. 2002. MITEMP3 Model Calibration and Validation in 2000–2001, Lake Almanor and Butt Valley Reservoir.

Catenazzi, A. and Kupferberg, S.J., 2017. Variation in thermal niche of a declining river-breeding frog: From counter-gradient responses to population distribution patterns. *Freshwater Biology*, 62(7), pp.1255-1265.

Carlander, K.D. 1969. Handbook of freshwater fishery biology. Iowa State University. Gast, T. 2004. Pratville Intake Modification and Potential Impacts to Lake Almanor Fishery Study. June. Interim Report. Arcata, CA.

Fischer, J.R. 2012. Characterizing lentic fish assemblages and community-environment relationships: an evaluation of natural lakes and reservoirs in Iowa, USA. Graduate Theses and Dissertations. 12854 Jones & Stokes. 2004. Simulation of temperature and dissolved oxygen in Lake Almanor, California, using the CE-QUAL-W2 water quality model. March. Final Draft. (J&S 03-223.) Sacramento, CA.

Hayes D. B., C. P. Ferreri, and W. W. Taylor. 1996. Active fish capture methods. Pages 193– 220

Hubert, W. A. 1996. Passive capture techniques. Pages 157–192

Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Lytle, D.A., Miller, S.W., Dibble, K.L., Kortenhoeven, E.W., Metcalfe, A.N. and Baxter, C.V., 2016. Flow management for hydropower extirpates aquatic insects, undermining river food webs. *BioScience*, 66(7), pp.561-575.

Kupferberg, S.J. 1996. Hydrologic and geomorphic factors affecting conservation of a river breeding frog (*Rana boylii*). *Ecological Applications* 6(4): 1,332–1,344.

Kupferberg, Sarah; Alessandro Catenazzi; Mary Power. (University of California, Berkeley). 2011a. The Importance of Water Temperature and Algal Assemblage for Frog Conservation in Northern California Rivers with Hydroelectric Projects. California Energy Commission. Publication number: CEC-500-2014-033.

Kupferberg, S.J., Lind, A.J., Thill, V. and Yarnell, S.M., 2011b. Water velocity tolerance in tadpoles of the foothill yellow-legged frog (*Rana boylii*): swimming performance, growth, and survival. *Copeia*, 2011(1), pp.141-152.

Kupferberg, S.J., Palen, W.J., Lind, A.J., Bobzien, S., Catenazzi, A., Drennan, J.O.E. and Power, M.E., 2012. Effects of flow regimes altered by dams on survival, population declines, and range-wide losses of California river-breeding frogs. *Conservation Biology*, 26(3), pp.513-524.

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

Kupferberg, S.J., Palen, W.J., Lind, A.J., Bobzien, S., Catenazzi, A., Drennan, J.O.E. and Power, M.E., 2012. Effects of flow regimes altered by dams on survival, population declines, and range-wide losses of California river-breeding frogs. *Conservation Biology*, 26(3), pp.513-524.

Lind, A.J. 2005. Reintroduction of a declining amphibian: Determining an ecologically feasible approach for the foothill yellow-legged frog (*Rana boylii*) through analysis of decline factors, genetic structure, and habitat associations. Doctoral dissertation. University of California, Davis, CA.

Murphy and D. W. Willis, editors. 1996 Fisheries techniques, second edition. American Fisheries Society, Bethesda, Maryland.Olden, J.D. and Naiman, R.J. (2010), Incorporating thermal regimes into environmental flows assessments: modifying dam operations to restore freshwater ecosystem integrity. *Freshwater Biology*, 55: 86-107. doi:10.1111/j.1365-2427.2009.02179.x

P. Schneider, S. J. Hook, R. G. Radocinski, G. K. Corlett, G. C. Hulley, S. G. Schladow, and T. E. Steissberg3. 2009. Satellite observations indicate rapid warming trend for lakes in California and Nevada. *Geophysical Research Letters*, Vol. 36, L22402, doi:10.1029/2009GL040846, 2009.

Pope, K. L., and D. W. Willis. 1996. Seasonal influences of freshwater fisheries sampling data. *Reviews in Fisheries Science* 4:57–73.

State Water Resources Control Board (State Water Board). 2020. Revised Draft Environmental Impact Report for the Upper North Fork Feather River Hydroelectric Project FERC Project No. 2105. State Clearinghouse No. 2005082122Steel, AE, Peek, RA, Lusardi, RA, Yarnell, SM. Associating metrics of hydrologic variability with benthic macroinvertebrate communities in regulated and unregulated snowmelt-dominated rivers. *Freshwater Biology* 2018; 63: 844– 858. <https://doi.org/10.1111/fwb.12994>.

Stetson. 2009. Level 3 Report. Analysis of Temperature Control Alternatives Advanced From Level 2 Designed to Meet Water Quality Requirements and Protect Cold Freshwater Habitat Along the North Fork Feather River.

Wheeler, C., Bettaso, J., Ashton, D. and Welsh, H., 2013. Effects of water temperature on breeding phenology, growth and timing of metamorphosis of foothill yellow-legged frogs (*Rana boylii*) on the mainstem and selected tributaries of California's Trinity River-2004-2009. US Forest Service, Redwood Sciences Laboratory and US Fish and Wildlife Service: Arcata, California.

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

#### **I. Introduction**

Following a review of the analysis performed by State Water Resources Control Board (SWRCB), PG&E has concluded that the SWRCB took basic, one and two dimensional models and tried to use them for a purpose beyond the models' functionality. PG&E does not refute all studies done in support of the Project, but is concerned that the water temperature models in question were not designed to evaluate the specific changes required within Condition 6.

PG&E acknowledges that some of these early studies were used to evaluate the minimum instream flows (MIFs) defined under Condition 1, which PG&E has accepted as part of the Settlement Agreement. These MIFs represent relatively minor changes to existing conditions, which these models were shown to reliably reproduce. Therefore, the use of these models to evaluate MIFs (as presented in the FEIS) is appropriate as Lake Almanor dynamics would not change significantly with MIFs prescribed in Condition 1.

However, the changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence Lake Almanor dynamics. The SWRCB's use of the modeling studies in this situation is not reliable. PG&E's specific concerns with the SWRCB's use of the model for Condition 6 are summarized in this section.

Studies performed during the CEQA process and included within the Revised Draft EIR (RDEIR) used models that represented the best available science at the time of their development and use. These models were sufficient to study the baseline conditions as they were shown to reproduce observed conditions well. However, the SWRCB inappropriately used these models to justify major changes to Lake Almanor operations (Condition 6). Lake Almanor is a large geometrically complex lake and studies performed in the development of the RDEIR used

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

simplified 1-dimensional (MITEMP<sup>1</sup>) and 2-dimensional (CE-QUAL-W2<sup>2</sup>) models. While these models have an appropriate scientific foundation, they include several assumptions and simplifications to their core computations with relation to spatially varying hydrodynamic processes including spatial mixing, an important feature of Lake Almanor with major flows entering and leaving from different spatial regions, both horizontally and vertically. These assumptions and simplifications were made to achieve ease of use and faster computational times at the cost of accuracy of the model results, a desirable balance historically when computational resources were limited. Achieving accurate predictions of thermal profiles with these simplified models for physical modifications within Lake Almanor (thermal curtains as in Alternatives 1 and 2) is difficult, if not impossible. There is likely significant spatial variability in temperatures within Lake Almanor.

The SWRCB used models developed earlier by PG&E for different objectives and repurposed them to support Condition 6. Incorrect use of these models, perhaps, was the reason for the “exceedance” based evaluation approach that SWRCB employed as the models lacked the ability to compute continuous thermal profile for the entire system under each alternative. This approach inappropriately matches exceedance outflow temperatures to external conditions based on the definition of “normal”, “extreme”, etc. As such a significant subset of conditions is potentially ignored (e.g., “50% exceedance outflow water temperature” [defined as “normal conditions”] at Canyon Dam only modeled under normal meteorological and “normal” year release schedule).

---

<sup>1</sup> Massachusetts Institute of Technology’s Transient Temperature Prediction Model

<sup>2</sup> <http://www.ce.pdx.edu/w2/>

## Exhibit C

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

#### **II. Model Selection Issues**

The SWRCB used the MITEMP model to assess water temperature in Lake Almanor. As discussed in Bechtel (2002), the model assumed “the temperature gradient is predominantly in the vertical direction. The variation in the horizontal direction is minimal.” The basis of this assertion was the data collected in 2000 and 2001 (see **Error! Reference source not found.**), a potentially accurate assessment based on only two years of data. However, SWRCB’s Level 3 Report (Stetson 2009) continued to make this assertion that “temperature measurements at various locations throughout Lake Almanor showed that the lake exhibits a significant temperature gradient in the vertical direction but little variation in the horizontal direction during the summer months.”

The SWRCB’s use of MITEMP model for their analysis supporting Condition 6 has significant uncertainty that is exacerbated by the exceedance approach employed.

The DEIR also notes that “Lake Almanor shows little or no evidence of long-term trends, except for a recent finding by Schneider, et al. (2009) that the nighttime lake surface temperature appears to be warming at about  $0.15 \pm 0.03^{\circ}\text{C}$  per year since 1992.” If the findings in Schneider et al. (2009) are correct, then the Lake Almanor surface nighttime temperatures will have increased by  $1.3^{\circ}\text{C}$  since the Level 3 Report and  $2.2^{\circ}\text{C}$  since the Bechtel (2002) assessment.

#### **III. Modeling Approach Issues**

While the SWRCB ’s approach included the use of technically sound models, the SWRCB used the models for a purpose beyond their functionality. Consequently, the SWRCB’s analysis did not capture the complexity of the UNFFR system, and did not have the ability to provide the type of output necessary to evaluate the overall objectives related to improving the cold freshwater habitat. By using these models, the SWRCB relied on inconsistent methodology (using different models for Lake Almanor) and developed an assessment approach that lacked comprehensiveness.

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

The approach consisted of scenarios (exceedance levels for outflow temperatures) that are, without further information from SWRCB, not comprehensive. The SWRCB's scenarios for each alternative consisted of comparing temperature profiles under different outflow temperature exceedance levels (maximum, 10%, 25% and 50%) for different water year types. The SWRCB, based on the years and their water year types used for these exceedance levels, further defined them as "normal conditions" (50%), "reasonable extreme conditions" (25%) and "extreme conditions" (10%). Lacking additional details, these were then matched with similar flow and meteorological conditions. An example is that the 50% exceedance outflow water temperature was matched with normal meteorological conditions with dam releases corresponding to the "normal" year release schedule. Similar matching and use of data was applied for downstream reaches. This approach of scenario development is unable to represent conditions observable in the future. Using scenarios developed by simply matching exceedance levels to different water year type conditions (meteorology and flows) is inappropriate. SWRCB developed scenarios that only represent a subset of potential observable conditions.

Stetson (2009) indicates that a major source of inflow to Lake Almanor, especially colder inflow, are springs in the lake. The SWRCB intends to use this cold flow for downstream temperature reductions. A water balance approach was used to estimate the quantity of flow from the cold spring. The water balance included the two major gaged inflows to Lake Almanor (North Fork Feather River at Chester and Hamilton Branch), outflows (Prattville and Canyon Dam) and the change in lake storage to estimate the unknown amount of cold spring flows entering Lake Almanor. PG&E estimates that a part of the inflow entering Lake Almanor is ungaged surface runoff. These flows that are warmer than the cold springs in the lake, are likely captured as the calculated cold spring flows leading to overestimation of the availability of cold water within Lake

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

Almanor. Therefore, it is likely that the model overestimated the availability of cold water within Lake Almanor.

In addition to the potential overestimation of cold water availability within Lake Almanor, the supplemental flows would have a varying effect on the downstream reaches. The temperature profiles within Lake Almanor vary year to year and also within a year resulting in a large range of temperatures for the supplemental flows. At times, depending on the year type and the time of year, there may negligible to no cold water available within Lake Almanor resulting in almost no cooling effects downstream at the cost of lost power generation, and potential further depletion of suitable cold freshwater habitat. The SWRCB's assessment does not estimate the effect of all cases in all water year types. For example, the SWRCB's assessment under the extreme cases (maximum and 10% exceedance) only uses the dry/critically dry year conditions (meteorology and normal), but does not evaluate such conditions occurring later in the year when the temperatures would be higher in a year type other than dry/critically dry. PG&E believes that the SWRCB's assessment of Condition 6 is not accurate and could result in detrimental impacts within the lake.

#### **IV. Summary**

PG&E has reviewed the various studies performed during the CEQA process and included within the Revised Draft EIR (RDEIR) that formed the basis of the Condition 6 in the WQC. PG&E found that while these studies were adequate for certain assessments, they do not meet the level of detail and comprehensiveness necessary to support significant changes to flows, and potentially significant capital expenditures, as part of the Condition 6. These studies use models that make assumptions related to the actual physical system that are not supported by the record. Similarly, these studies used a water balance approach to estimate spring flows (a primary source of cold water for Lake Almanor), and may have significantly overestimated these flows. The

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

modeling studies also developed a set of scenarios for the evaluation of various alternatives. Scenario selection should be comprehensive enough to provide bounding estimates of most, if not all, potential future conditions. The scenarios selected for these evaluations based on outlet temperature exceedance levels and their limited matching with the external conditions (meteorology and flows) only assessed a sub-set of potential observable conditions. The alternatives evaluation, therefore, is limited which is exacerbated by the fact that the supplemental flows required under Condition 6 do not have any appropriate temperature thresholds.

#### **V. References**

- Bechtel. 2002. MITEMP3 Model Calibration and Validation in 2000–2001, Lake Almanor and Butt Valley Reservoir.
- Jones & Stokes. 2004. Simulation of temperature and dissolved oxygen in Lake Almanor, California, using the CE-QUAL-W2 water quality model. March. Final Draft. (J&S 03-223.) Sacramento, CA.
- Stetson. 2009. Level 3 Report. Analysis of Temperature Control Alternatives Advanced From Level 2 Designed to Meet Water Quality Requirements and Protect Cold Freshwater Habitat Along the North Fork Feather River.

## **ENCLOSURE 2**

**PG&E COMMENTS TO SWRCB ON  
REVISED DRAFT EIR  
DATED JULY 7, 2020**

**BEFORE THE STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD**

**In the Matter of  
Water Quality Certification for the  
Upper North Fork Feather River  
Hydroelectric Project License**

**FERC Project No. 2105**

**PACIFIC GAS AND ELECTRIC COMPANY'S  
COMMENTS ON THE  
REVISED DRAFT ENVIRONMENTAL IMPACT REPORT  
FOR THE UPPER NORTH FORK FEATHER RIVER  
HYDROELECTRIC PROJECT LICENSE**

Annette Faraglia, Chief Counsel  
Law Department  
PACIFIC GAS AND ELECTRIC COMPANY  
77 Beale Street, B30A  
San Francisco, CA 94105  
Telephone: (415) 973-7145  
Email: [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com)

JO LYNN LAMBERT  
LAMBERT LAW  
300 East State Street, Suite 600  
Redlands, CA 92373  
Telephone: (909) 793-4942 or (415) 973-5248  
Facsimile: (909) 792-5150  
Email: [JLambertLaw@Outlook.com](mailto:JLambertLaw@Outlook.com)

*Attorneys for Pacific Gas and Electric Company*

Dated: July 7, 2020

**PACIFIC GAS AND ELECTRIC COMPANY'S  
COMMENTS ON THE  
REVISED DRAFT ENVIRONMENTAL IMPACT REPORT  
FOR THE UPPER NORTH FORK FEATHER RIVER  
HYDROELECTRIC PROJECT LICENSE**

**I. INTRODUCTION**

Pacific Gas and Electric Company (“PG&E”) contests the legitimacy of the Revised Draft Environmental Impact Report (“RDEIR”) issued by the State Water Resources Control Board (“State Water Board” or “Board”) on May 15, 2020 for PG&E’s Upper North Fork Feather River (“UNFFR”) Hydroelectric Project (“Project”).

On March 4, 2020, the State Water Board denied without prejudice PG&E’s latest request for water quality certification for the UNFFR Project. Rather than submit another request to the State Water Board, PG&E, on April 23, 2020, filed with the Federal Energy Regulatory Commission (“FERC”) a Petition for Declaratory Order Requesting Waiver of Water Quality Certification for the Project (“FERC Petition”). With no pending request for water quality certification before it, the State Water Board lacks discretionary authority over any aspect of PG&E’s Project and, therefore, is not authorized under the California Environmental Quality Act (“CEQA”) to issue any draft environmental document or proceed with review of the Project.

Even if the RDEIR had been validly issued, it is fundamentally flawed as an environmental review document under CEQA. It was founded on inappropriate State Water Board objectives, which, in turn, tainted the choice and analysis of alternatives. No preferred alternative is identified in the RDEIR, creating confusion as to what project is proposed by the Board. Mitigation establishing a new flow regime is improperly aimed at curing existing concerns in the watershed rather than reducing the identified impacts of the Proposed Project; it is so open-ended that virtually anything (including thermal curtains, flows above 250 cfs and “*any other temperature control measures*”) could be imposed without further CEQA review or Board approval. These elemental deficiencies are exacerbated by the State Water Board’s reliance on water temperature models that were repurposed, used beyond their functionality, and are otherwise unreliable to inform the analysis in the RDEIR. As a result, critical conclusions in the RDEIR are not based on substantial evidence.

PG&E provides these comments to preserve its rights and without waiving any claims, including, without limitation, the matters raised in the FERC Petition.

**II. The State Water Board Lacks Authority to Issue the RDEIR**

For this Project, the State Water Board has no pending request for water quality certification before it and, thus, no authority to issue a water quality certification. *See* PG&E’s Comments on the Draft Water Quality Certification (“WQC”) for the UNFFR Hydroelectric Project License filed June 15, 2020 in this proceeding, attached as Exhibit A and incorporated herein by reference (“PG&E draft WQC comments”), at 1-5.

With no discretionary approval authority over any part of the Project, the State Water Board lacks authority to conduct a CEQA review. CEQA review is triggered by a discretionary approval<sup>1</sup> and imposes obligations on an agency whenever it exercises its discretionary powers.<sup>2</sup> CEQA review must take place “before granting any approval of a project subject to CEQA.”<sup>3</sup> Without the ability to grant a discretionary approval, there is no “project” cognizable under CEQA.<sup>4</sup>

While the State Water Board *once* had discretionary approval authority over the Project, it failed to exercise that authority by not approving a water quality certification over nearly 18 years. PG&E’s last request for certification was denied by the State Water Board without prejudice, and PG&E (for the first time in this proceeding) did not renew its request. The State Water Board’s historic authority provides no basis for the Board to issue the RDEIR now, when it no longer has jurisdiction over the Project.

### **III. The RDEIR is Fundamentally Flawed Because It Analyzes a New, De Facto Water Board Plan Rather than Environmental Impacts associated with PG&E’s Project**

Even if the RDEIR had been properly issued in a pending State Water Board proceeding (which it was not), it would nevertheless be legally deficient under CEQA. As explained below, the State Water Board’s misguided identification of Project objectives, inappropriate selection of alternatives, and misunderstanding of the legal scope of allowable mitigation has resulted in a CEQA review document that evaluates, and mitigates for, a different project.

#### **A. The State Water Board Incorrectly Identified Project Objectives**

The “Proposed Project” in the RDEIR is the continued operation of PG&E’s UNFFR hydroelectric facilities as described in PG&E’s FERC relicensing application and as modified by the Project 2105 Relicensing Settlement Agreement (“2004 Settlement Agreement”), federal agency mandatory conditions, and FERC’s Staff Alternative.<sup>5</sup> PG&E agrees that this accurately describes the Project before the State Water Board for purposes of CEQA review.

The State Water Board acknowledged PG&E’s objectives for this Proposed Project in Section 3.4 of the RDEIR, stating:

---

<sup>1</sup> Pub. Res. Code, § 21080; *see also Guidelines for Implementation of the California Environmental Quality Act*, Cal. Code Regs., tit. 14, §§ 15000, *et seq* (“Guidelines”), §§ 15002, subd. (i), 15040.

<sup>2</sup> Guidelines, § 15040, subd. (a) (“CEQA is intended to be used in conjunction with discretionary powers granted to public agencies by other laws.”)

<sup>3</sup> Guidelines, § 15004, subd. (a).

<sup>4</sup> See Guidelines, §§ 15378, subd. (a) (project under CEQA not undertaken or funded by a public agency requires issuance of “a lease, permit, license, certificate, or other entitlement for use”), 15268 (ministerial projects are exempt from CEQA).

<sup>5</sup> See RDEIR, § 3.4; *see also*, e.g., §§ 1.2; 7.2.

PG&E developed its proposed project to ensure that it could meet its objectives for the UNFFR Project:

1. Continue generating electricity for the term of the new license to produce electric power from a renewable source for its customers.
2. Continue providing power to help meet both short- and long-term needs for power and ancillary services in PG&E's service area and within the California Mexico Power Area.
3. Implement measures to conserve energy, mitigate damage to fish and wildlife (including related spawning grounds and habitat), provide recreational opportunities, and preserve other aspects of environmental quality.<sup>6</sup>

These Project objectives should have been addressed in the RDEIR. Instead, the State Water Board created another set of objectives – not for the Project, *per se*, but to promote separate, broader goals for the watershed. Making no bones about these being “*the State Water Board’s objectives*” (emphasis added), the Board’s objectives include not only the legitimate Project aims of ensuring compliance with water quality objectives in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (“Basin Plan”)<sup>7</sup> and reasonable protection of beneficial uses,<sup>8</sup> but also the following inappropriate measures (numbered as in the RDEIR):

3. *Improve* water quality in the North Fork Feather River downstream of Canyon Dam, while protecting the cold-water beneficial uses associated with Lake Almanor.
4. Effectively and reliably *reduce water temperatures* in the North Fork Feather River below Canyon Dam during the summer months to achieve a preliminary temperature target of 20°C, consistent with temperature objectives identified in the Rock Creek–Cresta Relicensing Settlement Agreement.
6. Ensure that controllable factors (e.g., flow release volumes, timing, and durations) that could *reduce water temperature* in the North Fork Feather River below

---

<sup>6</sup> RDEIR, § 3.4, p. 54.

<sup>7</sup> Central Valley Regional Water Quality Control Board (fifth edition, 2018); note that the Project meets the objectives in the Basin Plan with respect to water temperatures, given that the Basin Plan requires “a. At no time or place shall the temperature of intrastate waters be increased more than 5°F [2.8°C] above natural receiving water temperature; and, b. The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration does not adversely affect beneficial uses.” The Project fulfills these requirements. See PG&E draft WQC comments at 7-8.

<sup>8</sup> RDEIR, § 1.3, p. 24, objectives 1 and 2.

Canyon Dam are not overridden by uncontrollable physical factors (e.g., lack of river shading, air temperature, etc.).<sup>9</sup>

Each of these objectives goes beyond reframing PG&E’s Project objectives to describe broader watershed objectives unrelated to the Project.

As to Objective 4, nowhere in the Basin Plan is there a temperature target of 20°C for the North Fork Feather River.<sup>10</sup> The settlement agreement for Rock Creek-Cresta is exactly that – a settlement agreement limited to relicensing that project. The State Water Board’s attempt to transform this temperature target into a CEQA objective in a different proceeding, beyond the settlement agreement *for this Project* and without any qualifiers like those in the Rock Creek-Cresta settlement, is highly inappropriate.

Together, these State Water Board objectives represent a new plan for the area – essentially a *de facto* amendment to the Basin Plan. While the State Water Board has broad authority to set water quality rules and standards,<sup>11</sup> that authority must be exercised in a different forum and must comply with the procedural requirements for amending a water quality control plan.<sup>12</sup> At issue here is approval of a water quality certification for renewal of a single, existing license. The Project objectives *for this Project* must be tailored to this Project, not to a grander scheme.

## B. Faulty Objectives Led to Faulty Alternatives

Under CEQA, project objectives – along with project impacts – are used to formulate project alternatives. When the state legislature enacted CEQA, it articulated the policy reason that a lead agency would analyze alternatives and impose mitigation measures:

[I]t is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects . . . .<sup>13</sup>

---

<sup>9</sup> The remaining objective aims to ensure that the Project “is technologically feasible, reliable, and maintainable,” and “[c]an be implemented under current legal obligations and logistical constraints” (*id.*, objective 5) – all reflecting inherent legal requirements under CEQA for feasibility and lead agency authority but nevertheless acknowledging limits to the State Water Board’s authority.

<sup>10</sup> See *gen’ly* Basin Plan and PG&E draft WQC comments, Exh. A, at 6-8, 10-11.

<sup>11</sup> See *United States v. State Water Resources Control Bd.*, 182 Cal.App.3d 82 (1986), 109-110; citing the Porter-Cologne Water Quality Control Act (Porter-Cologne Act; § 13000 et seq.) (Stats. 1969, ch. 482).

<sup>12</sup> See *State Water Resources Control Bd. v. Office of Admin. Law* 12 Cal.App.4th 697 (1993), 701-702 (water quality control plans are quasi-legislative and amendments to such plans are regulations that may not be adopted without following the procedures set forth in the Administrative Procedure Act (“APA”), Gov. Code, §§ 11340 et seq., at 11370).

<sup>13</sup> Pub. Resources Code, § 21002 (*emphasis supplied*).

In furtherance of this policy, a lead agency under CEQA must prepare an Environmental Impact Report (“EIR”) if there is substantial evidence that the project may have a significant effect on the environment.<sup>14</sup> An EIR, in turn, must analyze alternatives to the proposed project that “would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.”<sup>15</sup> As this regulatory language indicates, the selection of legally adequate alternatives is founded on a proposed project’s 1) objectives and 2) significant effects.

The State Water Board deviated from these clear CEQA precepts when it inserted its own non-Project objectives into the EIR. Acknowledging that “the Proposed Project represents small changes to the current operation of the UNFFR Project” that are “designed to improve the environment and improve access and enjoyment of the resources contained within the project,”<sup>16</sup> the Board described a different focus for its alternatives analysis:

The alternatives evaluated are *intended to further improve the temperature conditions* in the North Fork Feather River *beyond the Proposed Project* while maintaining the cold water habitat in reservoirs.<sup>17</sup>

The Board’s conclusion is equally clear in its focus on its own objectives:

In summary, the proposed project would have the fewest significant environmental impacts relative to baseline conditions, but it would also be the least effective in achieving the State Water Board’s objective of reducing water temperatures in the North Fork Feather River to protect cold freshwater habitat.<sup>18</sup>

Nowhere in the alternatives assessment did the State Water Board focus on the *Project’s* objectives,<sup>19</sup> which included power production, a beneficial use identified in the Basin Plan, and the collaborative balancing of beneficial uses done by all of the stakeholders in reaching the 2004 Settlement Agreement.

The California Supreme Court rejected this type of agency overreach in *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (“*In re Bay-Delta*”), where it declared:

The Court of Appeal erred also in failing to sufficiently distinguish between preexisting environmental problems in the Bay-Delta, on the one hand, and adverse environmental effects of the proposed CALFED Program. Under CEQA, the range of alternatives that

---

<sup>14</sup> CEQA Guidelines, § 15064, subd. (a).

<sup>15</sup> CEQA Guidelines, § 15126.6, subd. (a) (*emphasis supplied*).

<sup>16</sup> RDEIR, § 7.3, at 377-378.

<sup>17</sup> *Id.*, at 378 (*emphasis supplied*).

<sup>18</sup> *Id.*, at 388 (*emphasis supplied*).

<sup>19</sup> See gen’ly RDEIR, ch. 7.

an EIR must study in detail is defined in relation to the adverse environmental impacts of the proposed project.<sup>20</sup>

Here, the State Water Board’s focus should have been on addressing adverse impacts of the Proposed Project rather than on fixing existing environmental problems related to downstream cold water habitat.

Applying its non-Project objectives, the State Water Board developed inappropriate alternatives. Section 15126.6 of the CEQA Guidelines specifies that “[t]he alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.”<sup>21</sup> Although the State Water Board identified several potentially-significant impacts of the proposed Project before mitigation,<sup>22</sup> the alternatives were not selected to “avoid or substantially lessen” the Project’s significant environmental impacts.<sup>23</sup> Instead, all three alternatives – each of which included the proposed Project plus additional requirements<sup>24</sup> – were aimed at further improving downstream cold water habitat beyond the improvement offered by the proposed Project, in accordance with the State Water Board’s objectives.

No other objectives were considered in the selection of alternatives. Although the State Water Board listed among its objectives two concerning the protection of beneficial uses in the Basin Plan “including water supply, power, recreation, warm and cold freshwater habitat, warm and cold water spawning, and wildlife habitat,”<sup>25</sup> cold water habitat downstream of Canyon Dam drove the choice of alternatives. None of the selected alternatives would improve power generation to meet short- and long-term power needs (a genuine Project objective<sup>26</sup>), or improve other beneficial uses such as water supply, recreation, warm freshwater habitat or spawning, or

---

<sup>20</sup> *In re Bay Delta*, 43 Cal.4th 1143, 1167 (2008).

<sup>21</sup> CEQA Guidelines, § 15126.6, subd. (f) (*emphasis supplied*).

<sup>22</sup> For example, the RDEIR identified as a Project impact a decrease in cold water habitat in Lake Almanor and the resultant impacts to fisheries, particularly in dry and critical dry years (RDEIR, Ch. 5.5, p. 188). However, even the questionable modeling in the RDEIR indicates that Alternatives 1 and 2 have a greater reduction in habitat during critical dry years and Alternative 3 has similar impacts to the Project. (See RDEIR, Ch. 5.5, Table 5.5-2) The alternatives are not designed to address the minor impacts to Lake Almanor purportedly caused by the Project.

<sup>23</sup> *Id.*; see also RDEIR, § 3.5, at 68 (the only Project impacts were due to improvements that stakeholders supported, so the State Water Board declined to evaluate those impacts and instead “focused on the development of alternatives that would address the issue of elevated temperatures in the North Fork Feather River that was left unresolved by the Settlement Agreement.”)

<sup>24</sup> Alternative 1 included the Proposed Project plus thermal curtains at 2 locations and increased summertime releases up to 250 cfs. Alternative 2 included the Proposed Project plus thermal curtains at 2 locations. Alternative 3 included the Proposed Project plus increased summertime releases up to 250 cfs. See, e.g., RDEIR, § 7.2.

<sup>25</sup> See RDEIR, § 1.3, p. 24, objectives 1 and 2.

<sup>26</sup> See RDIER, § 3.4, p. 54.

wildlife habitat.<sup>27</sup> The State Water Board’s selection of alternatives ignored all beneficial uses except downstream cold water habitat and dismissed the collaborative balancing of beneficial uses done by all stakeholders in reaching the 2004 Settlement Agreement.

The State Water Board continued its misguided interpretation of CEQA by analyzing its alternatives with the wrong yardstick. The Proposed Project would not increase water temperatures in the North Fork Feather River.<sup>28</sup> Rather, the Project would decrease water temperatures downstream by releasing additional cooler flows through Canyon Dam in accordance with the 2004 Settlement Agreement; the RDEIR concluded that the reduction of water temperatures in the North Fork Feather River below Canyon Dam and Belden Dam resulted in no impact (Beneficial).<sup>29</sup> Because the Proposed Project would have a positive impact on temperatures downstream of Lake Almanor by providing cooler water than under baseline conditions, there is no “significant effect of the project” that would be avoided or substantially lessened by – and thus no legal justification under CEQA for – proposing *only* project alternatives that attempt to further reduce downstream water temperatures.

The State Water Board’s conclusions were shaped entirely by its erroneous reliance on non-Project objectives. According to the RDEIR, the Proposed Project “would have the fewest significant impacts relative to baseline conditions.”<sup>30</sup> Nevertheless, it “would also be the least effective in achieving the State Water Board’s objective of reducing water temperatures in the North Fork Feather River to protect cold freshwater habitat.”<sup>31</sup> Alternative 1 would have the most significant impacts, but would “be the most effective in reducing water temperatures in the North Fork Feather River” and have temperature benefits “substantially greater than the proposed project.”<sup>32</sup> Alternatives 2 and 3, according to the State Water Board, would avoid some of the significant impacts of Alternative 1 and have temperature benefits “greater than the proposed project, but not as great as Alternative 1.”<sup>33</sup> Alternatives 1 and 2 would have significant and unavoidable impacts on Aesthetics and Recreation.<sup>34</sup> The RDEIR concluded that Alternative 3 “strikes a balance between improved cold water habitat in the Upper North Fork Feather River and loss of cold water habitat in Lake Almanor and Butt Valley Reservoir.”<sup>35</sup>

---

<sup>27</sup> See RDIER, § 7.3.

<sup>28</sup> See RDIER, § 5.5, Impact WQ-3, p. 190-191.

<sup>29</sup> *Id.* The RDEIR concluded that the Proposed Project would reduce downstream temperatures from baseline by 8 percent in dry years and 6 percent in critical dry years over the entire reach for the entire summer.

<sup>30</sup> RDEIR, § 7.3, at 388.

<sup>31</sup> *Id.*

<sup>32</sup> *Id.*, at 388.

<sup>33</sup> *Id.*, at 389.

<sup>34</sup> *Id.*, at 378.

<sup>35</sup> *Id.*

The State Water Board then incorporated all three faulty alternatives into the draft Water Quality Certification (“draft WQC”), maintaining the focus on *further* reducing downstream temperatures to *improve* cold water habitat.<sup>36</sup>

In *Citizens for East Shore Parks v. State Lands Commission*, 202 Cal.App.4th 549 (2011) (“*East Shore Parks*”), involving a lease renewal for a marine terminal, the appellate court found that a wish to open up new recreational uses on the bay was not a valid reason to include an alternative that would remove an existing causeway and bury currently-exposed pipelines. The appellate court stated:

The final EIR identified potential significant impacts due to oil spills, but not due to impediment of recreation. Accordingly, the EIR did not need to address the causeway removal and buried pipeline alternative urged by plaintiffs, since it was directed at an asserted impact not identified in the EIR.<sup>37</sup>

Moreover, the court continued, given that the existing conditions included the causeway and exposed pipelines, “the final EIR correctly concluded the asserted impact on recreational uses was not a potential significant impact of the lease renewal project.”<sup>38</sup> The same analysis applies here, where PG&E’s license renewal project will have a positive, rather than negative, impact on downstream water temperatures. None of the alternatives put forward by the State Water Board to address this non-Project impact are legally supportable under CEQA.

The RDEIR did not expressly identify Alternative 3 – or any other alternative – as the preferred alternative or the project the State Water Board was selecting,<sup>39</sup> despite including all three alternatives in Condition 6 of the draft WQC. An EIR can be overturned if it analyzes a range of alternatives but fails to identify a preferred alternative as the project.<sup>40</sup> The alternatives analysis in the RDEIR concluded that Alternative 3 “strikes a balance between improved cold water habitat in the Upper North Fork Feather River and loss of cold water habitat in Lake Almanor and Butt Valley Reservoir” but stopped short of calling it the preferred alternative. The RDEIR is, in short, confusing and misleading. Without identifying the preferred alternative or a stable project, the public is left with a moving target, creating an obstacle to informed participation.<sup>41</sup>

The RDEIR also failed to identify the environmentally superior alternative, despite the State Water Board’s claim that the purpose of the alternatives comparison was to identify “the environmentally superior alternative that also achieves the project objectives listed in Section

---

<sup>36</sup> Draft WQC, Condition 6.

<sup>37</sup> 202 Cal.App.4<sup>th</sup> at 564.

<sup>38</sup> *Id.*

<sup>39</sup> Other than pointing out that Alternative 3 “strikes a balance,” no preferred alternative was identified (*see* RDEIR, § 7.3, at 389).

<sup>40</sup> *See Washoe Meadows Community v. Department of Parks & Recreation*, 17 Cal.App.5th 277, 288-289 (2017).

<sup>41</sup> *Washoe Meadows*, 17 Cal.App.5th, at 290.

1.3.”<sup>42</sup> CEQA requires an EIR to identify the environmentally superior alternative and discuss the facts that support that selection.<sup>43</sup> While the State Water Board concluded that the Proposed Project would have the fewest significant impacts, it did not identify the Project – or any of its alternatives – as the environmentally superior alternative.<sup>44</sup>

The draft WQC issued with the RDEIR incorporates Alternative 3 – but with an open-ended contingency provision that would also implement Alternatives 1 and 2 if Alternative 3 doesn’t reduce temperatures sufficiently.<sup>45</sup> Indeed, Condition 6 of the draft WQC would grant the State Water Board’s Deputy Director broad discretion to impose other requirements that were never considered in the CEQA review:

The Deputy Director may approve the Contingency Plan, with or without conditions, or *require the Licensee to evaluate or implement any other temperature control measures that the Deputy Director determines are feasible, reasonable, and necessary to meet the fisheries goals.*<sup>46</sup>

This open-ended language would effectuate an invalid end run around CEQA, inappropriately deferring formulation of the measures and allowing an unlimited number of changes to the project after approval to meet the State Water Board’s non-Project objectives.

### C. Much of the Mitigation in the RDEIR, Imposed as Conditions in the Draft WQC or as Separate Mitigation, Is Not Justified by Project Impacts

Each of the alternatives analyzed in the RDEIR included the Project as proposed *plus* measures to further reduce downstream temperatures (e.g., thermal curtains, releases up to 250 cfs). As explained above, these alternatives were then incorporated into the draft WQC in Condition 6, with releases up to 250 cfs under Alternative 3 being mandatory and the thermal curtains at 2 locations under Alternatives 1 and 2 (or other unnamed measures to reduce water temperature) permissible as a contingency. The RDEIR also identified measures specific to reducing the significant impacts of the alternatives: FS-1 (MIF during construction modifications to the low-level outlet) and RE-2 (relocating the Marvin Alexander Day Use Area if thermal curtains are installed). A third measure that would primarily reduce significant impacts of the alternatives, WQ-1 of the RDEIR, requires fish monitoring, augmented stocking of the cold water fishery in Lake Almanor, and adaptively managing Canyon Dam releases; most of its provisions were incorporated in Conditions 8 and 12 of the draft WQC. Finally, the RDEIR

---

<sup>42</sup> RDEIR, § 7.2, at 376. Note, however, that a lead agency cannot select the environmentally superior alternative based on the fact that it will more effectively address existing environmental problems. *See In re Bay Delta*, 43 Cal.4th at 1167-1168. Thus, the State Water Board could not choose an environmentally superior alternative because it would improve cold water habitat by reducing existing water temperatures if the Project did not adversely affect such temperatures.

<sup>43</sup> See CEQA Guidelines Section 15126.6(e)(2).

<sup>44</sup> See RDEIR, § 7.3, at 389.

<sup>45</sup> See Draft Water Quality Certification, Condition 6, subd. 6(D).

<sup>46</sup> *Id.*, emphasis supplied.

identified mitigation measures for the Project and the 3 alternatives associated with construction: GGS-1, WQ-8, BR 1-6, CR-2 a & b, TT-2, AQ-1 and NO-1.

Both the conditions of the draft WQC and the mitigation measures of the RDEIR are mitigation based on the analysis in RDEIR. As such, they are subject to the limitations of CEQA and constitutional law.

### **1. Alternatives 1-3 are Incorporated into the Draft WQC in Condition 6 and Constitute Mitigation that is Not Justified by Project Impacts**

As stated above, the State Water Board accurately identified PG&E's Proposed Project as the continued operation of PG&E's Upper North Fork Feather River hydroelectric facilities as proposed in PG&E's FERC relicensing application and as modified by 2004 Settlement Agreement, federal agency mandatory conditions and FERC's Staff Alternative.<sup>47</sup> The State Water Board also identified the baseline from which to assess Project impacts as existing conditions, which is consistent with CEQA requirements.<sup>48</sup>

The State Water Board departed from CEQA, however, by proposing conditions and mitigation measures in the RDEIR and the draft WQC that ignore both the baseline and Project impacts. CEQA authorizes a lead agency to impose mitigation only to address project impacts,<sup>49</sup> and provides no legal justification for forcing PG&E to implement measures to address existing problems within the local watershed unrelated to the Project. To be constitutionally valid, mitigation must be reasonably related to an impact *created by the Project*<sup>50</sup> and must be roughly proportional to that impact.<sup>51</sup>

The mitigation imposed by the State Water Board does not meet these constitutional prerequisites. As indicated in Table 7-1 in the RDEIR, the Proposed Project is already providing a beneficial impact on downstream water temperatures relative to the baseline, and there is no legal basis for the additional mitigation proposed by the State Water Board in Condition 6. Moreover, inclusion of this condition will have adverse impacts on Lake Almanor by reducing

---

<sup>47</sup> See RDEIR, § 3.4; see also, e.g., §§ 1.2; 7.2.

<sup>48</sup> The California Supreme Court has confirmed the basic rule that the baseline from which to measure Project impacts must be existing conditions. *See, e.g., Communities for a Better Environment v. South Coast Air Quality Management District*, 48 Cal.4th 310, 321-323 (2010) (“CBE v. South Coast”) (baseline must be based upon actual Physical conditions rather than conditions allowed by a plan or regulatory framework); *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, 57 Cal.4th 439, 448 (2013), (a different baseline than existing conditions would be allowed only “when necessary to prevent misinforming or misleading the public and decision makers”)).

<sup>49</sup> CEQA Guidelines, § 15041, subd. (a).

<sup>50</sup> See *Nollan v. California Coastal Commission* (1987) 483 U.S. 825, 834-837; *see also* CEQA Guidelines, §15126.4, subd. (a)(4).

<sup>51</sup> See *Dolan v. City of Tigard* (1994) 512 U.S. 374, 391; *see also* CEQA Guidelines, §15126.4, subd. (a)(4).

cold water habitat. It will adversely impact aquatic resources in the Seneca reach below Canyon Dam by making temperatures colder than optimal for salmonid species. And it will adversely impact aquatic resources in stream reaches downstream of Belden Dam by making temperatures colder than optimal for the current native fishery, including hardhead, which is a California and U.S. Forest Service special-status species. Condition 6 is not only unwarranted, but likely detrimental to several species that the Basin Plan seeks to protect.

## **2. Mitigation for Impacts Caused by the Alternatives Rather than the Proposed Project is Legally Unjustified When the Alternatives Do Not Address Project Impacts**

The State Water Board concluded that all three alternatives analyzed in the RDEIR had potentially significant impacts, only some of which could be mitigated.<sup>52</sup> In the areas of Aesthetics and Recreation, the State Water Board found that – unlike those of the Proposed Project – the impacts of both Alternatives 1 and 2 are significant and unavoidable. For impacts that could be mitigated or partly mitigated, the State Water Board proposed FS-1 (MIF during construction modifications to the low-level outlet), RE-2 (relocating the Marvin Alexander Day Use Area if thermal curtains are installed), and WQ-1 (Conditions 8 and 12) (requiring fish monitoring, augmented stocking of the cold water fishery in Lake Almanor as needed, and adaptively managing Canyon Dam releases). Because the alternatives did not address significant Project impacts, these measures do not address a significant impact caused by the Project and are not justified under CEQA.<sup>53</sup>

For example, Condition 8 of the draft WQC, requiring Lake Almanor fishery monitoring, was prompted by the anticipated adverse impact on cold water fish habitat in Lake Almanor created by Alternatives 1 and 3’s requirement to increase releases from Canyon Dam up to 250 cfs.<sup>54</sup> Condition 12 was added to mitigate the adverse impact on Lake Almanor’s cold water fish population caused by these releases.<sup>55</sup> The Project without Alternatives 1 and 3 – which is to say, the Proposed Project – would not require conditions 8 and 12.

Alternatives 1, 2 and 3 were all formulated “to further improve the temperature conditions in the North Fork Feather River *beyond the Proposed Project* while maintaining the cold water habitat in reservoirs.”<sup>56</sup> None were created to address Project impacts because the Project itself would improve UNFFR conditions by reducing downstream temperatures, while also balancing other beneficial uses. Therefore, any mitigation required to implement the alternatives does not, *a fortiori*, reduce significant impacts created by the Project and is not constitutionally sound.

---

<sup>52</sup> See *gen’ly* RDEIR, § 7.3.

<sup>53</sup> See CEQA Guidelines, §§ 15041, subd. (a); 15126.4, subd. (a)(4).

<sup>54</sup> See draft WQC, Condition 6 (effects of supplemental flows up to 250 cfs on Lake Almanor fishery to be studied and adaptively managed).

<sup>55</sup> See draft WQC, Condition 12.

<sup>56</sup> See RDEIR, § 7.3, at 378.

### **3. The State Water Board Failed to Identify Several Significant Impacts Caused by its Alternatives**

The alternatives selected by the State Water Board, and ultimately included as the Proposed Project in its draft WQC,<sup>57</sup> have other potentially-significant impacts that were not identified or analyzed by the State Water Board:

- Water Quality (FS-2): Alternatives 1 and 3 would cause a significant loss of cold-water habitat in Lake Almanor in dry years, which could result in an overall warming of Lake Almanor affecting the fishery and promoting algal blooms. Algal blooms resulting from warming have been identified in authoritative scientific literature<sup>58</sup> and could have significant biological, recreational, and aesthetic impacts. Human health could also be affected if microcystins, a class of neurotoxin, are produced by algal cyanobacteria in abundance. While the State Water Board has proposed to require PG&E to mitigate impacts to the recreational fishery by funding additional stocking of Lake Almanor, the State Water Board has not analyzed or proposed mitigation for other water quality effects or public health issues and, in any case, mitigation would be infeasible in a reservoir as large as Lake Almanor. For this reason, Alternatives 1 and 3 could result not only in significant, but significant and unavoidable, impacts due to algal blooms.
- Fisheries (FS-4): The State Water Board's Objective 4 is to reduce water temperatures to less than 20°C in the North Fork Feather River below Canyon Dam. Alternatives 1 and 3, intended to meet this objective, (1) would cause slower growth rates for fish and other aquatic resources in the Seneca reach by reducing already cool temperatures to levels below optimal for growth for rainbow trout, and (2) could displace and/or affect growth rates of sensitive transitional-zone native species in the NFFR, including hardhead. The State Water Board recognized thermal preferences for hardhead (>20°C for growth, and 24°C to 28°C for optimal physiological performance)<sup>59</sup> from the Belden reach but these impacts are dismissed as less than significant in the RDEIR<sup>60</sup> under the assumption that hardhead will migrate to Project reservoirs, a fact that is contradicted by the State Water Board's recognition that the presence of centrarchids within the reservoirs renders the reservoirs unsuitable as habitat.
- Cultural resources (CR-1 and CR-2): These impacts are dismissed as less than significant for Alternatives 1 and 2; however, the tribes considered the construction of

---

<sup>57</sup> See draft WQC, Condition 6, subd. (D).

<sup>58</sup> See Beaulieu, M., Pick, F. & Gregory-Eaves, I. Nutrients and water temperature are significant predictors of cyanobacterial biomass in a 1147 lakes data set. *Limnol. Oceanogr.* 58, 1736–1746 (2013); see also Kosten, S. et al. Warmer climates boost cyanobacterial dominance in shallow lakes. *Glob. Chang. Biol.* 18, 118–126 (2012).

<sup>59</sup> RDEIR, § 5.6 pg. 223.

<sup>60</sup> RDEIR, § 5.6 pg. 224.

the thermal curtains to be a significant impact in their comments on the 2014 DEIR; this is does not appear to be analyzed or resolved in the 2020 RDEIR.

- Climate change (CC-1): The RDEIR finds climate change impacts for the alternatives to be less than significant; however, a reduction in energy production from a carbon neutral source under the alternatives would potentially cause this generation to be replaced by a fossil fuel plant, resulting in a cumulative increase in carbon emissions and a potentially-significant impact affecting climate change.

#### **4. Other Mitigation is Not Justified By Any Project Impact, But Rather is Aimed at Carrying Out Unrelated State Water Board Objectives**

Conditions 5 (Gaging and Facilities Modifications), 13 (Recreation Facilities Management), 14 (Whitewater Recreation Flows), 16 (Roads), and 17 (Reintroduction of Anadromous Fish) of the draft WQC are also unwarranted because they do not reduce an impact created by PG&E’s Proposed Project. In each of these conditions, the State Water Board has inserted process requirements that are unnecessary and burdensome, adding additional controls that would make PG&E’s already-agreed on requirements and beneficial improvements more difficult and expensive to implement. *See also* PG&E comments on draft WQC, Exh. A, at 3, 5-7. These additional process requirements do not address Project impacts, and are not justified under CEQA.<sup>61</sup>

#### **IV. Substantial Evidence Does Not Support the State Water Board’s Water Temperature Analysis or Mitigation**

Even if the State Water Board had authority to issue the RDEIR (which it does not), and also had authority under CEQA to select the objectives, alternatives and mitigation described in the RDEIR (which it does not), the State Water Board’s reliance on inappropriate, repurposed and otherwise unreliable modeling calls into question the conclusions in the RDEIR and the resulting requirements in the draft WQC. CEQA requires that the analysis in an EIR be supported by “substantial evidence in the record,”<sup>62</sup> which “shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.”<sup>63</sup> Evidence that is “clearly erroneous or inaccurate” does not constitute “substantial evidence.”<sup>64</sup>

The State Water Board’s models used to evaluate the effect of various alternatives on temperatures in Lake Almanor and downstream reaches are clearly inaccurate and do not support the conclusions in the RDEIR. First, the State Water Board relied on existing models for the region and used them for purposes beyond the models’ functionality. While none of the models used by the State Water Board were available for a detailed review, PG&E experts found

---

<sup>61</sup> See fn 52-53.

<sup>62</sup> Guidelines, § 15091, subd. (b).

<sup>63</sup> Pub. Resources Code, § 21082.2.

<sup>64</sup> Guidelines, § 15384, subd. (a)

sufficient evidence in the available record to determine that the numerical modeling performed by the State Water Board was inappropriate and lacked technical rigor. The State Water Board applied simplified models that lacked the details necessary to appropriately analyze the complex processes influenced by the spatial and temporal complexity of the Lake Almanor and UNFFR system. These models are also not detailed enough to appropriately resolve the changes to these systems under the evaluated alternatives. In certain cases, the State Water Board's use of a model was inconsistent with the model developer's recommendations. Because the State Water Board used pre-existing models instead of developing a more comprehensive and integrated modeling framework, the overall assessment consisted of a patchwork of models to address different needs, often introducing inconsistencies. The model applications themselves have several gaps and assumptions that significantly compromise the reliability of these models. These and similar mistakes render the State Water Board's resulting conclusions highly questionable because they are not based on credible, substantial evidence in the record.

For a detailed, technical explanation of these concepts, *see* Exhibit C of PG&E draft WQC comments, in Exhibit A attached, and additional detailed comments concerning the modeling in Exhibit B attached. Resumes of the experts providing these comments are also included as an attachment to Exhibit B.

## **V. Comments on Specific Provisions of the RDEIR**

PG&E has additional concerns with the RDEIR, which are summarized in Exhibit C attached.

As stated above, PG&E is submitting these comments to preserve its rights and to provide information to the interested parties in this proceeding. Nevertheless, PG&E does not, by submitting this letter, waive its claim that the State Water Board has waived the opportunity to issue a water quality certification for this Project, or that the State Water Board lacks authority under CEQA to issue the RDEIR.

Respectfully submitted,

Annette Faraglia, Chief Counsel  
Law Department  
PACIFIC GAS AND ELECTRIC COMPANY  
77 Beale Street, B30A  
San Francisco, CA 94105  
Telephone: (415) 973-7145  
Email: [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com)

Jo Lynn Lambert  
LAMBERT LAW  
300 East State Street, Suite 600  
Redlands, CA 92373  
Telephone: (909) 793-4942 or (415) 973-5248  
Facsimile: (909) 792-5150  
Email: [JLambertLaw@Outlook.com](mailto:JLambertLaw@Outlook.com)

By: /s/ Jo Lynn Lambert  
JO LYNN LAMBERT

Attorneys for  
PACIFIC GAS AND ELECTRIC COMPANY

Dated: July 7, 2020

## **Exhibit A**

- 1) PG&E Comments dated June 15, 2020 on Draft Water Quality Certification
- 2) Exhibit A to June 15, 2020 Comments – Responses to Specific WQC Conditions
- 3) Exhibit B to June 15, 2020 Comments – Condition 6 Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery
- 4) Exhibit C to June 15, 2020 Comments – Condition 6 Water Temperature Management Program – Comments on Previous Modeling

**BEFORE THE STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD**

**In the Matter of  
Water Quality Certification for the  
Upper North Fork Feather Hydroelectric  
Project License**

**FERC Project No. 2105**

**PACIFIC GAS AND ELECTRIC COMPANY'S  
COMMENTS ON THE DRAFT WATER QUALITY CERTIFICATION  
FOR THE UPPER NORTH FORK FEATHER RIVER  
HYDROELECTRIC PROJECT LICENSE**

Annette Faraglia  
Chief Counsel, Hydro Generation  
Law Department  
PACIFIC GAS AND ELECTRIC COMPANY  
77 Beale Street, B30A  
San Francisco, CA 94105  
Telephone: (415) 973-7145  
Email: [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com)

Dated: June 15, 2020

*Attorney for Pacific Gas and Electric Company*

**BEFORE THE STATE OF CALIFORNIA**  
**STATE WATER RESOURCES CONTROL BOARD**

**In the Matter of**  
**Water Quality Certification for the**  
**Upper North Fork Feather Hydroelectric**  
**Project License**

**FERC Project No. 2105**

**PACIFIC GAS AND ELECTRIC COMPANY'S**  
**COMMENTS ON THE DRAFT WATER QUALITY CERTIFICATION**  
**FOR THE UPPER NORTH FORK FEATHER RIVER**  
**HYDROELECTRIC PROJECT LICENSE**

**INTRODUCTION**

On May 15, 2020, without a pending application before it, the Executive Director of the State Water Resources Control Board (“State Water Board” or “Board”) issued a Draft Water Quality Certification (“WQC”), in anticipation of a final WQC pursuant to Section 401 of the federal Clean Water Act (“CWA”), 33 U.S.C. § 1341, to Pacific Gas and Electric Company (“PG&E”) for the Upper North Fork Feather River Hydroelectric Project License, Federal Energy Regulatory Commission (“FERC”) Project No. 2105 (“Project”). On May 15, 2020, the Executive Director also issued a Revised Draft Environmental Impact Report (“Revised DEIR”) pursuant to the California Environmental Quality Act (“CEQA”), Pub. Resources Code, § 21000, *et seq.* PG&E submits these comments on the Board’s Draft WQC and the conditions contained therein. PG&E will submit separate comments on the Revised DEIR by the deadline established by the State Water Board.

PG&E has no pending application for WQC before the State Water Board. PG&E submitted its first request for certification for the Project on October 9, 2002. The State Water Board has refused to take action on PG&E’s repeated requests for certification for almost 18 years.

On March 4, 2020, the State Water Board denied without prejudice PG&E’s most recent request for certification, and PG&E has not submitted another request with the Board. Instead, on April 24, 2020, PG&E filed with the Federal Energy Regulatory Commission (“FERC”) a Petition for Declaratory Order Requesting Waiver of Water Quality Certification for the Project (“FERC Petition”).

As described in these comments, PG&E objects to the State Water Board’s authority to issue the WQC for the Project because there is no pending request for certification and the Board has waived its authority to issue certification. In addition, PG&E opposes Condition 6 in its entirety because it is not necessary for the Project to comply with water quality requirements and is not supported by the Board’s record. PG&E also opposes a number of conditions in the Draft WQC, because they are inconsistent with State law and the CWA; operationally problematic, vague, or infeasible to implement; redundant of measures proposed in the Settlement Agreement, the U.S. Department of Agriculture, Forest Service’s (“USFS”) Section 4(e) conditions, or FERC staff’s recommendations in the Final Environmental Impact Statement (“FEIS”); or address issues that are subject to the management authority of federal and State fish and wildlife agencies and do not specifically address water quality issues associated with Project operations. While PG&E submits these comments to preserve its rights, PG&E reserves all rights and, by making this filing, does not waive any rights including, without limitation, the matters raised in the FERC Petition.

## **COMMENTS**

### **A. The State Water Board Lacks Authority to Issue a Final WQC**

The State Water Board lacks authority to issue a final WQC pursuant to CWA Section 401 because there is no pending request for WQC from PG&E. The State Water Board’s authority to

issue WQC derives from Section 401 of the CWA, which imposes three procedural requirements on a State with respect to WQC, none of which have been satisfied by the Board in this case.

First, the CWA grants a State authority to issue a WQC only in response to a *request* by an applicant. 33 U.S.C. § 1341(a); 23 California Code of Regulations (“CCR”) § 3835(d). In the absence of such a request, a State has no authority to issue a WQC pursuant to Section 401 of the CWA or State regulations. *See* 23 CCR §§ 3838; 3860 (application must be filed under 23 CCR, § 3855(b) before it can be considered by the State Board). Further, States have no separate or independent authority to issue a Section 401 WQC under State law. While Section 401(d) contemplates the inclusion of conditions derived from “appropriate requirement[s] of State law,” 33 U.S.C. § 1341(d), such conditions are valid only if included in a lawfully issued and valid WQC under the CWA. In this case, because there is no pending request for WQC before the State Water Board, the Board does not have the authority under State or federal law to issue a final WQC in this proceeding pursuant to Section 401 of the CWA.

Second, the CWA requires a State to comply with public notice procedures in the case of all applications for certification, 33 U.S.C. § 1341(a)(1) (a State “shall establish procedures for public notice in the case of all applications for certification.”), and requires a State to “immediately” notify the U.S. Environmental Protection Agency (“EPA”) Administrator “upon receipt of such application.” *Id.* at § 1341(a)(2); 23 CCR § 3835(c). Since PG&E did not file a request for certification after the Board’s March 4, 2020 denial without prejudice of PG&E’s prior request for certification, the Board could not have complied with public notice requirements and the Board could not have delivered a copy of such a request to the EPA Administrator.

Third, the CWA allows a State to issue a WQC for a period of up to one year after a request for certification has been submitted by an applicant for a federal license or permit. 33 U.S.C.

§ 1341(a). The one-year period, which can be initiated only by the filing of a request by an applicant, is critical because the period determines when a State must act on a request for certification and whether certification has been waived. *Hoopa Valley Tribe v. FERC*, 913 F.3d 1099 (D.C. Cir. 2019) (“*Hoopa*”). Without a pending request for certification on file, there is no mechanism to determine whether the Board has complied with the mandatory one-year deadline established by Congress in the CWA.

#### **B. The State Water Board Has Waived Its Authority to Issue WQC**

Section 401 of the CWA provides that its certification requirement “shall be waived” if a state certifying agency “fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request.” 33 U.S.C. § 1341(a)(1). In addition, in *Hoopa*, the U.S. Court of Appeals for the D.C. Circuit held that tolling schemes, like the repeated annual withdrawal and resubmittal of requests for WQC for the same federal application, as occurred here, violates the statutory language in Section 401 of the CWA. *Hoopa*, 913 F.3d at 1105. *Hoopa* also holds that FERC acts arbitrarily and capriciously when it fails to find waiver where State certifying agencies attempt to toll the one-year deadline through mechanisms like the withdrawal and resubmittal scheme. *Id.* at 1104.

The State Water Board has waived its authority to issue a WQC pursuant to Section 401 of the CWA because it failed to act on PG&E’s pending requests for certification for almost 18 years. PG&E filed its first request for WQC with the Board on October 9, 2002, and has responded to annual notifications from the State Water Board by withdrawing and resubmitting its requests for WQC for the same federal application for the Project. Thus, under the express terms of Section 401 of the CWA and *Hoopa*, the State Water Board has waived its authority under Section 401 to

issue WQC for the Project. PG&E's pending FERC Petition seeks confirmation of the Board's waiver.

Because the Board has waived its authority under Section 401 of the CWA, any recommended license measures filed with FERC by the Board must be supported by the FERC record and consistent with the Federal Power Act ("FPA") in order to be included in the license. Where applicable, PG&E's substantive comments below identify conditions or portions of conditions that are inconsistent with the FERC record for the Project and/or are incompatible with the FPA.

**C. Conditions in the WQC that Modify the Flow Regime Are Not Appropriate or Required Under Either the Federal or State Law**

The conditions in the Revised DEIR that modify the flow regime, particularly Condition 6 (Water Temperature Management Program) and Condition 1 (Minimum Instream Flows), should be modified by the Board to be consistent with the Settlement Agreement and recommended by FERC staff in the FEIS. These conditions in the Draft WQC do not address any Project impact identified in the record of this proceeding; the flows and other actions required by these conditions are not necessary for Project discharges to comply with the CWA or water quality standards; and the conditions are inconsistent with the Board's and FERC's mandate to balance the beneficial uses of a waterway.

**1. The Proposed Conditions Do Not Have a Nexus to the Impacts of the Project**

While certifying authorities are authorized under the Clean Water Act to assure compliance with water quality standards, the State Board authority is constrained by U.S. constitutional mandates, which allow the Water Board to impose conditions on a project only if there is a direct causal relationship or "nexus" between the condition and a public need or burden created by the proposed project. *Nollan v. Cal. Coastal Com*, 483 U.S. 825, 837 (1987); *see also*

CEQA Guidelines § 15126.4(a)(4). The proposed conditions must be “related both in nature and extent to the proposed development’s impact. *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994). CEQA expressly incorporates these U.S. Constitutional mandates requiring an “essential nexus” and rough proportionality between the condition and an impact caused by the proposed Project. See CEQA Guidelines § 15126.4(a)(4). Thus, the record in the proceeding must support this essential nexus. In addition, EPA regulations make clear that a State’s Section 401 authority is limited to assuring that a discharge from the activity will comply with water quality requirements (40 Code of Federal Regulations (“CFR”), § 121.3), and this authority does not allow conditioning to address environmental issues in the watershed that are unrelated to the impacts of the proposed Project.

The State has failed to show how many of the proposed conditions, which operate to establish a new flow regime, are necessary to address Project impacts and ensure Project compliance with applicable water quality standards and water quality objectives. As described more fully below, the proposed Project will decrease temperatures compared to current conditions, thereby improving fish habitat while preserving and protecting the beneficial uses of hydroelectric power and water recreation. Therefore, the conditions proposed in the WQC, particularly the new supplemental flow regime requirements, have no direct causal relationship to the impacts associated with this Project and therefore are not supported by the record in this proceeding.

2. Several Conditions Are Not Necessary to Comply with the CWA or Water Quality Standards

The State has failed to establish that many of the proposed conditions in the Draft WQC, particularly Condition 6, are necessary to meet applicable water quality standards and objectives. The Water Quality Control Plan for the Sacramento and San Joaquin River Basins (“Basin Plan”) (Central Valley Regional Water Board 2018) designates the beneficial uses to be

protected along with the water quality objectives necessary to protect those uses. As identified in the Basin Plan, the existing beneficial uses for the North Fork Feather River include, among others, hydropower generation, contact recreation, canoeing and rafting, cold freshwater habitat, and cold spawning habitat. The existing beneficial uses for Lake Almanor include hydropower generation, contact recreation, warm and cold freshwater habitat, warm spawning habitat, and wildlife habitat.

The Draft WQC identifies the following applicable water quality objectives for water temperature:

- a. At no time or place shall the temperature of intrastate waters be increased more than 5°F [2.8°C] above natural receiving water temperature; and,
- b. The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration does not adversely affect beneficial uses.

The record shows that Project operations comply with these water quality objectives and thus there is no justification for the temperature-related conditions proposed in the Draft WQC. With respect to the first objective, the proposed operation of the Project, with the measures proposed in the Settlement Agreement and recommended by FERC staff in the FEIS, will not increase water temperatures. On the contrary, the Project will lower temperatures based on the Settlement Agreement minimum instream flows (“MIF”), which were established with State Board guidance to specifically provide “cooler water temperatures” compared to current conditions. Thus, the Project will *decrease* water temperature in the North Fork Feather River compared to baseline conditions and will not adversely impact water temperature.

The State Board’s rationale for instituting a completely new flow regime to address temperature is premised solely on the fact that the Settlement Agreement identified temperature as

a subject that was not resolved by the Settlement Agreement. (Draft WQC, p. 2). While there was disagreement over the extent to which additional measures were necessary to address temperature in the North Fork Feather River, the Board’s rationale ignores the substantial measures agreed to by signatories to the Settlement Agreement that would decrease temperatures compared to existing conditions, including MIF and pulse flows releases from Canyon Dam. Notably, the rationale for Condition 6 did not identify any violation of the applicable water quality objectives stated above. Indeed, the Draft WQC fails to identify how the Project would increase temperatures and violate applicable water quality objectives.

Similarly, Condition 6 is not required to meet the second identified water quality objective because the MIF established in the Settlement Agreement will serve to benefit identified beneficial uses, including Cold Freshwater Habitat, Spawning for cold water fisheries by improving baseline conditions. The Draft WQC acknowledges that modeling “shows periods with little or no suitable habitat under baseline conditions.” Draft WQC, p. 12. The Project will improve baseline conditions by implementing the MIF from the Settlement Agreement, as recommended in the FEIS, which is targeted to improve suitable habitat in both the North Fork Feather River and Lake Almanor. Thus, the Project will not adversely affect beneficial uses for Cold Freshwater Habitat, and the State Board has failed to show how the new flow regime required by Condition 6 is necessary to comply with state water quality standards and objectives.

### **3. Several Conditions Are Inconsistent with the Requirement to Balance Beneficial Uses Under State and Federal Law**

The measures adopted in the Settlement Agreement and recommended by FERC staff in the FEIS were negotiated to ensure that FERC could satisfy its mandate under Section 10(a) of the FPA to balance *all* relevant beneficial uses. The Board has a parallel obligation under State law, which requires the State Board to consider a balance of interests when implementing water

quality objectives and mandates that “the waters of the state shall be regulated to attain the highest water quality which is *reasonable*, considering *all demands* being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. *See California Water Code, § 13000.*

The proposed conditions mandating higher flows focus exclusively on cold water habitat to the exclusion of hydroelectric uses, water uses, recreational uses, fish habitat in Lake Almanor and the economic impacts that would result from instituting a new flow regime and associated adaptive management measures. By focusing exclusively on one beneficial use, the State Board ignored potential adverse effects on *other* identified beneficial uses such as hydropower generation and water recreation. *See Beneficial uses of North Fork Feather River, Central Valley 2009.*

Moreover, since waiver of certification authority has occurred already, any conditions submitted to FERC as recommendations must be consistent with Section 10(a) of FPA, under which FERC must balance numerous competing beneficial uses when issuing a license. FERC staff's recommendations in the FEIS, which are substantially consistent with the measures proposed in the Settlement Agreement, balance the need for hydropower generation, fish and wildlife (including habitat concerns, such as temperature), and recreation. Accordingly, not only are the proposed flow regime conditions unnecessary to ensure compliance with water quality standards, they would serve to adversely affect other beneficial public interests, such as hydroelectric power and water recreation.

**D. Condition 6 is Operationally Infeasible, Vague, and Inappropriately Supported by a Model Designed for a Different Purpose**

Condition 6 requires actions that create significant uncertainty with respect to Project costs; requires implementation of undefined fisheries goals that are inconsistent with the management

goals of State and federal fish and wildlife management agencies with respect to special-status species; and is supported by water temperature models that were not designed for the purpose for which they are being used by the Board. For these reasons, Condition 6 should not be included in a final WQC or should be modified to be consistent with the measures in the Settlement Agreement.

1. Operational Uncertainty for the Life of the License

Condition 6 is vague and introduces significant uncertainty to PG&E's operations. For example, the elements of adaptive management are not defined appropriately, leaving PG&E with significant lack of clarity on operations, compliance objectives and the metrics needed to initiate consultation on modifications to these conditions (*see, e.g.* 6(B) Supplemental Flow Reduction). These uncertainties are exacerbated by lack of appropriate goals, and preemptive implementation of conditions (without FERC approval), combined with State Water Board's reserved authority to require further changes without specific criteria on when such changes would be considered. Such provisions are inconsistent with recently promulgated regulations, 40 C.F.R. Part 121 (pending effectiveness), wherein EPA determined that Section 401 "does not provide authority for [the Board] to unilaterally modify a certification, either through certification conditions that purport to authorize the [Board] to reopen the certification in the future or through any other mechanism."

*See Clean Water Act Section 401 Certification Rule*, Final Rule, pg. 255 (pre-publication version issued June 1, 2020) (available at: <https://www.epa.gov/cwa-401/clean-water-act-section-401-certification-rule>).

2. Condition 6 May Harm Existing Fisheries

Condition 6 imposes a water temperature goal of < 20°C throughout the lower reaches of the North Fork Feather River, without identifying any clear fishery goal or any source for this

requirement in the Basin Plan. As discussed above, the flow measures in the Settlement Agreement and recommended by FERC staff in the FEIS will reduce water temperatures in the North Fork Feather River compared to existing conditions, and thus will satisfy the stated temperature objective in the Basin Plan. By failing to articulate or discuss a fishery goal for the temperature threshold in Condition 6, the Board has ignored potential impacts to the existing fishery caused by increased summer releases from Canyon Dam up to 250 cfs, including adverse effects to the native fishery and special-status species in the North Fork Feather River and to water quality and the fishery of Lake Almanor.

As discussed herein, State law requires the Board to balance beneficial uses by providing for the *reasonable* protection of such uses. Condition 6 fails to reasonably protect beneficial uses in Lake Almanor and beneficial uses, other than cold freshwater habitat, in the North Fork Feather River. Specifically, Condition 6(A), *Canyon Dam Supplemental Flows*, would increase releases from Canyon Dam up to 250 cfs for the purpose of reducing water temperatures to below a threshold of 20°C throughout the lower reaches of the North Fork Feather River. However, these releases are intended to achieve fishery goals that have not been defined and will not be defined until after implementing the release schedule (see Condition 6(C) *Fishery Performance Goals*) using data collected under Conditions 7 and 8 (*Water Quality Monitoring* and *Lake Almanor Fishery Monitoring*, respectively). The Board fails to recognize that setting specific metrics for fisheries is extremely challenging given the highly dynamic nature of fish communities, even under steady state conditions. Numerous studies have shown that fisheries can vary by a factor of two from year to year (Carlander 1969) even when sampled at the same site, using the same methods, and without any modification of flows between years.<sup>1</sup>

---

<sup>1</sup> Accurate assessment in lacustrine environments are particularly troublesome due to the biases associated with various sampling techniques and the extremely limited proportion of the total population that can be

The State Water Board includes Condition 6 *without* any expectation that the program will be successful at reducing temperatures in the NFFR to < 20°C (see Condition 6(D) *Feather River Temperature Contingency Plan*). The 20°C threshold would be met within the UNFFR Seneca Reach under the minimum instream flow schedule included in the draft WQC and Settlement Agreement.

The State Water Board adds Condition 6 *without* a full assessment of its impacts to the existing fishery, yet *with* the understanding that if successfully implemented, the program could have adverse effects to the native fishery and special-status species. The existing fishery in the NFFR includes a coldwater fishery upstream of Belden Dam. Below Belden Dam, the fishery is composed primarily of transitional zone species (warmer water fish of the hardhead/ pikeminnow/ sucker assemblage), including special status species hardhead (CA and USFS Species of Concern) and foothill yellow-legged frog (CA Threatened). If the condition were to be successful at maintaining temperatures <20°C downstream through much of the Cresta Reach, the condition could result in adverse effects to the existing fishery (including special status fish and amphibians). Exhibit B describes these points in more detail as well as describes the existing fisheries in Lake Almanor and downstream reaches (Seneca, Belden, Rock Creek Dam, and Cresta Dam) of the NFFR.

### 3. The State Water Board Used Models For Purposes Beyond Their Functionality to Support Condition 6

The Board's assessment fails to support the Board's assertions that Condition 6 would protect the water quality and biological integrity of the recreational fishery in Lake Almanor because the models relied on by the Board were not designed to evaluate significant changes to

---

captured (Fischer, J.R 2012; Murphy and Willis 1996, including chapters by Hayes et al. 1996, Hubert 1996; Pope and Willis 1996). See full references in Exhibit B.

existing operations. PG&E does not take issue with all studies done in support of the new license, and acknowledges that some of these early studies were also used to evaluate the minimum instream flows (MIFs) defined under Condition 1, which PG&E has accepted as part of the Settlement Agreement. However, these MIFs represent relatively minor changes from the existing conditions, and these models were shown to reliably reproduce existing conditions. Therefore, the use of these models to evaluate MIFs (as presented in the FEIS) is appropriate as the Lake Almanor dynamics would not change significantly with these MIFs. In contrast, the changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence the Lake Almanor dynamics. PG&E's specific concerns with these models and their use for Condition 6 are summarized in this section.

The studies performed as part of the development of the Revised DEIR used simplified 1-dimensional (MITEMP<sup>2</sup>) and 2-dimensional (CE-QUAL-W2<sup>3</sup>) models. These models were based on assumptions and simplifications to achieve ease of use and faster computational times for use in particular cases where the waterbody has simplified geometry (long and narrow) and has limited spatially varying mixing (minimal flows from different sides). They were not designed to provide accurate results for predicting thermal profiles for physical modifications (e.g., thermal curtains as in Alternatives 1 and 2) within a large, geometrically-complex lake like Lake Almanor that exhibits spatial variability in temperatures. *See Exhibit C for a more-detailed explanation.*

The State Water Board used the existing models developed earlier by PG&E for different objectives and re-purposed them to support Condition 6. Because the SWRCB used these models in an inappropriate manner, the results are unreliable. This flawed approach is likely the reason for the “exceedance”-based evaluation approach the State Water Board employed, as the re-

---

<sup>2</sup> Massachusetts Institute of Technology’s Transient Temperature Prediction Model

<sup>3</sup> <http://www.ce.pdx.edu/w2/>

purposed models lacked the ability to develop a continuous thermal profile for the entire system under each alternative. This approach inappropriately matches temperature exceedance outflow temperatures to external conditions based on the definition of “normal,” “extreme,” etc., thus failing to capture a significant subset of conditions.<sup>4</sup> As a result, the Board did not account for spatial variability in temperature in Lake Almanor, overestimated cold water availability within Lake Almanor, and improperly assessed the temperature of water released from Canyon Dam for downstream temperature reduction (see Exhibit C). The Board’s flawed use of the models to require significant changes to PG&E operations is inappropriate because it has resulted in Condition 6, which imposes requirements that are well beyond the balancing of beneficial uses required under federal and State law and agreed to in the Settlement Agreement. The Board cannot fulfill its responsibilities to balance all beneficial uses by re-purposing models to use them in a manner for which they were not designed.

#### **E. Additional Conditions in the Draft WQC Are Beyond the Scope of the Board’s Authority**

The FPA preempts State authority over FERC-jurisdictional hydroelectric projects, except in very limited circumstances, such as a State’s authority over proprietary rights in water. *See 16 U.S.C. § 821; First Iowa Hydro-Electric Cooperative v. FPC*, 328 U.S. 152, 176 (1946). Section 401 of the CWA provides a narrow exception to FERC’s exclusive authority with respect to water quality issues. However, the Board’s authority over water quality issues is “not unbounded” because it is limited to imposing conditions related to effluent limitations and requirements of State law that address water quality issues. *See PUD No. 1 of Jefferson County v. Wash. Dept. of*

---

<sup>4</sup> For example, it suggests that the “50% exceedance outflow water temperature” (defined as “normal conditions”) at Canyon Dam only occurs under normal meteorological and “normal” year release schedule, when in fact these outflow water temperature levels could occur in dry and wet year conditions (see Exhibit C).

Ecology, 511 U.S. 700, 712 (1994); *see also* 40 C.F.R. § 121.3 (pending effectiveness) (the scope of a CWA section 401 certification is limited to assuring that a discharge from a Project will comply with specific water quality requirements applicable to point source discharges).

The State Water Board seeks to improperly expand its narrow authority over water quality issues by proposing conditions in the Draft WQC that are completely unrelated to water quality and that include procedural requirements contrary to FERC's exclusive authority to enforce any conditions included in the license, including conditions from a WQC, such as requirements for Board approval of plans, notification periods that are inconsistent with the Settlement Agreement and FERC staff's recommendations in the FEIS, and conditions that are inconsistent with other resource agency recommendations, including 4(e) conditions filed by the USFS and Settlement Agreement measures adopted by federal and State fish and wildlife agencies.

For example, the draft WQC provides that the Deputy Director can instruct PG&E to consult with State and federal agencies, and other stakeholders, but can order PG&E to implement changes or undertake new mitigation measures *without* securing FERC's approval. In addition, the State Water Board includes conditions that are not specifically tied to water quality, such as Condition 12 (Fish Stocking), Condition 13 (Recreation Management Plan), Condition 14 (Whitewater Recreation Flows), Condition 16 (Roads), Condition 17 (Reintroduction of Anadromous Fish), and Condition 20 (Grebe Management Plan). None of these conditions have any nexus to water quality and should be removed or modified to ensure consistency with the Settlement Agreement.

The Draft WQC also relies on an adaptive management strategy with unspecified goals and monitoring methods, and open-ended requirements for mitigation. The Draft WQC purports to give the State Water Board unlimited authority over many conditions and does not consider the

impact to other beneficial uses or to the fact that only FERC has the authority to approve and enforce any conditions in the license or plans required by the license. The open-ended nature of the mitigation requirements indicate that the State Water Board does not have sufficient evidence in its record to adopt the conditions included in the Draft WQC and frustrates FERC's ability to determine Project costs for the term of the license, which in turn affects whether the Project is economic and whether PG&E will accept the FERC license. The Settlement Agreement contained a variety of constraints designed to balance beneficial uses consistent with the Board's CEQA obligations and FERC's FPA obligations, and to allow PG&E to understand the cost of the license. The Draft WQC disregards all of the constraints on the range of adaptive management measures that were included in the Settlement Agreement and the Forest Service 4(e) conditions.

Furthermore, the Draft WQCs provisions with respect to maintaining the inspection schedule for Project works directly conflicts with FERC's exclusive authority over the safety of Project works and any requirements of the California State Division of the Safety of Dams ("DSOD") that are not inconsistent with FERC's authority. To our knowledge, the State Water Board has no expertise in this area and does not conduct such inspections on other hydroelectric projects. Duplication of this effort by the State Water Board could lead to conflicting requirements from the overlapping jurisdiction between FERC, DSOD and the State Board.

#### **F. Comments on Specific Conditions in the Draft WQC**

Additional comments on specific conditions in the Draft WQC are summarized in Exhibit A. PG&E intends to provide additional comments on the rationale statements in Section 5.0 as we complete our review and comments on the Revised Draft EIR for the Project, due July 7, 2020.

## CONCLUSION

PG&E objects to the issuance of an invalid final WQC when there is no pending request for a WQC before the State Water Board. The State Water Board's Condition 6, requiring release of supplemental flows, is based on unspecified and undeveloped goals that are intended to protect a coldwater fishery, in transitional fish communities downstream of the Project area, without consideration of potential impacts on special status species such as hardhead and foothill yellow-legged frog. In the event the State Water Board issues a final WQC for the purpose of submitting FPA Section 10(a) recommendations to FERC, PG&E requests that the conditions be modified to be consistent with the FPA and the record in the FERC proceeding. In addition, PG&E requests that the conditions discussed herein be modified to address the concerns, corrections and clarifications identified by PG&E.

If you have any questions about these comments, please contact Steve Bauman, Sr. Project Manager, at (415) 973-7410 or at [steve.bauman@pge.com](mailto:steve.bauman@pge.com). You may also contact me at (415) 973-7145 or [annette.faraglia@pge.com](mailto:annette.faraglia@pge.com).

Respectfully submitted,



Annette Faraglia  
Chief Counsel, Hydro Generation

Dated: June 15, 2020

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 1 Condition 1. Minimum Instream Flows

### **1(A) Water Year Types**

The determination of the Water Year Type and associated notifications included in the Draft WQC are not consistent with those in the Settlement Agreement or other licenses in the Feather River Watershed.

### **1(C) Minimum Instream Flow Measurement and Dissemination**

Condition 1(C) requires public notice on the internet of all known events that will affect MIF releases, 30 days in advance, which is sometimes not feasible and is inconsistent with other PG&E projects in the Feather River Basin.

### 1(F) Highlight Footnote 10

#### **Overreach of State Water Board Resources Control Board (SWRCB) Authority**

Condition 1 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. There are separate notification requirements to the SWRCB that would generally be provided to FERC and all stakeholders. Additionally, Condition 1(F) and footnote 10 specify minimum inspection schedules and criteria of Project Works, which is under the authority of FERC and the California Division of Safety of Dams. See also PG&E's Comments regarding SWRCB authority.

## 2 Condition 2. Ramping Rates

### **2(A) Ramping Rates**

The Settlement Agreement allows variability in ramping rates (i.e., good faith effort) below Canyon Dam because of “gate size and other factors.” This flexibility is not incorporated in the draft WQC and is necessary for PG&E to meet the intended compliance.

### **2(B) Evaluation of Ramping Rates**

The 6-month timeframe to evaluate monitoring data and develop alternatives is not sufficient. This timeframe does not allow adequate time to assess monitoring results, and conduct necessary collaboration, or make alternative recommendations.

### **2(C) Belden Powerhouse Block Loading**

PG&E is currently engaged in consultation regarding Poe and Rock Creek-Cresta ramping rates. PG&E agrees that Belden block loading should be aligned with Poe and Rock Creek-Cresta ramping rates and is appropriately tied to the outcome of downstream requirements.

#### **Overreach of SWRCB Authority**

Condition 2 requires separate SWRCB approval and notifications, which disregards the Settlement Agreement process, which requires agreement of all parties to the Settlement Agreement. See also PG&E's Comments regarding additional concerns with SWRCB authority.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

### 3 Condition 3. Pulse Flows

#### **3(A) Pulse Flows**

This condition appears consistent with the Settlement Agreement and FERC recommendations in the FEIS, but lacks language establishing maximum volumes for pulse flow events, as was provided in the Settlement Agreement. The Settlement Agreement inherently provides some flexibility to explore different rates and durations to maximize the benefits of the pulse flows while not adversely affecting other beneficial uses including generation, Lake Almanor water surface elevations, and recreation.

The Settlement Agreement (Section 1.3.A) and USFS Section 4(e) Condition 25.3 both state: “No Pulse Flows are required in months where the Water Year Type forecast for that month indicates that the water year will be either Dry or CD.” PG&E supports pulse flow implementation as cited by these sources. Providing pulse flows during Dry Water Years would have the potential to impact beneficial uses related to downstream habitat, reservoir water surface elevations (Condition 4) and Water Quality (Condition 7). Additionally, members of the 2105 Licensing Group expressed concerns that too aggressive of a pulse flow schedule might have deleterious effects on spawning gravels and reproductive success of substrate-dependent organisms.

The Settlement Agreement includes biological, water quality, habitat, and gravel monitoring to inform the evaluation of the effectiveness of the Pulse Flows and any modification to the schedule, should it be warranted. PG&E commented on the FEIS in opposition of the pulse flows in Dry years. In PG&E’s December 12, 2005 comment letter to FERC on the FEIS, we note that the pulse flow plan contained in the Settlement Agreement is a more prudent plan than the FERC alternative (also included in the Draft Water Quality Certificate). PG&E maintains that the Pulse Flow schedule included in the Settlement Agreement, with pulse flow requirements implemented for Normal and Wet Water Year Types only, is appropriate to protect beneficial uses.

#### **Overreach of SWRCB Authority**

Condition 3 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. In Condition 3, this is specifically relevant when (1) a flow change is warranted, and (2) on proposed flow changes. The Settlement Agreement further establishes limits on these changes that are not included in the SWRCB condition. Additionally, Condition 3 gives SWRCB unilateral decision-making authority for future changes to license conditions or plans which is inappropriate and redundant with FERC. See also PG&E’s Comments regarding SWRCB authority.

### 4 Condition 4. Water Surface (Reservoir) Elevations

SWRCB states in Section 5.4 (rationale for Condition 4), that “the reservoir elevations required in Condition 4 are consistent with those in the Settlement Agreement;” however, the WQC Lake Almanor surface elevation requirements in Condition 4 are contradictory to the USFS 4(e) and Settlement Agreement conditions. The reservoir surface level requirement given in the USFS 4(e) condition and Settlement Agreement state that water elevations shall reach specified requirements “by May 31” and do not include minimum elevations between Sept and May, whereas the WQC

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

includes year-round minimum water surface elevations. Altering this condition to require water surface elevations to be maintained from September 1 – May 31 will severely limit the Licensee’s ability to manage the reservoir for non-recreational beneficial uses.

In Table 7, the specific gage referenced as Belden Forebay is not clear. Belden Forebay is measured at Gage NF-67.

**Overreach of SWRCB Authority**

Condition 4 requires separate SWRCB approval, which disregards the Settlement Agreement process, which requires agreement of all parties. Additionally, Condition 4 gives SWRCB unilateral decision-making authority for future changes to water surface elevation requirements, which is inappropriate and redundant with FERC. Section 3.5 of the Settlement Agreement (Multiple Dry Water Years) identifies a list of resource agencies and parties to be consulted during multiple dry water years, including SWRCB. See also PG&E’s Comments regarding SWRCB authority.

## 5 Condition 5. Gaging and Facilities Modifications

The description of Condition 5 specifies only NF-9, but does not name other gages to be included. The Settlement Agreement includes gages NF-2 and NF-70. The condition also references new gages, which are not anticipated as a part of the license or operation.

Regarding the facilities modifications portion of the plan described, the condition isn’t specific about which facilities are included or what is meant by this component.

Consultation requirements included in this condition and the burden of documenting consultation for a gaging plan with other agencies (Forest Service, CDFW, USFWS) is excessively burdensome for PG&E.

**Overreach of SWRCB Authority**

Condition 5 requires development of a Gaging and Facilities Modification Plan; however, PG&E’s gaging practices are supervised by the United States Geological Survey, who defines the standards and practices by which the gages are installed, maintained, and operated. If this plan were to be necessary, Condition 5 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E’s Comments regarding SWRCB authority.

## 6 Condition 6. Water Temperature Management

See PG&E’s Comments on the Draft WQC.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 7 Condition 7. Water Quality Monitoring

### **Overreach of SWRCB Authority**

Condition 7 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition authorizes the SWRCB to implement measures to unilaterally address water quality impacts, which is not appropriate in a FERC-licensed project, where FERC approval would also be required. See also PG&E's Comments regarding SWRCB authority.

## 8 Condition 8. Lake Almanor Fishery Monitoring

Accurately measuring thermally-induced mortality in the Lake Almanor coldwater fish population is not feasible. Other factors that may affect the fishery, and may not be project related, would need to be considered and would be difficult to isolate, including food production and prey competition, changes in coldwater refugia, seasonal distribution of fish, angling pressure, stocking programs, and disease. PG&E recommends removing the requirement to monitor the fish population in Lake Almanor.

### **Overreach of SWRCB Authority**

Condition 8 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 9 Condition 9. Gravel

### **Overreach of SWRCB Authority**

Condition 9 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 10 Condition 10. Lower Butt Creek Habitat

### **Overreach of SWRCB Authority**

Condition 10 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 11 Condition 11. North Fork Feather River Biological Resources Monitoring

### **Overreach of SWRCB Authority**

Condition 11 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

requires SWRCB approval separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 12 Condition 12. Fish Stocking

### **Overreach of SWRCB Authority**

Condition 12 requires an agreement with CDFW, which is the appropriate agency to handle issues such as fish stocking. Since it doesn't impact water quality, the SWRCB is not the appropriate agency to address fish stocking. See also PG&E's Comments regarding SWRCB authority.

## 13 Condition 13. Recreation Facilities Management

### **Overreach of SWRCB Authority**

Condition 13 generally references the Settlement Agreement, but expands the content of the Recreation Management Plan and inserts SWRCB authority with additional planning and reporting requirements, consultation with agencies, and SWRCB approval. Further, additional requirements with the SWRCB are assigned if recreational use increases and or the usage causes concerns for water quality. PG&E will consult with the SWRCB; however, FERC has approval authority, and PG&E is unaware of any authority granted to the SWRCB that would allow them to expand the Recreation Management Plan in the ways described in the Draft WQC.

Condition 13 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires that the Licensee develop in the Recreation Management Plan, water quality protection/monitoring prescriptions for proposed and existing construction and modification to recreation facilities. The Recreation Management Plan will not contain the details of construction or modification for each existing or proposed facility so specific water quality protection measures cannot be prescribed in the Plan. The design and construction planning phase of each facility is the place where specific water quality protections prescriptions will be made, in conjunction with relevant permitting requirements and design approvals. Licensee will include a provision in the Recreation Management Plan that commits each facility construction project to assess for and implement industry Best Management Practices for water quality/erosion protection as part of the design, authorization, and permitting process.

In general, all recreation site improvements or modifications will be consistent with Clean Water Act construction and operational requirements. SWRCB does not otherwise have authority over these resources. Recreation sites and their improvement is generally not within the authority of the SWRCB.

Condition 13 requires recreation monitoring; however, recreation monitoring authority rests with FERC and with the Forest Service where recreation sites are located on Forest Service lands. Identification of recreation use surveys that will be conducted as part of the Project and submittal of the associated results to SWRCB staff is inappropriate. Reporting of recreation monitoring results to SWRCB should not be required. This section should be deleted from the WQC, as

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

recreation monitoring is sufficiently covered in the Settlement Agreement. See also PG&E's Comments regarding SWRCB authority.

## 14 Condition 14. Whitewater Recreation Flows

### **Overreach of SWRCB Authority**

Condition 14 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 15 Condition 15. Aquatic Invasive Species

### **Overreach of SWRCB Authority**

Condition 15 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition also requires separate SWRCB approval, which is inappropriate as it is redundant with FERC. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 16 Condition 16. Roads

Condition 16 is inconsistent with the Settlement Agreement and USFS 4e conditions, and requires actions beyond what was included in those agreements. The Road Management Plan is to address Forest Service and unclassified road rehabilitation and maintenance within the Project boundary. These Forest Service and unclassified roads must meet the FERC definition of a Project Road. Roads that are not used almost exclusively for Project purposes are not considered Project roads.

### **Overreach of SWRCB Authority**

Condition 16 is overly prescriptive of plan contents, which should be delegated to the Licensee and named resource agencies and other stakeholders when appropriate. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC's authority over the License resource management plans. Further, SWRCB approval is required separately of any modifications. PG&E will consult with stakeholders including the SWRCB, specifically as it pertains to assessing a road's impact on water quality; however, FERC has approval authority over the License Plans. See also PG&E's Comments regarding SWRCB authority.

## 17 Condition 17. Reintroduction of Anadromous Fish

### **Overreach of SWRCB Authority**

Condition 17 reserves SWRCB authority for study requirements, which is overly prescriptive. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

**Exhibit A**  
*Responses on Specific Draft WQC Conditions*

## 18 Condition 18. Annual Consultation Meetings

### **Overreach of SWRCB Authority**

Condition 18 is overly prescriptive of TRG activities including the notification in advance of meetings on the Licensee's webpage, which should be delegated to the TRG. The condition requires separate SWRCB approval, which is inappropriate as it is redundant with FERC's authority over the License resource management plans. Further, SWRCB approval is required separately of any modifications. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 19 Condition 19. Extremely Dry Conditions

### **Overreach of SWRCB Authority**

Condition 19 requires separate SWRCB consultation and notification, which is inappropriate as it is redundant with FERC. FERC is the appropriate authority for approvals of this kind. See also PG&E's Comments regarding SWRCB authority.

## 20 Condition 20. Grebes Management

### **Overreach of SWRCB Authority**

Condition 20 requires development of a Grebes Management Plan, which was not previously required in the Settlement Agreement or other stakeholder agreements, and does not have a nexus with water quality. See also PG&E's Comments regarding SWRCB authority.

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### **I. Introduction**

The draft WQC adds a new condition, Condition 6 (Water Temperature Management Program), which calls for increased summer releases (Condition 6(A) *Canyon Dam Supplemental Flows*) with the intent to protect the fishery downstream of the project-affected reaches by maintaining water temperatures < 20°C throughout most of the NFFR:

1. *without* defined fishery goals (see Condition 6(C) *Fishery Performance Goals*);
2. *without* any expectation that the program will be successful (see Condition 6(D) *Feather River Temperature Contingency Plan*); and
3. *without* a full assessment of its impacts to water quality and the existing fishery in the NFFR or Lake Almanor or on water quality in Lake Almanor, if successful; yet
4. *with* the understanding that if successfully implemented, the program could have adverse effects to the native fishery and special-status species and on the fishery in Lake Almanor.

#### **II. Condition 6(C) Fishery Performance Goals**

The supplemental flows are based on unspecified fishery goals to be developed during implementation of the new license (See Condition 6(C) Fishery Performance Goals). Implementing any condition without clear fishery goals is irresponsible. The intent of the condition is to provide “reasonable protection to cold freshwater species” in the NFFR far downstream into the Cresta Reach. However, the existing fishery composition is primarily warmer water, or native transitional-zone, fishes (i.e., hardhead-pikeminnow-sucker assemblage) below Belden Dam (Table B-1). Hardhead (*Mylopharodon conocephalus*, California Species of Special Concern and USFS Species of Conservation Concern) is the dominant fish species in the Rock Creek and Cresta reaches. Additionally, the lower reaches of the NFFR support breeding populations of foothill yellow-legged frogs (FYLF, *Rana boylii*, California Threatened), which also rely on warmer water to complete their life cycle. The intended outcome of Condition 6(C) is to change baseline conditions from a transitional-zone fishery to a coldwater fishery. The SWRCB fails to recognize the existing transitional zone fishery in this condition.

## Exhibit B

### Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery

**Table B-1: Fish species identified in recent surveys of waters in the NFFR (Data sources: UNFFR FERC FEIS; Stillwater Sciences 2005; Poe FLA).**

Assemblage and Species		Native/Introduced	Lake Almanor	NFFR Seneca Reach	NFFR Belden Reach	NFFR Rock Creek Reach	NFFR Cresta Reach	NFFR Poe Reach
Cold	Rainbow trout <i>Oncorhynchus mykiss</i>	N	X	X	X	X	X	X
	Brown trout (game fish) <i>Salmo trutta</i>	I	X	X	X			
	Chinook salmon <i>Oncorhynchus tshawytscha</i>	I <sup>1</sup>	X					
Cold or Transitional	Prickly sculpin <i>Cottus asper</i>	N	X	X	X	X	X	
	Riffle sculpin <i>Cottus gulosus</i>	N		X	X	X	X	X
Transitional	Sacramento sucker <i>Catostomus occidentalis</i>	N	X	X	X	X	X	X
	Sacramento pikeminnow <i>Ptychocheilus grandis</i>	N	X		X	X	X	X
	Hardhead <i>Mylopharodon conocephalus</i>	N			X	X	X	X
Warm	Sacramento perch <i>Archoplites interruptus</i>	N	X					
	Smallmouth bass <i>Micropterus dolomieu</i>	I	X			X	X	X
	Largemouth bass <i>Micropterus salmoides</i>	I	X					
	Brown bullhead	I	X					

## Exhibit B

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

Assemblage and Species	Native/Introduced	Lake Almanor	NFFR Seneca Reach	NFFR Belden Reach	NFFR Rock Creek Reach	NFFR Cresta Reach	NFFR Poe Reach
<i>Ameiurus nebulosus</i>							
Wakasagi (Japanese pond smelt) <i>Hypomesus nipponensis</i>	I	X					
Common carp <i>Cyprinus carpio</i>	I	X					X

<sup>1</sup> The Chinook salmon introduction into Lake Almanor is outside of their native range.

PG&E would expect the fishery performance goals to include reasonable protection to both coldwater and transitional-zone fish species, including special-status hardhead and FYLF (see *Temperatures Impacts*, below); however, Condition 6(A) presumes the goals will only include support of a coldwater fishery.

### **III. 6(D) Feather River Temperature Contingency Plan**

SWRCB acknowledges the likelihood for Condition 6(A) to be unsuccessful at maintaining temperatures < 20°C (see SWRCB RDEIR Section 5.5, *Water Quality*), and includes a separate contingency plan (Condition 6(D) *Feather River Temperature Contingency Plan*) to allow for future modifications. In fact, the goal of the contingency plan is to identify action(s) for achieving the (undefined) fisheries goals and improving habitat conditions altered by the diversion, storage, and use of water associated with Project operations.

### **IV. Potential Impacts to the Existing Fishery**

SWRCB finds limited impacts to the existing NFFR fishery in their RDEIR, citing the expectation that implementation of Condition 6(A) would likely be unsuccessful at completely maintaining temperatures < 20°C (see SWRCB RDEIR Section 5.5, *Water Quality*), and therefore, preferred habitat for transitional species would still be available. SWRCB does acknowledge the potential for adverse effects, including to the Lake Almanor coldwater fishery, and includes provisions that allow for future reductions of supplemental flows (Condition 6(B) *Supplemental Flow Reductions*) to minimize these potential effects. However, if the program were to be successful, SWRCB does not fully describe impacts, especially to the existing native fishery within the NFFR.

## Exhibit B

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### **a. Unspecified Impacts to Lake Almanor Fishery**

Section 5.6 of the draft WQC (*Rationale for Condition 6 – Water Temperature Management*) states that “Notwithstanding the modeling, it is uncertain whether the Proposed Project or any of the alternatives would adversely affect the fishery in Lake Almanor.” However, SWRCB acknowledges (Condition 6(B) *Supplemental Flow Reductions*) that “a decrease or suspension of the supplemental flows [may be] necessary to reasonably protect the cold freshwater beneficial uses of Lake Almanor and the North Fork Feather River.” It may not be possible to create a coldwater fishery in the downstream NFFR while simultaneously protecting the coldwater fishery in Lake Almanor during summer months.

Lake Almanor supports coldwater, warmwater, and transitional-zone fish populations (Table B-1). Stocking efforts by CDFW have recently focused on rainbow trout, brown trout, and Chinook salmon (SWRCB 2020) and PG&E financially supports an ongoing trout planting program in Lake Almanor. SWRCB’s water temperature modeling demonstrates that Condition 6, along with alternatives indicated in Condition 6(D) *Feather River Temperature Contingency Plan*, decrease the Lake Almanor coldwater habitat (See Exhibit C). For example, installation of a thermal curtain at the Prattville Intake would reduce available summer salmonid habitat in Lake Almanor, despite inducing only minor changes to water temperature and dissolved oxygen (Gast 2004). Jones and Stokes (2004) simulated the volume of salmonid habitat available during late summer stratification if a thermal curtain had been utilized, finding a 38% reduction in habitat relative to existing conditions. Though the effect of the thermal curtain on suitable habitat would be small during cool summers, habitat volume would be substantially reduced in hot summers as what little cool water available in Lake Almanor would be selectively removed (Gast 2004). Similarly, the effect of thermal curtains on habitat volume is seasonally dependent. The effect is small for a majority of the year (fall through spring) but is significant in late summer (August–September) when lake volume is at its minimum, under existing conditions, as a substantial portion of what little suitable coldwater that remains in the lake is removed at the intake. SWRCB found that any reduction of coldwater habitat in dry or critical dry years, whether via thermal curtains at Prattville and Caribou intakes (Alternative 2), supplemental releases from Canyon Dam (Alternative 3), or a combination of the two (Alternative 1), would have a significant impact on Lake Almanor aquatic habitat. The SWRCB goes on to require PG&E pay for additional stocking to mitigate the impact created by the condition.

With this condition, the draft WQC creates the potential for a future conflict of interest between the NFFR and the Lake Almanor coldwater fisheries that is not currently present, and which is insufficiently evaluated in the RDEIR. After implementing Condition 6, if a coldwater fishery becomes established in the lower reaches of the NFFR (e.g., Rock Creek and Cresta reaches) and impacts to Lake Almanor water quality and/or coldwater fishery that may trigger suspension of the supplemental flows (under Condition 6(B)) are observed, future changes to this condition could result in impacts to the future coldwater fishery. Nowhere does the SWRCB

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

clearly state its specific objectives in balancing these two resources so that the licensee and the public can understand what the SWRCB hopes to achieve, what the impacts seeking those objectives might be on these and other beneficial uses including water quality in Lake Almanor, recreation in Lake Almanor and the NFFR, water supply, power generation, and others. Nor does the SWRCB discuss the potential costs of the open-ended mitigation they stipulate forth under this condition.

The releases from Canyon Dam vary (see Condition 1, *Minimum Instream Flows*) and differences in water temperatures at the intake (due to the seasonal lowering of the reservoir water surface elevation and changing thermocline) will have a varying degree of effects on water temperatures downstream. There is a high level of variability and uncertainty involved with realized benefits of these releases downstream, but depletion of the coldwater habitat within Lake Almanor throughout the release period (June 15–September 15) is well understood (see Exhibit C).

PG&E does not support the requirement of supplemental flow releases prior to development of specific management goals, especially given an unachievable thermal threshold. However, given the dynamic nature of fish communities and populations, even in a static system, setting specific metrics will also be extremely challenging.

#### **b. Temperature Impacts**

Condition 6 would not protect, and may adversely affect, special-status fish and amphibian species in the NFFR. Increased flows would temporarily modify both temperature and physical habitat, which would adversely affect transitional-zone fishes, including hardhead and FYLF.

Hardhead currently reside in the NFFR downstream of Belden Dam. Optimal water temperatures for hardhead are 24–28°C (Moyle 2002). Where only colder temperatures are present, hardhead will move to the warmest water available (Moyle 2002; Cocherell et al. 2014). In areas with low water temperature and high flow, juvenile hardhead swimming performance is reduced (Fangue et al. 2015), potentially decreasing their survival rate. Similarly, Sacramento pikeminnow also favor warmer water (18–28°C), and although Sacramento suckers can tolerate a wide range of temperatures, their preferred range is 20–25°C (Moyle 2002).

Though intentional release of coldwater from the hypolimnion of Lake Almanor would benefit colder-water species, coldwater releases can have negative effects on species adapted to streams warming in summer (Catenazzi and Kupferberg 2017), including special-status species such as FYLF. FYLF populations have not been documented in the Seneca or Belden reaches; however, potentially suitable habitat exists. Known breeding populations in the Cresta and Poe reaches of the NFFR have been monitored annually since 2001, and breeding has been observed in the Cresta reach in the vicinity of the lowermost compliance gage for the 20°C requirement (NF-56 [USGS Gage No. 11404330]). Maintaining cooler water temperatures in

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

summer would have an adverse impact on FYLF by potentially limiting breeding and tadpole growth. Sierran populations of FYLF have been found to be most dense where mean summer maximum 30-day temperature is greater than 20.3°C, and density is reduced in Sierra foothill rivers below hydropower reservoirs where mean summer maximum 30-day temperature is below 20°C (Kupferberg et al. 2011a). Tadpoles from the Poe reach of the NFFR displayed a preference for temperatures between 21–25.8°C, and adult populations in regulated reaches of the NFFR were most dense where summer mean maximum 30-day water temperature was greater than 20°C. Where breeding does occur in cold streams, FYLF may be near their thermal niche limit, thereby reducing larval fitness and making extirpation of metapopulations likely (Catenazzi and Kupferberg 2017). Tadpole feeding and growth rates are lower in colder water, making them more prone to predation (Kupferberg et al. 2011a), and superior metamorph body condition is likewise associated with warmer streams (Wheeler et al. 2013).

#### **c. Spring and Summer Flow Fluctuations**

Releasing additional water during summer while tadpoles are present in the river would have additional adverse impacts on FYLF. Increased velocities may displace tadpoles. Pulse flows such as these, though more often related to hydropower production or recreation, are known to cause mortality of FYLF tadpoles. Tadpoles also utilize low-velocity areas to optimize the energy required for feeding (Kupferberg et al. 2011) and metamorphose by late summer (Kupferberg et al. 2012). In the Cresta Reach of the downstream Rock Creek-Cresta Project, summer pulse flows were unfavorable for the survival of both tadpoles and embryos, and mortality was lower in other reaches where flows were more stable (Kupferberg et al. 2012). The critical flow where tadpoles are flushed out of their habitat decreases with tadpole body mass and can be as low as 10 centimeters per second (cm/s) (Kupferberg et al. 2011b). Tadpoles are most susceptible to elevated flow in mid to late summer when supplemental flows would likely be implemented to maintain reduced water temperature (See Exhibit C, *Modeling*). Repeated tadpole exposure to subcritical flow (i.e., 5 to 10 cm/s when tadpoles are not flushed from their habitat) is also likely with the proposed supplemental flows, which would reduce tadpole growth and subsequently cause them to be more vulnerable to predation (Kupferberg et al 2011b).

In addition to directly impacting native fish and amphibians, flow fluctuations and artificially reduced temperatures have adverse impacts on the primary fish food source, benthic macroinvertebrates (BMIs). A seasonal flow fluctuations, even at magnitudes that do not cause scour or catastrophic drift, can reduce BMI recruitment by stranding them after eggs are laid at higher flows (Kennedy et al. 2016). Unstable daily water temperatures and elevated rates of flow change relative to a natural hydrograph are associated with reduced BMI diversity in Sierra Nevada rivers (Steel et al. 2018), and it has been broadly observed that reduced water temperatures below dams alters BMI communities (Olden and Naiman 2010), which can negatively impact native fish assemblages.

## Exhibit B

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

#### V. References

Bechtel. 2002. MITEMP3 Model Calibration and Validation in 2000–2001, Lake Almanor and Butt Valley Reservoir.

Catenazzi, A. and Kupferberg, S.J., 2017. Variation in thermal niche of a declining river-breeding frog: From counter-gradient responses to population distribution patterns. *Freshwater Biology*, 62(7), pp.1255-1265.

Carlander, K.D. 1969. Handbook of freshwater fishery biology. Iowa State University. Gast, T. 2004. Pratville Intake Modification and Potential Impacts to Lake Almanor Fishery Study. June. Interim Report. Arcata, CA.

Fischer, J.R. 2012. Characterizing lentic fish assemblages and community-environment relationships: an evaluation of natural lakes and reservoirs in Iowa, USA. Graduate Theses and Dissertations. 12854 Jones & Stokes. 2004. Simulation of temperature and dissolved oxygen in Lake Almanor, California, using the CE-QUAL-W2 water quality model. March. Final Draft. (J&S 03-223.) Sacramento, CA.

Hayes D. B., C. P. Ferreri, and W. W. Taylor. 1996. Active fish capture methods. Pages 193– 220

Hubert, W. A. 1996. Passive capture techniques. Pages 157–192

Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Lytle, D.A., Miller, S.W., Dibble, K.L., Kortenhoeven, E.W., Metcalfe, A.N. and Baxter, C.V., 2016. Flow management for hydropower extirpates aquatic insects, undermining river food webs. *BioScience*, 66(7), pp.561-575.

Kupferberg, S.J. 1996. Hydrologic and geomorphic factors affecting conservation of a river breeding frog (*Rana boylii*). *Ecological Applications* 6(4): 1,332–1,344.

Kupferberg, Sarah; Alessandro Catenazzi; Mary Power. (University of California, Berkeley). 2011a. The Importance of Water Temperature and Algal Assemblage for Frog Conservation in Northern California Rivers with Hydroelectric Projects. California Energy Commission. Publication number: CEC-500-2014-033.

Kupferberg, S.J., Lind, A.J., Thill, V. and Yarnell, S.M., 2011b. Water velocity tolerance in tadpoles of the foothill yellow-legged frog (*Rana boylii*): swimming performance, growth, and survival. *Copeia*, 2011(1), pp.141-152.

Kupferberg, S.J., Palen, W.J., Lind, A.J., Bobzien, S., Catenazzi, A., Drennan, J.O.E. and Power, M.E., 2012. Effects of flow regimes altered by dams on survival, population declines, and range-wide losses of California river-breeding frogs. *Conservation Biology*, 26(3), pp.513-524.

## **Exhibit B**

### *Condition 6. Water Temperature Management Program – Comments on Potential Impacts to the Existing Fishery*

Kupferberg, S.J., Palen, W.J., Lind, A.J., Bobzien, S., Catenazzi, A., Drennan, J.O.E. and Power, M.E., 2012. Effects of flow regimes altered by dams on survival, population declines, and range-wide losses of California river-breeding frogs. *Conservation Biology*, 26(3), pp.513-524.

Lind, A.J. 2005. Reintroduction of a declining amphibian: Determining an ecologically feasible approach for the foothill yellow-legged frog (*Rana boylii*) through analysis of decline factors, genetic structure, and habitat associations. Doctoral dissertation. University of California, Davis, CA.

Murphy and D. W. Willis, editors. 1996 Fisheries techniques, second edition. American Fisheries Society, Bethesda, Maryland.Olden, J.D. and Naiman, R.J. (2010), Incorporating thermal regimes into environmental flows assessments: modifying dam operations to restore freshwater ecosystem integrity. *Freshwater Biology*, 55: 86-107. doi:10.1111/j.1365-2427.2009.02179.x

P. Schneider, S. J. Hook, R. G. Radocinski, G. K. Corlett, G. C. Hulley, S. G. Schladow, and T. E. Steissberg3. 2009. Satellite observations indicate rapid warming trend for lakes in California and Nevada. *Geophysical Research Letters*, Vol. 36, L22402, doi:10.1029/2009GL040846, 2009.

Pope, K. L., and D. W. Willis. 1996. Seasonal influences of freshwater fisheries sampling data. *Reviews in Fisheries Science* 4:57–73.

State Water Resources Control Board (State Water Board). 2020. Revised Draft Environmental Impact Report for the Upper North Fork Feather River Hydroelectric Project FERC Project No. 2105. State Clearinghouse No. 2005082122Steel, AE, Peek, RA, Lusardi, RA, Yarnell, SM. Associating metrics of hydrologic variability with benthic macroinvertebrate communities in regulated and unregulated snowmelt-dominated rivers. *Freshwater Biology* 2018; 63: 844– 858. <https://doi.org/10.1111/fwb.12994>.

Stetson. 2009. Level 3 Report. Analysis of Temperature Control Alternatives Advanced From Level 2 Designed to Meet Water Quality Requirements and Protect Cold Freshwater Habitat Along the North Fork Feather River.

Wheeler, C., Bettaso, J., Ashton, D. and Welsh, H., 2013. Effects of water temperature on breeding phenology, growth and timing of metamorphosis of foothill yellow-legged frogs (*Rana boylii*) on the mainstem and selected tributaries of California's Trinity River-2004-2009. US Forest Service, Redwood Sciences Laboratory and US Fish and Wildlife Service: Arcata, California.

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

#### **I. Introduction**

Following a review of the analysis performed by State Water Resources Control Board (SWRCB), PG&E has concluded that the SWRCB took basic, one and two dimensional models and tried to use them for a purpose beyond the models' functionality. PG&E does not refute all studies done in support of the Project, but is concerned that the water temperature models in question were not designed to evaluate the specific changes required within Condition 6.

PG&E acknowledges that some of these early studies were used to evaluate the minimum instream flows (MIFs) defined under Condition 1, which PG&E has accepted as part of the Settlement Agreement. These MIFs represent relatively minor changes to existing conditions, which these models were shown to reliably reproduce. Therefore, the use of these models to evaluate MIFs (as presented in the FEIS) is appropriate as Lake Almanor dynamics would not change significantly with MIFs prescribed in Condition 1.

However, the changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence Lake Almanor dynamics. The SWRCB's use of the modeling studies in this situation is not reliable. PG&E's specific concerns with the SWRCB's use of the model for Condition 6 are summarized in this section.

Studies performed during the CEQA process and included within the Revised Draft EIR (RDEIR) used models that represented the best available science at the time of their development and use. These models were sufficient to study the baseline conditions as they were shown to reproduce observed conditions well. However, the SWRCB inappropriately used these models to justify major changes to Lake Almanor operations (Condition 6). Lake Almanor is a large geometrically complex lake and studies performed in the development of the RDEIR used

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

simplified 1-dimensional (MITEMP<sup>1</sup>) and 2-dimensional (CE-QUAL-W2<sup>2</sup>) models. While these models have an appropriate scientific foundation, they include several assumptions and simplifications to their core computations with relation to spatially varying hydrodynamic processes including spatial mixing, an important feature of Lake Almanor with major flows entering and leaving from different spatial regions, both horizontally and vertically. These assumptions and simplifications were made to achieve ease of use and faster computational times at the cost of accuracy of the model results, a desirable balance historically when computational resources were limited. Achieving accurate predictions of thermal profiles with these simplified models for physical modifications within Lake Almanor (thermal curtains as in Alternatives 1 and 2) is difficult, if not impossible. There is likely significant spatial variability in temperatures within Lake Almanor.

The SWRCB used models developed earlier by PG&E for different objectives and repurposed them to support Condition 6. Incorrect use of these models, perhaps, was the reason for the “exceedance” based evaluation approach that SWRCB employed as the models lacked the ability to compute continuous thermal profile for the entire system under each alternative. This approach inappropriately matches exceedance outflow temperatures to external conditions based on the definition of “normal”, “extreme”, etc. As such a significant subset of conditions is potentially ignored (e.g., “50% exceedance outflow water temperature” [defined as “normal conditions”] at Canyon Dam only modeled under normal meteorological and “normal” year release schedule).

---

<sup>1</sup> Massachusetts Institute of Technology’s Transient Temperature Prediction Model

<sup>2</sup> <http://www.ce.pdx.edu/w2/>

## Exhibit C

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

#### **II. Model Selection Issues**

The SWRCB used the MITEMP model to assess water temperature in Lake Almanor. As discussed in Bechtel (2002), the model assumed “the temperature gradient is predominantly in the vertical direction. The variation in the horizontal direction is minimal.” The basis of this assertion was the data collected in 2000 and 2001 (see **Error! Reference source not found.**), a potentially accurate assessment based on only two years of data. However, SWRCB’s Level 3 Report (Stetson 2009) continued to make this assertion that “temperature measurements at various locations throughout Lake Almanor showed that the lake exhibits a significant temperature gradient in the vertical direction but little variation in the horizontal direction during the summer months.”

The SWRCB’s use of MITEMP model for their analysis supporting Condition 6 has significant uncertainty that is exacerbated by the exceedance approach employed.

The DEIR also notes that “Lake Almanor shows little or no evidence of long-term trends, except for a recent finding by Schneider, et al. (2009) that the nighttime lake surface temperature appears to be warming at about  $0.15 \pm 0.03^{\circ}\text{C}$  per year since 1992.” If the findings in Schneider et al. (2009) are correct, then the Lake Almanor surface nighttime temperatures will have increased by  $1.3^{\circ}\text{C}$  since the Level 3 Report and  $2.2^{\circ}\text{C}$  since the Bechtel (2002) assessment.

#### **III. Modeling Approach Issues**

While the SWRCB ’s approach included the use of technically sound models, the SWRCB used the models for a purpose beyond their functionality. Consequently, the SWRCB’s analysis did not capture the complexity of the UNFFR system, and did not have the ability to provide the type of output necessary to evaluate the overall objectives related to improving the cold freshwater habitat. By using these models, the SWRCB relied on inconsistent methodology (using different models for Lake Almanor) and developed an assessment approach that lacked comprehensiveness.

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

The approach consisted of scenarios (exceedance levels for outflow temperatures) that are, without further information from SWRCB, not comprehensive. The SWRCB's scenarios for each alternative consisted of comparing temperature profiles under different outflow temperature exceedance levels (maximum, 10%, 25% and 50%) for different water year types. The SWRCB, based on the years and their water year types used for these exceedance levels, further defined them as "normal conditions" (50%), "reasonable extreme conditions" (25%) and "extreme conditions" (10%). Lacking additional details, these were then matched with similar flow and meteorological conditions. An example is that the 50% exceedance outflow water temperature was matched with normal meteorological conditions with dam releases corresponding to the "normal" year release schedule. Similar matching and use of data was applied for downstream reaches. This approach of scenario development is unable to represent conditions observable in the future. Using scenarios developed by simply matching exceedance levels to different water year type conditions (meteorology and flows) is inappropriate. SWRCB developed scenarios that only represent a subset of potential observable conditions.

Stetson (2009) indicates that a major source of inflow to Lake Almanor, especially colder inflow, are springs in the lake. The SWRCB intends to use this cold flow for downstream temperature reductions. A water balance approach was used to estimate the quantity of flow from the cold spring. The water balance included the two major gaged inflows to Lake Almanor (North Fork Feather River at Chester and Hamilton Branch), outflows (Prattville and Canyon Dam) and the change in lake storage to estimate the unknown amount of cold spring flows entering Lake Almanor. PG&E estimates that a part of the inflow entering Lake Almanor is ungaged surface runoff. These flows that are warmer than the cold springs in the lake, are likely captured as the calculated cold spring flows leading to overestimation of the availability of cold water within Lake

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

Almanor. Therefore, it is likely that the model overestimated the availability of cold water within Lake Almanor.

In addition to the potential overestimation of cold water availability within Lake Almanor, the supplemental flows would have a varying effect on the downstream reaches. The temperature profiles within Lake Almanor vary year to year and also within a year resulting in a large range of temperatures for the supplemental flows. At times, depending on the year type and the time of year, there may negligible to no cold water available within Lake Almanor resulting in almost no cooling effects downstream at the cost of lost power generation, and potential further depletion of suitable cold freshwater habitat. The SWRCB's assessment does not estimate the effect of all cases in all water year types. For example, the SWRCB's assessment under the extreme cases (maximum and 10% exceedance) only uses the dry/critically dry year conditions (meteorology and normal), but does not evaluate such conditions occurring later in the year when the temperatures would be higher in a year type other than dry/critically dry. PG&E believes that the SWRCB's assessment of Condition 6 is not accurate and could result in detrimental impacts within the lake.

#### **IV. Summary**

PG&E has reviewed the various studies performed during the CEQA process and included within the Revised Draft EIR (RDEIR) that formed the basis of the Condition 6 in the WQC. PG&E found that while these studies were adequate for certain assessments, they do not meet the level of detail and comprehensiveness necessary to support significant changes to flows, and potentially significant capital expenditures, as part of the Condition 6. These studies use models that make assumptions related to the actual physical system that are not supported by the record. Similarly, these studies used a water balance approach to estimate spring flows (a primary source of cold water for Lake Almanor), and may have significantly overestimated these flows. The

## **Exhibit C**

### *Condition 6. Water Temperature Management Program Comments on Previous Modeling*

modeling studies also developed a set of scenarios for the evaluation of various alternatives. Scenario selection should be comprehensive enough to provide bounding estimates of most, if not all, potential future conditions. The scenarios selected for these evaluations based on outlet temperature exceedance levels and their limited matching with the external conditions (meteorology and flows) only assessed a sub-set of potential observable conditions. The alternatives evaluation, therefore, is limited which is exacerbated by the fact that the supplemental flows required under Condition 6 do not have any appropriate temperature thresholds.

#### **V. References**

- Bechtel. 2002. MITEMP3 Model Calibration and Validation in 2000–2001, Lake Almanor and Butt Valley Reservoir.
- Jones & Stokes. 2004. Simulation of temperature and dissolved oxygen in Lake Almanor, California, using the CE-QUAL-W2 water quality model. March. Final Draft. (J&S 03-223.) Sacramento, CA.
- Stetson. 2009. Level 3 Report. Analysis of Temperature Control Alternatives Advanced From Level 2 Designed to Meet Water Quality Requirements and Protect Cold Freshwater Habitat Along the North Fork Feather River.

## **Exhibit B**

PG&E's Comments on Modeling Performed for  
Revised Draft Environmental Impact Report

## **Exhibit B**

### *Comments on Modeling Performed for RDEIR*

#### **I. Introduction**

PG&E experts believe that the modeling performed by the State Water Resources Control Board (“State Water Board” or “SWRCB”) is inaccurate, inconsistent and lacks the comprehensiveness necessary to evaluate the various alternatives in the RDEIR. PG&E highlighted several of the issues in its response to the SWRCB-issued draft Water Quality Certification (“draft WQC”) (Exhibit C, PG&E comments on draft WQC dated June 15, 2020, incorporated herein by reference). These highlighted issues mostly focused on SWRCB’s use of the MITEMP model for Lake Almanor, and the accompanying modeling approach applied by SWRCB. In summary, the State Water Board relied on existing models for the region and used them for purposes beyond the models’ functionality. Lake Almanor is a large geometrically complex lake and the State Water Board used simplified 1-dimensional (MITEMP) and 2-dimensional (CE-QUAL-W2) models. While these models have an appropriate scientific foundation, they include several assumptions and simplifications to their core computations with relation to spatially varying hydrodynamic processes including spatial mixing, an important feature of Lake Almanor, which has major flows entering and leaving from different spatial regions, both horizontally and vertically. Achieving scientifically reliable predictions of thermal profiles with these simplified models for physical modifications within Lake Almanor (thermal curtains as in Alternatives 1 and 2) is not possible. This present Exhibit further expands on PG&E identified issues related to Lake Almanor assessment as well as moves downstream to the UNFFR assessment. This and the previously submitted exhibit are not meant to be an exhaustive list of identified shortcomings with SWRCB’s modeling assessment, but only to list the most egregious of them.

#### **II. The State Water Board Applied Simplified Models Downstream**

For all downstream assessments, SWRCB applied the SNTEMP model which, like MITEMP model, is a simplified 1-dimensional steady-state (average mean daily) model. These spatial (1-dimensionality) and temporal (daily average) simplifications could compromise the model’s ability to accurately reproduce observed or projected conditions within the UNFFR. The SNTEMP model is also not a hydrological model, and relies entirely on the supplied

## **Exhibit B**

### *Comments on Modeling Performed for RDEIR*

hydrology data. Therefore, the model does not have the ability to simulate any lateral or vertical gradient in temperature resulting from spatially varying mixing within a stream.

Due to the temporal simplifications (average mean daily), SNTEMP does not capture the actual diurnal cycle of the temperatures. The model does not have the temporal granularity to appropriately distinguish cloud conditions where a day (24-hour period) that is clear all night and cloudy all day looks the same to SNTEMP as a 24-hour period that is cloudy all night and clear all day. Yet the actual temperatures would be different. Similarly, evaporative fluxes are not estimated accurately, as wind changes within a day are ignored.

The model is also not suitable for reaches of the river that have travel times larger than a day. SWRCB did not provide any information related to the travel times for each of the reaches modeled and its variation under different flow (hydrological year type) to confirm SNTEMP models applicability to these reaches under all modeled conditions.

### **III. The State Water Board's Impact Assessment Uses a Patchwork of Models**

SWRCB's assessment for water quality (dissolved oxygen) and suitable habitat is based on the CE-QUAL-W2 (W2) model. This assessment also evaluates the use of thermal curtains and their effects on the water quality and suitable habitat within Lake Almanor. The W2 model is a well-known reservoir water quality model, but “because the model assumes lateral homogeneity, it is best suited for relatively long and narrow waterbodies exhibiting longitudinal and vertical water quality gradients”<sup>1</sup>. SWRCB's use of W2 model for Lake Almanor, a lake that is neither laterally homogenous nor relatively long and narrow, is inconsistent with the recommendation of the model developer themselves.

The State Water Board's use of two separate models (MITEMP for temperature and CE-QUAL-W2 for dissolved oxygen (DO) and temperature) is confusing at best, and completely

---

<sup>1</sup> Scott A. Wells, 2019. CE-QUAL-W2: A Two-Dimensional, Later-ally Averaged, Hydrodynamic and Water Quality Model, Version 4.2. User Manual: Part 1 Introduction, Model Download Package, How to Run the Model

## Exhibit B

### *Comments on Modeling Performed for RDEIR*

irrational at worst. The Level 3 report attempts to clarify SWRCB's rationale, but brings significantly conflicting arguments. The following bullets are direct quotes from the Level 3 report, with bold text added for emphasis. Specific issues with these arguments are described in the paragraphs following the bullets.

- ***Both the MITEMP and CE-QUAL-W2 models of Lake Almanor will be used in the Level 3 analysis of UNFFR water temperature reduction alternatives for these purposes.***
- ***MITEMP simulates reservoir water temperature only; MITEMP does not have the capability to simulate DO because it does not have water quality components.***
- ***On the other hand, although the Lake Almanor CE-QUAL-W2 model has the capability to simulate both water temperature and DO, the MITEMP model will continually be used to simulate Lake Almanor water temperature profiles and discharge water temperatures at the Butt Valley PH and Canyon Dam.***
- ***The bathymetry of Lake Almanor in the Prattville Intake area is complicated and the hydraulics at the intake area is very much three-dimensional.***
- ***The reliability of the Lake Almanor CE-QUAL-W2 model in simulating the hydraulic effects of with and without removing the submerged levees near the intake under the thermal curtain condition has not been well established.***
- ***It is Stetson's opinion that, compared to the Lake Almanor CE-QUAL-W2 model, the Lake Almanor MITEMP model appears more credible for simulating the incremental benefit in discharge water temperature reduction for different alternatives, a crucial parameter in the Level 3 analysis of water temperature reduction alternatives.***

If SWRCB did not deem the CE-QUAL-W2 model credible enough to simulate the hydraulic effects and temperature changes under thermal curtains, then it is hard to understand why the model was used for a lake habitat assessment that is both DO and temperature dependent. If the W2 model is not credible and detailed enough as the hydraulics are three-dimensional, then the results of the W2 models are not accurate for lake habitat assessment. Furthermore, if the two-dimensional model (W2) does not appropriately capture the three-dimensionality of the hydraulics in Lake Almanor under the thermal curtain, then SWRCB's justification of using an even more simplified one-dimensional model defies any scientific

## **Exhibit B**

### *Comments on Modeling Performed for RDEIR*

reasoning. The distinction of using the MITEMP model for downstream assessments and the W2 model for in-reservoir assessments is nonsensical as the quality of downstream assessment relies heavily on the water temperatures leaving Lake Almanor, which are based on the modeled in-reservoir temperatures.

Because the SWRCB used two different models for Lake Almanor, both with technical limitations, attempts were made by the Board to have some consistency within the two model setups. The State Water Board, in one instance, oversimplified the cold spring flows applied to the relatively more detailed CE-QUAL-W2 model by using a constant flow value used by the MITEMP model. This oversimplification compromised the CE-QUAL-W2 model's ability to appropriately reproduce the water budget within Lake Almanor, a feature that the CE-QUAL-W2 model would have reproduced well without the State Water Board's oversimplification. This further impaired the results of the water budget from the CE-QUAL-W2 model for the Butt Valley Reservoir. Such handicapping of these models would not have been necessary, if SWRCB had used a single, more appropriately detailed model for these analyses.

#### **IV. The State Water Board's Water Quality Model Performance is Questionable**

The application of the W2 model, and its use in reproducing DO profiles within Lake Almanor, is not clearly defined by SWRCB. Water quality modeling is a significantly complex process that requires accurate representation of nutrient loading into the system, appropriate assessment of algal productivity and appropriate specification of the sediment oxygen demand. The Level 3 report lacks sufficient details on these inputs of significant importance that would allow PG&E and others to evaluate the model development by the SWRCB. The questionable performance of the W2 model, as demonstrated in the Level 3 Report (Appendix A), is concerning. The W2 model performs well in reproducing temperatures within the epilimnion (upper warm layer), but consistently over-predicts the temperatures within the hypolimnion (lower colder layer) by up to 3°C. The model's consistently poor performance in the hypolimnion, a region of particular interest from a lake habitat assessment perspective, bring significant uncertainty to the reliability of the water quality impact assessment in the RDEIR.

## **Exhibit B**

### *Comments on Modeling Performed for RDEIR*

#### **V. The State Water Board's Modeling Approach is Faulty and Does Not Constitute Credible Evidence**

SWRCB's modeling approach to perform impact assessment is significantly flawed. Not only does the approach use inappropriate models, the model development, application, and use for impact assessment have several additional shortcomings. For example, SWRCB used a water balance approach to estimate spring flows (a primary source of cold water for Lake Almanor). The approach missed several sources of surface flows entering Lake Almanor; ignoring these results in a significant overestimation of spring flows (source of cold water pool in Lake Almanor). Throughout the various reports that make up the RDIER and its appendices, there was no discussion of the Chester Diversion Dam, a feature used to divert high flows from the Chester region through a flood canal that enters Lake Almanor south of the diversion point. SWRCB simply applied the measured flows in Chester Branch at NF1, a location farther downstream of the diversion. As such, all diversions during high flow periods were applied as spring flows instead of warmer surface flows. This overestimation of spring flows entering Lake Almanor results in the model calculating increased availability of cold water pool within Lake Almanor that isn't there, minimizing the impacts due to the modeled alternatives. This, and similar other mistakes, render the Board's resulting conclusions related to the impact assessment highly questionable because they are not based on credible, substantial evidence in the record.

ROHIT SALVE  
3401 Crow Canyon Road, Room 148E, San Ramon, CA 94583  
ROSK@pge.com, 925 415 6432 (desk), 925 719 2110 (cell)

---

Twenty-five years of professional experience in addressing technical and programmatic issues at the nexus of energy and water. Proficient in designing, implementing and managing technical and scientific projects. Successful in developing and incorporating new technologies.

### EDUCATION

**PhD Hydrology**, University of California, Berkeley, CA  
**MS Forest Science**, Yale University, New Haven, CT  
**BA Environmental Studies**, World College West, Petaluma, CA  
**BS Agriculture**, Allahabad Agricultural Institute, India

### RECENT COURSES

**Project Management**, University of California-Extension, Berkeley  
**Strategic Thinking**, PG&E  
**Mastering Innovation and Creativity**, PG&E  
**Reservoir System Analysis HEC ResSim**, US Army Corps of Engineers, Davis

### PROFESSIONAL EXPERIENCE

**Senior Environmental Scientist:** Environmental Management Group, Pacific Gas and Electric Company, 2016-Present

- Managed water quality, hydrology and geomorphology related activities associated with hydro-electric and gas projects.
- Provided technical and scientific guidance for a wide range of complex issues, multiple projects and system improvements.
- Proposed and adopted new solutions and programmatic approaches for system-wide issues.

**Journey Aquatic Biologist:** Aquatic and Natural Resources Department, Pacific Gas and Electric Company, 2014-2016

- Provided environmental science and water quality support for hydroelectric relicensing studies and license compliance monitoring programs.
- Developed operations models and field monitoring strategies.

**Hydrogeologic Scientist:** Earth Sciences Division, Lawrence Berkeley National Laboratory. 1997-2014

- Initiated, designed, developed and managed projects to assess and reduce environmental impacts associated with energy production.
- Developed innovative technologies to facilitate investigations of subsurface hydrology.
- Advised and provided technical support to colleagues at the Berkeley Lab and the larger scientific community.
- Analyzed and interpreted data, and shared results with the broader community via reports, journal articles, conferences and invited talks.

**Lead Scientist for Earth Sciences:** Deep Underground Science and Engineering Laboratory (DUSEL). 2009-2011

- Served as liaison between the multi-disciplinary scientific community and DUSEL engineers during the design phase of the underground research facility.
- Advised the National Science Foundation and other reviewers on design of proposed experiments.

## SELECTED INVENTIONS

### ***Electrical Resistance Probes (ERPs)***

Salve, R., 2011. A sensor array system for profiling moisture in unsaturated rock and soil, *Hydrological Processes*, doi: 10.1002/hyp.8053.

Salve, R., J.S.Y. Wang and T.K. Tokunaga, 2000. A probe for measuring wetting front migration in rocks, *Water Resources Research*, 36: 1359-1367.

### ***Tunnel Evaporation Measurement System (TEMS)***

Salve, R., 2002. An automated tunnel evaporation measurement system for confined spaces, *Hydrological Processes*, 16: 1101-1109.

### ***Passive-Discrete Water Sampler (PDWS)***

Salve, R., 2005. A passive-discrete water sampler for monitoring seepage. *Groundwater*, 43: 133-137.

## SELECTED PUBLICATIONS IN REVIEWED JOURNALS (*from over thirty*)

- Salve, R. and D.M. Rempe, 2013. Backfill impacts on moisture measurements in fractured rock, *Vadose Zone Journal*, 14, doi:10.2136/vzj2013.04.0076.
- Salve, R., D.M. Rempe, and W.E. Dietrich, 2012. Rain, rock moisture dynamics, and the rapid response of perched groundwater in weathered, fractured argillite underlying a steep hillslope, *Water Resources Research*, 48, W11528, doi:10.1029/2012WR012583.
- Salve, R., E.A. Suderth, S.B. St. Clair, and M.S. Torn, 2011. Effect of grassland vegetation type on the responses of hydrological processes to seasonal precipitation patterns, *Journal of Hydrology*, doi: 10.1016/j.jhydrol.2011.09.003.
- Salve, R., N.Y. Krakauer, M.B. Kowalsky, and S. Finsterle, 2008. A qualitative assessment of microclimate perturbations in a tunnel, *Int. J. of Climatology*, doi: 10.1002/joc.1697.
- Salve, R., T.A. Ghezzehei and R. Jones, 2008. Infiltration into fractured bedrock, *Water Resources Research*, 44, doi:10.1029/2006WR005701.
- Salve, R., 2005. Observations of preferential flow during a liquid release experiment in fractured welded tuffs, *Water Resources Research*, 41: doi:10.1029/2004- WR003570.
- Salve, R., and T. Kneafsey, 2005. Vapor-phase transport in the near-drift environment at Yucca Mountain, *Water Resources Research*, 41: doi:10.1029/2004WR003373.
- Salve, R., H.H. Liu, Q. Hu, D. Hudson, P. Cook, and A. Czarnomski, 2004. Unsaturated flow and transport through a fault embedded in fractured welded tuff, *Water Resources Research*, 40: doi:10.1029/2003WR002571.
- Salve, R., and T.K. Tokunaga, 2002. Seepage response along an alluvial valley in a semi-arid catchment in north-central California, *Hydrological Processes*, 16: 65-86.
- Salve, R., and C.M. Oldenburg, 2001. Water flow in a fault in altered nonwelded tuff, *Water Resources Research*, 37: 3043-3056.

# Shwet Prakash

Partner

Water Resources, Climate Change and Modeling

Shwet is a Partner who manages ERM's Water Resources, Climate Change and Modeling Group. Over the last 16 years, he has been involved in developing state of the art models for a variety of water quality and transport applications including fisheries and benthic impacts. His experience includes directing projects related to hydrodynamic studies, water quality assessments, groundwater contamination, accidental oil spill studies, sediment transport and scour studies, TMDL development and regulatory permitting. Shwet has worked on water quality and operational assessment for several domestic and international hydropower stations including working closely with the United States Bureau of Reclamation (USBOR) on CE-QUAL-W2 enhancements. He has authored or co-authored some of the industry leading numerical models used by researchers globally.



**Experience:** 16 years' experience in oil & gas, power, chemical, mining and manufacturing industry.

**Email:** [Shwet.Prakash@erm.com](mailto:Shwet.Prakash@erm.com)

**Link:** <https://gemss.com/index.html>

## Education

- M.S. (Civil Engineering), University at Buffalo, State University of New York, NY, February 2004
- B.S. (Civil Engineering), Indian Institute of Technology, Bombay, India, May 2001
- Watershed Management Training Certificate, The Watershed Academy, EPA
- Professional Development courses in Environmental Hydrodynamics and Sediment Transport Modeling with POM and ECOMSED, Stevens Institute of Technology, Hoboken, NJ

## Languages

- English, fluent
- Hindi, native speaker

## Fields of Competence

- Computational fluid dynamics
- 1-D, 2-D and 3-D numerical modeling of coastal and shelf processes including hydrodynamics and waves
- Chemical transport and fate and water quality modeling
- Ecological risk assessment & spill modeling
- Sediment transport modeling
- Particle tracking and entrainment modeling
- Watershed assessment and hydrological modeling
- In-reservoir and downstream impacts from hydropower projects
- Groundwater modeling
- Programming in FORTRAN, C, Visual Basic and HTML
- Field data processing and analysis

## Key Industry Sectors

- Oil and Gas
- Electric Utility (fossil fuel, nuclear, wind and hydropower)
- Mining
- Chemical

## Key Projects

**Boysen Reservoir Water Quality Assessment, WY**  
 Directed a comprehensive water quality assessment for the Boysen Reservoir in support of an oil & gas producer to evaluate their ability to discharge produced water to surface waters. The study comprised of modeling Boysen Reservoir over a period of 22 years including model calibration, validation and a variety of projection scenarios to support future expansions and treatment requirements.

### Implementation of Sediment Diagenesis in CE-QUAL-W2.

Lead programmer and developer for ERM's work with Alberta's Cumulative Environmental Management Association (CEMA) to estimate recovery time for tailings ponds. Key issues were rate of compaction, resulting morphodynamic changes and transfer of contaminants to surface waters. Developed the complex sediment diagenesis model within the CE-QUAL-W2 model framework which is now a standard part of the W2 model.

### Implementation of Hydropower Dam and Reservoir Water Quality Features in CE-QUAL-W2.

Lead programmer working on implementing several features related to hydropower reservoirs for the United States Bureau of Reclamation (USBOR). These features included adding programmatic changes to the CE-QUAL-W2 model for time-varying dam openings, selective withdrawal, time-varying wind stress coefficients (reservoir mixing) and detailed algal transport including nutrient absorption.

### Purari Hydro Project, Papua New Guinea

Purari Hydro Project is a proposed hydroelectric power project aimed at providing electricity to Papua New Guinea, north and far north Queensland, and Australia's National Electricity Market. The project will have a capacity of 1,800 MW of baseload

electricity. ERM is currently developing models to assess the impacts related to the development of reservoir on downstream water quality, sediment and hydrodynamic characteristics. The modeling work involves connecting in-reservoir models developed by Électricité de France and downstream impact models developed by ERM. The study is currently underway with models being developed in conjunction with field data collection.

### World Bank, Trung Son Reservoir CE-QUAL-W2 Model Application and Software Training, Vietnam

Trung Son Reservoir is a proposed hydroelectric power project on the Trung Son River in central Vietnam for Vietnam Electric Utility (EVU). The client requested assistance with development and training with the 2-dimensional hydrodynamic and water quality model, CE-QUAL-W2. The goal was to assess the water quality of the proposed reservoir and the management options for clearing the flooded areas. The technology transfer took place as a 6-day intensive workshop presented in Nha Trang, Vietnam. The workshop achieved two objectives: the model was fully customized to the Tung Son Reservoir problem definition, and the client (fifteen engineers and scientists) were trained in the use and theory of the model.

### Lake Mohave CE-QUAL-W2 water quality modeling, Las Vegas, NV

The primary objective of this study is to provide the Southern Nevada Water Authority and the Metropolitan Water District of Southern California with a CE-QUAL-W2 application capable of estimating changes in the water quality of Lake Mohave and its downstream releases due to the discharge of additional phosphorus at the upper end of Lake Mohave. The model was set up for the periods 1977-1978 and 1981-1982. The model grid was developed from HEC-RAS data sets available

for the lake using a program written by ERM and modified further for this application.

### **United States Bureau of Reclamation, Lake Mead Water Budget and Water Quality Modeling, Nevada**

Lake Mead is a large reservoir in the arid southwestern USA. Recent multi-year droughts have called into question the methods of computing flow rates from several of the large drainages that support storage in Lake Mead. These issues were examined using CE-QUAL-W2. For the current project, the model's evaporation computations were modified to better represent wind conditions at Lake Mead. With respect to water quality issues, the code was modified to allow gypsum exposed during extreme drawdown to be a source when the reservoir rises to a full condition.

### **Baynes Reservoir, Cunene River, Angola-Zambia**

ERM applied two reservoir models to assess potential environmental impacts from the construction and operation of the Baynes Hydroelectric Reservoir on the Cunene River between Angola and Zambia. The primary impacts are (1) the change in the water temperatures in the reservoir and immediately downstream of the dam and (2) the potential for eutrophication in the reservoir. The U.S. Army Corps of Engineers CE-QUAL-W2 model was chosen to assess the impacts of the Project on the temperature structure of the Baynes Reservoir. The U.S. Army Corps of Engineers BATHTUB model was used to estimate its trophic status. Results of the models identified the range of surface water elevations through the year, vertical water temperature distribution and behavior, monthly average discharge water temperatures, and the effectiveness of discharge structure placement. The trophic status of the reservoir was projected to be oligotrophic due to the low level of nutrient loading.

### **Kalivaç Reservoir, Albania**

ERM applied two reservoir models to assess potential environmental impacts from the

construction and operation of the Kalivaç Hydroelectric Reservoir in Albania. The primary impacts are (1) the change in the water temperatures in the reservoir and immediately downstream of the dam and (2) the potential for eutrophication in the reservoir. The Generalized Environmental Modeling System for Surface Waters (GEMSS®) model was chosen to assess the impacts of the Project on the temperature structure of the Kalivaç Reservoir. The U.S. Army Corps of Engineers BATHTUB model was used to estimate the trophic status of Kalivaç Reservoir.

### **Peach Bottom Atomic Power Station 316(a) NPDES and EPU analysis.**

This project includes the design of a temperature monitoring system and an accompanying 3-D modeling approach to support a biological assessment of Conowingo Pond. The temperature and biological assessment will be used to apply for a NPDES permit renewal and to examine the necessity of operating helper towers during the summer. The spatially extensive and continuous temperature data will be presented in the context of Susquehanna River flows; hydroelectric operations at Holtwood and Conowingo Dams and at Muddy Run (pumped storage); and, Peach Bottom operations. The monitoring and modeling program is projected to run for four years, during which one or more cooling towers will be operated. The monitoring and modeling programs will be used to assess the performance of the towers and the significance of the temperature reductions on the fisheries. In addition, the monitoring program will provide data for calibration and validation of the model.

### **Lake Whatcom, Washington**

ERM was tasked with evaluating the performance of the reservoir model component of the Lake Whatcom Nutrient Response Model (LWNRM). The LWNRM consists of the reservoir model (CE-QUAL-W2) and the watershed model (HSPF), which provides tributary flows and nutrient loads to the reservoir

model. This model had been used to simulate nutrient water quality in the Lake for the two-year period 2002-2003, first to reproduce existing conditions (the calibration), then to simulate natural conditions, and finally to develop the Total Maximum Daily Load (TMDL). Because the TMDL process looks forward in time to predict improvements in water quality, ERM tested the model against field data for 2007-2008 and developed an alternative TMDL using loads for this two-year period. To do so, ERM developed new input files, made specific improvements in DO. It was desirable, therefore, to evaluate the model's performance against a dataset for another period. ERM performed the TMDL analysis for this new period to evaluate the projection capability of these TMDL estimates in to the future.

### **Budd Inlet Water Quality Modeling**

Involved in the development of a carbon based water quality model for Budd Inlet and Capitol Lake, WA. ERM had done a similar study in 1998 for the Lacey, Olympia, Tumwater and Thurston County (LOTT) partnership for wastewater permitting. Current work includes improvement in the water quality calibration performed during the previous study along with the inclusion of Capitol Lake in the modeling domain.

### **Delaware Bay TMDL**

Developed and applied a hydrodynamic, transport and water quality model for Delaware Inland Bays. The objective of the study was to determine the TMDLs for the impaired waters on the State's 303(d) list for nitrogen, phosphorus, and DO within the Inland Bays of southern Delaware. These water bodies included Rehoboth Bay, Indian River, Little Assawoman Bay, and the surrounding tributaries and ponds. This analysis was accomplished using a hydrodynamic and water quality model GEMSS to verify the effectiveness of prescribed point and non-point source load reductions to meet the TMDL objectives.

### **Hydrodynamic Mixing Zone modeling of the confluence of the Nottawasaga River with Nottawasaga Bay**

Involved in performing the hydrodynamic mixing analysis of Nottawasaga River with Nottawasaga Bay using GEMSS-HDM & GEMSS-WQM in support of developing future TMDL for the waterbodies. The work includes estimation of near field mixing zone and its effects on the local water quality. Study will also be done on estimating the extent of the Nottawasaga River mixing zone on various River loading conditions and the subsequent water quality in the near field Bay region.

### **Charlotte Harbor water quality modeling**

Involved in development of a Charlotte Harbor water quality model using GEMSS to analyze the relationship between physical and biochemical processes in the estuary. The analysis included study of phytoplankton effect on dissolved oxygen and investigation of the occurrence of hypoxia in the deeper regions of the harbor.

### **South Seas Marina Flushing Study**

Modeled the South Seas marina for exchange of water with the open seas. It was found that the marina in its planned configuration did not flush (replace) 90% of the water within 24 hours. Several improvements to the marina configuration were proposed and evaluated. It was found that a combination of widening and deepening of entry channel along with opening of one design breakwater will improve the flushing and increase the degree of exchange with the open sea.

### **Flushing and Water Quality Study for South Bethany**

Assessed improvements to DO, nutrient levels, and other potential changes to the environment due to increasing ocean flushing into Delaware's Inland Bays (Indian River, Rehoboth Bay, and Little Assawoman Bay) using GEMSS HDM and WQM modules. Various methods of providing the flushing

improvements and increasing the degree of exchange were examined including tidally driven inlets and pumping systems. Final recommendations were provided along with a cost-benefit analysis for the various options.

### **Monitoring of Harmful Algal Bloom (HAB) for Lake Ontario**

Developed a three-dimensional free surface sigma co-ordinate hydrodynamic model for Lake Ontario based on Princeton Ocean Model (POM) for NOAA: MERHAB Lower Great Lakes. Also developed a Random walk particle-tracking model, to link with the hydrodynamic data to track the movement of algal blooms. Project also included analyzing the impact of Niagara River flow on the southern coastal region of the lake and on bloom movements. The overall goal was to setup a web page for real time simulations, where a user can specify the current bloom location and then monitor the trajectory.

### **Algae Transport & Water Quality model for Lake Ontario**

Developed a FORTRAN based two-dimensional Dissolved Oxygen (DO) and algae transport model for Lake Ontario as a part of the Rochester Harbor project for the US Army Corps of Engineers (USACE) and URS Corporation. The models were developed to monitor the water quality and algae fate for analyzing the efficiency of “herd and pump” approach adopted to solve the algae accumulation at the Ontario beach. Also performed calibrations for the dispersion values in the lake using conductivity data. Submitted a final report on the analysis results to URS suggesting preferred pumping locations.

### **Salem Generating Station Cooling Water Intake System improvements.**

Salem Generating Station (SGS) withdraws water from Delaware Estuary its cooling water (CW). Detrital material suspended in the Estuary is also drawn into the CW system. ERM developed a high resolution hydrodynamic and particle tracking model

simulate the movement of detritus. It was found that approximately 40% of the grass collected at the intake structure comes from the grass disposed at the ends of the intake structure. Moving the disposal point from the ends of the intake structure to the CW outfall provided a large reduction in recirculation of grass. It was found that less than 5% of the disposed grass is recirculated to the intakes when it is disposed through the CW outfall. This result reflects an improvement of almost 90% compared to the current procedure (40% down to 5%).

### **Multiple Studies Related to Water Quality and Thermal Impacts from Onshore LNG facilities, Qatar**

Managing and developing various large scale comprehensive water quality and thermal impacts studies in Ras Laffan Industrial City, Qatar. Modeling studies included assessment of chlorine discharges, thermal discharges and brine water discharges into the Arabian Gulf.

### **Development of Constructed Wetlands Model for Water Reuse. Confidential client.**

Directed development of numerical model for constructed wetlands that could aid in designing these wetlands for treatment of wastewater through the removal of nutrients, metals and organic compounds. A functioning wetlands system would allow for the reuse of treated process water for irrigation or recharging groundwater.

### **Water Quality Impact Assessment from Onshore LNG Terminal Expansion, BP, Indonesia.**

Managed a comprehensive modeling exercise to quantify environmental impacts related to expansion of an onshore LNG facility in Indonesia. Environmental risks associated to wastewater discharge, dredging, drill cuttings and mud discharge and pipeline hydrotesting were estimated using a 3-D hydrodynamic and transport model. Individual wastewater components were modeled and

evaluated against relevant ambient water quality standards.

### **NRDA Computations, Gulf of Mexico, Confidential Client.**

**Water Quality Modeling for Diamond Mine Support in Snap Lake.** ERM developed hydrodynamic and water quality model for Snap Lake diamond mining operations. Modeling included past and future water quality impacts due to mining operations. Ice conditions were implemented to reproduce winter freeze and affects on the lake water quality.

**Gran Canal Interoceánico de Nicaragua.** The Nicaragua Canal ESIA project required 15 separate water resource specialist studies including specialized water quality, hydrology, sediment transport, hydrodynamics, dredging and aquatic habitat in coastal, estuarine, riverine and lacustrine environments. Mr. Prakash was the technical manager and coordinator for all water impacts specialist studies annexes that provided technical information for the ESIA.

**Squaw Creek reservoir hydrothermal modeling**  
Involved in the development of hydrodynamic model for Comanche Peak Steam Electric Station located at Squaw Creek Reservoir, TX using GEMSS-HDM. The study was oriented towards evaluating the current and historical conditions during the plant full load and identifies different alternatives to decrease the intake water temperature. Several alternatives such as Spray modules, cooling towers and water garden steps were evaluated. Several enhancements to GEMSS were done to include modeling of such alternatives and analyzing their efficiency.

### **Selected Publications**

- Buchak, E.M., S. Prakash, D. Mathur, S.E. Sklenar. 2012. "Comparison of Modeled and

Observed Avoidance in a Thermally Loaded Reservoir". Symposium on Innovations in Thermal Research and Ecological Effects from Thermal Discharges at the 142nd Annual Meeting of the American Fisheries Society, Minneapolis – St. Paul, MN. 19 – 23 August.

- Mather, D., D. Royer, R. Bleistine, K. Long, R. Matty, T. Sullivan, S. Prakash, E. Buchak. 2013. "Analysis of American Shad Migration through Conowingo Pond, Susquehanna River ". Presented at the 2013 Georgia Water Resources Conference, Athens, Georgia, 10 April.
- Prakash, S., J. A. Vandenberg, E. M. Buchak. 2014. "Sediment Diagenesis Module for CE-QUAL-W2 Part 2: Numerical Formulation". Environmental Modeling & Assessment. (in press).
- Vandenberg, J. A., S. Prakash, E. M. Buchak. 2014. "Sediment Diagenesis Module for CE-QUAL-W2. Part 1: Conceptual Formulation". Environmental Modeling & Assessment. DOI 10.1007/s10666-014-9428-0. Print ISSN 1420-2026. Online ISSN 1573-2967. Springer International Publishing. November.
- Prakash, Shwet, J.A. Vandenberg and E. Buchak. 2012. "CEMA Oil Sands Pit Lake Model". CONRAD 2012 Water Conference. April 20-22. Edmonton, Alberta.
- Prakash, S., J.A. Vandenberg and E. Buchak. 2011. "The Oil Sands Pit Lake Model - Sediment Diagenesis Module." MODSIM 2011. Modelling and Simulation Society of Australia and New Zealand, December 12-16, 2011. Perth, Australia.
- Vandenberg, J.A., S. Prakash, N. Lauzon and K. Salzsauler. 2011. "Use of water quality models for design and evaluation of pit lakes." Australian Center for Geomechanics. Mine Pit Lakes: Closure and Management. Page 63-81.
- Kolluru, V.S., M.J. Fichera, S. Prakash. 2006. "Multipurpose modeling tool for aquatic and sediment contaminant fate and effect assessments". SETAC North America 27th Annual Meeting. Montreal, Canada. November 2006.

# Venkat S. Kolluru, Ph.D.

Technical Fellow, Partner  
Water Resources, Climate Change Modeling

## Hydropower Experience

Dr. Kolluru is ERM's Global Technical Lead for water resources and Technical Lead for ERM's Water Resources, Climate Change and Modeling Specialty Group, located in ERM's Philadelphia office, USA. He is the author of widely used 3-D hydrodynamic and water quality modeling system called GEMSS® (Generalized Environmental Modeling System for Surfacewater). He has used a wide variety of computer models including GEMSS to assess the impact of thermal, sediment, and pollutant discharges on water quality, aquatic and marine resources in estuaries, rivers, lakes, reservoirs and coastal systems. He has also used computer models for design studies, water management, EIA, regulatory permitting and climate change. Hydropower experience includes reservoir water quality assessments, sediment transport, e-flow analysis, catchment modeling and river/stream hydraulics.



**Experience:** Over 29 years' experience

**Email:** [Venkat.Kolluru@erm.com](mailto:Venkat.Kolluru@erm.com)

### Education

- Ph.D. (Ocean Engineering), The University of Rhode Island, Kingston, Rhode Island, 1991
- M.S. (Ocean Engineering), The University of Rhode Island, Kingston, Rhode Island, 1987
- M.Sc. (Turbomachines), Indian Institute of Science, India, 1985
- B.S. (Mechanical Engineering), University of Madras, India, 1982

### Professional Affiliations and Registrations

- American Society of Mechanical Engineers
- American Society of Civil Engineers

### Languages

- English, native speaker
- Tamil, Telugu and other South Indian Languages

### Fields of Competence

- Hydraulic and hydrologic studies
- Hydraulic and hydrologic modeling
- Water quality & sediment transport
- Computational fluid dynamics
- 1-D, 2-D and 3-D numerical modeling of riverine and estuarine systems
- Integrated water management
- Surface-subsurface-groundwater modeling
- Climate change data modeling
- Geographical information system (GIS)
- Hydropower EIAs and ESIsAs as per IFC and WB guidelines

### Key Industry Sectors

- Oil & Gas
- Chemical
- Harbors and Ports
- Power
- Water Supply and Wastewater
- Mining
- Financial Institutions (WB, IFC & IADB)

## Key Projects

### **Environmental and Social Impact Assessment for 130MW Pokko Hydropower Project, PLN, Indonesia, 2019.**

PLN (PERSERO) appointed ERM Indonesia (ERM) to conduct an Environmental and Social Impact Assessment (ESIA) for the development of the 130 megawatt (MW) Poko Hydropower Plant Project and its associated facilities and activities (Poko HPP or the Project). A cumulative Impact Assessment (CIA) of the Project, including detailed hydrologic, water balance, hydraulic, and water quality studies, and environmental flows was required as part of the ESIA process. Served as the subject matter expert on hydrological and hydraulic studies for this project. For the hydrological assessment, the Soil and Water Assessment Tool (SWAT) was used to develop a calibrated hydrological model of Mamasa Basin and River that includes the section of the Sadang River downstream of the confluence of the Mamasa and Sadang Rivers. The calibrated SWAT model was thereafter used to simulate long-term river flows in the Mamasa and Sadang rivers and their major tributaries as input to hydraulic and water quality modelling of the section of the Mamasa River that stretches approximately 30 km from upstream of Poko Dam to the confluence of the Mamasa River with the Sadang River. Reservoir model was run for to evaluate various operational regimes and the quality of water for eflow, powerhouse and spillway releases. The results of various modelling studies conducted for this project were used for ecological assessment and downstream water usage for various socioeconomic activities.

**ESIA, CIA and SPS for Upper Arun Hydroelectric Project (UAHEP) and Ikuwa Khola Hydropower Project (IKHPP), NEA, Nepal, 2019.** Lead hydraulic modeler for the assessment of Environmental Flows (EFlows) at the Upper Arun Hydroelectric Project (UAHEP) and for the Ikuwa Khola Hydropower Project (IKHPP). The EFlow Assessment follows the World Bank Group Good Practice Handbook: Environmental Flows for Hydropower Projects (2018). Based on the handbook, a medium resolution approach, which requires a Connectivity Assessment and a Sediment Assessment was

identified for this project. ERM used the U.S. Hydrologic Engineering Center's River Analysis System (HEC-RAS) model to conduct a Connectivity Assessment. Minimum Depth Scenario was modelled using an iterative process to determine the EFlow required to maintain the minimum required for local biological species.

### **Confidential Client, Hydroelectric Power Project, North Sumatra, Indonesia (2015).**

As part of a supplemental ESIA to meet IFC requirements, ERM assessed environmental flows for a proposed hydropower project. Two distinct reaches of the river will be affected by the Project: the bypass reach between the dam and Power House (reduced flow) and the reach downstream of the Power House (flow ramping). The methodology for the assessment included a HEC-RAS hydraulic model covering both the bypass and downstream reaches. To assess ecological effects of the new flow regimes, depth, width, and velocity information from the hydraulic model were combined with known habitat preferences for representative fish species identified during literature review and field surveys. Human uses of the river were similarly identified during field studies and stakeholder engagements.

### **Sediment transport and river morphology analysis of the Upper Karnali Hydropower Project, Nepal, 2015.**

Served as technical lead for the study of geomorphological, hydrologic and hydraulic changes in the Upper Karnali River, Nepal. Hydrologic and hydraulic models were developed to estimate water availability and sediment transport in the Upper Karnali watershed. GIS and geomorphic analysis were adopted to estimate the sediment transport impacts in the bypass reach downstream of the dam. The model output and the analysis outcome were used to estimate impacts on the river ecosystem and aquatic habitats. Strategies for optimal reservoir operations were and a sediment management plan were developed.

### **Hydrologic and sediment transport analysis of the Batangtoru Hydropower Dam, Sumatra, NSHE, 2015.**

As part of the environmental impact assessment of the hydroelectric power plan, Dr. Kolluru developed hydrologic and sediment transport models. GIS analysis and hydrologic modeling were adopted to characterize the stream morphology and its major tributaries downstream of the dam. A hydraulic and sediment transport model of the river network was developed and run for several pre- and post-project scenarios. Flow duration curves, stage-discharge relationships and sedigraphs were provided for a wide range of low flow conditions.

### **Hydrologic and Sediment transport analysis for Nicaragua Grand Canal, Honk Kong Nicaragua Development, 2014.**

Performed hydrologic and sediment transport simulations to assess runoff and sedimentations changes in the watersheds intersected by the canal. Several new reservoirs, lakes and wetlands were planned as part of the project. The goal was to understand the extent of sedimentation that would occur in the new water bodies and to estimate the new gain and losses in the sediment budget of Lake Nicaragua. The canal represents a major transportation route for large tanker and container ships.

### **Coastal sediment transport and infill of dredge channels, Mexico, Confidential, 2015.**

As part of a site review for a LNG facility, ERM provided an assessment of the coastal sedimentation rates for a dredged channel and turning basin. Statistical analysis and hydraulic modeling were performed to study the near-shore dynamics. Waves and currents sediment transport was computed for normal meteocean conditions and for typical tropical storms. Monthly siltation rates were estimated for different channel designs. Hurricane conditions were evaluated. Indications for optimal design were provided.

### **Hydrologic and sedimentation modeling, Impact Assessment and Water Management Plan for a**

### **mine, Guinea, Africa, Global Alumina Corporation, 2015.**

ERM assessed the overall impacts of a large bauxite mine on the surface and groundwater resources of a major watershed. A thorough hydrologic model was developed to analyze the pre-, during- and post-mining conditions on water quality. Sedimentation analysis was performed to assist the design of dams and impoundments to retain the excess runoff and sediment release to the river. A Water Management Plan was developed to coordinate and perform water resources monitoring during the mining operation and provide Adaptive Management.

### **Sediment Transport Modeling in highly managed watersheds of Iowa, IIHR – Hydroscience & Engineering, the University of Iowa, 2014.**

Served as a technical lead for a multi-party project to simulate the effect of different management options to control sediment and nutrient transport in Iowa. The 2-dimensional hydrodynamic and sediment transport model FESWMS was adopted to simulate fate of sediment throughout Iowa. The goal was to understand the importance of channel geometry and channelization in terms of erosion and deposition processes in order to assess their role at the watershed scale.

### **Zambezi River Authority, Batoka Gorge Hydro Electric Scheme, ESIA, Zambia and Zimbabwe (2014).**

As part of the ESIA for this project, ERM modelled water temperatures, dissolved oxygen, and nutrients to assess potential changes in these parameters within proposed Batoka Reservoir and in the Zambezi River downstream of the project. Several models and computations were used, each of which required hydrologic and climatological inputs as well as information on the morphometry of the reservoir and river and dimensions and locations of hydropower facilities. The hydrologic record was used to select three years for simulation and to generate nine scenarios that represent potential hydropower operating schemes. In addition, there were two alternate powerhouse intake elevations to consider, resulting in 54 analyses. ERM worked cooperatively on this project with the design

engineers, Studio Pietrangeli, and biological consultants, Southern Waters.

**Mkushi Reservoir, Muchinga Hydropower Project, Zambia (2012).** The objective of this evaluation was to determine the potential stratification regimes that Mkushi Reservoir (at the Muchinga Hydropower Project) may experience during typical operating and hydro-meteorological conditions. The analysis was based on the Lake, Richardson, and Wedderburn Numbers for the project using the proposed reservoir morphology, hydrologic and meteorological data, and water temperature data from other existing reservoirs in the area. These empirical characteristic numbers provide an index describing the reservoir's mixing potential, the degree of tilting of a thermocline and upwelling, the stability of seasonal stratification, and short-term mixing patterns.

**Baynes Reservoir, Cunene River, Angola-Zambia (2011-2012).**

ERM applied two reservoir models to assess potential environmental impacts from the construction and operation of the Baynes Hydroelectric Reservoir on the Cunene River between Angola and Zambia for an ESIA in accordance with IFC Performance Standards. The primary impacts are (1) the change in the water temperatures in the reservoir and immediately downstream of the dam and (2) the potential for eutrophication in the reservoir. The U.S. Army Corps of Engineers CE-QUAL-W2 model was chosen to assess the impacts of the Project on the temperature structure of the Baynes Reservoir. The U.S. Army Corps of Engineers BATHTUB model was used to estimate its trophic status.

**Reventazon Hydroelectric Project, Costa Rica (2011-12).**

Performed hydrology and stream flow assessment for Reventazon River and Reservoir for IDB and IFC lending requirements. Determined water allocation impacts and energy generation. Modeled reservoir water quality, stratification, and sediment transport. Developed future hydrologic scenarios for testing

with climate change and greenhouse gas assumptions.

**Kalivaç Reservoir, Albania (2010).** ERM applied two reservoir models to assess potential environmental impacts from the construction and operation of the Kalivaç Hydroelectric Reservoir in Albania. The primary impacts are (1) the change in the water temperatures in the reservoir and immediately downstream of the dam and (2) the potential for eutrophication in the reservoir. The Generalized Environmental Modeling System for Surface Waters (GEMSS®) model was used to assess the impacts of the Project on the temperature structure of the Kalivaç Reservoir. The U.S. Army Corps of Engineers BATHTUB model was used to estimate the trophic status of Kalivaç Reservoir.

**First Energy, Yards Creek Pumped Storage NJPDES Permit Modifications, NJ, USA (2009).**

Re-designed the scope of work to use existing analysis and to eliminate costly field program. Developed heat budget, estimated maximum annual reservoir temperature, and performed CORMIX computations to demonstrate that the bearing cooling water discharge is insignificant. Presented results to NJDEP staff with follow-up analyses are required. Suggested acceptable temperatures to NJDEP's permit writer. NJDEP has approved the permit modification granting relief.

**EIA/SIA Studies, Nam Sane 3 Hydroelectric Power Project, Xieng Khouang Province, Laos PDR (2008-09).**

The scope of work for this project was to perform hydrologic and water quality assessments of a proposed hydroelectric dam and reservoir in Laos. The key hydrologic and water quality impacts identified were changes in water temperature, dissolved oxygen, and sediment in the reservoir and in the reach downstream of the powerhouse, as well as the impacts of changes in the flow regime in the bypass reach and downstream of the powerhouse. A minimum riparian release was proposed in the analysis to maintain existing aquatic ecology and

mitigate overall environmental, health, and social impacts.

#### **Alcoa, Greenland (2008-09).**

Assessed water resource impacts of two proposed hydroelectric facilities with a combined generating capacity of 955 MW and an associated aluminum smelter with port facility in southwest Greenland. Led water resource modeling of freshwater and marine project locations. Provided input on field data program, primarily on data collection locations and water quantity and quality parameters. Project scope encompassed a broad range of issues due to multiple locations, various water environments, and glacial and permafrost environmental features.

#### **World Bank, Trung Son Reservoir CE-QUAL-W2 Model Application and Software Training, Vietnam (2008).**

Trung Son Reservoir is a proposed hydroelectric power project on the Trung Son River in central Vietnam for Vietnam Electric Utility (EVU). The client requested assistance with development and training with the 2-dimensional hydrodynamic and water quality model, CE-QUAL-W2. The goal was to assess the water quality of the proposed reservoir and the management options for clearing the flooded areas. The technology transfer took place as a 6-day intensive workshop presented in Nha Trang, Vietnam.

#### **Pacific Hydro, Chile (2008).**

**ERM performed a third party review of the 110 MW Chacayes Hydroelectric Plant in Chile, based on IFC Performance Standards, Equator Principles, and Chilean regulations. Specific tasks included evaluation of the hydrologic and hydraulic environmental impact assessments and gap analyses.**

#### **Bui Development Secretariat, Ghana (2006-2007).**

The purpose of this project was to assess potential environmental impacts associated with the construction and operation of the Bui Project, a hydroelectric dam project located on the Black Volta River in western Ghana. Potential water quality and sedimentation impacts in the reservoir, and an un-

seasonal water level regime in the river downstream were identified as issues that warranted further investigation. ERM undertook basic reservoir and downstream river modeling studies to quantify the nature and extent of these potential impacts for presentation in the final EIA report. Methods included HEC-RAS modeling of the downstream reach, a Vollenweider-type assessment of the eutrophic level of the proposed reservoir, and a sediment balance to determine reservoir filling rates.

#### **Flood Hazard Modeling, Jaguar, Guatemala, 2014.**

Prepared a flood risk and hazard assessment for the Jaguar Energy Generating Station in Guatemala. ERM evaluated the 2, 10, 25, 50 and 100-year flood events at the station using the HEC-HMS model to generate the flood hydrographs and Flo2D to compute the inundation areas. Both upstream floods and on-site floods were considered. Sewered portions of the site were modeled using EPA's Storm Water Management Model (SWMM). Flood risk was classified by an index based on inundated depth and flow velocity.

#### **Weda Bay TM12 Watershed Study Project, 2011.**

This project was commissioned to cover a number of water use risks associated with the implementation of the Weda Bay Nickel Project in Indonesia. Performed hydrologic and sediment transport modeling for this project using the U.S. Army Corps of Engineers Gridded Surface Subsurface Hydrologic Analysis (GSSHA) software within the Watershed Modeling System (WMS) to assess the pre, during, and post-mining effects on the effected rivers and watersheds.

## **Exhibit C**

**PG&E's Specific Comments the Revised Draft  
Environmental Impact Report**

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 1

This Exhibit describes specific comments on the RDEIR. Subject text from the RDEIR is included with reference to the RDEIR section and page number, and PG&E comments are shown in *italics*.

## Chapter 1 - Introduction

### Comment 1. 1.3 State Water Board's Objectives, pages 24 and 25

The following are the State Water Board's objectives:

1. Ensure that the project will comply with the water quality objectives described in the Basin Plan designed to reasonably protect the beneficial uses of Lake Almanor and the North Fork Feather River.
2. Ensure reasonable protection of the beneficial uses described in the Basin Plan that apply to Lake Almanor and the North Fork Feather River, including water supply, power, recreation, warm and cold freshwater habitat, warm and cold water spawning, and wildlife habitat.
3. Improve water quality in the North Fork Feather River downstream of Canyon Dam, while protecting the cold-water beneficial uses associated with Lake Almanor.
4. Effectively and reliably reduce water temperatures in the North Fork Feather River below Canyon Dam during the summer months to achieve a preliminary temperature target of 20°C, consistent with temperature objectives identified in the Rock Creek–Cresta Relicensing Settlement Agreement.
5. Ensure that the selected alternative:
  - Is technologically feasible, reliable, and maintainable, and
  - Can be implemented under current legal obligations and logistical constraints.
6. Ensure that controllable factors (e.g., flow release volumes, timing, and durations) that could reduce water temperature in the North Fork Feather River below Canyon Dam are not overridden by uncontrollable physical factors (e.g., lack of river shading, air temperature, etc.).

### PG&E Comments

*As described in the accompanying comment letter dated July 7, 2020 (“PG&E RDEIR comments”) to which this is Exhibit C, the State Water Board selected project alternatives based on incorrect objectives.*

*Notwithstanding this point, the State Water Board also fails to demonstrate how any of alternatives meet the Board’s own objectives.*

**SWRCB Objective 1:** *The SWRCB Alternatives fail to protect the beneficial uses of Lake Almanor. See also Comment 14, Comment 25, Comment 26, Comment 33, Comment 36, Comment 37, and Comment 53 on Section 5.5, Water Quality and Section 5.6, Fisheries.*

**SWRCB Objective 2:** *The SWRCB did not fully evaluate impacts to warm-water habitat and warm-water spawning, which exists under current conditions, nor the cold water released from the hypolimnion of Lake Almanor during the 250 cfs summer flows. See also Comment 16, Comment 30, Comment 40, Comment 45, Comment 58, Comment 61, Comment 62, Comment 65, and Comment 69 regarding water quality and fisheries.*

**SWRCB Objective 3:** *The SWRCB Alternatives 1, 2, and 3 fail to protect the cold-water beneficial uses within Lake Almanor and do not fully evaluate effect of “improving water quality” below Canyon Dam. See also Comment 14, Comment 25, Comment 26, Comment 33, Comment 36, and Comment 53 regarding water quality and fisheries.*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 2

**SWRCB Objective 4:** *The SWRCB Alternatives 1, 2 and 3 fail to reasonably or reliably reduce water temperatures below 20°C because thermal curtains and additional higher flows will provide only incremental benefits at an unreasonably high cost and loss of generation as well as significant adverse aesthetic, recreational and fishery impacts. See also Comment 14 and Comment 18 and Exhibit B regarding water temperatures and modeling.*

**SWRCB Objective 5:** *The SWRCB Alternatives are not maintainable without potential significant impacts to other resources, including water quality in Lake Almanor. Nor can they be implemented under current legal obligations because the State Water Board lacks authority to impose mitigation that does not address impacts of the Project. See also Comment 14, Comment 25, Comment 26, Comment 33, Comment 36, and Comment 53 regarding water quality and fisheries.*

**SWRCB Objective 6:** *PG&E has provided comments regarding the inadequacies of SWRCB modeling (Exhibit B). Even with these shortcomings, SWRCB modeling shows that the controllable factors will not successfully and reliably reduce water temperatures to below 20°C, largely because of (1) ambient conditions of the river canyon, (2) the distance downstream to the lowermost compliance point. See also Comment 14 regarding water quality and water temperature and Exhibit B to PG&E's 2020 RDEIR Comments.*

**Comment 2. 1.4 Relationship of RDEIR to the UNFFR Environmental Impact Statement and Settlement Agreement, page 26**

In its comment letters on the Draft and Final EISs, the State Water Board notified FERC that it was addressing the water temperature issues by preparing an EIR and considering measures for Basin Plan compliance.

**PG&E Comments**

*The SWRCB's implication that FERC did not complete a water temperature assessment, and that the SWRCB is responsible for this analysis is misleading and misguided.*

*FERC analyzed 42 measures that could reduce water temperatures (FEIS, Appendix D). FERC immediately dismissed 20 and analyzed 5 in more depth (See FEIS Section 3 p 62-79), including modified minimum instream flows (MIF) between 200-400 cfs. FERC concluded "Providing PG&E's proposed MIFs exclusively and using the low-level gates for all Canyon dam MIF releases would have negligible effects on the thermal regime of Lake Almanor, continue to maintain cool temperatures in the Seneca reach, and generally reduce peak temperatures in the Belden, Rock Creek, Cresta, and Poe reaches. However, temperatures of a little greater than 20.0°C would continue to occur throughout most of these reaches during July and August."*

*Based on their assessment, FERC did not recommend additions of thermal curtains (the SWRCB Alternatives 1 & 2). FERC also did "not recommend MIFs higher than those proposed by PG&E in the SA" (i.e., SWRCB Alternative 3), citing incremental benefits with higher releases, high cost and impact to generation, and adverse effects to the Butt Valley Reservoir fishery.*

**Comment 3. 1.5 Other Hydroelectric Projects in the North Fork Feather River Basin, page 29**  
Figure 1-3. Schematic Diagram of Flow.

**PG&E Comments**

*Hamilton Branch powerhouse is noted as a Project powerhouse – this is incorrect. Hamilton Branch is a FERC exempt project and not part of the UNFFR Project (FERC No. 2105).*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 3

**Comment 4. 1.6 Agency Responsibilities- USFWS, page 31**

The USFWS has management authority over five sensitive species that may occur within the UNFFR Project boundary: the bald eagle (*Haliaeetus leucocephalus*); golden eagle (*Aquila chrysaetos*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); California red-legged frog (*Rana aurora draytonii*); and slender Orcutt grass (*Orcuttia tenuis*).

**PG&E Comments**

*Although not within the Project affected area, foothill yellow-legged frog (FYLF, *Rana boylii*, California Threatened) would be adversely affected by SWRCB Condition 6 (Water Temperature Management), which increases streamflow from Canyon Dam to decrease water temperature in the Cresta reach. This was not fully addressed in the RDEIR. See also PG&E's draft WQC comments, filed herewith as Exhibit A.*

*Please delete the valley elderberry longhorn beetle, as the USFWS revised the range for this species. The UNFFR project is well above the upper elevation of 500 ft described in the revised range description, and there are no known occurrences.<sup>1</sup>*

## **Chapter 3 - Proposed Project and Alternatives**

**Comment 5. 3.3 Overview of the North Fork Feather River Project, page 52**

**Recreation Facilities**

PG&E manages a number of recreation facilities associated with the UNFFR Project, including facilities on USFS lands, which are maintained by PG&E under a special use permit from the USFS. The USFS manages other recreation facilities in the vicinity of the UNFFR Project. PG&E-managed recreation facilities include:

Lake Almanor:

- Lake Almanor Campground – Loops 1, 2, and 3
- Camp Connery Group Camp
- Canyon Dam Day Use Area
- Almanor Scenic Overlook
- Eastshore Day Use Area
- Last Chance Campground and Group Camp
- Rocky Point Campground and Day Use Area

Butt Valley Reservoir:

- Ponderosa Flat Campground
- Alder Creek Day Use Area and Boat Launch
- Cool Springs Campground Belden

Forebay to Belden Powerhouse:

- North Fork Fishing Trail
- Belden Rest Stop on State Route 70

---

<sup>1</sup> USFWS (U.S. Fish and Wildlife Service). 2017. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). Prepared by U.S. Fish and Wildlife Service, Sacramento, California. 28 pp. May.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 4

**PG&E Comments**

*This section should be updated to correct naming and excluded facilities: Lake Almanor Campground and Rocky Point Campground are the facility and should be called Rocky Point Campground. Marvin Alexander Day Use Area should be added to this list under Lake Almanor. The North Fork Fishing Trail should be deleted because it is not included under the current license, and PG&E does not conduct operations or maintenance on the North Fork Fishing Trail.*

**Comment 6. 3.4 Proposed Project, page 54**

PG&E developed its proposed project to ensure that it could meet its objectives for the UNFFR Project:

1. Continue generating electricity for the term of the new license to produce electric power from a renewable source for its customers.
2. Continue providing power to help meet both short- and long-term needs for power and ancillary services in PG&E's service area and within the California- Mexico Power Area.
3. Implement measures to conserve energy, mitigate damage to fish and wildlife (including related spawning grounds and habitat), provide recreational opportunities, and preserve other aspects of environmental quality.

Under the proposed project, UNFFR hydroelectric facilities will be operated and modified per PG&E's FERC application with additions from the Settlement Agreement, section 18 prescriptions, the 4(e) conditions, and FERC staff additions as summarized in the sections 0 and 0, below. The proposed project, along with three water temperature management alternatives, is evaluated in this Revised Draft Environmental Impact Report (RDEIR).

**PG&E Comments**

*These are the Project objectives that need to be considered in the CEQA evaluation, not the revised objectives developed by the State Water Board which are presented in Section 1.3.*

**Comment 7. 3.5 Development of Alternatives to the Proposed Project, page 68**

Relative to this baseline, renewal of PG&E's UNFFR Project license without any changes to the license conditions would not result in a physical change to the environment, except to the extent that ongoing UNFFR Project operations are contributing to the long-term deterioration of environmental conditions.

**PG&E Comments**

*Ongoing Project operations – including any past deterioration, are part of the baseline under CEQA, and thus cannot be used to justify alternatives or mitigation. No new deterioration of environmental conditions has been shown to result from PG&E's Proposed Project.*

**Comment 8. 3.5 Development of Alternatives to the Proposed Project, page 68**

Accordingly, the State Water Board has not developed what would essentially be a "straw man" alternative that would avoid or lessen environmental impacts by eliminating one or more of the PM&E's included in the Settlement Agreement. Instead, the Board has focused on the development of alternatives that would address the issue of elevated temperatures in the North Fork Feather River that was left unresolved by the Settlement Agreement.

**PG&E Comments**

*The State Water Board assessed Project alternatives based on incorrect and inappropriate objectives (see also PG&E RDEIR comments). Elevated temperatures in the NFFR within Project reaches were not identified*

## Exhibit C

### PG&E's Specific Comments the RDEIR

Page 5

*as a project impact after mitigation [Table 5.5-5, Impact WQ-3. Proposed Project -No Impact (Beneficial)], and therefore developing Alternatives to mitigate this beneficial impact is not warranted. However, potential adverse thermal effects to the fishery within the Seneca Reach resulting from the high summer releases of cold water from Lake Almanor under Alternatives 1 and 3 are likely and are not fully evaluated in this RDEIR. Resulting water temperatures would be detrimental to fish and aquatic resources within Lake Almanor and downstream of Canyon Dam. See also Comment 30 and Comment 54 on Section 5.5, Water Quality and Section 5.6, Fisheries, regarding reduced temperatures in the Seneca reach.*

#### Comment 9. 3.6 Selected Alternatives, page 90

Vegetation removal would occur only as necessary. Ideally, this activity would be scheduled during the non-nesting season for avian species (after August 1 and before March 1); if this schedule is found not to be feasible, environmental protection measures, including pre-construction surveys and avoidance of nest sites, would be required.

#### PG&E Comments

*Nesting bird season is February 15 to August 31. This should be corrected in the RDEIR.*

## Chapter 5 - Environmental Setting, Impacts, and Mitigation

#### Comment 10. 5.2 Land Use and Mineral Resources, Page 118

Most of the reservoir is accessible for day-use recreation, such as boating, fishing, and wildlife viewing; however, boats are excluded from the southern end of Butt Valley reservoir near the Caribou intakes for safety reasons.

#### PG&E Comments

*This last statement is incorrect. As described in PG&E's 2014 DEIR comment letter, boats are excluded from the southern-most end of the reservoir only during the winter period. During the rest of the year, the area is configured so that boats can access the area near the Caribou intakes safely.*

#### Comment 11. 5.2 Land Use and Mineral Resources, Page 124

The thermal curtain around the Caribou intakes would not affect land uses at Butt Valley reservoir or from the adjacent shoreline in the vicinity of Butt Valley dam. Boating access is currently limited near the intakes and the dam, and there is minimal recreational use in the vicinity of the dam.

#### PG&E Comments

*This last statement is incorrect. As described in PG&E's 2014 DEIR comment letter, boats are excluded from the southern-most end of the reservoir only during the winter period. During the rest of the year, the area is configured so that boats can access the area near the Caribou intakes safely.*

#### Comment 12. 5.3 Mitigation Measures, page 145

**Mitigation Measure GGS-1:** Approval of Construction Activities by the State Water Board (Turbidity and Total Suspended Solids)

Prior to construction, PG&E shall submit detailed plans outlining all construction activities to the State Water Board for review and written approval. Each plan will contain a detailed description of the proposed activities, activity boundaries, potential environmental impacts, pollutants of concern, and selection of appropriate best management practices (BMPs) that will be implemented. The following measures, or their equivalent, shall be required for construction activities:

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 6

**PG&E Comments**

*SWRCB is going beyond SWRCB, and thus CEQA, authority with this mitigation measure. Projects will be submitted for SWRCB review if a Clean Water Act (CWA) 404/401/402 permit is required. SWRCB does not have authority outside CWA and especially not in uplands where the need for a CWA approval is not triggered (CWA 402). Note additionally that the Porter-Cologne Act is preempted by the Federal Power Act within the FERC Project boundary. CEQA does not provide the SWRCB with authority that it does not have under other laws. See CEQA Guidelines, § 15040, subd. (b).*

**Comment 13. 5.5 Water Quality, Page 164**

Though the source of the impairment is listed as “unknown” because a source analysis has not been performed, the primary causes of water temperature impairment in the North Fork Feather River may be attributed to hydromodification and flow regulation/modification.

**PG&E Comments**

*This unsubstantiated statement should be removed. The SWRCB has not presented any evidence – substantial or otherwise – to support its speculative statement that hydromodification and flow regulation/modification are the source of water temperature impairment. Even if past temperature rise were due to “hydromodification” and not another cause (e.g., climate change), the water temperature impairment is part of the baseline and no justification for the selected alternatives.*

**Comment 14. 5.5 Water Quality, Page 164**

This RDEIR focuses on potential modifications to the existing UNFFR Project that may be implemented to better protect the overall beneficial uses of the North Fork Feather River, while limiting water quality impacts to the beneficial uses of Lake Almanor.

**PG&E Comments**

*SWRCB analyses contained within this RDEIR does not demonstrate that the Proposed Project will adversely affect beneficial uses of the North Fork Feather River and Lake Almanor, nor does it demonstrate that the beneficial uses would be better protected by the State Water Board Alternatives. The Proposed Project supports beneficial uses in the North Fork Feather River and in Lake Almanor. The State Water Board’s Project Alternatives reduce the cold water beneficial use habitat in Lake Almanor compared to the Proposed Project and could displace special status species in downstream reaches (and results in significant and unavoidable impact to other resource areas including recreational swimming and panning for gold). See also Comment 25, Comment 26, Comment 36, Comment 53, Comment 64, Comment 65, Comment 66, and Comment 67 on Section 5.5, Water Quality and Section 5.6, Fisheries, and PG&E’s comments on the 401 WQC (included in Exhibit A of this document) on the Alternatives impacts to cold water lake habitat, and hardhead and FYLF in the NFFR.*

**Comment 15. 5.5 Water Quality, Page 166**

Data reported by Sierra Institute (2012) suggest average yearly temperatures in Lake Almanor from 1990 to 2010 have trended upward, from 50.38°F in 1990 to 56.95°F in 2010. In addition, Schneider et al. (2009) found that the nighttime lake surface temperature appears to have been warming at about  $0.15 \pm 0.03^{\circ}\text{C}$  per year since 1992.

**PG&E Comments**

*This rapid increase is dramatic and suggests the likelihood that additional depletion of cold water lake habitat following modification of project operations may cause further stress to the existing cold water fishery in the lake.*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 7

**Comment 16. 5.5 Water Quality, Page 166**

The overall water quality of Lake Almanor may be influenced by such factors as water depth, season, climatic conditions, and the timing and volume of stream and spring inflows, overland runoff, erosion and sediment influx, and septic system leachate and treated wastewater effluent discharges to the lake (California Department of Water Resources 1975; California Department of Fish and Game 1974; Earthworks Restoration and CH2M Hill 2007; Johnston and McMurtry 2009, 2010, 2011, 2012, 2013, 2014; Johnston and McReynolds 2016).

**PG&E Comments**

*Water quality in Lake Almanor is also affected by its outflows, dependent on the timing, volume, and location of those releases. (See Level 3 Report in the Project record.) The Board should consider water quality implications of altering outflows from Lake Almanor as an additional impact of the Alternatives.*

**Comment 17. 5.5 Water Quality, Page 175**

As with Belden forebay, the Belden reach has exceeded Basin Plan objectives for water temperature (mostly in July and August), specific conductance, mercury, and PCB concentrations in fish tissues (Pacific Gas and Electric Company 2002, State Water Resources Control Board 2010).

**PG&E Comments**

*The Board's Basin Plan does not specify exceedances for water temperature in the Belden Reach or generally in the North Fork Feather River. The Basin Plan states: "At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature." This Basin Plan objective has not been exceeded. SWRCB's assessment that the Belden Reach has exceeded Basin Plan objectives is unsubstantiated.*

**Comment 18. 5.5 Water Quality, Page 176**

Average daily water temperatures in the Belden reach upstream of the East Branch exceeded 20°C for 20 to 29 percent of the days in July and August during 1999 to 2004 compared to downstream of the East Branch, where 51 percent of the days in June through September during 1999 to 2004 exceeded 20°C (Pacific Gas and Electric Company 2002, 2005b; Federal Energy Regulatory Commission 2005).

**PG&E Comments**

*These temperature exceedance results presented by the SWRCB clearly demonstrates that project effects on water temperatures in the NFFR are greatly diminished downstream of the confluence with the East Branch Feather River. At these downstream locations, the temperatures are greatly influenced by ambient conditions (i.e., air temperatures) and input from other tributaries. See also Comment 48 on Section 5.6, Fisheries, and Exhibit A herewith, and PG&E's draft WQC comments regarding the inappropriate use of a 20°C threshold.*

**Comment 19. 5.5 Water Quality, Page 178**

During summertime, Lake Almanor is stratified. Warm water stays on the surface, the epilimnion, and does not mix with cooler deeper water that becomes depleted of oxygen, the hypolimnion. When stratification occurs, suitable cold water habitat becomes limited to a middle layer where temperatures are cool enough and DO is high enough. The criteria used for this analysis was temperature less than or equal to 20°C and DO greater than 5 mg/L.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 8

**PG&E Comments**

*The discussion here again refers to the 20°C threshold to assess cold water habitat. PG&E does not agree that this threshold is protective for the species that occur in the river, as further described in Comment 48, on Section 5.6, Fisheries, regarding 20°C threshold.*

**Comment 20. 5.5 Water Quality, Page 178**

The criteria used for this analysis was temperature less than or equal to 20°C and DO greater than 5mg/L.

**PG&E Comments**

*There is no mention of the 20°C criteria in the Project objectives or Basin Plan. The Basin Plan DO criterion is 7 mg/L, which should be used for this analysis, at least in comparison to the selected 5 mg/L criterion. Use of the Basin Plan criterion would show that there would be even more limited cold water habitat than indicated in the Board's analysis. Amendments to the Basin Plan, following proper procedures, are required to impose new temperature criteria.*

**Comment 21. 5.5 Water Quality, Page 178**

Then daily metrological data was compiled for three years: 2000 "normal," 2001 "dry," 2009 "critical."

**PG&E Comments**

*These year-type designations are incorrect; 2001 was a "critical dry" year, and 2009 was a "dry" year.*

**Comment 22. 5.5 Water Quality, Page 178**

Rainbow trout can survive excursions above the 20°C threshold without being lethal for periods over a week, however, there may be impacts to physiological performance such as reduced growth and weakened disease resistance.

**PG&E Comments**

*This claim is made without citation or substantial evidence. The SWRCB lacks authority to implement a 20 °C threshold as a cold water temperature objective in this proceeding. Moreover, any amendment to the Basin Plan must be supported by a rigorous basis for assigning a 20 °C threshold. See also Comment 48 on Section 5.6, Fisheries.*

**Comment 23. 5.5 Water Quality, Page 178**

It should be noted that the Lake Almanor CE-QUAL-W2 model may not be able to capture the potentially small, isolated "pockets" of suitable cold water habitat that may occur in some local areas, and as a result may underestimate the total available habitat in Lake Almanor.

**PG&E Comments**

*This statement is not supported by substantial evidence. SWRCB suggests that the "pockets" of suitable cold water habitat may occur, but it is unknown whether springs at the bottom of Lake Almanor contribute to suitable habitat in small areas, as spring water discharged into the lake may be anoxic. The State Water Board does not quantify spatial or temporal variations in spring contribution to suitable habitat, if any, during summer in order to make this note.*

**Comment 24. 5.5 Water Quality, Page 178**

Use of 5 mg/L DO concentration for the purpose of defining a lower criterion for the thermal refuge habitat index at Lake Almanor is not to be construed as a departure from the Basin Plan DO objective of 7 mg/L for cold, freshwater habitat because the natural process of thermal stratification in lakes results in a declining relationship of DO saturation levels with depth in thermally stratified lakes during the summer. This results in DO levels below 7 mg/L at depths with the colder temperatures that are preferred by cold water fish. DO

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 9

may be near air saturation levels in shallower, warmer water above the thermocline (see Appendix F for a detailed rationale). In addition, as shown in Figure 6.5-2b, the entire lake had a DO level below 7 mg/L in September and November of 2011. Applying the Basin Plan DO objective of 7 mg/L as the lower criterion for the thermal refuge habitat index would indicate an absence of suitable cold freshwater habitat in the Lake Almanor, which is not the case since there have been no observed fish kills.

**PG&E Comments**

*See PG&E's Comment 20 regarding DO criteria.*

**Comment 25. 5.5 Water Quality, Page 180**

Table 5.5-1. Suitable Cold Water Volume in Lake Almanor.

**PG&E Comments**

*The State Water Board Alternatives markedly reduce suitable habitat for cold water fishes, by up to 87 percent in dry years, which would likely cause harmful population-level effects on Lake Almanor salmonids. The model presented indicates that little suitable habitat is available even under baseline conditions, and each of the State Water Board Alternatives has the effect of almost eliminating that habitat in dry summers. Though the reduction in normal years may only persist for a short period, it is unclear if those durations are long enough to cause significant harm to salmonid populations; SWRCB does not provide sufficient detail on the persistence of these unsuitable conditions. Nonetheless, significantly greater reductions of suitable habitat in dry years may cause population declines.*

**Comment 26. 5.5 Water Quality, Page 181**

Figure 5.5-3. Lake Almanor Cold Water Habitat Volume (<20°C and >5 mg/l DO).

**PG&E Comments**

*The scale used in these graphs is inappropriate as it fails to highlight the substantive changes in cold water habitat illustrated in Table 5.5-1. The graph should either be scaled to approximate the maximum and minimum amount of suitable habitat provided or shown as percentage changes from the baseline. The figure duplicates information contained in Table 5.5-1, and in the form presented, does not contribute to the reader's understanding of the differences between the Alternatives, Proposed Project, and Baseline conditions, and incorrectly implies little difference between them.*

**Comment 27. 5.5 Water Quality, Page 182**

Table 5.5-2. Seasonal Available Habitat in Lake Almanor and Butt Valley Reservoir.

**PG&E Comments**

*This table should be deleted because it is confusing and misleading. It is not clear what the available habitat volumes in this table are intended to represent, nor how the values are useful in relation estimating effects on cold water fish populations. It also obfuscates cold water fishery habitat relationships by combining this estimate across both Lake Almanor and Butt Valley, and then uses a non-standard and meaningless statistical construct (Thousand Acre Foot days) to attempt to demonstrate minimal effects. It is unlikely that the information presented in this table serves a useful purpose, as fish productivity is generally driven by the minimal amount of habitat available over short periods rather than cumulative habitat available over a longer period, or arbitrarily selected intervals. Mortality or physiological dysfunction (e.g., reduced growth or disease) induced by unsuitable habitat, even if present for only a short period, may be permanent or long-lasting. Attempting to compress available summer habitat in Lake Almanor into a single value is misleading, and conceals periods of minimal suitable habitat when these effects may occur.*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 10

*In addition, Table 5.5-2 presents information for Butt Valley reservoir that is not discussed in any detail, as is done within section 5.5 for Lake Almanor. Particularly given the substantial shortcomings with the habitat metric in this table as discussed above, a comprehensive discussion of suitable habitat in Butt Valley reservoir should be presented in this section. It is also unclear what is shown by, or what value is gained from, combining Lake Almanor and Butt Valley reservoir available habitat. Combining available habitat for two detached reservoirs implies fish might be able to move between and utilize either one or the other when conditions are locally unfavorable; however, intentional passage between the reservoirs is impossible for fish.*

**Comment 28. 5.5 Water Quality, Page 182**

All modeled alternatives showed an annual combined cold water habitat (acre-feet-days) of Lake Almanor and Butt Valley Reservoir increasing from 3.0 percent to a loss of 1.9 percent compared to baseline. Alternative 1, thermal curtains and 250 cfs at Canyon Dam, shows the largest gain in habitat during normal years (3.0%), but also the largest loss of habitat in critical dry years (-1.9%). Alternative 3, 250 cfs at Canyon Dam, resulted in the smallest habitat gain during normal years, but also the smallest loss during critical dry years.

**PG&E Comments**

*SWRCB's use of combined metrics for both Lake Almanor and Butt Valley Reservoir is highly questionable and leads to a false conclusion. The conclusions made from combining reservoir habitat misses the significant reductions in cold water habitat during summer months within Lake Almanor from all three State Water Board Alternatives, as summarized in Table 5.5-1. Cold water habitat would be reduced by up to 86–87% under the SWRCB Project Alternatives 1–3 during dry years in August compared to current conditions with minimal benefits during other times; the maximum increase of cold water habitat is only 8% and this occurs in September, late in the summer, in a normal year. See also Comment 27 regarding Table 5.5-2.*

**Comment 29. 5.5 Water Quality, Page 183**

Temperatures above 20°C are not lethal for short periods of time and the model may underestimate the total volume of cold water habitat due to local cold water pockets around the springs.

**PG&E Comments**

*The statement regarding cold water habitat associated with cold water springs is speculative. It is unknown whether water from the springs within Lake Almanor is anoxic or otherwise unsuitable for fish, thus cold water discharge from springs may not contribute to suitable habitat.*

**Comment 30. 5.5 Water Quality, Page 183**

The river temperature below Belden Reservoir was modeled for a representative day each month from June to September for the various alternatives and a range of meteorological and hydrologic conditions.

**PG&E Comments**

*The analysis of temperature effects for the Seneca reach is missing and should be presented, as the State Water Board Alternatives will cool this reach, resulting in suboptimal temperatures and potential adverse impacts on trout populations.*

**Comment 31. 5.5 Water Quality, Page 183**

Table 5.5-4, below, shows the Proposed Project and each of the three alternatives compared to baseline by creating a single metric of a daily average degree-day-kilometer (degree-d-km), which is the difference of the river temperature.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 11

**PG&E Comments**

*This is a non-standard statistic and appears to be meaningless from a biological perspective. Please provide citations relating to its derivation and use in determining biological impacts. A more useful and standard representation should be used to communicate modeling results, such as longitudinal temperature profiles, temperature exceedances, MWAT, etc. Reducing temperature change to a single value oversimplifies the State Water Board's analysis, rendering it unreliable, and does not accurately represent the complexities of the NFFR and its biological communities.*

**Comment 32. 5.5 Water Quality, Page 187**

Under all water year types, the Proposed Project's suitable cold water habitat in Lake Almanor (i.e., water equal to or less than 20°C with DO of 5 mg/L or greater) would be within 0.5 percent of baseline conditions on the seasonal average, see Table-5.5-2

**PG&E Comments**

*This statistic is misleading (See also Comment 27 regarding Table 5.5-2). The bottom of Table 5.5-1 provides a more appropriate statistic and indicates that the Proposed Project would reduce habitat relative to baseline by up to 8 percent, during an approximate 2 week window in Normal years, and by up to 13% in a Dry year. The very limited cold water habitat in a critical dry year under baseline conditions would be eliminated under the Proposed Project and all Alternatives.*

**Comment 33. 5.5 Water Quality, Page 188**

[Regarding the Proposed Project] Due to the limited amount of suitable cold water habitat, the predicted loss of habitat in both absolute volume and duration would be potentially **significant without mitigation**.

**PG&E Comments**

*This conclusion is not supported by the model results. The Proposed Project would result in minor reductions (13% or less for short periods) of cold water habitat in Normal and Dry years. For a short period in critical dry years, there is no cold water habitat available under baseline conditions; any available cold water habitat in critical dry years is eliminated earlier under the Proposed Project and all Alternatives. Therefore, under all conditions (baseline, the Proposed Project, and all Alternatives), all cold water fish would either find other refugia or perish. Therefore, the accurate impact conclusion for the Proposed Project is Less than Significant and no mitigation would be required. See also Comment 27 regarding Table 5.5-2.*

**Comment 34. 5.5 Water Quality, Page 188**

Data is summarized in Table-5.5-2 by multiplying the habitat volume (volume of water less than 20°C and greater than 5 mg/l DO) with the number of days represented by each habitat volume calculation and summing the results to obtain a seasonal habitat volume calculated in acre-feet-days for each water year type.

**PG&E Comments**

*This is not a standard statistic, nor is it useful for understanding the impacts to the cold-water fishery. Furthermore, arbitrarily multiplying these habitat volumes by number of days and combining them as a measure of impacts is somewhat misleading as it hides the actual reduction in habitat volume that could be detrimental to cold water habitat within Lake Almanor. See also Comment 27 regarding Table 5.5-2.*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 12

**Comment 35. 5.5 Water Quality, Page 188**

Suitable habitat in August is very limited. Calculated suitable habitat volumes for baseline, Proposed Project, and all the alternatives are less than 6 percent of total lake volume in *normal years*, less than 1 percent in *dry years*, and none in *critical dry years*.

**PG&E Comments**

*Comparison of the cold water habitat to total reservoir volume is not meaningful for this analysis, which was developed to determine the change in cold-water habitat relative to the baseline. For this reason, its conclusions are misleading and do not support the SWRCB's conclusions.*

**Comment 36. 5.5 Water Quality, Page 188**

All the alternatives resulted in an increase in seasonal suitable cold water habitat compared to baseline and the Proposed Project during normal years,

**PG&E Comments**

*This is an inaccurate conclusion not supported by substantial evidence due to inappropriate methodology where SWRCB multiplied the lake habitat volume to the duration of time between habitat volume calculations to estimate a non-standard metric of acre-feet-day. Then the SWRCB added these over the entire summer period and reported in Table 5.5-2. Fish survivability depends on the actual habitat volume and not a combined habitat volume over a longer period of time (as perhaps intended through Table 5.5-2), ignoring periods of little to no habitat. The results shown by SWRCB in Table 5.5-2 conceal significant impacts from the State Water Board Alternatives. To be accurate, the analysis should focus on the results in Table 5.5-1, which indicate that cold-water habitat would be reduced by 23%, 21%, and 9% for Alternatives 1, 2 and 3, respectively in August of normal years, and by up to 87% in August and September in Dry years. In Critical Dry years, the model indicates that cold water habitat would be eliminated in all scenarios (i.e., baseline, the Proposed Project, and Alternatives 1–3).*

**Comment 37. 5.5 Water Quality, Page 188**

[Regarding Alternatives 1, 2, and 3] Nonetheless, due to the limited volume of suitable cold water habitat in Lake Almanor during critical dry years, any loss of habitat volume would be potentially significant without mitigation.

**PG&E Comments**

*In critical dry years, modeling indicates that cold water habitat would be eliminated under the baseline and all scenarios (i.e., baseline, the Proposed Project, and Alternatives 1–3); presumably all cold water fish would either find other refugia or perish. Given the baseline, the appropriate finding for critically dry years should be **No Impact** (see also Comment 36 regarding cold water habitat in critical dry years).*

*Additionally, modeling results (Table 5.5-1) indicate that State Water Board Alternatives 1 and 2 would result in substantial reductions in cold water habitat in Normal years as well. In Dry years, modeling indicates massive reductions in cold water habitat for all three State Water Board Alternatives. These findings highlight the lack of clarification and rationale from the SWRCB on what determines "significant impact;" SWRCB is inconsistently determining "significant impact" findings with the cold water habitat changes. As a result, its conclusions are unsubstantiated.*

**Comment 38. 5.5 Water Quality, Page 189**

Data collected as part of the water quality monitoring program and Lake Almanor fish monitoring program will be used to monitor and assess potential impacts to the suitable habitat in Lake Almanor, which may result in a determination that releases from Canyon Dam for purposes of meeting minimum instream flows or temperature control should be modified or suspended.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 13

**PG&E Comments**

*As stated in PG&E's comments on the 2014 DEIR, it would be nearly impossible to develop a fisheries monitoring program for Lake Almanor that would allow one to discern whether the cause of fisheries decline was due to any of the alternatives proposed here. Fish populations can be highly variable (Carlander, K.D. 1969)<sup>2</sup> and are extraordinarily difficult to sample quantitatively (Murphy and D. W. Willis, editors. 1996)<sup>3</sup> or with a level of precision that would allow the objectives identified here to be met. Many factors other than temperatures or DO for cold water habitat availability, as defined here, may influence fish population response, such as food supply, availability of refugia, predation, fishing pressure, disease and parasites, climate change, changes in other water quality parameters, etc. Based on this, a fisheries monitoring program cannot accurately evaluate the effectiveness of pre-emptive implementation of Alternatives, and the required adaptive management associated with this monitoring should be removed.*

**Comment 39. 5.5 Water Quality, Page 190**

The average degree-d-km over 20°C is reduced from the baseline by 8 percent in dry years and 6 percent in critical dry years over the entire reach for the entire summer (see Table 5.5-4)

**PG&E Comments**

*See Comment 31 regarding use of degree-d-km.*

**Comment 40. 5.5 Water Quality, Page 191**

All three alternatives reduce temperatures in the Seneca reach through to the Poe reach.

**PG&E Comments**

*This statement is based on a non-standard statistic and cannot be relied on for evaluating biological impacts (see Comment 31). The Board concluded that the Proposed Project would have a beneficial impact on water temperature. It has not demonstrated that the temperature reductions are needed to protect fishery in the UNFFR. Furthermore, Alternatives 1 and 3 have the potential to significantly reduce temperatures in the Seneca reach to below those optimal for trout growth. This adverse impact on trout must also be evaluated and described in the RDEIR. Appendix E excludes an evaluation of temperatures in the Seneca reach, even though modeling of this reach is necessary to model downstream reaches (which are presented; see Figures 1 to 4, and Tables 3-6).*

**Comment 41. 5.5 Water Quality, Page 191**

Based on the June through September average daily temperature exceedance (calculated as degree-d-km), Alternative 1 has the largest reduction, followed by Alternative 2, then Alternative 3.

**PG&E Comments**

*This is a non-standard statistic and cannot be relied on for evaluating biological impacts. See Comment 31 regarding use of degree-d-km.*

---

<sup>2</sup> Handbook of freshwater fishery biology. Iowa State University

<sup>3</sup> Fisheriestechniques, second edition. American Fisheries Society, Bethesda, Maryland.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 14

**Comment 42. 5.5 Water Quality, Page 198**

See sections 0 for mitigation measures associated with construction activities related to the Proposed Project and alternatives.

**PG&E Comments**

*The construction activities described herein are already controlled by various laws and regulations that PG&E must comply with to implement them, include obtaining 401, 404, and SWPPP permits, depending on the specific project. The mitigation proposed here is duplicative and unnecessary.*

**Comment 43. 5.5 Water Quality, Page 200**

The State Water Board will modify the UNFFR Project or require additional mitigation measures, as necessary, in order to prevent impacts to water quality objectives or designated beneficial uses.

**PG&E Comments**

*SWRCB is going beyond SWRCB, and thus CEQA, authority with this mitigation measure. See Comment 12 regarding Mitigation Measure GGS-1.*

**Comment 44. 5.6 Fisheries, Page 201**

Local Plans or Policies for Fisheries: No watershed-specific habitat conservation plans or fishery management plans have been adopted for fisheries in the UNFFR Project vicinity.

**PG&E Comments**

*This statement is incorrect. Fishery programs are managed by CDFW in the Belden Reach and Lake Almanor. Plumas NF includes fish and other aquatic species in their Forest Plans. The Plumas National Forest Management Plan should be discussed in the EIR.*

**Comment 45. 5.6 Fisheries, Page 201**

The UNFFR Project waters support warm water and cold water fisheries, with Lake Almanor supporting both types of fisheries and the other UNFFR Project waters supporting primarily cold water fisheries.

**PG&E Comments**

*This statement is inaccurate. While the Rock Creek and Cresta reaches support trout, they also support a transitional-zone assemblage (i.e., the pikeminnow, hardhead, sucker assemblage). Hardhead are designated as a California species of special concern and a USFS species of Special Conservation Concern.*

**Comment 46. 5.6 Fisheries, Page 201**

The North Fork Feather River historically was dominated by cold water fishes, including Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), which is listed under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA); Central Valley steelhead (*O. mykiss irideus*, the anadromous form of rainbow trout), which is listed under the federal ESA; and Central Valley fall-run Chinook salmon, which is a federal ESA species of concern.

**PG&E Comments**

*Chinook and steelhead were historically present in the NFFR, but historical records do not provide support for the claim that cold water species were dominant, especially throughout the entire NFFR. This statement omits discussion of a natural barrier in the NFFR (Salmon Falls; within the Seneca reach) across which reportedly no steelhead migrated and few Chinook did. PG&E's Final License Application states that there is no documentation of steelhead upstream of the natural barrier before the construction of dams.*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 15

**Comment 47. 5.6 Fisheries, Page 202**

As a result of historic and current uses, the beneficial uses of the North Fork Feather River, as designated in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) (Central Valley Regional Water Quality Control Board 2011) include cold freshwater habitat, spawning and rearing habitat for cold water fisheries, and water-dependent wildlife habitat (see Table 2-1).

**PG&E Comments**

*This Basin Plan omits protection for the current fishery in the NFFR, which includes native transitional and warm water fisheries, despite the presence of sensitive species such as hardhead and yellow legged frogs.*  
See Comment 48

**Comment 48. 5.6 Fisheries, Page 203**

Key temperature thresholds above which some level of physiological impairment can occur are generally found to be over a temperature range of from 18°C to 21°C for rainbow trout.

**PG&E Comments**

*The designation of 20°C as a maximum chronic temperature threshold above which impairment occurs is arbitrary, given the upper temperature limit for salmonids of 21°C cited by SWRCB (page 203 and Figure 5.6-1) and the extensive amount of literature relating to temperature tolerances for rainbow trout. The Board does not provide a rationale for its selection of either temperature and is basing this criterion on the potential for any level of physiological impairment, while on the other hand ignoring the potential impairment caused to fish in the Seneca Reach caused by cooling temperatures to those below optimal for rainbow trout growth. In addition, an upper limit of 20°C for the exclusive purpose of benefitting cold water species does not consider the temperature requirements of sensitive transitional-zone native temperate species in the NFFR, such as hardhead or foothill yellow-legged frog (FYLF).*

**Comment 49. 5.6 Fisheries, Pages 203 and 211**

The cold water fishery in the Seneca and Belden reaches is dominated by rainbow trout.

The fish community inhabiting the Belden reach is primarily composed of riffle sculpin, rainbow trout, Sacramento sucker, and prickly sculpin.

**PG&E Comments**

*This statement is incorrect. Based on relicensing studies (PG&E 2002, pages E3.1-64 through E3.1-68), sculpin (riffle and prickly) are numerically dominant. Although rainbow trout represented a larger proportion of the total biomass than sculpin in the upper Belden subreach, they represented a small proportion of total biomass in the lower Belden subreach. Sacramento sucker (a transition zone species) dominated the biomass of both the upper and lower subreaches. As such, rainbow trout is not the dominant species. Prickly sculpin dominated in snorkel and electrofishing surveys conducted 2000-2001 in both the Seneca and Belden reaches. In the lower Belden reach below the Gansner barrier, rainbow trout were only 6% of all fish collected in both 2000 and 2001. Also note that, while hardhead were not observed in the Belden Reach during relicensing studies, over 100 were captured in a small area surrounding Gansner Bar Fish Barrier during fish rescue efforts surrounding the removal of that structure in 2015.*

**Comment 50. 5.6 Fisheries, Page 203**

Aquatic habitat is considered suitable for trout and other cold water fishes if water temperatures do not regularly exceed 20°C and dissolved oxygen (DO) content is at least 80 percent of saturation with a concentration of at least 5.0 milligrams per liter (mg/L) (Bjornn and Reiser 1991).

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 16

**PG&E Comments**

*This statistic is misleading. See Comment 32.*

**Comment 51. 5.6 Fisheries, Page 213**

The study focused on changes in the frequency and duration of exceedances of critical chronic and acute upper temperature tolerances and requirements of non-spawning adult and juvenile rainbow trout during the period of maximum summer water temperatures.

**PG&E Comments**

*As this statement confirms, the analysis conducted by SWRCB does not consider the effect of reduced temperatures on native non-salmonid species, including sensitive species including hardhead. As such, the analysis does not adequately examine the potential effect of temperature regime alteration associated with each Alternative relative to current fishery resources.*

**Comment 52. 5.6 Fisheries, Page 214**

Additionally, 21°C and 22°C were selected as secondary thermal refuge criteria for this evaluation because suitable habitat meeting the ≤20°C primary criteria and containing sufficient DO can be absent at times in Lake Almanor even under the baseline conditions.

**PG&E Comments**

*Given this reasoning for selecting secondary temperature thresholds, that suitable habitat can be absent in Lake Almanor, the same secondary thresholds should be applied for the NFFR. Even if the SWRCB could legally select a numerical target temperature, the target of 20°C is too inflexible to protect all fishery resources. Analyses conducted for Alternatives 1-3 indicate that the 20°C threshold will not be achieved in summer in the NFFR for any water year type, and as such, 21°C or 22°C should be considered as secondary thresholds.*

**Comment 53. 5.6 Fisheries, Page 215**

Table 5.6-3      Summary of Fishery (FS) Impacts

Impact FS-2: Implementation of Proposed Project or the alternatives could alter aquatic habitat conditions in Lake Almanor.

**PG&E Comments**

*Alternatives 1 2, and 3 all result in a substantial decrease in cold water habitat in Lake Almanor as demonstrated in Section 5.5 Water Quality and summarized in Table 5.5-1. The Proposed Project does not, and therefore any mitigation for this effect is not justified by CEQA. Moreover, no analysis or substantial evidence is presented to support the proposed mitigation is to stock additional fish and to conduct fishery monitoring. It would not be possible to design and implement a fisheries monitoring program sufficient to provide information on the impacts of these alternatives on the Lake Almanor fishery. The RDEIR does not provide evidence to indicate adding fish is adequate mitigation to render a "less than significant" designation. Further, Alternatives 1 and 3 may result in an overall warming of Lake Almanor, which could promote blooms of cyanobacteria in the reservoir having potentially-significant biological, recreational, aesthetic, and human health effects. The mitigation measure of requiring PG&E to pay for increased stocking of the reservoir to offset fisheries impacts does not address the full potential impacts of the SWRCB Alternatives, which would be avoided in the Proposed Project.*

**Comment 54. 5.6 Fisheries, Page 215**

Table 5.6-3. Summary of Fishery (FS) Impacts.

Exhibit C  
PG&E's Specific Comments the RDEIR

Page 17

**Impact FS-4:** Implementation of Proposed Project or the alternatives could alter cold freshwater habitat conditions in the North Fork Feather River over the long term.

**PG&E Comments**

*The Proposed Project is beneficial, therefore there is no impact under CEQA and no additional measures are legally justified. Further, Alternatives 1 and 3 would cause slower growth rates for fish and other aquatic resources in the Seneca reach by reducing already cool temperatures to levels below those optimal for rainbow trout growth. These alternatives would also likely displace hardhead (CDFW SSC, USFS SSC) from the Belden reach and may impact macroinvertebrate populations. It may also affect temperature suitability for foothill yellow legged frogs in the Rock Creek and Cresta reaches.*

**Comment 55. 5.6 Fisheries, Page 215**

Table 5.6-3      Summary of Fishery (FS) Impacts

Impact FS-5: Implementation of the Proposed Project or alternatives would adversely affect the recreational fishery of Butt Valley reservoir as a result of reduced forage fish in the reservoir.

**PG&E Comments**

*Alternatives 1 and 2 would result in a decrease in the recreational fishery associated with the tailwaters of Butt Valley Powerhouse, as the curtains would reduce entrainment of wakasagi from Lake Almanor (Gast 2004)<sup>4</sup>. The Proposed Project would not have this effect. The impact statement refers to the effect of the decline on recreational fisheries, not the forage base. As described elsewhere, the tailwater fishery at Butt Valley Powerhouse is renowned and this fishery is not present when the powerhouse is offline, which is representative of the effects of the thermal curtain on the intake. Predatory fish take advantage of the forage base provided by the disoriented wakasagi as they come through the powerhouse. Even if an equivalent number of wakasagi occur elsewhere in Butt Valley Lake, they would not provide the same forage base for the game fish, and most importantly, would not provide the same opportunity for anglers to catch the trophy fish they target. This impacts from Alternatives 1 and 2 on this fishery should be significant and likely unavoidable.*

**Comment 56. 5.6 Fisheries, Page 219**

The Proposed Project shows a habitat loss of up to 13 percent in dry years for day with the lowest total habitat, and 100 percent reduction for critical dry years. The seasonal loss for all water year types is less than 0.5 percent. In addition, the response of Lake Almanor's cold water fish population to restricted thermal refugia habitat even under current conditions in *critically dry years* is uncertain due to a lack of information on fish distribution; there are no historic records of fish health issues or mortality during these conditions. Nonetheless, as a result of the limited cold water habitat during *dry* and *critical dry years*, any reduction in cold water habitat could significantly impact the cold water fishery, and therefore the impact of Proposed Project on aquatic habitat in Lake Almanor would be potentially **significant without mitigation**.

---

<sup>4</sup> Gast, Tom, Thomas R. Payne and Associates 2004. Prattville Intake Modification and Potential Impacts to Lake Almanor Fishery Study. Prepared for Pacific Gas and Electric Co. June 20, 2004.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 18

**PG&E Comments**

*It should be clarified that the reduction in habitat refers specifically to cold water fish habitat, and the reduction in critical dry years is immaterial as there is no cold water habitat in critical dry years under baseline conditions for portions of the season. See also Comment 36 regarding cold water habitat in critically dry years. Thus, there is no significant reduction from the Project on the cold water fish habitat in critical dry years. In dry years, a 13% reduction in cold water habitat during one week (RDEIR Table 5.5-1) by itself would not rise to the level of a significant impact. Therefore, FS-2's conclusion of significant without mitigation for the Project is incorrect.*

**Comment 57. 5.6 Fisheries, Page 219**

Mitigation Measure WQ-1 (Proposed Project, Alternatives 1, 2, and 3): Implement Water Quality and Fish Monitoring, Augment Stocking of Cold Water Fishery in Lake Almanor, and Adaptively Manage Canyon Dam Releases.

**PG&E Comments**

See Comment 32, Comment 33, Comment 34, Comment 36, Comment 37, and especially Comment 40 on Section 5.5, Water Quality.

**Comment 58. 5.6 Fisheries, Page 221**

The lower temperatures during the summer would result in somewhat slower growth rates for rainbow trout in the Seneca and Belden reach, but the change in growth rates is likely to be minor because the existing temperature regime is already relatively cold in most years.

**PG&E Comments**

*Cooler water temperatures in the Seneca reach are not considered in the evaluation of riverine water temperatures and need to be. The statement that the "change in growth rates is likely to be minor" is not supported by evidence, as no analysis is presented to evaluate the effect of the alternatives on temperatures in the Seneca Reach nor on the effects of any such reduced temperature on rainbow trout growth rates. An assessment of the Proposed Project and Alternatives 1–3 should be conducted to quantify their effects on trout growth rates.*

**Comment 59. 5.6 Fisheries, Page 221-222**

The Proposed Project minimum flow schedule would have a minimal effect on water temperature in these reaches reducing the average daily degree-d-km by less than the 20 percent (Table 5.5-4); however, thermal conditions in the Seneca reach would remain suitable for cold water fish (Appendix E3 – Figures 1 – 8).

**PG&E Comments**

*This statement is based on a non-standard metric that cannot be relied upon for analytical purposes. See Comment 31 regarding use of degree-d-km, and Comment 64 regarding temperature effects.*

**Comment 60. 5.6 Fisheries, Page 223**

A release of up to 250 cfs from mid-June to mid-September from the Canyon Dam outlet structure into the Seneca reach to Poe would decrease water temperatures and increase streamflow compared to baseline conditions.

**PG&E Comments**

*The preceding statement is not correct in indicating where the SWRCB alternatives would require additional flow releases. SWRCB Condition 6 (Water Temperature Management) would increase streamflow from Canyon Dam into the Seneca Reach up to 250 cfs to decrease water temperature downstream into the*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 19

*Cresta reach. The 250 cfs release applies to Canyon Dam only, which would increase flows in the Seneca reach. This increased flow would not extend beyond Belden forebay.*

**Comment 61. 5.6 Fisheries, Page 223**

The lower temperatures during the summer could result in somewhat slower growth rates for rainbow trout in this reach, but the change in growth rates is likely to be minor because the existing temperature regime is relatively cold in most years.

**PG&E Comments**

*This conclusion is not presented or evaluated in the Water Quality section or in Appendix E. See Comment 58 regarding water temperature effects in the Seneca Reach.*

**Comment 62. 5.6 Fisheries, Page 223**

Under Alternative 1, the average degree-d-km above the threshold of 20°C from Belden to Poe would be reduced by 86 percent in wet years and 67 percent in critical dry years (Table 5.5-4).

**PG&E Comments**

*Much more context and information are needed to understand the effect on temperature. Each water year type should be discussed. Representing this section of the NFFR as a single segment is highly inaccurate when there are three reservoirs with associated managed releases not included in Alternative 1 in that segment. The statistic used in this analysis is non-standard and inappropriate for this analysis; see also Comment 31 regarding use of degree-d-km.*

**Comment 63. 5.6 Fisheries, Page 223**

As a result of the increase in spawning and adult WUA and decrease in temperature, the effect is considered to be less than significant (beneficial).

**PG&E Comments**

*No analysis or evidence supports the extent of temperature decrease and its associated effects on fish. See also Comment 58 regarding water temperatures in the Seneca reach. The flow changes provided under Alternative 1 occur only from June 15 through September 15, outside of the rainbow trout spawning season.*

**Comment 64. 5.6 Fisheries, Page 223**

The reduced water temperatures in the North Fork Feather River below Belden dam would slightly reduce the length of river with temperatures preferred by hardhead, primarily during June and July, based on hardhead thermal preferences (>20°C for growth, 24°C to 28°C for optimal physiological performance).

**PG&E Comments**

*The SWRCB stated objective is to reduce water temperatures, to less than 20°C through much of the Cresta reach. Achievement of this objective would result in less than suitable habitat for hardhead growth throughout most of the river.*

**Comment 65. 5.6 Fisheries, Page 224**

However, water temperature conditions downstream of the Belden dam would still provide a gradient and a diversity of thermal conditions within the temperature range tolerated and preferred by hardhead.

**PG&E Comments**

*No evidence is provided to support the claim that a gradient of suitable temperatures is available in the Belden reach for hardhead. If model results were obtained that demonstrate a portion of the reach would*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 20

*contain preferred temperatures for hardhead, those results should be shown in this discussion. Although it is possible that shallow, edgewater habitats might provide warmer water suitable for hardhead; a) the modeling effort conducted for this document is incapable of predicting temperatures in those habitats, b) no prior work is referenced providing evidence of existing edgewater habitats, and c) adult hardhead prefer deep, slow current habitat as stated in this document and would be unlikely to utilize shallow, warmer habitat whether or not it occurs in the Belden reach.*

**Comment 66. 5.6 Fisheries, Page 224**

Additionally, each of the downstream hydroelectric projects provides deep, slow-current habitat preferred by hardhead at their diversion dams.

**PG&E Comments**

*This statement is incorrect. Earlier in section 5.6, SWRCB states: "Hardhead can colonize reservoirs, but persist only if exotic species, especially centrarchid (sunfish) basses, are not present." This (correctly) indicates that hardhead will not be successful if reduced temperatures in the river cause them to move to NFFR reservoirs, as centrarchids are present in these reservoirs. Therefore, these reservoirs are not suitable habitat for hardhead, and thus cannot serve as a replacement for lost riverine habitat.*

**Comment 67. 5.6 Fisheries, Page 224**

Effects on hardhead in the North Fork Feather River would, therefore, be less than significant.

**PG&E Comments**

*This conclusion is contradicted by the information provided.*

*The "less than significant" finding appears to be predicated on the faulty assumption that hardhead populations would continue to be self-sustaining if pressured to migrate into centrarchid habitat. In addition, no data or quantitative analysis is presented to support this conclusion, and what qualitative information is discussed suggests nearly all optimal hardhead habitat would be eliminated. Therefore, the effect should instead be **significant without mitigation**. Also see Comment 64, Comment 65, and Comment 66 regarding hardhead populations in the NFFR.*

**Comment 68. 5.6 Fisheries, Page 224**

Figure 5.6-4. Hardhead (adult and juvenile) water temperature suitability criteria curve (adapted from Gast et al. 2004).

**PG&E Comments**

*This figure does not accurately reflect the thermal preferences of hardhead cited in the text, as it arbitrarily connects known temperature thresholds as an undefined "suitability" curve, and suggests extreme high and low temperatures may be considered suitable even if those values cause death or severe physiological complications for the species. Neither the figure nor the text attempt to explain the definition of suitability in the context of this 0 – 1 scale, and incorrectly cites Gast et al. 2004 as the basis of this figure, despite there being no discussion of hardhead in that report. Additionally, the "83% of Preferred  $T_w$ @20 C" label is not defined nor discussed in the caption or text, and possibly implies that 20 C is suitable thermal habitat for hardhead with no discussion of the associated effects of sub-optimal temperature.*

**Comment 69. 5.6 Fisheries, Page 224**

No significant change in trout growth or survival would be expected in the Seneca Reach compared to baseline conditions.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 21

**PG&E Comments**

*There is no analysis or evidence supporting this statement. See also Comment 58 regarding water temperatures in the Seneca Reach.*

**Comment 70. 5.6 Fisheries, Page 224**

The average degree-d-km exceedances over 20°C would be reduced by 78 percent in wet years to 52 percent in critical dry years (see Table 5.5-4).

**PG&E Comments**

*This analysis is based on a non-standard and inappropriate statistic and improperly combines multiple stream reaches. See Comment 62 on Section 5.6, Fisheries.*

**Comment 71. 5.6 Fisheries, Page 225**

The reduction in the length of river with temperatures preferred by hardhead would be slightly less than baseline conditions; however, adequate hardhead habitat (as discussed above for Alternative 1) would still be available. As a result, the thermal curtains would have a less than significant impact on the fisheries resources of the North Fork Feather River.

**PG&E Comments**

*The SWRCB stated objective is to reduce water temperatures, to less than 20°C in the NFFR below Canyon Dam. Achievement of this objective would result in less than suitable habitat for hardhead growth throughout most of the lower river reaches. See Comment 65 and Comment 66 regarding temperature effects on hardhead in the NFFR.*

**Comment 72. 5.6 Fisheries, Page 225**

Without thermal curtains, the effect of increased Canyon Dam releases of up to 250 cfs would provide a benefit on the cold water fish habitat in the North Fork Feather River, but to a lesser degree than Alternatives 1 or 3. The average degree-d-km exceedances over 20°C would be reduced by 52 percent in wet years to 39 percent in critical dry years (see Table 5.5-4).

The reduction in the length of river with temperatures preferred by hardhead would be slightly less than the baseline condition, however, adequate hardhead habitat (as discussed above for Alternative 1) would still be available. As a result, the impact of increased Canyon dam releases of up to 250 cfs on the North Fork Feather River cold water habitat would be less than significant.

**PG&E Comments**

*The SWRCB stated objective is to reduce water temperatures, to less than 20°C in the NFFR below Canyon Dam. Achievement of this objective would result in less than suitable habitat for hardhead growth throughout most of the lower river reaches. See Comment 65 and Comment 66 regarding temperature effects on hardhead in the NFFR.*

**Comment 73. 5.6 Fisheries, Page 226**

It is probable that wakasagi have established self-sustaining populations in Butt Valley Reservoir, and any reduction in wakasagi entrainment at the Prattville intake as a result of the thermal curtain is not expected to have a significant effect on the presence of forage fish in the reservoir. This impact would therefore be less than significant.

**PG&E Comments**

*The impact conclusion is based on the effect of the decline on recreational fisheries, not the forage base, and is thus inaccurate. The tailwater fishery at Butt Valley Powerhouse is renowned and this fishery is not*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 22

*present when the powerhouse is offline. Predatory fish take advantage of the forage base provided by the disoriented wakasagi as they come through the powerhouse. Even if an equivalent number of wakasagi occur elsewhere in Butt Valley Lake, they would not provide the same forage base for the game fish, and most importantly, would not provide the same opportunity for anglers to catch the trophy fish they target. This impact should be significant and likely unmitigable.*

**Comment 74. 5.7 Vegetation, Wildlife, and Sensitive Biological Resources, Page 267**

The monitoring results show that increases in the rate of lake level drawdown during the grebe breeding season correlated with decreased reproductive success.

**PG&E Comments**

*This statement indicates that effects to grebes would be greater under Alternatives 1 and 3 than they would be under the Proposed Project.*

**Comment 75. 5.7 Vegetation, Wildlife, and Sensitive Biological Resources, Page 271**

The removal of less than 1 acre of vegetation for road construction along the western shore of Butt Valley reservoir would remove habitat for special-status plants and could remove special-status plants, if present.

**PG&E Comments**

*"Would" should be replaced with "could" to instead state: "The removal of less than 1 acre of vegetation for road construction along the western shore of Butt Valley reservoir **could** remove habitat for special-status plants and could remove special-status plants, if present."*

**Comment 76. 5.7 Vegetation, Wildlife, and Sensitive Biological Resources, Page 273**

If work cannot be avoided during this period, a qualified biological monitor will be present during construction. If construction requires more than one day and equipment or materials are left onsite overnight, the biological monitor will survey around and underneath the equipment or materials prior to moving them the following day to ensure that no amphibians are present.

**PG&E Comment**

*There is no evidence of a potential impact to justify this condition, which is unnecessary and unduly burdensome. No special status amphibians have been observed in the UNFFR project area and these areas do not provide suitable habitat for any frog species. These projects would be large and take many months to complete, requiring presence of a biological monitor onsite for a significant period of time.*

**Comment 77. 5.7 Vegetation, Wildlife, and Sensitive Biological Resources, Page 274**

To determine whether roosts or hibernacula are present, PG&E will retain a qualified biologist to conduct a preconstruction survey of potential habitat within the UNFFR Project area.

**PG&E Comments**

*The survey area specified in this mitigation measure is overly broad and burdensome. PG&E recommends restricting the preconstruction survey to areas of potential impact plus a 100 ft buffer. Bats roosts are known to occur in Canyon Dam, Prattville and Caribou intakes, and avoidance of these intakes during construction of curtains is not possible, nor would it be possible to avoid the roosting season. Finally, exclusion from these areas is likely not practical. Based on this, there will be potentially-significant impacts to bats through implementation of Alternatives 1 and 2 as mitigation is not feasible.*

**Comment 78. 5.8 Recreation, Page 288**

Installation of a thermal curtain at the Caribou intakes would not affect boat use in Butt Valley reservoir because the existing log boom would be reconfigured to restrict boat access around the activity area while

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 23

enabling boats to navigate between the intake area and the dam face. Boats are excluded from the southern-most end of the reservoir during the winter season. The Caribou intakes thermal curtain would not create a hazard for boaters or other recreationists at Butt Valley reservoir.

**PG&E Comments**

*There would be a permanent loss of access around the curtain areas throughout the year, rather than the current seasonal loss. This would not be mitigatable, so it would be an additional significant and unavoidable impact of the thermal curtains.*

**Comment 79. 5.8 Recreation, Page 290**

Under Alternatives 1 and 3, some fishing spots may experience an increase in flow to a point that the quality of fishing for some individuals would be reduced. However, the flow increases could improve fishing opportunities at other locations along the river. To some extent, the increase in summer flows through the Seneca reach would reduce water temperatures, which could have some effect on growth rates, size of, and relative abundance of catchable fish. The modified flow regimes, including periodic recreational pulse flows in the Belden reach, would result in a small percentage of days when increased flows could affect fishing conditions.

**PG&E Comments**

*The statement regarding fishing experience is unsupported speculation. Further, the data from the Fishability study cited above indicates that all days when flows exceed 175 cfs would experience reduced fishing suitability. This could be for the entire summer season. This is a significant impact. The Board seems to be accounting only for the pulse flows and not for the higher minimum flow releases*

**Comment 80. 5.9 Aesthetics, Page 293**

The orientation of the day use area directs views toward Lake Almanor and surrounding forests and mountains to the northeast and east, and generally away from the intake structure (Photographs 1a, 1b, 2b, and 2c).

**PG&E Comments**

*This statement cannot be supported. The intake structures are immediately visible from the Marvin Alexander Day Use Area and the curtain structure would be clearly visible from here.*

**Comment 81. 5.12 Cultural Resources, Page 328**

Construction of thermal curtains around the Prattville

**PG&E Comments**

*Construction of thermal curtains was the primary area of cultural resources concern associated with the 2014 DEIR. The State Water Board appears to have modified the methods and locations to try to address these concerns, but there is no evidence that they have been addressed in the RDEIR.*

## **Chapter 6 - Cumulative Impacts and Other CEQA Considerations**

**Comment 82. 6.2 Cumulative Impacts Analysis, Page 367**

Reduction in water temperatures in the North Fork Feather River downstream of Belden dam would improve cold water fish habitat to varying degrees, compensating for the warming effects of hydropower diversions in the bypass reaches between dams and powerhouses.

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 24

**PG&E Comments**

*There is no evidence of any warming effects of the hydropower diversions, so this statement should be removed. The analysis should recognize that the proposed Alternatives 1-3 would adversely affect native warm/transitional zone species, including special status hardhead. See Comment 64, Comment 65, and Comment 66 regarding effects of the alternatives on hardhead.*

**Comment 83. 6.4 Significant Effects, Page 372**

**Significant Unavoidable Effects**

CEQA (Pub. Res. Code Section 21100(b)(2)(A)) requires that an EIR include a statement that summarizes any significant effects on the environment that cannot be avoided if a proposed project is implemented. CEQA Guidelines Section 15126.2(c) states that such impacts include those that can be mitigated but not reduced to a less-than-significant level. When there are significant impacts that cannot be fully mitigated to a less-than-significant level or minimized by changing the project design, the implications of the impacts and the reasons why the project is being proposed must be described. Under Alternatives 1 and 2, impacts on Aesthetics and Recreation associated with installation of a thermal curtain around the Prattville intake were identified as significant and unavoidable, as further described in Section 5.8 and 5.9. In the localized areas around the Prattville intake, the Prattville thermal curtain has the potential to detract from the existing scenic views of the surrounding forests and mountains or the overall views of the Lake Almanor area. The Prattville thermal curtain also has the potential to reduce the quality of recreational opportunities at Lake Almanor in that area due to the closure of Marvin Alexander day use area or the construction of the thermal curtain bin and trolley system next to or within the Marvin Alexander day use area. No feasible mitigation measures were identified to adequately reduce Aesthetic and Recreation impacts to a less than significant level.

**PG&E Comments**

*The impacts due to the thermal curtains could be avoided by not using thermal curtains, which are not justified by Project impacts and would themselves create significant and unavoidable impacts. For example, the project has the potential to impact the fishery in the Seneca Reach, as well as reaches downstream of Belden Dam. See also Comment 58, Comment 64, Comment 66, and Comment 67 regarding potential impacts to the fishery in the Seneca Reach and to hardhead.*

*In addition, there are feasible alternatives to the recreation impact assessed for Marvin Alexander Day Use Area: 1) the facility could be shifted on-site east to avoid the curtain (available shoreline to the east) or 2) could be relocated east of Prattville-into existing dispersed shoreline use area.*

## **Chapter 7 - Alternatives Analysis.**

**Comment 84. Section 7.1 - Introduction, Page 375**

The purpose of the alternatives analysis in this Revised draft RDEIR is to identify ways to meet project objectives and protect the designated beneficial uses of the Upper North Fork Feather River while avoiding and mitigating potentially significant adverse impacts that could result from the implementation of Proposed project or one of the three alternatives.

**PG&E Comments**

*The alternatives analysis performed by the SWRCB did not demonstrate that the Proposed Project will not protect the designated beneficial uses of the Upper North Fork Feather River and found that the Proposed Project had a beneficial impact on water temperatures in the NFFR. The Proposed Project maintains the beneficial uses in the North Fork Feather River and Lake Almanor. Furthermore, the alternatives result in*

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 25

*additional impacts compared to the proposed project, and compromise designated beneficial uses in Lake Almanor.*

**Comment 85. Section 7.1 - Introduction, Page 375**

An EIR shall describe a range of reasonable alternatives to the project which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project on the environment

**PG&E Comments**

*The Proposed Project meets the Project objectives and avoids significant effects to the environment. SWRCB's alternatives, on the other hand, result in additional impacts to the environment.*

**Comment 86. Section 7.3 – Comparison of Alternatives, Page 378**

The relative reservoir habitat changes are less than the relative changes in cold water river habitat where modeling efforts indicate unsuitable river habitat (greater than 20°C) was reduced by the alternatives from 39 to 86 percent from baseline while the proposed project resulted in 6 to 20 percent reduction.

**PG&E Comments**

*The Board compares reservoir habitat changes to river habitat, which is not appropriate because the habitats are not interchangeable and cannot be substituted for one and other. Under Alternatives 1 and 2, coldwater habitat would be all but eliminated from Lake Almanor in dry years, and completely eliminated in critical dry years. The alternatives would also reduce temperatures in the Seneca reach below those optimal for trout growth.*

**Comment 87. Section 7.3 – Comparison of Alternatives, Page 378**

Table 7-1 Comparison of Potential Impacts of the Project Alternatives to Baseline Conditions

**PG&E Comments**

*This table demonstrates that the Proposed Project has the same level of impact significance as all alternatives evaluated, with the exception for aesthetics and recreation, where Alternatives 1 and 2 have significant and unavoidable impacts, while the Proposed Project and Alternative 3 have a less than significant impact.*

**Comment 88. Section 7.3 – Comparison of Alternatives, Page 386**

Table 7-1 Comparison of Potential Impacts of the Project Alternatives to Baseline Conditions

**Impact CR-1:** Construction activities associated with the Proposed Project or alternatives could disturb or damage underwater historical or archaeological resources listed or eligible for listing in the National Register of Historic Places or California Register of Historic Resources.

“less than significant” finding

And

**Impact CR-2:** Construction activities associated with the Proposed Project or alternatives could disturb or damage previously undiscovered historical or archaeological resources or human remains.

“less than significant with mitigation” finding

**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 26

**PG&E Comments**

*These impacts are identified as “less than significant” by the Board. It is unclear if feedback from the tribes was considered in these findings, as the tribes consider the construction of thermal curtains (alternatives 1 and 2) a significant issue, as noted in their comments on the 2014 DEIR.*

**Comment 89. Section 7.3 – Comparison of Alternatives, Page 388**

The thermal curtain at the Prattville Intake would have potentially significant Aesthetic and Recreation impacts, and the selective withdrawal of cold water from Lake Almanor under this alternative would reduce cold water habitat in Critical Dry Years.

**PG&E Comments**

*The impacts discussed here by the Board also apply to the dry years in addition to the critical dry years.*

**Comment 90. Section 7.3 - Consistency with State Water Board Objectives, Page 389**

Alternative 3 strikes a balance between improved cold water habitat in the Upper North Fork Feather River and loss of cold water habitat in Lake Almanor and Butt Valley Reservoir.

**PG&E Comments**

*PG&E disagrees with this conclusion, as the SWRCB’s comparison of different habitat is incorrect and based on inaccurate models. Alternative 3 does not strike a balance between these habitats as the loss in coldwater habitat in Lake Almanor outweighs any downstream benefits, as estimated by the Board. Further, this alternative results in reduction of generation, another identified impact by the Board.*

## Appendix E Level 3 Report, Appendix A

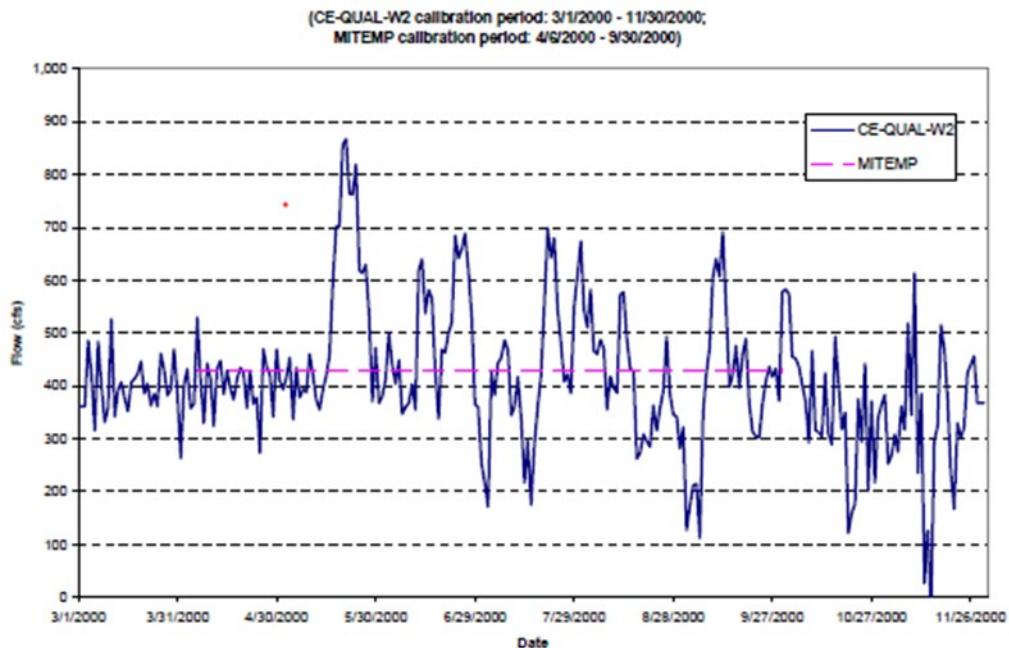
**PG&E Comments**

*Appendix A of the Level 3 Report describes SWRCB’s evaluation and correction of the previous MITEMP and CE-QUAL-W2 models for Lake Almanor. In addition to the significant accuracy issues related to the model selection, modeling methodology and scenario development, this appendix highlights an attempted correction in the CE-QUAL-W2 model that is inappropriate. SWRCB identified inconsistent specification of inputs to the Lake Almanor models intended to be used for same alternatives assessment. SWRCB resolved the key hydrological differences between the two models (MITEMP and CE-QUAL-W2) by modifying and significantly simplifying the cold spring flows applied to the CE-QUAL-W2 model. The MITEMP used constant spring flows for normal and dry years based on water balances for the 2000 and 2001 years. This was different than the time-varying spring flows used in the CE-QUAL-W2 model (see figure below).*

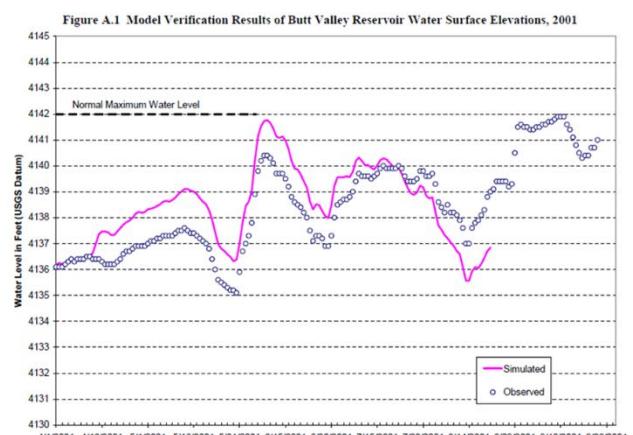
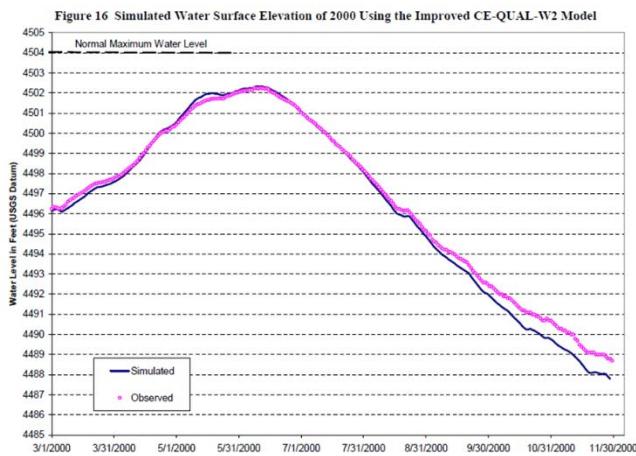
**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 27

**Figure 10b Model Input Comparison of Spring Inflows, 2000 Calibration**



SWRCB aligned the two model inputs by using the same constant spring flows for the CE-QUAL-W2 model. This over-simplification forced by the need for consistency with the other oversimplified model (MITEMP) results in poor performance of the CE-QUAL-W2 model in terms of water balance (see figures below for simulated water surface elevation for Lake Almanor and Butt Valley Reservoir). The results are highly unreliable and do not provide credible support for the conclusions in the RDEIR.



**Exhibit C**  
**PG&E's Specific Comments the RDEIR**

Page 28

## **ENCLOSURE 3**

**PG&E COMMENTS TO SWRCB ON FINAL WQC  
DATED AUGUST 14, 2020**



**Pacific Gas and  
Electric Company™**

Annette Faraglia  
Chief Counsel, Hydro Generation  
Law Department

*Mailing Address*  
P.O. Box 7442  
San Francisco, CA 94120

*Street/Courier Address*  
Law Department  
77 Beale Street  
San Francisco, CA 94105

(415) 973-7145  
Fax: (415) 973-5520  
E-Mail: Annette.Faraglia@pge.com

August 14, 2020

**Via Electronic Submittal**

Mr. Erik Ekdahl  
Deputy Director, Division of Water Rights  
California State Water Resources Control Board  
1001 I Street, 14<sup>th</sup> Floor  
Sacramento, CA 95814  
Email: [Erik.Ekdahl@waterboards.ca.gov](mailto:Erik.Ekdahl@waterboards.ca.gov)

**Re: Upper North Fork Feather River Hydroelectric Project (FERC Project No. 2105)  
Document Entitled “Water Quality Certification for Federal Permit or License”**

Dear Mr. Ekdahl:

Pacific Gas and Electric Company (“PG&E”) objects to the document entitled “Water Quality Certification for Federal Permit or License” (“Final WQC”), issued by the State Water Resources Control Board (“State Water Board” or “Board”) on July 15, 2020, for PG&E’s Upper North Fork Feather River Hydroelectric Project, Federal Energy Regulatory Commission (“FERC” or “Commission”) Project No. 2105 (“UNFFR” or “Project”). For reasons described below, the State Water Board’s issuance of the Final WQC was not an appropriate action.

The Final WQC purports to provide water quality certification pursuant to Section 401 of the Federal Clean Water Act (“CWA”), 33 U.S.C. § 1341. While the Final WQC has no legal effect, PG&E submits these objections in order to preserve its rights and without waiving any claims as to the invalidity of the document itself or any conditions associated with it.<sup>1</sup>

First, the State Water Board lacked authority to issue a water quality certification for this Project because PG&E had no pending application for WQC before the Board. PG&E submitted its first request for certification for the Project on October 9, 2002 and then, for almost 18 years, the State Water Board refused to act on PG&E’s repeated requests for certification. On March 4, 2020, the State Water Board denied without prejudice PG&E’s most recent request for certification. PG&E

<sup>1</sup> PG&E incorporates by reference its Comments on the Draft Water Quality Certification for the Upper North Fork Feather River Hydroelectric License, filed with the State Board on June 15, 2020.

did not submit another request for certification with the Board. Instead, on April 24, 2020, PG&E filed with FERC a Petition for Declaratory Order Requesting Waiver of Water Quality Certification for the Project (FERC Petition).

The CWA grants a State authority to issue a WQC only in response to a request by an applicant. (23 California Code of Regulations (“CCR”), § 3835(d).) In the absence of such a request, a State has no authority to issue a WQC pursuant to Section 401 of the CWA or State regulations. (*See* 23 CCR, §§ 3838; 3860 (application must be filed under 23 CCR, § 3855(b) before it can be considered by the State Board).) Nor do States have separate or independent authority to issue a Section 401 WQC under State law. Thus, the State Water Board had no authority to issue a WQC for the Project on July 15, 2020.

Second, the State Water Board waived its authority to issue a water quality certification by failing, for almost 18 years, to act on PG&E’s pending requests for certification. Section 401 of the CWA provides that its certification requirement “shall be waived” if a state certifying agency “fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request.” (33 U.S.C. § 1341(a)(1).) In addition, in *Hoopa Valley Tribe v. FERC*, 913 F.3d 1099 (D.C. Cir. 2019) (“*Hoopa*”), the U.S. Court of Appeals for the D.C. Circuit held that tolling schemes, like the repeated annual withdrawal and resubmittal of requests for WQC for the same federal application, as occurred here, violate the statutory language in Section 401 of the CWA. (*Hoopa*, 913 F.3d at 1105.) Also, in response to PG&E’s April 24, 2020 FERC Petition regarding the UNFFR, the Commission, on July 16, 2020, issued a Declaratory Order on Waiver of Water Quality Certification granting PG&E’s waiver request.

Third, even if the Board’s Final WQC were valid (which it is not), the State Water Board lacks authority to impose conditions that are unrelated to water quality and thus not authorized under the CWA. For example, Conditions 6 and 1 of the Final WQC, which establish a new flow regime, are inconsistent with FERC recommendations and the Settlement Agreement reached during the FERC proceedings, and are improper because the conditions are not necessary for the Project to comply with water quality requirements and are not supported by the Board’s record. Other conditions proposed in the State Water Board’s Final WQC are equally improper because they are inconsistent with State law and the CWA, operationally problematic, redundant of other required measures, subject to the management authority of federal and State fish and wildlife agencies, and unrelated to water quality issues associated with Project operations. (*See gen’ly* PG&E’s Comments on the Draft Water Quality Certification for the UNFFR Hydroelectric Project License filed June 15, 2020 in this proceeding, incorporated herein by reference.)

The proposed conditions mandating higher flows focus exclusively on preserving cold water habitat to the exclusion of hydroelectric uses, water uses, recreational uses, fish habitat in Lake Almanor and the economic impacts that would result from instituting a new flow regime and associated adaptive management measures. By focusing exclusively on one beneficial use, the State Water Board improperly ignored potential adverse effects on other identified beneficial uses such as fish habitat in Lake Almanor, water recreation, and hydroelectric power. State law requires the State Board to consider a balance of interests when implementing water quality objectives and mandates that “the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total

values involved, beneficial and detrimental, economic and social, tangible and intangible.” (See California Water Code, § 13000.) The Board’s single-minded attention to cold water habitat is inconsistent with this mandate.

In addition to PG&E’s June 15, 2020, comments on the Draft Water Quality Certification, PG&E also provided extensive comments on the Revised Draft Environmental Impact Report on July 7, 2020, incorporated herein by reference. PG&E does not believe that these comments were adequately addressed in the Final WQC. For example, the State Water Board’s CEQA analysis failed to consider Project objectives and instead imposed the Board’s own objectives in place of, and without consideration of, the Project objectives. It then evaluated the impacts of the Project based on its own objectives. It goes on to inappropriately mitigate Project effects that the Board’s own analysis determined were beneficial to the resource in question. This mitigation results in substantial and unavoidable impacts to other resources that would not occur without the Board’s measures.

PG&E would also like to underscore the following technical issues from PG&E’s previous comments that were not addressed in the Final WQC:

- The State Water Board’s models used to evaluate the effect of various alternatives on temperatures in Lake Almanor and downstream reaches are clearly inaccurate and do not support the conclusions in the RDEIR. First, the State Water Board relied on existing models for the region and used them for purposes beyond the models’ functionality. While none of the models used by the State Water Board were available for a detailed review, PG&E experts found sufficient evidence in the available record to determine that the numerical modeling performed by the State Water Board was inappropriate and lacked technical rigor. The State Water Board applied simplified models that lacked the details necessary to accurately analyze the complex processes influenced by the spatial and temporal complexity of the Lake Almanor and UNFFR system. These models are also not detailed enough to correctly predict the changes to these systems under the evaluated alternatives. The changes required in Condition 6 (supplemental flows and other significant modifications such as thermal curtains) are expected to significantly influence the Lake Almanor dynamics.
- Condition 6 is operationally infeasible, vague, and inappropriately supported by a model designed for a different purpose. Condition 6 requires actions that create significant uncertainty with respect to Project costs, requires implementation of undefined fisheries goals that are inconsistent with the management goals of State and federal fish and wildlife management agencies for special-status species, and is supported by water temperature models that were not designed for the purpose for which they are being used by the Board. Condition 6 fails to reasonably protect beneficial uses in Lake Almanor and beneficial uses, other than cold freshwater habitat, in the North Fork Feather River. Specifically, Condition 6(A), Canyon Dam Supplemental Flows, would increase releases from Canyon Dam up to 250 cfs for the purpose of reducing water temperatures to below a threshold of 20°C throughout the lower reaches of the North Fork Feather River. However, these releases are intended to achieve fishery goals that have not been defined and will not be defined until after implementing the release schedule (see Condition 6(C), Fishery Performance Goals)

using data collected under Conditions 7 and 8 (Water Quality and Lake Almanor Fishery, respectively). The Board fails to recognize that setting specific metrics for fisheries under these conditions will be virtually impossible for PG&E given the highly dynamic nature of fish communities, even under steady state conditions.

- In many of the conditions in the Final WQC, the State Water Board has inserted process requirements that are unnecessary and burdensome, adding additional controls that would make PG&E's already agreed to requirements and beneficial improvements more difficult and expensive to implement.

Since waiver of certification authority has already occurred, any conditions submitted to FERC as recommendations must be consistent with Section 10(a) of FPA, under which FERC must also balance numerous competing public interests when issuing a license. FERC staff's recommendations in the FEIS, which are substantially consistent with the measures proposed in the Settlement Agreement, balance the need for hydropower generation, fish and wildlife (including habitat concerns, such as temperature), and recreation. PG&E believes these are the measures that should become part of the new UNFFR license.

Sincerely,



Annette Faraglia  
Chief Counsel, Hydro Generation

cc: [via email](#)  
Jordan Smith (SWRCB)  
[Jordan.Smith@waterboards.ca.gov](mailto:Jordan.Smith@waterboards.ca.gov)  
Jeff Wetzel (SWRCB)  
[Jeff.Wetzel@waterboards.ca.gov](mailto:Jeff.Wetzel@waterboards.ca.gov)  
WR401 Program  
[WR401Progam@waterboards.ca.gov](mailto:WR401Progam@waterboards.ca.gov)

## **CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each person designated on the official Service List in this proceeding (Project No. 2105) in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure.

Dated at Walnut Creek, California this 21<sup>st</sup> day of October, 2020

/s/ Lynn Powell

**LYNN POWELL**

PG&E Law Department  
77 Beale Street, B30A-3012  
San Francisco, CA 94105-1814  
(415) 973-3164