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October 2, 2009

Filed via Electronic Submittal

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Docket Room
Washington, DC 20426-001

Subject: Kilarc-Cow Creek Project (FERC Project No. 606)
Response to FERC Additional Information Request in Letter dated September 3, 2009

Dear Secretary Bose:

This letter provides the additional information you requested for the Kilarc-Cow Creek Project (FERC Project No. 606) License Surrender Application that the Pacific Gas and Electric Company (PG&E) filed on March 13, 2009. The attached response follows the outline of the items included in your September 3, 2009 letter and addresses water resource, cultural resource, recreation, and land use issues. For clarity, each response is preceded by the specific request in the September 3, 2009 letter.

All parties that may have an interest in the Project will receive compact discs that contain the attached documents in an electronic format. PG&E's response will also be made available on the Project website: http://www.kilarc-cowcreek.com/.

If you have any questions or need additional information, please do not hesitate to contact me at 415-973-7465.

Sincerely,

Lisa Whitman
Interim Project Manager – Kilarc-Cow Creek Project

Enclosures (Response to AIR and attachments A through S)

cc: FERC Project No. 606 Interested Parties Mailing List (attached) with enclosures

Name	Address	City	Zip Code
Interested Parties			
Aaron Dowling		Millville	96062
Al Smith		Santa Cruz	95062
Albert W. Smith - SD Living Trust		Homewood	96141
An Swain		Whitmore	96096
Annie Manji		Redding	96001
Arne Hultgren California Land & Timber Manager Roseburg Resources Co		Weed	96094
Art Tilles		Whitmore	96096
Barbara and Roger Arnold		Whitmore	96096
Bill Ruhe		Redding	96003
Billie Albaugar		McArthur	96056
Bill & Betty Stoltenberg		McArthur	96056
Bill Ellis		Whitmore	96096
Billi Mason		Fall River Mills	96028
Bob & Bonnie Azark		Whitmore	96096
Bob Carey W.M. Beaty & Associates.		Redding	96099-0898
Bob Harris		Whitmore	96096
Bob Mark		Whitmore	96096
Bob Stanton		Millville	96062
Bob Whitmore		Whitmore	96096
Brian Johnson Trout Unlimited		Berkeley	94710
Bruce Ross		Redding	96003
Candie Jefferies		Cottonwood	96022
Cassie Patrick		Whitmore	96096
Chantz Joyce		Shingletown	96088
Charles Bonham Trout Unlimited		Berkeley	94710
Charles McKitrick		Redding	
Chris Engels		Redding	96003
Chuck Keefer		Redding	96003
Chuck Lydy		Redding	96003-3977
Cody Washburn		Redding	96099
Curtis Stevens		Whitmore	96096
Dan Nelson		Palo Cedro	96073
Dan Smith Association of California Water Agencies		Sacramento	95814
Daryl Harris		Redding	96003
Dave Albrecht		San Jose	95139
David Braga		Whitmore	96096
Denise Harman		Redding	96001
Dianne Parten		Whitmore	96096
Dil Donohoe		Whitmore	96096
Dorothy Mason		Fall River Mills	96028
Dottie Smith		Palo Cedro	96073
Dylan Darling		Redding	96003
Dylan Darling Redding Record-Searchlight		Redding	96049-2397
Earl & Joan Whitmore		Oak Run	96069
Ed Bishop		Whitmore	96096
Elizabeth Hadley		Redding	96001
Ellie Rumbrough		Whitmore	96090
Emily Brady		Whitmore	96096
Eric Engels		Shasta Lake City	96007
Erik Poole		Millville	96062
Ernie West		Burney	96013
Evelyn Reed		Whitmore	96096
Fletter Family Trust c/o Ann E. Soske		Anacortes, WA	98221
FORT CROOK MUSEUM c/o Robert Ingram Fort Crook Historical Society		Fall River Mills	96028
Gary E. Gamel Attorney at Law		Woodside	64062
Frances Francis Spiegel & McDiarmid LLP		Washington DC	20036
Freida Keefer		Redding	96001
Gary Hendrix		Oak Run	96069
Gary Mitchell		Palo Cedro	96073
Glenn & Judy Dye		Whitmore	96096
Heidi Silva		Whitmore	96096
Horton, Know, Carter & Foote		El Centro	92243
James Duffy		Whitmore	96096

James W. Fletter President, Fort Sutter Company		Sacramento	95821
Jan Caster		Redding	96049
Jay Gerdes		Redding	96002
Jeff Drecen		Whitmore	96096
Jerry Kelley		Anderson	96007
Jerry Smith		Redding	96001
Jim Fletter		Sacramento	95864
Jim Linnell		Whitmore	96096
James W. Fletter c/o Fort Sutter Company		Sacramento	95821
Joe and Bert Stewert		Cottonwood	96022
Joe Warren		Whitmore	96096
John Fenn		McArthur	96056
John Livingston		Redding	96001
John Higley		Palo Cedro	96073
John Hutford		Whitmore	96096
Joshua Horewitz Bartkiewiez, Kronick & Shanahan		Sacramento	95816-4907
Joshua Patrick		Whitmore	96096
Judith and William Arnold		Whitmore	96096
Justin Gooch		Whitmore	96096
Katy Patrick		Whitmore	96096
Kay Luster		Shasta	96087
Kelly Catlett		Sacramento	95811
Kelly Sackheim		Fair Oaks	95628
Kim and Lyle Wroe		Whitmore	96096
Laura Carnley		Whitmore	96096
Len Lindstrand		Redding	96099
Lew Winberg		Redding	96002
Linda Barneby		Whitmore	96096
Lorin Neel		Whitmore	96096
Lucille Lansing		Carmichael	95608
Lynette & Richard Gooch		Whitmore	96096
Maggie Trevelyn		Whitmore	96096
Margie Simpson		Oak Run	96069
Maria Burnham		Whitmore	96096
Mark Perlis Dickstein Shapiro LLP		Washington DC	20006-5403
Mike Berry		Redding	96001
Mike Quinn KLXR		Redding	96001
Monty Turner		Bella Vista	96008
Nancy E. Martin		Whitmore	96096
Nancy Snodgrass		Red Bluff	96080
Nancy Tranberg		Whitmore	96096
Neil Tocher		Whitmore	96096
Norene Post		Whitmore	96096
Norman Matteoni Matteoni, O'Laughlin & Hechtman		San Jose	95126
Pete Dubyck		Whitmore	96096
Pete and Peggy Hufford		Whitmore	96096
Randy Benthin		Redding	96001
Randy Carnley		Whitmore	96096
Richard Dederer		Whitmore	96096
Richard Ely		Davis	95618
Richard and Lynette Gooch		Whitmore	96096
Richard & Rachelle Dederen		Whitmore	96096
Richard Roos-Collins		San Francisco	94111
Richard Stapler		Millville	96060-9100
RJ Roth		Whitmore	96096
Rob Robinson		Whitmore	96096
Robert Fay		Whitmore	96096
Robert Ingram		McArthur	96056
Robert Pelissier		Redding	96003
Ron Whitney		Whitmore	96096
Roy Atkins		Whitmore	96096
Russ Herrick		Redding	96001
Russ Mull		Redding	96001
Ruth Patrick		Whitmore	96096
Sandra L. Winters		Anderson	96007
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Sharon Prince		Redding	96003
Sharyn Cornelius		Palo Cedro	96073
Shasta Historical Society		Redding	96001
Sherryl Dye		Whitmore	96096

Sidney Mannheim California Electricity Oversight Board		Sacramento	95814
Spencer & Dee Allen		Whitmore	96096
Steve & Becky Miller		Redding	96001
Steve Cole		Whitmore	96096
Susan Goodwin		Whitmore	96096
Susan Goodwin		Whitmore	96096
Terry & Jeri Johnson		Whitmore	96096
Thomas Glenn Dye		Whitmore	96096
Thomas R. Dye		Whitmore	96096
Timothy Dye		Whitmore	96096
Tricia Bratcher		Whitmore	96096
Tricia Bratcher		Whitmore	96096
VR Farrell Family c/o Sandee Farrell Blalock		Millville	96060
Ken and Lori Newsom		Palo Cedro	96073
The Jones Family		Millville	96062
Richard T. Jones		Millville	96062
Bob and Debbie Stanton		Millville	96062
Jeff and Sandee Blalock		Shingletown	96088
Bud Farrell		Millville	96062
Erik and Kristi Poole		Millville	96062
Rick Sabanovich		Palo Cedro	96073
Art Abbott		Millville	96062
Steve Tetrick		Millville	96062
William R. Ellis		Whitmore	96096
Whitmore Volunteer Fire Department		Whitmore	96096
Joel Mallette		Whitmore	96096
Brett Toler		Palo Cedro	96073
Camie Weir		Whitmore	96096
Scott Rynd		Whitmore	96096
Chuck and Melissa Brehmer		Whitmore	96096
Brian B. Brady		Whitmore	96096
Patricia McTimmonds		Whitmore	96096
Donna Abbott		Redding	96099-0898
Rio Reimer, Vice President S. Cow Creek Ditch Association		Whitmore	96096-0096
Ada Little-Fay		Whitmore	96096
Richard Stapler		Millville	96062-9700
Peter Hufford		Whitmore	96096
Robert Harris		Whitmore	96096
Kelly Miller		Anderson	96007
Sandy and Don Winters		Anderson	96007
Phil & Suzanne Betts		Whitmore	96096
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Ben Lego	Madesi Band, Pit River Indians PO Box 278	Montgomery	96065
Bill George	Atsugewi Band, Pit River Indians PO Box 114	Hat Creek	96040
Caleen Sisk-Franco	Winnermem Wintu Tribe 14840 Bear Mountain Road	Redding	96003
Carol Cantrell	Madesi Band PO Box 203	Montgomery	96065
Carol Sinclair	9253 Chaparral Dr.	Redding	96001
Gloria Gomes	United Tribe of Northern California Inc. Wintu, Wintun, Wintoon	Redding	96003
Kelli Hayward	Wintu Tribe of Nothern Claifornia 3576 Oasis Road	Redding	96003
James Hayward, Sr.	Redding Rancheria 2000 Redding Rancheria Road	Redding	96001
Jessica Jim	Pit River Tribe 37014 Main Street	Burney	96013
John Castro	United Tribe of Northern California Inc. Wintu, Wintun, Wintoon	Redding	96003
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Loretta Root	5620 Kofford Lane	Redding	96001
Matthew Root	16117 North St.	Keswick	96001

Reitha Amen	Itsatawi Band 18342 Rory Lane	Cottonwood	96022
Sharon Elmore	Pit River Environmental Office 37118 State Highway 299E	Burney	96013
Tracy Edwards	Redding Rancheria 2000 Redding Rancheria Road	Redding	96001
Tracy Edwards	Roaring Creek Rancheria PO Box 52	Montgomery	96065
Willard Rhoades	Itsatawi Band 3907 Joanne Lane North	Cottonwood	96022

Response to AIR

ADDITIONAL INFORMATION

Water Resources

Water Resources Item 1: *Section E.2.4.7 summarizes results of a 2003 water temperature study that was conducted at the project. Please provide a copy of the 2003 study report and any water temperature modeling that may have been performed to allow a thorough assessment of the impacts of flow changes on critical water temperature issues. In addition, please provide electronic files of the temperature monitoring data.*

RESPONSE – Water Resources Item 1: Section E.2.4.7 of the License Surrender Application (LSA, PG&E 2009) summarizes the results of the water temperature monitoring conducted in 2003 as part of the relicensing studies. PG&E made its decision to decommission the Project instead of seeking a new license before a report was produced. No temperature model was developed.

Although no study report was developed, the temperature data collected in 2003 were analyzed and evaluated during the development of the LSA (PG&E 2009). LSA Section E.2.4.7 describes monitoring methods and evaluates results. Water temperature monitoring station locations are shown in Figure E.2.4-1 of the LSA and listed in Tables E.2.4-2 and E.2.4-3. Daily mean, maximum, and minimum temperatures, as well as the number of days the mean daily temperature exceeded 18°C and the maximum daily temperature exceeded 24°C at each monitoring station, are provided in Tables E.2.4-13 and E.2.4-14 of the LSA. Appendix I of the LSA provides monthly water quality data, including temperature.

The attachments listed below provide electronic files of the temperature monitoring data. Electronic files of the raw, *in-situ*, 20-minute temperature monitoring data for each station are provided in Attachment A. Daily mean, maximum, and minimum temperatures of the 20-minute data are provided in Attachment B. The electronic data files used to develop the analysis presented in the LSA are provided in Attachment C. These files include plots showing daily mean temperatures at monitoring stations in Old Cow Creek and South Cow Creek over the course of the 2003 monitoring period. Electronic files of meteorological data at Kilarc and Cow Creek powerhouses are provided in Attachment D. Detailed stream temperature data are provided in Attachment E. For each station, hourly temperature averages are listed for the duration of the monitoring period. Daily maximum, mean, and minimum of the hourly temperatures are also provided for each monitoring day.

Water Resources Item 2: *Section E.2.5.2 refers to personal communications with representatives of California Department of Fish and Game (CDFG) and National Marine Fisheries Service (NMFS) relative to natural barriers to fish passage on Old Cow Creek and South Cow Creek. Please provide any documentation of these communications and the scientific data supporting these determinations. Have the agencies indicated what the minimum high flow conditions are that would permit upstream fish passage at these barriers?*

RESPONSE – Water Resources Item 2: Section E.2.5.2 of the License Surrender Application (LSA, PG&E 2009) refers to communications with CDFG and NMFS regarding fish passage in Old Cow Creek. The specific communications are in regard to two barriers on Old Cow Creek; Whitmore Falls, located several miles downstream of the Kilarc Development, and an unnamed falls within the Kilarc Development bypass reach 2.7 miles upstream of Kilarc Powerhouse. Section E.2.5.2 also discusses other barriers on Old Cow Creek, which were documented during a barrier inventory conducted by PG&E in the bypass reach in 2003.[1]

Section E.2.5.3 of the LSA discusses barriers in the South Cow Creek bypass reach. PG&E's 2003 data on these barriers are presented in LSA Appendix J-2. No communications from CDFG and NMFS regarding these barriers were cited in the LSA, and therefore they are not discussed further in this response.

In Old Cow Creek, both Whitmore Falls and the unnamed falls were assessed visually by CDFG and NMFS to reach their determinations regarding the ability of fish to pass these barriers. PG&E provided technical data regarding the unnamed falls (designated OC-11) in Appendix J-2 of the LSA (page 3-5, Table 10 [page T-10] and Figure Appendix A-1). CDFG, NMFS and PG&E all believe the falls (OC-11) to be impassable for anadromous salmonids. PG&E did not conduct an independent assessment of Whitmore Falls, as it is not within the project boundaries. No specific measurements or other technical information were developed for Whitmore Falls by CDFG or NMFS, but both agencies indicated this barrier is passable in most winters (see consultation summary below). No estimate of the minimum passable flows has been made for Whitmore Falls.

Discussions and correspondence with NMFS and CDFG regarding the ability of anadromous fish to pass Whitmore Falls and the unnamed falls within the Kilarc Bypass Reach are summarized below.

Whitmore Falls

In its response to the First Stage Consultation Package dated October 3, 2002, CDFG asserts that Whitmore Falls "is not an absolute barrier to anadromous fish" (Attachment F, top of page 3) and expressed that it would manage the project area as restorable for steelhead.

In a meeting on January 30, 2003, CDFG indicated that it did not consider Whitmore Falls to be an impassable barrier to anadromous fish. This is documented at the bottom of page 23 of the meeting notes (Attachment G).

During a meeting on December 5, 2003, representatives of both CDFG and NMFS described Whitmore Falls as being passable during most years. Meeting notes documenting this discussion are included as Attachment H. The discussion begins at the bottom of page 17 and is highlighted in green. The technical basis for this determination was not discussed at the December 5th

[1] PG&E conducted a passage barrier inventory in the Project bypass reaches of Old Cow and South Cow creeks in 2003. A description of the methods used to assess barriers on Old Cow and South Cow creeks is provided in the *Aquatic Habitat and Fisheries Resources Report* (Appendix J-2 of PG&E 2009). Tables 10 and 21 of that report provide a description of the physical characteristics of these barriers for Old Cow Creek and South Cow Creek, respectively (Appendix J-2 of PG&E 2009). Appendix A of that report provides photos of each barrier identified.

meeting. CDFG reiterated that Whitmore Falls was passable in most winters in letters to PG&E dated October 17, 2007 (Attachment I) and October 30, 2008 (Attachment J).

In response to FERC's Additional Information Request (AIR) (FERC letter dated September 3, 2009), Mr. Larry Wise of ENTRIX called Mr. David White of NMFS and Mr. Mike Berry of CDFG on September 10, 2009, to see if any quantitative assessment of Whitmore Falls had been conducted. In a voice message left on September 11, 2009, Mr. White indicated that the conclusion was reached based on a visual assessment and comparison with other passage impediments that steelhead are known to pass. Mr. Berry returned the call along with Mr. Matt Meyers, also from CDFG. Mr. Berry indicated that when the falls were examined by qualified fisheries biologists at high flows, they were clearly passable (photo provided by Mr. Berry, Attachment K), with a substantial plunge pool and vertical drop of about eight feet. Flows of a magnitude sufficient to allow upstream passage occur in most years during rain events, according to Mr. Berry. He indicated that these flows are likely associated with rainfall events, and so would provide episodic passage. The minimum flows that would provide passage have not been assessed as the falls are on private property to which CDFG does not have access, and because these falls were deemed to be readily passable by CDFG.

Unnamed Falls, Located 2.7 Miles Upstream of Kilarc Powerhouse

In a meeting on January 30, 2003, CDFG stated they had identified a falls within the Project bypass reach that they considered to be impassable. This is documented at the top of page 22 of the January 30 meeting notes (Attachment G).

Following-up on the January 30, 2003 meeting, Annie Manji of CDFG sent Larry Wise at ENTRIX an email on February 25, 2003 describing the unnamed falls within the project reach. This email is included as Attachment L. This email provides the coordinates of the falls and indicates that the falls are "probably a barrier to all species at all flows". Photos of the falls are included in Appendix A of the *Aquatic Habitat and Fisheries Resources Report*, which was provided as Appendix J-2 of the License Surrender Application (PG&E 2009). The impassability of these falls was later confirmed with David White at NMFS during informal discussions (December 2008).

Water Resources Item 3: *Please provide a map of the Old Cow Creek and South Cow Creek basins indicating the location of other diversions and licensed or exempt hydro projects above and below the Cow Creek and Kilarc developments.*

RESPONSE – Water Resources Item 3: Attachment M contains the diversion maps from the 1969 Adjudication of Old Cow Creek, South Cow Creek, and Lower Cow Creek. See "In the Matter of the Determination of the Rights of the Various Claimants to the Water of Cow Creek Stream System Excepting Clover Creek, Oak Run Creek and North Cow Creek in Shasta County, California", Case No. 38577 (Shasta Cty. Sup. Ct., August 25, 1969). The Adjudication remains the operative document codifying water rights for the Cow Creek system.

A map that shows other licensed and exempt hydro projects above and below the Cow Creek and Kilarc Developments is included as Attachment N.

Water Resources Item 4: *Please provide information, including any available data, regarding the hydrogeology and groundwater resources in the project area that might be reasonably influenced by the Kilarc forebay. Please discuss the potential impacts of dewatering the Kilarc forebay on local groundwater resources.*

RESPONSE – Water Resources Item 4: Hydrogeology and groundwater resources in the vicinity of the Kilarc Forebay are described below followed by discussion of potential impacts of dewatering the Kilarc Forebay on local groundwater resources.

Regional Hydrogeology

The regional groundwater basin consists of 39,715 acres that range from approximately 2,000 feet to 5,200 feet above mean sea level (MSL) as shown on Figure 1. The aerial extent of the regional groundwater basin boundaries were determined by delineating the topographic divides between adjacent watersheds. The groundwater basin was assumed to be coincident with the topographic drainage basin.

The Old Cow Creek watershed lies within the transition zone between the southern end of the volcanic rocks of the Cascade Range and the eastern extent of sedimentary rocks of the northern Sacramento Valley (See also LSA Exhibit E, Geology and Soils, Section E.2.1). Most of the surficial rocks in the study area are volcanic in origin and generally dip gently to the west-northwest (MacDonald and Lydon 1972). The volcanic rock units within the study area are Quaternary-aged basalt flow (Qb), Tertiary-aged andesite flow (Ta), and the Tertiary-aged lahar deposit - Tuscan Formation (Tt). The only sedimentary rock unit within the Old Cow Creek watershed is the Tertiary-aged Montgomery Creek Formation (Tm), which is arkosic sandstone with lenses of conglomerate (See Figure 2).

Within the groundwater basin, erosion through the massive volcanic layers has exposed the underlying, less consolidated Montgomery Creek Formation in the valley bottoms of Old Cow Creek, resulting in the instability of the valley walls of the Old Cow Creek drainage system (MacDonald and Lydon 1972). Examples of this instability are the large-scale landslide deposits within the upper Old Cow Creek watershed northwest of the Kilarc Powerhouse, and an array of slump-style normal faults that occur below the west flank of Kilarc Forebay to the east and above Old Cow Creek.

Locally, at higher elevations, fracture flow may play a significant role in groundwater discharge (DWR 1984). The Tertiary-aged andesite flows are the uppermost rock units in the Kilarc Development and are moderately permeable, most likely due to fracture flow within the massive unit. The primary aquifer in the study area is the Tuscan Formation (Figure 2). Lenses of more permeable material (paleo stream channels and fractures) cause perched aquifers within the Tuscan Formation (DWR 1984). The Tuscan Formation's water capacity occurs in structural weaknesses between bed contacts or in lenses of conglomerate. The Tuscan Formation is underlain by the Montgomery Creek Formation. The Montgomery Creek Formation is only slightly permeable and forms a semi-impervious barrier to the downward movement of groundwater (DWR 1984), even though it is most likely the discharge unit for groundwater entering Old Cow Creek. Due to the difference in permeability, groundwater discharge (e.g., creek baseflow and springs) is expected at or near the contact of the Tuscan and Montgomery

Creek Formations (DWR 1984; Figure 2). Field reconnaissance confirms this contact as a groundwater discharge area, with observations of springs and perennial wetlands directly above and below this contact north, west, and south of the Kilarc Development.

Local Hydrogeology

The groundwater basins in the vicinity of the Kilarc Forebay encompass an area of 2,297 acres, which are subdivided into three study basins (Figures 2 and 3). All known springs, ponds and supply wells are shown on Figure 3.

Basin #1 was delineated using local topography, rock type, and structure representing the approximate recharge area north of the Kilarc canal and forebay (Figure 4). Basin #2 was delineated as the approximate recharge area for the privately owned perennial ponds/wetlands to the southwest and below Kilarc forebay. Basin #3 was delineated as the approximate recharge area for a spring and a domestic well site to the south of the Kilarc forebay (Figure 3).

All the major geologic units of the upland areas are present in Basin #1 with the addition of a welded tuff member of the Tuscan Formation. The areas are capped with Tertiary andesite flows that are slightly permeable. This suggests that the storage and transport of groundwater occurs predominantly in the underlying units. The Tuscan Formation is the primary conduit for groundwater transport and storage due to its relatively greater permeability, while the Montgomery Creek Formation provides a more limited amount of groundwater transport and storage due to relatively lower permeabilities. The contact between the Tuscan Formation and underlying Montgomery Creek formation is inferred to dip towards the west-northwest (Figures 2 and 4), which suggests that both units also dip towards the west-northwest. The orientation of the formations suggests that local groundwater flows towards the west-northwest within Basin #1.

Basin #2 contains 167 acres of the estimated recharge area for the privately owned perennial ponds/wetlands to the southwest and downslope of the Kilarc Development (Figure 5). Tertiary Andesite flows, the Tuscan Formation, and the Montgomery Creek Formation are present in the basin. The basin drops steeply to the west from the andesite flow in the uplands, which exposes the westward dipping Tuscan and Montgomery Creek Formations. The dip of these two units, along with the presence of groundwater discharge areas along Old Cow Creek, results in groundwater flow to the west-northwest towards the flank of the basin. However, no significant groundwater discharge areas were field-identified on the west-facing slope of the basin. There is one small swale supporting maples that are suggestive of shallow groundwater levels most of the year (Figure 3). The absence of groundwater discharge in this area suggests that, locally, groundwater is also conducted through the Montgomery Creek Formation. Two slump-style normal faults occur within the basin, which have resulted in a block of Montgomery Creek Formation moving downward relative to the adjacent layer of Tertiary andesite flow. A large spring-fed perennial wetland (Figure 2) (two ponds fed by Diversion #15 [SWRCB 1969]) is located along this westernmost fault boundary adjacent to the uplifted andesite block. In addition, there are several springs and ponds within the high-density fault region to the west of Basin #2 (Figure 2) (spring Potential Diversion #15a [SWRCB 1969]).

Basin #3 contains 156 acres of the estimated recharge area for a domestic well and a spring. This basin is underlain by Tertiary andesite flows and the Tuscan Formation, and both units dip to the west-northwest away from intermittent stream course within Miller Valley to the east (Figures 3 and 6). The spring is located at the top of the Tuscan Formation at the approximate contact with the overlying Tertiary andesite unit. This spring results from either groundwater flows along the contact between the units until they reach an impervious boundary, or from groundwater flows through a highly permeable fracture in the andesite until they reach the less permeable layer of the Tuscan Formation. One domestic well (Kamp Property) is located at the bottom of Basin #3 in an area where the Tuscan Formation outcrops (Figures 3 and 6). However, the contact with the Montgomery Creek Formation may become shallow at this location, and the water produced by this domestic well may originate from the underlying Montgomery Creek Formation. The geologic unit that represents the source of the groundwater pumped from this domestic well is uncertain because the thickness and dip of the formations at depth is unknown, and well log data were unavailable at the time of this analysis.

Groundwater recharge in the Old Cow Creek watershed is mainly from infiltration of rainfall (DWR 1984). Based on an annual average rainfall of 44 inches, the study area receives a mean annual precipitation volume of 145,622 acre-feet. Regionally, groundwater discharge occurs along stream valleys and flat low-gradient meadows to the west and northwest of the groundwater basin.

Evaluation of Hydrologic Impacts to Groundwater Resources

Local water supply wells, stock ponds, and wetlands might be reasonably influenced by the loss of Kilarc Forebay. To evaluate the potential for impacts, available climatic, hydrologic, and geologic data were reviewed to determine if sufficient data exist to develop a water budget for the regional groundwater flow system, as well as the localized smaller groundwater basins. A water budget is a balance of inflow to the aquifer system (recharge from precipitation, seepage from the Forebay, etc…) and outflow (baseflow of streams; pumping from supply wells, etc…). The water balance approach would allow for an assessment of the relative importance of Kilarc Forebay to overall groundwater resources. Knowledge of well construction and use could enable an assessment of the use of groundwater resources for domestic or agricultural purposes.

Important parameters that need to be estimated to develop a water budget are:

- Areal extent of groundwater basin(s)
- Recharge rate to groundwater basin from infiltration of precipitation
- Well construction, pumping rates, and time of use of supply wells of concern
- Groundwater discharge rate to streams, also called baseflow
- Leakage rate of the Kilarc Main Canal
- Infiltration rate of Kilarc Forebay

Topographic maps, meteorological data, and literature values are available to estimate the first two bulleted items above (See Figures 2 and 3).

Well construction and usage information is available through the California Department of Water Resources, with owner permission. In 2008, 11 well owners within the area were contacted by PG&E to receive authorization to obtain available information from the California Department of Water Resources. The letter from PG&E and the list of persons contacted are provided in Attachment O. Of these 11, only one form was returned in October 2008.

Operational data for the Kilarc Powerhouse and the associated water supply system were reviewed to determine if the last three items listed above could be reliably estimated.

PG&E operates several streamflow gages in the basin. Streamflow gages used for FERC compliance are operated to United States Geological Survey (USGS) standards. PG&E also has several operational gage stations that are not used for compliance and are not typically operated to USGS standards.

The review found that the available streamflow data is insufficient for evaluating flow rates needed to develop a water budget to accurately analyze the impacts on groundwater resources of decommissioning the Kilarc Main Canal and Forebay.

Cultural Resources

Cultural Resources Item 1: *Please provide the State Historic Preservation Officer (SHPO) concurrence letter for the Cultural Resources Inventory and evaluation for the Kilarc-Cow Creek Hydroelectric Decommissioning Project, FERC No. 606, Shasta County, California.*

RESPONSE – Cultural Resources Item 1: The concurrence letter from the California State Historic Preservation Officer concerning the *Cultural Resources Inventory and Evaluation for the Kilarc-Cow Creek Hydroelectric Decommissioning Project, FERC No. 606, Shasta County, California* and the Determination of Eligibility and Finding of Effect for the Kilarc-Cow Creek Hydroelectric Decommissioning Project is provided in Attachment P.

Cultural Resources Item 2: *Your surrender application provides information on contact with various tribes in the area of the project. Please provide documentation of any comments or response received from the tribes regarding consultation.*

RESPONSE – Cultural Resources Item 2: By letter dated March 19th, 2009, PG&E requested that the Redding Rancheria, other Shasta County tribes, and the Bureau of Indian Affairs (BIA), participate as consulting parties to the Memorandum of Agreement (MOA) process for the Decommissioning of the Kilarc-Cow Creek Hydroelectric Project (FERC License No. 606) and the License Surrender Application. On March 25th, 2009, PG&E sent a follow up letter to the Redding Rancheria, other Shasta County tribes, and BIA, enclosing the MOA, and requesting their review and comment on the MOA. On June 3, 2009, PG&E sent an additional letter to the Redding Rancheria, other Shasta County tribes, and BIA, requesting their participation in the MOA process.

The BIA sent a letter to PG&E on July 10, 2009 regarding the MOA for the Decommissioning of the Kilarc-Cow Creek Hydroelectric Project (FERC License No. 606) and the License Surrender Application (Attachment Q). The BIA noted its concerns that the MOA does not clearly define

the exterior structure and the final disposition of the Cow Creek penstock that crosses Indian trust land. With clarification of these issues, BIA stated that it would be more inclined to become a party to the MOA. PG&E will continue to work with BIA in an effort to address its concerns.

The Redding Rancheria Tribe of Redding, California is the only Project area tribe to consult with PG&E concerning the License Surrender Application. James Hayward, Sr., Cultural Resources Specialist of the Redding Rancheria contacted James Nelson, PG&E Cultural Resources Specialist, in the spring of 2009 requesting a tour of the Kilarc-Cow Creek Project to review its important cultural resources. Since then, Mr. Nelson has contacted Mr. Hayward several times via both voicemail and email to schedule the tour but no date was set. The most recent exchange was on September 17, 2009 when Mr. Hayward contacted Mr. Nelson re-confirming his desire to tour the facility. Mr. Nelson will continue to work with Mr. Hayward to confirm a site tour date.

Recreation

Recreation Item 1: *Please provide information on any possible mitigation concepts which would possibly help offset impacts to public recreation at the project that will result from the proposed decommissioning. In particular, we are interested in understanding any mitigation proposals or ideas that have been discussed with stakeholders or considered by PG&E to compensate for the loss of water-based public recreation opportunities that are currently available at the project.*

RESPONSE – Recreation Item 1: The Kilarc Forebay and Day Use Area is the only location in the Project Area where developed formal facilities have been established. As documented in LSA Exhibit E.2.10 and E.3.10, the impact on recreational facilities would be limited within the context of other regional recreational opportunities. Therefore no PM&E measures have been recommended.

In response to public input, on March 10, 2008, PG&E issued solicitations of interest to all Interested Parties to determine if there were entities potentially interested in operating the Kilarc Forebay and/or Kilarc Powerhouse and adjacent land for a recreational or historical public use (Attachment R). The solicitation did not include re-operation of the project for power production purposes. In addition, PG&E developed a guidance document to assist any organizations potentially interested in owning, managing and operating the facilities as a recreational resource that described the requirements, obligations and opportunities associated with the undertaking and the issues that would need to be addressed by a prospective owner/operator (Attachment S). No completed applications were received by PG&E. One interested party did submit a general letter, but expressed its interest in the Project facilities for generation purposes, not solely for a recreational and historical public use.

In addition, PG&E contacted a local landowner to explore whether a local lake (Buckhorn Lake), currently closed to public recreation, could be made available for future public recreation use. The private landowner indicated that it would not be made available for future public use.

Land Use

Land Use Item 1: *In light of Mr. Albrecht's comment letter dated 30 April 2009, (a) explain the difference between "Deeded Easement" and "Prescriptive rights"; (b) will these properties be treated differently upon completion of project decommissioning; and, if so (c) approximately how much property (in acres) does PG&E possess in each category for the project.*

RESPONSE – Land Use Item 1: The term "deeded easement" refers to an express, written easement that was granted to PG&E. The reference to "prescriptive rights" refers to the rights that are established as a matter of law. The statutory procedure for acquiring an easement by prescription is set forth in California Civil Code section 1007, which provides that "Occupancy for the period prescribed by the Code of Civil Procedure as sufficient to bar any action for the recovery of the property confers a title thereto, denominated a title by prescription, which is sufficient against all ...." The party claiming such a prescriptive right must show use of the property which has been open, notorious, continuous and adverse for an uninterrupted period of five years. (*Warsaw v. Chicago Metallic Ceilings, Inc.* [1984] 35 Cal.3d 564, 570.)

As stated in the License Surrender Application, where PG&E holds easements over private lands for Project facilities, upon completion of decommissioning PG&E proposes to provide a quitclaim deed to the private landowner. A quitclaim deed is a term used to describe the document by which PG&E as the easement holder conveys any right, title or interest it may have in the burdened property to the property owner. The quitclaim deed therefore serves to allow the private landowner to clear the encumbrance from record title. Where PG&E holds prescriptive rights on private lands, those rights will be extinguished automatically by operation of law after PG&E abandons use of the property. Consequently, it will not be necessary to quitclaim those properties.

The total Patented area (lands not owned by the Federal Government or PG&E) for this project is approximately 75 acres. Of these lands, PG&E has written easement deeds for approximately 65 acres and prescriptive rights for approximately 10 acres. The approximate area for which PG&E does not have a written right affects portions of Section 6, Township 31 North, Range 1 West (shown on G-2, Exhibit G, LSA) and Section 33, Township 32 North, Range 1 West MDM (shown on G-4, Exhibit G, LSA). Determination as to precisely how much acreage falls on any given property would not be possible given existing data.

Land Use Item 2: *(a) What is the status of the Land Conservation and Conveyance Plan (LCCP) being prepared by the Pacific Forest and Watershed Land Stewardship Council (Stewardship Council); and (b) if the LCCP exists, what provisions does it contain for land preservation?*

RESPONSE – Land Use Item 2: The Pacific Forest and Watershed Lands Stewardship Council (SC), an independent nonprofit organization, is charged with overseeing implementation of PG&E's Land Conservation Commitment. The SC does not have a set date for developing a Land Conservation and Conveyance Plan, which would contain recommendations of future fee donees and/or conservation easement holders, for PG&E's watershed lands associated with the Kilarc-Cow Creek Project. Implementation of PG&E's Land Conservation Commitment will not

and cannot interfere with PG&E's hydroelectric operations, including compliance with any order from FERC (license orders, decommissioning, or other). As such, the SC will reassess the Kilarc and Cow Creek planning units to make recommendations based on the outcome of the decommissioning process or the status at that time.

References:

California Department of Water Resources (DWR). 1984. Eastern Shasta Ground Water Study. State of California, The Resources Agency, Department of Water Resources, Northern District.

MacDonald, G.A. and Lydon, P.A. 1972. Geologic map of the Whitmore quadrangle, California: U.S. Geological Survey Geologic Quadrangle Map GQ–993, scale 1:62,500.

Pacific Gas & Electric Company (PG&E). 2009. Kilarc-Cow Creek Hydroelectric Project, FERC Project No. 606 Final License Surrender Application. March 2009.

Shasta County Superior Court. 1969. In the Matter of the Determination of the Rights of the Various Claimants to the Water of Cow Creek Stream System Excepting Clover Creek, Oak Run Creek and North Cow Creek in Shasta County, California, Case No. 38577. August 25, 1969.

State Water Resources Control Board (SWRCB). 1969. Cow Creek Stream System Excepting Clover Creek, Oak Run Creek, and North Cow Creek Showing Diversions and Irrigated Lands, Sheet 1 of Book 1[map]. [Scale not given.] In State of California, The Resources Agency, State Water Resources Control Board, Cow Creek Stream System Excepting Clover Creek, Oak Run Creek, and North Cow Creek Showing Diversions and Irrigated Lands, Shasta County. State of California, The Resources Agency.

Warsaw et al. v. Chicago Metallic Ceilings, Inc., 35 Cal. 3d 564, 199 Cal. Rptr. 773, 676 P.2d 584.

FIGURES

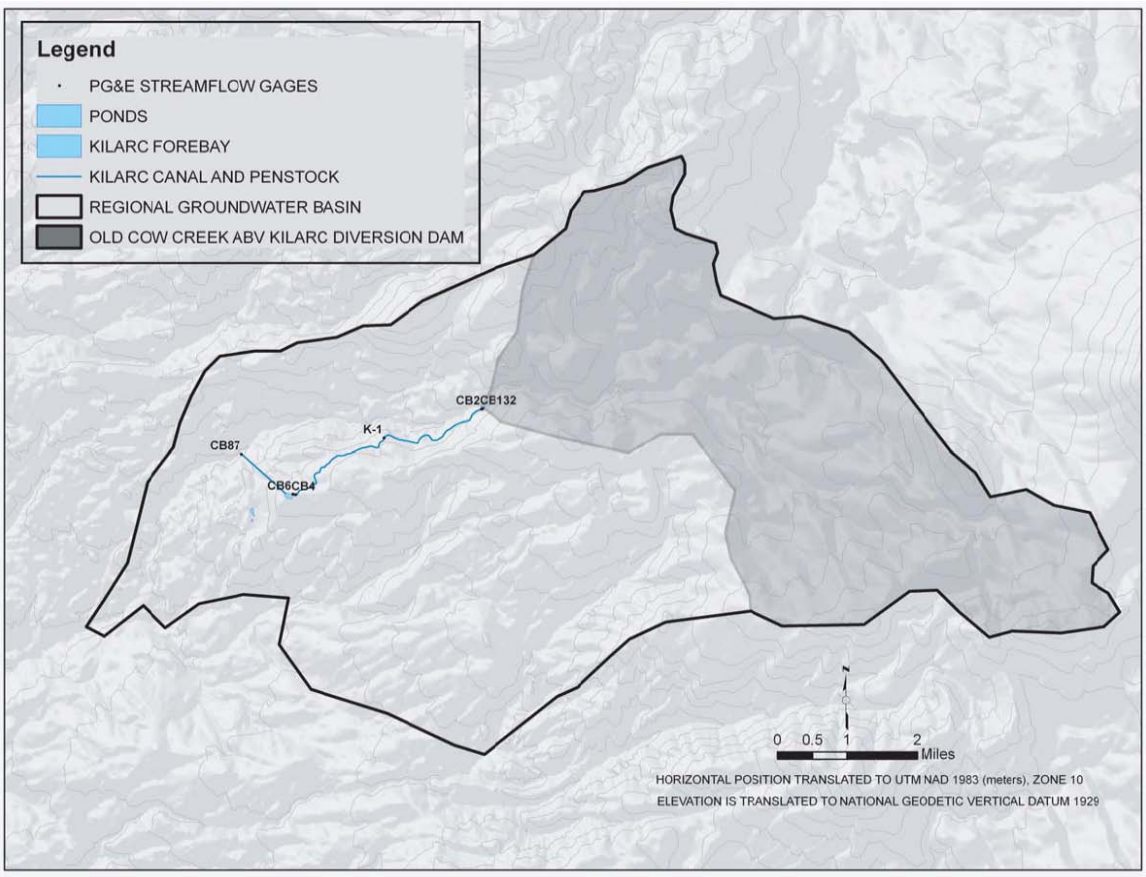

Figure 1. Regional Groundwater Basin and Old Cow Creek above the Kilarc Diversion Dam Watershed

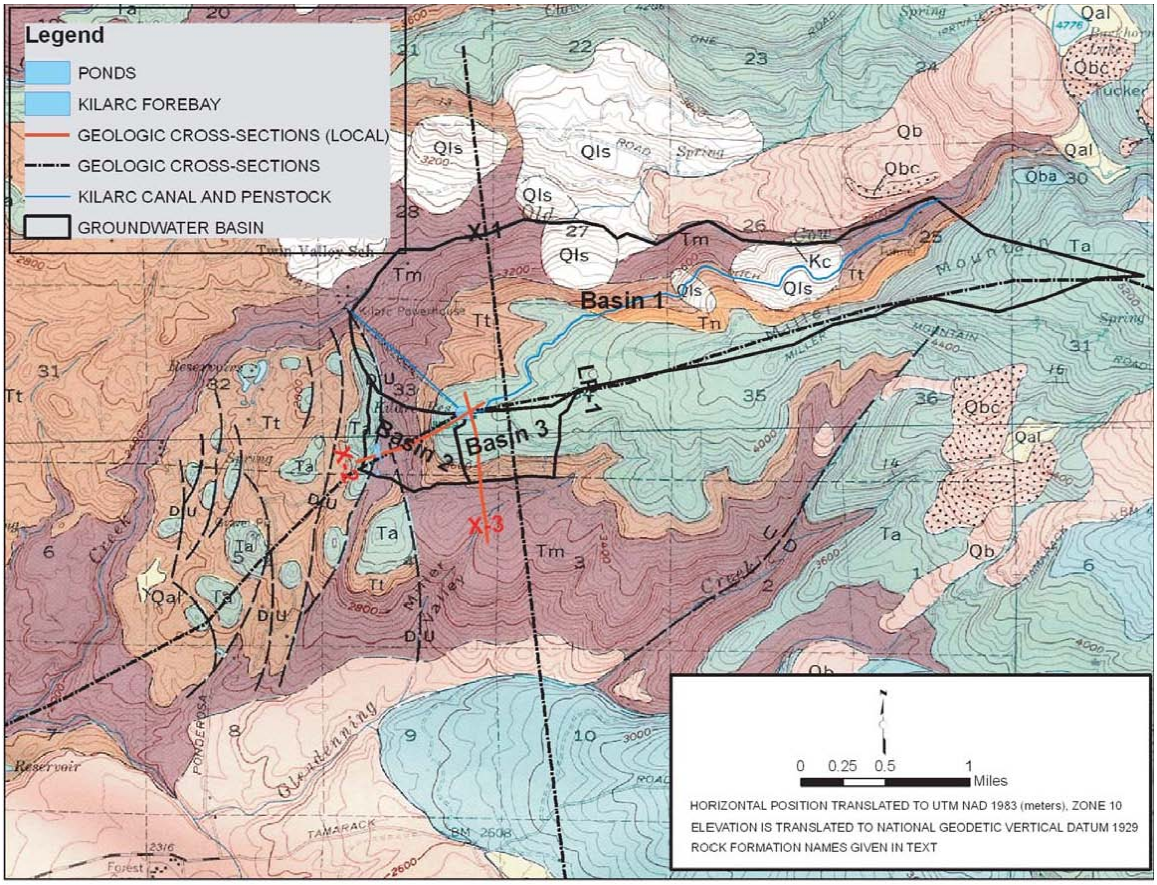

Figure 2. U.S. Geological Survey Geologic Map Showing Cross-Section Locations and Local Groundwater Basins

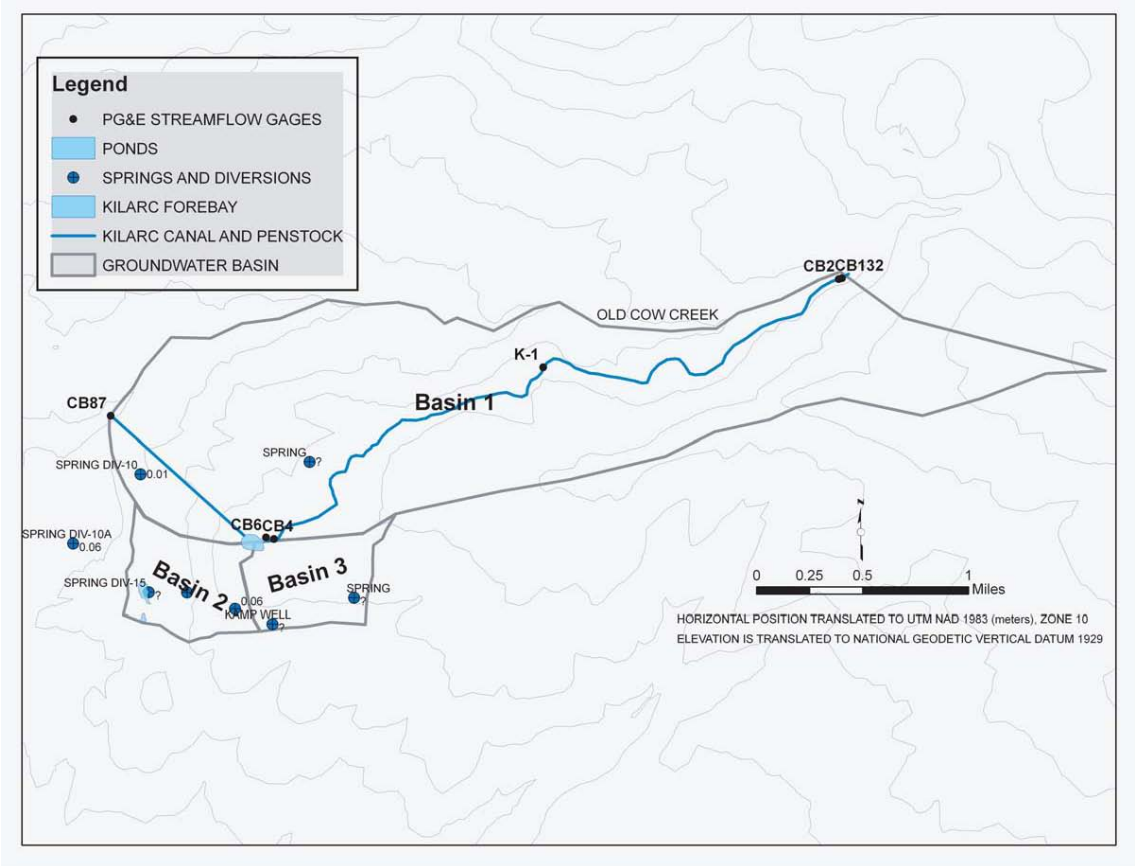

Figure 3. Local Groundwater Basins, Streamflow Gages, Springs and Diversion Points in Vicinity of Kilarc Forebay

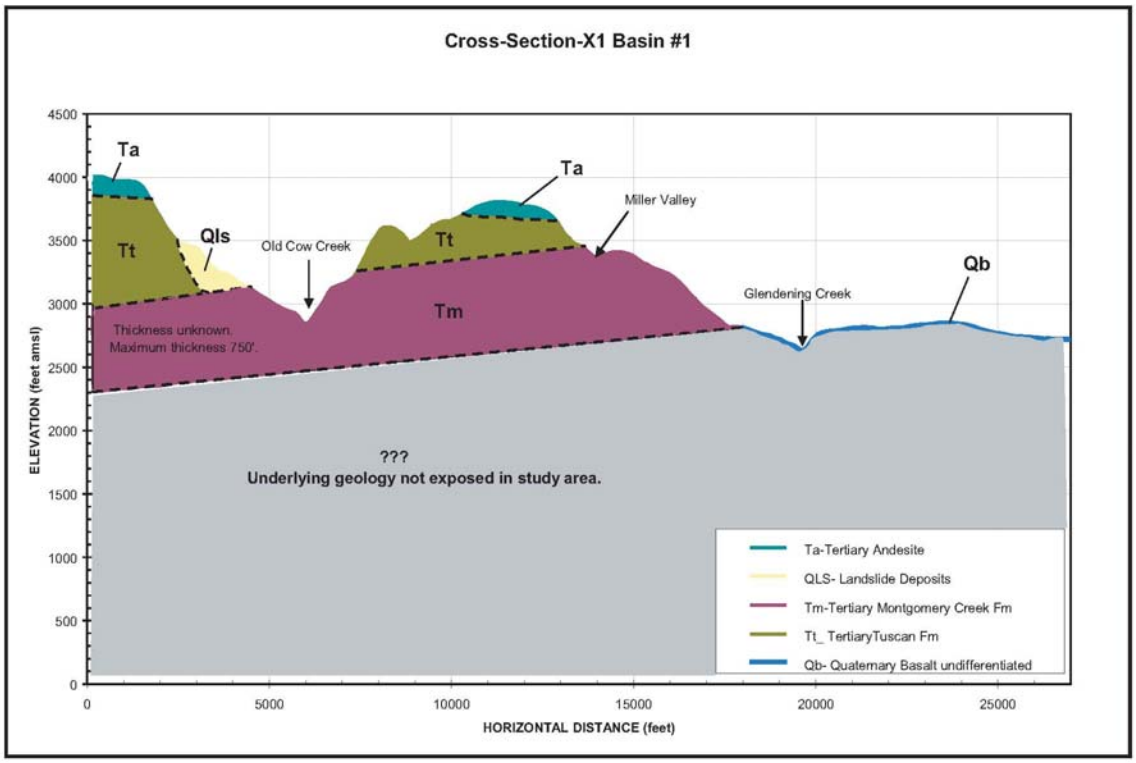

Figure 4. Cross-Section X-1 Perpendicular to Basin #1, #2, and Old Cow Creek

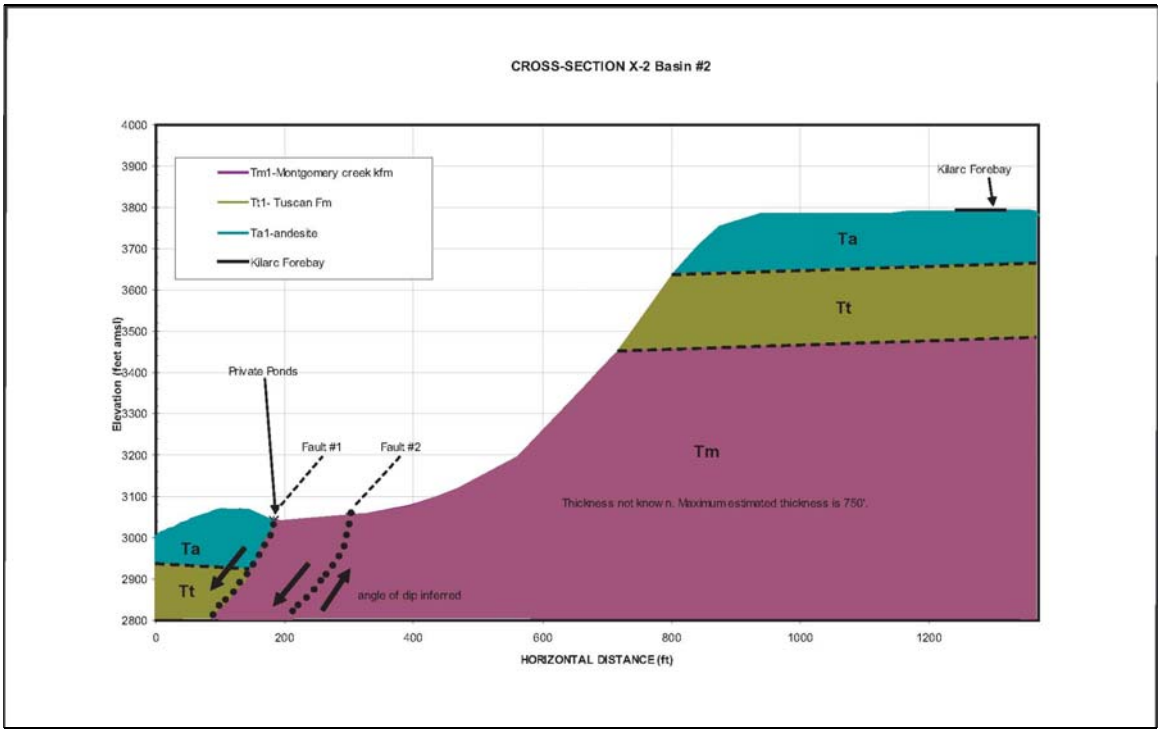

Figure 5. Cross-section X-2 Perpendicular to Basin #2 and the Kilarc Forebay

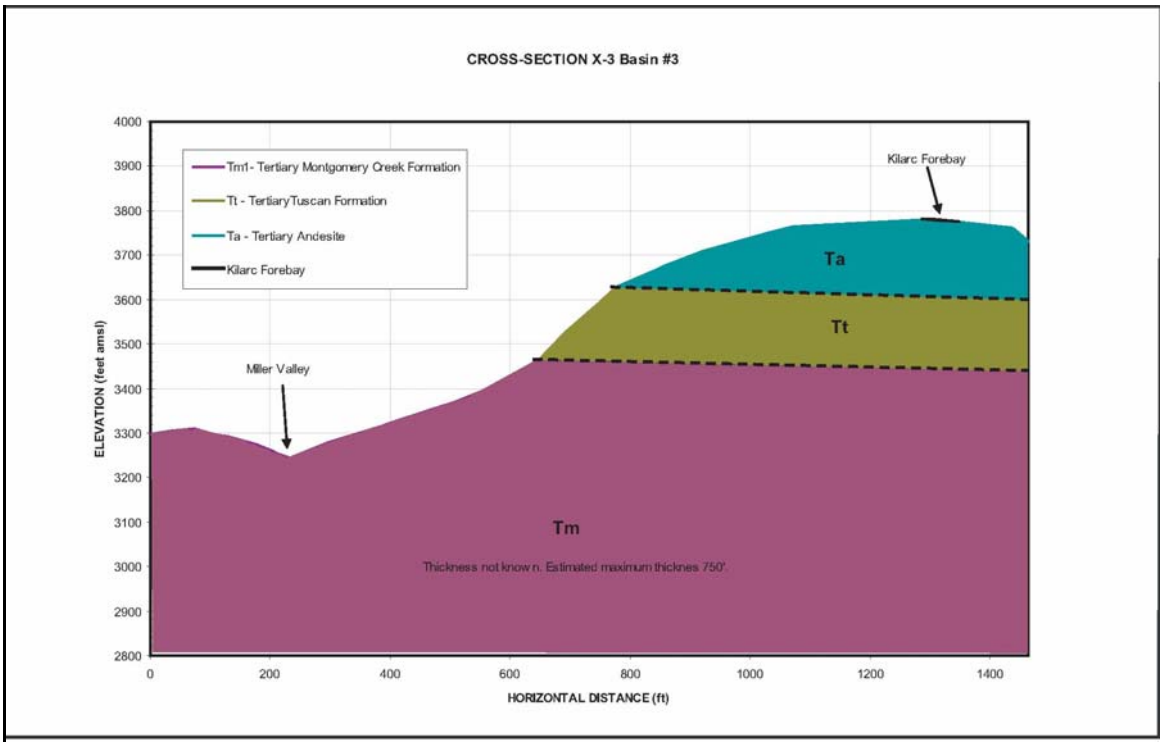

Figure 6. Cross-Section X-3 Cross-Section X-3 Perpendicular to Basin #3 and the Kilarc Forebay

Attachment A

Electronic files of the raw, in-situ, 20-minute temperature monitoring data for each station

(Attached separately)

Attachment B

Daily mean, maximum, and minimum temperatures
(Attached separately)

Attachment C

Select temperature monitoring data analysis presented in LSA

(Attached separately)

Attachment D

Electronic files of meteorological data at Kilarc and Cow Creek powerhouses
(Attached separately)

Attachment E
Water temperature tables
(Attached separately)

Attachment F

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

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov

601 Locust Street
Redding, CA 96001
(530) 225-2300

GRAY DAVIS, *Governor*

Flex your POWER

October 3, 2002

Ms. Angela Risdon
Kilarc-Cow Creek Relicensing Project Manager
Pacific Gas and Electric Company
P.O. Box 770000, Mail Code N11C
San Francisco, CA 94177-0001

Dear Ms. Risdon:

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

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

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

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

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

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

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

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

Specific Study Comments and Requests

I. Hydrology

Authority and Rationale

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

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

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

Methodologies

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

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

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

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

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

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

II. Water Quality

Authority and Rationale

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

Methodologies and Applications

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

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

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

III. Aquatic Resources

Authority and Rationale

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

Methodologies and Applications

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

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

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

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

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

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

Summary

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

Sincerely,

for **DONALD B. KOCH**
Regional Manager

cc: See pages eleven and twelve

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Attachment G

Meeting notes from January 30, 2003

ENTRIX
Environmental Consultants

January 30, 2003
MEETING MINUTES
KILARC-COW CREEK PROJECT (FERC No. 606)

Meeting between NOAA National Marine Fisheries Service (NMFS), State Water Resources Control Board (SWRCB), United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), ENTRIX, and Pacific Gas and Electric (PG&E).

Location: The meeting was located at the offices of NMFS
650 Capitol Mall, Sacramento, California.

Attendees:

National Marine Fisheries Service
Eric Theiss – NMFS Project Manager
Dave White – NMFS Fish Passage Engineer (joined by conference call)
Steve Edmondson – NMFS FERC Coordinator (joined by conference call)
Stacy Li - NMFS Instream Flow Specialist (joined by conference call)

State Water Resources Control Board
A. Britt Fecko – SWRCB Environmental Specialist
Carson Cox – SWRCB Environmental Specialist

California Department of Fish and Game
Annie Manji – CDFG FERC Coordinator (joined by conference call)
Steve Baumgartner – CDFG Fisheries Biologist (joined by conference call)

United States Fish and Wildlife Service
Levi Lewis – USFWS Biologist

Pacific Gas and Electric Company
Angela Risdon – PG&E Project Manager
Curtis Steitz – PG&E Biologist
Bob Folsom – PG&E Hydrographer
Dan Kogut – PG&E Hydrographer
Chip Stalica – PG&E Manager for Northern Hydro
Sally Lubben – PG&E Planner

ENTRIX, Inc.
Jean Baldrige – ENTRIX Project Manager
Mitchell Katzel – ENTRIX Project Geomorphologist
Janelle Nolan-Summers – ENTRIX Project Wildlife Biologist
Tracy MacMillan – ENTRIX Staff Biologist

Purpose: To review the Kilarc-Cow Creek Hydro Relicensing Project and study plans; directly addressing issues raised in agency correspondence to the First Stage Consultation Document (FSCD).

Meeting Agenda (Attachment 1) was distributed and the meeting commenced at 9:30 a.m.

INTRODUCTIONS and PROJECT OVERVIEW

PG&E: Angela Risdon kicked off the meeting by introducing herself. Meeting participants were introduced to one another and Ms. Risdon proceeded with an overview of the project using the schematics (Attachment 2). Ms. Risdon discussed the main features on the Kilarc side of the project being the three diversions: 1) one on North Canyon Creek with 2.5 cfs capacity, 2) one on South Canyon Creek (Toscher Diversion) with a 7.5 cfs capacity, and 3) the Kilarc Main Diversion Dam on Old Cow Creek. The Kilarc Diversion Dam (capacity 52-cfs) diverts water into the Kilarc Forebay via the Kilarc Main Canal and then flows through a penstock to Kilarc Powerhouse. Downstream of the Kilarc Powerhouse is the Olsen Project, which is operated by the Olsen Power Partners.

The South Cow Creek Main Canal (capacity 50 cfs) receives water from South Cow Creek Diversion Dam located just upstream of the confluence of Mill Creek and South Cow Creek. Mill Creek Diversion has a 10-cfs capacity, and dumps water into South Cow Creek just upstream of South Cow Creek Diversion Dam where this water is diverted again. German Ditch is the last diverter in the reach above South Cow Creek Diversion. The flow in the South Cow Creek Main Canal empties into the South Cow Creek Forebay, enters the penstock and flows to the Cow Creek Powerhouse. The powerhouse releases water into Hooten Gulch, where it is potentially diverted at Wild Oak Diversion (a non-PG&E facility) for hydropower and again at Abbott Ditch (non-PG&E facility). Hooten Gulch provides the water supply for the Abbott Ditch with a capacity of 7.5 cfs.

NMFS: Eric Theiss wanted to know if the flow from German Ditch was included in PG&E's project.

ENTRIX: Jean Baldrige explained that German Ditch is not a project feature, but the unused water gets diverted to Mill Creek.

NMFS: Eric Theiss wondered what type of diversion structure was there.

PG&E: Chip Stalica explained that the German Ditch dam had been recently taken out by high flows and now there is just a culvert remaining. The flow in Mill Creek upstream of the diversion consists of a natural flow and unused water imported from South Cow Creek through German Ditch. There are several diversions from South Cow Creek upstream of the South Cow Creek Diversion Dam. PG&E have water rights at the terminus of German Ditch for diversion to Mill Creek. However, in recent years, water has not been

available at the end of German Ditch for this diversion probably because there are a lot of irrigators using water from that diversion.

AGENCY MANAGEMENT GOALS

PG&E: Angela Risdon moved the meeting along to the next meeting agenda item, to discuss Agency Management Goals for the Project watershed, and handed the discussion over to Jean Baldrige.

ENTRIX: Jean Baldrige said the intent of this discussion was to define each Agency's management goals for the Project and have them on record. CDFG highlighted their goals throughout their FSCD response letter, as did SWRCB, so PG&E believes that they have a pretty good understanding of the management objectives of these agencies.

CDFG Management Goals: manage the South Cow Creek for both anadromous and trout populations and it is the Agency's position that steelhead can get over Whitmore Falls.

SWRCB Management Goals: focus on water quality objectives that protect beneficial uses for the project streams.

SWRCB: Carson Cox said that SWRCB's goals are to preserve water quality and are outlined in the Basin Plan.

ENTRIX: Jean continued with NMFS management goals.

NMFS Management Goals: Believed to be similar to USFWS's goals, in protecting endangered species potentially affected by the project, although a response letter had not been received from USFWS as yet. Believes NMFS has an interest to discover whether spring-run Chinook can migrate beyond Whitmore Falls.

NMFS: Eric Theiss said that NMFS's comments were very comprehensive but still broad in their management objectives and that they need to gather more information.

NMFS: Steve Edmondson apologized for all of the personnel changes that this Project has had to date and asked if it would help to get a letter specifying NMFS' management goals and objectives.

ENTRIX: Jean Baldrige indicated that this would be very helpful.

NMFS: Steve Edmondson said that it would probably require another site visit but he would generate a list of resource management goals and objectives for the Project watershed.

ACTION ITEM: Steve Edmondson to provide an outline of NMFS's resource management goals and objectives.

ENTRIX: Jean Baldrige completed her discussion by explaining that PG&E was designated by FERC as the nonfederal representative for ESA consultations.

LAND OWNERSHIP IN THE PROJECT AREA

ENTRIX: Jean Baldrige explained that there was no Federal land included within the Project boundaries so the United States Forest Service (USFS) were not part of the project consultation process. The land status also has implications for recreation as recreational opportunities are limited due to the extensive private land holding in the Project vicinity.

TOPICS FOR DISCUSSION

ENTRIX: Jean Baldrige explained that the "topics for discussion" were organized by study, focusing on the ones that had similar comments from the Agencies. Ms. Baldrige clarified that some of the studies, Aquatic Habitat and Passage Barrier Analysis in particular, had already been started. The big rains had interrupted the fieldwork, but they would be completed when flow levels dropped.

SWRCB: Carson Cox asked if habitat study had started at base flows.

ENTRIX: Jean Baldrige said that it was started at moderate flows, not base flows and that it was not finished because there was about 50 cfs out at Old Cow Creek right now.

NMFS: Stacy Li wanted to know the purpose for the type of aquatic habitat study that ENTRIX planned on doing if no detailed habitat mapping was intended.

ENTRIX: Jean Baldrige said it was being used to help select instream flow sampling locations.

NMFS: Stacy Li reminded ENTRIX that the habitat may or may not change with discharge depending on the gradient and one way to derive that information is to map the system at various flows.

ENTRIX: Jean Baldrige said that we would get more into this topic when we discussed the Instream Flow Study. Ms. Baldrige also explained that we needed to collect the IFIM information within the coming year.

STREAM GAGING and UNIMPAIRED HYDROGRAPH

ENTRIX: Jean Baldrige described the existing gaging system was limited and the Licensee did not have gage records to identify the underlying hydrology of this system. There is some good data at PG&E diversions for low flows but no good gages at high flow. Paul Wisheropp (ENTRIX) and Dan Kogut (PG&E) are working on a simulated model for hydrology of the system.

SWRCB: Carson Cox said that stream gaging was discussed at length in the last Public Agency Meeting and he believed that ENTRIX had agreed to generate a gaging plan instead of

relying solely on estimated hydrography. SWRCB understands the difficulty of gaging this system but there were some options that had been discussed in lieu of USGS recorders.

PG&E: Dan Kogut discussed the difficulty in implementing any sampling methodology due to the limited site access from private lands.

SWRCB: Carson Cox asked about the possibility of gaging fish flows at KilarcDiversion Dam.

PG&E: Dan Kogut said that he had brought the local USGS representative out to the site to discuss gaging options. They discussed the possibility of gaging but the flow is not uniform or laminar. There can be an excessive amount of velocity and you would have to calibrate the information. It would be difficult to calibrate if there were no uniform flows and there are no accurate weir formulas.

SWRCB: Carson Cox said that high flows could easily be gaged, and low flows could be collected through the Powerhouse, only leaving middle flows. The information may not be to USGS standards but a little creative thinking could get the middle flows extrapolated out from the low and high flow data. It is important to look at what could actually be measured, especially at medium flows, which would be the most impacted by the Project.

ENTRIX: Jean Baldrige agreed that additional information was needed but pointed out the information that we do have such as, the flow coming into the diversions was known to be 50 cfs, and summer flows in the project area are well documented.

SWRCB: A. Britt Fecko questioned why there was no high flow information when there were three USGS gages on Cow Creek.

ENTRIX: Mitchell Katzel said that there was one gage on South Cow Creek below the Powerhouse but that was the only one that he knew of in the area.

SWRCB: A. Britt Fecko compared the USGS gage numbers that she had to the one that Mitchell Katzel (ENTRIX) had in his documentation. The numbers that Ms. Fecko had did not match the one that Mr. Katzel had. The location of the gages to which SWRCB is referring is still in question.

ENTRIX: Jean Baldrige stated that it was certainly the intent of ENTRIX and PG&E to use all hydrological information available to them.

SWRCB: Carson Cox asked whether it was ENTRIX's intention to put together a gaging plan discussing the information available and the information to be provided.

NMFS: Stacy Li asked what there was in terms of a simulated hydrograph.

ENTRIX: Jean Baldrige explained that Paul Wisheropp (ENTRIX) and Dan Kogut (PG&E) were working on the simulated hydrology for the system and that there was some information

from gages that had operated for a short time. Middle flow ranges were going to need verification.

SWRCB: A. Britt Fecko said that SWRCB had some serious concerns about solely using simulated hydrograph information for this project and asked if ENTRIX and PG&E would please present what Paul Wisheropp and Dan Kogut were doing. Also asked if ENTRIX and PG&E would please develop a plan to discuss a gaging system and options.

ACTION ITEM: Present the simulated hydrograph information to the Agencies.

ENTRIX: Jean Baldrige said that the simulated hydrology would be released as soon as it was complete. Ms. Baldrige continued to explain that there just were not many options for gaging on the Old Cow side. There were a few more options available on the South Cow side of the Project; however, one year's worth of good data would provide little real value to this Project given the Project schedule for these studies.

NMFS: Eric Theiss said that it would be great to lay out the options none-the-less and prepare a plan that could be passed around.

SWRCB: Carson Cox agreed wholeheartedly.

PG&E: Dan Kogut explained that the annual delivery pattern for the watershed was like a fingerprint and that no two water years are alike. He reiterated that a year's worth of information retrieved from gaging would not provide any real value to the Project hydrology.

ENTRIX: Jean Baldrige also reminded the participants that part of the problem occurred due to the diversions upstream.

NMFS: Steve Edmondson said that a gaging plan is what they were looking for.

ENTRIX: Jean Baldrige stated that PG&E anticipated the need for some full gaging systems with their new license and that generation of a detailed stream flow monitoring gaging plan was certainly something to do as part of the new license implementation.

ACTION ITEM: Generate a detailed Stream Flow Monitoring gaging plan in consultation with the Agencies after the new license is issued.

ENTRIX: Jean Baldrige asked if there were any additional questions or comments regarding the stream gaging.

Levi Lewis from USFWS entered and introductions went around the room.

CDFG: Annie Manji asked if the overflow at Kilarc Forebay would be quantified by the study and if structural modification had been ruled out on the Kilarc portion of the Project.

ENTRIX: Jean Baldrige stated that streamflow measurements would be collected for the studies and that PG&E was still evaluating structural modification but it had been ruled out for the short term.

SWRCB: Carson Cox said that there was concern with the accuracy of the information if no additional measurements were collected.

ENTRIX: Jean Baldrige explained that extra flow would be measured at the Cow Creek Gage.

PG&E: Dan Kogut said that trying to quantify flows from the Kilarc overflow could have impacts on operations and could compromise operation of the canal, which leads back to the Creek. The canal could be surveyed but taking actual discharge measurements would be very challenging.

CDFG: Annie Manji asked Dan Kogut who the USGS representative was that visited the site.

PG&E: Dan Kogut said that it was Mike Friebel out of the Redding office.

SWRCB: A. Britt Fecko stated again that SWRCB would like to see other plans for stream gaging in addition to the simulation.

ENTRIX: Jean Baldrige stated that there were not a lot of other options to be explored in the short term. The gaging would not provide the type of information that the Agencies were looking for in a year's time.

SWRCB: A. Britt Fecko said SWRCB was concerned about verification of the simulation.

ENTRIX: Jean Baldrige believes that many of the concerns with stream gaging and hydrography will be addressed when Paul Wisheropp and Dan Kogut present the information that they have been working on.

NMFS: Eric Theiss wanted to know if any temporary gages were going to be used in South Cow or anywhere on the Project.

ENTRIX: Jean Baldrige asked Eric Theiss what type of temporary gages he was thinking of.

NMFS: Eric Theiss explained that he was thinking of a pressure transducer with a data logger recorder, which is fairly inexpensive.

ENTRIX: Jean Baldrige said that it was something ENTRIX and PG&E would evaluate.

WATER QUALITY and WATER TEMPERATURE STUDIES

ENTRIX: Jean Baldrige explained that water quality and temperature monitoring was planned up and down of the project features and in the forebays. Ms. Baldrige acknowledged that SWRCB had some additional suggestions on the parameters to be analyzed and that the

program would be modified to include PCBs, cadmium, phosphorous, copper, and boron (as proposed by SWRCB).

For Water temperature monitoring, data loggers would be used to monitor the water temperature at all of the same locations that water quality samples were collected at. The sample locations should help determine how the temperature patterns change with Project operations.

Note: During this discussion, Ms. Baldrige pointed out the proposed water temperature and water monitoring sample locations illustrated on a poster sized schematic diagram. In the drawing showing the temperature recording stations it was discussed that the temperature station in the Kilarc penstock should be removed. Removing the sample location in the Kilarc penstock also amended the second figure showing fish population study areas. The amended figures are in the project file.

SWRCB: A. Britt Fecko asked if sampling would occur in the canals.

ENTRIX: Jean Baldrige said that no sampling would be performed in the canals but water would be collected at the head of the Diversions and the Kilarc Forebay.

PG&E: Chip Stalica reminded participants that Kilarc Forebay is a heavily used recreation site and to expect vandalism of the data loggers.

NMFS: Eric Theiss said that he had lots of experience with monitoring in highly populated areas and that it was a problem, but definitely manageable. The monitoring equipment should be camouflaged with a log or pipe.

ENTRIX: Jean Baldrige explained that there were a lot of Agency comments on temperature modeling and that modeling may be considered but the option was being withheld until additional information was collected.

NMFS: Eric Theiss asked if the goal of the model was to regress the information with historical data.

ENTRIX: Jean Baldrige stated that if a temperature model were used, the goal would be to calibrate a temperature model with summer patterns and historical information and see what you would expect with project impacts. The analysis would include a discussion on anticipated impacts associated with the continued operation of the Project. The impact evaluation would consider whether project operations contribute to any inconsistencies and if so, modeling would be a consideration.

The meeting was handed over to Mitchell Katzel to discuss the Sediment Studies. Mitchell had a handout (Attachment 3) that was distributed and faxed to the individuals participating via teleconference. During the lull that occurred to fax Mr. Katzel's handout, Jean Baldrige asked Levi Lewis (USFWS) to discuss USFWS's position on the FSCD and the status of their response letter.

ISFWS: Levi Lewis apologized for the comments to the FSCD being so late and explained that USFWS was having a lot of personnel issues. The response letter has been written and is awaiting signature, which should happen today. Mr. Lewis explained that he had the comments with him and he would share those with the participants today. Another project incongruity is that tomorrow is Mr. Lewis' last day and Debra Giglio would be the new project contact for USFWS. The Branch Chief is gone and two senior biologists retired leaving the project with Debra Giglio who only has a year of experience but is the only person left to handle hydrology. Mr. Lewis was not sure as to how active USFWS would be in this process.

ENTRIX: Jean Baldrige explained where the meeting was in terms of the Agenda and said that USFWS's comments could be discussed under "Other Studies". Ms. Baldrige handed the meeting over to Mitchell Katzel again.

SEDIMENT STUDIES

ENTRIX: Mitchell Katzel said that as a prelude to discussing sediment he wanted to talk about the geomorphology of the channel. There were three main topics to discuss with the participants (Pg. 1 of Attachment 3): 1) What factors influence potential alteration of channel morphology, 2) What flows are responsible for forming and maintaining the channel morphology, and 3) How much water can be diverted without altering channel morphology.

(Pg. 2 of Attachment 3). To answer the first question, *What factors influence potential alteration of channel morphology?* we look at magnitude of flow and sediment alteration. Intuitively, if you change the flow a little, geomorphology changes a little. You would also look at the distance you are from the point of disturbance. Typically, the effects of diversion decrease downstream. Then you would look at the channel morphology. Generally, lower gradient channels are more responsive than higher gradient ones.

(Pg. 3 of Attachment 3). To answer the second question, *What flows are responsible for forming and maintaining the channel morphology?* you look at geomorphically significant flows, "effective discharge", and "bankfull discharge".

CDFG: Annie Manji asked what kind of time frame Mitchell Katzel was discussing when he used the term "over time".

ENTRIX: Mitchell Katzel explained that as a rule of thumb, channels dammed or flow regulated take a few decades to respond and come back into equilibrium. Some channels may do it in 40 to 50 years and some may do it in 10 years.

NMFS: Stacy Li questioned why Mitchell Katzel would assume that the channels in the Project area have a relevance to bankfull discharge.

ENTRIX: Mitchell Katzel said that he did believe there was a relevance to bankfull discharge in the Project area and thought that his rationale would become clear later in the discussion.

NMFS: Stacy Li asked if Mitchell Katzel believed that the channels were connected to a floodplain, which is typical of "bankfull discharge".

ENTRIX: Mitchell Katzel said that he did not believe they were connected to a floodplain. He explained that bankfull discharge is nearly synonymous with effective discharge on alluvial channels and it was empirically determined that 1.5 to 2 years of annual flooding does the most work in the channel by moving sediments. This is all typical, but there are exceptions, which is probably what Stacy Li (NMFS) was getting at.

Mr. Katzel continued with a discussion of estimated geomorphically significant flows at the two main points of diversion: Old Cow Creek at Kilarc Diversion Canal and South Cow Creek at Main Canal. The closest gaging station to both diversions with annual peak flow data is USGS gage 11372200 on South Cow Creek downstream of Cow Creek Powerhouse; that has 16 years of peak flow data. The type of flows that would be expected to affect channel geomorphology. The USGS gage does not get Old Cow Creek.

NMFS: Eric Theiss asked if the USGS gage was downstream of the Kilarc Powerhouse.

ENTRIX: Jean Baldrige said "yes" but that it still did not get Old Cow Creek data.

CDFG: Annie Manji asked if the gage was located upstream of the confluence of Old Cow Creek.

ENTRIX: Jean Baldrige responded "yes".

ENTRIX: Mitchell Katzel continued with his discussion of geomorphology, stating that peak flows at a gaged location can be used to estimate peak flows at an un-gaged location by developing a proportional drainage area relationship for two locations. There is a close relationship between streamflow and drainage area. On a seasonal basis, you can have a dry year in total flow volume, but you might get a big flow event with one good storm in a drought. Ideally you want 20 to 25 years of data for stability of the hydrologic record, but we do not have it for this Project. Discussed table on Pg. 4 of Attachment 3.

(Pg. 5 of Attachment 3). Mr. Katzel explained the rationale behind the relationship between peak flows and drainage areas. To check the information he performed two checks on the data. Check one was to compare Cow Creek at Millville gaging station to South Cow Creek gaging data. Check two was to use regional curves for drainage area-bankfull discharge relationships. As the table on page 5 of the handout indicates, the comparison of peak annual flows was 19.9 percent on average over 9 years. Average over 7 years was 17 percent.

The South Cow gage is 18 percent of the drainage area to the Millville gage, which matches the average. Thus concluding that the drainage area correlation is pretty good, and we should be able to reasonably represent the peak annual discharge.

Check 2 involved the use of regional curves for drainage area-bankfull discharge relationships. (Pg. 6 of Attachment 3). The regional curve is fairly close to the calculated bankfull discharge; therefore curve F was used to check the estimated bankfull from drainage areas for the two diversion locations.

CDFG: Annie Manji inquired as to how Mitchell Katzel chose curve F.

ENTRIX: Mitchell Katzel said it was based on 49 years of reliable Millville data. Mr. Katzel continued with his presentation directing participants to look at the table on the bottom of page 6 of Attachment 3.

NMFS: Eric Theiss asked how 50-cfs maximum diversion rate divided by 16,500 cfs equaled 3 percent.

ENTRIX: Mitchell Katzel explained that the number was based on each year's peak flow, not the combined years peak flow. (Pg. 7 of Attachment 3). Mr. Katzel explained that there are no set criteria for magnitude of flow reduction and expected significance of effects but there are guidelines. A 5 percent decrease of peak flow has been suggested by SWRCB's staff a couple of years ago as a threshold without requiring environmental documentation.

ENTRIX: Jean Baldrige asked Mitchell if the threshold information he was providing was specific to Coastal Anadromous Streams.

ENTRIX: Mitchell Katzel said "yes" but that it should be applicable to the Sierra Nevadas. Continuing with geomorphology, Mr. Katzel asked (rhetorically) if we had a responsive channel or not. Kilarc has 2 to 12 percent gradient slopes with most of the slopes in the 4 to 6 percent range. It is a fairly typical mountain channel gradient, moderately to highly incised. Higher gradient, incised mountain channels generally have a greater sediment transport capacity than supply. That type of channel morphology is resilient to alterations of the flow or sediment regime. A low gradient, moderately incised channel would be more affected than the mountain channel type that we have. The effects you would expect to see on this Project are likely to be small.

ENTRIX: Jean Baldrige asked if we would expect to have concern about sediment and the spawning gravels due to the Project or the timber operations upstream.

ENTRIX: Mitchell Katzel said that it was possible to effect the spawning gravel but unlikely. Any changes in sediment deposition would probably be subtle in this system. There could be some cumulative effects in the riffles but the unimpaired 1.5 and 2-year flows have not been significantly reduced by the project operations. If there was a problem with sedimentation you would expect to find it in the lower gradient stream reaches, particularly in pools. However, Mr. Katzel believes that the sediment would be flushed

out with the first higher flows of the runoff season, probably about every other year. There is evidence of bank erosion that would contribute sediment to the channel as well, but the bed is comprised predominantly of large boulders and it can take a good flow.

SWRCB: Carson Cox said that the presentation was really good and the point was well taken but that it did not rule out that the Project may be having effects annually on the channel. Mr. Cox is primarily concerned with the INTRA-ANNUAL effects from Project operations; the subtle but really important impacts. Mr. Cox asked Mitchell Katzel how you establish the intra-annual effects geomorphically.

ENTRIX: Mitchell Katzel said that there was obviously a lot of variability in the stream conditions from year to year anyway. You have to ask yourself if a total of 50-cfs diversion capacity is going to alter the channel, and how would you distinguish subtle alterations, for example, from the effects of a long-term drought.

SWRCB: A. Britt Fecko asked if the diversions were all unlined.

PG&E: Chip Stalica said that they were partially lined and unlined. Mr. Stalica also noted that PG&E does not always divert 50 cfs. They reduce their diversion proportionally to the flow.

ENTRIX: Mitchell Katzel said that he used 50 cfs for all of his calculations to assume a worst case scenario.

NMFS: Eric Theiss questioned PG&E as to whether they could divert 50 cfs even if the flow was only at 54 cfs.

PG&E: Chip Stalica said "yes", that it was PG&E's water rights to divert 50 cfs.

ENTRIX: Mitchell Katzel said that geomorphically, the Project area streams are just not in the channel types that would be responsive or sensitive to flow and sediment alterations.

SWRCB: A. Britt Fecko expressed her concern about dismissing the possibility of sedimentation when sediment collects in the forebays and diversions.

PG&E: Chip Stalica thought that if anything, PG&E was helping to remove the fines since there was deposition over time in the forebays. The deposition occurs in the forebays because the gradient is flat and the velocities are very low, unlike the stream channels.

NMFS: Eric Theiss asked where the dredged fines were deposited.

PG&E: Chip Stalica informed him that the fines were deposited on the banks of the forebays.

ENTRIX: Jean Baldrige asked if Eric Theiss was concerned about the dredged material getting back into the system. Eric Theiss nodded an affirmation.

PG&E: Chip Stalica said that the material revegetates quickly and it is hardly noticeable within a season.

ENTRIX: Jean Baldrige explained that the Aquatic Habitat Surveys and Riparian Surveys would all be looking at bank erosion and evidence of sedimentation. The slower backwater areas is where they would expect to see sedimentation buildup if there was going to be any. Jean Baldrige asked Mitchell Katzel if there would be any way to determine sedimentation from the logging activities from that of the Project.

ENTRIX: Mitchell Katzel said that you would have to go way upstream, above the logging activities, if that were possible, in order to obtain baseline information that was unaffected by logging.

SWRCB: Carson Cox suggested that ENTRIX and PG&E look above the diversion and do a comparison upstream and above the diverted reach, focusing on the impacts that would occur during the summer. Project impacts would be seen earlier in the season, instead of August, September, conditions appear in the diverted reach in June or July. Not only should assessments be done in the spring, but they should also be performed monthly or bimonthly.

ENTRIX: Jean Baldrige thought that ENTRIX should focus on the areas where you would anticipate an impact such as riffles and backwaters.

NTRIX: Mitchell Katzel agreed that ENTRIX should focus on the most sensitive areas of the Project.

SWRCB: Carson Cox reiterated that monitoring above and below the diversions would provide valuable information on sedimentation. Mr. Cox asked when the flow drops off.

PG&E: Chip Stalica said that it varied from year to year but it usually occurred around August, September or October.

SWRCB: Carson Cox said that if the flows typically dropped off in those months then you would want to do the monitoring in June and July.

ENRIX: Jean Baldrige stated that Mitchell Katzel would work with PG&E to come up with a plan to address it.

NMFS: Stacy Li wanted to know if there was a Sediment Management Plan. If you are looking at ten diversions with sediments being hauled out of the system without going downstream than you are not looking at the whole system and it may be sediment starved.

ENTRIX: Mitchell Katzel said that from what he had seen there was continual sediment recruitment.

NMFS: Stacy Li thought that it would be appropriate for ENTRIX and PG&E to address those issues in a Sediment Management Plan. Mr. Li also expressed concern about bankfull assessments at much higher flows than are necessary to transport sediment, and that entrenched channels are a different thing.

ENTRIX: Mitchell Katzel agreed that entrenched channels were different because they had a higher transport rate.

NMFS: Stacy Li said that ENTRIX and PG&E just needed to make sure that they were covering the ground. Mr. Li suggested that spawning gravel availability be closely looked at.

ENTRIX: Mitchell Katzel said that there just was no interruption of the bedload transport and Jean Baldrige again stated that the dams are too low to interfere with the transport.

NMFS: Stacy Li asked if PG&E plans to operate the project passively.

SWRCB: A. Britt Fecko raised her concern again about the deposition of fines in Kilarc Forebay from the canal banks.

PG&E: Chip Stalica said that fines could not be transported that far down into PG&E's system. The canals have been there for 100 years and PG&E has never had to rebuild the banks, so they are stable and there is little bank erosion. The water is so controlled that there are no huge flows and no substantial erosion in the Project canals.

SWRCB: Carson Cox asked if the sediment deposition in the Kilarc Forebay was from fines in the stream.

NMFS: Steve Edmondson asked if the diversions were low enough for transport of all bed sizes.

ENTRIX: Jean Baldrige explained that PG&E does not clean gravels out of their system.

NMFS: Stacy Li asked if the project was interrupting bed load movement.

ENTRIX: Mitchell Katzel said he would include additional information on bed load, channel sedimentation, and an evaluation of bank erosion when developing the study plan. The study plan should look specifically at spawning gravels and whether or not the Project exacerbates sedimentation.

ACTION ITEM: Mitchell Katzel is to provide additional information on bed load, evaluation of bank erosion, spawning gravels, and channel sedimentation when developing the study plan.

CDFG: Annie Manji asked about the effects of riparian encroachment on geomorphology.

ENTRIX: Jean said that Janelle Nolan- Summers would discuss this in greater detail.

CDFG: Annie Manji wondered if we were just talking about bed load.

ENTRIX: Mitchell Katzel said that Annie Manji was right on track with considering the aspects of how alterations of flow influence channel morphology and potential riparian encroachment.

ENTRIX: Janelle Nolan-Summers said that, as part of the Riparian Habitat Surveys ENTRIX would be looking at the health and vigor of existing riparian vegetation. Ms. Nolan-Summers explained that the project area had very limited riparian vegetation in narrow bands adjacent to the channel with spotty distribution because there was not much floodplain in the Project area.

SWRCB: A. Britt Fecko asked Mitchell Katzel to please explain why ENTRIX believed that Rosgen Level II classification was unnecessary.

ENTRIX: Mitchell Katzel explained that with the type of channel we were looking at, Rosgen Level II classification would not change the picture of how the peak flow regime responsible for maintaining the channel has been only slightly altered.

SWRCB: A. Britt Fecko said that it would give you the ability to determine changes between the reference stream, a level of quantification and entrenchment that would not be possible with Rosgen Level I characterization and Rosgen Level II may be needed.

ENTRIX: Mitchell Katzel thought that in lieu of channel typing it would be more productive to go to the most sensitive locations and study those locations, making sure they are comparable.

SWRCB: A. Britt Fecko said again that it was not characterization or classification that she was interested in obtaining from the Rosgen Level II information.

ENTRIX: Mitchell Katzel said that if SWRCB was not looking for classification information from the Rosgen Level II but rather the quantification information, then ENTRIX was doing something very similar.

SWRCB: A. Britt Fecko asked if ENTRIX was proposing to perform a Rosgen Level II characterization in the areas that were identified as highly sensitive.

ENTRIX: Mitchell Katzel said "yes".

SWRCB: Britt Fecko reiterated that she was interested in quantification of the channel because there was a lot of professional opinion being used to characterize the area and that made her uncomfortable.

SWRCB: Carson Cox wanted to clarify and asked if ENTRIX was planning to look at the Rosgen Level II criteria on a limited and intensive scale versus channel wide.

ENTRIX: Mitchell Katzel said "yes". Thought it was more effective than doing a shotgun approach, which would not prove to be very effective. Thoroughly investigating the most sensitive locations seems like the best approach for this system and then if problems arise the scope would be broadened.

SWRCB: Carson Cox asked that he and Britt Fecko be included with the study, results and decision process regarding this issue.

SWRCB: A. Britt Fecko said that they were particularly interested if problems were observed. SWRCB would like to know where and why the problems exist.

ENTRIX: Mitchell Katzel asked if the logging activities upstream of the Project were in the headwaters.

PG&E: Chip Stalica said that the logging operations were on the Old Cow side.

ENTRIX: Mitchell Katzel said that if ENTRIX finds a problem it would be very difficult to determine whether it was from logging in the watershed, from the diversion, or if it was a natural, temporal change in the channel conditions. Mr. Katzel said that if ENTRIX were to find a sedimentation issue he could not promise that there would be an answer as to who was creating it.

SWRCB: Carson Cox said that the study should at least give us an idea of what is happening in the system.

ENTRIX: Jean Baldrige said that there were two levels being dealt with: 1) the aquatic and riparian habitat surveys, and 2) the sensitive areas. Both would provide information to identify if sedimentation was an issue.

SWRCB: A. Britt Fecko asked why only one season of field work was planned and if there was any flexibility in that schedule.

PG&E: Angela Risdon explained the time frame in which PG&E's license expires and when the draft license needs to be submitted. With the date required for submittal of PG&E's application, there really was not any flexibility with the schedule.

NMFS: Eric Theiss asked why field work was not started before now since NMFS was asking for two years worth of data per FERC. Mr. Theiss was concerned with the schedule and timing of fieldwork.

PG&E: Angela Risdon explained that the Project was considered to be small and uncomplicated when the process was started and PG&E scheduled it in accordance with size and anticipated scope. As the process has gone along, the scope has expanded and ideally things should have started sooner but they were not and now PG&E is trying to fit them in to comply with their FERC deadlines. Ms. Risdon explained that some of the studies

would slip into next spring but they should be completed in time for the application to be submitted.

USFWS: Levi Lewis inquired about the Flow Studies and how ENTRIX was going to quantify the flows to ensure that they were not moving fines.

ENTRIX: Mitchell Katzel said that 2-cfs would not move any fines.

USFWS: Levi Lewis said that if the fines were settling out in the Forebays at 50 cfs how could ENTRIX be sure that they were not being transported through the system.

PG&E: Chip Stalica said that the velocity of the water changed considerably in the Forebays. The water was at 50 cfs when entering but it did not remain at the same velocity.

ENTRIX: Jean Baldrige said that the habitat survey should tell us whether we have fines settlement in the pools. The information would not necessarily be obtained through the Stream Flow Study but through the Habitat Assessments.

USFWS: Levi Lewis asked if ENTRIX had an Incipient Motion Study Plan.

ENTRIX: Mitchell Katzel said that if a problem was discovered then an Incipient Motion Study Plan could be developed.

USFWS: Levi Lewis said that USFWS would need to make flow recommendations in the future and thought PG&E and ENTRIX should keep this in mind.

ENTRIX: Mitchell Katzel said that if a lot of sediment was observed in the pools then they would be talking about it, but it was not expected with the channel type.

SWRCB: A. Britt Fecko asked how ENTRIX was planning to evaluate the sediment deposition in the pools.

ENTRIX: Jean Baldrige said that it would be done through the Habitat Assessments.

SWRCB: A. Britt Fecko wanted to know if there was a methodology or a protocol that would be followed.

ENTRIX: Jean Baldrige said that the first step was to identify whether there was a problem or not. To determine that, aquatic and riparian habitat studies would be performed, and particular attention would be paid to bank erosion and sediment in pools. Once the surveys are performed then ENTRIX would work with Mitchell Katzel to see how the project could impact the system.

SWRCB: Carson Cox returned to Levi Lewis' line of questioning and wanted to know how ENTRIX was going to analyze low flows in the riffle habitats.

ENTRIX: Mitchell Katzel said that whether you had flows at 4 cfs or 50 cfs you were not going to see fine sediment moving through the system.

SWRCB: Carson Cox said that you would see fines.

ENTRIX: Mitchell Katzel said that the physics just are not there to move fines at those flows.

ENTRIX: Jean Baldrige said that Mitchell Katzel was thinking like a Geomorphologist and not a fish biologist.

SWRCB: A. Britt Fecko asked if ENTRIX was talking about picking up and moving sediments or turbidity.

ENTRIX: Jean Baldrige said that ENTRIX was planning on doing detailed studies in sensitive areas of the diverted reach, which she believed would answer the questions that are being asked.

PG&E: Angela Risdon said we should adjourn for lunch and return at 1:00 p.m. since there was still quite a bit to discuss.

Meeting adjourned for Lunch.

PG&E: Angela Risdon waited for everyone to return from lunch and started the meeting again at approximately 1:10 p.m.

SWRCB: A. Britt Fecko inquired as to whether PG&E or ENTRIX had thought about having an independent note taker and hoped that they would consider it depending on communication protocols. Ms. Fecko also wanted to know if the Agencies would be receiving a written protocol for the passage barrier survey prior to the study being completed.

ENTRIX: Jean Baldrige said that the passage barrier surveys had already begun.

SWRCB: A. Britt Fecko said that she specifically wanted to know if the results and decisions made during this meeting and the plans that have been asked for will be provided prior to the field work being initiated.

NMFS: Eric Theiss said that study plans had to be prepared before the fieldwork could be started.

ENTRIX: Jean Baldrige explained that the FSCD was the Study Plan.

NMFS: Eric Theiss said that the FSCD was not detailed enough to act as the Study Plan and USFWS and SWRCB wholeheartedly agreed.

SWRCB: A. Britt Fecko explained that quantitative studies needed to be outlined and modifications to studies such as the portions of Rosgen Level II that will be adapted to the sensitive areas need to be outlined with a description of the modifications.

USFWS: Levi Lewis shared an example of where the USFWS thought the Study Plans needed more information. The Fish Population Study states that the size of the fish will be evaluated unless 100 or more fish are captured and then they would be categorized. USFWS feels that this description of field activities is too vague.

ENTRIX: Jean Baldrige explained that the fish would be put into sub-samples and each sub-sample would be stratified by class size, so technically they would all be measured.

CDFG: Annie Manji said that Steve Baumgartner had to leave for another meeting so she was going to try to handle the Fish Study information on her own.

ENTRIX: Jean Baldrige gave an overview of the aquatic habitat study to be performed and then discussed the fish studies, instream flow and passage barrier programs again.

INSTREAM FLOW STUDY

SWRCB: Carson Cox asked about PHABSIM.

ENTRIX: Jean Baldrige explained that ENTRIX was not going to be able to rely on the detailed mapping that ENTRIX usually has, but that some transects would be flagged. There are dilemmas with the South Cow because some representative transects have been identified during the current moderate flows. Ms. Baldrige recommended that the interested parties get out to see the transect selections before the flows change.

ACTION ITEM: Schedule a trip to the Project area with stakeholders to review and assist with transect selection before flows change.

SWRCB: Carson Cox asked if ENTRIX was selecting the transects based on a quick habitat study at higher flows and then was planning to weight them on lower flows. Mr. Cox suggested that a conservative approach be taken with installation of more transects so when the flows decrease there is some assurance that they have been captured.

NMFS: Stacy Li asked how ENTRIX is planning on doing transects in the representative reaches.

ENTRIX: Jean Baldrige said that she had originally wanted to go off the habitat mapping but she was open to suggestions.

NMFS: Stacy Li suggested that there be adequate representation in the dominant habitat types, i.e., a representative reach approach.

ENTRIX: Jean Baldrige said that she hoped Stacy Li would be out in the field for the transect selection. The important thing is to make a decision when everyone is looking at the

Creeks to determine whether the approach will be representative reach or transect. The problem with the South Cow Creek is that there is no habitat mapping data to rely on yet.

CDFG: Annie Manji asked if the spawning gravels were limited on South Cow.

PG&E: Curtis Steitz said that South Cow had gravel in the riffles and tails of pools. PG&E believes that these would be good spawning areas.

CDFG: Annie Manji said that sampling needed to be performed in areas where spawning habitat was sparse, such as in the backwater.

ENTRIX: Jean Baldrige explained that the study would be looking at low flow, riffles, backwaters, and she believed that Annie Manji's concern would be alleviated. Ms. Baldrige asked Stacy Li to explain why he would like to see a representative reach approach.

NMFS: Stacy Li explained that it was better to think of transects as depth and velocity to get a more accurate record. Mr. Li believed that the representative reach was a more powerful tool but the trick was in selecting how many transects you needed.

NMFS: Steve Edmondson said that the state of the art approach was to do habitat transects versus representative reach.

ENTRIX: Jean Baldrige said that ENTRIX had planned to select transects based on the habitat survey information, but may need to take an alternative approach given the flow levels in the stream. .

NMFS: Steve Edmondson asked if the Agencies would be receiving a write-up of the proposed approach.

ENTRIX: Jean Baldrige said "yes" and also the opportunity to select the transects with ENTRIX and PG&E.

ACTION ITEM: Provide Agencies with a detailed approach and methodology for the Instream Flow Study.

CDFG: Annie Manji wanted to know if there was a date set for transect selection.

ENTRIX: Jean Baldrige said that a date had not been set because it was flow dependent.

SWRCB: A. Britt Fecko would like to be notified when the transect selection is going to occur.

NMFS: Steve Edmondson would also like to be present for transect selection and would also like to get David White (NMFS) out to the project area before the transects are selected for a "dog and pony" tour of the project.

CDFG: Annie Manji expressed an interest in having a couple of CDFG project people attend the "dog and pony" show as well.

ACTION ITEM: Set up a site visit for new project participants and other interested individuals prior to scheduling the transect selection.

ENTRIX: Jean Baldrige explained that the instream flow monitoring would also be used for analysis of the macroinvertebrate habitats, so there were a couple of things being accomplished with the transects. Ms. Baldrige continued to explain how originally Old Cow was not being looked at for anadromous fish types but now those curves would be run. South Cow would be looked at for fall, late-fall Chinook and steelhead.

SWRCB: Carson Cox questioned whether curves would be run for all fish present.

ENTRIX: Jean Baldrige explained that originally ENTRIX considered Whitmore Falls to be a barrier but based on CDFG's letter, steelhead will be considered to have the potential to be in Old Cow Creek and Chinook have a future potential to be in the Creek.

NMFS: Eric Theiss disagreed that Chinook were incapable of making it over the Falls now.

NMFS: Stacy Li said that the macroinvertebrate study needed to be done on a representative reach rather than as a sample of depth and velocity. The area of the riffle would be needed and he did not believe that you would get that information with a transect. Mr. Li believes that the riffle needs to be actively mapped.

ENTRIX: Jean Baldrige said that a couple of transects (two transects versus one) within the riffle would do what Stacy Li was describing and then the Gore and Judy curves would be used.

NMFS: Stacy Li said that would work but it may involve two transects per riffle transects.

ENTRIX: Jean Baldrige said that transect placement would be evaluated in the field.

PASSAGE BARRIER SURVEY

ENTRIX: Jean Baldrige discussed the intentions of the passage barrier survey using the Powers and Orsborn protocols. ENTRIX would be looking at cascades and small dams, critical riffles, and identifying natural features that could potentially be barriers.

CDFG: Annie Manji asked at what flows the passage barrier surveys would be performed.

ENTRIX: Jean Baldrige said that they would be looking at base flows and low flows.

NMFS: Eric Theiss asked if a modifier would be applied to the low flow.

ENTRIX: Jean Baldrige said that the survey would be performed at low flow and if a potential barrier was observed, the surveyors would document whether they thought it would be passable at higher flows.

NMFS: Eric Theiss thought that kind of assumption would be a guess and said that passage barriers identified during low flows would have to be revisited at high flows to establish their validity.

CDFG: Annie Manji said that CDFG personnel had just gone out and done some surveys on Old Cow Creek for the Roseburg and Timber Harvest Plan Project. At a relatively good flow they observed an absolute barrier midway in Old Cow Creek.

ENTRIX: Jean Baldrige asked if CDFG considered it to be an absolute barrier for anadromous fish.

CDFG: Annie Manji said "yes". Ms. Manji said that she had electronically mailed the information to the other stakeholders and Eric Theiss brought up the picture on his computer. Annie Manji said that she could provide pictures and coordinates to ENTRIX. Ms. Manji believed the location of the absolute barrier to be 1.3 miles above the Kilarc Powerhouse. Ms. Manji reiterated that CDFG does not consider anadromous fish to be present in the upper half of Old Cow Creek above the absolute barrier.

ACTION ITEM: CDFG to send a map with the areas that have already been surveyed by CDFG, with pictures and coordinates of the absolute barrier. Fieldwork is to be coordinated between ENTRIX and CDFG to avoid duplication of effort.

ENTRIX: Jean Baldrige said that she would like to visit that barrier on the field trip that is to be scheduled.

FISH STUDIES

ENTRIX: Jean Baldrige discussed the proposed fish study plan. Surveys were planned for early summer and later in the season. Electrofishing would be performed in Old Cow Creek above the absolute barrier and snorkeling would be performed in the areas expected or assumed to have ESA salmonids.

SWRCB: A. Britt Fecko asked if she remembered hearing a story about someone fishing in the canal.

ENTRIX: Jean Baldrige said that you could fish in the Kilarc Main Canal. It could be thought of as a fish conveyance system as well as a water conveyance system. There would not be any fish in the South Cow Creek Main Canal because it was screened at one end. Fish surveys would be performed by snorkeling only on the South Cow side and some snorkeling would be conducted on the Old Cow side with electrofishing above the barrier. Sampling would be completed in the canals and forebays.

NMFS: Stacy Li inquired as to the kind of electrofishing that would be done in the field.

'NTRIX: Jean Baldrige said that it was just a little 3-pass backpack shocker.

PG&E: Curtis Steitz asked how the reservoirs were going to be sampled.

ENTRIX: Jean Baldrige said that there would be gill netting at the Cow Creek Forebay, fyke netting and electrofishing.

CDFG: Annie Manji asked when the snorkeling would be done and how frequently.

ENTRIX: Jean Baldrige said the snorkeling would be performed in May and June with another survey planned for September.

CDFG: Annie Manji asked if ENTRIX was looking to see if the steelhead were using the reaches.

ENTRIX: Jean Baldrige said that we were going to assume that the steelhead were there since CDFG were going to consider this area of the South Cow to be steelhead habitat whether the fish population studies were successful in identifying the steelhead or not.

CDFG: Annie Manji clarified that PG&E was agreeing that the lower part of the Kilarc reach is potential steelhead habitat because CDFG was considering the area potential steelhead habitat but they were not necessarily assuming that steelhead were currently present.

'NTRIX: Jean Baldrige said that steelhead had been shown to be present historically and even if CDFG was prepared to consider them unlikely to be there, NMFS would like ENTRIX to consider them present.

NMFS: Steve Edmondson said that he had talked to Phil Scordelis about the Olsen Project and he thought Phil might have some documentation of steelhead observed above the Olsen Powerhouse.

ENTRIX: Jean Baldrige said that it did not really matter whether the steelhead were actually there or not because ENTRIX would assume that they were there and would evaluate aquatic areas for appropriate habitat and monitor the water temperature, and address the issue of their presence with the studies.

CDFG: Annie Manji said that she was very interested in this and confirmed that snorkeling was planned for May above and below Whitmore Falls.

ENTRIX: Jean Baldrige asked Annie Manji what the long-term perspective for recovery/restorable goals on the watershed were. Ms. Baldrige wanted to know if CDFG was going to try to get more flow in the lower portion of the watershed.

CDFG: Annie Manji said that she was very pleased that ENTRIX and PG&E were assuming that the area was potential steelhead habitat and CDFG no longer thought it was necessary to put a ladder at Whitmore Falls.

√MFS: Eric Theiss asked where the Olsen Project was in relation to the Kilarc-Cow Project.

CDFG: Annie Manji responded by saying that the Olsen Project was a mile downstream of the Kilarc Powerhouse and there is approximately 3 miles between Whitmore Falls and Olsen. Water is diverted for about a 3-mile reach.

NMFS: Steve Edmondson wondered if anyone from CDFG had been out to evaluate the Olsen fish ladder and when steelhead is expected to be in the watershed.

CDFG: Annie Manji said that the fish ladder was being looked at by Carrie Moore and Mike Barry who were the leads on anadromy issues. CDFG has planned snorkeling surveys for March and April. Steelhead would be expected in the watershed now.

ENTRIX: Jean Baldrige was interested to see CDFG's sample locations.

CDFG: Annie Manji said she would let ENTRIX know. Right now CDFG was planning on surveying above the diversion on South Cow. It was a little late in the season for steelhead and early for spring run Chinook but CDFG was hoping to see something. Annie Manji reiterated how a cooperative effort between ENTRIX and CDFG would be advantageous to both parties.

Action Item: CDFG will provide PG&E/Entrix with sample locations.

ENTRIX: Jean Baldrige agreed.

SWRCB: Carson Cox questioned whether fall run Chinook were expected on the South Cow above the diversion.

ENTRIX: Jean Baldrige said that they were expected, assuming that they can move up the ladder.

SWRCB: Carson Cox asked if the ladder had ever been assessed.

PG&E: Curtis Steitz said it had been assessed after installation and it had been designed for both salmon and steelhead.

ENTRIX: Jean Baldrige added that Chinook would have a hard time getting through Wagner Canyon.

SWRCB: Carson Cox asked where Wagner Canyon was in relation to the Project features.

PG&E: Curtis Steitz responded that it was just above the Powerhouse.

ENTRIX: Jean Baldrige added that it was located downstream of Mill Creek Diversion, upstream of Hooten Gulch in the bypass reach.

SWRCB: Carson Cox inquired as to why Chinook would have a hard time getting through Wagner Canyon. Were there project induced low flows or other causes.

ENTRIX: Jean Baldrige said that the passage barrier study would identify all of those issues.

SWRCB: Carson Cox asked if the study would be conducted when the fish would be moving.

ENTRIX: Jean Baldrige said that ENTRIX had not planned on that. Currently, ENTRIX was planning on doing the passage barrier study during the aquatic habitat studies.

SWRCB: Carson Cox thought that if ENTRIX was looking for fish then they should look for fall-run Chinook as a nice "tie-in".

ENTRIX: Jean Baldrige said that ENTRIX would address the issue from a habitat perspective and assume that they are there so there is no need to look for them. If ENTRIX happens to see them during the studies then the information would obviously be reported but a lot of hours were not going to be spent to document their presence.

CDFG: Annie Manji asked why ENTRIX was planning on doing fish studies since they were assuming the presence of salmonids and anadromous fish species populations.

ENTRIX: Jean Baldrige explained that ENTRIX is trying to get an idea of resident communities and a number of young rainbow or steelhead on the Old Cow side.

SWRCB: Carson Cox read the Fish Population Study Objectives (Study 12 of the FSCD) which states that "the objective of this study is to characterize the distribution and abundance of fish species within the Project Area with emphasis on anadromous and resident salmonids, the target species." Mr. Cox added that ENTRIX really was not intending to determine the abundance if assumptions were going to be made of their presence.

ENTRIX: Jean Baldrige said that they would be looking for salmonids when people are in the field performing other work, but that there were no plans to sample fish during spawning migrations. Ms. Baldrige does not believe that snorkelers would be successful in finding the anadromous fish during high flows.

NMFS: Eric Theiss agreed that Carson Cox had a point and that abundance needed to be evaluated. That the objective of the Fish Population Study was to determine if spring Chinook and steelhead are present or not.

NMFS: Steve Edmondson said that Jean Baldrige had a point in that you were unlikely to see them because they are a listed species. The reason they are listed is because you are unlikely to find them and you have limited survey approaches to try to find them since they are listed.

NMFS: Eric Theiss said that he was not saying it was a necessary element of the study but that it would be interesting to see how much time the effort would take and he is interested to see a more "flushed out" study plan.

ENTRIX: Jean Baldrige said again that ENTRIX was not planning on spending any time finding out the abundance of anadromous species. Whether ENTRIX were to find 0, 50 or 100 fish it would not change the outcome of the project, which basically requires that the area be treated as though the fish are present.

NMFS: Steve Edmondson added that it would be more of a problematic issue for the Project if a lot of time was spent to find the anadromous fish and they were in fact found. If they were found one year and then not the next, as is likely to happen, it would be more of a concern to PG&E.

SWRCB: A. Britt Fecko asked how this approach to the fish population study would lend itself to an impact analysis.

ENTRIX: Jean Baldrige said that the question has to be answered with how the project is affecting potential habitat and that is why a detailed evaluation will be performed around fish screens.

SWRCB: A. Britt Fecko asked if ENTRIX had any intention of doing a redd survey.

'NTRIX: Jean Baldrige said "no".

SWRCB: A. Britt Fecko said that she was not interested in a population study of the redds, more of an indication as to whether there was a project impact.

PG&E: Curtis Steitz said that redds surveys had been done in the past with trapping and aerial surveys and they did not have very much luck.

SWRCB & NMFS: A. Britt Fecko and Eric Theiss agreed that you do not get a lot of information from the air that that ground truthing needed to be done.

PG&E: Curtis Steitz said that he had found exactly the opposite to be true for redds surveys. Mr. Steitz thought that you could see carcasses much better from the air than on land.

SWRCB: A. Britt Fecko said that there was merit in walking and looking for redds.

ENTRIX: Jean Baldrige asked how the information would be used to affect the outcome of the project.

SWRCB: Carson Cox asked if ENTRIX was likely to find some reason as to why Chinook do not get through Wagner Canyon when the passage barrier and habitat studies are conducted.

PG&E: Curtis Steitz said that the flows are low and there is a possibility that they just do not get through.

SWRCB: A. Britt Fecko reiterated that her concern was not with the population study but with the level of impact to the population and how that would be addressed if there was no baseline information.

ENTRIX: Jean Baldrige repeated that studies have been done in the past and she just did not see what the value to the project would be to do it again. ENTRIX would like to focus on what the project effects to the habitat are.

NMFS: Eric Theiss asked if ENTRIX would be assuming that spring Chinook stop at Wagner Canyon.

ENTRIX: Jean Baldrige said that the temperatures in the South Cow are so warm that spring Chinook were more likely to occur in Old Cow but that ENTRIX would evaluate habitat in both streams.

NMFS: Eric Theiss clarified by asking if ENTRIX was assuming that fall and late fall Chinook get past the Canyon.

ENTRIX: Jean Baldrige said that all of the reach would be evaluated to see if there is potential habitat for the species.

SWRCB: Carson Cox asked about the dangers of assuming that the minimum flows in Wagner Canyon were not sufficient enough for salmon to pass. The assumption could be wrong and the minimum flows could be right in the ballpark for the salmon to pass.

ENTRIX: Jean Baldrige reiterated that the habitat evaluation in Wagner Canyon would answer a lot of the questions and that if fall Chinook are not found, it will not mean that they cannot be there.

SWRCB: A. Britt Fecko reiterated her concerns about the hydrology data and impressed upon the participants how necessary it was to have accurate hydrology information.

ENTRIX: Jean Baldrige said that one years worth of data was not going to cure the problem and simulation would still be necessary.

SWRCB: A. Britt Fecko said that she just wanted it to go on the record that the existing information, and what ENTRIX is proposing now, may not be enough.

ENTRIX: Jean Baldrige said that ENTRIX would face those challenges as PG&E went through the relicensing process.

USFWS: Levi Lewis indicated that he was not familiar with the Powers and Orsborn methodology and wondered if it provided a flow relationship.

NMFS: Eric Theiss explained that the methodology was still somewhat subjective but that SWRI had taken it and made it less subjective.

ENTRIX: Jean Baldrige explained that the Powers and Orsborn methodology gives you an assessment of what the passage barrier is like at other flows.

USFWS: Levi Lewis inquired as to whether they actually define a flow.

ENTRIX: Jean Baldrige said that they provide the height of the barrier and the size of the jump pool.

USFWS: Levi Lewis asked if the flow information was ambiguous.

NMFS: Eric Theiss said that it was based on opinion.

ENTRIX: Jean Baldrige said that it was a structured opinion and that if a significant barrier was found the participants would be able to make their own assessments.

SWRCB: A. Britt Fecko asked if it was possible to do a more quantitative analysis at this point.

ENTRIX: Jean Baldrige said that all of the important parameters were being assessed following the guidance of Powers and Orsborn.

USFWS: Levi Lewis questioned the fish sampling methodology and wanted to know why both snorkeling and electrofishing were going to be performed since you could not compare the data collected from one method to the other.

ENTRIX: Jean Baldrige said that the electrofishing gives a better resolution for resident trout in the Old Cow system and that electrofishing was not allowed with listed anadromous species.

SWRCB: A. Britt Fecko thought that Levi Lewis had brought up an excellent point and wondered what the accuracy of snorkeling was and how the information would be interpreted against the electrofishing data.

ENTRIX: Jean Baldrige said that you could snorkel the entire system and still not have comparable data between Old Cow and South Cow because of different habitat types.

USFWS: Levi Lewis asked if there was a way to compare the information obtained via different methodologies that he was not aware of.

ENTRIX: Jean Baldrige stated that the intention was not to compare the electrofishing data to that of the snorkeling. The number of fish per mile was not going to be compared.

NMFS: Steve Edmondson clarified the areas that were going to be snorkeled versus electrofished. Snorkeling would be performed up and down stream of South Cow Creek Diversion

Dam. Electrofishing would be performed up and down stream of Kilarc Diversion Dam and the data obtained from either system would not be compared.

NMFS: Eric Theiss thought that a reach could be snorkeled and then electrofished to rate the individual snorkler, as kind of a calibration.

SWRCB: A. Britt Fecko thought this was a good idea and that CDFG had some good stocking numbers that could help with rating the snorkler.

CDFG: Annie Manji said that they had data like that from the forties, but not really anymore.

SWRCB: A. Britt Fecko said that they were stocking Old Cow up until last year and there might be some information to verify accuracy of the snorkeling surveys.

CDFG: Annie Manji said that she would be happy to share whatever data CDFG had.

SWRCB: A. Britt Fecko asked when Tom Payne had done his study.

CDFG: Annie Manji said that she believed it was in 1984 above the PG&E Project area.

ENTRIX: Jean Baldrige said that she thought that project involved the stocking of juvenile Chinook by Coleman.

SWRCB: A. Britt Fecko said that there was a project referenced in the FSCD.

ENTRIX: Jean Baldrige said it was the Morellie Ranch Project from 1984 on the South Cow Creek, which occurred 5 miles upstream of the South Cow Diversion by Atkins Creek.

OTHER STUDIES

USFWS: Levi Lewis discussed the FSCD response letter prepared by USFWS. Mr. Lewis reassured the participants that Kathy Brown was still on the project and her comments addressed the need for some additional studies for:

- Bald Eagle
- Peregrine Falcon
- Northern Spotted Owl
- Willow Flycatcher
- Adding Pacific Fisher to the list
- Looking at Elderberry Bushes for the VELB

ENTRIX: Jean Baldrige said that she knew Janelle Nolan-Summers and Kathy Brown had met before and that Janelle Nolan- Summers would be contacting her. Janelle Nolan-Summers had left the meeting after lunch because she had another meeting to attend.

SWRCB: Carson Cox and A. Britt Fecko said that they had a question about the Foothill Yellow-legged Frog Surveys.

ENTRIX: Jean Baldrige said that she thought that Janelle Nolan- Summers had discussed this with someone at SWRCB and that PG&E's study had reflected an updated version of the protocol.

SWRCB: Carson Cox said that the copy of the protocol that they had was released May 2002.

ENTRIX & PG&E: Jean Baldrige and Curtis Steitz did not know whether the May 2002 revision was the latest draft.

ACTION ITEM: Get a copy of the latest version of the *Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog* to SWRCB if the protocol has been updated since May 2002. If the protocol has not been updated, check the to see why there is an apparent discrepancy between PG&E's protocol and the standard operating procedures

SWRCB: A. Britt Fecko and Carson Cox were interested to know how many times ENTRIX planned to go out for the amphibian surveys. Carson Cox said that you could get up to four surveys depending on whether you find eggs or not.

'G&E: Curtis Steitz agreed that you could get up to 4 surveys.

SWRCB: Carson Cox asked that this information be clarified in the study plan.

ENTRIX: Jean Baldrige continued with "other studies" and said that PG&E was not going to do an assessment of recreation on private land.

SWRCB: A. Britt Fecko asked if PG&E was consulting with the Cow Creek Watershed Group.

PG&E: Angela Risdon said that they were included in all communications and invited to all of the meetings. Ms. Risdon asked Chip Stalica how many private owners he had to call for access to the Project areas.

PG&E: Chip Stalica said that it was onerous on the Old Cow side, something like 8 or 9, and not so bad on the South Cow side.

CDFG: Annie Manji repeated how important it was for PG&E and CDFG to coordinate efforts because they had to contact all of the private owners for their study purposes as well and multiple calls did not need to be going to the landowners. Annie Manji asked if she could coordinate with Chip Stalica for CDFG's sampling efforts.

PG&E: Angela Risdon thought that was a good idea and that it was always worth calling Chip Stalica if they were planning any field efforts, even just to find out what was going on operationally for safety purposes.

CDFG: Annie Manji asked if there was any plan to evaluate the fish ladder.

ENTRIX: Jean Baldrige said that ENTRIX would be looking at how well the ladder met its performance criteria.

CDFG: Annie Manji asked if the criterion was based on CDFG or NMFS ladder criteria.

ENTRIX: Jean Baldrige said "both".

NMFS: Steve Edmondson said that NMFS did not really have a ladder criterion, just "rules of thumb".

ENTRIX: Jean Baldrige said that ENTRIX was using what they had received from John Mann

NMFS: Steve Edmondson said that even with the information, NMFS would need a fish passage engineer out there to take a look at it.

ENTRIX: Jean Baldrige said that anyone and everyone was welcome and that the participants would be notified when the fieldwork was scheduled.

NMFS: Stacy Li said the sooner that a "dog and pony" show of the Project area was scheduled, the better.

ENTRIX: Jean Baldrige thought that it would be better if there was more water in the system to look at it under different circumstances and make some decisions.

PG&E: Angela Risdon asked if February would be fine with the people who were interested in seeing the Project features and getting an idea of the area. Interested parties should coordinate with Chip Stalica and Curtis Steitz to get the "tour".

ENTRIX: Jean Baldrige said that ENTRIX would generate a schedule for field studies but that it was difficult since some of them are flow dependent. Ms. Baldrige also stated that the information obtained from the programs would also be disseminated.

ACTION ITEM: Generate a schedule of field studies that can be distributed.

USFWS: Levi Lewis said that USFWS was concerned about the 100-feet of dewatered stream reach within the system.

PG&E: Chip Stalica said that it would be costly to revise the system.

USFWS: Levi Lewis said that it was an area that USFWS would be paying particular attention to.

IMFS: Eric Theiss asked where the section was.

ENTRIX: Jean Baldrige said that it was right below the Kilarc Diversion and at low flow the water goes into the canal and comes out of the bypass release downstream from the diversion.

CDFG: Annie Manji wanted to know what the capacity of the diversion canals is.

PG&E: Chip Stalica reported that the canal capacity is 52 cfs, releasing 4 cfs, so you could say 56 cfs.

CDFG: Annie Manji asked if the spill over the dam (versus release) had ever been measured and what the capacity of the spill over is at the point of diversion.

ENTRIX: Jean Baldrige thought there was information on the spill volumes in the work that Dan Kogut and Paul Wisheropp were doing.

PG&E: Curtis Steitz asked Chip Stalica if the added water was due to Canyon Creek.

PG&E: Chip Stalica did not know what the additional water was from but said that PG&E can never exceed their diversion right anyway.

ACTION ITEM: Clarify the spill volumes with Dan Kogut.

SWRCB: Carson Cox asked if the hydrology study would look at the natural variability versus the variability of people turning on and off their diversions, and that it was necessary to look at a natural, unimpaired stream for background information.

ENTRIX: Jean Baldrige explained that during the agricultural season the flows that get to PG&E's diversion are known and the water rights above PG&E are also known. With those numbers known it is possible to add back the other diversions. It is not a perfect system but it gives an idea of what is being taken out of the system upstream of the Project.

SWRCB: A. Britt Fecko asked if Jean Baldrige had the adjudication information for primary and secondary diverters. Jean Baldrige was given a copy of the table that Mr. Fecko had with her. Table was missing the even numbered pages.

PG&E: Chip Stalica added that a conservative approach was good and there is a fair chance that people are over diverting. A question to ask is how to handle two parts of the year on unimpaired flows.

ENTRIX: Jean Baldrige asked if there were any additional questions or comments and closed the meeting.

Meeting Adjourned at 3:15 p.m.

ACTION ITEMS

ACTION ITEM: Steve Edmondson of NMFS to provide an outline of NMFS's resource management goals and objectives.

ACTION ITEM: Present the simulated hydrograph information to the Agencies.

ACTION ITEM: Generate a detailed Stream Flow Monitoring gaging plan in consultation with the Agencies.

ACTION ITEM: Mitchell Katzel is to provide additional information on bed load, evaluation of bank erosion, spawning gravels, and channel sedimentation when developing the study plan.

ACTION ITEM: Schedule a trip to the Project area with stakeholders to review and assist with transect selection before flows change.

ACTION ITEM: Provide Agencies with a detailed approach and methodology for the Instream Flow Study.

ACTION ITEM: Set up a site visit for new project participants and other interested individuals prior to scheduling the transect selection.

ACTION ITEM: CDFG to send a map with the areas that have already been surveyed by CDFG, with pictures and coordinates of the absolute barrier. Fieldwork is to be coordinated between ENTRIX and CDFG to avoid duplication of effort.

Action Item: CDFG will provide PG&E/Entrix with sample locations.

ACTION ITEM: Get a copy of the latest version of the *Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog* to SWRCB if the protocol has been updated since May 2002. If the protocol has not been updated, check the to see why there is an apparent discrepancy between PG&E's protocol and the standard operating procedures (i.e., listed two versus three site visits).

ACTION ITEM: Generate a schedule of field studies that can be distributed.

ACTION ITEM: Clarify the spill over volume with Dan Kogut.

cc: Angela Risdon, PG&E
Eric Theiss, NMFS
A. Britt Fecko, SWRCB
Levi Lewis, USFWS (replace Levi's name whoever at FWS is handling this project.
Annie Manji, CDFG

Attachment H

Meeting notes from December 5, 2003

ENTRIX
Environmental Consultants

December 5, 2003
MEETING MINUTES
KILARC-COW CREEK PROJECT

Meeting between NOAA National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), ENTRIX, and Pacific Gas and Electric (PG&E).

Location: The meeting was located at the Sacramento ENTRIX office.
7919 Folsom Boulevard, Suite 100
Sacramento, California 95826

Attendees:

National Marine Fisheries Service
Howard Brown – NMFS Biologist
Dave White – NMFS Fish Passage Engineer (joined by conference call)

California Department of Fish and Game
Mike Berry – CDFG Fisheries Biologist
Annie Manji – CDFG FERC Coordinator (joined by conference call)
Steve Baumgartner – CDFG Fisheries Biologist (joined by conference call)

United States Fish and Wildlife Service
Kathy Brown – USFWS Biologist

Pacific Gas and Electric Company
Angela Risdon – PG&E Project Manager
Steve Nevares – PG&E Project Manager
Curtis Steitz – PG&E Biologist
Bob Folsom – PG&E Hydrographer
Dan Kogut – PG&E Hydrographer
Brian Frantz – PG&E Biologist

ENTRIX, Inc.
Jean Baldrige – ENTRIX Project Manager
Tracy MacMillan – ENTRIX Assistant Project Manager
Larry Wise – ENTRIX Project Fisheries Biologist
Mitchell Katzel – ENTRIX Project Geomorphologist
Kathy Frye – ENTRIX Project Wildlife Biologist
Sean Barry – ENTRIX Project Herpetologist
Paul Wisheropp – ENTRIX Project Hydrologist

Purpose: To review the Kilarc-Cow Creek Hydro Relicensing Project and study plans; directly addressing issues raised in agency correspondence to the First Stage Consultation Document (FSCD).

Meeting Agenda (Attachment 1) was distributed and the meeting commenced at 9:30 a.m.

INTRODUCTIONS and PROJECT OVERVIEW

PG&E: Angela Risdon kicked off the meeting by introducing herself. Meeting participants were introduced to one another and Ms. Risdon proceeded with an overview of the PowerPoint presentation (Attachment 2) and discussion topics:

- Discussion # 1 - Hydrology Information which includes Studies 1 & 2.
- Discussion #2 - Water Quality and Temperature, which includes Studies 3 & 4.
- Discussion # 3 - Sediment, which is Study 5.
- Discussion # 4 - All of the aquatic resources, which includes Studies 9 through 15.
- Discussion #5 - Botanical Resources, which are Studies 6 through 8.
- Discussion #6 - Wildlife Resources, which include Studies 16 through 20.
- Discussion # 7 - Cultural & Recreational Resources, which are Studies 21 through 28.

Ms. Risdon provided a brief project overview reminding attendees that the project has two main drainages (Base Map of Project Area was displayed): (1) the Old Cow Creek side which has North Canyon Creek and South Canyon Creek Diversions with Toscher Diversion also diverting at the South Canyon Creek into the main Kilarc Canal. There is also the Kilarc Cow Diversion, the Forebay and the Powerhouse. Downstream on that project there is the Olsen project, which is a small power facility downstream, and then Whitmore falls is located on that bypass reach; and (2) the other side is what PG&E refers to as the South Cow Creek portion of the project. There is a non-project feature upstream on South Cow Creek called German Ditch. PG&E take water from both South Cow Creek at the Cow Creek Diversion Dam and from Mill Creek. The water comes across and discharges into South Cow Creek. The water is then picked up by the Cow Creek Diversion Dam and is sent through the South Cow Creek Canal and goes into Kilarc Cow Creek Forebay. Once through the Powerhouse, the water is taken back out to the South Cow Creek via a drainage ditch, which PG&E refers to as Hooten Gulch. So a portion of Hooten Gulch would be one of the project features. There is also a diversion for Wild Oak Power and Agricultural purposes on Hooten Gulch, and at the bottom of that drainage ditch you have the Abbott drainage.

Ms. Risdon reminded attendees that the Kilarc-Cow Creek Hydroelectric Project is a very small facility, under 5 Megawatts. PG&E are following a different set of FERC regulations for facilities under 5 Megawatts, which allows PG&E a little bit more flexibility in the rigors of relicensing. PG&E has focused their energy and efforts on those areas that are of primary concern versus those that are not particularly important to this project, such as recreation.

Ms. Risdon concluded her discussion and turned the meeting over to Jean Baldrige to present the PowerPoint presentation.

ENTRIX: Jean Baldrige asked if there were questions on how the project operates or where the water goes? Ms. Baldrige explained that Paul Wisheropp was going to talk a little bit more about water issues during his presentation on Hydrology.

Ms. Baldrige reiterated that the project is small and that there are really two facilities: one on South Cow and one on Kilarc (Old Cow). She also noted that an interesting feature to the project is the lack of public lands. Everything is privately owned within the Project Area since PG&E disposed of or sold their property a few years ago. This has presented some unique circumstances related to this relicensing.

DISCUSSION 1: ESTIMATING AND MONITORING FLOW (Studies 1 and 2)

ENTRIX: (Following the PowerPoint Presentation) Paul Wisheropp explained that the purpose of his task was to come up with estimates of available flow in South Cow Creek and Old Cow Creek at the Diversion Dams. The purpose of this was to be able to allow other task leaders such as Mitchell Katzel (Geomorphology) and Larry Wise (Fisheries) to be able to understand the project influences. Paul's task estimated the available flow over a long hydrologic record. Also, PG&E had an objective of collecting some data that could be used to validate this process.

The approach Mr. Wisheropp took is one recommended by the State Board when estimating available flow and that is an approach of unit runoff in the watershed. Mr. Wisheropp reviewed many data sources that were available, starting out with USGS records and also PG&E flow records in the watershed. He also looked at the water rights decision that was issued many years ago for Cal Creek South Cal, and the other tributaries in the Project Vicinity, such that he could identify on the USGS quad map where the different diversions were in the watershed. All of the diversions in the watershed, bought for agriculture and pasture irrigation, are unmeasured diversions. And so, there is no data on those diversions. Mr. Wisheropp went through a large exercise with the water rights information and tried to estimate, based on water rights, where there are diversions in the watershed. Those diversions are all aggregated. Mr. Wisheropp also looked at records from DWR in Red Bluff relative to the land use. There was information regarding how water is being used in the watershed. From those data, Mr. Wisheropp developed a spreadsheet model that uses the State Board recommended approach of flow per unit area. Basically, the approach attempts to back out the diversions and potential return flows from irrigated agriculture to come out with a flow per unit area that is then applied upstream of the watershed to points of diversion, yielding an estimated flow upstream of the Kilarc and Cow Creek Diversions. The next step was to collect some data to start validating the model. PG&E went out this year (2003) starting in April and monitored a flow at two different locations. This is in addition to canal flow that PG&E monitored. One of the new monitoring locations was

on Old Cow Creek upstream of the Kilarc Powerhouse. The second location is at the Diversion Dam on South Cow Creek and that measures spill over the dam.

PG&E: Dan Kogut pointed out that in addition to the new transducer monitoring locations, there are some existing sites being monitored by PG&E.

ENTRIX: Paul Wisheropp continued with Mr. Kogut's point explaining that at both locations (Old Cow and South Cow Creek Diversions) water is diverted and a portion of it is immediately returned to the river for the minimum instream flow release. PG&E monitor that data. Also, at each of the forebays PG&E has the potential to spill back to the river and that is another monitored flow. So there are different monitoring stations throughout. But then there are also elements of the system, such as the Canyon Creeks and German Ditch that are not monitored. So these (indicating diagrams presented in PowerPoint presentation) are actual measured flow values starting about April 23, 2003 and those data are continuing to be collected.

PG&E: Dan Kogut commented that monitoring would continue throughout the winter and into next year so that the model could be continually calibrated.

ENTRIX: Paul Wisheropp added that PG&E (Dan Kogut and Bob Folsom particularly) made quite an effort to get a gage upstream of the Kilarc diversion and finally, concluded that it just wasn't possible to monitor accurately at that location. Cow Creek is a very steep channel, high gradient stream with a lot of boulders and very turbulent flow.

PG&E: Dan Kogut explained that he had also gone above the Kilarc Diversion on Old Cow with a USGS representative to see if they could provide some guidance on methodologies for an attempt to gage up there and they could not provide any recommendations. In fact, they mentioned that back when the project was being licensed, the reason a Weir Box was placed out there is because Old Cow Creek could not be adequately gaged to meet anybody's standard.

ENTRIX: Paul Wisheropp elaborated on the point that since data for a real direct one on one comparison between the modeled flows upstream of the diversion and the actual major flows was not possible, the flows were reconstructed upstream of the diversion (shown on the graph). Mr. Wisheropp identified the modeled flow versus the 2003 data representations.

Mr. Wisheropp concluded that he believed that the model provides a reasonable estimate, especially in the lower flow months.

ENTRIX: Jean Baldrige asked if the graphs were showing monthly flows.

ENTRIX: Paul Wisheropp responded "Yes", that the model was based on average monthly flows.

CDFG: Annie Manji asked if statistical analysis had been, or could be, performed on the model to continually refine the model and its estimates.

ENTRIX: Paul Wisheropp stated that there was not enough data at this point to perform a statistical analysis with any type of confidence. As Dan Kogut mentioned, PG&E is continuing to collect the data and ENTRIX will continue to evaluate the model based on the new data collected through time. But right now it's just limited records - April through September - five months, five data points.

CDFG: Annie Manji asked if a statistical analysis could be performed on the existing data information to any degree of reliability or if it was something that ENTRIX was planning on doing in the near future.

ENTRIX: Jean Baldrige stated that there may be some information that can pulled from the analysis allowing ENTRIX to fine tune the modeling efforts and that is what ENTRIX will be striving for.

ENTRIX: Paul Wisheropp said that he could not answer Ms. Manji's question at this point on how much of a statistical analysis ENTRIX can perform on it. The flows are truly estimates - whether it's the measured numbers or the calculated numbers in the model. Since the numbers are estimates, Mr. Wisheropp is not sure how may data points it would take to get a real accurate statistical comparison. The answer to the question is that ENTRIX will continue to refine the model and discuss its applications with Mr. Katzel and others who are using the model results to come up with better estimates.

ENTRIX: Jean Baldrige explained that the hydrology information available gives a pretty good idea about the summer flow coming into the diversion, because the diversion has the opportunity to capture most of that summer time flow. There is less information for the wet period when there are spawning and passage issues. That's where the model is going to be important to help us understand what the hydrology is in the Project Area when the flows exceed the capacity of the diversion of that reach. To reconstruct the hydrology we would be taking the best available information from each part of the simulation in PG&E's records to put the picture together.

CDFG: Annie Manji asked Dan Kogut if it was Mike Friebel from the USGS that had accompanied him to evaluate gaging opportunities on Old Cow.

PG&E: Dan Kogut said "Yes". Mr. Kogut continued to respond to Ms. Manji by stating that he thought her concern regarding statistical analysis was legitimate, especially when models are used by themselves. However, with this effort, PG&E are not resting on the model alone and they plan to continuously calibrate it to further define it.

ENTRIX: Paul Wisheropp asked that everyone also keep in mind the application of the model, which is for resource topics such as geomorphology. How Mitchell Katzel and others use the data is the important issue.

As far as the results of Studies 1 & 2, ENTRIX developed the model and then tested calibration of the model based on the April through September data set. Also, new sampling locations have been established in the Project Area to monitor flows and that is ongoing. The sampling locations will be very useful in not only updating or validating the model, but also for just monitoring what's happening in the system.

DISCUSSION 2: WATER TEMPERATURE AND WATER QUALITY (Studies 3 and 4)

ENTRIX: Jean Baldrige asked if there were any questions or additional discussion regarding the hydrology information.

Ms. Baldrige continued with the presentation information. The next discussion is on water quality and water temperature. Brian Frantz from PG&E did a lot of the data collection and today we are going to summarize some of the objectives and results. For the water quality section we were really looking to determine what water quality conditions were out there, what constituents were found in the area upstream and downstream of the diversions and some of the Project Facilities. We also wanted to match those up against the Basin Plan and EPA guidelines to see where those constituents fell within the Project Area.

The purpose for the water quality collection stations was that the locations would allow PG&E/ENTRIX to look at Project Operations. So PG&E sampled above and below diversion facilities and tailraces for powerhouses and also we sampled within the impoundments themselves, the forebays. So we had 12 stations where we collected water quality information. We also had some additional stations where we were collecting some *in situ* measurements. We looked at 19 different organic and inorganic constituents through water quality laboratory analysis. Our structure is really sampling in the spring and then again in the fall for the water quality parameters. At the i*n situ* water quality sampling stations we also took a look at temperature, dissolved oxygen, pH, turbidity with a HydroLab and Brain Frantz was out there collecting this information at a number of locations so that we could better understand how that worked within the system. In the water quality results we were a little concerned about coliform levels since that has been an issue in an number of streams and we did find that we had a few sites where we exceeded the criteria. There is cattle grazing upstream of a couple of the sampling sites above the diversion, which we believe to have contributed to the exceedances. There are also a couple of stations that exceeded the pH levels. Between the Basin Plan and the EPA we had different guidelines between what the high level pH is. The Basin Plan is 8.5 and the EPA is 9. The EPA guidelines were not exceeded, but there were three locations that had a pH higher than the Basin Plan's 8.5 in August. Those measurements were collected in: (1) South Cow, SC4 is downstream near the Powerhouse, (2) Hooten Gulch, HG1 is downstream of the Wild Oak Diversion, and (3) is the Kilarc Forebay – KF1.

PG&E didn't have a lot of information on water temperature but there was some original work that was done under the previous relicensing studies, so we were able to look at what water temperatures were coming into the Project. We knew that South Cow was a

fairly open drainage and we were expecting high temperatures. Old Cow is a little better shaded and also has some spring flows so we were expecting cooler temperatures there. A number of temperature monitoring locations were set up with the same strategy as the water quality monitoring - to look up and downstream of the diversions, tailraces and forebays. Water temperatures were recorded every 20 minutes and the information was summarized to look at the mean daily temperatures for the stations. When you look at the maximum and minimum temperatures (PowerPoint Presentation) from May through September – you can look at Old Cow 1, 2, 3 and 4 as you are going down the system, you can see that those water temperatures remain relatively cool – below the 20 degree C level in Old Cow throughout the entire system.

NMFS: Howard Brown asked if the temperatures shown were the maximum and minimum daily averages?

ENTRIX: Jean Baldrige confirmed that they were the averages. The other thing that you'll see a little better when the graphs are up (PowerPoint presentation) is that there are fairly constant temperatures in Old Cow. There is not a lot of variation up and down as you go through the summer period, which is probably related to the fact that it is a steeper system and there is spring flow.

CDFG: Annie Manji asked for clarification of the water temperature information and whether it was an average value was presented for both the minimum and maximum temperatures.

ENTRIX: Jean Baldrige responded that PG&E summarized water temperatures into the mean daily values and that is what is presented.

Ms. Baldrige noted that the water temperature warms slightly on Old Cow as the water moved down through the stations, but the degree of warming is not very significant. The graph compared the water temperature to air temperature data and stream flow data. The water temperature does seem to respond somewhat to air temperature, but there is a much greater response in the South Cow stations.
On South Cow we have warmer temperatures coming into the diversion which is what we had anticipated. One of the interesting things that we found is that Mill Creek has a cooling influence on South Cow Creek. Where Mill Creek water comes into South Cow Creek, there is a slight depression of maximum daily temperature. Downstream from there, water temperatures warm.

CDFG: Mike Berry asked for clarification on the cooling effect of Mill Creek since monitoring station SC3 states that it is located in South Cow Creek above the confluence with Mill Creek.

PG&E: Brian Frantz clarified that the monitoring location is below the Mill Creek Diversion – so you're getting the Mill Creek water but the monitoring site is actually above the confluence with Mill Creek itself (reference schematic).

*ENTRIX***:** Jean Baldrige continued with the presentation illustrating the comparison between water temperature, air temperature and stream flow on South Cow Creek, indicating that it is much warmer than the Old Cow Creek system.

CDFG: Mike Berry asked if the bypass flow in South Cow Creek was 5 cfs?

*ENTRIX***:** Jean Baldrige stated that the bypass flow in South Cow Creek is 4 cfs and 2 cfs in Old Cow Creek. She indicated that the anomaly on the flow line was related to the water releases performed by PG&E during the instream flow surveys.

The water temperature monitoring found cooler temperatures in Old Cow. South Cow water temperatures were consistently greater than 20 degrees upstream of the diversion and then further warming as water travels through the bypass reach.

NMFS: Howard Brown asked if data was collected in any way that would allow PG&E to see whether temperature increases through the forebays.

*ENTRIX***:** Jean Baldrige explained that with the way the project operates, the temperature monitoring was focused on the effects of the bypass reaches. The forebays are very small. Additionally water temperatures below the confluence with Hooten Gulch, which is where the tailrace water discharge shows there is not a lot of cooling associated with that water. The sampling points indicate that the forebays have a negligible impact on the water temperature.

CDFG: Annie Manji asked if PG&E had monitored temperatures in the actual canals themselves.

*ENTRIX***:** Jean Baldrige responded "No". We monitored the water temperatures going into the canals and then we monitored temperatures in the forebays but we do not have temperatures at the end of the canal.

CDFG: Annie Manji was interested to see a thermal mass comparison of the water data**.**

ENTRIX: Jean Baldrige said that the temperatures in Hooten Gulch could be evaluated to provide the information that Ms. Manji was requesting.

PG&E: Brian Frantz stated that Hooten Gulch temperature data is very similar to SC5.

DISCUSSION 3: SEDIMENT AND CHANNEL STABILITY (Study 5)

ENTRIX: Mitchell Katzel reviewed the objectives and methodologies associated with the sediment and channel stability analysis that he performed. He explained that he had relied heavily on the background information provided in the Watershed Assessment report prepared by SHN Consultants in 2001.

CDFG: Annie Manji asked for the document reference again.

ENTRIX: Mitchell Katzel replied: SHN, Consulting Engineers and Geologists, Inc., 2001. Cow Creek Watershed Assessment. Mr. Katzel continued with the presentation discussing the areas that were focused on during the field studies. Some additional work was done to further evaluate the hydrology, specifically looking at how possible changes in streamflow affect sediment transfer. In addition, Mr. Katzel reviewed PG&E's sediment and maintenance practices.

Two types of channel classification were evaluated in the field: (1) the Rosgen Classification type, and (2) the Montgomery-Buffington classification. The methods are similar but different. The Montgomery-Buffington classification focuses a lot on the channel form to look at stream processes. Sediment sources were also evaluated. Landslides and bank erosion areas were tracked. Bank stability ratings were ranked high, moderate, and low. Then tributary confluence deposits were recorded to see if there was sediment build-up.

CDFG: Annie Manji asked if pebble counts had been done?

ENTRIX: Mitchell Katzel responded "No". Pebble counts were not done but under the Rosgen Classification type the dominant particle size was classified.

CDFG: Annie Manji wanted to know the methodology for classifying dominant particle size.

ENTRIX: Mitchell Katzel said that it was a visual estimate. Mr. Katzel continued with the discussion of the channel classification results. Old Cow Creek is boulder dominated, generally high gradient – between 5 to 6% grade. Above the diversion on Old Cow Creek it's even higher – almost 10%. It is a B-channel type which means that it has a moderate entrenchment, a moderate width to depth ratio, and tends to have very limited floodplain development. This is a supply-limited sediment transport system, which does not mean that there is not a lot of sediment. In fact there is a good amount of sediment in Old Cow Creek. But the relative capacity of the channel to move that sediment is much greater than the amount of sediment being supplied to the channel overall. The B-channel and cascade/step-pool bedform channel types are typically morphologically resilient to changes in flow and sediment regime. You can do a lot to those channels and you tend not to see a big change. It doesn't mean that there's no change at all, but you tend not to see those sorts of changes in those channel types.

South Cow Creek is also a B-channel type. The interesting thing about South Cow Creek is for about the first mile and a half below the diversion it's a little bit lower gradient than just about anywhere else in the Project system. It's about 1.5% grade and it's a plane-bed to step-pool bedform. This is an intermediate type in the Montgomery-Buffington classification scheme between step pool and plane bed. Both forms tend to be relatively resistant to changes in morphology and resilient to changes in flow and sediment regime. The lower gradient section, the 1.5 mile reach, is probably the most responsive to changes in flow and sediment. Still it is characterized as supply-limited sediment transport capacity. You can poor a lot of sediment in and it still has quite a bit of capacity to move that sediment. Once you get below river mile 1.5 to about 3.8 it tends

to be boulder and cobble dominated so it's a little bit larger bed material and it's higher gradient of the B-channel form. Again, it becomes a cascade step-pool bedform with the same characteristics as Old Cow Creek.

Hooten Gulch above and below the powerhouse is more of a cobble to gravel dominated plane-bed to pool-riffle bedform below the powerhouse. The pool-riffle bedform is probably the most responsive to potential changes in flow and sediment regime of all the bedform types. It's considered transitional in terms of its capacity to carry sediments. So unlike the supply-limited channels, if you poor enough sediment into the pool-riffle bedform, you can see responses and changes in the channel. It's relatively more responsive to changes in flow and sediment regime than any of the other project reaches.

ENTRIX: Jean Baldrige commented that Hooten Gulch comes in upstream of the tailrace water.

ENTRIX: Mitchell Katzel continued with the presentation referencing tables in the Resource Report for additional information.

ENTRIX: Jean Baldrige clarified that the meeting/presentation objective was to provide the Agencies with preliminary information about topics that they had expressed an interest in previously. There are much more detailed reports that will be coming out that will allow the Agencies to get into these topics in much greater detail than the information provided in the Status Report. The intent of the status report was to present some preliminary results.

PG&E: Angela Risdon expounded on Jean Baldrige's comment that the meeting was also an opportunity for the Agencies to raise concerns about the data, approach, or methodologies used.

ENTRIX: Mitchell Katzel continued with the presentation, discussing bank stability results. Overall, South Cow Creek had a very high bank stability. Old Cow Creek had a moderate to low bank stability. There is a section of Old Cow Creek starting about 9/10 of a mile below the diversion to about 2.5 miles below the diversion where there were some significant landslides. Most of the landslides were a function of the geology of the region.

NMFS: Howard Brown asked what the geology of the region was?

ENTRIX: Mitchell Katzel responded that the lower portion is sandstone and there is a layer of tuff from volcanic activity. The sandstone portion is the one that is really weak.

Hooten Gulch had a moderate bank stability rating. There was one relatively small slide observed near the powerhouse. Above the powerhouse, Hooten Gulch received a low to moderate bank stability rating because there were some significant slides occurring. So there are recruitment areas for sediment.

In terms of sediment storage, this is where ENTRIX characterized the amount of sediment, fine sediment that is easily available for transport in pools and in bars. Overall there was limited sediment storage found which was somewhat surprising considering the amount of recruitment from the landslide activities. Looked at nearly 100 pools between all of the stream reaches and on average there was approximately 12% of the bed surface area of all pools measured were comprised of fine sediment. That meant that 88% of the pool area was comprised of non-fine sediment material, that was predominantly boulders, sometimes cobble size material, and bedrock. So a very limited area of pools actually held fine sediment at all. Average thickness of pool fine sediment was 0.6 inches or less. Overall, fine sediment has almost no influence on residual pool volume. Residual pool volume being the volume you would have in the pool if the fine sediment was removed. There would be very little difference because you have very little fine sediment.

NMFS: Howard Brown asked for further clarification of the methodology used to evaluate fine sediment in the pools. Did you look at the pool and estimate the surface area covered by fine sediment and then measure depth to get an idea of the volume?

ENTRIX: Mitchell Katzel responded "Yes". It was an approach to identify overall sediment deposition.

NMFS: Howard Brown said it sounded like a good approach for covering a large area.

ENTRIX: Jean Baldrige asked if Mitchell Katzel noticed any difference between lower gradient and higher gradient areas.

ENTRIX: Mitchell Katzel responded "No".

NMFS: Howard Brown asked if there were any areas where volumetric analysis had been completed?

ENTRIX: Mitchell Katzel responded "No". That would have been a V-Star measurement, which is what ENTRIX would have done if a moderate to excessive amount of fine sediment had been observed, but our initial analysis did not warrant it.

Mitchell Katzel continued with presentation. Hooten Gulch had greater amounts of fine sediment in pools than either South Cow or Old Cow Creeks. By comparison, 56% of the pool bed surface was occupied by fine sediment versus the 12% in South and Old Cow Creeks. Significant active landslides above the powerhouse in Hooten Gulch could account for the amount of sediment in the area. So it may be a natural condition and not necessarily influenced by the powerhouse. In fact, if you think about it, the powerhouse is adding water so it would help flush the sediment.

ENTRIX: Jean Baldrige added that there are cattle grazing and logging activities in the Project Area.

ENTRIX: Mitchell Katzel continued with presentation, discussing sediment maintenance practices. The canals are very low gradient and therefore have a limited transport capacity. If sediment was being deposited into the canals it would be evident.

CDFG: Mike Berry asked what the flow capacity of the two canals is?

ENTRIX: Mitchell Katzel said that the flow capacity is 45 to 50 cfs for each canal.

Mitchell Katzel concluded that given what we know about maintenance practices and the amount of gravel observed, there is not much gravel getting into the canals to represent any kind of loss of gravel from the stream system.

In terms of the capacity of the streams to move flows, we focused on the sediment transport flows. Specifically, looking at flows at or near the bankfull discharge. We look at those flows because those are geomorphically significant. Flows less than the bankfull discharge tend not to move sediment, so they are important in terms of habitat but they are not important in terms of the ability to form and maintain the channel, they have little influence on channel morphology. We wanted to know what the magnitude of flows would be to move sediment. We had to do some flow extension techniques because the record is not very long near the project diversions. ENTRIX looked at the gage with the longest period of record in Old Cow (50 some years of data) and made a mathematical relationship between that and the South Cow Creek gage where they overlap (16 years of data in South Cow Creek) to come up with a reasonably good correspondence, getting an idea of the major flows at the 1.5 year flow to transport sediment. The 1.5-year flow on South Cow Creek works out to greater than 2,000 cfs. The 1.5-year flow on Old Cow Creek works out to greater than 1,000 cfs. These numbers might not be exact but that's fine since we wanted to get an idea of the range. When you look at the magnitude of flows required and the capacity of the canals which is about 50 cfs, you're looking at a possible 2.5 to 4.8% reduction of flow by the diversions (assuming operation). These are not very significant changes. When you look at everything together, you see that there is actually very little change and the channels are very resilient.

ENTRIX: Jean Baldrige asked if there were any other questions for Mitchell Katzel.

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CDFG: Annie Manji asked how long the 1.5 year bankfull flow needs to be maintained to flush sediments?

ENTRIX: Mitchell Katzel replied that there is no specific formula for that. It is a good question and a hard one to answer and different researchers have different amounts of time.

CDFG: Annie Manji asked how long do you estimate that there was 2,000 cfs going through South Cow?

ENTRIX: Mitchell Katzel said that he did not look at the number of days on average where the channels had bankfull flows or greater. Whatever it is, the amount of diversion that is

being taken (the 50-cfs) would not change the number of days you would expect to get bankfull flows. Basically, the project has no effect on bankfull flows.

CDFG: Annie Manji asked PG&E if there was any consideration to increasing the capacity of the diversions.

PG&E: Angela Risdon said "No".

PG&E: Dan Kogut said that there were water rights associated with the diversion capacity and these were not going to change. The watershed is adjudicated for the most part and there really is not an opportunity to acquire more water.

ENTRIX: Jean Baldrige asked if there were any more comments or questions before releasing the group for a 15-minute break.

BREAK

DISCUSSION 4: AQUATIC RESOURCES (Studies 9 through 15)

ENTRIX: Jean Baldrige resumed the meeting and introduced the next discussion topic. Aquatic resources include a number of different studies that were focused on evaluating aquatic resources and they have been combined for discussion purposes. Larry Wise, the task leader for the aquatic resource section, will walk through the results of those studies. Some of these studies are still in progress. As we move forward we will let the Agencies know the status of those studies.

ENTRIX: Larry Wise first started talking about the aquatic habitat inventory objectives and methodologies.

CDFG: Annie Manji asked what the flows were during the habitat evaluation?

ENTRIX: Larry Wise said that the information would be provided in the next slide. Larry Wise continued with the presentation explaining that Old Cow Creek had been considered one reach with mapping flows that varied from 5 to 60 cfs depending on the timing. The data will be looked at for overlap to see how much variability there is based on flow level.

ENTRIX: Jean Baldrige asked if we have mapped everything at the base flows?

ENTRIX: Larry Wise responded "Yes".

CDFG: Mike Berry asked if the entire Old Cow Creek was one reach within the diverted section?

ENTRIX: Larry Wise responded "Yes". The entire diverted section was defined as a single reach since it had a similar gradient throughout.

CDFG: Mike Berry asked if there were any comparisons done to the undiverted section?

ENTRIX: Larry Wise said "No". Larry Wise continued with the presentation. The habitat is really divided equally between pools, riffles and runs. South Cow Creek was divided into two reaches and mapping flows varied between 6 to 40 cfs. The two reaches differed somewhat in the quantity of cascades.

CDFG: Mike Berry asked if the evaluation of South Cow was also limited to the diverted reach?

ENTRIX: Larry Wise confirmed that the habitat inventory was performed solely for the diverted reach.

ENTRIX: Jean Baldrige said that the focal point was to understand the habitat in the diverted reaches and use that as the basis for some of the studies that were conducted.

NMFS: Howard Brown asked where Wagoner Canyon is on the schematic?

ENTRIX: Larry Wise said it was located in the lower portion of South Cow Creek, approximately 1.5 miles downstream of the South Cow Creek Diversion.

Larry Wise continued with the presentation, discussing the evaluation of spawning gravels. The quality of spawning gravels were assessed within the channel in relation to their embeddedness, fine sediments, where they were located in the channel, how compacted they were, and how homogeneous the areas were. Old Cow Creek had poor to fair spawning gravels with an area of 1,279 square feet per mile for rainbow trout, 2,941 sq.ft./mile for steelhead , and 3,279 sq.ft./mile for Chinook salmon. South Cow Creek had primarily good quality spawning gravel with an area of 301 sq.ft./mile for rainbow trout, 616 sq.ft./mile for steelhead, and 621 sq.ft./mile for Chinook salmon.

CDFG: Mike Berry asked if perched gravel beds were evaluated?

ENTRIX: Larry Wise said that perched gravel beds were evaluated.

CDFG: Mike Berry asked if the numbers included the perched gravel?

ENTRIX: Larry Wise responded "Yes".

ENTRIX: Jean Baldrige stated that what we don't know is what kinds of depths and velocities we would have over the perched gravels, but the square feet are incorporated.

CDFG: Mike Berry asked how the widths were measured if the flow height was unknown?

ENTRIX: Larry Wise stated that there are no floodplains in the area so anything 3-feet above the waterline would not be considered available.

CDFG: Mike Berry confirmed that the criterion used was whatever was 3-feet above the waterline was not included.

ENTRIX: Larry Wise said "Yes".

PG&E: Curtis Steitz commented that it was fairly apparent when out in the field as to what to include and what not to.

CDFG: Annie Manji asked if the methodologies were going to be outlined and provided?

ENTRIX: Larry Wise informed the attendees that all of that information will be provided in the habitat inventory report.

CDFG: Annie Manji asked if the habitat inventory information was incorporated into the IFIM models and given to the transect selection team?

ENTRIX: Larry Wise said the information was incorporated in some areas but it was not a specific criteria for the placement of transects because specific spawning transects were not established.

NMFS: Howard Brown asked if there was any additional information/explanation on the criteria used for evaluating the spawning gravels?

ENTRIX: Larry Wise said that there were some criteria that would be presented in the report, but that the evaluation of gravels suitable for spawning was based primarily on professional judgement Larry Wise wrapped up the habitat inventory discussion and started on the passage barrier information. ENTRIX identified 14 potential barriers on Old Cow Creek with four of them considered to be impassable.

PG&E: Curtis Steitz asked if the four barriers were considered low flow barriers?

ENTRIX: Larry Wise said that the falls were considered impassable at all flows but the South Cow Creek Diversion dam and other two barriers were probably passable at higher flows.

NMFS: Howard Brown asked how the information was incorporated to determine the flows that rendered the barriers passable versus impassable?

ENTRIX: Larry Wise said that ENTRIX was still in the process of collecting some of the data to do that. The height and complexities of the barriers have been measured.

NMFS: Howard Brown asked if ENTRIX planned on putting together any profiles that would overlay the water stage elevations and flow that would give the Agencies a more quantitative sense of the fish passage?

ENTRIX: Larry Wise said that that was the planned approach.

ENTRIX: Jean Baldrige said that some of the passage barriers need to be re-evaluated at higher flows.

CDFG: Mike Berry asked if ENTRIX would be making a determination on what flow they become passable.

ENTRIX: Jean Baldrige said that ENTRIX's goal was to determine the range of flows where the barrier obstructed passage, depending on the flows present in the streams when the assessments were made.

ACTION ITEM: Evaluate the passage barriers under higher flows to assess the flows at which the lower flow barriers become passable.

CDFG: Steve Baumgartner wanted to know if there would be an announcement of when ENTRIX planned to go out and look at the passage barriers during higher flows?

ENTRIX: Jean Baldrige said "Yes" and asked if Steve Baumgartner would like to go with the field team.

CDFG: Steve Baumgartner said "Yes".

CDFG: Annie Manji wanted a definition for "complete barriers" because it sounds as though the barriers are only "complete" at low flows.

ENTRIX: Larry Wise said that the one barrier that he believes to be a barrier at any flow is the single falls on Old Cow (upstream of the Kilarc Powerhouse). The other ones are probably passable at higher flows but the team needs to go out and look at that more quantitatively. "Complete" in this context really refers to lower flows.

ENTRIX: When we get our dates together, we'll be happy to notify everyone about when the flows get up to a more sustained level that we can go out and have another look at the barriers. But the goal really is to identify barriers that are significant problems at low flow and we need to go out and see if those barriers become passage at higher flow, or we leave them in the category of complete barrier at all times. That is what we're attempting to do when we go out at the higher flows. Some of the other barriers that we've identified that are partial barriers, we know that at higher flows those are going to become passable and we'll be checking in on those to see at what flow level they become passable.

ACTION ITEM: Inform Agency personnel of field monitoring dates for additional evaluation of the passage barriers.

NMFS: Howard Brown commented that the language used for the barriers is raising a red flag. It sounds as if the barriers have been classified as a complete barrier unless other information indicates that they are not.

ENTRIX: Jean Baldrige said that that was not ENTRIX's intention.

CDFG: Mike Berry suggested that the terminology be changed to say "impassable at lower flows".

ENTRIX: Jean Baldrige thought that was a good idea.

ENTRIX: Larry Wise continued with the passage barrier presentation, describing the locations on a figure in the presentation (figures were faxed to Annie Manji and Dave White because they were not visible in the e-mailed version of the presentation). Mr. Wise explained that the 25UP was actually the Old Cow Creek Diversion Dam.

CDFG: Mike Berry asked which habitat unit represented the big impassable barrier?

ENTRIX: Larry Wise informed Mike Berry that it was number 271. Larry continued with the presentation, discussing passage barriers on South Cow Creek. There were 9 potential barriers identified on South Cow, one of which was considered completely impassable. In fact, it is known that steelhead get up through Wagoner Canyon to the diversion and to the ladder at the diversion. One of the 9 barriers identified is the diversion dam and that is the one that was considered complete. The rest of the barriers are less than 6-feet high and fish could probably get through them at various flows. During habitat mapping, large salmon were observed in South Cow Creek above Wagoner Canyon. So we know that they can get up through Wagoner Canyon as well, even through fairly low flows.

CDFG: Mike Berry asked if the ladder on South Cow was designed for steelhead?

PG&E: Curtis Steitz responded that it was designed for both salmon and steelhead.

ENTRIX: Larry Wise noted that all of the passage barriers on South Cow Creek are within Wagoner Canyon, with the exception of the Diversion Dam. Habitat unit 198 is about at the top of the Canyon.

NMFS: Howard Brown asked where the Chinook salmon was observed?

ENTRIX: Larry Wise said the salmon was observed right above habitat unit 198.

NMFS: Dave White asked for confirmation that the only barrier considered complete on South Cow Creek was the Diversion Dam.

ENTRIX: Larry Wise responded "Yes" and said that it does have a ladder. Larry Wise asked if there were any further questions to the passage barrier information.

CDFG: Mike Berry referred to the discussion of Whitmore Falls in the Status Report saying that there have been several field trips where all of the Agencies have agreed that Whitmore Falls is passable during the winter time.

ENTRIX: Jean Baldrige clarified that CDFG believes that under certain flow conditions Whitmore Falls is passable.

CDFG: Mike Berry said "Yes", and that he had thought that we had all agreed to that - that Whitmore Falls is not a barrier.

NMFS: Dave White said that that was NMFS' impression as well.

ENTRIX: Jean Baldrige said that our understanding had been that it was passable under certain circumstances, but not during most winters. ENTRIX will be happy to take another look at that.

CDFG: Annie Manji reiterated CDFG's objective to manage Old Cow Creek as an anadromous fishery and that PG&E had also agreed to that. Ms. Manji emphasized how important it was to know what PG&E's position on this was.

ENTRIX: Jean Baldrige noted that PG&E was planning to manage the reach as an anadromous fishery and there are two reasons for that: one of them could be from a discussion of Whitmore Falls, but the other one is that CDFG has clearly indicated that they have plans for that to be an anadromous fishery in the future.

CDFG: Mike Berry stated that CDFG has no plans to fix the falls because it is evident during high flows that steelhead could pass through.

ENTRIX: Jean Baldrige explained that originally it had been unclear exactly how much of a barrier Whitmore Falls was to the project but it was irrelevant to the study methodologies since CDFG had clearly outlined their management objectives and PG&E accepted that the reach was to be (if it was not already) managed as an anadromous fishery. The idea that the falls are passable most winters versus under some extreme circumstances will be incorporated in to the documents.

ACTION ITEM: Revise reports to reflect current information on Whitmore Falls.

CDFG: Mike Berry wanted to clarify that the statement in the Status Report saying:

"The passage of anadromous salmonids into the Project bypass reach on Old Cow Creek is likely restricted by Whitmore Falls, which is located downstream of the town of Whitmore about 9 miles below the Kilarc powerhouse. These falls have previously been considered impassible by CDFG, but was recently reclassified as being passable under very high flow conditions. Until more reliable passage past these falls can be provided, passage within the project bypass reach is likely moot."

was no longer valid.

ENTRIX: Jean Baldrige agreed to modify the language in the Resource Report.

PG&E: Angela Risdon reiterated that the purpose of having "Preliminary Draft" on all of the documents is because they are still a work in progress.

CDFG: Annie Manji added that NOAA Fisheries believed that the unnamed falls in the bypass reach were passable under extremely rare situations, which may have been the cause for confusion regarding Whitmore Falls.

PG&E: Curtis Steitz added that there haven't been any observations, that PG&E is aware of, of anadromous fish above Whitmore Falls. So PG&E thought that Whitmore Falls might be passable under certain conditions but it's obviously not that easy or fish sightings would be reported.

ENTRIX: Jean Baldrige asked if there were any additional questions to the passage barrier information.

CDFG: **Mike Berry reiterated that the key is to look at what flows the lower flow barriers become passable.**

ENTRIX: Larry Wise continued with the aquatic resources presentation, discussing instream flow objectives and methodologies. Old Cow Creek was very uniform and therefore considered as one reach. South Cow Creek was divided into two reaches, above and within Wagoner Canyon. It was evident for previous discussions that the Agencies were primarily interested in the activities above Wagoner Canyon versus within Wagoner Canyon so the transects were concentrated in the reach above Wagoner Canyon. The transects placed within the canyon are not expected to be as responsive to changes in flow as the other transects are. Transects were placed in riffles, runs, shallow pools and deep pools, with emphasis on deep pools in South Cow Creek. Calibration flows in Old Cow Creek ranged from 3 to 48 cfs, with 3 to 10 cfs considered low flow, 25 to 32 considered moderate, and 42 to 48 considered high. Calibration flows in South Cow Creek ranged from 5 to 41 cfs, with 5 to 9 cfs considered low flow, 16 to 23 considered moderate, and 37 to 41 considered high. Velocity measurements were taken at the high flow levels. At this point with the PHABSIM data, we have calibrated the models and we're getting ready to start the habitat simulation. We need to get a consensus on the criteria to be used in developing the habitat versus flow functions. Our study plan used the Battle Creek models, but we need to schedule another meeting with the group to get some consensus on what the appropriate criteria to be used is.

ACTION ITEM: Coordinate a meeting with the Agencies to discuss habitat suitability criteria to be used for the habitat simulation.

CDFG: Annie Manji asked if Larry could discuss the activities that were completed at the low, middle and high flows again?

ENTRIX: Larry Wise said that the depth and velocities across the transects were collected at the high flows. Water surface elevations were collected at the middle flows. Substrate information and channel profiling was completed at the low flows.

NMFS: Howard Brown clarified that there would be a follow-up meeting to discuss the suitability of the Battle Creek curves for the Kilarc-Cow Creek project.

ENTRIX: Larry Wise responded "Yes".

ENTRIX: Jean Baldrige stated that the Battle Creek curves are attractive because they're right next door, the next watershed over, and there was a fair amount of effort that was spent in coming up with the criteria.

NMFS: Howard Brown asked if there weren't transferability tests that could be developed?

ENTRIX: Larry Wise responded that there were but that they were not really suitable for this project.

ENTRIX: Jean Baldrige added that the transferability tests require information from fish locations and that few anadromous fish have been observed in South Cow and Old Cow Creeks. We will probably have to determine the most appropriate criteria based on geomorphic and channel structure and stocks and go from there.

NMFS: Howard Brown suggested that PG&E include Mark Gard from the Fish and Wildlife Service in the criteria discussions.

ENTRIX: Jean Baldrige said that we had been discussing these issues with Stacy Li from NMFS and that he was a great resource. Ms. Baldrige asked if there were any other questions or comments to the instream flow information?

CDFG: Annie Manji wanted to know if some of the riffle transects were in spawning gravels?

ENTRIX: Larry Wise said, "Yes", that some of the spawning habitat was associated with some of the riffle transects, as were some of the pool tailout transects.

CDFG: Annie Manji asked if there were enough to characterize the spawning habitat versus flow relationship?

ENTRIX: Jean Baldrige said that the original protocols were based on random selection, which was conditioned by access. A number of the transects pass through spawning areas, but spawning areas were not targeted. We did not use a critical habitat approach for this particular analysis, but we do have spawning areas, particularly in the reach that we are most interested in which is right below the diversion on South Cow. There are enough transects there that we should be able to characterize that spawning habitat versus flow relationship.

PG&E: Curtis Steitz added that on Battle Creek there were transects that were specifically selected to address spawning habitat. The difference being that fish were observed and actual fish spawning sites were identified. The areas were flagged and transects were

then installed. For the Kilarc-Cow Creek Project, PG&E really would not be able to specifically identify spawning sites. Additionally, the problem with specific selection versus random placement of transects is that biologists are often wrong when they place transects in locations that they believe to be providing spawning habitat, when the fish really don't use the site at all.

CDFG: Annie Manji asked if redd locations could be identified?

PG&E: Curtis Steitz said that he did not believe that redd surveys would be possible in Old Cow Creek at all since anadromous fish have not been observed in that reach. There would be a potential to see redds in South Cow Creek but it would be very difficult, due to high flows during the winter months.

CDFG: Mike Berry noted that redds were observed on South Cow during the field studies.

ENTRIX: Larry Wise responded that a few test redds were observed in South Cow Creek in mid-October, but these were not fully developed redds and that it was still too early to expect significant numbers of fall run chinook salmon to be spawning. These redds may have been from a spring run adult, preparing for spawning. Larry Wise continued with the presentation, discussing fish population objectives and methodologies. Since the bypass reaches are considered accessible to listed species, snorkeling was completed in the bypass reaches and in the stream channels above and below the bypass reaches. Electrofishing was done in the canals and forebays and gill netting was done in the forebays.

CDFG: Mike Berry stated that the Status Report said:

"Snorkel surveys were used to describe fish populations within the Project Area because electrofishing cannot be conducted in areas where listed salmonids are potentially found."

Mr. Berry commented that a year or so ago it had been determined that electrofishing would be fine as long as PG&E/ENTRIX had the proper permits.

NMFS: Jean Baldrige said that NOAA Fisheries disagreed with that position. NOAA Fisheries thought it would be better to use snorkeling methods in case salmonids were present.

PG&E: Curtis Steitz commented that there would not have been time to acquire the proper permits with the relicensing schedule even if NOAA Fisheries had been amenable to using the electrofishing technique.

NMFS: Howard Brown asked if Mike Berry was concerned about the use of snorkel surveys from a calibration perspective?

CDFG: Mike Berry asked if ENTRIX would be discussing the methods used to calibrate the snorkelers?

ENTRIX: Larry Wise said "Yes". Mr. Wise continued with the presentation, discussing survey dates and explaining that the late start was due to higher than usual flows in the spring and early summer months.

NMFS: Howard Brown asked where the reference sites were located?

ENTRIX: Larry Wise responded that there are three snorkeling sites within each of the bypass reaches that were compared to snorkeling sites above and below each bypass reach.

CDFG: Annie Manji asked if 9 habitat units were snorkeled at each site?

ENTRIX: Larry Wise responded "Yes". ENTRIX sampled three runs, three riffles, and three pools.

CDFG: Annie Manji asked if that was also done above the Kilarc Diversion because she didn't believe there was much riffle habitat to sample in that area due to the gradient?

ENTRIX: Marlene Heller responded "Yes". Ms. Heller said that more pool habitat was sampled above the diversion in the high gradient reach, but she found two runs and two riffles that were snorkeled above the diversion.

CDFG: Mike Berry asked if ENTRIX had the raw data on how long each of the rifles and runs were?

ENTRIX: Marlene Heller responded "Yes" and said that that information could be provided.

CDFG: Mike Berry commented that it did not seem that the habitat in the higher gradient areas was very comparable to the habitat downstream.

ENTRIX: Jean Baldrige agreed that it was hard to find good riffles in that area.

ENTRIX: Larry Wise said that the riffles sampled upstream were definitely shorter than those sampled downstream, but with the way the data is being interpreted, the length is not a significant variable.

CDFG: Mike Berry said that if the riffle upstream is only a foot long and the riffle downstream is 40 feet long, there's a better chance that you're going to see more fish per foot. That leads to the question of how the areas outside of the bypass reach were compared – were the downstream and upstream portions averaged, and if so, can they be broken out?

ENTRIX: Larry Wise responded "Yes upstream and downstream areas were averaged and they can be broken out". By averaging the riffles between the two sites, Mr. Berry's concerns regarding unit length are somewhat alleviated, as six riffles were averaged to obtain the number of fish per unit stream length. Additionally, while the riffle upstream of the project area on Old Cow Creek was shorter on average than those in the bypass area, that below the diversion was longer on average, thus things balance out somewhat. In regard to averaging the sites or doing paired comparisons, Mr. Wise responded that Mike

Berry's concerns are reasonable, when looking at South Cow Creek, as there are two distinct communities below Wagoner Canyon and above it. Additionally the channel structure below the canyon is much different than that within and above the canyon. Thus ENTRIX would provide a comparison of bypass and reference sites for these two areas individually. On Old Cow Creek, the community structure was similar at all sites, and the only site that was significantly different in terms of channel structure was Site 5, the reference site above the diversion. Thus in this area, a pairwise comparison is not warranted. However, in the report, information will be provided for each individual site.

CDFG: Mike Berry said that you would need to compare the site just above the diversion to the next site below the diversion instead of averaging the whole diversion and the whole non-diversion. Mr. Berry suggested that a paired analysis would be better than averaging the sites.

ENTRIX: Marlene Heller commented that the report has each site listed individually so they can be compared in any fashion.

PG&E: Curtis Steitz commented that there is potentially a difference in flows.

CDFG: Mike Berry stated that that was the key to doing the surveys. If the flow above was 60 cfs and the flow below was 4 cfs, you would expect differences in fish densities. Mr. Berry asked for clarification on the fish per foot rating, whether it was fish per square foot or linear foot?

ENTRIX: Larry Wise stated that it was linear feet.

CDFG: Annie Manji asked if ENTRIX had used the same number of divers in all of the study areas?

ENTRIX: Larry Wise said that the number of divers was based on the flows and visibility in the stream at any given point. If one diver could adequately see from one side of the channel to the other, then only one diver would be used to have minimal disturbance on the fish. If two divers were necessary to cover the channel effectively then two divers were used and in some of the non-project reaches three divers were used.

CDFG: Mike Berry asked if replicate dives were completed to calibrate the divers?

ENTRIX: Larry Wise said that the divers were not calibrated with replicate dives or cross calibration. However, the divers from all teams worked together at the larger sites at the beginning of each trip, discussing procedures and techniques, before the crews went on individually to sample the smaller sites. This provided a high degree of confidence in the comparability of results between the different sites. Additionally, conditions in the different sites were generally similar in terms of visibility, so this would not be expected to add significant variability.

CDFG: Annie Manji asked if water temperature data was collected for each of the dives, and if so, could that information be provided?

ENTRIX: Larry Wise said "Yes". The information will be broken out into individual sites in the report and water temperatures will be presented.

CDFG: Mike Berry said that the same should be done for the flows.

ACTION ITEM: Present the individual fish population sampling sites with flows, water and air temperatures.

Additionally, Mr. Berry commented that the write-up in the Status Report talks about choosing the habitat units outside the bypass reach, yet the habitat typing was only done within the bypass reach.

ENTRIX: Larry Wise stated that the reference sites were selected by walking up and downstream of the reaches.

ENTRIX: Marlene Heller said that they would walk up and downstream to select habitat units, looking for those that had comparable lengths to the areas sampled within the bypass reaches.

ENTRIX: Larry Wise continued with the presentation, discussing the findings on South Cow Creek. Four adult and three juvenile Chinook salmons were observed in South Cow Creek.

CDFG: Annie Manji requested that the flow, air and water temperature data be presented with the fish population information.

ENTRIX: Larry Wise responded that the information will be provided in the report but due to time constraints associated with the presentation, it was not included on the slides.

Mr. Wise continued with the presentation. Mr. Wise discussed the fish (California roach, rainbow trout, and lamprey) that were discovered within South Cow Main Canal, which is screened. The roach probably went through the screen. It is unknown how the rainbow trout entered the canal.

CDFG: Mike Berry had an editorial note to the write-up in the Status Report. One of the theories presented for how the rainbow trout entered South Cow Main Canal was that they climbed over the screens.

ENTRIX & PG&E: Larry Wise and Curtis Steitz stated that it was a typographical error and it should say lamprey instead of rainbow trout.

ENTRIX: Jean Baldrige added that the rainbow trout have an opportunity to stay in the system since there is some gravel in the canal, but those screens have closed the system since 1987 or 1988.

CDFG: Mike Berry asked if the canals had been dewatered since 1987 or 1988 for maintenance, because that could put a damper on the resident rainbow trout theory?

PG&E: Curtis Steitz responded that the water would be slowly lowered and fish could move into the Forebay.

NMFS: Dave White asked if habitat assessments had been completed on the canals?

ENTRIX: Larry Wise responded "No". Habitat assessments were not done on the canals.

CDFG: Annie Manji asked why entrainment was not evaluated on the South Cow Main Canal?

ENTRIX: Larry Wise said because it is screened and the screens were assumed to be relatively effective.

NMFS: Howard Brown asked if NOAA fish screen engineers had evaluated the screens?

ENTRIX: Jean Baldrige said that they have been looked at a couple of times and that ENTRIX is in the process of doing an evaluation of the screens. We are waiting for the flows to come up.

The reason we were focusing on the entrainment that could be occurring from the Kilarc side was because it's an open system and we were interested in how fish were moving from the area upstream of the diversion down into the Forebay, so we set up a protocol to sample that movement pattern.

NMFS: Dave White asked if the Agencies would be informed when the fish screen evaluations were going to be performed?

ENTRIX: Jean Baldrige said "Yes".

ACTION ITEM: Inform Agency personnel when fish screen evaluations are to be performed.

CDFG: Mike Berry wanted clarification on the statement in the Status Report that said early Chinook redds were noted during the October sampling.

ENTRIX: Marlene Heller said that Chinook redds were observed upstream of Hooten Gulch during the habitat inventory studies.

CDFG: Mike Berry was interested in knowing whether the sighting was early or late in October.

ENTRIX: Marlene Heller said that it was around October 20th.

NMFS: Howard Brown asked if snorkel surveys were done throughout the system to try and quantify the number of Chinook salmon in the system since they had been sighted?

ENTRIX: Larry Wise said "No". Four fish were observed: three within the canyon and one above the canyon. Since they were observed above the canyon, clearly the canyon is not a passage barrier for Chinook. The surveys were habitat based and did not focus on specific fish species.

ENTRIX: Jean Baldrige added that there had been a lot of question as to whether fish could get through Wagoner Canyon early in the project. We now know that they can get above Wagoner Canyon. So PG&E will be looking at that whole section from a management perspective for steelhead and Chinook habitat. Since observations of the fish with low populations are somewhat opportunistic, we decided a habitat based approach would be more suitable for this system and we would manage for them without trying to spend a lot of effort in finding them.

CDFG: Mike Berry wanted clarification on the fish that were observed. There were adults in June, fairly good-sized juveniles in July, and redds showing up in October before there was enough rain to open up the main part of Cow Creek. Is that correct?

ENTRIX: Larry Wise responded "Yes".

ENTRIX: Jean Baldrige added that we think there is potential for those to be spring-run.

CDFG: Mike Berry went back to Howard Brown's comment and said that snorkeling the entire reach of the canyon in June and July would give us a better idea of what the salmon population is, whether it was just a couple of strays or if something is happening.

ENTRIX: Larry Wise continued with the presentation, discussing entrainment potential in the Kilarc Main Canal. Macroinvertebrate and fish protection results are pending.

ENTRIX: Jean Baldrige asked if there were any more questions or comments to the aquatic resources presentation?

NMFS: Howard Brown asked if there was any consideration to do the entrainment studies during other times of the year when fish would be more migratory?

ENTRIX: Larry Wise said that had been the original plan but the water year had made it difficult.

NMFS: Dave White asked if there were any habitat quality assessments performed on Mill Creek?

ENTRIX: Jean Baldrige said "Yes". That habitat mapping was completed on Mill Creek and the section below the diversion is what ENTRIX focused on.

DISCUSSION 5: BOTANICAL RESOURCES (Studies 6, 7 and 8)

ENTRIX: Kathy Frye discussed vegetation mapping, special-status plant surveys, and riparian communities for the Kilarc-Cow Creek Project (follow PowerPoint Presentation)

DISCUSSION 6: WILDLIFE RESOURCES (Studies 16 through 20)

ENTRIX: Kathy Frye discussed general wildlife, presence or absence of special-status species with raptors, California red-legged frogs, foothill yellow-legged frogs, and valley elderberry longhorn beetles.

ENTRIX: Jean Baldrige introduced Dr. Sean Barry (ENTRIX Herpetologist) to the group who joined the meeting to respond to any issues related to the frog studies (follow PowerPoint Presentation).

ENTRIX: Kathy Frye continued with the presentation, discussing objectives, methodologies and results.

USFWS: Kathy Brown asked if peregrine falcons and bald eagles had been observed during the incidental raptor sightings?

ENTRIX: Kathy Frye said "No". Only osprey and golden eagles were observed. Kathy Frye continued with the presentation, discussing the site assessments completed for the California red-legged and foothill yellow-legged frogs. The project does not provide any suitable habitat for the California red-legged frog with the possible exception of Hooten Gulch. Hooten Gulch is considered summer habitat, but not breeding habitat.

USFWS: Kathy Brown asked about the ponds that were located on private lands that were not evaluated and whether there was grazing associated with them?

ENTRIX: Kathy Frye and Sean Barry said that there was grazing associated with some of the ponds, but that in general, the ponds did not appear to provide promising habitat.

ENTRIX: Kathy Frye continued with the presentation, discussing the foothill yellow-legged frog survey results. Foothill yellow-legged frogs were observed on South Cow Creek but not Old Cow Creek.

USFWS: Kathy Brown asked when USFWS would be seeing the study results for the yellow-legged and red-legged frog studies?

ENTRIX: Jean Baldrige said that the reports were ready in draft form and pending review they would be issued shortly.

CDFG: Annie Manji asked if there would be any effort to locate egg sites in the spring for the foothill yellow-legged frogs?

ENTRIX: Jean Baldrige said that the current approach was going to be based on our knowledge that they exist on South Cow Creek and evaluate how the project operations might effect them.

Jean Baldrige asked if there were any other questions to the wildlife information?

DISCUSSION 7: ARCHEOLOGICAL, CULTURAL, RECREATIONAL, LAND MANAGEMENT & AESTHETICS (Studies 21 through 28)

ENTRIX: Tracy MacMillan discussed the regional and Project Area recreation information. It had been determined that none of the meeting attendants were particularly interested in archaeological, cultural, land management, or aesthetic issues from resource management perspectives.

Out of 135 questionnaires distributed, 45 responses were received. Fishing was found to be the primary activity (86%) of the visitors and a total of 475 visitors were counted for the six sites. The highest number of visitors recorded at the Kilarc Forebay Shoreline was 370.

CDFG: Annie Manji asked if the 370 was one day?

ENTRIX: Tracy MacMillan responded "Yes", during either Labor Day or Memorial Day weekend.

CDFG: Annie Manji commented that there was a very large brown trout (25 pounds) caught at the Kilarc Forebay that received a lot of press which would maybe explain why so many people were in the area.

PG&E: Angela Risdon commented that it is a strange event to have that number of people up there for a weekend so it is worthwhile noting in the report that there were extenuating circumstances.

ENTRIX: Jean Baldrige said that the information would be put into context within the report.

ENTRIX: Tracy MacMillan completed the recreation discussion and asked if there were any questions?

NOTE: Tracy MacMillan verified the information with ENTRIX's recreation task leader (John Baas) and 370 was the TOTAL number of people observed along the shoreline during the entire recreational survey – not during one holiday weekend. The striking information is that of 475 total visitors to the area, 370 of them were noted along the Kilarc Forebay Shoreline.

CLOSING

PG&E: Angela Risdon reiterated that the purpose of the meeting was to provide an overview of what the preliminary results from the studies were and to make sure that everyone was comfortable with the study plans. Mr. Risdon also wanted to confirm that the necessary information had been collected to answer the resource management questions that will arise for the Kilarc-Cow Creek Project.

There are studies that will continue to go forward. As we mentioned, we will continue to do the instream flow study, finish up the macroinvertebrate study, the fish facilities study, and distribute the California red-legged frog site assessment to see if USFWS protocol level surveys are required.

CDFG: Annie Manji said that she was not prepared to say whether the study methodologies were acceptable, but appreciated the opportunity to discuss the studies with the individuals that actually did the work.

ENTRIX: Jean Baldrige thanked all of the participants and said that we would continue our evaluation of the report and move forward. As Larry Wise mentioned, we need to put together a conference call to discuss criteria to be utilized for the habitat suitability criteria.

CDFG: Annie Manji asked that we give the Agencies a little bit of forewarning prior to completing the fish passage and fish screen evaluations. CDFG is not allowed on a lot of South Cow but they are allowed on most of Old Cow, and as long as the scheduling works out they would be happy to come out and see some of that work.

PG&E: Angela Risdon asked that the Agencies review the information and address areas of concern sooner versus later.

CDFG: Annie Manji commented that the nature of the questions during the presentation should provide an idea of where the Agencies have concerns.

ENTRIX: Jean Baldrige asked Kathy Brown if there was anything surprising about the results of the wildlife studies?

USFWS: Kathy Brown said “No”.

PG&E: Angela Risdon thanked all of the participants for attending the meeting.

Meeting Adjourned at 12:35.

ACTION ITEMS

ACTION ITEM: Evaluate the passage barriers under higher flows to assess the flows at which the lower flow barriers become passable.

ACTION ITEM: Inform Agency personnel of field monitoring dates for additional evaluation of the passage barriers.

ACTION ITEM: Revise reports to reflect CDFG's position on Whitmore Falls.

ACTION ITEM: Coordinate a meeting with the Agencies to discuss suitable habitat versus flow function criteria to be used for the habitat simulation.

ACTION ITEM: Present the individual fish population sampling sites with flows, water and air temperatures.

ACTION ITEM: Inform Agency personnel when fish screen evaluations are to be performed.

cc: Steve Nevares, PG&E
Curtis Steitz, PG&E
Dave White, NMFS
Howard Brown, NMFS
Kathy Brown, USFWS
Annie Manji, CDFG
Mike Berry, CDFG
Britt Fecko, SWRCB

ATTACHMENT 1

Kilarc-Cow Creek Hydro Relicensing Project
Joint Agency Consultation Meeting
MEETING AGENDA

December 5, 2003

Time:	9:00 a.m. – 1:00 p.m.	Moderator:	Angela Risdon
Location:	ENTRIX Sacramento, California	Recorder:	Tracy MacMillan

9:00 INTRODUCTIONS (10 minutes)

PURPOSE and OBJECTIVES for MEETING

- 2003 Process and Completed Studies
- Structure and Organization of Information/Presentation
- Project Overview

DISCUSSION 1 (30 minutes)
9:10 Hydrology

- Stream Flow Monitoring
- Estimate Flow
- Calibration of Unimpaired Hydrograph

DISCUSSION 2 (30 minutes)
9:40 Water Quality and Temperature

DISCUSSION 3 (30 minutes)
10:10 Sediment and Channel Stability

10:40 BREAK (15 minutes)

DISCUSSION 4 (40 minutes)
10:55 Aquatic Resources

- Aquatic Habitat
- Passage Barrier
- Instream Flow
- Fish Population
- Entrainment
- Macroinvertebrates
- Fish Protection

DISCUSSION 5 (30 minutes)
11:35 Botanical Resources
- Vegetation Mapping
- Special-Status Plant
- Riparian

DISCUSSION 6 (30 minutes)
12:05 Wildlife Resources
- Common Wildlife
- Special-Status Wildlife
- California Red-Legged Frogs
- Foothill Yellow-Legged Frogs
- Elderberry

DISCUSSION 7 (10 minutes)
12:35 Cultural and Recreational
- Historical
- Archaeological
- Recreational
- Aesthetics
- Land Management

12:45 CLOSING
- Ongoing Studies
- Project Alternatives
- Next Steps

1:00 Adjourn

Attachment I

CDFG letter to FERC dated October 12, 2007

State of California – The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
NORTHERN REGION
601 Locust Street
Redding, CA 96001
(530) 225-2300

ARNOLD SCHWARZENEGGER, Governor

ORIGINAL

October 12, 2007

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

Comments on Recent Proposals for Kilarc-Cow Creek Project, Federal Energy Regulatory Commission (FERC) No. 606, Old and South Cow Creeks, Shasta County

The Department of Fish and Game (DFG) recently received copies of two distinct proposals for future operation of the Kilarc-Cow Creek Project (Project). The first, dated September 10, 2007, prepared by Pacific Gas and Electric Company (PG&E), is a Preliminary Proposed Decommissioning Plan (Plan). The second, dated September 11, 2007, prepared by Davis Hydro LLC, is an Alternative Proposal to Facilities Removal (Alternative). Upon review of both of these documents, DFG respectfully offers the following comments.

A primary goal for DFG throughout the subject FERC process is implementation of the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act's directive to restore the State's anadromous fish populations. The portion of South Cow Creek within the Project boundary is managed for anadromous and resident fish including fall-run Chinook salmon, steelhead, and rainbow trout. The current extent of anadromy in Old Cow Creek is unknown; however, DFG biologists have determined all falls identified below the Project are passable for steelhead trout under certain flow conditions. Until such time that appropriate data indicate otherwise, the DFG will manage the portion of Old Cow Creek within the Project boundary for both anadromous and resident fish including steelhead and rainbow trout. Further, given the lack of absolute physical barriers between known steelhead habitat in Old Cow Creek and the Project, DFG intends to manage the subject area as restorable steelhead habitat for the foreseeable future.

PG&E Plan

DFG generally concurs with the scope and direction presented by PG&E in this preliminary document. We reiterate our support of PG&E's commitment to implement a responsible and reasonable decommissioning plan as described in the March 2005 Agreement (Agreement) signed by PG&E, DFG, the State Water Resources Control Board (SWRCB), the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the National Park Service, Trout Unlimited and Friends of the River.

One area of the September 2007 Plan where we request greater detail is the disposition of PG&E's six water rights which support current Project operations. As the Plan notes, the original Agreement anticipated a transfer of appropriative water rights to a resource agency or other acceptable entity to protect, preserve or enhance aquatic resources. The Agreement also identified securing enforceable and permanent water rights as a desired condition of the decommissioning process.

The section on water rights in the new Plan represents a significant modification to the original Agreement. PG&E proposes to abandon the subject water rights in order to avoid re-opening the 1969 Adjudication. It is not clear to DFG what information PG&E relied on in making this new proposal. In signing the 2005 Agreement, DFG anticipated PG&E would ultimately change their non-consumptive use of water from power to environmental enhancement. For example, PG&E could petition the SWRCB to dedicate the subject appropriative water rights for the purpose of preserving and enhancing fish and wildlife resources pursuant to Water Code Section 1707. After securing a dedication of use for instream resource benefits, PG&E could then transfer the subject water rights to an appropriate party. It is not clear to us why the actions of change of use and transfer of ownership would require a re-opening of the 1969 Adjudication.

In contrast, the proposal to simply abandon the water rights does not identify how such an action would achieve the desired outcome of enforceable and permanent water rights that are protected and used to preserve or enhance aquatic resources. It is our understanding that there are water right holders, as well as undeveloped riparian rights, within both of the Project reaches where surface flows would be enhanced by decommissioning. The nature of these existing and potential water rights, and how an abandoned versus a dedicated water right would affect them needs to be clearly presented in order for DFG to provide an informed assessment of this new proposal. Until such a detailed explanation is provided, DFG recommends the disposition of water rights as described in the Agreement.

Additional Comments

- DFG is unclear about the timing, schedule, and sequence of the removal for both the Kilarc and Cow Creek developments. Will they be removed simultaneously or treated individually with different schedules? We look forward to working with PG&E and all interested parties in order to maximize our goals and objectives while protecting fishery resources.

- DFG would like to see more detailed descriptions and as built drawings of the diversion structures on both developments in order to further our understanding of these facilities so appropriate recommendation can be made for their removal.

- DFG would like to continue to work with PG&E to explore additional recreational opportunities within the watershed. Examples include, but are not limited to, working with the Stewardship Council to look at the possibility of a land transfer with Roseburg Forest Products for lands around Buckhorn lake, and/or providing a fishing platform and access point at the Kilarc Powerhouse and Switchyard.

Davis Hydro Alternative

DFG staff has reviewed Davis Hydro's Alternative Plan document and do not believe this plan will benefit the recovery of anadromous fish in Cow Creek. Many of the statements and conclusions lack scientific citations that support these statements. The Davis Hydro proposal is based on experimental methods that are untested and have a high consequence to the resource if they fail, therefore we do not accept this proposal as a viable alternative to full decommissioning.

In conclusion, DFG still considers the decision made by PG&E to surrender the Project to be the best alterative for meeting our resource objectives. Our review of all available information, including Davis Hydro's Alternative, has not caused us to change our position. This completes our comments on the two documents provided for our review regarding the Kilarc-Cow Project. If you have any questions regarding the above comments, please contact Environmental Scientist Matt Myers at (530) 225-3846.

Sincerely,

for **GARY STACEY**
Regional Manager

cc: See Page Four and Five

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Administration & Compliance
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National Park Service
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California Electricity Oversight Board
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Messrs. Carl Wilcox and Craig Wilson
Ms. Annie Manji
Water Branch
Department of Fish and Game
830 S Street
Sacramento, CA 95814

Messrs. Mark Stopher, Steve Turek,
Randal C. Benthin, Matt Myers,
and Mike Berry
Ms. Donna Cobb
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Attachment J

CDFG letter to PG&E dated October 30, 2008

State of California – The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
NORTHERN REGION
601 Locust Street
Redding, CA 96001
(530) 225-2300

ARNOLD SCHWARZENEGGER, Governor

October 30, 2008

Ms. Stacy Evans
Kilarc-Cow Creek Hydroelectric Project
Draft License Surrender Application Comments
c/o Darcy Kremin
2300 Clayton Road, Suite 200
Concord, CA 94520

Dear Ms. Evans:

Comments on Draft License Surrender Application for Kilarc-Cow Creek Project, Federal Energy Regulatory Commission (FERC) No. 606, Old and South Cow Creeks, Shasta County

The Department of Fish and Game (DFG) received the Draft License Surrender Application (DLSA) for the Kilarc-Cow Creek Project (Project) on September 9, 2008. DFG respectfully offers the following comments.

DFG reiterates our support of PG&E's decision to decommission the Project and implement a responsible and reasonable decommissioning plan as described in the March 2005 Agreement (Agreement) signed by PG&E, DFG, the State Water Resources Control Board (SWRCB), the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the National Park Service, Trout Unlimited, and Friends of the River. DFG believes the DLSA adequately represents the subjects and desired conditions of that Agreement.

Water Rights Comments:

On October 10, 2007, DFG provided comments on PG&E's Preliminary Proposed Decommissioning Plan. One of our comments requested greater detail about the disposition of PG&E's six water rights which support current Project operations. The original Agreement anticipated a transfer of appropriative water rights to a resource agency or other acceptable entity to protect, preserve or enhance aquatic resources. DFG noted that the new plan represented a significant modification to the original Agreement. PG&E responded to DFG by letter on December 10, 2007, and provided the rationale behind their decision to abandon their water rights rather than transferring them to an agency or other entity.

PG&E believes that court approval would be necessary for PG&E to change its use from power generation to instream use prior to transferring its water rights. This could be very time-consuming and would likely be contested by parties to the Cow Creek Decree No. 38577 and disrupt settled water rights in the adjudicated streams. PG&E also believes that by abandoning their water rights they would still achieve the goals and objectives in the original Agreement. PG&E points out that their water rights are non-consumptive and no new water will be made available for appropriation, and those junior rights holders in the stream reaches between PG&E's point of diversion and points of use will not be able to divert any additional water.

While the DLSA and PG&E's December 10, 2007 letter do differ from the 2005 Agreement, DFG believes that PG&E's decision to abandon their water rights rather than transferring them will accomplish the original goals of the Agreement.

Volume 1 Comments:

Page E.2-42 - E2.5.2. The DLSA indicates that steelhead (*Oncorhynchus mykiss*) migrate upstream of Whitmore Falls "likely during wet years". This needs to be corrected to state steelhead migrate upstream of Whitmore Falls during winter and spring high flows each year.

There is a statement in the second paragraph of this section claiming "fall-run Chinook salmon (*Oncorhynchus tshawytscha*) cannot pass over Whitmore Falls and therefore cannot access the project area on old Cow Creek". Fall-run Chinook may pass over Whitmore Falls in years there is seasonally early rain. In fact the list of species observed at Kilarc Tailrace includes Chinook salmon (See Table E.2.5-1).

Page E.2-44 First Paragraph. This paragraph includes the statement "The forebay supported large numbers of naturally-produced brown trout." Please provide a citation for this comment and the following conclusion that these trout use springs or the canal to spawn. If there are large numbers of juvenile natural brown trout in the forebay they may be coming from miles upstream and passing into the forebay through the unscreened diversion. Additionally, if natural springs occur in the bottom of Kilarc forebay, they will need to be addressed in the decommissioning plan. If springs are not present in the forebay, the above paragraph needs to be revised to adequately represent the environmental conditions.

Page E.4-3 Last Paragraph. This paragraph states that "the release of sediment behind the Kilarc Main Canal and South Cow Creek diversion dams may result in short-term filling of pools downstream of the dams and the creation of fish passage impediments." GEOM-1 should include fish passage monitoring for two years after the diversion is removed that would identify any fish passage impediments. If a passage impediment is identified as a result of the diversions being removed, PG&E would consult with DFG and appropriate measures would be conducted, if necessary.

Page E.4-8. Regarding PM&E Measure AQUA-5, the document states, "PG&E will request that CDFG stop stocking trout into the Kilarc Forebay the year before the facility is decommissioned. Additionally, PG&E will request that the Fish and Game Commission alter the catch limits for anglers to provide additional recreational benefits and further reduce the number of fish remaining in the Forebay when decommissioned." DFG fisheries managers prefer to determine the appropriate time to cease trout stocking based on time of year, water conditions, and hatchery operations. DFG is also in favor of considering all management options with respect to altering catch limits as decommissioning approaches.

Page E.4-9. In response to PM&E Measure AQUA-6: Conduct Fish Rescue in Canals and Forebays, as Needed, DFG is supportive of PG&E conducting fish rescues on the Kilarc Canal and Forebay. DFG will consult with PG&E as to the appropriate areas to relocate the rescued fish.

Volume 2 Comments:

Page 2-35. The disposition of the Cow Creek Powerhouse needs to include the removal of the gunite (shot-crete) from the bed of Hooten Gulch. Once the powerhouse structure is abandoned in place and the downstream seasonal dam is no longer functional, Hooten Gulch will return to its historical state as a seasonal channel and will likely support steelhead spawning. The gunite section will be a velocity barrier during a wide range of flows and therefore will need to be removed and the associated stream banks will need to be stabilized.

Page 2-8. The last bullet and last sentence under Siphon should read, "Buried portions of the siphon will be capped and abandoned in place."

In conclusion, DFG believes that with the above mentioned changes that the DLSA adequately describes the Project features and proposes decommissioning actions that will sufficiently remove the Project facilities. PG&E's proposed Protection, Mitigation, & Enhancement measures will reduce

or eliminate any adverse impacts that were identified as part of the decommissioning activities. If you have any questions regarding the above comments, please contact Environmental Scientist Matt Myers at (530) 225-3846.

Sincerely,

for **GARY B. STACEY**
Regional Manager

cc: Ms. Kimberley D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Mr. Hossein Ildari
Deputy Director
Division of Hydropower Administration & Compliance
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Mr. Timothy Welch, Chief
Hydro West Branch
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Mr. Steve Edmondson
and Mr. David White
National Marine Fisheries Service
777 Sonoma Avenue, Suite 325
Santa Rosa, CA 95403-6528

Mr. Eric Theiss
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814

Mr. William Foster
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95821-6340

National Park Service
600 Harrison Avenue, Suite 600
San Francisco, CA 94107

Ms. Cam Williams
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Ms. Margaret Kim
California Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Ms. Traci Bone
California Public Utilities Commission
505 Van Ness Avenue, Fifth Floor
San Francisco, CA 94102

cc: California Electricity Oversight Board
770 L Street, Suite 1250
Sacramento, CA 95814

Mr. David Arthur
Redding Electric Utility
P.O. Box 496071
Redding, CA 96049

Messrs. Randal Livingston and Steve Nevares
Pacific Gas and Electric Company
Mail Code N11D
P.O. Box 770000
San Francisco, CA 94177

Mr. John Sandhofner
Pacific Gas and Electric
Shasta Hydro
20818 Black Ranch Road
Burney, CA 96013

Ms. Liv Imset
Pacific Gas and Electric
245 Market Street
San Francisco, CA 94105

Mrs. Noel Wise and
PG&E Law Dept. FERC Cases
Pacific Gas and Electric
77 Beale Street, B30A
San Francisco, CA 94105

Mr. William V. Manheim
Pacific Gas and Electric
P.O. Box 7442
San Francisco, CA 94120

Ms. Kelly Caitlett
Friends of the River
915 20th Street
Sacramento, CA 95814

cc: Mr. Brian Johnson and Mr. Charlton Bonham
Trout Unlimited
18008 B Street
Berkeley, CA 94710

Mr. John Whittaker
Winston& Strawn LLP
1700 K Street, NW
Washington, DC 20006

Ms. Kelly Sackheim
Sackheim Consulting
5096 Cocoa Palm Way
Fair Oaks, CA 95628

Mr. Dick Ely
Davis Hydro
27264 Meadowbrook Drive
Davis, CA 95616

Mr. Richard Roos-Collins
Natural Heritage Institute
100 Pine Street, Suite 1550
San Francisco, CA 94111

Mr. Stephen Puccini
Department of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

Messrs. Carl Wilcox and Craig Wilson
Ms. Annie Manji
Water Branch
Department of Fish and Game
830 S Street
Sacramento, CA 95814

Messrs. Mark Stopher, Steve Turek, Randal C. Benthin, Matt Myers, Mike Berry and Ms. Donna Cobb
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Attachment K

Photo provided by Mr. Berry of Whitmore Falls

Attachment L

CDGF email to ENTRIX on February 25, 2003

Attachment L

Email from Annie Manji, CDFG, re: impassable barrier on Old Cow Creek [this refers to the barrier located in the project bypass reach, not Whitmore Falls]
Received 2/25/03

Larry - Here is the original (1/24/03) message from our Timber Harvest Crew along with the photos they took:

The coordinates for these falls are: 40.68396, 121.83041 According to the spatial locator, this is approximately 2.3 miles above the Fern Road bridge at Kilarc powerhouse. Fern Road bridge is at 40.67942, 121.87042

We agreed that this is probably a barrier to all species at all flows.

Attached are the pics from today and one from low flow (#643).

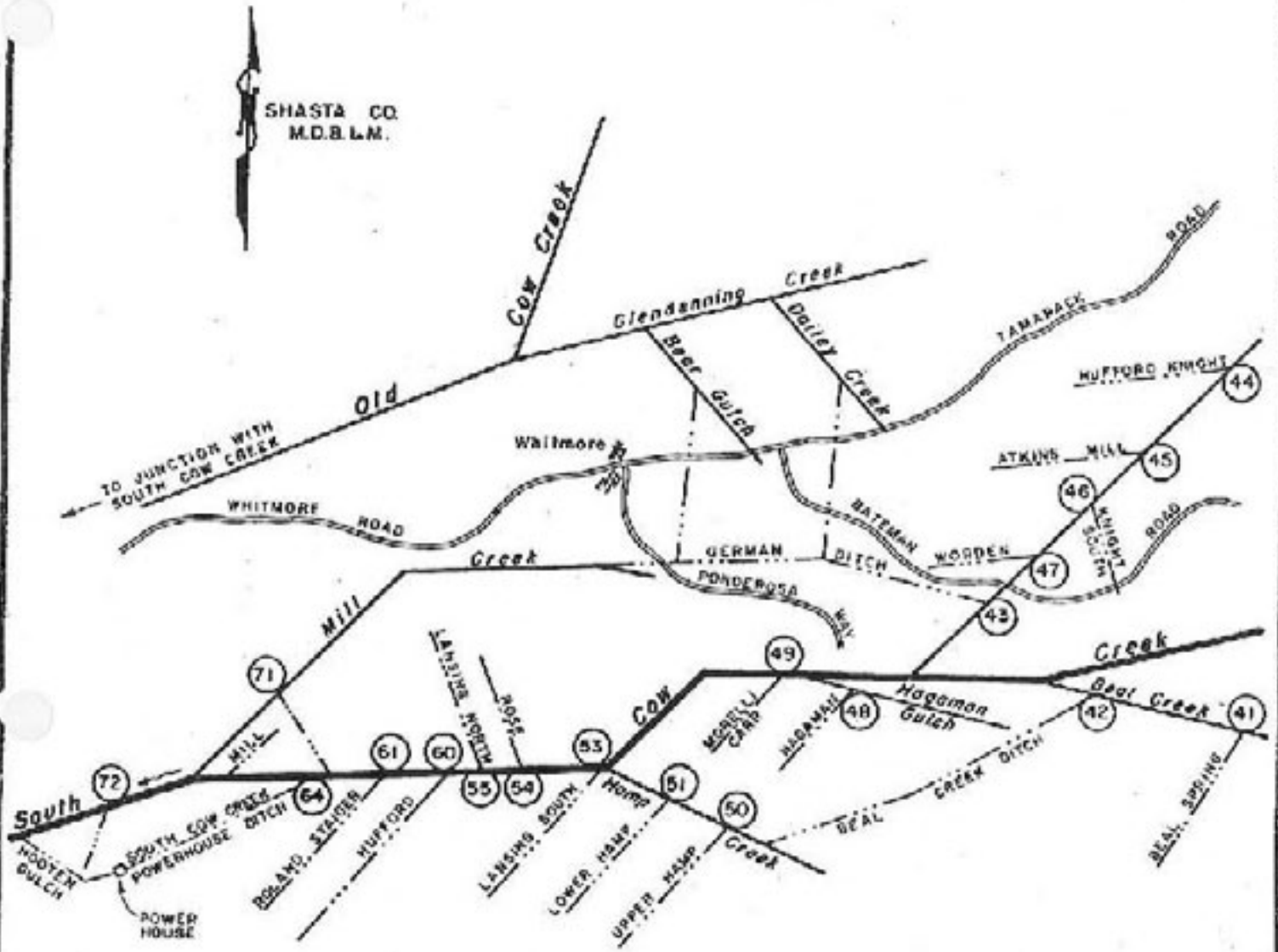
Let me know if you have questions,

Annie Manji
FERC Coordinator
California Department of Fish and Game
Northern California North Coast Region
601 Locust St., Redding, CA, 96001
phone - (530) 225-3846 FAX - 2381
e-mail - amanji@dfg.ca.gov

Attachment M

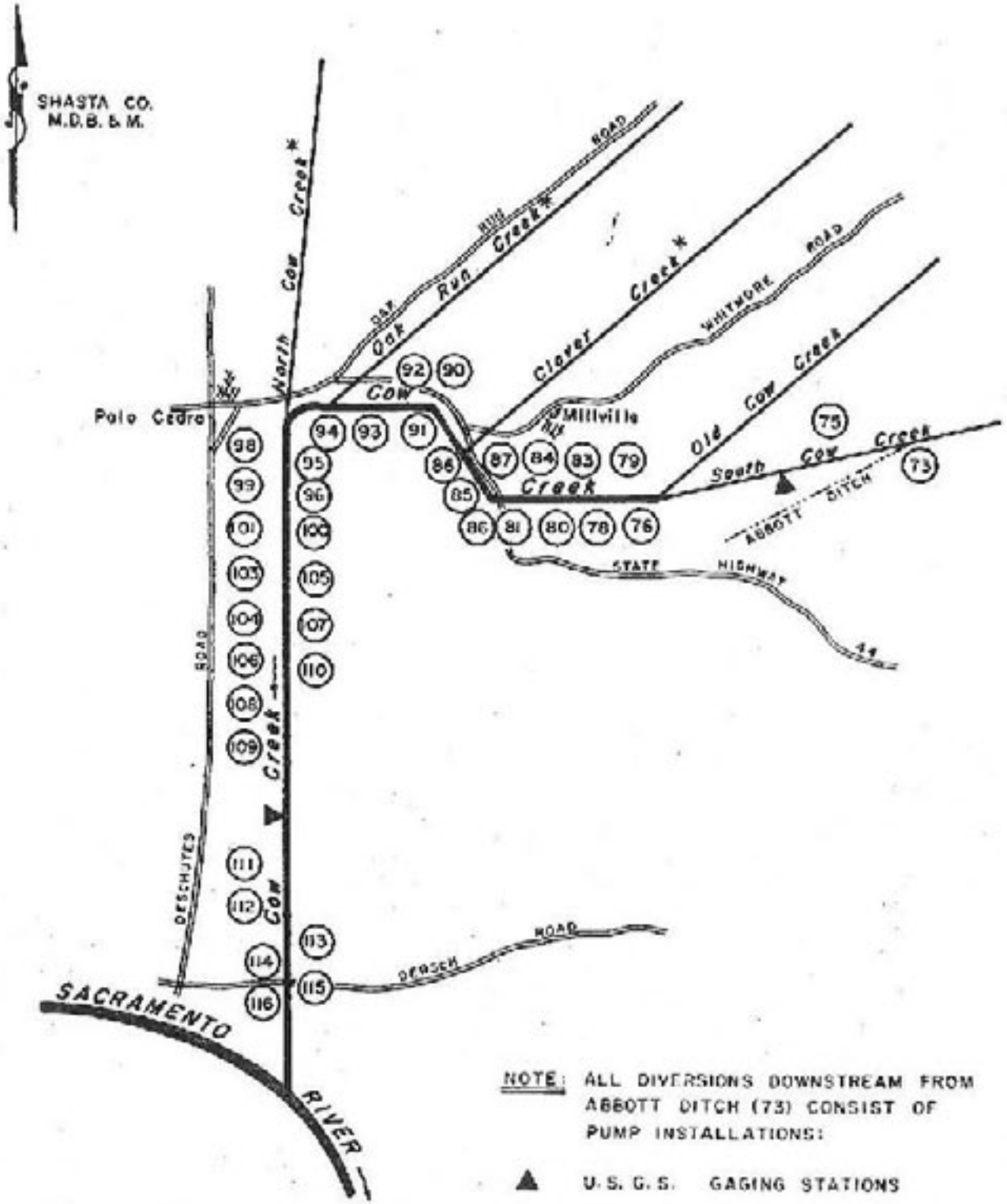
Diversion maps from the 1969 Adjudication of Old Cow Creek, South Cow Creek, and Lower Cow Creek

FIGURE 2



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SOUTH COW CREEK

FIGURE 3



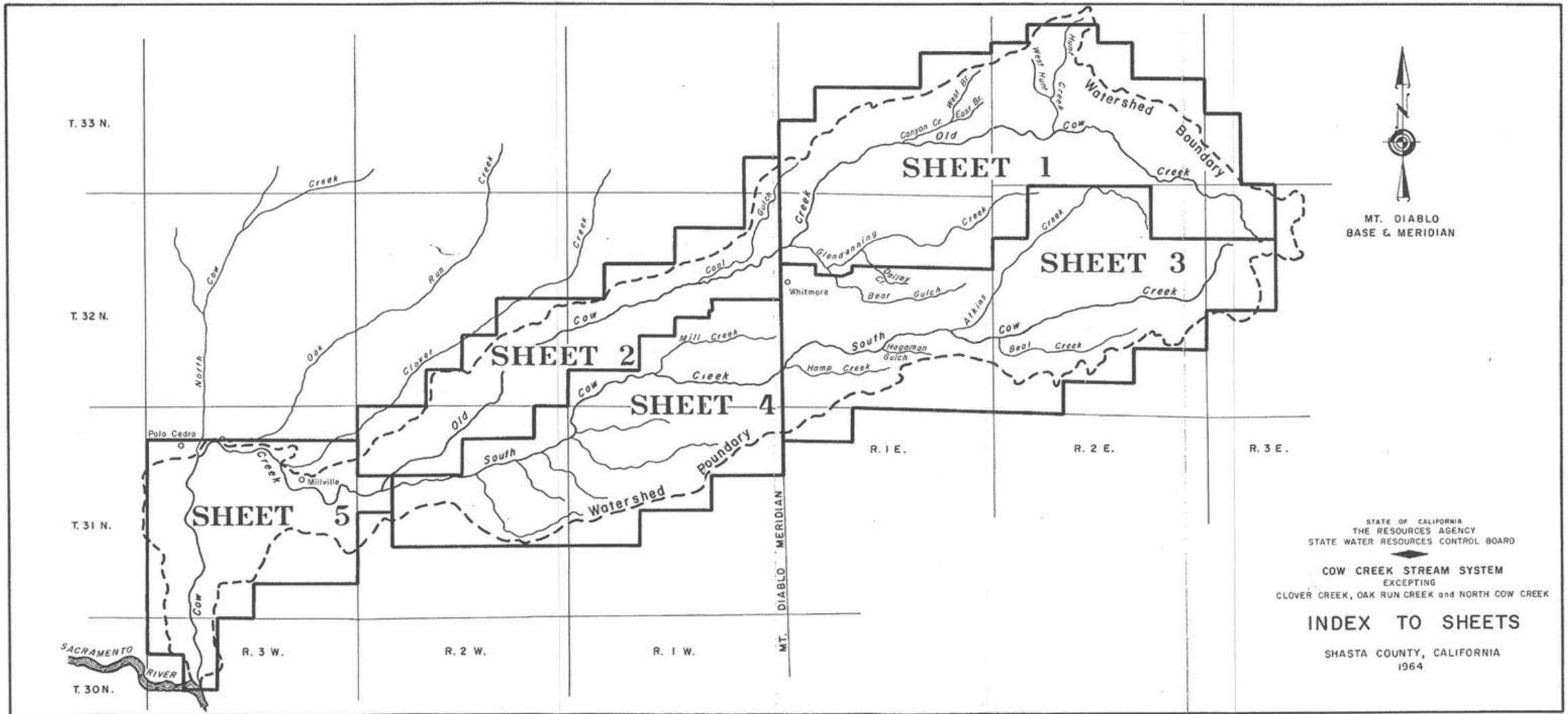
NOTE: ALL DIVERSIONS DOWNSTREAM FROM ABBOTT DITCH (73) CONSIST OF PUMP INSTALLATIONS.

▲ U. S. G. S. GAGING STATIONS

* THESE STREAMS EXEMPTED FROM PROCEEDINGS

SCHEMATIC DIAGRAM OF DIVERSIONS FROM

LOWER COW CREEK



STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

COW CREEK STREAM SYSTEM
EXCEPTING
CLOVER CREEK, OAK RUN CREEK and NORTH COW CREEK

INDEX TO SHEETS

SHASTA COUNTY, CALIFORNIA
1964

R. 4 W. R. 3 W.

R. 3 W. R. 2 W.

SEE SHEET 2

SEE SHEET 4

SEE INSET "A"

SEE INSET "B"

INSET "A"

INSET "B"

INSET "C"

MT. DIABLO BASE & MERIDIAN

T. 31 N.
T. 30 N.

R. 4 W. R. 3 W.

PARCEL OWNERS FOR INSETS "A", "B" & "C"

SHASTA COUNTY, TOWNSHIP 31 NORTH, RANGE 3 WEST, M.D.B.&M.

SECTION 10

1. NORTHERN LANDS INC.
2. W. FARMER
3. J. DUASS ET AL
4. NORTHERN LANDS INC.
5. H. WATEGA

SECTION 17

1. L. FLANERY
2. B. HOLDEN
3. L. WARD
4. R. WILSON
5. T. BUSTOS
6. J. HARRIS
7. M. GRAHAM
8. R. TYRRELL
9. J. MADLONKA
10. J. MADLONKA
11. T. FORSYTH
12. V. COLLINS
13. H. LABOUR
14. N. LOWRANCE
15. J. KENYON
16. R. BRAND ET AL
17. H. MARKEN
18. D. JONES
19. R. GEORGE
20. J. NICHOLS
21. G. HUSH
22. G. SLUDER
23. B. COMPTON

SECTION 20

1. B. WILSON
2. P. CARTER
3. C. WILKES
4. C. STOCKTON
5. C. BERTEL
6. C. STOCKTON
7. J. ROBINSON
8. M. GREEN
9. W. GREEN
10. M. [illegible]
11. A. MORSE
12. T. FIELDS
13. W. HARPER
14. T. PEARSON
15. A. TOMICICH
16. W. RICE
17. D. HUNT JR
18. T. PEARSON
19. L. PARK
20. J. PARK
21. I. WILLIAMS
22. A. SOELAKER
23. R. FITZPATRICK
24. E. Irwin

SECTION 29

1. NORTH VALLEY TITLE & ESCROW CO
2. NORTH VALLEY TITLE & ESCROW CO
3. J. TIPPIN
4. M. HOFFMAN
5. I. WILLIAMS
6. L. PIERCE
7. R. PIERCE
8. L. PIERCE
9. C. KEEPER
10. F. PANAGININ
11. W. HERMAN
12. W. LAWSON
13. E. TINSLEY
14. S. SHANDLEY
15. W. SURNHAM
16. S. PRIGMORE
17. J. SINGODA

L E G E N D

- I IRRIGATED
- A ALFALFA
- G GRAIN
- MA IRRIGATED MEADOW HAY
- P PASTURE
- O IRRIGATED GARDEN OR ORCHARD
- d ARABLE DORMANT RIPARIAN LAND
- NC UNDER CONSTRUCTION (1964)
- W NATIVE VEGETATION
- IRRIGATED AND DORMANT RIPARIAN LAND

- TOWNSHIP LINE
- SECTION LINE
- PROPERTY LINE
- ROAD
- CREEK
- SPRING
- DITCH
- PIPELINE OR FLUME
- POINT OF DIVERSION
- PROPOSED POINT OF DIVERSION
- WATER LINE

REVISED 1959 TO ACCOMPANY DECREE NO. 38577

State of California
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

COW CREEK STREAM SYSTEM

EXCEPTING
CLOVER CREEK, OAK RUN CREEK and NORTH COW CREEK

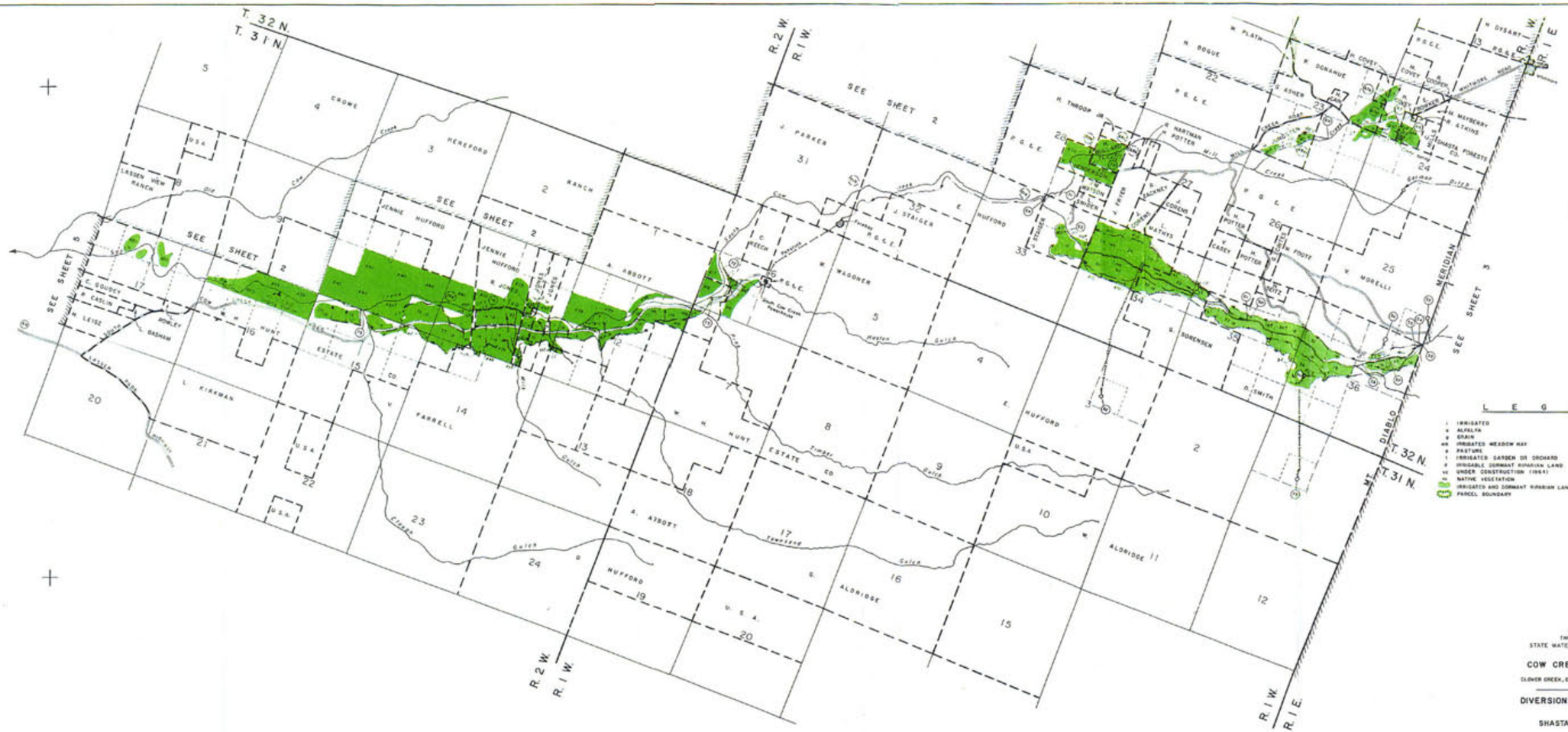
SHOWING

DIVERSIONS and IRRIGATED LANDS

SHASTA COUNTY, CALIFORNIA

1964

SCALE



L E G E N D

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- G GRAIN
- IRR IRRIGABLE MEADOW HAY
- P PASTURE
- I IRRIGATED GARDEN OR ORCHARD
- D IRRIGABLE DORMANT RIPARIAN LAND
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- IRRIGATED AND DORMANT RIPARIAN LAND
- PARCEL BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- PROPERTY LINE
- ROAD
- CREEK
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- DITCH
- PIPELINE OR FLUME
- POINT OF DIVERSION
- PROPOSED POINT OF DIVERSION
- PARCEL NUMBER
- WATCH LINE

MT. DIABLO BASE & MERIDIAN

State of California
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

COW CREEK STREAM SYSTEM

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CLOVER CREEK, OAK RUN CREEK and NORTH COW CREEK

SHOWING

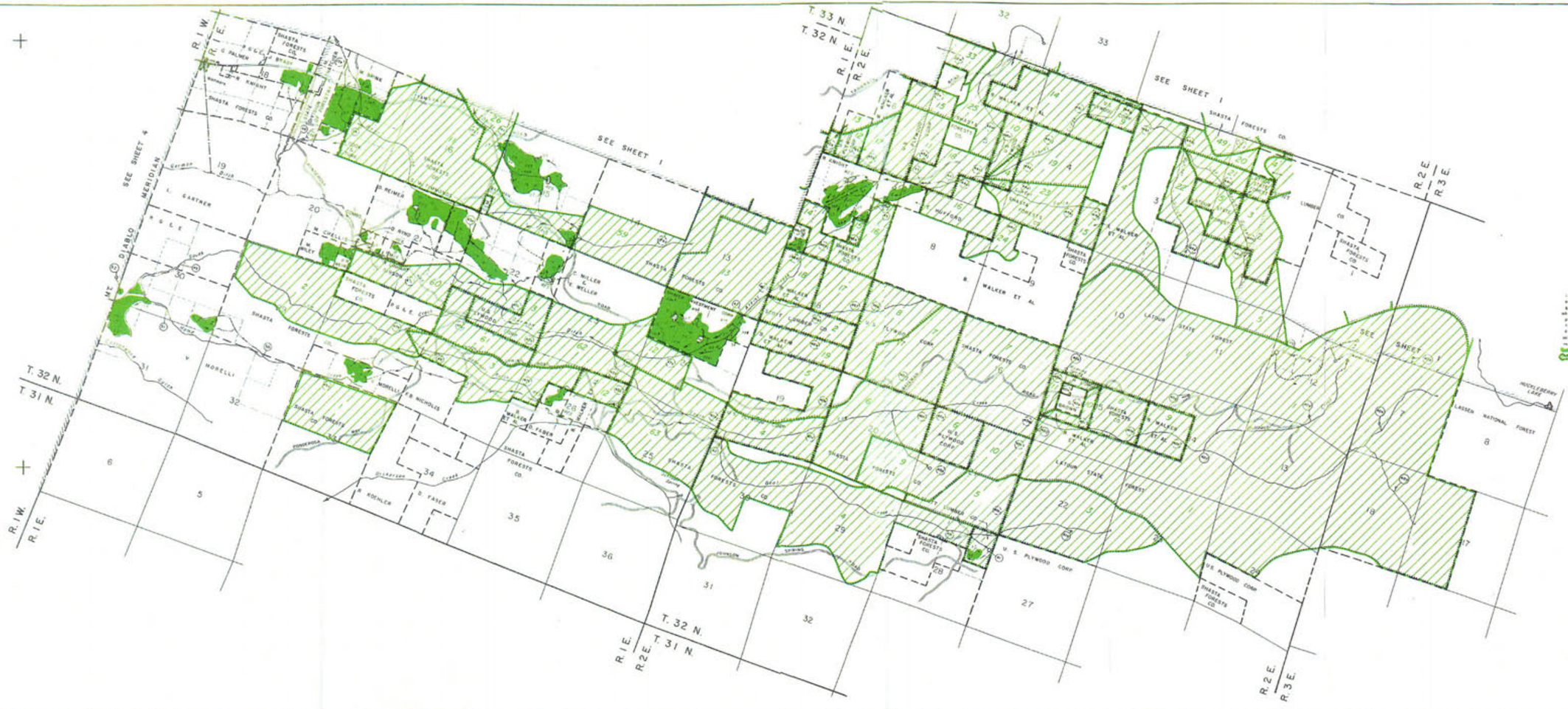
DIVERSIONS and IRRIGATED LANDS

SHASTA COUNTY, CALIFORNIA
1964*

SCALE

*REVISED 1969 TO ACCOMPANY DECREE NO. 38577

SHEET 3 of PLATE 1



MT. DIABLO
BASE & MERIDIAN

L E G E N D

- I IRRIGATED
- A ALFALFA
- G GRAIN
- MH IRRIGATED MEADOW HAY
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State of California
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

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DIVERSIONS and IRRIGATED LANDS

SHASTA COUNTY, CALIFORNIA
1964*

SCALE

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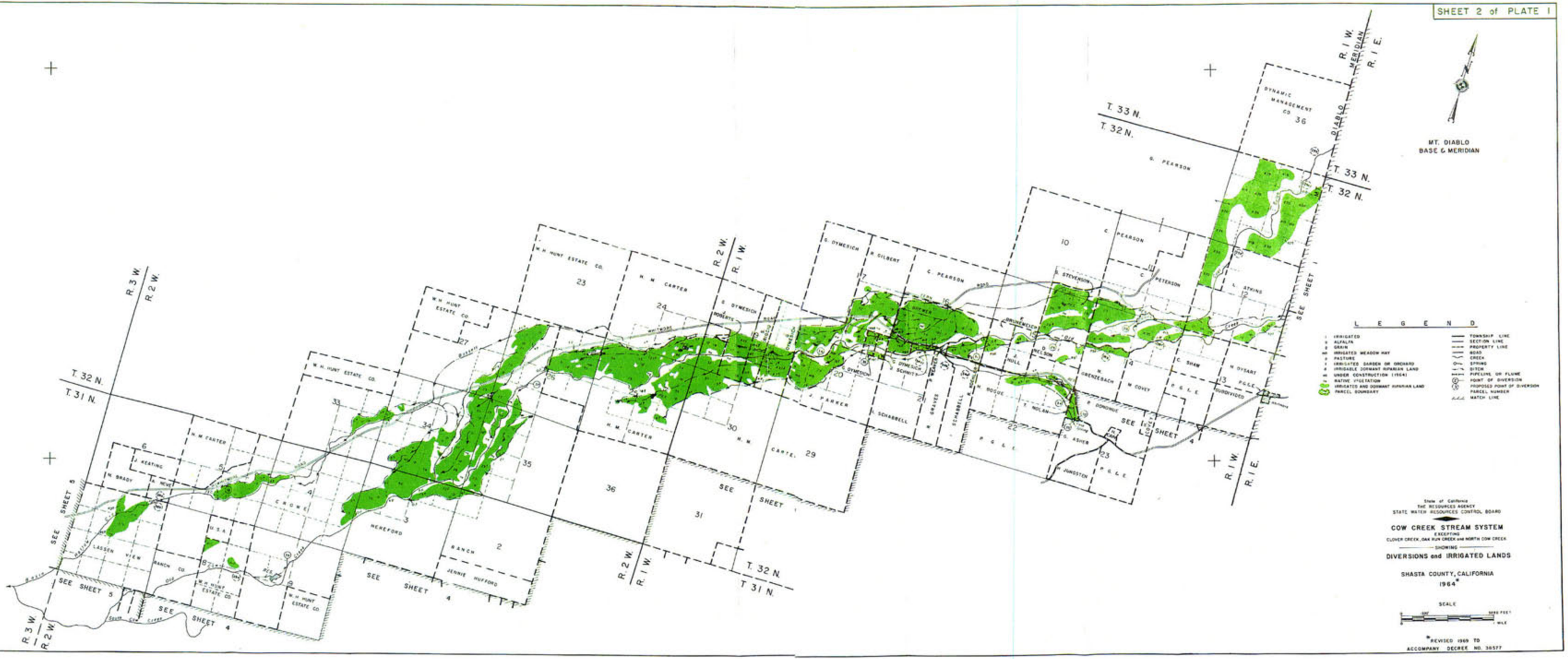
SHEET 2 of PLATE 1



State of California
THE RESOURCES AGENCY
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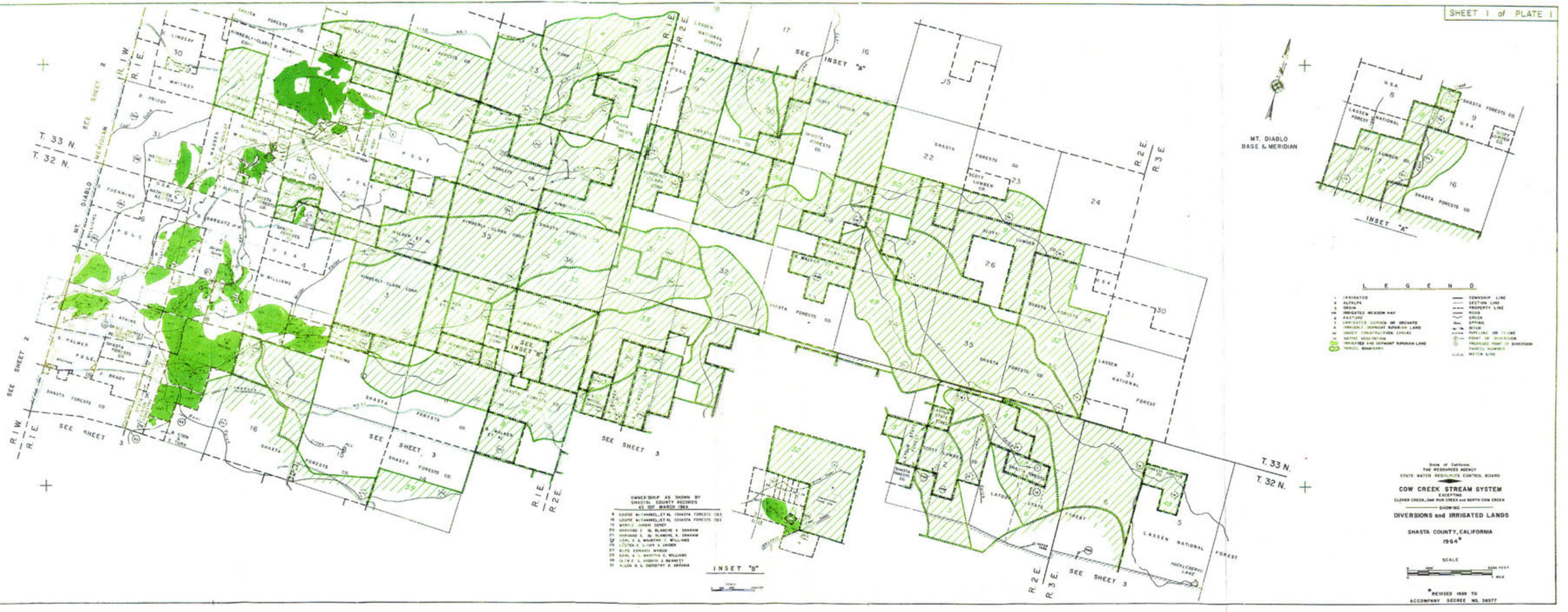

State of California
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

COW CREEK STREAM SYSTEM

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SHOWING

DIVERSIONS and IRRIGATED LANDS

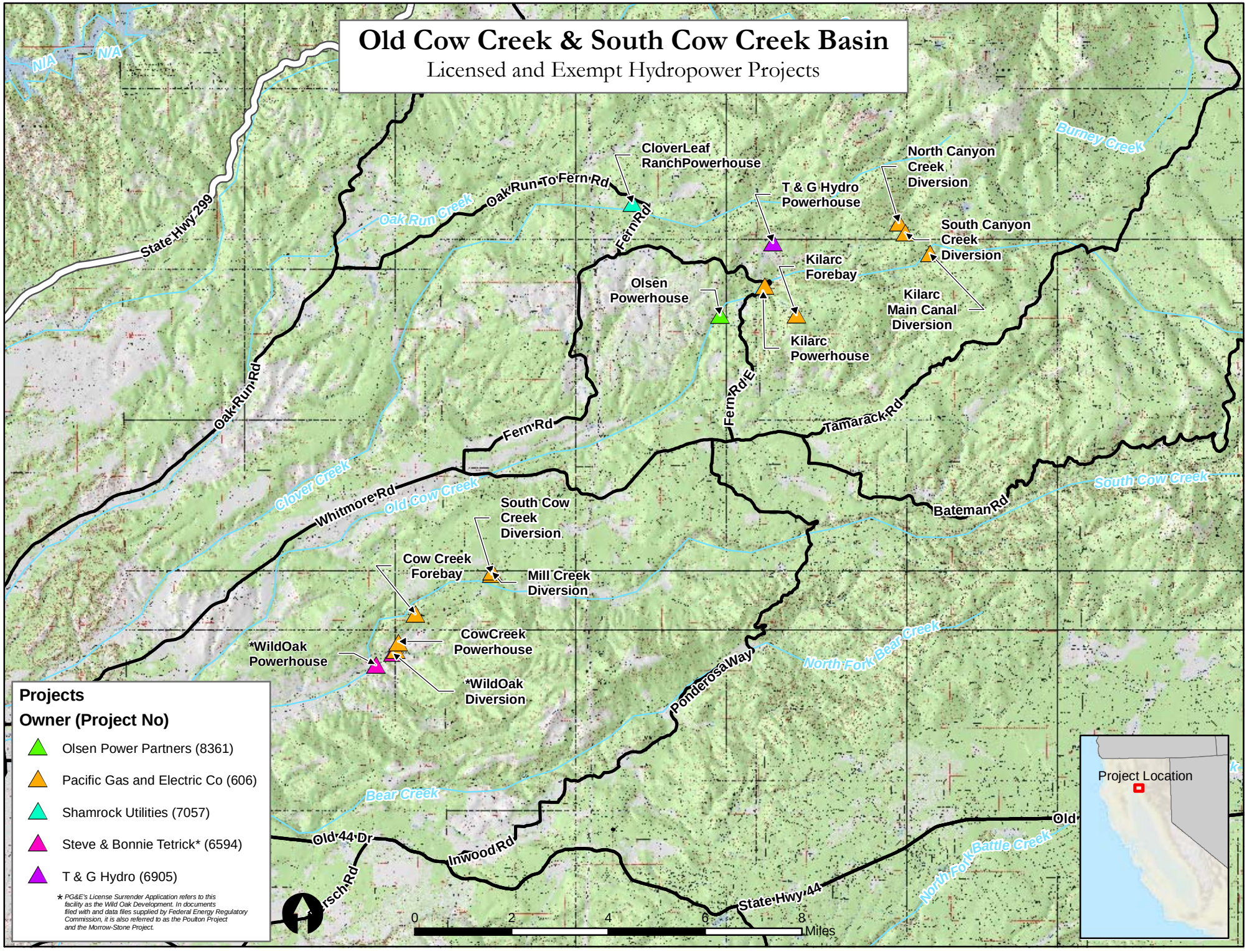
SHASTA COUNTY, CALIFORNIA
1964*

SCALE

*REVISED 1969 TO ACCOMPANY DECREE NO. 39577

Attachment N

A map that shows other licensed and exempt hydro projects above and below the Cow Creek and Kilarc developments


Old Cow Creek & South Cow Creek Basin
Licensed and Exempt Hydropower Projects
N/A
N/A
State Hwy 299
Oak Run Creek
Oak Run To Fern Rd
Fern Rd
CloverLeaf RanchPowerhouse
T & G Hydro Powerhouse
North Canyon Creek Diversion
Burney Creek
South Canyon Creek Diversion
Kilarc Forebay
Olsen Powerhouse
Kilarc Main Canal Diversion
Kilarc Powerhouse
Fern Rd E
Oak Run Rd
Fern Rd
Tamarack Rd
Clover Creek
Whitmore Rd
Old Cow Creek
South Cow Creek
Bateman Rd
South Cow Creek Diversion
Cow Creek Forebay
Mill Creek Diversion
CowCreek Powerhouse
*WildOak Powerhouse
*WildOak Diversion
Ponderosa Way
North Fork Bear Creek
Bear Creek
Old 44 Dr
Inwood Rd
State Hwy 44
North Fork Battle Creek
Old
Projects
Owner (Project No)
Olsen Power Partners (8361)
Pacific Gas and Electric Co (606)
Shamrock Utilities (7057)
Steve & Bonnie Tetrick* (6594)
T & G Hydro (6905)
* PG&E's License Surrender Application refers to this facility as the Wild Oak Development. In documents filed with and data files supplied by Federal Energy Regulatory Commission, it is also referred to as the Poulton Project and the Morrow-Stone Project.
0
2
4
6
8
Miles
Project Location

Attachment O

Letter from PG&E to well owners within the area to receive authorization to obtain available information from the CDWR and the list of persons contacted

Pacific Gas and Electric Company

Power Generation
245 Market Street
San Francisco, CA 94105

Mailing Address
Mail Code N11C
P.O. Box 770000
San Francisco, CA 94117

May 6, 2008

Dear Landowner,

Pacific Gas and Electric Company (PG&E) is developing a License Surrender Application for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606, which is required to be filed with the Federal Energy Regulatory Commission (FERC) by March 2009. PG&E will be conducting resource studies to support the License Surrender Application and to determine the potential impacts from future decommissioning activities.

The purpose of this letter is to notify you of PG&E's intent to conduct a groundwater study, and to ask for authorization to obtain California Department of Water Resources' (DWR) Well Completion Reports. Data from Well Completion Reports is integral to understanding the relationship between the Kilarc Forebay and nearby groundwater wells to determine if removing the Kilarc Forebay will have a potential measurable impact on your groundwater supply. However, PG&E cannot obtain the Well Completion Reports filed with the DWR without written landowner authorization. PG&E is requesting your assistance by authorizing DWR to release Well Completion Reports filed for groundwater wells on your property.

Data provided in these Well Completion Reports will be used to characterize the different geologic formations that have an effect on groundwater flow. PG&E will use the well data to enhance our understanding of the local geology and groundwater hydrology in our investigation of the potential relationship between the forebay and groundwater wells.

Please complete the attached DWR form to the best of your ability. Please sign the form in the space labeled "Owner's Signature Authorizing Release" (bottom right-hand corner) and the space labeled "Signature" (bottom left hand corner). Please return the completed form to us in the enclosed self-addressed stamped envelope by Friday May 13, 2008.

We appreciate your support as we move forward in this process. Please do not hesitate to contact me at 415-973-4731 if you have any questions or concerns related to this request.

Sincerely,

Stacy Evans
Project Manager- Kilarc Cow Creek Decommissioning

First	Middle	Last	Address	City	State	Zip	Account #	Telephone #
Lucille	T	Lansing	50 Covered Bridge Road	Carmichael	CA	95608		510.649.1377
Kim		Wroe	13511 Fern Road	Whitmore	CA	96096		
Lyle	T	Wroe	13511 Fern Road	Whitmore	CA	96096		530.472.3647
Lorin	P	Neel	15482 Fern Road	Whitmore	CA	96096		530.474.3889
Ron		Burrows	13353 Fern Road	Whitmore	CA	96096		530.472.1519
							4059680160	
Barbara		Arnold	Fern Road East	Whitmore	CA	96096	4018012453	530.472.1645
Judith	B	Arnold	29479 Oak Hollow Lane	Whitmore	CA	96096	8143012189	530.472.1428
Renee		Arnold	30472 Boggs Lane	Whitmore	CA	96096	7834925113	530.365.3338
							4059680160	
Roger		Arnold	Fern Road East	Whitmore	CA	96096	4018012453	530.472.1645
William	S	Arnold	29479 Oak Hollow Lane	Whitmore	CA	96096	8143012189	530.472.1428
Tom		Kamp	31931 Miller Mountain Rd	Whitmore	CA	96096		

Attachment P

Concurrence letter from the California State Historic Preservation Officer

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov

November 4, 2008

In Reply Refer To: FERC050822A/FERC080922A

Stacy Evans
PG&E Project Manager
245 Market Street
P.O. Box 770000
San Francisco, CA 94117

Re: Determination of Eligibility and Finding of Effect for the Kilarc-Cow Creek Hydroelectric Decommissioning Project (FERC No. 606)

Dear Ms. Evans:

You are continuing consultation with me regarding the above referenced project in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f) as amended and its implementing regulations codified at 36 CFR 800. Pacific Gas and Electric (PG&E) has been delegated authority to complete Section 106 responsibilities for the Federal Energy Regulatory Commission (FERC). PG&E consulted with my office in March of 2008 and has determined that the decommissioning of the Kilarc-Cow Creek system involves properties that are eligible for the National Register of Historic Places (NRHP). Your recent letter (received in this office (6 October 2008) requests my concurrence with the following items:

1) the Kilarc and Cow Creek Powerhouses are eligible to the NRHP ,
2) the Kilarc and Cow Creek hydroelectric systems (canals, bridges, dams, flumes, siphons, tunnels, spillways berms, forebays and penstocks) are not eligible individually or as components of historic districts due to their lack of integrity,
3) the avoidance of the five unevaluated prehistoric sites is appropriate for the purposes of decommissioning the systems,

To support these findings, you have submitted a report entitled *Cultural Resources Inventory and Evaluation for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606, Shasta County, California*. Based on the documentation you have provided, I have the following comments:

- I concur with PG&E's determination of eligibility for the Kilarc and Cow Creek Powerhouses.
- I concur that the hydroelectric systems are not eligible individually or as components of historic districts.
- I agree that the avoidance of the five unevaluated sites is appropriate

Further, PG&E has determined that the decommissioning of these systems constitutes an "adverse effect" and proposes to draft a Memorandum of Agreement (MOA) to mitigate these effects. I concur with this finding and agree that an MOA is the appropriate document.

I look forward to working with your staff to draft the MOA and addressing the effects of decommissioning activities. If you have any questions, please contact Cheryl Foster-Curley of my staff at (916) 653-9019, or email at ccurley@parks.ca.gov.

Sincerely,

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Attachment Q
Letter from BIA to PG&E on July 10, 2009

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Northern California Agency
1900 Churn Creek Road, Suite 300
Redding, California 96002-0292

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
Natural Resources

JUL 10 2009

HYDRO LICENSING
ORIG.
CC:
JUL 15 2009
FERC NO.
TRACK NO.
FILE NO.
ACTION:

Charles White
Project Manager – Power Generation,
Pacific Gas and Electric Company
MC N11C, P.O. Box 770000
San Francisco, CA 94177

Dear Mr. White:

This correspondence is regarding the Memorandum of Agreement (MOA) for the Decommissioning of the Kilarc-Cow Creek Hydroelectric Project (FERC License No. 606), and the license surrender application.

The MOA indicates the surrender of FERC License No. 606 would result in the decommissioning of the Project facilities, including the Kilarc and Cow Creek Powerhouses (Powerhouses), penstock, water conveyance canals, diversion dams, flumes, forebays and other ancillary buildings/structures within the project area. The MOA further states the final disposition as decommissioning the Powerhouses, removal of the interior generation equipment, but the exterior structure would be secured and left in place.

Beyond the interior of the powerhouses, there is no definition of the exterior structures to be secured and left in place. In our opinion the exterior structure of the powerhouse does not include the penstock crossing Indian trust land. In our March 21, 2008, letter we listed two viable options; 1) PG&E purchases the land in the easement, or 2) PG&E removes the pipe and restore the land to pre-permit conditions.

With the clarification of the exterior structure, or the disposition of the penstock, we would be more inclined to become party to the MOA.

If you have any questions, please contact Rebecca Wasson, Natural Resources Officer, (530) 246-5141, Ext. 14, or me at Ext. 31.

Sincerely,

Dr. Virgil Akins,
Superintendent

Attachment R

PG&E issued solicitations of interest to all Interested Parties on March 10, 2008

Pacific Gas and Electric Company

Power Generation

245 Market Street
San Francisco, CA 94105

Mailing Address
Mail Code N11C
P.O. Box 770000
San Francisco, CA 94117

March 10, 2008

Subject: Kilarc-Cow Creek Hydroelectric Project (FERC No. 606)
Solicitation of Interest for Ownership and Management of Kilarc Powerhouse and Adjacent Land for Public Use

To Interested Parties,

Pacific Gas and Electric Company (PG&E), the Licensee for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project), is applying to the Federal Energy Regulatory Commission to surrender the license for this Project. As part of the surrender process, PG&E proposes to decommission and remove the Project works as discussed in the Preliminary Proposed Decommissioning Plan (Preliminary Plan) issued by PG&E on September 10, 2007. In the development of the Preliminary Plan, local community members expressed concerns that the Kilarc Powerhouse would be decommissioned. PG&E would support transferring the Kilarc Powerhouse and adjacent lands to another entity for public use, which would be recreational or historical in nature. However, it is PG&E's intention to work within the requirements of its Land Conservation Commitment to permanently protect specific watershed lands through donation of conservation easements and/or fee interests in such lands to qualified entities. Although others may be considered, we would expect that any entity proposed to take over the Kilarc Powerhouse and adjacent lands to be a State or Federal agency, local government, or nonprofit group that has the demonstrated capacity and capability of owning and managing the facility for a recreational/ historical public use.

PG&E has prepared a guidance document to assist organizations potentially interested in owning and managing Kilarc Powerhouse and adjacent lands. The document, entitled "Requirements for Acquiring, Owning and Managing Kilarc Powerhouse and Adjacent Land," is attached. It evaluates the requirements and obligations associated with such an undertaking, and discusses the issues that would need to be addressed by a prospective owner/operator.

Solicitation of Interest

With this letter, PG&E is soliciting statements of interest in owning, managing, and operating Kilarc Powerhouse and adjacent land for a recreational/ historical public use[1]. Qualified organizations must have the capability to maintain and operate the facilities, as well as the

[1] Kilarc Powerhouse for generation purposes will not be considered under this solicitation. PG&E has no authority to authorize continued operation of Project facilities for power generation.

capability to obtain the necessary regulatory and legal approvals for transfer and operation of the facilities. Interested parties are invited to return the attached "Solicitation of Interest Form" **by April 24, 2008.** PG&E will review any Solicitation of Interest forms received, and contact respondents by mail or phone to discuss interests and, if warranted, establish a process for further discussion.

Completed Solicitation of Interest Forms should be mailed (US Postal delivery) to:

Stacy Evans
Pacific Gas and Electric Company
Power Generation
Mail Code N11C
PO Box 770000
San Francisco, CA 94117

Or express mailed (Overnight Delivery) to:

Stacy Evans
Pacific Gas and Electric Company
Power Generation
245 Market Street
San Francisco, CA 94105

Sincerely,

Stacy Evans and Steve Nevares
Co-Project Managers– Kilarc-Cow Creek Project

Attachments

Solicitation of Interest Form

Requirements for Acquiring, Owning, Managing Kilarc Powerhouse and Adjacent Land

SOLICITATION OF INTEREST FORM

1. Please provide the following:
   a. Name of organization
   b. Principal contact person
   c. Contact Information: Address, Telephone, Fax, E-mail
   d. Names, roles and contact information for any major teaming partners

2. Please provide an overview of your organization, including legal structure, mission, history, location, accomplishments, and personnel resources. Please provide any supporting documentation in this regard.

3. Briefly describe your organization's experience managing facilities and land for public uses, especially those historical and/or recreational in nature.

4. Briefly describe your organization's experience obtaining environmental and/or regulatory permits, especially your experience working with the California State Historic Preservation office.

5. Briefly describe your organization's experience with facility upgrades for compliance with the American for Disabilities Act, and with seismic retrofits.

6. Briefly describe how your organization proposes to finance the operations and maintenance of the facility and land.

7. Briefly describe your organization's plan to manage the financial and other liabilities associated with operating a facility for public use.

8. Briefly describe your assessment of the key challenges and risks in operating and maintaining Kilarc Powerhouse and adjacent land for recreational/historical public use.

9. Briefly describe what types of support does your approach need for success?

Pacific Gas and Electric Company

Power Generation

245 Market Street
San Francisco, CA 94105

Mailing Address
Mail Code N11C
P.O. Box 770000
San Francisco, CA 94117

March 10, 2008

Subject: Kilarc-Cow Creek Hydroelectric Project (FERC No. 606)
Solicitation of Interest for Operation of Kilarc Forebay as a Recreation Facility

To Interested Parties,

Pacific Gas and Electric Company (PG&E), the Licensee for the Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project), is applying to the Federal Energy Regulatory Commission to surrender the license for this Project. As part of the surrender process, PG&E proposes to decommission and remove the Project works as discussed in the Preliminary Proposed Decommissioning Plan (Preliminary Plan) issued by PG&E on September 10, 2007. In the development of the Preliminary Plan, local community members expressed concerns that the proposed removal of Project works included the decommissioning of Kilarc Forebay. It was suggested by local community members that another entity could potentially take over the recreational facilities at Kilarc Forebay. PG&E is not opposed to the transferring to another entity the facilities necessary to continue operation of Kilarc Forebay as a recreational facility. However, it is PG&E's intention to work within the requirements of its Land Conservation Commitment to permanently protect specific watershed lands through donation of conservation easements and/or fee interests in such lands to qualified entities. Although others may be considered, we would expect that any entity proposed to take over the Kilarc Forebay recreational facilities be a State or Federal agency, local government, or nonprofit group that has the demonstrated capacity and capability to continue operations of Kilarc Forebay for recreational purposes.

PG&E has prepared a guidance document to assist organizations potentially interested in owning, managing and operating the recreational facilities at Kilarc Forebay. The document, entitled "Information for Operation of Kilarc Forebay as a Recreation Facility," is attached. It evaluates the requirements and obligations associated with such an undertaking and discusses the issues that would need to be addressed by a prospective recreation owner/operator.

Solicitation of Interest

With this letter, PG&E is soliciting statements of interest in owning, managing, and operating the facilities necessary to continue operation of Kilarc Forebay as a recreational facility[1]. Qualified

[1] Interest in continued operation of Kilarc Forebay for generation purposes will not be considered under this solicitation. PG&E has no authority to authorize continued operation of Project facilities for power generation.

organizations must have the capability to maintain and operate the facilities, as well as the capability to obtain the necessary regulatory and legal approvals for transfer and operation of the facilities. Interested parties are invited to return the attached "Solicitation of Interest Form" **by April 24, 2008.** PG&E will review any Solicitation of Interest forms received, and contact respondents by mail or phone to discuss interests and, if warranted, establish a process for further discussion.

Completed Solicitation of Interest Forms should be mailed (US Postal delivery) to:

Stacy Evans
Pacific Gas and Electric Company
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Mail Code N11C
PO Box 770000
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Or express mailed (Overnight Delivery) to:

Stacy Evans
Pacific Gas and Electric Company
Power Generation
245 Market Street
San Francisco, CA 94105

Sincerely,

Stacy Evans and Steve Nevares
Co-Project Managers– Kilarc-Cow Creek Project

Attachments

Solicitation of Interest Form

Information for Operation of Kilarc Forebay as a Recreation Facility

SOLICITATION OF INTEREST FORM

1. Please provide the following:
   a. Name of organization
   b. Principal contact person
   c. Contact Information: Address, Telephone, Fax, E-mail
   d. Names, roles and contact information for any major teaming partners

2. Please provide an overview of your organization, including legal structure, mission, history, location, accomplishments, and personnel resources. Please provide any supporting documentation in this regard.

3. Briefly describe your organization's experience managing recreation facilities.

4. Briefly describe your organization's experience operating and maintaining water conveyance facilities.

5. Briefly describe your organization's experience obtaining environmental and/or regulatory permits.

6. Briefly describe how your organization proposes to finance the operations and maintenance of the facility.

7. Briefly describe your organization's plan to manage the financial and other liabilities associated with operating a public recreation facility.

8. Briefly describe your assessment of the key challenges and risks in operating and maintaining Kilarc Forebay for public recreation purposes.

9. Briefly describe what types of support your approach needs for success.

Attachment S
PG&E guidance document

PACIFIC GAS AND ELECTRIC COMPANY

Kilarc-Cow Creek Hydroelectric Project
FERC Project No. 606

REQUIREMENTS FOR ACQUIRING, OWNING AND MANAGING KILARC POWERHOUSE AND ADJACENT LAND

March 10, 2008

REQUIREMENTS FOR ACQUIRING, OWNING AND MANAGING KILARC POWERHOUSE AND ADJACENT LAND

TABLE OF CONTENTS

Section 1.0 Introduction

Pacific Gas and Electric Company (PG&E) is the owner and operator of the federally-licensed Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project). PG&E began to relicense the Project in 2002. During the process of relicensing, PG&E identified issues associated with resource protection and upgrades that would be required for continued operation of the facilities. Evaluation of the costs of operating the Project under a new license with anticipated conditions showed that the likely cost of providing the necessary level of protection, mitigation, and enhancement of the resources affected by the Project would outweigh the economic benefit of generation at the Project over the life of the new license. After discussions with resource agencies, PG&E made the decision not to file for a new license to operate the Project. After the decision was made the Federal Energy Regulatory Commission (FERC) allowed for interested parties to file for a new license for the Project, however no entity filed for the license in the timeframe allowed. Consequently, FERC ordered PG&E to develop a Surrender Application, which includes a decommissioning plan. In development of PG&E's decommissioning plan, several local community members expressed concerns that the Kilarc Powerhouse would be decommissioned. It was suggested that another entity could perhaps take over the facility for future public use. In support of PG&E's Land Conservation Commitment to permanently protect watershed lands through donation of conservation easements and/or fee interests in the lands, PG&E would support a donation of the land facility to a State or Federal agency, local government, or nonprofit group that has demonstrated capacity and capability to maintain the facility for a recreational/historical public use.

PG&E has prepared this document to assist entities potentially interested in acquiring, owning and managing the Kilarc Powerhouse and adjacent land for future public use, which would be recreational or historical in nature, to evaluate the opportunities, requirements and obligations associated with such an undertaking. Information is provided on maintenance of essential facilities, required land transfers, institutional obligations, and potential permits and upgrades that may be needed.

This document reflects PG&E's current understanding of the issues that would need to be addressed to modify Kilarc Powerhouse and adjacent land for public use. Additional issues to those identified herein may arise in the course of transferring the Kilarc Powerhouse and adjacent land to another entity for recreational or historical purposes and additional requirements could be applicable. Those entities interested in owning Kilarc Powerhouse and adjacent land are advised to conduct their own due diligence, including consulting with the various agencies of jurisdiction as to the applicable regulations and requirements.

1.1 Project Description

The Project, which includes Kilarc Powerhouse, is located in Shasta County approximately 30 miles east of Redding near the community of Whitmore. The Project consists of two separate developments; one on South Cow Creek (Cow Creek Development), and one on Old Cow Creek

(Kilarc Development). Each development has a series of diversions from streams, a canal system, access roads, forebay, powerhouse with electric generators, tail race, switchyard, and a short transmission line connecting the powerhouses to the power grid.

Kilarc Powerhouse and Adjacent Land – The Kilarc Powerhouse was constructed in 1904, and is a two story, rubble masonry wall buildings with a corrugated metal roof. Inside the powerhouse are two turbines and generators as well as other electrical equipment.

On the same parcel as the Kilarc Powerhouse, adjacent to the northeast portion of the building, is the Kilarc switchyard, a small paved parking area, and an unpaved parking area. To the southwest of the Kilarc Powerhouse is a level grassy lawn that affords direct access to Old Cow Creek that the public currently informally uses for picnicking and fishing access. PG&E would retain and continue to operate the switchyard, which would require the property parcel to be split. The Kilarc Powerhouse and adjacent land to the southeast could be operated and maintained for public use. These facilities could have several future public uses, such as: utilizing Kilarc Powerhouse as a museum, formalize the use of the level grassy area as a picnic site, and access to Old Cow Creek for recreational fishing.

Photograph 1.1-1a Kilarc Powerhouse and Adjacent Land

Section 2.0 Considerations and Operation Issues

After Project decommissioning, Kilarc Powerhouse will not be operated by PG&E or any other entity for power generation. If another entity were interested in the future ownership of Kilarc Powerhouse and adjacent land for public use, PG&E would be supportive, so long as all regulatory and legal requirements were met, the facilities were adequately maintained, and PG&E retained no future legal, financial, or other obligations. PG&E would be willing to meet with interested entities to discuss their interest in future ownership of this site for public recreational and/or historical use.

PG&E has identified the following issues that may need to be addressed by a prospective owner. However, as mentioned previously, PG&E cannot anticipate all of the potential issues involved in seeking to operate Kilarc Powerhouse as a recreational facility. Consequently, this list is not intended to be exclusive, exhaustive, or definitive.

- Identify a future use of the Powerhouse that would be compatible with PG&E's continued use of the adjacent switchyard;
- Parcel Split will be required;
- Upgrade to meet seismic retrofit requirements;
- Upgrade to meet ADA requirements for public recreational use;
- Assume liability for future operation and maintenance as a recreational facility and for public use;
- Obtain FERC, CPUC, and other regulatory approvals that may be necessary.

2.1 Land Transfers and Access

PG&E owns the land around the Kilarc Powerhouse. For future ownership of the Kilarc Powerhouse and adjacent land (excluding the portion of the parcel on which the switchyard is located), a portion of the PG&E-owned lands would need to be acquired by the interested entity for public use. The transfer of utility facilities is subject to certain regulatory and legal requirements, as discussed in Section 2.2 below.

2.2 Involvement/Approval of Other Entities

Project Agreement for Kilarc Cow Creek Hydroelectric Project – Future public use of the Kilarc Powerhouse and surrounding area would support the Project Agreement, by preserving the historical, architectural and cultural value of the Kilarc Powerhouse, and/or support public recreation opportunities. When PG&E was considering decommissioning as an alternative to relicensing the Project, it consulted with State and Federal resource agencies and environmental groups to determine the expectations of those parties regarding decommissioning. The

consultation resulted in the Project Agreement[1], which identifies the parameters of decommissioning the parameters of decommissioning.

Federal Energy Regulatory Commission – Since the Kilarc Powerhouse is part of a project licensed by FERC under the Federal Power Act, the disposition of Project facilities, including Kilarc Powerhouse and the adjacent land, would require FERC's approval and would be subject to evaluation under the National Environmental Policy Act. If the facilities are to be transferred to another entity, during the decommissioning process, PG&E would need to include this proposal in the Surrender Application for FERC's consideration.

California Public Utilities Commission (CPUC) – In some cases, the CPUC has authority over the disposition or encumbrance of utility lands and facilities. Proposed transactions may need to be submitted to the CPUC for approval under Section 851 of the Public Utilities Code. Under that statute, the CPUC has an approval process for certain asset transfers. The method for seeking CPUC approval depends in part on the value of the land or asset to be transferred. Depending on the intended use of the property, CEQA review and approval by the CPUC may be required.

State Historic Preservation Office – Mitigation conditions established in the License Surrender Application, such as consultation with the State Historic Preservation Office and FERC under Section 106 of the National Historic Preservation Act, will also guide future use for the site. This consultation with the SHPO could include ensuring that any rehabilitation or modification of the Kilarc Powerhouse in preparation for its use as a historic site or as a recreational facility is conducted in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. An agreement (PA or MOA) between FERC, PGE, the future property owner, and SHPO could be established as part of the License Surrender Application, where the responsibilities and schedule are provided as to the future of the powerhouse.

2.3 Required Facilities

Kilarc Powerhouse and Adjacent Land – In order to make the facility suitable for public use, the following activities and modifications may need to be made depending on the specific proposed uses of the Powerhouse and the adjacent land: site planning to create a more suitable parking area; construction of public restrooms; improvements to the site and building in compliance with the Americans with Disabilities Act; and seismic retrofitting of the Powerhouse to a level necessary for public use.

Recreation Facility Maintenance – Maintenance of Kilarc Powerhouse and adjacent land should be comparable to other facilities of this size. Generally, maintenance and operations would include landscaping, janitorial work, and snow removal, as well as other basic maintenance needs including repairing sprinkler system, fencing repairs, painting, pest control, roof repairs, window and door servicing, and plumbing repairs.

[1] Parties to the Project Agreement are PG&E, U.S. Fish and Wildlife Service, California Department of Fish and Game, National Park Service, California State Water Resources Control Board, National Marine Fisheries Service, Friends of the River, and Trout Unlimited.

2.4 Potential Liabilities Associated with Kilarc Powerhouse Recreation Operations

The potential liabilities associated with the retention of Kilarc Powerhouse and adjacent land for public use include the potential for personal injury associated with public use. All electrical generation equipment in the powerhouse will be de-energized as a part of the decommissioning plan.

2.5 Transfer and Upgrade Costs

In addition to the maintenance costs, there are other costs associated with the transfer and permitting of Kilarc Powerhouse and adjacent land for future public use including seismic retrofit, ADA requirements. Conditions established in the Surrender Application, such as consultation with the State Historic Preservation Office and FERC under Section 106 of the National Historic Preservation Act, and the California Environmental Quality Act (CEQA) may also apply to the transfer and upgrades, which could potentially require additional costs.

PG&E has not estimated what the transfer and upgrade costs would be at this time.

Section 3.0 Summary

PG&E supports the potential acquisition, ownership and management by an outside entity of the Kilarc Powerhouse and adjacent land for public use. The transfer of facilities would need to be approved by FERC, the CPUC, and other State and Federal agencies as part of standard permitting processes for management of these facilities for a new use.

If the approvals are obtained for transfer of the Project facilities and lands, the prospective owner would need to assume all liability for the Project, including personal injury and accidental death. The future owner would need to work with PG&E to obtain land rights and necessary parcel divisions and assume fiscal responsibility for the facilities.

PG&E is available to discuss with interested parties the transfer of the Kilarc Powerhouse and adjacent lands. .

Interested parties should contact Stacy Evans, PG&E's Project Manager at 415-973-4731.

PACIFIC GAS AND ELECTRIC COMPANY

Kilarc-Cow Creek Hydroelectric Project

FERC Project No. 606

INFORMATION FOR OPERATION OF KILARC FOREBAY AS A RECREATION FACILITY

December 20, 2007

INFORMATION FOR OPERATION OF KILARC FOREBAY AS A RECREATION FACILITY

TABLE OF CONTENTS

Section 1.0 Introduction

Pacific Gas and Electric Company (PG&E) is the owner and operator of the federally-licensed Kilarc-Cow Creek Hydroelectric Project, FERC No. 606 (Project). PG&E began to relicense the Project in 2002. During the process of relicensing, PG&E identified issues associated with resource protection and upgrades that would be required for continued operation of the facilities. Evaluation of the costs of operating the Project under a new license with anticipated conditions showed that the likely cost of providing the necessary level of protection, mitigation, and enhancement for the resources affected by the Project would outweigh the economic benefit of generation at the Project over the life of a new license. After discussions with resource agencies, PG&E made the decision to not file for a new license to operate the Kilarc-Cow Creek Hydroelectric Project. After the decision was made, the Federal Energy Regulatory Commission (FERC) allowed for interested parties to file for a new license for FERC Project 606, however no entity filed for the license in the timeframe allowed. FERC ordered PG&E to develop a Surrender Application which includes a decommissioning plan. In development of PG&E's decommissioning plan, concerns were expressed that decommissioning the Project included the decommissioning of Kilarc Forebay. It was suggested that another entity could take over the operations and maintenance required to continue use of the recreational facilities at Kilarc Forebay. PG&E would not oppose the transfer of these facilities to a State or Federal agency, local government or nonprofit group that has the capability to continue operations of Kilarc Forebay for recreational purposes if approved by FERC, California Public Utilities Commission (CPUC) and other relevant State and Federal agencies.

PG&E has prepared this report to assist entities potentially interested in managing and operating the recreational facilities at Kilarc Forebay to evaluate the requirements and obligations associated with such an undertaking. Information is provided on operations and maintenance of essential facilities, required land transfers and easements, institutional obligations, necessary permits and potential upgrades needed for continued operations at Kilarc Forebay.

This document reflects PG&E's current understanding of the issues that would need to be addressed to retain Kilarc Forebay as a recreational facility. It is intended to provide a general overview of the issues, but is not an exhaustive study. Additional issues to those identified herein may arise in the course of transferring the Kilarc Forebay and associated facilities to another entity for recreation purposes and additional requirements could be applicable. Those entities interested in operating Kilarc Forebay as a recreational facility are advised to conduct their own due diligence, including consulting with the various agencies of jurisdiction as to the applicable regulations and requirements.

1.1 Project Description

The Kilarc-Cow Creek Project, which includes Kilarc Forebay, is located in Shasta County approximately 30 miles east of Redding near the community of Whitmore. The Project consists of two separate developments; one on South Cow Creek (Cow Creek Development), and one on Old Cow Creek (Kilarc Development). Each development has a series of diversions from

streams, a canal system, access roads, forebay, powerhouse with electrical generators, tail race, switchyard, and a short transmission line connecting the powerhouses to the power grid. The combined generation capacity of the two developments is less than 5 megawatts. To operate Kilarc Forebay as a recreational facility, the new recreational operator would need to operate and maintain the following facilities: Kilarc Diversion on Old Cow Creek, Kilarc Main Canal, Kilarc Forebay, and the Forebay dam, spillway and spill channel.

Recreational Facilities at Kilarc Forebay - As part of the FERC Project license, PG&E constructed and maintains day use recreation facilities at Kilarc Forebay. These facilities include two picnic areas on the northeastern side which can be used year-round. The eastern-most facility includes eight picnic tables, four barbecue pedestals, two vault toilets and a parking area. The second picnic facility is a first-come, first-serve group area. It also includes a parking area, eight picnic tables and four barbecue pedestals. A short trail provides direct access to the toilets at the eastern picnic area from the group area. A footbridge was constructed across the entrance of the Kilarc Main Canal to provide access to the Forebay. A trail around the Forebay provides access for fishing. Camping, boating and swimming are currently prohibited at the Forebay. Additional information on recreational use of Kilarc Forebay can be found in the Recreational Resources report published on the Project website (www.kilarccowcreek.com).

Kilarc Forebay Operations - Kilarc Forebay was constructed in 1902 and is situated on a flat plateau at the west end of a spur from Miller Mountain. It has a surface area of 4.5 acres and a volume capacity of 30 acre feet. The Kilarc Diversion Dam diverts water in the upstream reaches of Old Cow Creek into the Kilarc Main Canal. The Kilarc Main Canal conveys the water to the Forebay where it passes through an intake structure into the penstock. In the penstock, water drops approximately 1,200 feet to the powerhouse, and then is released through the tail race to Old Cow Creek. The Kilarc Forebay has an overflow spillway that during periods of high flows drops water over the Forebay dam, down the spill channel and into Old Cow Creek. Photos of the Project facilities are included in Appendix A.

Kilarc Main Canal Diversion Dam - The water in the main canal is diverted from the Old Cow Creek drainage and no other water source is available to the Forebay. The Kilarc Main Canal Diversion Dam is a concrete structure, 83-ft long**,** 8-ft high and has a crest elevation of 3,814 ft.

Kilarc Main Canal - The Kilarc Main Canal delivers the water from the Kilarc diversion on Old Cow Creek to the Forebay. The Kilarc Main Canal was constructed in 1903-1904. It has a total length of 3.65 miles with a capacity of 52 cfs and an average grade of .00021. The conduit consists of 2.03 miles of canal, 1.44 miles of a 5.5-ft by 3-ft flume, and 0.18 miles of a 6-ft by 7-ft wood-lined tunnel. The canal route travels around hills and along slopes and at times it is perched on the side of steep slopes.

Kilarc Forebay Dam - Kilarc Forebay is created by Kilarc Forebay Dam. The dam is earth filled and has a maximum height of 13 ft. The maximum base width is 43 ft and the dam's crest length is 1,419 ft at 3,782 ft elevation.

Kilarc Forebay Spillway and Spill Channel - Under high flow conditions, the water delivered to the Forebay is designed to pass over the spillway and return to Old Cow Creek via the

spillway channel rather than through the penstock. The spillway is 10 ft wide and 3 ft deep and has a rated capacity of 50 cfs. The spillway empties into the spill channel.

Access Roads - Access roads to the Kilarc Development Facilities are gravel roads that cross private lands as well as PG&E lands. Kilarc Forebay is reached by a two lane gravel road. The Kilarc Main Canal Diversion Dam and portions of the waterways are reached by single lane roads. The canal has an unimproved road along the edge of the canal. The roads include culverts and bridges at water crossings.

Section 2.0 Considerations and Operation Issues

After Project decommissioning, Kilarc Forebay will not be operated by PG&E as a recreation resource. If another entity is interested in taking responsibility for the operations of Kilarc Forebay for public recreation purposes, PG&E would not be opposed, so long as all regulatory and legal commitments are met to operate and maintain the required facilities, and PG&E retained no future obligation. If these requirements are met, PG&E anticipates the signatories of the Project Agreement (discussed below in Section 2.3) would concur with operation of Kilarc Forebay as a recreation facility. PG&E would be willing to meet with interested entities to discuss their interest and assist them in understanding the operation and maintenance activities that would be necessary based on our knowledge to continue to support recreational use of Kilarc Forebay.

PG&E has identified the following issues that may need to be addressed by a prospective recreation operator. However, as mentioned previously, PG&E cannot anticipate all of the potential issues involved in seeking to retain Kilarc Forebay as a recreational facility. Consequently, this list is not intended to be exclusive, exhaustive, or definitive. Those entities interested in operating Kilarc Forebay as a recreational facility are advised to conduct their own due diligence, including consulting with the various State, Federal and local governmental agencies of jurisdiction as to the applicable regulations and requirements.

- Upgrade the Kilarc Main Canal Diversion Dam to address regulatory and environmental requirements,
- Obtain land rights or easements for public access across private lands,
- Obtain easements from private landowners for operations and maintenance for Kilarc Diversion and canals,
- Obtain necessary permits for operating and upgrading the Kilarc Main Canal Diversion,
- Complete studies and obtain approval from necessary parties on flows to be diverted to Kilarc Forebay to maintain as recreation facility,
- Obtain water rights for the operations of Kilarc Forebay as a recreation facility,
- Assume liability for future operation and maintenance as a recreational facility and liability for public use, and
- Obtain FERC, CPUC, and other regulatory approvals that may be necessary.

2.1 Land Transfers and Access

PG&E owns the lands around the Project facilities and along the Project canals. PG&E has acquired rights and easements from private landowners to access the Project facilities and

spillways. For continued operation and maintenance of Kilarc Forebay as a recreational facility, the PG&E-owned lands would need to be acquired and the acquiring entity would need to secure from private landowners the right to cross private land to access the facilities for operation, maintenance, and public use of the Kilarc Forebay recreational facilities. The public is currently permitted to access the Kilarc Forebay for recreational use in conjunction with PG&E's FERC license. This right of public access will otherwise cease with PG&E's decommissioning of the Project. The transfer of utility facilities for recreation purposes would need to be approved by FERC in the decommissioning process since the facilities are part of the federally-approved project. The potential applicability of Section 851 of the California Public Utilities Code would need to be considered in advance of any transfer of lands or facilities. If applicable, Section 851 would require CPUC approval in advance of the transfer.

2.2 Water Rights

PG&E has an adjudicated non-consumptive water right to divert 52 cfs at the Kilarc Main Canal Diversion Dam for power production. Any prospective recreational operator would need to secure water rights to preserve the Forebay, either by arranging for the transfer of a portion of PG&E's existing water rights or by obtaining a new non-consumptive water right. A permit from the State Water Resources Control Board (SWRCB) would be required to obtain a new non-consumptive water right. In Old Cow Creek, the process here would include a few extra steps. The Cow Creek basin, including Old Cow Creek, has been declared fully appropriated and also was subject to formal court adjudication in 1969. For a new water right, the prospective recreational operator would need to petition the SWRCB for an exemption to the fully appropriated stream designation. If successful, then the applicant's application would be accepted by the SWRCB. The SWRCB would then review the application and determine whether or not to issue a permit to allow water to be diverted. If a new water right is granted, it would be junior to all other adjudicated users and could not harm existing senior water users. If the prospective recreation operator arranges for a transfer of PG&E's existing water rights to support the Forebay, the adjudicating court, in this case the Shasta County Superior Court, would need to approve the transfer. Reopening the adjudication would likely be time consuming and resource-intensive.

The issuance of new water rights permits or a change in an existing permit by the SWRCB is a discretionary action, subject to California Environmental Quality Act (CEQA) review.

2.3 Involvement/Approval of Other Entities

Project Agreement for Kilarc Cow Creek Hydroelectric Project - When PG&E was considering decommissioning as an alternative to relicensing the Project, it consulted with State and Federal resource agencies and environmental groups to determine the expectations of those parties regarding decommissioning. The consultation resulted in the Project Agreement[1]. The

[1] Parties to the Project Agreement are PG&E, U.S. Fish and Wildlife Service, California Department of Fish and Game, National Parks Service, California State Water Resources Control Board, National Marine Fisheries Service, Friends of the River, and Trout Unlimited.

Project Agreement identifies the parameters of decommissioning. Continued operation of Kilarc Forebay as a recreational facility was not contemplated by the parties to the Project Agreement. If all of the regulatory and legal requirements were met, PG&E anticipates the signatories of the Project Agreement would concur with operation of Kilarc Forebay as a recreation facility.

Federal Energy Regulatory Commission - Since the Kilarc Forebay is part of a project licensed under the Federal Power Act by FERC, the disposition of project facilities, including the Project's current recreation facilities, requires FERC's approval. As part of the Surrender Application required by the FERC, the proposed disposition of the recreational facilities, including the Forebay would need to be identified. If the facilities are to be transferred to another entity for operation as a recreational facility, PG&E would need to include this proposal in the Surrender Application for FERC's consideration.

California Public Utilities Commission - In some cases, CPUC has authority over the disposition or encumbrance of utility lands and facilities. Proposed transactions may need to be submitted to the CPUC for approval under Section 851 of the Public Utilities Code. Under that statute, the CPUC has an approval process for certain asset transfers. The method for seeking CPUC approval depends in part on the value of the land or asset to be transferred. Depending on the intended use of the property, CEQA review and approval by the CPUC may be required.

2.4 Required Facilities

Kilarc Main Canal Diversion - The quality of the recreational fishing at Kilarc Forebay depends on the water diverted from Old Cow Creek drainage. No other water source is available to the Forebay. A diversion of 5 cfs may provide sufficient water to support a recreational fishery in the Forebay[2]. At this flow rate, much of the water previously diverted would remain in Old Cow Creek. The recreational operator would need to obtain water rights for the diversion of water at the Kilarc Main Canal diversion. This process is discussed in Section 2.3. The diversion would also be subject to mandatory bypass flows to provide specific instream flows downstream of the diversion. Even though the amount of water diverted would be less than what PG&E was diverting, and more water will be bypassed at the facility, the new instream flows may constrain diversion operations in dry periods. As part of the water rights process, the recreational operator would work with California Department of Fish and Game (DFG), National Marine Fisheries Service (NMFS), SWRCB and potentially others to establish new instream flows.

The Kilarc Main Canal Diversion Dam is currently a barrier to fish passage. It is anticipated that the diversion would need to be upgraded to include a fish ladder to provide passage for resident fish. The diversion may also require screens to prevent fish from being entrained in the flow. The size of the fish screens would be related to the amount of water diverted. The configuration and design of the fish protection facilities would be developed in consultation with DFG.

[2] The estimate of a 5cfs diversion rate to support recreational values and provide habitat for rainbow trout in Kilarc Forebay would need to be verified by water temperature modeling and further study.

PG&E anticipates that to upgrade the Kilarc Diversion to meet current environmental standards, it would be necessary to obtain:

(1) a Streambed Alteration Agreement with the DFG;

(2) water rights for water diversion and storage from the SWRCB and potentially need approval by the adjudication court;

(3) an Army Corps of Engineers permit, pursuant to Section 404 of the Clean Water Act; and

(4) a certification from the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act.

These actions require environmental review under the CEQA for DFG, SWRCB, and RWQCB and under the National Environmental Policy Act (NEPA) for the Army Corps of Engineers.

Kilarc Main Canal - The Kilarc Main Canal delivers the water from the Kilarc diversion to the Forebay. The Kilarc Main Canal has a total length of 3.65 miles. The canal route travels around hills and along slopes and at times it is perched on the side slopes. One of the most important issues of canal operations is to ensure that the canal does not overtop or breach and release water down a hillside. Water spilling out of the canal could cause serious erosion and could destabilize the canal resulting in canal failure. Rocks and trees occasionally fall into the canal, blocking the waterway. PG&E monitors the water level in the canal 24 hours a day, 7 days a week. By comparing the levels at the upstream end of the canal with the downstream end, PG&E can determine if the water is travelling through the canal correctly.

The waterways are inspected regularly. The canal, flumes and tunnels are checked weekly to identify if debris has entered the canal, if the structure has developed any cracks or if the flumes and flume supports are intact. Occasionally land slides can block portions of the canal or create unstable conditions. Once a year, the canal system is drained, cleaned and thoroughly inspected. Maintenance and monitoring of the canal is critical to prevent it from breaching and/or sliding downhill.

Kilarc Forebay - Kilarc Forebay itself requires periodic cleaning and dredging. Dredging would be required less frequently if the diversion rate is reduced to 5 cfs, as the lower flows would transport less sediment. However if the canal were not cleaned regularly, the sediment load to the Forebay could be similar to or greater than that experienced under current operations. Approximately every 30 years, the Forebay requires dredging. DFG currently stocks catchable rainbow trout to support the recreational fishery, and for the Forebay to continue to support recreational fishing, fish would need to be stocked regularly from the DFG or a private hatchery.

Kilarc Forebay Dam - Kilarc Forebay is created by Kilarc Forebay Dam. After decommissioning, the dam would fall under the regulations of the California Division of Safety of Dams (DSOD). Because of its small size, the dam may not be subject to regular inspection by DSOD. However, to remain sound, the prospective recreational operator would need to inspect

the dam regularly and perform regular repair and maintenance, including periodic clearing of vegetation from the face of the dam.

Kilarc Forebay Spillway and Spill Channel - For power generation, the water passes into the penstock which is located at the other end of the Forebay. For recreation purposes, the spillway is the logical pathway for water to exit Kilarc Forebay. This change in outflow location raises an issue regarding the maintenance of suitable water quality in the Forebay for trout. The spillway is located adjacent to the point where the canal empties into the Forebay. To ensure that the water from the canal circulated through the Forebay, an additional structure may need to be installed. A curtain or wall may need to be placed between the entrance from Kilarc Main Canal and the exit through the spillway. After the water passes into the spillway, the spill channel guides it down into Old Cow Creek. The spill channel needs to be inspected for erosion and blockage from rocks and trees.

Access Roads - There are approximately 9 miles of access road that would need to be maintained to operate and maintain the Project facilities. Approximately 6 miles of one lane gravel roads would need to be maintained for accessing the canal, flumes and the Kilarc Diversion. The 3-mile segment used by the public for accessing Kilarc Forebay is a two lane gravel road. All of the roads require annual grading and vegetation control, as well as roadside cleaning, seasonal culvert maintenance and erosion control measures. The 3-mile segment to Kilarc Forebay requires more maintenance than other roads since it serves the public as well as PG&E and local landowners. Oiling and regraveling of this road occur on an as-needed basis.

Recreation Facility Maintenance - Maintenance of the recreation facilities at the Forebay includes cleaning and repair. Parking lots need to be graded and regraveled as needed. The pathway around the Forebay requires cleaning and smoothing. The vault toilets are cleaned and restocked with supplies weekly. The wooden bridge, picnic table and signs need to be regularly checked for repairs and painting.

2.5 Potential Liabilities Associated with Kilarc Forebay Recreation Operations

The potential liabilities associated with operation of Kilarc Forebay for recreation includes the potential for personal injury associated with public use and a variety of liabilities associated with potential environmental damage. Operation of the waterways is a primary concern for environmental liability from the risk of the canal overtopping and causing substantial erosion and other environmental damage. The Kilarc Main Canal carries the water from the Kilarc Main Canal Diversion to the Forebay, frequently traversing steep hillsides. Water spilling out of the canal could cause serious erosion and result in significant damage to Project features, private property, and natural resources, including sensitive fish and wildlife species.

Section 3.0 Anticipated Costs Based on PG&E Expenditures

3.1 Operation and Maintenance

To provide a reference for estimated operating costs, PG&E has compiled labor, equipment and material costs of operations and maintenance for Kilarc Development based on charges incurred for manpower time over the last five years. A recreational operator's cost or manpower may not be the same as PG&E's. Table 1 represents PG&E's estimated annual effort in annual person hours. A prospective recreational operator would need to demonstrate the financial capacity to support the costs associated with the annual operation and maintenance effort.

Table 1. Maintenance and Operation of Facilities Essential for Recreations Operations

Activity	Estimated Annual Person Hours[A]
General Administration	400
Manage/maintain water gages and water rights reporting	200
Access/ Communication equipment	225
Manage Environmental Operations	40
Maintain Reservoir, Dam and Waterways	225
Maintain Roads and Bridges	450
Maintain Forebay, Dam and Spillway	110
Manage Recreation Facilities	150
Total	1800

[A] PG&E maintains staff to monitor Project operations on a 24 hour basis, 7 days a week. These hours were not included in this table. The proper function of the canals is essential to the Project. The new recreational operator may opt for a different method to satisfy this obligation such as automatic shut off valves or other fail-safe methods.

There are additional maintenance activities that occur on a less frequent basis. These are summarized in the following table (Table 2).

Table 2. Long-Term Maintenance Activities

Activity	Frequency	Estimated Costs[B]
Dredging Forebay	30 years	$200,000
Forebay Dam Maintenance and Berm Repair	10 years	$10,000

[B] Costs are estimated in 2007 dollars.

3.2 Transfer and Upgrade Costs

In addition to the operation and maintenance costs, there are other costs associated with the transfer and permitting of Kilarc Forebay as a recreation facility. To continue operation, as discussed above, the Kilarc Main Canal Diversion would need to be upgraded to meet the current permit requirements for the DFG's Streambed Alteration Agreements (Fish and Game code section 1600). The DFG will likely require that diversion provide safe fish passage upstream and downstream of the facility.

To complete the diversion upgrades, a Section 404 (CWA) permit from the U. S. Army Corps of Engineers (USACE), a Section 401 (CWA) certification and a stormwater control permit from the SWRCB would be necessary. The costs for preparing the application for these permits are included in the Table 3.

An additional category of cost associated with the transfer of facilities is the permit acquisition and the compliance with CEQA and National Environmental Protection Act (NEPA). The transfer and upgrades involve both State and Federal agencies. A joint document could serve to address environmental compliance for both NEPA and CEQA. The exact form of the document would be determined by the public agency or nonprofit that takes over the facilities and the lead agencies for the environmental review. State agencies that could serve as lead agency include CPUC, DFG or the SWRCB. For federal permits, the USACE would be the action agency responsible for NEPA compliance.

Costs for the acquisition of water rights and access agreements or easements to cross private lands have not been estimated. These costs would need to be determined by the public agency or nonprofit group undertaking the acquisition and operation of the Kilarc Forebay and associated facilities.

Other costs associated with the conversion of the Project operations from power production to recreation will likely be encountered as the issues emerge with fuller consideration of the modifications needed to support the new project purpose (recreation) and subsequent refinement of facility operations. One example would be the resolution of the Forebay circulation issue mentioned in Section 2.4. The cost of installing a potential solution, such as a wall or curtain in the Forebay, has not been is included in Table 3 since this potential solution would require further investigation.

Table 3. Potential Transfer and Upgrade Costs

Diversion Upgrades	Potential Cost Range[B]
Fish Ladder and Fish Screen Engineering and Construction	$200,000 to $1,000,000
Additional regulatory costs and permits (including CEQA/ NEPA)	$50,000 to $500,000

[B] Costs are estimated in 2007 dollars.

Section 4.0 Summary

PG&E supports the potential for the Kilarc Forebay to be maintained as a recreation facility with a new owner and operator. The transfer of facilities would also need to be approved by FERC, the CPUC, the signatories to the Project Agreement, and other State and Federal agencies as part of standard permitting processes for operation of these facilities.

If the approvals are obtained for transfer of the Project facilities and lands, the prospective operator would need to assume all liability for the Project, including personal injury and accidental death, potential damage to adjacent private property resulting from public use of the Kilarc Forebay, and potential environmental damage associated with operation and maintenance of all the project facilities and operations that are part of the recreation operations. These include diversion facilities, water conveyance facilities, access roads, forebay, forebay dam, and spill channel. The recreational operator would need to obtain water rights, obtain land rights or easements for access to facilities project located on private property, and assume fiscal responsibility for the upkeep and operation of the facilities.

PG&E is available to discuss with interested parties the transfer of the recreation facilities at the Forebay and the facilities associated with essential operations. PG&E is willing to work with prospective operators to help them understand the scope of activities required to operate project facilities, support the Forebay fishery, and maintain the picnic areas

Interested parties should contact Stacy Evans, PG&E's Project Manager at 415-973-4731 for further information.

Appendix A

Project Facilities at Kilarc Forebay

Photograph A-1. Kilarc Main Canal Diversion from Upstream.

Photograph A-2. Kilarc Main Canal Intake.

Photograph A-3. Kilarc Main Canal Diversion.

Photograph A-4. Flow Release at Kilarc Main Canal Diversion for Bypass Flows.

Photograph A-5. Concrete Lined Section of Kilarc Main Canal.

Photograph A-6. Shotcrete Lines Section of Kilarc Main Canal.

Photograph A-7. Wooden Fume Section of Kilarc Main Canal.

Photograph A-8. Steel Fume of Kilarc Main Canal.

Photograph A-9. Kilarc Forebay Spill Channel.

Photograph A-10. Kilarc Forebay Spill Channel.