

COMMENTS AND RECOMMENDATIONS

Ready for Environmental Analysis
Final License Application
DeSabla – Centerville Project (FERC No. 803)
Docket No. P-803-087
Applicant: Pacific Gas & Electric Co.

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June 27, 2008

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission

Dear Ms. Bose:

Friends of Butte Creek (FBC), the California Sportfishing Protection Alliance (CSPA), Friends of the River (FOR), and American Whitewater (AW) (collectively, Conservation Groups) have reviewed the May 1, 2008, "Notice of Application Ready for Environmental Analysis and Soliciting Comments, and Recommendations, Final Terms and Conditions, and Prescriptions" (REA Notice) for the Pacific Gas and Electric Company's DeSabla - Centerville Hydroelectric Project, FERC Project No. 803 (Project). Conservation groups have also reviewed PG&E's Application for License for Project 803 (October, 2007) and a myriad of other documents on the FERC record in this proceeding and in earlier FERC proceedings relating to Project 803, including documents from the 1980 relicensing of the Project, the 1991 FERC- ordered license amendment, and correspondence and legal documents which were occasioned by substantial pre-spawn mortality of Spring-run Chinook salmon (SRCS) in project-affected reaches of Butte Creek in 2002 and 2003.

In response to the REA Notice, Conservation Groups hereby offer the following suite of recommendations under Section 10(a) of the Federal Power Act, and hereby provide a series of comments regarding needs for the Commission's planned Environmental Assessment for the relicensing of Project 803, under the National Environmental Policy Act (NEPA).

Project Description

The principal features of the DeSabla – Centerville Project consist of two storage reservoirs (Round Valley and Philbrook), three major diversions (Hendricks Diversion Dam on the West Branch Feather River, and Butte Head Dam and Lower Centerville Diversion Dam on Butte Creek), three powerhouses (Toadtown, DeSabla and Centerville), and more than twenty miles of flumes, canals and tunnels.

The Project facilities are located in two distinct watersheds: the West Branch Feather River and Butte Creek. Water is diverted from the West Branch Feather River (WBFR) at Hendricks Diversion Dam, and is routed through the Hendricks Canal (which includes a tunnel and conveys water in a natural streamcourse for a short distance) through Toadtown Powerhouse, a run-of-river facility located on the canal. Water then continues through the Toadtown Canal to confluence with Butte Canal, and thence to DeSabla Forebay. In the Butte Creek watershed, water from Butte Creek is diverted at Butte Head Dam into Butte Canal. Butte Canal joins Toadtown Canal where it is mixed with West Branch Feather River water, and the combined flow enters DeSabla Forebay. Water from DeSabla Forebay passes through a long penstock down through DeSabla Powerhouse on the bank of Butte Creek, and enters Butte Creek, joining water in Butte Creek that has bypassed Butte Head Dam and accreted downstream of it. Water is (re-)diverted several hundred yards downstream of DeSabla Powerhouse at Lower Centerville Diversion Dam (LCDD) into Lower Centerville Canal. The water diverted into Lower Centerville Canal travels six miles in the canal to Centerville Powerhouse (CVPH), bypassing about 6 miles of Butte Creek (Bypass Reach) downstream. After passing through Centerville Powerhouse, the diverted water is discharged back into Butte Creek just upstream of the Covered Bridge.

All project canals pick up tributary inflow at various points, by means of minor project diversions. In some cases the quantity of water diverted from these tributaries is significant, predictably during periods of runoff.

Both Project reservoirs are located in the West Branch Feather River watershed. Round Valley Reservoir, with storage capacity of about 1200 af, is located near the headwaters of WBFR. Philbrook Reservoir is located on Philbrook Creek, a major WBFR tributary east of WBFR, and has a storage capacity of about 5000 af. Water is stored in both reservoirs during the spring runoff period, and is used to augment WBFR flows, for diversion at Hendricks Diversion Dam, once natural flow in WBFR drops below the usable capacity of Hendricks Canal. The operation of these reservoirs has changed significantly in the last fifteen years.

Statement of Interests and Position

Conservation Groups have participated and are participating in the underlying collaborative relicensing effort. However, notwithstanding that involvement, project operations going forward under new license conditions as proposed by Licensee will fail to optimize anadromous fishery resources, water quality and quantity, and could cause serious adverse effects, in the form of widespread pre-spawn mortality, to sensitive populations of federally listed salmon. Project operations as proposed by licensee will also fail to optimize rearing habitat for federally listed juvenile steelhead. Project operations going forward as proposed by licensee may also limit reasonable recreational opportunities.

Conservation Groups believe that the most important and sensitive resource issue in this relicensing is the population of Spring-run Chinook salmon. According to PG&E, the run of SRCS in Butte Creek comprises an average of about 70% of the total remaining population of all SRCS in the Central Valley (Final License Application, ES-3). The 6,214 fish that spawned in Butte Creek in 2007 comprised over 5% of *all* salmon, hatchery or wild, Fall-run, Winter-run, or Spring-run, that spawned in California's Central Valley in that year.¹ These numbers are especially important in light of the fact that for 2008 the commercial and sport fishing season for salmon was completely shut down in ocean waters off California and most of Oregon. The survival of this cornerstone species is in the balance, and Butte Creek is a crucial component of that balance.

In the following pages we outline a suite of measures that we believe would best balance power and non-power resources in Butte Creek. Conservation Groups recommend a suite of measures, including the phased-in decommissioning of the Centerville Powerhouse, Lower Centerville Canal, and Lower Centerville Diversion Dam (collectively, the Centerville Development), in order to ensure the best overall use of the project-affected resources. As we outline below, the scientific and economic rationale for such measures is clear.

Background

Prior to 1980, the minimum bypass flow in Butte Creek below Lower Centerville Diversion effectively precluded use by SRCS of this bypass reach for holding. An ineffective weir located just upstream of Centerville Powerhouse discouraged, but did not prevent, SRCS from moving upstream of the powerhouse. Those that did move upstream, as well as juvenile steelhead that failed to move downstream of CVPH before spill ended at Lower Centerville Diversion Dam, routinely perished.

During the relicensing of the Project in the late seventies, which culminated in license issuance in June, 1980, PG&E resisted increasing the bypass flow below LCDD, on the

¹ Pacific Fishery Management Council, *Preseason Report 1: Stock Abundance Analysis for 2008 Ocean Salmon Fisheries*, February, 2008, page 23.

grounds that passage issues downstream of the project limited the likely effectiveness of such an increase:

“Our biologists do agree that increasing the flow to 20 cfs below Centerville Diversion Dam could be beneficial for maintaining salmonid habitat in Butte Creek in the project area. However, if the aforementioned downstream problems are not resolved, we do not believe any increase in flow or anadromous fish planting will significantly benefit the Butte Creek anadromous fishery.” (Letter from H.M. Howe, Chief Siting Engineer, PG&E, to E.C. Fullerton, Director, DFG, September 4, 1980). PG&E recommended a bypass flow of 6 cfs in normal years, and 3 cfs in dry years.

In issuing the License in 1980, FERC gave PG&E three years to develop recommendations for flows below LCDD. In a license amendment issued in 1984, FERC set the minimum flow for the Bypass Reach at 10 cfs, plus additional flows up to 40 cfs as needed to maintain water temperatures less than 20° C.

Also in the eighties, PG&E agreed to conduct, in conjunction notably with the California Department of Fish and Game (DFG), a series of studies aimed at determining habitat needs and reasonable improvements that could be made in the Project for the benefit of anadromous fish, especially SRCS. These studies, in part, led to a license amendment ordered by FERC in 1992 that increased the summer bypass flow in Butte Creek below LCDD to 40 cfs in all years, with the same or lesser flows at other times of year, and with some variation at those other times depending on water year type.

Meanwhile, in 1988, the California legislature passed the *Salmon, Steelhead Trout, and Anadromous Fisheries Program Act*, and in 1991, the federal *Central Valley Project Improvement Act* was signed into law. These acts and others, including the 2000 *CalFed Record of Decision*, provided initiative and funding to make numerous improvements in Butte Creek downstream of the Project, notably for passage, screening, and reconnection of the river to the floodplain. 35 million dollars was spent in the Butte Creek watershed, notably for fish ladders and screens, and reconnection of the creek to the floodplain (see *Butte Creek Department of Fish and Game Anadromous Fish Restoration and CalFed Programs*, 2005). These efforts were spectacularly successful, and by the late 1990’s, annual runs of SRCS had increased from the hundreds to the thousands, and in many years to greater than ten thousand.

In 2002, an estimated 3082 SRCS died before spawning upstream of CVPH, while 349 SRCS pre-spawn mortalities occurred downstream of CVPH. In 2003, 10,115 pre-spawn mortalities occurred upstream of CVPH, and 1116 downstream (Paul Ward et al, *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation 2003* (Ward, 2004)).

A concise description of the project background is also provided in Ward (2004). Reviewing this document (and others), we see that most of the issues that were raised and wrestled with in the present relicensing were considered in the past, often on several occasions. Moreover, some of the issues that were raised in the past were explicitly

deferred, by FERC and by others, to this relicensing, notably, for example, the creation of a water temperature model that can evaluate flow effects at a full range of potential summer operational scenarios.

The conclusions and recommendations drawn by Ward et al at the time are worth citing at length (Ward (2004), pp 21-2). It is important to note that many of these conclusions are consistent with positions that have been taken by PG&E prior to and during this relicensing.

There were approximately 11231 Butte Creek SRCS that died prior to spawning during 2003, of which 90% were in the reach above Centerville Powerhouse. The cause of the mortalities was large numbers of SRCS concentrated in limited holding pools, warm water temperatures, and an outbreak of two pathogens, columnaris and the protozoan Ich. ...

Hydropower generation has altered flows in Butte Creek since about 1908, and appears to have provided a net overall benefit to SRCS. During the key holding period June through September hydropower diversions from the West Branch of the Feather River have significantly increased the natural flows in Butte Creek and generally have provided cooler temperatures. ... Subsequent to the 1991 FERC requirement that PG&E maintain a minimum release of 40 cfs from June 1 through September 14, below the Centerville Heard Dam, the flow and temperature regime appears to have maximized survival and spawning success. Existing evaluations suggest that there is little potential to decrease temperatures by increasing flows in the reach above the Centerville Powerhouse during the summer holding period.

Current diversions through the Centerville Powerhouse significantly decrease temperatures in Butte Creek below the Centerville Powerhouse, provide important holding habitat during the summer, and ultimately contribute to the maximum usage of spawning habitat. Based upon the recent evaluation of useable spawning habitat and an average redd area of 23 sq. ft. to 200 sq. ft., it is estimated that at 40 cfs, approximately 27—2352 adults spawn above the Centerville Powerhouse. Below the Centerville Powerhouse, at an average flow of 130 cfs, there is sufficient spawning gravel to accommodate approximately 1262-10976 adults. During 2003, approximately 1527 adults spawned above the Powerhouse and 4536 below. Evaluation of holding and spawning distribution since 2001, shows a net downstream movement from holding pools to spawning habitat. However, there is not significant movement from above the Centerville Powerhouse to below. The result is saturation of spawning habitat above and significant underutilization below.

In general, while current PG&E project operations appear to provide a net benefit to Butte Creek SRCS, several potential modifications should be evaluated and implemented as feasible to alleviate or reduce spawning temperatures in the holding and spawning reach:

- * Alternatives to eliminate heating through the DeSabla Forebay
- * Other means to reduce sources of heating, particularly within the reach of Butte Creek between Centerville Head Dam and Quartz Bowl Pool.
- * Schedule maintenance operations for periods after SRCS have spawned.
- * Develop a predictive model to better manage flows from the West Branch of the Feather River.

This write-up summarizes a substantial number of the major issues that have arisen, the decisions that have been made in response, and a number of the till-now deferred issues.

Regarding the cause of pre-spawn mortality, there are several contributing factors discussed: water temperature, fish concentration, and pathogens. The pathogens are almost always present during the migration-holding lifestage of returning adult salmon (see Decostere, et al, *Influence of Water Quality and Temperature on Adhesion of High and Low Virulence Flavobacterium Columnare Strains to Isolated Gill Arches*, 1999), but, similar to staph bacteria that are widely present in human environments, only become virulent in certain circumstances.

Water temperature is a long-recognized issue in Butte Creek, especially in the Lower Centerville bypass reach, but the possible benefit of increasing flows in this reach to decrease water temperature , both on an emergency response basis and in general, raises the concern that it might increase crowding at the upper end of the reach (See e-mail from Bill Zemke to agencies August 14, 2003: “A significant increase in release flows could also cause salmon holding below the powerhouse to move upstream,” included as part of Appendix in 20030916-0195).

While knowledge regarding the water temperature issue has been expanded on considerably in the current relicensing proceeding, knowledge regarding migration, and especially migration response to increased flow, saw virtually no study in the relicensing, and remains at the same level of speculation that it did in 2003.

“Net benefit”

Ward et al (2004) say that “Hydropower generation has altered flows in Butte Creek since about 1908, and appears to have provided a net overall benefit to SRCS.” This statement is a mantra that PG&E has used extensively, especially in the last few years, and merits analysis. First, the hydropower project provided no clear benefit prior to the increase in minimum flows in the Centerville Bypass Reach in ordered by FERC 1992. From 1966 through 1994, escapement numbers were generally in triple digits, and more commonly in double digits than quadruple. Any presumed net benefit in that time period, given these returns, and especially when compared to escapement figures after 1994, cannot be defended by the numbers. (1995 was the first year whose adult returns reflect juvenile production resulting from increased flows in the Centerville bypass reach begun in 1992).

Table 1. Butte Creek SRCS spawning escapement estimates for the period 1954 through 2004.

| Year | Run Size |
|------|----------|------|----------|------|----------|------|---------------|
| 1954 | 830 | 1969 | 830 | 1984 | 23 | 1999 | 3679* |
| 1955 | 400 | 1970 | 285 | 1985 | 254 | 2000 | 4118* |
| 1956 | 3000 | 1971 | 470 | 1986 | 1371 | | Snorkel |
| 1957 | 2195 | 1972 | 150 | 1987 | 14 | 2001 | 9605* 18312** |
| 1958 | 1100 | 1973 | 300 | 1988 | 1300 | 2002 | 8785* 12597 |
| 1959 | 500 | 1974 | 150 | 1989 | 1300* | 2003 | 4398* 6063 |
| 1960 | 8700 | 1975 | 650 | 1990 | 100* | 2004 | 7390* 10221 |
| 1961 | 3100 | 1976 | 46 | 1991 | 100* | | |
| 1962 | 1750 | 1977 | 100 | 1992 | 730* | | |
| 1963 | 6100 | 1978 | 128 | 1993 | 650* | | |
| 1964 | 600 | 1979 | 10 | 1994 | 474* | | |
| 1965 | 1000 | 1980 | 226 | 1995 | 7500* | | |
| 1966 | 80 | 1981 | 250 | 1996 | 1413* | | |
| 1967 | 180 | 1982 | 534 | 1997 | 635* | | |
| 1968 | 280 | 1983 | 50 | 1998 | 20212* | | |

* Surveys prior to 1989 used various methods of varying precision. Snorkel surveys used since 1989 are thought to significantly underestimate actual population size and are used as an index. Spawning survey results for 2001-2004 generated by a Schaefer Model carcass survey. Neither snorkel survey nor spawning survey estimates include pre-spawn mortalities.

** Number as reported in 2003 (22,744) in error (Ward et al., 2004b).

(from Ward et al, *Butte Creek Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Pre-Spawn Mortality Evaluation 2004* (Ward, 2006), page 1).

Numbers since 1995 clearly suggest a net benefit. However, the pre-spawn mortalities also clearly suggest a problem that is at least connected with project operation. Conservation groups believe that ‘Net benefit or not net benefit?’ does not appropriately capture the issue. The question is, rather, is everything reasonable being done to optimize SRCS habitat in the project-affected area? If the project provides a net benefit, yet still encompasses decisions that in 2003 resulted in the pre-spawn mortality of over 11,000 Spring-run salmon, about 65% of the year’s total run, then “net benefit” is too low a bar to set. We need to also consider, to start, how best to reduce the risk of such massive fish kills in the future. We note that in both 2002 and 2003, pre-spawn mortality was both initiated in the Bypass Reach, and affected far more fish in the Bypass Reach than in the reach below CVPH.

At this point, we feel the need to clarify a statement in the Executive Summary of the Final License Application that we believe is at best confusing: “The Centerville facilities are not needed for the trans-basin diversion of water, but provide a point of delivering this water to Butte Creek” (p. ES-3). The “net benefit” of *Lower Centerville Canal and Centerville Powerhouse* has nothing to do with the transfer of water from WBFR to Butte Creek. All the water that is delivered from WBFR to Butte Creek is discharged into Butte Creek below DeSabla Powerhouse. Downstream from this discharge, part of the previously transferred water is *re-diverted from Butte Creek into Lower Centerville Canal*. To be clear, as described and analyzed below, the “benefit” that is ascribed to diverting water through Lower Centerville Canal is twofold: water is presumed to stay

colder in Centerville Canal than it does in Butte Creek, and delivering this cooler water at Centerville Powerhouse tends to keep holding Spring-run Chinook salmon further downstream, where a greater amount of spawning habitat is present.

“Maximized survival”

Ward et al (2004) also maintain: “Subsequent to the 1991 FERC requirement that PG&E maintain a minimum release of 40 cfs from June 1 through September 14, below the Centerville Heard Dam, the flow and temperature regime appears to have maximized survival and spawning success.” Again, particularly in the years 2002 and 2003, one has to question whether the flows below Centerville Head Dam (aka Lower Centerville Diversion Dam) have “maximized survival.”

Thanks to a temperature model developed during the relicensing, we now have an answer to the contention in Ward (2004) that “Existing evaluations suggest that there is little potential to decrease temperatures by increasing flows in the reach above the Centerville Powerhouse during the summer holding period.” We shall return to this issue below, in our evaluation of results from the temperature model runs performed during the present relicensing proceeding.

Downstream Migration from Holding to Spawning Habitat

We also have greater insight into the contention that “Evaluation of holding and spawning distribution since 2001, shows a net downstream movement from holding pools to spawning habitat. However, there is not significant movement from above the Centerville Powerhouse to below. The result is saturation of spawning habitat above and significant underutilization below.”

The “Butte Creek 2007 SRCS Numbers,” a spreadsheet released by DFG, confirms the previously noted trend of downstream migration during the period just prior to spawning that was noted above in Ward (2004). However, a substantial number of SRCS held upstream of CVPH and spawned downstream of CVPH, contrary to the opinion that such downstream migration was “not significant”: according to analysis of the DFG spreadsheet for 2007, 72% of SRCS held upstream of the CVPH, while only 42% of SRCS spawned upstream of CVPH. Friends of Butte Creek videotaped salmon near Helltown moving downstream in September, 2007; a copy of this video is provided on c.d.

Overarching Issues and Management Since 2003

Of the recommendations made by Ward et al in 2004, two have been extensively considered in this relicensing proceeding: reducing the heating of water as it passes through DeSabla Forebay, and the creation of a predictive model (actually, models) to aid in project operations. Maintenance outages have been scheduled to reduce impact on SRCS, and licensee now proposes to reschedule some outages to earlier in the spring to further reduce that impact.

Subsequent to the widespread fish mortality in 2003, PG&E and the agencies embarked on a number of endeavors that sought to reduce water temperatures in Butte Creek downstream of LCDD. This was carried out largely under the aegis of the annual Operations Plan that PG&E first established and implemented in 1999. The main types of measures undertaken included reduction of flows in WBFR below Hendricks Diversion and movement of the water not released into WBFR, instead, to Butte Creek; an effort to maintain relatively large amounts of water moving through Butte and Hendricks/Toadtown Canals throughout the summer, in order to reduce heating during conveyance both in the canals and through DeSabla Forebay; and reoperation of the project reservoirs, especially Round Valley, to reduce the heating effect of warm water leaving this impoundment, especially as it drained. (On analysis, it appeared that late releases, well into July, from Round Valley had contributed to the high mortality in 2003). Finally, a plan was formulated to increase flows of cool water from Philbrook Reservoir during “heat storm” periods, in order to provide added cooling.

Notably absent from these measures were, first, a notion that was promoted by NMFS in 2004 to consider spilling extra water from Lower Centerville Canal into the Centerville Bypass Reach during hot spells or periods when mortality became marked. Also absent was the concept of increasing summer minimum flows in the Bypass Reach.

Management of Spring-run through Diversion of Water into Lower Centerville Canal

Some of the rationale for the decision not to increase minimum flows in the Bypass Reach has been discussed above. A de facto “thermal barrier” is established in the summer at the outflow from Centerville Powerhouse, where the temperature of the outflow is considerably cooler than the temperature of the water in Butte Creek immediately upstream. Monitoring from 2001 through 2005 showed that a substantial number of the total run of SRCS in each year holds just downstream of CVPH. In addition, there is the stated desire to keep the salmon downstream of the powerhouse, because of the downstream location of most of the creek’s accessible spawning gravels. Finally, there is the theory, or simply the fear, that increased flow in the bypass reach will encourage upstream migration, leading both to crowding issues during holding and reduced likelihood of efficient gravel use during spawning.

The fisheries resource agencies displayed a remarkable reticence to change project operations even in the face of extensive die-offs of Spring-run in 2002 and 2003. This reticence has been pronounced right on through the relicensing as well. The almost certain benefit of increasing flows in the bypass reach to reduce water temperature, and thus among other things the likelihood of such fish kills, has been consistently opposed because of the perceived benefit of current summer operations to fish downstream of CVPH. Key to this approach has been the notion of keeping as many fish as possible close to spawning habitat which exists in appreciably higher concentration downstream of CVPH.

There was also considerable speculation on the part of both the licensee and the fisheries agencies that any benefit to SRCS holding above CVPH would necessarily result in a detriment to salmon holding downstream of the powerhouse, and that any potential benefit to those fish in the bypass reach would necessarily be small. This speculation was included in the Preliminary Biological Opinion (PBO) produced by NMFS in November, 2006. The PBO states, for example, on page 47: "As flows in the upper reach increase above 40 cfs, each additional increment of flow not only becomes less effective at moderating temperatures (i.e., reducing thermal loading), but may produce warmer water below the Centerville Powerhouse. This net warming would occur because water flowing down the natural channel experiences greater thermal loading, due to increased travel time and more direct exposure to solar radiation in a wide stream channel, as compared to water traveling within the narrow and fast moving Lower Centerville Canal."

Conservation Groups find it troubling that these and other speculative statements find their way into significant documents, and then, because they represent the opinions of individuals from resource agencies, tend to take on extra weight once in print. Often in this proceeding, these speculative comments have represented the opinion of one person from one of two resource agencies. It is precisely for the purposes of reducing speculation that relicensing studies are designed and carried out. Fortunately, on this count at least, information was developed in the relicensing process that sheds light on the particular issue noted above (see discussion of temperature modeling, below).

The Importance of Sublethal Water Temperatures

The PBO also mentions speculation from a report by S.T. Lindley et al, 2004 (*Population Structure of Threatened and Endangered Chinook salmon ESUs in California's Central Valley Basin*): The mentioned citation is: "It appears that Butte Creek spring-run chinook salmon regularly survive temperatures above the incipient lethal limit reported for chinook salmon, suggesting that they may be adapted to warmer temperatures than most chinook stocks...(p. 20)."

In 2007, Conservation Groups commissioned a report by Dr. Alice A Rich, one of California's best known experts on the effects of water temperature on salmonids. This report, entitled "*Preliminary Comments on the Thermal Effects of PG&E's DeSabla – Centerville Project on Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*)*" (Rich, 2007), was circulated to a number of relicensing participants, including the licensee. It addressed the notion of the ability of Butte Creek SRCS to withstand high water temperatures on a number of counts:

No physiologically-based site-specific thermal studies had been undertaken on Butte Creek, to determine thermal requirements or thermal thresholds for adult Spring-run Chinook salmon; ... There was no physiological evidence that suggested that the thermal requirements for each of the races of Chinook salmon differed; ... Until site-specific physiological thermal studies are undertaken, water temperatures, beginning at 15° C (59° F) should be considered stressful, and 17° C (62.6° F) should be considered to be lethal for adult Spring-run Chinook

salmon in Butte Creek; ... Sublethal water temperatures result in decreased survival of Chinook salmon. "Within a population, the inability to maintain near optimum growth at less than optimum temperatures is as decisive to continued survival as more extreme temperatures are to immediate life" (Brett, 1956).

Conservation Groups respect and appreciate the efforts that have been made by both the licensee and the resource agencies over the last four summers to avoid widespread pre-spawn mortality of SRCS in Butte Creek. However, we believe that the approach that has been taken in those last four years has resulted in a mindset that excludes consideration of options for still better operation of the project in terms of the benefit to SRCS and to the forgotten stepchild of this project, Central Valley steelhead, also a listed species under the federal Endangered Species Act. And while we agree that the hydrology, storage and geography of the project often preclude the ability to manage for water temperatures in the range that Dr. Rich would like to see, we nonetheless believe that the concerns outlined by Dr. Rich about the importance of addressing sublethal conditions requires more attention than has been previously devoted to the matter.

Water Temperature Modeling

In October, 2002, CSPA filed a complaint with FERC alleging that project operations had caused the pre-spawn mortality of thousand of SRCS in August, 2002. In response, PG&E filed a letter (20021025-0163) with FERC on October 25 that stated:

On August 15 ~, the Company met with NOAA Fisheries and CDF&G and jointly determined that the best course to address concerns regarding the summer survival rate of the salmon was for the Company to request Commission authorization to temporarily reduce flows at Hendricks Head Darn in consultation NOAA Fisheries and CDF&G. Both the Company and NOAA Fisheries wrote the Commission seeking such authorization, which was granted on September 6 ~. The Company has since worked closely with NOAA Fisheries and CDF&G to moderate flows at Hendricks Head Dam as appropriate.

Today, thanks to the CE-QUAL-W2 water temperature model developed by PG&E in the course of this relicensing proceeding, we know that the likely net effect of the action described in PG&E's letter above was to reduce the mean daily water temperature at Helltown on Butte Creek by approximately .04° C., and the water temperature below CVPH by about .1° C. Thanks to the SNTEMP model for WBFR developed in this relicensing (see Final License Application, Appendix E6.2.2.3-1-E1, WBFR July 15 2005 simulation, on c.d. only), we also know that the net effect of this action on the WBFR below Hendricks diversion was to increase the mean daily water temperature from about 20° C and to about 22° C, likely killing a fair percentage of the trout downstream of Hendricks.

As noted above, the Preliminary Biological Opinion for the DeSabla – Centerville Project issued by NMFS in November, 2006 speculated that little opportunity existed to improve holding conditions for SRCS in the Centerville bypass reach using flow to achieve

cooling, and further speculated that significant improvements could be made in terms of Butte Creek water temperatures should a means be devised to reduce thermal loading in DeSabla Forebay.

Thanks again to the CE-QUAL-W2 temperature model (model runs 052708 as posted on the DSC relicensing website; pdf provided along with other references), we are now able to quantify the relative benefits available to SRCS from these various reoperation scenarios.

Under current operations, the mean daily water temperature improvement that might be gained by a 50% reduction in thermal loading at DeSabla Forebay in a Normal water year (2005) characterized by hot ambient temperatures (2005; 4% exceedence) is as given below for the various locations:

| | |
|--|--------|
| Butte Creek Below Centerville Powerhouse | .17° C |
| Butte Creek Above Centerville Powerhouse | .14° C |
| Butte Creek At Helltown | .15° C |

With an 80% reduction in thermal loading at DeSabla Forebay, in a Normal water year (2005) characterized by hot ambient temperatures (2005; 4% exceedence), the mean daily water temperature improvement under current operations for the same locations would be for the same locations:

| | |
|--|--------|
| Butte Creek Below Centerville Powerhouse | .27° C |
| Butte Creek Above Centerville Powerhouse | .22° C |
| Butte Creek At Helltown | .24° C |

To summarize: changes at DeSabla Forebay, coupled with current operations, buy about a quarter of a degree Celsius, or less, of improvement in water temperatures for holding Spring-run, in Normal water years with high air temperatures, both upstream and downstream of Centerville Powerhouse.

The figures for Dry year (2001) hydrology coupled with hot ambient temperatures (2005) increase the benefit below CVPH to about .4° C downstream of CVPH if thermal loading is reduced by 80%, with less benefit upstream. If loading is reduced by 50%, with other conditions the same, net water temperature benefit is .26° or less, depending on location.

Now, let's reconsider the notion that flow might make a substantial improvement in water temperature conditions for holding Spring-run, (noting that such benefits would also have to consider increased wetted perimeter, overall habitat, WUA for juvenile steelhead and resident adult rainbow trout, and diminished thermal conditions for predators such as Sacramento pikeminnow, all of which we will consider below). Part of the issue as we see it is that both licensee and resource agencies considered possible benefits to increased summer flow in the Bypass Reach only incrementally, in terms of an additional 20 or perhaps 40 cfs. At the repeated insistence of Conservation Groups, licensee modeled the thermal effect of leaving all summer flow below DeSabla Powerhouse in Butte Creek (no

re-diversion into Lower Centerville Canal), and then modeled this proposed action in combination with other management options.

The results were, in our opinion, dramatic.

If all the flow below DeSabla Powerhouse is left in Butte Creek, the benefit of this action alone in a hot, Normal water year is a mean daily temperature improvement of 1.2° C above CVPH, $.92^{\circ}\text{C}$ at Helltown, with only a $.16^{\circ}$ mean daily increase below CVPH. In a Dry year, the benefit above CVPH is 1.34° C , the benefit at Helltown is 1.06° C , and the downside below CVPH is $.2^{\circ}\text{ C}$.

This tends to valorize the notion that a benefit above the CVPH means a loss below CVPH, though the upstream benefit dwarfs the downstream detriment. However, when we examine scenarios in which all flow below DeSabla Powerhouse is left in Butte Creek, and combine this with reduced thermal loading at DeSabla Forebay, the downside evaporates.

If in a hot Normal water year we combine a 50% reduction in thermal loading at DeSabla Forebay with leaving all summer water in Butte Creek downstream of DeSabla Powerhouse, mean daily temperatures below CVPH remain the same as under current operations. The benefit above CVPH is 1.37° C , and the benefit at Helltown is 1.09° C . If we bump the reduction in thermal loading to 80%, we achieve, in Normal water years, *a benefit below CVPH of $.11^{\circ}$ over current conditions*. The benefit above CVPH increases to 1.47° C , and the benefit at Helltown becomes 1.09° C .

If in Dry years we combine a 50% reduction in thermal loading at DeSabla Forebay with leaving all summer water in Butte Creek downstream of DeSabla Powerhouse, mean daily temperatures below CVPH show a slight improvement ($.05^{\circ}\text{ C}$) over current operations; above CVPH, the benefit increases to 1.6° C , and at Helltown the benefit is 1.33° C . With an 80% reduction of thermal loading at DeSabla Forebay and all the water left in Butte Creek in a Dry year, the net benefit *below CVPH* is $.21^{\circ}\text{ C}$; above CVPH it is 1.75°C , and at Helltown it is 1.49° C .

Conservation Groups believe the evidence is clear. By far the greatest improvement that can be made to summer habitat for SRCS and juvenile steelhead through reoperation of the DeSabla – Centerville Project is to engineer improvements at DeSabla Forebay, and combine these improvements with an operation *that leaves all the water in the summer in Butte Creek*: zero diversion at Lower Centerville Diversion Dam. No other option with substantially improve the sublethal summer thermal conditions to which salmonids in the Lower Centerville Bypass Reach are routinely and constantly subjected.

Managing Spring-run Migration and Holding: A Different Approach

By far the most vocal argument we have read of and have heard in the context of this project for why increasing summer flow in the Centerville Bypass Reach is a bad idea is that such a measure will both cause fish to crowd upstream, and in being upstream will

leave them further from the majority of Butte Creek's spawning habitat. As noted above, this contention is highly speculative, and in spite of recommendations by Conservation Groups, no studies were conducted to improve clarity on this question or quantify the situation.

As mentioned in the background discussion above, we do have both documentation and video footage of SRCS migrating downstream to spawn.

We will concede that the distribution of holding Spring-run varies considerably from year to year. We also recognize that a "thermal barrier" is created by releasing colder water from Centerville Powerhouse into a Butte Creek whose water has passed down the bypass reach and thus warmed. However, the effect of this "thermal barrier" varies widely from year to year.

A report to FERC filed by PG&E (20030916-0195) after the large fish die-off in 2003 included, as evidence of consultation with the agencies, an e-mail chain, including an e-mail from Steve Edmonson of NMFS, who asked:

Regarding the question of tradeoffs between the adult holding habitat above the Centerville Powerhouse and the spawning habitat below, it seems to me that the question really comes down to limiting factors. Is improving or maintaining current spawning levels warranted if inadequate holding habitat exists to sustain returning adults?

We believe that states the dilemma succinctly. But we have to ask, why is current operation of Centerville Powerhouse the only option that has been considered to segregate the holding Spring-run? Why does maintaining the fish below CVPH have to come at the expense of holding conditions upstream?

We propose instead a simple alternative that is inexpensive and far more reliable. We propose that the jurisdictional resource agencies, each year as runoff flows in Butte Creek subside, install a removable weir to limit upstream migration. We suggest that the weir be removed in time to allow downstream migration for spawning. The particulars of timing and management of fish can be worked out by the Operations Group; this will in fact allow different options to be considered and experimented with, and will provide a much more efficient management tool than current operations.

Such a removable weir is routinely used by the U.S. Fish & Wildlife Service, as part of the Anadromous Fish Restoration Program, on the lower Stanislaus River to inventory and evaluate fish migration. The Stanislaus weir has a passage facility that can be opened or closed, and that is used for various aspects of fish study and management. A similar arrangement is also contemplated to segregate Spring-run and Fall-run downstream of Oroville Dam (see Settlement Agreement, Oroville Facilities, FERC #2100, 2006). Since the proposed weir on Butte Creek would not be needed except in summer months, issues of washout which plagued a permanent but ineffective weir previously located just upstream of CVPH would not come into play.



A weir such as the AFRP weir from the Stanislaus pictured above in our opinion answers the last aquatic argument against leaving all summer water downstream of DeSabla Powerhouse in Butte Creek, rather than diverting a portion into the Lower Centerville Canal. There remain the economic and power generation issues, which we will address below.

Disease Management

Related to the desire to avoid crowding upstream of CVPH is the notion, expressed in both Ward 2004 and in the PBO, that past disease outbreaks have been “density dependent.” We believe that our proposal for annual installation of a temporary weir is a more dependable solution to density management than is reliance on the “thermal barrier” created by current project operations.

We believe that it is also important to consider another aspect of the issue that has not in our opinion received adequate attention. In *Flowing Water: An Effective Treatment for Ichthyophthiriasis*, Bodensteiner et al (2000) make the case that flow in and of itself, either for reasons of velocity or increased turnover rate, reduces the outbreak and occurrence of Ich, which was one of the two principal pathogens involved in the 2002 and 2003 Butte Creek fish kills. While the Bodensteiner study was done in laboratory

conditions on channel catfish, the physiological explanation of the effect of flow on the pathogen itself appears to be applicable.

Steelhead

The temperature benefits to Spring-run Chinook holding upstream of Centerville Powerhouse are not the only aquatic benefit to our proposed reoperation of the project. *O. mykiss* are present in the Bypass Reach throughout the summer, and are no less affected by project operations than SRCS. However, management of the Bypass Reach has focused exclusively on salmon, in contradiction with recognized pitfalls of so doing.

In *Central Valley Steelhead*, (Fish Bulletin 179, Volume 1, published by California DFG, September, 2001), Dennis R. McEwan summarizes many of the issues relating to steelhead that are pertinent to Butte Creek:

The terms “rainbow trout” and “resident rainbow trout” are often used to identify nonanadromous forms of *O. mykiss*. This convention is confusing and technically inaccurate because “rainbow trout” is the common name of the biological species *O. mykiss*, and the term “resident,” used in this sense, ignores other, non-anadromous life-history forms and migratory behaviors. In this document, the term “rainbow trout” refers to the biological species *O. mykiss* regardless of life history, and the different life-history forms are referred to as anadromous (or steelhead), potamodromous, or resident, depending on their migratory behavior (or lack thereof in the case of residents). The term “nonanadromous” is used to refer collectively to all life-history types other than anadromous.

The structure of rainbow trout populations has important management implications that can only be addressed through an integrated management strategy that treats all life-history forms occupying a stream as a single population. However, management agencies have generally failed to recognize this, as exemplified by the federal government’s decision to exclude the non-anadromous forms in the ESA listing for steelhead, despite their recognition that they are important to the persistence of the anadromous forms. Steelhead need to be managed separately from chinook salmon stocks if recovery is to be successful.

Unlike most Spring-run Chinook, juvenile steelhead spend a summer in the river before they outmigrate to the ocean. (However, Ward et al, in *Butte and Big Chico Creeks Spring-run Chinook Salmon, Oncorhynchus Tshawytscha Life History Investigation*, 2004, note that of 393 yearling Chinook tagged over several years as they outmigrated from Butte Creek; four successfully returned as spawners, a rate of return far greater than the average for Butte Creek SRCS; this also suggests possible benefits to SRCS in managing for juvenile steelhead).

Results of the instream flow study for rainbow trout/steelhead in the Centerville Bypass Reach noted that weighted usable area for both juveniles and adults (life stages present

during summer months) peaks out at about 110 cfs (see Final License Application, Appendix E6.3.2.6-J2). It is about the same at 190 cfs for juveniles as it is at 45 cfs, and is slightly better for adults all the way up to 270 cfs than it is at 45 cfs. In sum, over the course of a summer, WUA for trout/steelhead will be no worse, and at the end of the summer will be better, under our proposed reoperation than it is under present operation of the project.

Moreover, there will be the same temperature benefits to *O. mykiss* in the Bypass Reach that there will be to SRCS. And perhaps most importantly, there will be less conducive conditions for Sacramento pikeminnow in the Bypass Reach when temperatures are reduced. We note in the Fish Population surveys (Final License Application, Appendix E6.3.2.2-D 2006 Length-Frequency) that the number of pikeminnow increases from Whiskey Flat (450 juvenile pikeminnow/hardhead; 3 large pikeminnow > 250 mm.) moving downstream to Helltown (thousands of juveniles, hardhead/pikeminnow usually not distinguished; 15 large adult pikeminnow > 250mm). Below CVPH, where water is colder and velocities are greater, there were far fewer pikeminnow than at Helltown (well under 100 juvenile pikeminnow; 1 or 2 adults > 250 mm.).

Though it foreshadows a later discussion, we would also like to emphasize, following the caveat of McEwan above, that “strategies must include measures to protect and restore the ecological linkages between the different life-history forms and measures to restore steelhead to some of their former habitat.” A critical component of improving the condition of steelhead in Butte Creek is thus providing the ability for *O. mykiss* that are upstream to migrate downstream and thus become potential recruits as steelhead. It is arguably equally critical that juvenile fish upstream be able to move downstream to improved river conditions, even if this migration results only in improved conditions for maturation as nonanadromous trout. This potential is currently obstructed at Lower Centerville Diversion Dam, where, except during spill, all trout migrating downstream are entrained into the unscreened Lower Centerville Canal. The bypass flow does not pass over, under, around or through the dam; rather, it is released from the canal a short distance below the canal intake. Once in the canal, velocities at the headworks are too great to allow entrained trout to swim back out (See *Assessment of Entrainment and Fish Passage Issues*, DTA, Powerpoint, June 28, 2006; included in Final License Application, Appendix 6.3.2.4-C). The proportion of fish that move down the canal, relative to those that survive the fall back into Butte Creek from the canal bypass outlet or that spill over the dam, was not quantified in the relicensing process. However, hundreds of rainbow trout are rescued every year during a maintenance outage on Lower Centerville Canal; the mean number removed from the Lower Centerville Canal each year in rescues from 1989 through 2006 was 1215 (Final License Application, page E6.3-187).

PG&E, in its Final License Application, proposes to maintain flows in the Bypass Reach from February 1 through April 30 of 80 cfs in Normal years and 75 cfs in Dry years, and then, in May, of 80 cfs in Normal years and 65 cfs in Dry years (page E8-20). The given reason for this flow proposal is to support conditions for steelhead spawning. Conservation Groups appreciate the gesture, but must point out that in the real-world hydrology of the DeSabla – Centerville project system, these flows will be available at

virtually all times in the February through May time period. Almost without exception, licensee could not capture enough water to reduce these proposed minimum instream flows even if it wanted to.

Steelhead, other than in Fish Population studies (a context in which Conservation Groups had to insist on a name change from rainbow trout to rainbow trout/steelhead), were virtually ignored in this relicensing proceeding. We don't know how many fish are in the system, and we certainly have no systematic analysis of their limiting factors. We would hypothesize, based on other systems with which we are familiar, including the Tuolumne and the Feather, that the largest limiting factor for Butte Creek steelhead is juvenile rearing habitat. We have sought to address this, in part, with our proposed summer flow requirement for the Lower Centerville bypass reach.

In conclusion to our consideration of steelhead, we would like to point out that, while the 2007 escapement of Chinook in the Central Valley was almost universally considered a disaster, the estimated number of steelhead in the system is substantially smaller.

Spawning Flows For Spring-run Chinook

For the past several years, PG&E has increased flows below Lower Centerville Diversion Dam on or about September 15, to provide increased spawning habitat for SRCS in the Bypass Reach. The relicensing IFIM study for the combined Lower Centerville Bypass Reach cited maximum spawning WUA for SRCS as being about 170 cfs (Appendix E6.3.2.6-J2). Mark Gard of the USFWS has maintained in an earlier study (*Flow-Habitat Relationships for Spring-run Chinook Salmon Spawning in Butte Creek* USFWS, 2003) that maximum spawning WUA was actually closer to 220 cfs. In either case, an increase in instream flow up to and even well above the average fall flow in Butte Creek, including imported water from the WBFR, is a benefit.

PG&E proposes in its License Application (page E8-20) to maintain an increased flow in the Bypass Reach throughout the SRCS spawning and emergence period (September 15 through January 31). It proposes a flow of 75 in Normal years, and 60 in Dry years. This is somewhat less than it has provided recently through its annual Operations Plans over the past few years, but is in keeping with its recent general approach. We agree that it is an improvement over operations in years past where the flow was kept at 40 cfs or less, and commend PG&E for its approach, as far as it goes, of proposing to make part of its new license a spawning flow augmentation.

DFG, in the recommendations in its *Pre-Spawn Mortality Reports*, has continued to recommend flows of "up to 80 cfs" during the spawning period (see e.g. Ward, 2006, p.17). It is our understanding that FWS proposes to recommend flows higher than this, based on its WUA calculations. DFG, in discussion, has expressed reticence to increase flows in Butte Creek to levels greater than the natural flow in Butte Creek, for fear of an outage on the Hendricks/Toadtown Canal and the possibility of dewatering redds. Conservation Groups do not find DFG's concern compelling; based in part on the opinion of Mr. Gard, a far more likely scenario would be that the depth of water over redds would

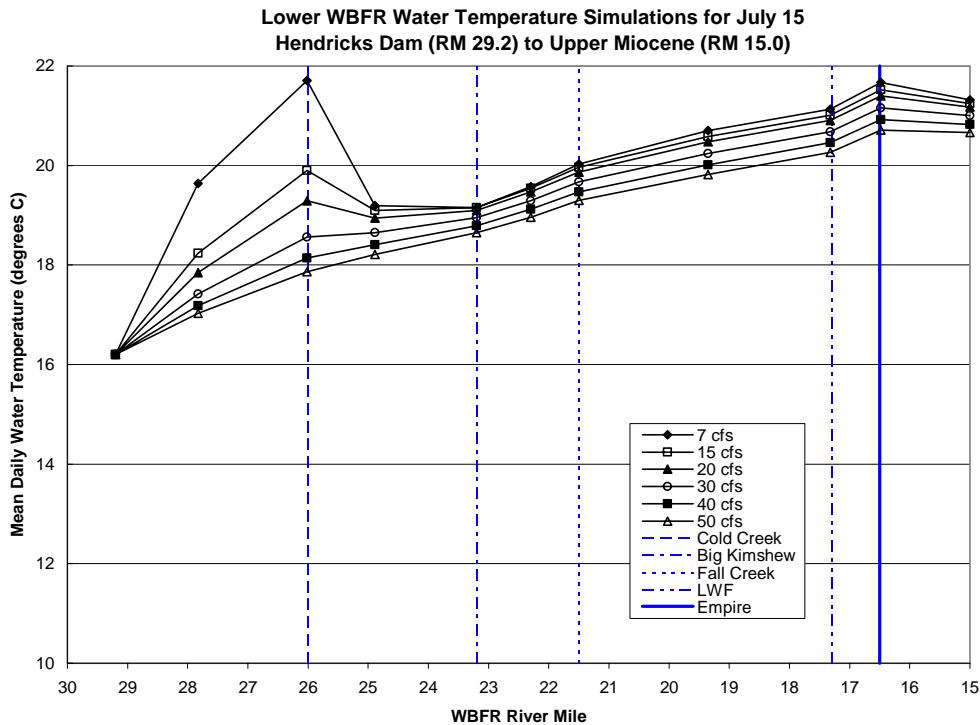
be reduced. We believe that a certain benefit of increased spawning flow is worth the small risk of less than optimum depths, or in the extreme case the dewatering of a few redds should the Hendricks/Toadtown Canal go down.

However, given our proposal to dewater the Lower Centerville Canal in the summer, we have a somewhat different conclusion than FWS. We believe that the best aquatic measure is to continue to leave all flow below DeSabla Powerhouse in Butte Creek through the spawning period. Since spawning is thought in many quarters to be one of, if not the, most critical limiting factor in SRCS production in Butte Creek, we cannot see any good reason to reduce flows in Butte Creek once the summer period ends.

Hendricks Diversion Dam Flow and Passage

PG&E proposes to increase minimum instream flows below Hendricks Diversion Dam from 15 to 20 cfs in Normal years. W2 model runs suggest that the mean daily summertime water temperature increase in Butte Creek at three locations (above and below CVPH, and Helltown) that would result from this proposed increase would be on the order of .01° C. However, an increase of from 15 cfs to 30 cfs would increase Butte Creek water temperatures more substantially, and Conservation Groups agree that an increase greater than 5 cfs over present operation is unwise.

(We note that licensee proposes a 30 cfs instream flow below Hendricks in Normal years from March through May. Natural flow will overwhelm the ability of licensee to reduce flows below this figure in virtually all circumstances).



The graph above represents the SNTEMP modeling of WBFR for the hottest two week period of the 2005 summer. Licensee failed to include in the Final License Application a model run for a representative Dry year scenario, but Conservation Groups assume a similar or even more dramatic Dry year result. The difference between 7 and 15 cfs for the first three miles downstream of Hendricks Diversion is not only great, it is in a range that pushes temperatures above the 20° C point, a frequently used, though in our opinion still too high, threshold for the tolerable temperature level for rainbow trout (see e.g. the Settlement Agreement and Project License for the Rock Creek – Cresta Project, FERC 1962, located on the North Fork Feather River nearby).

The benefit diminishes about three miles downstream with the entrance of water from the apparently aptly named Cold Creek into WBFR. Nonetheless, three miles is three miles. Licensee has pointed out that the property is owned by Sierra Pacific Industries, and its availability to the public for fishing is open to debate. As a navigable stream, access is allowed under California law up to the high water mark, and SPI has not, to our knowledge, sought to prevent angler access. Ownership may change over the next thirty to fifty years. And regardless of recreational access, the fishery has intrinsic value.

As pointed out in the discussion of Water Temperature Modeling above, increasing the Dry year instream flow on the WBFR below Hendricks Diversion would increase the water temperature at three stations on Butte Creek by about .1° C. Conservation Groups support this change, and believe that in the context of improvements that would follow from our proposed summer operation of Butte Creek below DeSabla Powerhouse and modifications at DeSabla Forebay, the benefit to WBFR outweighs the loss on Butte Creek.

A second compelling reason to maintain a Dry year instream flow requirement of 15 cfs for the WBFR below Hendricks Diversion is the need to maintain sufficient flow for a fish ladder at or near the Hendricks Diversion Dam. The 15 cfs figure was the minimum cited in PGE's *Assessment of Entrainment and Fish Passage Issues* (DTA, Powerpoint, June 28, 2006; included in Final License Application, Appendix 6.3.2.4-C). We recognize that problems with the design proposed in this assessment have been identified, and that the minimum flow required for a functional fish ladder may change. However, there has been little apparent desire on the part of Licensee to explore a workable or superior design or even a less expensive design, and some considerable effort on the part of licensee to persuade relicensing participants that passage at Hendricks Diversion should not be a license requirement. At a certain point, one has to simply work with what one has; the 15 cfs figure is the best available minimum flow estimate needed to operate a fish ladder at the site, and that is therefore the minimum figure that we at this time can support (especially given the above-cited temperature benefits).

As discussed previously, there has been extensive written and verbal discussion throughout this proceeding of the need or lack of need for a fish ladder and screen at Hendricks Diversion. Before considering the discussion, let us first recall the context:

- The project substantially reduces flow in WBFR below Hendricks Diversion except during high runoff periods.
- There is very limited opportunity to improve instream flow below Hendricks Diversion because of associated impacts in Butte Creek.
- The mean annual number of trout (including brown and rainbow trout) removed in fish rescues between 1989 and 2006 was 1565 (Final License Application, page E6.3-187).
- Based on 2007 sampling, licensee estimated 735 “catchable” (>6”) per mile upstream of the Diversion, and 393 per mile below the diversion. (Updated Study Results and License Application Sections, December 2007, page 6.3-40. These populations are poor in both locations, and in the lower location significantly poorer than in the upper.
- Similar to Lower Centerville Diversion and Butte Creek, all water flowing in the West Branch, except at spill, enters the Hendricks Diversion headworks, and the bypass flow is discharged from the canal back into the river some distance downstream of the diversion.
- There was a fish ladder at this location in the past. Its remnants are still present, though it is completely non-functional.

Licensee tells us on page E6.3-190 of the Final License Application:

The evaluation of diversion canal entrainment impact on fish populations in Project rivers is approximate at this time because there are two primary data gaps: 1) there is no reliable estimate of the total number of fish that move from the Project rivers into the various diversion canals, and 2) there is no estimate of the number of fish that leave the canal and any associated mortality due to passage through the powerhouses. Therefore, the following comparison and discussion of fish populations between the bypass canals and the Project streams is relative and qualitative.

We agree about the two identified data gaps, although the implication that some fish swim out of the canals at their headworks is flatly contradicted by the PGE’s *Assessment of Entrainment and Fish Passage Issues* (DTA, Powerpoint, June 28, 2006; included in Final License Application, Appendix 6.3.2.4-C). Since Licensee immediately thereafter proceeds to base analysis of fish populations in WBFR based on studies from 1977, 1987, 1988 and 2006 (see also page E6.3-187), we believe that there is a third data gap: overall fish populations in WBFR. CSPA commented on this data gap on May 4, 2007 in Comments on the Supplemental Initial Study Report. At or about the same time, USFS filed comments to the same effect. The Licensee objected to performing a more thorough sampling effort in the WBFR, and the Commission ordered repeated sampling only immediately upstream and downstream of the Hendricks Diversion for the 2007 season.

We will not rehash the debate. We will state only that licensee and its consultant sought to dress the discussion and analysis, in the Final License Application and before and since, in scientific garb. We give no more credence today to thirty-year-old fish population data than we gave in May, 2007; we attach no more mitigating effect or value

to “voluntary” entrance by fish into project canals; we still maintain that discussion by licensee of trout migration patterns within natural streamcourses cannot simply be referenced in the context of entrance by fish into canals.

In the end, we see licensee’s stance on this issue as an economic one. The process would have been much better served by stating this position up front and leaving it at that level. Even if more data had been collected, the fundamental lines of discussion would have remained the same. The most recent response of licensee to one of the agencies on this issue was as follows:

The Licensee agrees that all of these factors (flow, water temperature, upstream passage barrier and entrainment) can affect the overall fish populations above and below Hendricks Diversion; however, the 2007 study results show that fish populations were not conclusively negatively affected; results showed that the fish populations above and below the diversion were similar indicating that any loss to entrainment or the overall “transfer of energy” to the canal did not significantly negatively affect the stream populations (May 21, 2008: PG&E reply to SWRCB re study plan comments).

It is frankly impossible to imagine *any* conditions under which licensee and its consultants would have maintained anything other than “fish populations were not conclusively negatively affected.” The issue, really, then comes down to what standard is being applied and what values are being defended. We do not think the standard defended by the licensee (“conclusively negatively affected”) is consistent with its own stated corporate values. More importantly, we do not think it is consistent with the applicable portion of Section 10(a)(1) of the Federal Power Act, which tells us that a license must “be best adapted to a comprehensive plan for improving or developing a waterway … for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses.” 16 U.S.C. § 803(a)(1).

The data is completely insufficient to show that continuing fish rescues from the canal would have the same benefit as screening and laddering the Hendricks Diversion (or whether, in the terms of the Energy Policy Act of 2005, it would “provide for the adequate protection” of the resource, or be “no less protective”).

The West Branch of the Feather River is an important public resource and will only become more so. Because of Oroville Reservoir downstream, and because of PG&E’s unlicensed Miocene project downstream of Hendricks, which historically prevented anadromous fish and now prevents lake fish from Oroville Reservoir from moving up the West Branch to spawn, there are few improvements that can be made to the West Branch fishery. The most obvious potential improvement is to keep a minimum of about 1500 trout per year in the river and out of Project 803 canals. The Hendricks Diversion needs a fish screen.

Further, the Diversion needs upstream as well as downstream passage. Fish that are screened will end up, depending on screen configuration, either upstream or downstream of the diversion. If upstream, they are likely to bunch up, and the big trout will eat the little ones that cannot escape downstream. If downstream, spawners, especially fall spawning brown trout, will not move upstream to spawn, and will concentrate below the diversion, predating on anything that is screened down to them. Without a ladder, if the fish are screened to downstream, all trout in the area will also be subject to increased angler pressure (DFG regulations allow fishing downstream, but not upstream, of a fish screen (Inland Fisheries Regulations, 2008-9, section 2.35).

In the previous license for this project, the ostensible mitigation for fish in canals was to be to maintain a minimum flow in project canals at all times (not done), not gunite project canals so that habitat would be better (not done), allow public access (no longer seen as feasible, subject to eviction by hostile landowners). This was a terrible case of resource agencies going along with a really bad idea.

Hendricks Diversion needs a fish screen and a fish ladder.

The Operations Group

The Operations Group (Ops Group) that has planned operations for the DeSabla – Centerville Project since 1999 has been generally successful in managing project operations to improve SRCS habitat, the fish kills of 2002 and 2003 being the obvious exception. The Ops Group has consisted of staff from PG&E, FWS, DFG and NMFS. It has developed a substantial understanding of the project and its affected environment, and has achieved a laudable level of technical sophistication in approaching aquatic issues.

In the mind of Conservation Groups, the greatest shortcoming of the Ops Group has been its unwillingness to look beyond the general parameters of established project operations and expand its comfort zone of the realm of the possible. Conservation Groups believe that their participation in the Ops Group entity, an entity which we feel is essential for the project going forward, would add a heretofore missing perspective that will benefit the public and its resources.

Conservation Groups are well aware of the possible pitfalls of public participation in technical and policy decision making. We appreciate the fact that group dysfunction sometimes happens. We also appreciate the fact that, especially given ESA authority, the respective resource agencies must preserve their jurisdiction and statutory authority.

Therefore, we recommend the participation of Conservation Groups in the Ops Group in all discussion, and in all aspects of decision-making except where such decision-making would usurp the mandatory authority of a resource agency or agencies. Given the importance of the State Water Resources Control Board in this proceeding, we also recommend its inclusion in the Ops group.

Need for Police Support

Butte County, in which the project is entirely located, has recommended that the licensee provide one or more deputy sheriffs to assist in patrolling project facilities. The stated estimated cost of providing one deputy is about \$110,000 per year.

At various times in the proceeding, parties have discussed the issue of reducing harassment of holding SRCS by people floating in inner tubes (“tubing”) during the summer in Butte Creek. The PBO, for example, notes: “The Project’s diversion of water from the WBFR may provide conditions that enhance recreational opportunities for ‘tubing’ and swimming in Butte Creek downstream of Centerville Powerhouse. These recreational activities occur in areas supporting holding habitat for Chinook. … NMFS expects that the repeated frequency and intensity of these activities is likely to injure or kill some holding adults, and may result in reductions in fecundity (p. 64).”

In addition, public safety and trash reduction and removal have been noted as important issues within the project. Roads near the project are often littered with the hulks of abandoned, vandalized, and shot up vehicles. Local residents, as well as PG&E and BLM personnel, have recounted numerous incidents of the brandishing and use of firearms. Illegal off-road vehicle use is increasing, notably on the dry lakebed of Round Valley Reservoir. PG&E has reported incidents of vandalism to project facilities. Incidents of illegal campfires are commonplace; for the second straight year, 2008 has seen a serious fire in Butte Creek canyon.

Like all counties in California, Butte County is struggling to make ends meet. Unlike most other counties in the state, Butte is a very poor county.

The common thread that unites all of these problems is a need for added law enforcement. This is a fire issue, a resource issue and a personal safety issue. Because of the common presence of firearms, a patrol effort on a level less than full law enforcement is not reasonable. Regardless of overall project economics, it would be in the best interest of the licensee as well as the public to fund at least one deputy with a specific mandate to address the project area.

Recreational Access to Butte Creek at DeSabla Powerhouse and at Centerville Powerhouse

The project reaches below the DeSabla Powerhouse and below the Centerville Powerhouse are important local and regional resources, as was documented in the “Recreation Flow Study” (6.3.3-9) Phase 1 focus group. Access to these river reaches is critical to providing and improving whitewater recreation on this project. The Phase 1 component of the “Recreation Flow Study” contained a literature search, reconnaissance, and focus group interviews. According to the study plan, this was to be followed with a

Phase 2 flow assessment, if it was determined necessary in consideration of data collected in Phase 1.

In February, 2007, after the completion of Phase 1, an American Whitewater representative met with licensee staff to discuss the provision of access at the DeSabla and Centerville powerhouses in lieu of pursuing mitigation measures that could result from Phase 2 studies. While it is likely that the Phase 2 studies would have shown that project operations could be altered to improve whitewater recreation, AW waived the costly second phase of the “Recreation Flow Study” on the condition that licensee provide access to these two project reaches and flow information for the project. From American Whitewater’s perspective, this was a simple, straightforward, and pragmatic way to resolve the whitewater recreation PM&E’s and clear the way for important discussions surrounding ESA issues on this project.

In the first months of 2008, licensee changed its position. Licensee staff stated that licensee was willing only to give limited keyed access to members of the whitewater boating community and other “responsible parties.” Such an arrangement was never AW’s intention.

Aside from the complexity of determining who would get keys to access these river reaches and how this would happen, Conservation Groups are opposed to limiting public access to a few. The licensee has stated concerns with dumping of trash and public safety. American Whitewater has agreed to help with these issues as they arise. Conservation Groups also recommend an annual meeting to discuss the management of this access. Finally, Conservation Groups are prepared to limit their request for this access to the boating and fishing seasons, in order to meet the interests of other stakeholders.

Reduction of Thermal Loading at DeSabla Forebay

The notion of altering project works in order to reduce thermal loading of water as it passes through DeSabla Forebay was considered at least as early as the TES temperature report prepared by PG&E in 1992, though at that time PG&E concluded that the prospective expense did not justify what it characterized as a limited benefit.

A modification of project infrastructure at DeSabla Forebay was adopted in the PBO by NMFS, who attached a figure to the concept: at least 50% reduction in thermal loading. It is the understanding of Conservation Groups that this figure was based neither on a particular scientific imperative nor on a feasibility analysis, but rather was simply a place to start.

Licensee produced a report with preliminary design considerations for infrastructure improvements at DeSabla Forebay in its Draft License Application, and presented, on April 3, 2008, a refined table that discusses costs and operational issues, along with expected effectiveness, of nine alternatives.

Conservation Groups believe that the maximum feasible reduction in thermal loading at DeSabla Forebay is the most obvious action that can be taken to improve habitat for holding Spring-run and for juvenile steelhead. There is little opposition to the concept, including from the licensee. The question seems to center on how much reduction in thermal loading is possible, how much is feasible, and what operational issues may arise from various options. The two basic options that seem to us to have created the greatest interest are a sheet-pile baffle along the west side of the Forebay, to channel water more directly to the penstock intake near the south end of the Forebay; and a “pipe” alternative that would basically extend the penstock to near the entrance of the inflow of the combined Butte/Toadtown Canal, at the north end of the Forebay. The latter alternative envisions some kind of intake gate or bypass valve in case of emergency. At least for the sake of modeling, licensee recommended that the latter alternative be considered to be capable of reducing thermal loading in DeSabla Forebay by 80%.

Licensee has recommended the 50% solution, envisioning a sheet-pile arrangement as the less expensive and operationally simpler alternative. Further engineering work clearly needs to be performed to gain a more realistic understanding of both the expected benefits and the difficulties with the scenarios. Modeling suggests that an 80% reduction is likely worth the expense and the trouble, should 80% actually mean 80% (or better) and should 50% actually mean 50%, not more or less.

We have every confidence that licensee can resolve the operational difficulties of thermal reduction improvements at DeSabla Forebay once it decides to really solve the problems. In its April 3, 2008 document, licensee expressed an overriding concern with a “pipe” (i.e. penstock extension through the Forebay) configuration: should DeSabla Powerhouse trip offline, and should, simultaneously, the bypass works for the DeSabla Powerhouse fail to function correctly, then the Forebay might fill up, and when DeSabla Powerhouse came back on line, licensee would be forced to introduce a “slug of warm water” into Butte Creek.

Reality has introduced a simpler and far less draconian alternative: In an e-mail dated June 10, 2008 Bill Zemke from PG&E informed various agency personnel that

Due to the need to take a short emergency outage at the intake to the Toadtown Powerhouse, PG&E will be reducing the flow in the Hendricks Canal today by releasing most of the canal flow at Long Ravine. This will temporarily reduce the inflow to DeSabla Forebay, and at DeSabla Powerhouse, by about 90 to 100 cfs. This reduction will ultimately reduce the flow in the Lower Centerville Canal. The instream flow release to Butte Creek at Lower Centerville Diversion Dam will not be affected. If the flow drops to a level that will not support continued operation of the large Centerville Unit the water will be released down the Centerville spill channel. PG&E will have staff at the powerhouse to take water quality samples if the spill channel is used.

In short, at least on the Hendricks/Toadtown side, there are other options available for discharging canal water than building it up in DeSabla Forebay. Moreover, Paradise Reservoir is downhill and less than a mile from DeSabla Forebay. It is hard to imagine that its operator, Paradise Irrigation District, would object to any extra water in that reservoir that might result from a physical and legal arrangement to drain DeSabla Forebay into Paradise Reservoir on an emergency basis.

An issue that was raised by several relicensing participants concerning changes at DeSabla Forebay is the likely loss, at least for a couple of months during the summer, of the put-and-take trout fishery maintained by the licensee and DFG at the Forebay. We are not convinced that the loss is inevitable, especially with the sheet-pile option, where it is possible that trout would survive and even thrive in the portion of the Forebay where the water was being moved. However, given the potential for fish die-offs of native Spring-run Chinook salmon and steelhead/rainbow trout in Butte Creek downstream of DeSabla Powerhouse if the Forebay is not reconfigured, we believe in any case that the sacrifice of a planted fishery at the Forebay is well worth it. The loss could, should it prove necessary, be mitigated at nearby Paradise Reservoir, or elsewhere in the area.

Project Economics

In June, 2006, the licensee and four resource agencies (DFG, USFWS, USFS and NMFS) signed a “Letter of Understanding” regarding the relicensing of the DeSabla – Centerville Project. This letter was concealed from other relicensing participants for some time, but, after several promises that saw no follow-through, was posted to the relicensing website in the spring of 2008.

The letter noted that its intent was to “describe certain broad objectives that the Parties have agreed to work toward in the context of the relicensing proceeding.”

The letter stated that “PG&E’s forecast of the Project’s post-licensing economics indicate a potential for its cost-of-production to increase to a level such that the future operation of the Project, and the beneficial uses resulting from that operation, are at risk. While Resource Agencies are not familiar with economic processes used in this forecast, they do share the goal of relicensing the Project in a manner that will meet the objectives of each Party.”

Among the objectives outlined in the letter, the most notable to our mind are, first, that “The Project would be relicensed with a forecast cost-of-production that is competitive with market rates for alternative power.” Second, that “The Project would continue to operate to maintain reliable cold freshwater habitat (including water flow and temperature) for Spring-run Chinook salmon and steelhead in Butte Creek, with no diminishment of quality and quantity of currently available habitat.” Finally, that “The new license would provide opportunity for periodic adjustments to Project operations, within mutually acceptable limits, to optimize flow and temperature for holding and spawning of spring-run Chinook salmon and steelhead in Butte Creek.”

This suggests several limits: 1) Project costs have to be kept down, but the means by which the costs are analyzed by the licensee will not be revealed. 2. Licensee will continue to operate the project at a level of protection equivalent to current operations. 3. Licensee will have the right to veto any measures proposed by others for optimizing conditions for salmon and steelhead in Butte Creek.

For us, the troubling aspect with this document is not that resource agencies agreed to balance interests. Balancing interests is routine in relicensing, is in our opinion standard procedure for most serious participants, and is in conformance with the Federal Power Act.

The problem lies in the fact that an agreement was concluded behind closed doors, at a senior management level, involving neither other entities in the relicensing nor in many cases agency staff who are engaged on a day-to-day basis. Say what one may about the ambiguity of the resultant document, the process was secretive. If the goal was to establish a broad statement of interests at a senior management level, there was no reason that the process could not have been disclosed to all relicensing participants, whether they were less senior representatives of entities involved in the secret meetings, or whether they were representatives of entities that were not blessed with the respect warranted to be invited. Moreover, if the resource agencies are proposing to negotiate at this level in the public interest, the least they can do is insist on transparency in the process of evaluating project costs and economics.

The issue of project economics has been raised on many occasions by the licensee, and at several levels.

In early nineties, licensee evaluated the cost effectiveness of refurbishing Centerville Powerhouse. At an estimated cost of \$39.8 million, licensee decided, in 1994, that the potential gain was not worth the expense. Licensee therefore chose not to undertake the refurbishing, and to continue operations with the then-present equipment (see 19940623-0126).

In the Final License Application, PG&E again proposes to refurbish Centerville Powerhouse. Curiously, the cost estimate for this project is \$39.8 million, exactly the same price it was 14 years ago. The price for power has certainly increased. We find it hard to believe that the cost of refurbishing has remained the same.

On October 31, 2007, FERC issued an Additional Information Request for more detail regarding this cost estimate; On November 20, 2007, PG&E responded with a chart less than one page in length. CSPA requested, in a letter to FERC, greater elaboration of those costs (20071209-5001). However, PG&E declined to elaborate, and FERC determined that the information was sufficient for the purposes of completing its Environmental Assessment.

In a Powerpoint presentation to relicensing participants on April 24, 2007, licensee presented an estimated cost of \$17.3 million to decommission the Centerville development.

In the previously referenced Assessment of Fish Passage, the licensee presented an estimated cost of between \$6.3 and \$9 million to install a fish screen at Lower Centerville Diversion.

In the Final License Application, licensee estimated the 50 year cost of canal maintenance at \$7.5 million for canals throughout the project.

The Final License Application fails to address the need to remediate the spill channel just above Centerville Powerhouse. This channel spills with some frequency; in fact, when the smaller generating unit at CVPH is operating, water is necessarily spilled into this channel because the head required to operate the turbine requires more water than the capacity of the turbine. The lower end of this channel has been gunited. However, the upper end is unlined and unstable, and sediment is spilled into Butte Creek when this channel operates, especially after a period of non-use. The bottom of this channel spills into that portion of Butte Creek on which resource agencies have explicitly placed greatest emphasis, since it is at the top of the reach where the greatest amount of spawning habitat is located, and where a substantial percentage of SRCS hold below the “thermal barrier.” While we have no cost estimate for remediating this channel, relicensing participants were informed in meetings that the upper end of this channel is very unstable, and the effort needed to remediate would be financially significant and logically challenging.

In adding up the costs of operating and refurbishing Centerville Powerhouse, in addition to the cost of a fish screen and Lower Centerville Diversion which would be needed to protect federally listed O. mykiss as possible steelhead recruits, we are looking at a price differential, compared to decommissioning the Centerville development, at a figure greater than \$30 million.

Global warming must be figured into the cost. The resource value of cold or cool water will go up as less water is available in the summer, the thermal benefit below CVPH of splitting the flow between creek and canal will be reduced and perhaps in some cases eliminated, and the ambient conditions overall will likely be hotter and hotter sooner.

Finally, regarding project economics, we wish to offer an observation.

On the first page of the Executive Summary of the Final License Application, it states: “At this time, PG&E’s proposed Project includes 33 proposed resource management measures that will provide numerous environmental benefits and, conservatively, are expected to cost PG&E about \$48 million (about \$1.1 million annually) over the term of the new license – about \$23 million in new capital and Operation & Maintenance (O&M) expenses related to implementation of PG&E’s proposed measures and \$25 million in reduced generation.”

We wish to point out that the lost generation discussed appears to us to have been computed in comparison to existing license terms, not actual existing project operation. Operation to maximize returns strictly under existing license conditions had severe consequences for Spring-run salmon in the past, and would, if resumed, have serious consequences today. It would contradict the informal consultation with NMFS that has been place since 2002, and would be contrary to the agreements on project operations made with NMFS and other agency personnel in the Operations Group. It would almost certainly be contrary to any forthcoming Biological Opinion issued by NMFS.

Conservation Groups' Recommended License Conditions for the DeSabla – Centerville Project under Section 10(a) of the Federal Power Act

Pursuant to Section 10(a) of the Federal Power Act, Conservation Groups recommend that the following measures be incorporated into the new project license for the DeSabla – Centerville Project.

1. Upon license issuance, licensee shall begin the decommissioning of the Centerville Development over a planned five year period, with transitional project operation managed by the licensee and the Operations Group to protect aquatic resources.
 - a. During this five year period, licensee shall, beginning each June 15, divert into Lower Centerville Canal only the minimum amount of water needed to prevent damage to the canal, and shall continue operation of Lower Centerville Canal according to this exigency until at least the following February 15.
 - b. Ops Group shall develop protocols for and oversee the annual summer installation of a removable weir just upstream of Centerville Powerhouse. Ops Group shall also determine the date or trigger for removal of this weir, which shall be removed in time to best facilitate downstream migration of SRCS for spawning, and to facilitate optimum reasonable use of available spawning habitat.
 - c. Licensee, and resource agencies (NMFS, USFWS, DFG, SWRCB) will conduct monitoring of SRCS migration, holding and spawning in the interim period, in particular using the removable weir to enable this monitoring. The specific task of this monitoring shall be to set a default protocol for weir installation and removal, as well as for any other identified management that is found to be advantageous to SRCS habitat and reproduction.
 - d. At the end of the five year period, unless resource agencies unanimously agree on reverting to prior project configuration, licensee will decommission the Centerville Development, including removal of Lower Centerville Diversion Dam and removal of Lower Centerville Canal. Licensee will develop in the five year period a plan for the disposition of Centerville Powerhouse. Should agencies determine that decommissioning is counter-productive, FERC shall initiate a proceeding for the explicit purpose of determining the minimum instream flow for the Lower Centerville Bypass Reach.
 - e. Unless NMFS, USFWS, DFG and SWRCB unanimously agree that monitoring demonstrates that annual summer use of a removable summer weir is unnecessary or counter-productive, licensee, in consultation with and under the direction and supervision of the Ops Group, shall annually, through license term, install such a weir. Each year, the

Ops Group shall determine the date or trigger for weir installation and the date or trigger for weir removal, as well as devising monitoring protocols to evaluate and optimize use of future weir management options.

2. Minimum streamflows.

a. Licensee will maintain minimum streamflows downstream of Butte Head Dam as proposed in its Final License Application.

b. Licensee will maintain minimum streamflows downstream of Hendricks Diversion Dam in Normal years as proposed in its Final License Application. In Dry years, licensee will maintain minimum streamflows downstream of Hendricks Diversion as proposed in its Final License Application, except that its streamflow from June 1 through February 28 shall be 15 cfs. Minimum streamflows below Hendricks Diversion Dam will become effective only after completion of a temperature reduction device at DeSabla Forebay, as described in recommendation 6.

3. Licensee shall operate project reservoirs in consultation with Operations Group to minimize overall reduce thermal impacts in Butte Creek.

4. The Operations Group shall be expanded to include Conservation Groups in the Operations Group, or a subset of Conservation Groups that is acceptable to Conservation Groups. Conservation Groups shall be included in the decision-making process up to the point where such participation would impinge on resource agency statutory authority. The Operations Groups shall also be expanded to include the State Water Resources Control Board.

5. Within two years of license issuance, licensee shall install a fish screen and a fish ladder at Hendricks Diversion that is capable of operating year round, except under emergency situations.

6. Licensee shall, within two years of license issuance, construct a temperature reduction device at DeSabla Forebay that will reduce thermal loading through the Forebay by 80%.

7. Licensee shall continue to conduct annual canal fish rescues in Butte Canal, and in Lower Centerville Canal and so long as it continues to operate. Licensee shall continue to conduct fish rescues in Hendricks/Toadtown Canal until completion of a fish screen at Hendricks Diversion. Licensee shall establish a protocol for emergency fish rescues in Butte Canal in the event of a canal outage. Rainbow trout rescued from Butte and Lower Centerville canals, except trout that are clearly hatchery trout, shall be released into Butte Creek downstream of Lower Centerville Diversion. Brown trout that are rescued from Butte and Lower Centerville shall be released into DeSabla Forebay.

8. Licensee shall time canal maintenance outages on Butte and Hendricks/Toadtown Canals to take place as early in the spring as is reasonably safe to do so, in order to protect aquatic species. The goal of this measure is, in particular, to prevent scouring or dewatering of Foothill Yellow Legged Frogs egg masses in WBFR downstream of Hendricks Diversion, and to reduce the likelihood of mass upstream migration of SRCS

in Butte Creek in response to a sudden drop in Butte Creek flows (as was observed by Conservation Groups first hand in 2007).

9. Licensee shall provide financial support to cover the salary of one Butte County sheriff's deputy during the term of the license, based on adjusted 2008 cost. Prior to implementation of such support, Butte County shall provide to licensee and sign an MOU affirming its use of said deputy to address law enforcement and resource issues in the Butte and WBFR canyons. Said MOU shall be approved by the SWRCB.

10. Beginning the first season after license issuance, Licensee shall keep the gate to the DeSabla Powerhouse open from November 15th of each year through May 15th of the following year. Beginning the first season after license issuance, and continuing so long as licensee continues to operate any portion of the Centerville Development, licensee shall keep the gate to Centerville Powerhouse open from November 15th of each year through May 15th of the following year. Licensee shall convene an annual meeting of interested stakeholders to evaluate management issues arising from provision of river access at these locations.

11. Licensee shall mitigate as needed loss of the put-and-take fishery at DeSabla Forebay within two years of the completion of the DeSabla Forebay temperature reduction device as described above in proposed measure 6.

12. Licensee shall provide streamflow and reservoir level information on the internet for project streams and reservoirs.

13. Licensee shall reinitiate formal consultation with the National Marine Fisheries Service should there be pre-spawn mortality of more than 3000 SRCS, or 30% of the SRCS run as estimated by monitoring contemplated in Licensee's proposed measure 22, Final License Application, or the practical equivalent as developed, whichever number is less.

14. Licensee shall provide turbidity sensors at four locations on Butte Creek: one immediately downstream of DeSabla Powerhouse, one immediately downstream of Centerville Powerhouse, and two in between the powerhouses, as determined by the Ops Group. These devices shall be telemetered and connected to the internet through the California Data Exchange Center. If and when Centerville Powerhouse is decommissioned, Ops Group shall consider reducing the number of turbidity sensors.

15. Licensee shall implement the resource measures proposed in its Final License Application, Volume IID, except where these measures conflict with those proposed by Conservation Groups.

Inclusion of Conservation Groups' Recommendations as an Alternative under NEPA

Conservation Groups believe that this set of proposed license measures is a reasonable and feasible approach that provides a coherent alternative to existing operations and to conditions that are likely to be proposed by other relicensing parties. Conservation Groups therefore request that this set of proposed license conditions be evaluated en bloc by the Commission as a formal alternative in its NEPA analysis.

Further Measures Proposed by Conservation Groups for Analysis by FERC under NEPA, Assuming Non-adoption of Conservation Groups' Proposed Preferred Alternative.

Conservation groups request that the following measures also be evaluated by the Commission in its NEPA analysis, assuming non-adoption of Conservation Groups' proposed preferred alternative.

1. Licensee shall construct a fish screen at Lower Centerville Diversion Dam.
2. Licensee shall stabilize and remediate the spill channel located just above Centerville Powerhouse, to avoid continuing and repeated incidents of turbidity in Butte Creek at and below the spill channel outflow.
3. Licensee shall provide a minimum bypass flow of 1 cfs in Helltown Ravine below Lower Centerville Canal to benefit a known population of Foothill Yellow-Legged Frogs.
4. Licensee shall provide recreation access between November 15 and May 31 at Centerville Powerhouse.
5. Licensee shall provide turbidity sensors at four locations on Butte Creek: one immediately downstream of DeSabra Powerhouse, one immediately downstream of Centerville Powerhouse, and two in between the powerhouses, as determined by the Ops Group. These devices shall be telemetered and connected to the internet through the California Data Exchange Center.

Conclusion

On April 13, 2004, most of the present Conservation Groups petitioned FERC to initiate formal consultation with NMFS under Section 7(a)(2) of the Endangered Species Act regarding project impacts to Spring-run Chinook. This petition came in light of the listing of Spring-run in 1999, and in light of the fish kills in Butte Creek in 2002 and 2003. On August 13, 2004, FERC denied the petition. Conservation Groups subsequently sought relief in the U.S. Court of Appeals, Ninth Circuit. In a split ruling, the Ninth Circuit ruled that there had been no "federal agency action" on which to base the request for consultation, and the Conservation Groups' Petition for Relief was denied. The Court ruled that the fact that the Commission had the authority to re-open the project license did

not compel it to do so, and that in the absence of action by the Commission no basis for consultation existed.

What in retrospect is most disappointing about that series of events is not that the Commission was successful in defending its right to do nothing in the face of the pre-spawn mortality of half of one year's cohort of Central Valley Spring-run Chinook. Rather, it is that the Commission felt that nothing was an acceptable thing to do. Whatever the reason for this decision, circumstances have changed, and the Commission is now compelled by its own process to act affirmatively in regard to the anadromous fish resources of Butte Creek.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing documents upon each person designated on the official service list compiled by the Secretary in this proceeding.
Dated this 27th day of June, 2008.

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