

**UPPER NORTH FORK FEATHER RIVER PROJECT (FERC #2105)
PROJECT RE-OPERATION/WATER TEMPERATURE STUDIES - SUMMER 2006
FOR DEVELOPMENT OF CEQA ALTERNATIVES**

BACKGROUND

The Upper North Fork Feather River Hydroelectric Project (FERC #2105), owned by Pacific Gas and Electric Company (PG&E) is currently in the process of federal relicensing. Prior to issuance of a water quality certification for relicensing of the hydroelectric project, the State Water Resources Control Board (State Water Board) must evaluate the whole of the hydroelectric project and its potential for impacts to the environment, including effects to water quality and water temperature within and downstream of the project. Water temperature impacts have been identified in the North Fork Feather River (NFFR), and the State Water Board continues to investigate measures that can effectively minimize those impacts. As required by the California Environmental Quality Act (CEQA), the State Water Board is developing an Environmental Impact Report in connection with the State Water Board's water quality certification decision. The EIR will analyze CEQA Alternatives that consist of a suite of resource measures including measures to reduce seasonal water temperatures in the NFFR.

A broad range of potential measures for reducing water temperature along the NFFR to restore and protect the cold freshwater habitat beneficial use have been developed by PG&E and supplemented by Stetson Engineers from the North State Resources Team, consultants to the State Water Board. Various combinations of these measures could achieve the water temperature goal of 20 °C or below, established in the Rock Creek Settlement Agreement. A plan for special study of hydroelectric re-operation and water temperature relationships was developed by Stetson Engineers, in close collaboration with PG&E, for implementation in Summer 2006. The study plan establishes two water temperature monitoring programs occurring concurrently: 1) a special re-operation of FERC Project #2105 and focused monitoring program of selected water bodies (hereinafter, "special testing program"), and 2) a routine monitoring program of the NFFR water bodies. The overall objectives of these two programs are:

- To demonstrate, through actual operation and field measurement, the effectiveness of certain measures aimed at reducing water temperature along the NFFR; and,
- To provide data to support development of new or enhancement of existing computer simulation models of water temperature to enable formulation and evaluation of the effectiveness of CEQA alternatives for achieving the temperature objective.

SPECIAL TESTING PROGRAM UPDATE

Five special tests were recently completed. These tests include:

- **Special Tests 1, 2 and 4 - Increased Canyon Dam Release Test with Strict Peaking Operations for Caribou #2 Powerhouse**

The purpose of this special test was to better understand the effects of increased releases (at three different release rates: 90 cfs, 250 cfs, and 600 cfs) from the Canyon Dam low level outlets on: 1) rate of warming along the Seneca Reach, 2) the thermal structure at Belden Reservoir, 3) the water temperature of Belden Dam releases, and 4) thermal responses in the downstream reaches (i.e., Rock Cree, Cresta, and Poe reaches). These special tests are designed based on the principle that denser cold water from the Canyon Dam low level outlet would plunge into the bottom of Belden Reservoir without mixing during the Caribou #2 PH off-peaking hours and then transport along the bottom to Belden Dam for release to the river. During the Caribou #2 PH on-peaking hours, the cold water from the Canyon Dam low level

outlet would be completely mixed with much higher warm water discharges from the Caribou #2 PH.

- **Special Test 3 - Extended Off-Peaking Hours Test for Caribou #2 Powerhouse with Increased Canyon Dam Release at 250 cfs**

The purpose of this special test was to better understand the effects of peaking operations at the Caribou #2 Powerhouses on the thermal structure at Belden Reservoir and the water temperature of Belden Dam releases. This special test is designed based on the principle that extended off-peaking hours for the Caribou #2 Powerhouse will provide more opportunity for cold water from Canyon Dam's low level outlet to plunge to the bottom of Belden Reservoir.

- **Special Test 5 - Caribou Special Test with Reduced Butt Valley PH Flows at 500 cfs**

The purpose of this special test was to better understand the relationship between Prattville Intake flow rates and discharge water temperature at the Butt Valley PH, and whether cold water discharged from the Butt Valley PH (under reduced intake rates) would plunge without mixing and travel submerged in Butt Valley Reservoir to become available for withdrawal at the Caribou #1 Intake. Historical data indicated that decreasing volume and approach velocity at Prattville Intake would reduce tailrace discharge water temperature.

- **Special Test 6 - Increased Grizzly Creek Release Test**

The purpose of this test is to better understand the effectiveness of increased Grizzly Creek releases on reducing warming rate as flow travels down the creek and is delivered to the Cresta reach.

Special tests 1 – 5 were conducted in a coordinated fashion from July 2 through August 5. Data from these tests is currently being collected and prepared for further examination and analysis. Special test 6 is scheduled for August 10 – 15.

ROUTINE MONITORING PROGRAM

The routine water temperature monitoring program includes NFFR stream flow and temperature data collection, powerhouse discharge and temperature data collection, reservoir temperature profile monitoring, and meteorologic monitoring. The purpose of this routine monitoring is to 1) collect a complete and comprehensive set of data along the entire NFFR for recalibration of the existing reservoir water temperature models for Lake Almanor, and 2) to develop and calibrate new reservoir water temperature models for Butt Valley, Belden, and possibly Rock Creek Reservoirs. This routine monitoring program is similar to the monitoring program conducted by PG&E in 2002-2004, under the Rock Creek-Cresta License. It covers the watershed from Lake Almanor to the Poe Powerhouse and will enhance the understanding of thermal responses for the entire NFFR system to cool water infusion during the special tests, changes in reservoir operations, and meteorologic conditions. The routine monitoring program consists of:

- Continuous monitoring of stream flow and water temperature at selected stations;
- Continuous monitoring of reservoir water temperatures at about 5 feet depth intervals and lake stage in Lake Almanor, Butt Valley, Belden, and Rock Creek Reservoirs as well as periodic water temperature profile monitoring at more refined intervals;
- Continuous monitoring of local meteorologic conditions using the existing meteorology stations at Prattville Intake and Rock Creek Dam.

The routine monitoring program was initiated in April and will end in early October. This time period overlaps with the special testing program and covers the complete stratification cycle in the reservoirs.